U.S. Fish & Wildlife Service

Montezuma National Wildlife Refuge

Comprehensive Conservation Plan

February 2013

Front cover:
Waterfowl Hunter
Dave Menke, USFWS

Greater Yellowlegs at Puddlers Marsh
©Doug Racine

Duck Banding
Bernie Stopper

Refuge Staff Measuring Cedar
USFWS

American Bald Eagle and Blue Heron
©Cathy McCollumn

Child Observing Wildlife
Andrea VanBeusichem, USFWS

Back cover:
Montezuma NWR Visitor Center
©Doug Racine

This blue goose, designed by J.N. "Ding" Darling, has become the symbol of the National Wildlife Refuge System.

The U.S. Fish and Wildlife Service (Service) is the principal Federal agency responsible for conserving, protecting, and enhancing fish, wildlife, plants, and their habitats for the continuing benefit of the American people. The Service manages the National Wildlife Refuge System comprised of over 150 million acres including more than 555 national wildlife refuges and thousands of waterfowl production areas. The Service also operates 70 national fish hatcheries and 81 ecological services field stations. The agency enforces Federal wildlife laws, manages migratory bird populations, restores nationally significant fisheries, conserves and restores wildlife habitat such as wetlands, administers the Endangered Species Act, and helps foreign governments with their conservation efforts. It also oversees the Federal Assistance Program which distributes hundreds of millions of dollars in excise taxes on fishing and hunting equipment to state wildlife agencies.

Comprehensive Conservation Plans (CCPs) provide long-term guidance for management decisions on a refuge and set forth goals, objectives, and strategies needed to accomplish refuge purposes. CCPs also identify the Service's best estimate of future needs. These plans detail program levels that are sometimes substantially above current budget allocations and, as such, are primarily for Service strategic planning and program prioritization purposes. CCPs do not constitute a commitment for staffing increases, operational and maintenance increases, or funding for future land acquisition.

U.S. Fish & Wildlife Service

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February 2013

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U.S. Fish & Wildlife Service

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Refuge Vision Statement

Amid the clamor of thousands of birds, huge flocks of migrating waterfowl alight on freshwater marshes while bald eagles soar overhead. Sweeping vistas of expansive wetlands, interspersed with cattail-stands and forest, invite a closer look at areas teeming with a diversity of migratory birds and other wildlife. These are some of the images that reward and inspire visitors of Montezuma National Wildlife Refuge. Nestled in the heart of New York State's pastoral Finger Lakes region, the refuge is an essential link in an international network of wetlands and conservation lands. The refuge belongs to a coalition of partners which make up the Montezuma Wetlands Complex, part of what once was historically a 50,000-acre swamp and marshland where the sky is often "black with ducks." Through the collaboration of current and newly forged partnerships, the refuge continues to demonstrate and promote wise and responsible resource stewardship and showcase wetland restoration management practices applied on a landscape level to benefit both wildlife and people.

Visitors of all ages and abilities feel welcome at the refuge and enjoy spectacular wildlife viewing opportunities. The refuge continues to be an important component of the local economy and community, and provides a full complement of quality wildlife-dependent recreation, education and interpretation programs, and other public uses. We work closely with our friends, local citizens, and partners to enhance and improve nature-based tourism through community outreach, education, and advocacy.

We hope all refuge visitors from everywhere continue to value Montezuma National Wildlife Refuge for enhancing their quality of life. Within the National Wildlife Refuge System, Montezuma National Wildlife Refuge is treasured for conserving wetlands and wildlife and providing inspirational outdoor experiences for present and future generations of Americans.

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Summary

Type of Action:	Administrative – Development of a Comprehensive Conservation Plan
Lead Agency:	U.S. Department of the Interior, Fish and Wildlife Service
Location:	Montezuma National Wildlife Refuge Seneca Falls, NY
Administrative Headquarters:	Montezuma National Wildlife Refuge Seneca Falls, NY
Responsible Official:	Wendi Weber, Regional Director, Region 5, Northeast
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This Comprehensive Conservation Plan (CCP) for the 9,809-acre Montezuma National Wildlife Refuge (NWR) is the culmination of a planning effort involving the U.S. Fish and Wildlife Service (Service), New York State agencies, local partners, the Friends of Montezuma Refuge, and the local community. This CCP establishes the 15-year management goals and objectives for the refuge's wildlife and habitats, public use programs, and administration and facilities.

This plan sets forward the management direction that we think best achieves the refuge's purposes, vision, and goals, and responds to public issues. Under this plan, we will focus on our marsh and wetland restoration efforts, expand and improve public use opportunities on the refuge, and improve visitor services and refuge staffing.

Chapters

Glossary and Acronyms

Bibliography

Appendixes

Appendix A Species and Habitats of Conservation Concern at Montezuma National Wildlife Refuge

Appendix B Findings of Appropriateness and Compatibility Determinations

Appendix C Staffing Charts

List of Figures

List of Tables

List of Maps

Chapter 1

Doug Racine

Montezuma National Wildlife Refuge

Purpose of, and Need for, Action

- **Introduction**
- **The Purpose of, and Need for, Action**
- **Project Area**
- **The Service and the Refuge System: Policies and Mandates Guiding Planning**
- **Conservation Plans and Initiatives Guiding the Proposed Action**
- **Refuge Operational Plans (“Step-down” Plans)**
- **Refuge Purposes and Land Acquisition History**
- **Refuge Vision Statement**
- **Refuge Goals**

Introduction

This comprehensive conservation plan (CCP) for Montezuma National Wildlife Refuge (Montezuma NWR, refuge) was prepared pursuant to the National Wildlife Refuge Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997 (Refuge Improvement Act) (Public Law 105-57; 111 Stat. 1253). An environmental assessment (EA), as required by the National Environmental Policy Act of 1969 (NEPA), was prepared with the draft CCP.

This final CCP presents the combination of management goals, objectives, and strategies that we believe will best achieve our vision and goals for the refuge; contribute to the mission of the National Wildlife Refuge System (Refuge System); achieve refuge purposes; fulfill legal mandates; address key issues; incorporate sound principles of fish and wildlife management, and serve the American public. This CCP will guide management decisions and actions on the refuge over the next 15 years. The Service will use the CCP to promote understanding of, and support for, refuge management among State agencies in New York, our conservation partners, Tribal governments, local communities, and the public.

This CCP has 6 chapters and 10 appendixes. This first chapter sets the stage for the subsequent chapters. Specifically, Chapter 1, "Purpose of, and Need for, Action":

- Explains the purpose of, and need for, a CCP for the refuge.
- Defines the project area.
- Presents the mission, policies, and mandates affecting the development of this plan.
- Identifies other conservation plans used as references in the development of this plan.
- Lists the purposes for which the refuge was established and its land acquisition history.
- Describes refuge operational (or "step-down") plans.
- Presents the vision and goals that drive refuge management.

Chapter 2, "The Planning Process," describes our planning process, including public and partner involvement, its compliance with NEPA regulations, and identifies public issues or concerns that surfaced during plan development.

Chapter 3, "Existing Environment," describes the physical, biological, and human environments of the refuge.

Chapter 4, "Management Direction and Implementation," presents the actions, goals, objectives, and strategies that will guide our decision-making and land management for the refuge. It also outlines the staffing and funding needed to accomplish that management.

Chapter 5, "Consultation and Coordination," summarizes how the Service involved the public and its partners in the planning process; their involvement is vital for the future management of this refuge and all national wildlife refuges.

Chapter 6, “List of Preparers,” credits Service and non-Service contributors to the CCP.

Ten appendixes, a glossary with acronyms, and a bibliography provide additional documentation and references to support the developed narratives and analysis in the plan.

The Purpose of, and Need for, Action

We developed a CCP for the refuge that we believe best achieves the establishing purpose(s), vision, and goals of the refuge; contributes to the mission of the National Wildlife Refuge System (Refuge System); adheres to Service policies and other mandates; addresses identified issues of significance; and incorporates sound principles of fish and wildlife science.

The *purpose* of the CCP is to develop a management direction that best achieves the refuge purpose; attains the vision and goals developed for the refuge (see p. 1-22); contributes to the Refuge System mission; addresses key problems, issues, and relevant mandates; and is consistent with sound principles of fish and wildlife management.

The *need* for a CCP on this refuge is twofold. First, the Refuge Improvement Act requires national wildlife refuges to develop CCPs to help fulfill the mission of the Refuge System. Second, Service policies have been developed since the refuge was first established that provide specific guidance on implementing the Refuge Improvement Act. A CCP incorporates those policies and provides strategic management direction for the refuge for the next 15 years, by:

- Clearly stating the desired future conditions for refuge habitat, wildlife, visitor services, staffing, and facilities.
- Providing state agencies, refuge neighbors, visitors, partners, and other stakeholders a clear explanation of the management actions.
- Ensuring that refuge management conforms to the policies and mission of the Refuge System and legal mandates.
- Ensuring that present and future public uses are appropriate and compatible.
- Providing long-term continuity and consistency in management direction.
- Justifying budget requests for staffing, operating, and maintenance funds.

Project Area

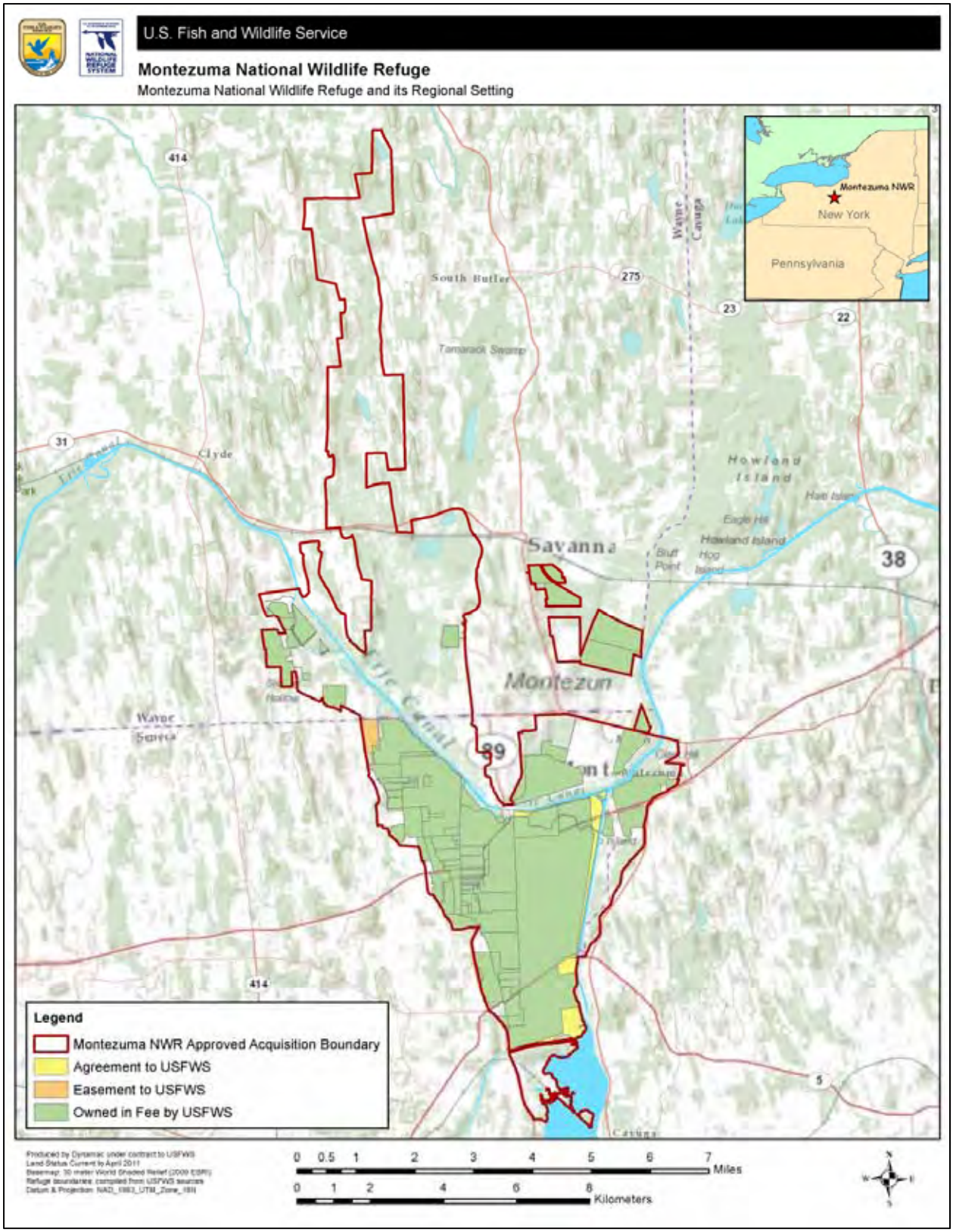
The refuge lies within the drumlin subzone of the Great Lakes Plain physiographic zone of central New York (map 1.1). The project area analyzed in this CCP includes the previously approved acquisition boundary of 19,510 acres, as well as the refuge’s recent authorized expansion of 1,223 acres. The refuge itself is located at the north end of Cayuga Lake in the Finger Lakes region of the State. Situated in Seneca, Wayne, and Cayuga Counties (map 1.1),

and encompasses 9,184 acres[1], including lands owned in fee and easements. Refuge habitats include emergent marshes and shallow-water mudflats, open water, bottomland floodplain forest, old fields and shrublands, croplands, grassland, and successional forest.

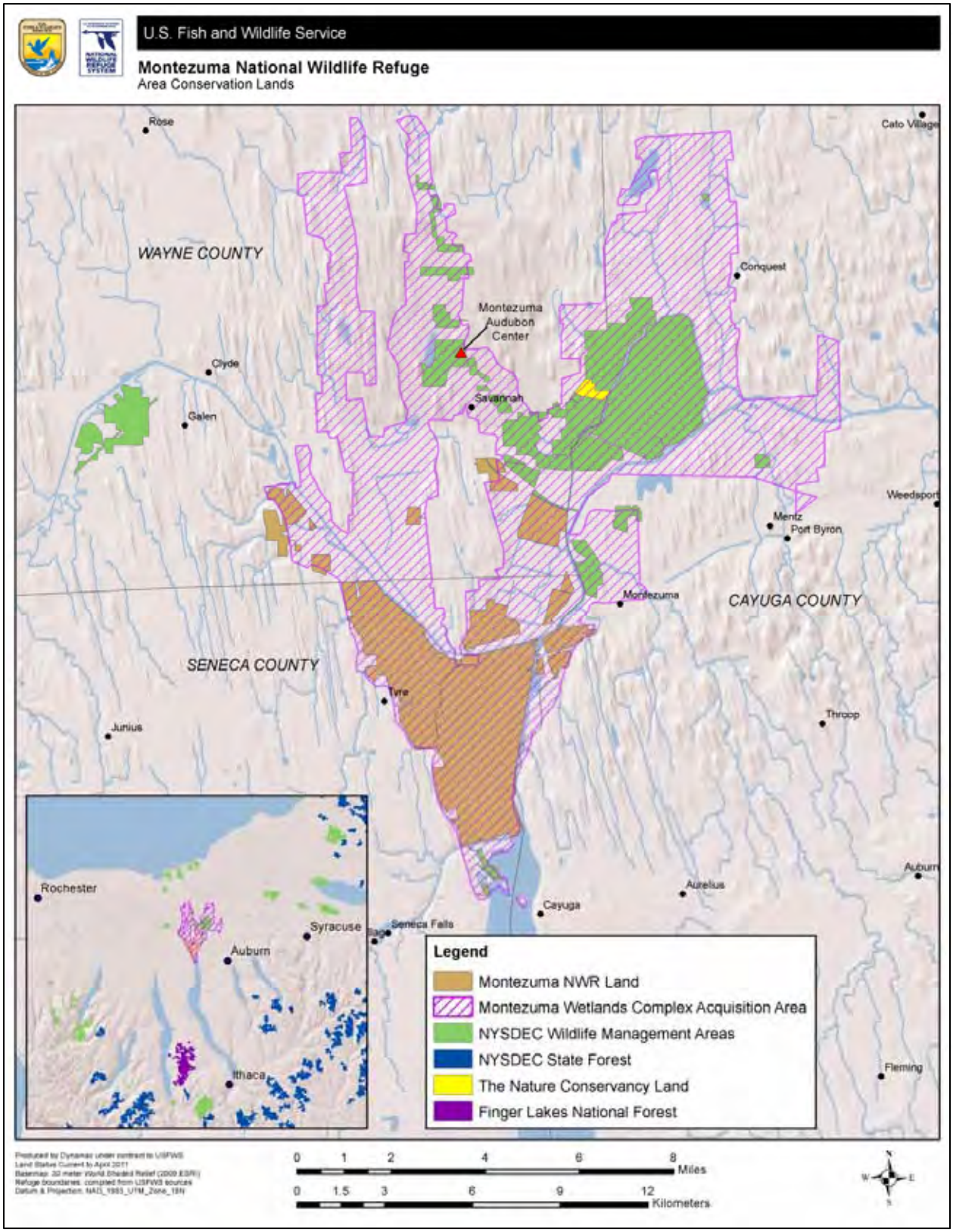
The refuge is part of the Montezuma Wetlands Complex (MWC), an area recognized for its role in the conservation of migratory birds, particularly waterfowl, by the Service, New York State Department of Environmental Conservation (NYSDEC), and other partners. The mission of the MWC is to protect, restore, enhance, and manage wildlife habitat; to preserve and restore ecological integrity for the long-term benefit of wildlife populations and society; and to serve as a model for landscape-level restoration and ecosystem management. Restoration of the MWC is among the largest and most ambitious wetland restoration and enhancement efforts in North America. The MWC is part of the 5,100-square-mile Oswego River watershed and includes wetlands and adjacent upland areas north of Cayuga Lake, extending up the Black Brook, Crusoe Creek, Butler Creek, Clyde River, and Seneca River drainages, all of which eventually flow into Lake Ontario (see chapter 3, "Existing Environment," for additional information).

A flagship project under the North American Waterfowl Management Plan (NAWMP), the MWC seeks to restore thousands of acres of wetland habitat and associated uplands within a 50,000-acre drainage basin that was once among the premier wetland areas in the eastern United States (U.S.). The MWC provides habitat for over 300 species of fish and wildlife and is situated along the Atlantic Flyway, a spring and fall migration route for millions of birds. The MWC has been recognized as an important bird conservation area by many conservation organizations and has been highlighted in many conservation plans including: North American Bird Conservation Plan- Bird Conservation Region (BCR) 13, Partners in Flight (PIF) Plan, Audubon New York's Important Bird Area (IBA) Program, and New York State Comprehensive Wildlife Conservation Strategy (CWCS). Within the Finger Lakes region, the MWC shares a mosaic of conservation lands with New York State Wildlife Management Areas (WMA), State Parks and State Forests, Finger Lakes National Forest, lands managed by The Nature Conservancy (TNC) and Finger Lakes Land Trust (map 1.2).

[1] Acreages are current as of October 2012.



Map 1.1. Montezuma National Wildlife Refuge and its Regional Setting.



Map 1.2. Area Conservation Lands

The Service and the Refuge System: Policies and Mandates Guiding Planning

This section highlights Service policies, legal mandates and regulations, and existing resource plans and conservation initiatives that influenced the development of this CCP.

The U.S. Fish and Wildlife Service and its Mission

As part of the Department of the Interior (Department, DOI), the Service administers the Refuge System. The Service's mission is, "Working with others, to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people."

Congress entrusts the conservation and protection of the following national natural resources to the Service: migratory birds and fish, federally listed, endangered or threatened species, interjurisdictional fish, wetlands, certain marine mammals, and national wildlife refuges. The Service also enforces Federal wildlife laws and international treaties on importing and exporting wildlife, assists states with their fish and wildlife programs, and helps other countries develop conservation programs.

The Service Manual (United States Fish and Wildlife Service [USFWS] 2011) contains the standing and continuing directives on implementing the Service's authorities, responsibilities, and activities. Special directives that affect the rights of citizens or the authorities of other agencies are not contained in the Service Manual; they are published by the Service separately in the Code of Federal Regulations (50 CFR 1-99; GPO 2011).

The National Wildlife Refuge System and its Mission and Policies

The Refuge System is the world's largest collection of lands and waters set aside specifically for conserving wildlife and protecting ecosystems. More than 555 national wildlife refuges exist in the system and encompass more than 150 million acres of lands and waters. The Refuge System has interests in all 50 states and several island territories in the U.S. Each year, more than 35 million visitors hunt, fish, observe and photograph wildlife, or participate in environmental education and interpretation activities on these refuges.

In 1997, President Clinton signed into law the National Wildlife Refuge System Improvement Act (Public Law 105-57; 111 Stat. 1253), amending the Refuge Administration Act (see "Introduction" of this chapter). The Refuge Improvement Act establishes the following unifying mission for the Refuge System:

"The mission of the [Refuge] System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the U.S. for the benefit of present and future generations of Americans" (National Wildlife Refuge System Improvement Act; Public Law 105–57).

It also establishes a new process for determining compatibility of public uses on refuges, and requires the Service to prepare a CCP for each refuge. The Refuge Improvement Act states that

the Refuge System must focus on wildlife conservation and that the mission of the Refuge System, coupled with the purpose(s) for which each refuge was established, will provide the principal management direction on that refuge.

The Service Refuge Manual contains policy governing the operation and management of the Refuge System, including technical information on implementing refuge polices and guidelines on enforcing laws. The Service is in the process of updating and transferring the policies and guidance in the Refuge Manual into the Service Manual (*http://www.fws.gov/policy/manuals/)*. While many of these policies are in the Service Manual, some have not been transferred yet and are still recorded in the Refuge Manual (USFWS 1989). The Refuge Manual is not available online, but can be viewed at refuge headquarters. In addition, there are a few noteworthy policies in the Service Manual that relate to the Refuge System and were instrumental in the development of this CCP; descriptions of those policies follow.

Policy 601 FW 1 – National Wildlife Refuge System Mission and Goals and Refuge Purposes

Service policy 601 FW 1 sets forth the Refuge System mission noted previously and how it relates to the Service mission, and explains the relationship of the Refuge System mission and goals to the purpose(s) of each refuge in the Refuge System. The policy identifies the following Refuge System goals:

- Conserve a diversity of fish, wildlife, and plants.
- Develop and maintain a network of habitats to meet important life history needs of species.
- Conserve those ecosystems, plant communities, wetlands, landscapes, and seascapes that are unique.
- Provide and enhance opportunities to participate in compatible, wildlife-dependent recreation.
- Foster understanding and instill appreciation of the diversity and interconnectedness of fish, wildlife, and plants and their habitats.

This policy also establishes the following management priorities for the Refuge System:

1. Conserving fish, wildlife, and plants and their habitats.
2. Facilitating compatible wildlife-dependent recreational uses.
3. Considering other appropriate and compatible uses.

Policy 602 FW 1, 3, and 4 – Refuge System Planning

Service policies 602 FW 1, 3, and 4 establish the requirements and guidance for Refuge System planning, including the CCP process and step-down management planning. Policy 602 FW 1 states that the Service will manage all refuges in accordance with an approved CCP that, when implemented, will help:

- Achieve refuge purposes.

- Help fulfill the Refuge System mission.
- Maintain and, where appropriate, restore the ecological integrity of each refuge and the Refuge System.
- Help achieve the goals of the National Wilderness Preservation System.
- Meet other mandates.

Policy 602 FW 3 provides step-by-step directions and identifies the minimum requirements for developing a CCP. Among these requirements, the Service is to review any existing special designation areas, such as wilderness and wild and scenic rivers; specifically address the potential for any new special designations; and conduct a wilderness review, incorporating a summary of that review into each CCP. As described in policy 602 FW 4, the Service may also develop step-down management plans for a refuge to provide strategies and implementation schedules for meeting the goals and objectives identified in the CCP. Service policies are available at: *http://www.fws.gov/policy/manuals/*.

Policy 603 FW 1 – Appropriate Refuge Uses

Federal law and Service policy provide the direction and planning framework for protecting the Refuge System from inappropriate, incompatible, or harmful human activities and ensuring that visitors can enjoy its lands and waters. Policy 603 FW 1 provides a national framework for determining appropriate refuge uses. It describes the decision process the refuge manager follows when considering whether new or existing uses are appropriate on a refuge. It also clarifies and expands on the compatibility policy (603 FW 2.10D), which describes when refuge managers should deny a proposed use without determining compatibility. This policy applies to all proposed and existing uses in the Refuge System only when we have jurisdiction over the use. It does not apply to refuge management activities or situations where reserved rights or legal mandates require that we must allow certain uses (603 FW 1). Appendix B further describes the Service's policy on appropriate refuge uses and its relationship to the CCP process.

Policy 603 FW 2 – Compatibility

The Refuge Improvement Act is the key legislation regarding management of public uses and compatibility on refuge lands and waters. The act requires that all existing or proposed public uses of a refuge must be compatible with the refuge's purpose(s). Service policy 603 FW 2 complements the policy on appropriate refuge uses. It establishes the process the Service uses for determining whether or not a public use is a compatible use, incorporating the compatibility provisions of the Refuge Improvement Act and procedures for documentation and periodic review of existing uses. Specifically, for a use to be compatible it must not "materially interfere with or detract from the fulfillment of the mission of the Refuge System or the purposes of the refuge" (Refuge Improvement Act; Public Law 105-57). The compatibility determinations for Montezuma NWR are presented in appendix B along with additional information on the process.

Policy 605 FW 1-7 – Wildlife-dependent Recreation

The Refuge Improvement Act established six wildlife-dependent priority public uses: hunting, fishing, wildlife observation and photography, and environmental education and interpretation. The Refuge Improvement Act also specifies that, if compatible, these uses are to receive enhanced consideration over other public uses in refuge planning and management. Service

policy 605 FW 1 explains how we will provide visitors with opportunities for these priority public uses on Refuge System lands and waters. This policy states that development of these programs should be done "in consultation with state fish and wildlife agencies and stakeholder input" and specifies how we will facilitate the priority public uses.

Policy 601 FW 3 – Maintaining Biological Integrity, Diversity, and Environmental Health

Service policy 601 FW 3 provides guidance on maintaining and restoring the biological integrity, diversity, and environmental health of the Refuge System, including the protection of a broad spectrum of fish, wildlife, and habitat resources in refuge ecosystems. This policy provides refuge managers with a process for evaluating the best management direction for a refuge to prevent the additional degradation of environmental conditions and restore lost or severely degraded components of the environment. It also provides guidelines for dealing with external threats to the biological integrity, diversity, and environmental health of a refuge and its ecosystem.

Other Mandates

Although Service and Refuge System policy and the purpose(s) of each refuge provide the foundation for refuge management, other Federal laws, executive orders, treaties, interstate compacts, and regulations on conserving and protecting natural and cultural resources also affect how the Service manages refuges. The "Digest of Federal Resource Laws of Interest to the U.S. Fish and Wildlife Service" describes many of them (see *http://www.fws.gov/laws/Lawsdigest.html*).

Of particular note are the Federal laws that require the Service to identify and preserve its important historic structures, archaeological sites, and artifacts. NEPA mandates the consideration of cultural resources in planning Federal actions, and the Refuge Improvement Act requires the CCP for each refuge to identify its archaeological and cultural values. Following is a summary of some cultural and historic resource protection laws and other Federal resource laws that relate to the development of CCPs.

Archaeological Resources Protection Act

The Archaeological Resources Protection Act (ARPA) of 1979, as amended (Public Law 96–95; 16 U.S.C. 470aa–470ll; 93 Stat. 721), largely replaced the resource protection provisions of the Antiquities Act of 1906 for archaeological items. ARPA establishes detailed requirements for the issuance of permits for any excavation for, or removal of, archaeological resources from Federal or Native American lands. It also establishes civil and criminal penalties for the unauthorized excavation, removal, or damage of those resources; for any trafficking of those resources removed from Federal or Native American land in violation of any provision of Federal law; and for interstate and foreign commerce in such resources acquired, transported, or received in violation of any state or local law.

Archaeological and Historic Preservation Act

The Archaeological and Historic Preservation Act of 1974, as amended (Public Law 86–523; 16 U.S.C. 469–469c; 74 Stat. 220; Public Law 93–291; 88 Stat. 174), carries out the policy

established by the Historic Sites Act described below. It directs Federal agencies to notify the Secretary of the Interior whenever they find that a Federal or federally assisted, licensed, or permitted project may cause the loss or destruction of significant scientific, prehistoric, or archaeological data. This act authorizes the use of appropriated, donated, or transferred funds for the recovery, protection, and preservation of that data.

Historic Sites, Buildings, and Antiquities Act

The Historic Sites, Buildings, and Antiquities Act, popularly known as the Historic Sites Act of 1935, as amended (Public Law 89–249; 16 U.S.C. 461–462, 464–467; 49 Stat. 666; 79 Stat. 971), declares it a national policy to preserve historic sites and objects of national significance (including those located on refuges) and provides procedures for designating, acquiring, administering, and protecting these resources. Among other things, National Historic and Natural Landmarks are designated under the authority of this act.

National Historic Preservation Act

The National Historic Preservation Act of 1966, as amended (Public Law 89–665; 16 U.S.C. 470–470b, 470c–470n; 80 Stat. 915), provides for the preservation of significant historical features (e.g., buildings, objects, and sites) through a program of matching grants-in-aid to the states (i.e., the Historic Preservation Fund) established under the existing National Trust for Historic Preservation (16 U.S.C. 468–468d). The National Historic Preservation Act establishes a National Register of Historic Places and directs Federal agencies to take into account the effects of their actions on items or sites listed or eligible for listing on the National Register. This act also establishes an Advisory Council on Historic Preservation, which became a permanent, independent agency in September of 1976 (Public Law 94–422; 90 Stat. 1319).

411 DM 1, 2, and 3 – Managing Museum Property

Through the DOI Manual Part 411, the Service also has a mandate to care for museum properties it owns in the public trust (411 DM 1, 2, and 3). The most common museum properties are archaeological, zoological, botanical collections, historical photographs, historic objects, and art. Each refuge maintains an inventory of its museum property, and the Service's regional museum property coordinators guide the refuges in caring for that property and helps them comply with the Native American Grave Protection and Repatriation Act and Federal regulations governing Federal archaeological collections. This Department of the Interior program ensures that these museum collections will remain available to the public for learning and research.

11

Other Federal Resource Laws

This section highlights other Federal resource laws that are also integral to developing a CCP. The Wilderness Act of 1964 (Public Law 88–577; 16 U.S.C. 1131–1136) establishes a National Wilderness Preservation System (NWPS) that is composed of federally owned areas designated by Congress as "wilderness areas." This act directs each agency administering designated wilderness to preserve the wilderness character of areas within the NWPS and to administer the NWPS for the use and enjoyment of the American people, in a way that will leave those areas unimpaired for future use and enjoyment as wilderness. The act also directs the Secretary of the Interior, within 10 years, to review every roadless area of 5,000 acres or more and every roadless island (regardless of size) within the Refuge System and National Park System for inclusion in

the NWPS. Service planning policy requires that the potential for wilderness on refuge lands be evaluated, as appropriate, during the CCP planning process.

The Wild and Scenic Rivers Act of 1968, as amended (16 U.S.C. 1271-1287; 82 Stat. 906), selects certain rivers in the nation possessing remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, preserves them in a free-flowing condition, and protects their local environments. Service planning policy requires that the potential for wild and scenic rivers designations on refuge lands also be evaluated, as appropriate, during the CCP planning process.

Conservation Plans and Initiatives Guiding the CCP

The following plans and initiatives were used in identifying the species of concern in appendix A and in developing management objectives and strategies to accomplish the aforementioned refuge goals.

Refuge System Visioning: Fulfilling the Promise, Conserving the Future

The 1999 report, "Fulfilling the Promise, The National Wildlife Refuge System: Visions for Wildlife, Habitat, People and Leadership" (USFWS 1999), was the culmination of a year-long process by teams of Service employees to create a Refuge System vision. This report was a result of the first-ever Refuge System Conference held in Keystone, Colorado, in October 1998. It was attended by every refuge manager in the country, other Service employees, and scores of conservation organizations. The report contains 42 recommendations organized under 3 vision statements relating to wildlife and habitat, people, and leadership. We have often looked to these recommendations while writing this CCP.

The Refuge System's "Conserving the Future" conference was convened in July 2011 to renew and update the 1999 vision. It began with a draft vision document. Over the course of the conference, the Service collected both online and in-person feedback which was used to revise and finalize the draft vision. The Service finalized the "Conserving the Future" vision document in October 2011 (USFWS 2011). The document has 20 recommendations. Currently, implementation teams are developing strategies to help us accomplish the vision. We will incorporate implementation strategies for this recommendation and the others, as appropriate, in our step-down plans and refuge programs.

Strategic Habitat Conservation

The Service has a goal of establishing and building capacity for science-driven landscape conservation on a continental scale. Our approach, known as Strategic Habitat Conservation (SHC), applies adaptive resource management principles to the entire range of species, groups of species, and natural communities of vegetation and wildlife. This approach is founded on an adaptive, iterative process of biological planning, conservation design, conservation delivery, monitoring and research. The Service is refining this approach to conservation in a national geographic framework. We will work with partners to develop national strategies to help at-risk wildlife adapt in a climate-changed world. This geographic frame of reference will also allow us to more precisely explain to partners, Congress, and the American public why, where, and how

we target resources for landscape-scale conservation and how our efforts connect to a greater whole. More information regarding SHC can be found at: *http://www.fws.gov/science/StrategicHabitatConservation.html*.

Landscape Conservation Cooperatives

As part of a collaborative effort with U.S. Geological Survey (USGS), the Service is initiating a new approach to landscape conservation through a national geographic network that will create a spatial frame of reference to build partnerships and connect projects to larger scale biological priorities. These 21 geographic areas are aggregates of Bird Conservation Regions and provide a basis for forming Landscape Conservation Cooperatives (LCCs) with other Federal agencies, nongovernmental organizations, states, tribes, universities, and other stakeholders to accomplish conservation goals.

Just as flyways have provided an effective spatial frame of reference to build capacity and partnerships for international, national, state, and local waterfowl conservation, the national geographic framework will provide a continental platform upon which the Service can work with state and other partners to connect project- and site-specific efforts to larger biological goals and outcomes. By providing visual context for conservation at "landscape" scales—the entire range of a priority species or suite of species—the framework helps ensure that resource managers have the information and decision-making tools they need to conserve fish, wildlife, plants, and their habitats in the most efficient and effective way possible.

The refuge is located in the Upper Midwest/Great Lakes (UMGL) LCC which combines BCRs 12 (Boreal Hardwood Transition), 13 (Lower Great Lakes/St. Lawrence Plain, previously described in more detail), and 23 (Prairie Hardwood Transition) (map 1.3). Across the 320-million-acre UMGL LCC, approximately 37 million acres (14 percent of the land area) are in conservation estate (USFWS 2010a). Conservation strategies in this region may focus on acquisition and restoration opportunities, but also highlight the importance of state and Federal conservation policies that support implementation on private lands.

The UMGL LCC area includes deepwater habitats, beaches, coastal wetlands, more than 35,000 islands, major river systems, boreal forests, and prairie-hardwood transition zones. These habitats provide for extensive resident and nonresident game populations, fish and many other aquatic resources, waterfowl, colonial waterbirds, marshbirds, and neotropical migrant landbirds.

Map 1.3. Upper Midwest/Great Lakes Landscape Conservation Cooperative

Birds of Conservation Concern Report (2008)

The Birds of Conservation Concern Report (BCC) fulfills the mandate of the 1988 amendment to the Fish and Wildlife Conservation Act of 1980 (100 Public Law 100–653, Title VIII) which requires the Secretary of the Interior, through the Service, to "identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act of 1973." The Service developed Birds of Conservation Concern 2008 (USFWS 2008a)–an update to their 2002 report–in consultation with the leaders of ongoing bird conservation initiatives; partnerships, such as Partners in Flight (PIF) North American Landbird Conservation Plan (Rich et al. 2004); the North American Waterfowl Management Plan and Joint Ventures; the North American Waterbird Conservation Plan (Kushlan et al. 2002); and the U.S. Shorebird Conservation Plan (Brown et al. 2001).

The geographic scope of this endeavor is the U.S. in its entirety, including island territories in the Pacific and Caribbean. Species of conservation concern are identified at three distinct geographic scales: national, regional, and landscape. The report includes a national species list, regional lists corresponding to the eight Service Regions, and species lists for the bird conservation regions designated by the North American Bird Conservation Initiative (NABCI). These lists are primarily derived from assessment scores from three major bird conservation plans: the PIF North American Landbird Conservation Plan, the U.S. Shorebird Conservation Plan, and the North American Waterbird Conservation Plan. Bird species listed in the report include nongame birds; gamebirds without hunting seasons; subsistence-hunted nongame birds in Alaska; and Endangered Species Act candidate, proposed, endangered, threatened, and recently delisted species. Population trends, threats, distribution, abundance, and relative density are all factors considered in listing species in the BCC.

This report is intended to stimulate coordinated and collaborative efforts among Federal, state, tribal, and private partners to conserve and manage these species in most need of conservation actions. By focusing attention on these highest priority species, it is hoped that the report will promote greater study and protection of the habitats and ecological communities upon which these species depend, thereby contributing to healthy avian populations and communities. We used the BCC list in compiling appendix A and to help focus on which species might warrant special management attention.

North American Waterfowl Management Plan Update (2004), Atlantic Coast Joint Venture Waterfowl Implementation Plan (2005), and Black Duck Joint Venture Plan (1993)

Originally written in 1986, the North American Waterfowl Management Plan (NAWMP) describes a 15-year strategy promulgated by the U.S., Canada, and Mexico to restore and sustain waterfowl populations by protecting, restoring, and enhancing habitat (U.S. Fish and Wildlife Service and Canadian Wildlife Service 1986). The plan committee, including representatives from each nation, has modified the 1986 plan twice to account for biological, sociological, and economic changes that influenced the status of waterfowl and the conduct of cooperative habitat conservation. The most recent modification (NAWMP 2004) updates the needs, priorities, and

strategies for the next 15 years, increases stakeholder confidence in the direction of its actions, and guides partners in strengthening the biological foundation of North American waterfowl conservation.

To convey goals, priorities, and strategies more effectively, the NAWMP (2004) is comprised of two separate documents: Strategic Guidance, for agency administrators and policymakers who set the direction and priorities for conservation, and an Implementation Framework that includes supporting technical information for use by biologists and land managers.

The NAWMP is implemented at the regional level in 14 habitat joint ventures and 3 species joint ventures that include the Arctic goose, black duck, and sea duck. Our project area (the refuge) lies in the Atlantic Coast Joint Venture (ACJV), which includes the Atlantic Flyway states, from Maine to Florida, and Puerto Rico. The waterfowl goal for the ACJV is to, "Protect and manage priority wetland habitats for migration, wintering, and production of waterfowl, with special consideration to black ducks, and to benefit other wildlife in the joint venture area."

In 2005, a revision to the original ACJV Waterfowl Implementation Plan (ACJV 1988) was completed. The revised waterfowl implementation plan (ACJV 2005) presents habitat conservation goals and population indices for the ACJV consistent with the 2004 NAWMP update, provides status assessments of waterfowl and their habitats in the joint venture, and updates focus area narratives and maps for each state. The implementation plan is intended as a blueprint for conserving the valuable breeding, migration, and wintering waterfowl habitat present within the ACJV boundary, based on the best available information and the expert opinion of waterfowl biologists from throughout the flyway.

The Black Duck Joint Venture Strategic Plan (Black Duck Joint Venture 2008) is also relevant to our project area. It identifies the goals and objectives of the joint venture and describes implementation plans for population monitoring, research, communications, and evaluation. Black ducks use the refuge year-round and are most plentiful during fall migration.

Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region (BCR 13; 2007)

The bird conservation regions designated by the NABCI are ecologically based units for planning, implementing, and evaluating bird conservation efforts. The refuge lies in the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region (BCR 13) (ACJV 2007). BCR 13 provides important habitat resources for migratory birds with ranges throughout the western hemisphere. The highest bird habitat values are associated with the region's major aquatic features (i.e., Lake Erie, Lake Ontario, and the St. Lawrence River) and associated wetlands, which provide critical staging areas for migratory waterfowl, waterbirds, and shorebirds, and in some instances, also serve as funnels for migrating landbirds. BCR 13 also provides some of the most important breeding habitat in eastern North America for birds associated with wetlands, grasslands, and shrubs. However, landscapes in the region have been highly modified from their original, natural condition, and are now dominated by agricultural activities or human/industrial development (e.g., large, urban areas and a large proportion of Canada's total human population). Habitat loss and degradation (e.g., fragmentation, intensive agriculture, pollution, and invasive species) are the greatest threats to bird populations in this region (ACJV 2007).

The BCR 13 Conservation Plan lists birds and habitats of high conservation priority for the region and activities thought to be most useful for addressing those conservation needs (ACJV 2007).

North American Waterbird Conservation Plan (Version 1, 2002) and Mid-Atlantic/New England/Maritime (MANEM) Waterbird Conservation Plan (2006)

The North American Waterbird Conservation Plan (Kushlan et al. 2002) represents a partnership among individuals and institutions with the interest in, and responsibility for, conserving waterbirds and their habitats. The primary goal of the plan is to ensure that the distribution, diversity, and abundance of populations and habitats of breeding, migratory, and nonbreeding waterbirds are sustained or restored throughout the lands and waters of North America, Central America, and the Caribbean. It also provides a framework for conserving and managing colonially nesting, water-dependent birds. In addition, the plan facilitates continentwide planning and monitoring; national, state, and provincial conservation; regional coordination; and local habitat protection and management (Kushlan et al. 2002).

The North American Waterbird Conservation Plan identifies 16 waterbird planning regions to allow for planning at a scale that is practical yet provides a landscape-level perspective. Montezuma NWR falls within the Mid-Atlantic/New England/Maritimes (MANEM) region which extends from the Gulf of St. Lawrence to the southern end of Chesapeake Bay. To facilitate waterbird conservation in the MANEM region of the U.S. and Canada, a partnership of organizations and individuals drafted a regional waterbird conservation plan for 2006 to 2010. According to the MANEM Waterbird Conservation Plan, 74 waterbird species utilize habitats in the MANEM region for breeding, migrating, and wintering (MANEM 2007). The plan summarizes information on waterbirds and their habitats, providing a regional perspective for local conservation action. We used this plan to help develop objectives and strategies for goal 1.

U.S. Shorebird Conservation Plan (2nd Edition, 2001) and Upper Mississippi Valley/Great Lakes Regional Shorebird Conservation Plan (2000)

Concerns about shorebirds led to the creation of the U.S. Shorebird Conservation Plan in 2000; a second edition was published in May 2001 (Brown et al. 2001). The plan was developed in partnership with individuals and organizations throughout the U.S. It presents conservation goals for each U.S. region, identifies important habitat conservation and research needs, and proposes education and outreach programs.

As part of the overall shorebird conservation strategy, regional plans are developed to step-down the goals of the U.S. Shorebird Conservation Plan to a smaller scale. For the area that includes the refuge, the Upper Mississippi Valley/Great Lakes Regional Shorebird Conservation Plan (de Szalay et al. 2000) was drafted to identify priority species, habitat and species goals, and implementation projects within the region.

National Bald Eagle Management Guidelines (2007)

The Service developed National Bald Eagle Management Guidelines in May 2007 (USFWS 2007a) to advise landowners, land managers, and others who share public and private lands with bald eagles when and under what circumstances the protective provisions of the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d; Eagle Act) may apply to their activities. The guidelines help minimize impacts on bald eagles, particularly where they may constitute a disturbance, which is prohibited under the Eagle Act. The guidelines serve to: (1) publicize the provisions of the Eagle Act; (2) advise landowners, land managers, and the public of the potential for various human activities to disturb bald eagles; and (3) encourage additional, nonbinding land management practices that benefit bald eagles. In July 2007, the Service issued a final ruling to remove the bald eagle from the Federal list of endangered and threatened species (72 FR 37346). The bald eagle remains protected under the Eagle Act and the Migratory Bird Treaty Act (16 U.S.C. 703-712) (MBTA). The Guidelines are intended primarily as a tool for landowners and planners who seek information and recommendations on how to avoid disturbing bald eagles.

Lower Great Lakes Plain Partners in Flight Bird Conservation Plan (2003)

In 1990, PIF began as a voluntary, international coalition of government agencies, conservation organizations, academic institutions, private industries, and citizens dedicated to reversing the population declines of bird species. The mission of PIF is to help species at risk, keep common birds common, and encourage voluntary partnerships for birds, habitats, and people (PIF 2009). The foundation of PIF's long-term strategy is a series of scientifically based bird conservation plans using physiographic areas as planning units. The goal of each PIF plan is to ensure the long-term maintenance of healthy populations of native birds, primarily nongame species. The plan for each physiographic area ranks bird species according to their conservation priority, describes their desired habitat conditions, develops biological objectives, and recommends conservation measures. The priority ranking factors in habitat loss, population trends, and the vulnerability of a species and its habitats to regional and local threats.

Our project area lies in the Lower Great Lakes Plain and is covered by the Lower Great Lakes Plain (Physiographic Area 15) (Dettmers and Rosenberg 2003).

New York State Wildlife Action Plan (2005)

At the end of 2001, Congress authorized the State Wildlife Grant (SWG) Program, which provides Federal dollars to states and territories to support wildlife conservation efforts aimed at preventing wildlife from becoming endangered (Public Law 107-63). The purpose of the program is to help state fish and wildlife agencies conserve fish and wildlife species of greatest conservation need. The funds appropriated under the program are allocated to each state according to a formula that takes into account its size and population.

To be eligible for additional Federal grants, and to satisfy the requirements for participating in the SWG program, each state and U.S. territory was charged with developing and submitting a statewide wildlife action plan or "Comprehensive Wildlife Conservation Strategy" (CWCS) to the National Advisory Acceptance Team by October 1, 2005. Each plan must address eight required elements, and identify and focus on "species of greatest conservation need," yet address the "full array of wildlife" and wildlife-related issues to "keep common species common." The

New York State CWCS was completed in 2005. It creates a vision for conserving New York's wildlife and stimulates other states, Federal agencies, and conservation partners to think strategically about their individual and coordinated roles in prioritizing conservation.

In addressing the eight elements, the New York State CWCS helps supplement the information the Service gathered on species and habitat occurrences and their distribution. It was also used to help identify conservation threats and management strategies for species and habitats of conservation concern in the CCP. The expertise convened to compile the New York State CWCS and its partner and public involvement process further enhance its benefits (NYSDEC 2005a).

Montezuma Wetlands Complex Management Plan (2000)

In 2000, the Service, NYSDEC, and Ducks Unlimited developed the MWC Management Plan. This 20-year plan details a strategy for protecting, restoring, and managing wetland ecosystem functions for wildlife and people in the MWC (map 1.2). We used this plan to help develop goals and objectives.

Other Information Sources

In addition to the resources described previously, the Service also consulted the plans and resources below as the refuge management objectives and strategies were refined.

Continental or National Plans

- National Wetlands Research Center Strategic Plan: 2010–2015 (USGS 2011)
- National Audubon Society Watch List (Butcher et al. 2007)
- North American Waterfowl Management Plan: A Strategy for Cooperation 1986 (NAWMP 1986)
- North American Waterfowl Management Plan. Strategic Guide: Strengthening the Biological Foundation 2004 (NAWMP 2004)

Regional Plans

- Ducks Unlimited's International Conservation Plan (Ducks Unlimited 2005)
- Strategic Plan: The Partners for Fish and Wildlife Program (USFWS 2006 to 2010)
- Confronting Climate Change in the Great Lakes Region (Kling et al. 2003)

State Plans

- 2009 New York State Open Space Conservation Plan (NYSDEC and New York State Office of Parks, Recreation, and Historic Preservation (OPRHP) 2009)

Local Plans

- A Greenprint for Seneca County (West 2010)

Individual Species Plans

- American Woodcock: Harvest and Breeding Population Status, 1997 (Bruggink 1997)
- A Management Plan for the Atlantic Population of Canada Geese (Canada Goose Committee 2008)
- Wild Turkey Management Plan (NYSDEC 2005

Refuge Operational Plans ("Step-down" Plans)

The refuge planning policy in the Service Manual lists more than 25 step-down management plans that may be required on refuges. These plans contain specific strategies and implementation schedules for achieving refuge goals and objectives. Some step-down plans require additional NEPA analysis, public involvement, and compatibility determinations (CD) before they can be implemented, and all plans require revision annually or every 5 to 10 years, as specified.

This CCP incorporates by reference those refuge step-down plans that are up-to-date. Chapter 4 provides more information about the additional step-down plans needed for the refuge and their schedule for completion.

The following step-down plans are currently in place for the refuge:

- Fire Management Plan (2009)
- Public Hunting Plan (1995)
- Public Fishing Plan (1993)
- Public Use Plan (1994)
- Avian Influenza Contingency Plan (2006)
- Chronic Wasting Disease Plan (2005)
- Habitat Management Plan (2008)

The following plans need to be completed:

- Safety Plan (to be completed within 1 year of CCP approval)
- Integrated Pest Management Plan (to be completed within 5 years of CCP approval)
- Inventory and Monitoring Plan (to be completed within 2 years of CCP approval)
- Visitor Services Plan (to be completed within 1 year of CCP approval)
- Law Enforcement Plan (to be completed within 5 years of CCP approval)

Refuge Purposes and Land Acquisition History

Refuges can be established by Congress through special legislation, by the President through Executive Order, or administratively by the Director of the Service (with authority delegated by the Secretary of the Interior). Refuge lands may be acquired under a variety of administrative and legislative authorities as well. The Montezuma NWR was established by Executive Order 7971 on September 12, 1938, "...as a refuge and breeding ground for migratory birds and other wildlife...." Montezuma NWR has acquired lands under the authority of the Migratory Bird Conservation Act (16 U.S.C. 715-715r), as amended, "...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds."

Since the refuge was established in 1938, the Service has acquired interests in additional lands through a variety of acquisition methods, including fee title acquisition and conservation easements. Since the early 1990s alone, over 2,500 acres of lands have been added to the refuge, and as of October 2012, the Service owned approximately 8,782 acres in fee and 402 acres in

conservation easements. Historically, land acquisition funds for the refuge come from two primary sources: the Land and Water Conservation Fund (LWCF), appropriated annually by Congress; and the Migratory Bird Conservation Fund (MBCF), which is replenished through the sale of Federal Migratory Bird Hunting and Conservation stamps (Duck Stamps). LWCF funding sources include revenues from the sale of surplus Federal real property, motorboat fuel taxes, fees for recreation on Federal lands, and receipts from mineral leases on the outer continental shelf.

The red line on map 1.1 depicts the refuge's approved acquisitions boundary as of 2012. Table 1.1 summarizes the land acquisition history of the refuge by year through October 2012. The dates prior to 1938 represent when some of the refuge lands were first transferred from private ownership to the Federal Government. These properties were owned by different Federal agencies and were eventually transferred to the Service.

Table 1.1. History of Land Acquisition at the Montezuma NWR through October 2012.

Acquisition Date	Acreage	Funding Source[1]
1937	2,564	MBCF[2]
1938	2,354	MBCF
1939	544	MBCF
1940	444	MBCF
1941	279	MBCF
1942	34	MBCF
1945	6	None
1959	176	MBCF
1963	27	MBCF
1965	16	MBCF
1993	53	MBCF
1995	397	MBCF
1996	186	MBCF
1997	54	MBCF
1998	608	MBCF
1999	142	MBCF
2000	87	MBCF
2001	387	MBCF, LWCF[3]
2002	75	MBCF, LWCF
2004	80	LWCF
2005	106	LWCF
2006	64	MBCF
2007	381	MBCF
2008	26	LWCF

Acquisition Date	Acreage	Funding Source[1]
2009	63	MBCF
2012	31	MBCF
Total	**9, 184**[4]	

[1] Includes some lands that were donated to the U.S. Fish and Wildlife Service.
[2] MBCF – Migratory Bird Conservation Fund
[3] LWCF – Land and Water Conservation Fund
[4] Acres are rounded to whole numbers; contact the refuge headquarters for precise acreages.

Farmers Home Administration Interests

From the late 1980s to the mid-1990s, the Farmers Home Administration (FmHA) acquired many properties throughout the country through foreclosure sales. Under the terms of a memorandum of understanding between FmHA and the Service, a review team consisting of their staff, our staff, staff from the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service, and staff from USDA Agricultural Stabilization and Conservation Service evaluated those properties for their conservation value. Based on those evaluations, and before reselling the properties, the FmHA placed permanent conservation easements on most of these properties to protect important habitats. FmHA retained full ownership in a smaller number of the properties. The responsibility for monitoring and enforcing those easements and managing the retained properties rests with the Service, which has usually delegated it to the manager of the closest refuge.

Montezuma NWR currently administers more than 200 FmHA interests, totaling more than 2,100 acres in easements and more than 1,000 acres in fee.

Refuge Vision Statement

Our planning team developed the following vision statement to provide a guiding philosophy and sense of purpose for the comprehensive conservation planning effort:

> Amid the clamor of thousands of birds, huge flocks of migrating waterfowl alight on freshwater marshes while bald eagles soar overhead. Sweeping vistas of expansive wetlands, interspersed with cattail stands and forest, invite a closer look at areas teeming with a diversity of migratory birds and other wildlife. These are some of the images that reward and inspire visitors of Montezuma National Wildlife Refuge. Nestled in the heart of New York State's pastoral Finger Lakes region, the refuge is an essential link in an international network of wetlands and conservation lands. The refuge belongs to a coalition of partners which make up the Montezuma Wetlands Complex, part of what once was historically a 50,000-acre swamp and marshland where the sky is often "black with ducks." Through the collaboration of current and newly forged partnerships, the refuge continues to demonstrate and promote wise and responsible resource stewardship and showcase wetland restoration management practices applied on a landscape level to benefit both wildlife and people.

Visitors of all ages and abilities feel welcome at the refuge and enjoy spectacular wildlife viewing opportunities. The refuge continues to be an important component of the local economy and community, and provides a full complement of quality wildlife-dependent recreation, education and interpretation programs, and other public uses. We work closely with our friends, local citizens, and partners to enhance and improve nature-based tourism through community outreach, education, and advocacy.

We hope all refuge visitors from everywhere continue to value Montezuma NWR for enhancing their quality of life. Within the National Wildlife Refuge System, Montezuma NWR is treasured for conserving wetlands and wildlife and providing inspirational outdoor experiences for present and future generations of Americans.

Refuge Goals

Refuge goals were developed after considering: (1) the vision statement, (2) the purposes for establishing the refuge, (3) the missions of the Service and Refuge Systems, and (4) the mandates, plans, and conservation initiatives discussed previously. These goals are intentionally broad, descriptive statements of purpose that highlight elements of the vision statement that will be emphasized in future refuge management. The biological goals take precedence and are presented in priority order.

Goal 1: Provide, enhance, and restore where possible, freshwater emergent marsh, open water wetland, and mudflat habitats to benefit native wildlife and plant communities, particularly migrating waterfowl, shorebirds, and breeding marshbirds.

Goal 2: Restore and maintain forested wetlands, riparian forests along the Seneca and Clyde Rivers, and upland forests to benefit priority native species, including songbirds, bats, and important plant communities.

Goal 3: Manage grassland and shrubland habitats primarily to benefit bird species of conservation concern.

Goal 4: Ensure visitors of all abilities and varied interests participate in and enjoy the refuge's opportunities for wildlife observation, interpretation, photography and environmental education. Motivate them to value, support, and contribute to the refuge, MWC, and the National Wildlife Refuge System. Increase their understanding of wetlands and wetland functions, and help them become better environmental stewards.

Goal 5: Provide opportunities for hunters and anglers to enjoy and support hunting and fishing on the refuge and increase their understanding of the regional environmental importance of the refuge and of the greater MWC.

Goal 6: Increase awareness and cooperation among State and Federal agencies, local communities, environmental organizations, universities and other partners. Help them understand the role of the refuge and the MWC in the community, and encourage participation in achieving the vision of the complex.

Chapter 2

Marty Hilliard

Osprey at Montezuma National Wildlife Refuge

The Planning Process

- **Comprehensive Conservation Planning Process**
- **Issues, Concerns, and Opportunities**

The Comprehensive Conservation Planning Process

Service policy 602 FW 3 establishes an eight-step comprehensive conservation planning process that provides guidelines for developing CCPs and facilitates compliance with NEPA by integrating NEPA compliance requirements in the CCP process (figure 2.1). The full text of the policy and a detailed description of the planning steps can be viewed at: *http://policy.fws.gov/602fw3.html*.

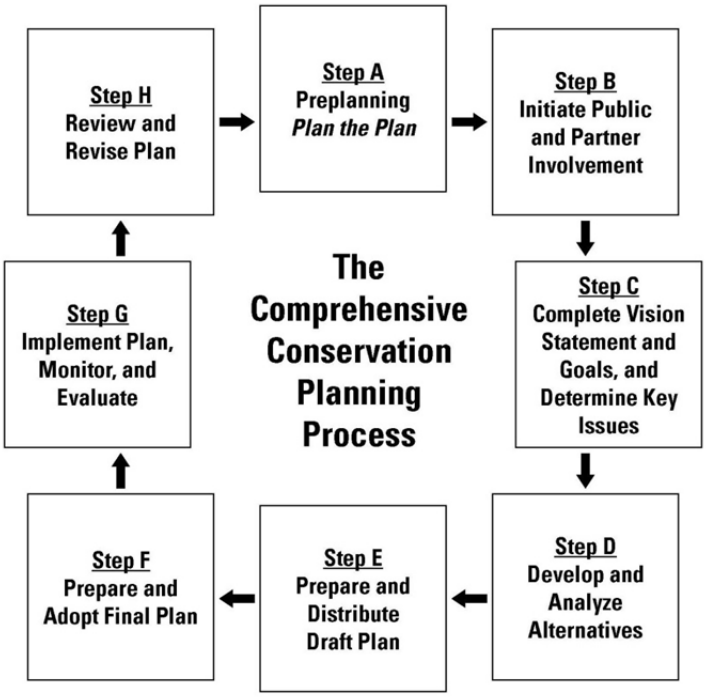


Figure 2.1. The CCP Planning Process and its Relationship to NEPA.

Since the refuge's establishment in 1938, the Service has focused on conserving lands within the approved refuge boundary; facilitating wildlife-dependent public uses; managing habitat for several focus species, such as grassland birds and bald eagles; and establishing relationships with the community and our partners. In 2005, we began collecting information on refuge resources and mapping refuge habitats in preparation for developing the CCP. The process described below was followed in the development of this CCP.

Steps in the Planning Process

Step A: Preplanning

Preplanning officially began in February 2010. Several steps were initiated as part of "Step A: Preplanning," including the formation of the core planning team which is responsible for developing the CCP. Our core planning team consists of refuge staff, Regional Office staff, a

representative of the New York State Department of Environmental Conservation, and a contractor responsible for compiling information and preparing documents. As part of the preplanning process, we discussed management issues, drafted a vision statement and tentative goals and compiled a project mailing list of known stakeholders, interested individuals, organizations and agencies. We also summarized the refuge's biological inventory and monitoring information.

Step B: Public Scoping

During the month of April 2010, we distributed copies of the first planning newsletter, including an issues workbook, to approximately 400 individuals, organizations, and agencies, announcing the beginning of the planning process and asking people if they wanted to remain on the mailing list. Copies were also made available to everyone who visited the visitor contact station and everyone who visited our Web site. The workbook asked people to share what they valued most about the refuge, their vision for its future, the Service's role in their community and any other issues they wanted to raise. We received 15 completed workbooks.

On May 7, 2010, the Service formally announced the start of the planning process in a Notice of Intent in the *Federal Register* (75 FR 25286). On May 18, 2010, two public scoping meetings were held at the refuge to identify public issues and concerns, share the vision statement and tentative goals, describe the planning process and explain how people could become involved and stay informed about the process. Those meetings helped identify the public concerns that would need to be addressed in the planning process. Meeting locations, dates, and times were announced in local newspapers, in special mailings, and on the refuge Web site. Twenty-five people attended the public meetings. Since then, the Service has also solicited public input and concerns regularly from individuals through visitor contacts, refuge sponsored events, community-sponsored events in which the refuge participated and answered invitations to speak to community organizations. Public scoping ended on June 30, 2010, and a scoping newsletter was released in July 2010. A copy of the scoping newsletter and other CCP planning updates can be found at: *http://www.fws.gov/northeast/planning/Montezuma/ccphome.html*.

Steps C and D: Vision, Goals, and Alternatives Development

Throughout June and July 2010, the planning team worked on "Step C: Review Vision Statement, Goals, and Identify Significant Issues." The Service held a workshop on June 23, 2010 to seek advice from State and Federal Agencies, Tribes, and local governments on what resources of conservation concern in the project area should be management priorities.

A planning update newsletter was distributed to the mailing list and posted on our Web site in July 2010. That newsletter shared our goals, provided an update on CCP activities and summarized the key issues the Service would address in the CCP. The team also conducted a wilderness review and evaluated wild and scenic rivers potential.

From August 2010 through December of 2011, the planning team worked on "Step D: Develop and Analyze Alternatives." The planning team compiled and analyzed three management alternatives to serve as the foundation for developing this CCP.

Step E: Draft CCP/EA and NEPA Document

The Service published a Notice of Availability (NOA) in the *Federal Register* on May 22, 2012 announcing the release of the draft CCP/EA for its 30-day period of public review and comment from May 22 to June 21. During that comment period, we held two public meetings at the refuge to obtain comments on the document, and also received comments by regular and electronic mail. We distributed the draft CCP/EA to all interested parties, contacted the media, and posted it on our Web site, in addition to distributing a newsletter summarizing the three management alternatives. After the comment period, we reviewed and summarized all of the substantive comments we received, developed our responses and published them as appendix K.

Step F: Adopt Final Plan

We submitted the final CCP to our Regional Director for approval in September 2012. We also submitted the final LPP (see appendix F) to the Service's Director for approval in September 2012. The Service's Director approved the final LPP in January 2013. In February 2013, the Regional Director determined that a Finding of No Significant Impact (FONSI) was warranted. We announced the Regional Director's final decision and the final CCP by publishing a Notice of Availability in the *Federal Register*. These actions complete step F to prepare and adopt a final plan.

Steps G and H: Implement, Evaluate, and Revise the Plan

With the planning phase of the CCP process complete, "Step G: Implement Plan, Monitor and Evaluate" will begin. Periodic review of the CCP will be required to ensure that objectives are being met and management actions are being implemented. Ongoing monitoring and evaluation will be an important part of this process. Monitoring results or new information may indicate the need to change our strategies.

As part of "Step H: Review and Revise Plan," the Service will modify or revise the final CCP, as warranted, following the procedures in Service policies 602 FW 1, 3, and 4 and the NEPA requirements. Minor revisions that meet the criteria for categorical exclusions (550 FW 3.3C) will require only an environmental action memorandum. As the Refuge Improvement Act and Service policy stipulate, the Service will review and revise the CCP at least every 15 years as needed.

Issues, Concerns, and Opportunities

A number of issues have been raised through initial scoping for the CCP. An issue is defined as "any unsettled matter requiring a management decision" and may be an "initiative, opportunity, resource management problem, threat to a resource, conflict in use, or a public concern." Issues can arise from many sources, including refuge staff; planning team members; other Service program staff; state agencies; other Federal agencies; refuge partners, neighbors and user groups; or Congress. The planning team has grouped the issues raised to date into two categories:

- Key issues—Key issues are those the Service has the jurisdiction and authority to resolve. They key issues, together with refuge goals, formed the basis for developing the management direction we describe in chapter 4.

- Issues considered, but not analyzed further—These issues do not fall within the scope of the "purpose of, and need for, action" in this CCP. These issues are discussed after the key issues below, but are not addressed further in the CCP analysis.

Key Issues

The following key issues, not arranged in any particular order, were derived from completed issues workbooks, public and partner meetings, visitor contacts, refuge staff, and planning team discussions.

1. *How will the refuge provide quality wildlife observation and photography opportunities for the public?*

Wildlife observation and wildlife photography are two closely related priority wildlife-dependent uses of the Refuge System and currently draw most of the refuge's visitors. Opportunities for wildlife observation and photography are provided by several trails, an auto tour route and observation towers and overlook areas. The refuge manages these activities to ensure that visitors have opportunities to observe wildlife in ways that do not disrupt wildlife or damage wildlife habitat and minimize conflicts between users.

During the scoping process, some commenters expressed interest in increased access to Tschache Pool and Knox-Marsellus Marsh for wildlife watchers. Some members of the public also expressed an interest in increasing the number of photography blinds and hiking trails, while other members of the public commented that they do not want more areas of the refuge opened to public use to prevent disturbance to wildlife. Our response to these concerns is addressed in chapter 4 under goal 4.

2. *How will the refuge provide quality hunting and fishing opportunities for the public?*

Hunting and fishing are two priority public uses of the Refuge System. They are also historical, traditional, and popular activities in the Finger Lakes region, in the State of New York and in the Refuge System.

Hunting

Our intent is to provide a quality hunting experience that is appropriate and compatible with the refuge purpose, vision, goals, and the mission of the Refuge System. Close cooperation and coordination with State fish and wildlife management agencies will continue to be important in developing and managing hunting opportunities on the refuge and in setting population management goals and objectives. Regulations permitting hunting of wildlife on the refuge will be, to the extent practicable, consistent with State fish and wildlife laws, regulations, and management plans. Hunting programs should be safe, accessible, and managed to minimize conflicts with other priority wildlife-dependent recreational uses. Currently, the refuge offers opportunities to hunt deer and waterfowl.

Fishing

Fishing on the refuge is in accordance with State regulations and is currently limited to the Seneca and Clyde Rivers. The refuge currently offers one fishing access area at May's Point via a parking area and a universally accessible pier.

Some members of the public have expressed interest in increased hunting and fishing opportunities, including the opening of additional areas and the taking of additional species (e.g., turkey). Other members of the public would like to close the refuge to hunting and fishing. Our response to these concerns is addressed in chapter 4 under goal 5.

3. *How will the refuge provide opportunities for trapping?*

Some members of the public have expressed interest in increased trapping opportunities. Other members of the public would like to close the refuge to trapping. Trapping on the refuge is considered a management action because it is the method used to manage populations of furbearers at sustainable levels. Trapping is currently controlled on the refuge through special use permits. Because it is a commercial activity, trappers bid for the permits. The number of permits distributed each year is adjusted to control furbearer populations at sustainable levels. This issue is addressed in chapter 4 under goals 1 and 2, since it is authorized as a management action.

4. *How will the refuge provide environmental education and interpretation opportunities for the public?*

Environmental education is a process designed to teach participants the history and importance of conservation and the biological and scientific knowledge of our Nation's natural resources in a more formal academic format. Through this process, as with hunting and fishing, we can help develop a citizenry that has the awareness, knowledge, attitudes, skills, motivation, and commitment to work cooperatively towards the conservation of our Nation's environmental resources. Environmental education within the Refuge System incorporates onsite, offsite, and distance learning materials, activities, programs, and products that address the audience's course of study, refuge purpose(s), physical attributes, ecosystem dynamics, conservation strategies, and the Refuge System mission. Because our partners at the Montezuma Audubon Center (MAC) provide a range of environmental education opportunities, the refuge has not felt the need to fully develop its own environmental education program, given our current limited staffing levels and resources. However, we do support school field trips upon request.

Opportunities for interpretation on Montezuma NWR are provided through displays in the visitor contact station, signs at various key points throughout the refuge, a guided cell phone tour, talks (Nature of Montezuma Series, Eco-Chat Series), and guided bus tours. The refuge's brochures are written not only to orient visitors to refuge information, but also as interpretive tools.

Visitors and members of the public have expressed a desire for an increase in environmental education opportunities and the inclusion of additional information in materials, activities, and interpretive displays, including information about climate change and other potential threats to refuge resources. Our response to these concerns is addressed in chapter 4 under goal 4.

5. *How will the refuge address outreach efforts?*

At Montezuma NWR, visitors can orient themselves with the refuge through available maps and brochures and an announcement board that posts current and upcoming events, as well as information on special refuge projects and area closures. Throughout the refuge, standard Service signage clearly leads visitors to different public use locations. The visitor services staff accommodate visitor needs whenever possible and strive to provide good customer service. Furthermore, refuge staff and volunteers staff the visitor center from April through November to help welcome and orient visitors. Refuge facilities, roadways, and trails are maintained regularly to provide a safe environment for visitors, volunteers and refuge staff; standards for maintenance require facilities be kept clean, hazard-free and accessible wherever possible.

The refuge's Web site (*http://www.fws.gov/r5mnwr/*) also serves as an outreach tool. The Web site contains refuge history and management information; announcements of programs, events and closures; a refuge map; descriptions of available public use areas and wildlife present in the refuge; local weather conditions; and links to other MWC Web sites. During the scoping process, we received requests from the public and area agencies and organizations for informational materials that provide a stronger link between the refuge and the MWC. Our response to these concerns is addressed in chapter 4 under goals 4 and 6.

6. *How will the impacts of habitat fragmentation be addressed?*

The refuge is fragmented by roads, canals, powerline and other utility corridors, and farmlands. Roads and powerlines can kill, injure, or impede wildlife during their movements, and species that are unable to traverse these barriers risk becoming isolated, which can have population-level impacts.

The effects of fragmentation can be minimized through a variety of means, some of which will be evaluated as part of this CCP. For instance, land acquisitions can include areas that increase connectivity between various habitats. Fragmentation of currently owned lands can be limited through changes in habitat management of key areas. Our response to these concerns is addressed in chapter 4 under goal 2.

7. *How will the refuge address the impacts of altered hydrology?*

The construction of the Erie Canal has drastically altered the area's hydrology, primarily by lowering the water table. Ditching of farmlands has caused further drying of wetlands through increased drainage. Roads and levees may both maintain dry conditions by keeping river water off of mucklands and cause water to be retained longer in areas that would have otherwise become dry periodically. The New York State Thruway (NYS Thruway; Interstate 90; I-90) is a major hydrological barrier that runs through the refuge and separates the May's Point Pool from the Main Pool. Culverts under I-90 could provide a connection between these two impoundments; however, because May's Point Pool is currently at a higher elevation, if these impoundments were connected, nearly all the water in May's Point Pool would drain into the Main Pool. Our response to these concerns is addressed in chapter 4 under goal 1.

8. *How will the Service promote trail and Wildlife Drive connectivity both on and off the refuge?*

Trails and wildlife drives provide visitors with opportunities to observe and photograph wildlife in their habitats. Currently, the refuge has nearly 4 miles of walking trail and a 3-mile Wildlife Drive.

Some members of the public have expressed interest in additional trails, including ones located along impoundments for viewing waterbirds. Other members of the public would prefer not to increase public access/use on the refuge to protect wildlife from disturbance. In addition, visitors have indicated interest in a trail system that would provide greater connectivity between the refuge and the MWC (e.g., the MAC, State conservation lands), as well as a wildlife driving route that would connect the refuge with the MWC and other local areas of interest (e.g., wineries, Erie Canalway points of interest, etc.). Some visitors have also expressed the desire to have biking allowed on the refuge Wildlife Drive. Our response to these concerns is addressed in chapter 4 under goal 4.

9. *How will the refuge be managed to protect Federal trust species?*

In addition to meeting their purpose(s), refuges are required to manage for Federal trust resources. These resources include: migratory birds; anadromous and interjurisdictional fish and other aquatic species; some marine mammals; federally listed, threatened and endangered, species; and, wetlands. Of these, Montezuma NWR currently supports migratory birds, the resource for which the refuge was established, wetlands, and possibly the federally listed, threatened Indiana bat. Management for migratory birds on the refuge primarily consists of habitat management and monitoring efforts. In the refuge's Habitat Management Plan (HMP), high and moderate priority habitats for migratory birds were identified on the refuge, ranging from emergent marsh and open water to early successional habitats (e.g., grasslands and shrublands). Furthermore, the refuge installs and maintains nesting structures (e.g., tern platforms, nest boxes, etc.) and regulates public access to limit disturbance to breeding and migrating birds. Monitoring of migratory birds on the refuge includes waterfowl surveys, breeding bird surveys, Christmas bird counts, and other efforts. Our response to these concerns is addressed in chapter 4 under goals 1, 2, and 3.

10. *How will the refuge be managed with respect to biological diversity?*

We define biological diversity (or biodiversity) as the degree of variation in life and its processes, including the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur. In accordance with the Refuge Improvement Act and the Service's policy on maintaining biological integrity, diversity and environmental health (601 FW 3), maintaining biological diversity is one of the major responsibilities of the Refuge System.

Several comments received during public scoping indicated a desire for the refuge to expand management efforts to include focusing on additional groups of species (such as reptiles and amphibians). Our response to these concerns is addressed in chapter 4 under goals 1, 2, and 3.

11. *How will the refuge manage newly acquired lands?*

One of the ways that the Service can protect habitat and wildlife is by acquiring suitable lands. Although the refuge has been actively acquiring lands and conservation easements from willing sellers (see table 1.1), less than half of the lands located in the original acquisition boundary have been purchased to date (see map 1.1). Most of the acreage acquired to date was former farmland that has subsequently been restored, usually by converting the acreage into impoundments, which are subjected to specific water-level regimes.

The refuge will continue to acquire new lands as funding and opportunities become available. During scoping, the planning team received comments expressing interest in the exploration of restoring new areas to less managed habitats (i.e., other than waterbird impoundments). Our response to these concerns is addressed in chapter 4 under goals 1 and 2.

12. *How will the refuge address the impacts of climate change?*

There is unequivocal evidence that Earth's climate is changing. Rainfall patterns are expected to change, with prolonged periods of drought punctuated by excessive rain being a possible scenario. Unpredictable and extreme weather events are anticipated, and changes in temperature and rainfall will alter the distribution and species composition of plants and wildlife in the area.

Although it is unlikely that the refuge can affect the large-scale changes in habitats and wildlife populations that will occur, there are ways it can minimize the deleterious effects of climate change. These include increased monitoring, increased habitat diversity (especially along a north-south gradient), and incorporation of redundancies and flexibilities into impoundments and other infrastructure designs to prepare for extreme rainfall events and droughts. We discuss the potential effects of climate change on the refuge in chapter 3, under *Physical Environment*. Our response to these concerns is addressed in chapter 4 under goals 1, 2, 3, and 6.

13. *How will the refuge address water quality?*

Sources of water on the refuge include rainfall, runoff, the Seneca and Clyde Rivers and Black Brook. Unpolluted sources of water are critical to the environmental health of the refuge, as contaminants can affect vegetation (e.g., excessive nutrients cause growth of undesirable plants) and wildlife (e.g., a range of toxins affect everything from fish to birds). Land use practices in the watershed largely dictate the water quality on the refuge.

Members of the public have expressed concern over the water quality of Black Brook, which flows through urban and agricultural areas and adjacent to the Seneca Meadows Landfill before reaching the refuge. Because the refuge cannot dictate land use outside its areas of jurisdiction, it must rely largely on environmental regulations by our partners (e.g., NYSDEC and the Natural Resource Conservation Service) and educational and outreach efforts with regional landowners

and other stakeholders to help ensure that water quality is maintained or improved. Our response to these concerns is addressed in chapter 4 under goals 1 and 6.

14. *How will the refuge address the impacts of hydraulic fracturing?*

Hydraulic fracturing (or hydrofracking) is a process that results in the creation of fractures in rocks, typically to facilitate the extraction of oil and natural gas wells. Environmental health and safety concerns with this practice have emerged, and the U.S. Environmental Protection Agency (EPA) is currently performing an extensive review of the practice, with a report likely to be released in the next few years. Currently, the Service is unaware of any ongoing or proposed hydraulic fracturing in the vicinity of the refuge; however, this may become an issue in the next 15 years. We address this issue in chapter 3, under Socioeconomic Environment.

15. *How will the refuge address universal accessibility?*

Providing access to the public is an important component of the refuge's visitor services program. The refuge maintains several trails, roads, overlooks, and parking areas that support a variety of priority public uses; where possible, the refuge strives to make public access areas compliant with the Americans with Disabilities Act of 1990, as amended (ADA).

The need for increased and improved access for people with disabilities was among the comments noted during public scoping. Our response to these concerns is addressed in chapter 4 under goals 4 and 5.

16. *How does/will the refuge affect the local economy?*

Although the purpose of the Refuge System is not to provide economic opportunities (its mission being "Wildlife First"), numerous studies have shown that, overall, refuges have a positive economic impact on local economies (see chapter 3 for further details regarding the effects on local economies by the refuge). Members of the public and representatives from area towns indicated concern over the effects of Service land acquisitions on the tax-base of local communities. The socioeconomic effects of the plan are considered in chapter 3 (see section on Effects on the Socioeconomic Environment).

Issues Considered, but not Further Analyzed

1. *Will the refuge address the development of a pulloff area along the New York Thruway (Interstate 90)?*

For several years, the refuge has supported the construction of a pulloff area along the NYS Thruway overlooking the Main Pool. This would provide a scenic vantage point, as well as offer wildlife observation, photography, and interpretation opportunities. The project was supposed to be a joint effort between the NYS Thruway Authority and the Service; however, because of budget issues, this project is no longer being pursued at the present time and will not be further addressed in this CCP.

2. *Will the refuge provide camping opportunities for the public?*

The refuge occasionally receives requests regarding camping. Camping is not one of the priority public uses, nor does it clearly support any of the six priority public uses. Camping could impact soils (e.g., soil compaction and vegetation loss), increase disturbance to wildlife, provide a new pathway for the introduction of invasive species, and would increase law enforcement and maintenance needs on the refuge. In addition, disposal of associated waste would be an issue. Therefore, camping will not be permitted on the refuge and will not be further addressed in this CCP.

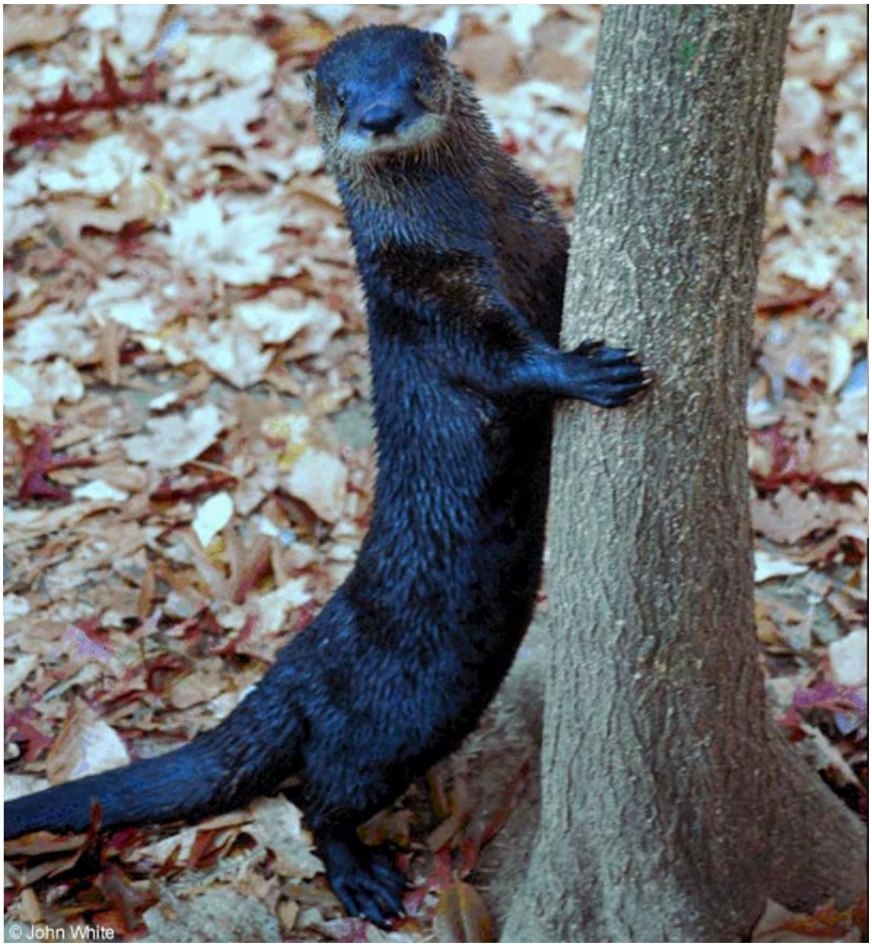
3. *Will entrance fees be implemented to help pay for public use programs and refuge upkeep?*

Members of the public have asked if the Service intends to implement entrance fees on the refuge to help pay for public use programs, as well as associated repairs and maintenance of refuge facilities. The issue of entrance fees was evaluated previously by the refuge and determined to place an undue burden on the visiting public. In addition, the collection of the fees would necessitate providing additional infrastructure (e.g., booth, barriers, etc.) and personnel to collect the fees. In light of this, the refuge has determined that, at this time, entrance fees will not be implemented and will not be further addressed in this CCP.

4. *Will the refuge promote carp fishing?*

We received a request to allow carp fishing in the impoundments. Carp, a nonnative, invasive species of fish is common in the Seneca and Clyde Rivers and is considered a sport fish by some anglers. In the spring, carp are often found congregating where the Main Pool water control structure connects to the Seneca River. In general, the Service does not promote the use of an invasive species for public use purposes, as this could create a demand for nonnative species. This could be contradictory to our mandate to control or eradicate if possible nonnative, invasive species; therefore, carp fishing will not be further addressed in this CCP.

Chapter 3



John White

River otter

Existing Environment

- **Introduction**
- **Physical Environment**
- **Biological Environment**
- **Cultural and Historical Resources**
- **Socioeconomic Environment**
- **Refuge Administration**
- **Refuge Public Use**

Introduction

This chapter describes the physical, biological, cultural, and socioeconomic environment of Montezuma NWR and the surrounding area. We provide descriptions and historical perspective of the physical landscape of the refuge and region. We also describe current refuge administration, refuge programs, and specific refuge resources.

Physical Environment

Major Historical Influences Shaping Landscape Vegetation

To evaluate future management options, it is useful to understand the historical types of natural vegetation on the refuge. For Montezuma NWR, several factors have influenced the distribution and composition of vegetation, including glaciation, ecological processes, and human disturbance. Because habitats change over time and it is difficult to determine specific historic habitat types, we describe a historical range of variation in habitats. This approach recognizes that vegetative communities are not static and shift over time. Preserving biological diversity can therefore best be attained by maintaining a range of habitat types, in different stages of succession (Foster et al. 2003).

Glaciation

The Earth has experienced several glacial periods: the last, known as the Pleistocene Ice Age, began about 2 million years ago. Glaciers advanced and retreated over time as temperatures fluctuated. The most recent period to affect portions of New York was the Wisconsin Glaciation. A 1-mile thick sheet of ice, known as the Laurentide Ice Sheet, covered the region until its retreat northward. It left northern New York about 10,000 years ago (Smith 1985). As the glacier retreated, it left behind piles or layers of sediments, rocks, and other debris; known as glacial drift. These surface deposits over bedrock come in two types: glacial till and glaciofluvial. Glacial till is a mixture of sand, silt, clay, and rock ground up by the glacier and dropped as it retreated. It covers most of this region. Glaciofluvial drift develops from the transport, sorting, and deposit of material by flowing glacial meltwater. Larger gravels and stones settle out at higher gradients, while finer silts, sands, and clays settle out as the waters slow at valley bottoms (Sperduto and Nichols 2004).

Glacial Lake Iroquois formed in the area of present day Lake Ontario when the Laurentide Ice Sheet receded, but about 3 times larger. This glacial lake, along with several others, existed for thousands of years and deposited layers of silt and clay in the Hudson River Valley.

In the Finger Lakes region of New York the receding glacier left behind a series of long, narrow lakes that in time developed into extensive marshes at their shallower northern and southern ends. At the north end of Cayuga Lake, on the old bed of one of these ancient lakes, a large system of marshes developed through which the Seneca and Clyde Rivers meandered. The extensive wetlands covered an area of over 80 square miles in a northerly direction from the head of Cayuga Lake almost to Lake Ontario (USFWS 2008b).

The refuge lies within the heart of these wetland basins at the north end and the south end of the "finger lakes," intermingled with the oval-shaped hills (drumlins) region of the New York Great Lakes Plain. These elongated hills are remnants of glacial activity and are generally oriented in a north-south direction. The flat basins between the drumlin formations often provide wetland habitats.

The New York State Canal System

Although the higher elevations were logged and farmed, there were no dramatic changes to the wetlands in the Montezuma area until the development of the Erie Canal and its subsequent expansions. The Erie Canal was first proposed in 1808 and completed in 1825, linking the Hudson River in the east to Lake Erie in the west. The canal included 83 locks with a rise of 568 feet from the Hudson River to Lake Erie. A 10-foot wide towpath was built along the bank of the canal for horses, mules, oxen, and their drivers. Since it was impractical to build an aqueduct across the entire Montezuma lowlands, the canal went down into and up out of the wetlands. Once the canal was operational, the wetlands caused many problems because it was a low point, so water from both the east and west drained into the Seneca River at Montezuma (Kapell 2011 personal communication).

In hopes of changing these problems, the canal group first tried to lower the water level of the Montezuma wetlands to reduce disease occurrence and create fertile farm land. This lowering began 30 miles to the east, and over the span of nearly 75 years, the water level of the Montezuma wetlands was lowered by approximately 12 feet. In the meantime, an aqueduct and earth-fill embankment was built over part of the wetland, blocking flood flows from following their natural course to the east, down the extremely low gradient Seneca River. Also, Keuka, Seneca, and Cayuga Lakes drain into the Seneca River, which runs into the Montezuma wetland, and the eastern Finger Lakes drain into the Seneca River downstream of Montezuma, creating a massive bottleneck for high flows.

The Erie Canal was enlarged between 1836 and 1862 to handle larger boats and more traffic (Whitford 1905). But it wasn't until 1918, with the completion of the current New York State Canal System (formerly known as the New York State Barge Canal; NYS Canal System), that the Montezuma marshes were most affected. The 525-mile NYS Canal System is the successor to the Erie Canal and other canals within New York, and it crosses the Montezuma NWR in several places. It includes the Erie, Oswego, Cayuga-Seneca, and Champlain Canals. The wetlands in the refuge have been most impacted by the Cayuga-Seneca Canal, which connects Seneca and Cayuga Lakes to the Erie Canal.

The original Erie Canal was not built into the rivers and functioned like an earthen dam, stopping the flow of water from the south and therefore increasing water levels in the vast flat area of the Montezuma marshes. The marsh near the northern end of Cayuga Lake became known as the Montezuma Marsh, and shortly thereafter the entire marsh and village area were referred to by the name Montezuma (Gable 2004). When the canal was moved in the river system in 1907, the water level was lowered. Construction of the Seneca and Cayuga extension of the NYS Canal System began in 1818 and by 1828 boats passed from Geneva to the Erie Canal at the town of Montezuma. This development had minor impact on the marshes because the river system was largely unaltered.

The hydrology was further altered in 1910 when a dam and lock were constructed at the north end of Cayuga Lake. The canal system was moved into the Seneca and Clyde Rivers, which were channelized (straightened and deepened), thus functioning as huge drainage ditches for the marshes. However, they did not restore water levels in the wetlands to their original elevations. These actions lowered the level of the Montezuma marshes by 10 feet (about 3 meters) (Kapell 2011 personal communication). Therefore the Montezuma wetlands are at the mercy of the artificially managed water levels within the canal system, managed by the New York State Canal Corporation (NYS Canal Corporation).

The canals are no longer used for commercial transport, but they are popular for fishing and recreational boating and are of great historical interest.

Current Land Use

Historically, the lands at lower elevations in the vicinity of the refuge consisted of contiguous wetland habitat. Following the development of the NYS Canal System in the early 1900s these wetlands were lost, directly and indirectly, as a result of the lower water table and associated ditching, tilling, and drainage for agriculture. Currently, agriculture is the primary land use including croplands used to grow corn, potatoes, and soybeans. These lands have muck, or organic soils, derived from drained wetlands. Typically, these areas flood every spring and occasionally in the fall and winter months.

Muck soils are often favored for vegetable or root crop production due to their excellent friability and water retention capability. However, they also carry risks of flooding and are prone to subsidence due to oxidation and wind and water erosion. As these soils lose organic matter the soil pH increases. This increase in pH has a negative effect on the availability of nutrients and the suitability of the soils for growing root crops. Eventually, shallow muck soils lose their value for the production of high value crops.

Most of the upland habitat is currently maintained in early successional stages, such as grassland and shrub fields, by active management practices (USFWS 2008b). Most of the uplands surrounding the refuge are forested. These habitats are managed to improve habitat and wildlife diversity. Upland habitats adjacent to wetlands act as a buffer from the effects of crop fertilization and crop runoff (Ducks Unlimited 2000).

Regional Land Use Patterns

Much of the lands in and around the MWC are in private ownership. The majority of these lands are used for agriculture and are dominated by muck farms. The major crops are corn, potatoes, onions, beans, wheat, and hay (Ducks Unlimited 2000). Muck is the organic soil from drained swamplands, exposed across large areas when the canals were created during the height of agriculture during the 1800s through 1900s. Muck farming was an important part of farming in New York and other states. Onions, potatoes, celery, and carrots grow especially well on these soils. Maintaining mucklands in agriculture is difficult, requiring constant drainage and wind barriers, as the rich muck soils are extremely susceptible to erosion from wind (as muck becomes wind borne when dry). In addition, oxidation of the rich organic material and subsidence have substantially reduced the topsoil depth and hence lowered the fertility. On much of the muck, corn has become the primary crop because it does not require deep rich soils. Given the nature of past

muck farming practices, high levels of pesticide residues are typically found on these sites (Ducks Unlimited 2000).

The agricultural land uses surrounding the MWC contribute runoff to the wetlands. However, the function and value of some of these restored agricultural lands may have lower wetland quality if invasive plants become established or concentrations of agricultural chemicals are left undetected. The opportunity for restoring abandoned or marginal agricultural lands to high quality wetlands is great in this region.

Wetlands comprise the second largest land cover in the complex, after farmland. The most common wetland type is forested. Forested wetlands are dominated by red maple (*Acer rubrum*), silver maple (*Acer saccharinum*), green ash (*Fraxinus pennsylvanica*), and swamp white oak (*Quercus bicolor*). Understory vegetation includes northern spicebush (*Lindera benzoin*), winterberry (*Ilex verticillata*), sensitive fern (*Onoclea sensibilis*), skunk cabbage (*Symplocarpus foetidus*), and arrow arum (*Peltandra virginica*). Nonforested wetlands are dominated by cattail (*Typha* spp.), purple loosestrife (*Lythrum salicaria*), and sedges and rushes (*Cyperus* spp., *Carex* spp., *Eleocharis* spp., *Juncus* spp.). Other less common wetlands include inland salt marshes and nonvegetated mudflats.

Most of the uplands surrounding the refuge are forested. These forests are characterized primarily by sugar maple (*Acer saccharum*), red maple, basswood (*Tilia americana*) and oak species (*Quercus* spp.). Grassland habitats are comprised of cool and warm season grasses and various forbes. Cool season grasslands are dominated by Timothy grass (*Phleum pratense*), smooth brome (*Bromus inermis*), orchard grass (*Dactylis glomerata*), redtop (*Agrostis gigantea*), and birds-foot trefoil (*Lotus corniculatus*). Warm season grasslands typically include switchgrass (*Panicum virgatum*), big bluestem (*Andropogon gerardii*), little bluestem (*A. scoparium*), sideoats grama (*Bouteloua curtipendula*), and Indiangrass (*Sorghastrum nutans*).

Open water surrounding the refuge consists of lakes, ponds, rivers, canals and streams that do not show emergent vegetation. Floating and submerged aquatic vegetation species may include duckweed (*Lemna spp*), coon's tail (*Ceratophyllum demersum*), waterweed (*Elodea canadensis*), water naiad (*Najas flexilis*), and pondweeds (*Potamogeton* spp.).

Ecosystem Context

Biophysical Region

The physical environment, expressed through climate, geology, topography or landform, and soils, explains much about the patterns and distribution of biological diversity. These patterns describe natural divisions, called biophysical regions or ecoregions, that inform our efforts to understand, conserve, and manage wildlife and other biodiversity. Ecoregions are relatively large geographic areas of land and water defined by common climate, geology, and vegetation patterns. The Nature Conservancy classified New York into seven ecoregions (USFWS 2008b). Montezuma NWR is in the Great Lakes Plain Ecoregion, a region formed during the last glacial advance and characterized by gently rolling, low level landscapes and flat lake plains (NYSDEC 2005a). New York has approximately 2.4 million acres of wetlands (as of the mid 1990s). The Lake Plains and the Adirondacks are the wettest portions, encompassing 74 percent of the State.

The New York State Department of Conservation (2010) estimated the percent wetland type in the Lake Plains region as forested−75.4 percent, scrub/shrub−14.2 percent, emergent marsh−7.9 percent, and open water wetland−3.3 percent.

Great Lakes Watershed

Montezuma NWR is in the southeastern corner of the 290,000-square mile Great Lakes watershed, the largest freshwater ecosystem in the world (USFWS 2008b). The watershed includes all tributary streams and inland lakes that are hydrologically connected to the five Great Lakes: Superior, Michigan, Huron, Erie, and Ontario. Together these lakes hold 20 percent of the world's supply of surface freshwater and 95 percent of the U.S. supply. The climate and hydrology of the Great Lakes create unique environmental conditions that support a diversity of wildlife species and communities. The glacial and cultural history also has greatly influenced the presence and distribution of biodiversity in this region (TNC 2000).

TNC has identified several threats to biodiversity in the Great Lakes ecoregion, including development, invasive species, hydrologic alterations, incompatible forestry and agricultural practices, and resource extraction (TNC 2003). Urban, residential, second home, and road construction are causing loss, degradation, and fragmentation of important habitats. Purple loosestrife, reed canary grass (*Phalaris arundinacea*), common reed (*Phragmites australis*), swallow-wort (*Cynanchum* spp.), garlic mustard (*Alliaria petiolata*), common buckthorn (*Rhamnus cathartica*), and zebra mussel (*Dreissena polymorpha*) are some of the invasive species negatively impacting the Great Lakes region. Dams, diversions, dikes, groundwater withdrawals, and other changes are affecting the natural flow regime of aquatic systems (TNC 2000).

Southeast Lake Ontario Basin

The refuge lies within the Southeast Lake Ontario (SELO) Basin (map 3.1) as described within the New York State Comprehensive Wildlife Conservation Strategy (NYSDEC 2005a). The New York State CWCS identified conservation priorities within the major watershed basins of the State (NYSDEC 2005a). The watershed basin boundaries are taken from the USGS 4-digit Hydrologic Unit Codes. The SELO Basin covers 4.3 million acres (all or part of 19 counties) in west central New York, from Rochester east to the mouth of Stony Creek and south encompassing the Finger Lakes. Important habitat types within the SELO include emergent marshes, riparian forests, and grasslands. According to the EPA's land classification, 50 percent of the Southeast Lake Ontario Basin is forested. The rest of the land area is dominated by agriculture, 24 percent in row crops and 16 percent in hay or pasture (table 3.1). Forty-five percent of the 1.7 million people that live in the SELO Basin are in and around Syracuse. The population of the Basin is expected to continue to decline (NYSDEC 2005a).

Table 3.1 Land Cover within the Southeast Lake Ontario Basin of New York (NYSDEC 2005a).

Land Cover Classification	Percent Cover
Deciduous Forest	34.17
Row Crops	24.38
Pasture/Hay	15.53
Mixed Forest	11.01
Water	5.01
Wooded Wetlands	3.17
Low Intensity Residential	2.57
Evergreen Forest	1.32
Parks, Lawns, Golf Courses	1.07
High Intensity Commercial/Industrial	0.79
High Intensity Residential	0.60
Emergent Wetlands	0.24
Barren; Quarries, Strip Mines, Gravel Pits	0.11

NYSDEC (2005a) identified 129 species of greatest conservation need (SGCN) that currently occur in the Basin and another 49 species that historically occurred in the Basin but are now believed to be extirpated. The State believes that within the SGCN category, populations of 43 species are decreasing, 11 are increasing, 8 are stable, and 67 are of unknown status (NYSDEC 2005a).

Western Oswego River Watershed

The MWC is a part of the 5,100-square mile Western Oswego River watershed that largely drains into Lake Ontario (USFWS 2008b). The primary surface-water is the easterly flowing New York State Canal System, located mostly within the former natural channels of the Clyde and Seneca Rivers. The MWC encompasses a 17.5-mile segment of the main canal. In an unaltered system, the water levels in the Clyde and Seneca Rivers would fluctuate according to natural weather events such as spring snowmelt/runoff, heavy spring rains/heavy runoff, and heavy fall rains before the winter freeze. However, since these rivers have been channelized as part of the NYS Canal System, the NYS Canal Corporation artificially maintains water levels for navigational purposes and to minimize flood damage within the Oswego River Basin. Typically, following the navigation season, the system's water levels are lowered in the fall to provide storage for spring snowmelt and storm runoff. The lowest water level on the system is maintained in winter. Water levels are then raised gradually to predetermined safe levels for summer use. Other waterways in the MWC include Black Brook, White Brook, and Crusoe Creek.

Map 3.1. Southeast Lake Ontario Basin.

Bird Conservation Region

As discussed in chapter 1, "Conservation Plans and Initiatives Guiding the Project," Montezuma NWR lies within BCR 13, the Lower Great Lakes/St. Lawrence Plain (map 3.2). BCR 13 encompasses the vast, low-lying lake plain region surrounding Lake Erie and Lake Ontario, the St. Lawrence River Valley, low-lying regions between the Adirondack Mountains and the Laurentian Highlands, and upper regions of the Hudson River Valley. In addition to important lakeshore habitats and associated wetlands, this region was originally covered with a mixture of oak-hickory, northern hardwood, and mixed-coniferous forests. Although once dominated by forests, the landscape currently is largely agricultural with interspersed wetlands and remnant forest stands. At one time or another, nearly 95 percent of the original habitat types have been logged or converted to agriculture and/or urban development. BCR 13 was identified as playing a critical role in providing important staging and migrating habitat for birds during the spring and fall migration (ACJV 2007). In addition, about 16 percent of the global population of bobolink (*Dolichonyx oryzivorus*) nests in the St. Lawrence Valley of northern New York (Rosenberg 2000).

Agriculture has been the major land use in BCR 13 for nearly 300 years. Today, this farmland matrix contains scattered remnant forest and patches of wetlands and is interspersed with towns and several large metropolitan areas. Within BCR 13, the agricultural lands comprise over 15 million acres (30 percent of the total land area) while hay and pasture (10 million acres) account for 21 percent of the total area. Approximately one third of BCR 13 is now covered with upland forest, consisting of deciduous (21.8 percent), mixed (8.6 percent), and coniferous (3.4 percent) stands. Urban areas make up 5 percent of the land area, and the remaining land cover consists of open water (5.5 percent), forested wetland (2.6 percent), and less than 1 percent open wetland (ACJV 2007). Heinselman (1981) describes the presettlement BCR 13 region as a forest belt, transitioning between the boreal forests of Canada and the deciduous forests of the eastern U.S.

Historically, the St. Lawrence River Valley was dominated by sugar maple-beech-birch forest, mesic oak hardwood forest, red maple-black ash swamp forest, and silver maple floodplain forest (Rosenberg et al. 2000). The Lower Great Lakes Plain consisted primarily of either northern hardwood forest or dry oak-hickory-ash forest (Dettmers and Rosenberg 2003). Historic nonforest natural vegetation types of the region include pitch pine-scrub oak woodlands, emergent freshwater marshes, and freshwater tidal marsh, as well as large river islands with beds of reeds or grass (including wild rice) (Rosenberg 2000).

Partners in Flight Physiographic Regions

In 1990, Partners in Flight was established as a means to promote cooperative conservation to address bird and habitat issues at a continental scale. The refuge lies within Area 15, the Lower Great Lakes Plain (LGLP) physiographic area, which encompasses approximately 11,788,162 acres (map 3.3). LGLP covers the low-lying areas to the south of Lake Ontario in New York and to the north of Lake Erie in southernmost Ontario in Canada. In addition to important lakeshore habitats and associated wetlands, this region was historically covered with a mixture of oak-hickory, northern hardwood, and mixed-coniferous forests. Roughly 74 percent of the land area is in agricultural production. In addition, several medium-sized cities (Syracuse, Rochester, Buffalo, Windsor, etc.) comprise over 800,000 acres of urban land, or 7.1 percent of the physiographic area. Priority bird species of the LGLP include Henslow's sparrow (*Ammodramus*

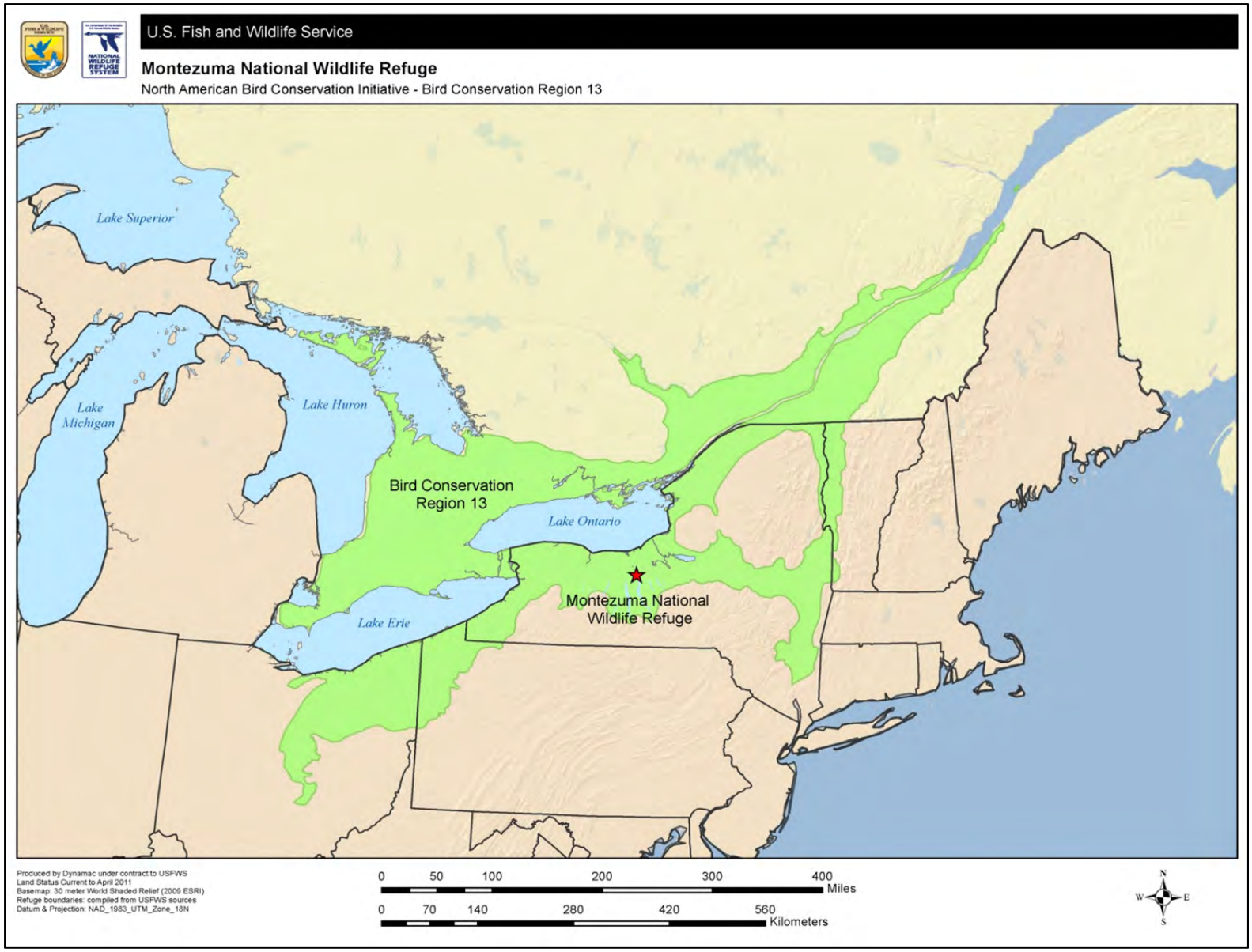
henslowii), bobolink, upland sandpiper (*Bartramia longicauda*), golden-winged warbler (*Vermivora chrysoptera*), American woodcock (*Scolopax minor*), cerulean warbler (*Dendroica cerulean*), and red-headed woodpecker (*Melanerpes erythrocephalus*). Specific conservation recommendations for this physiographic area include:

- Intensive survey and monitoring for high-priority species to identify most important areas in need of protection.
- Increased protection of forest and lakeshore habitats critical to cerulean warblers and migrant passerines.
- Increased management on protected and private lands to provide habitat for Henslow's sparrow and golden-winged warbler.
- Integration of land bird population and habitat objectives with those for wetland species and game species such as American woodcock.

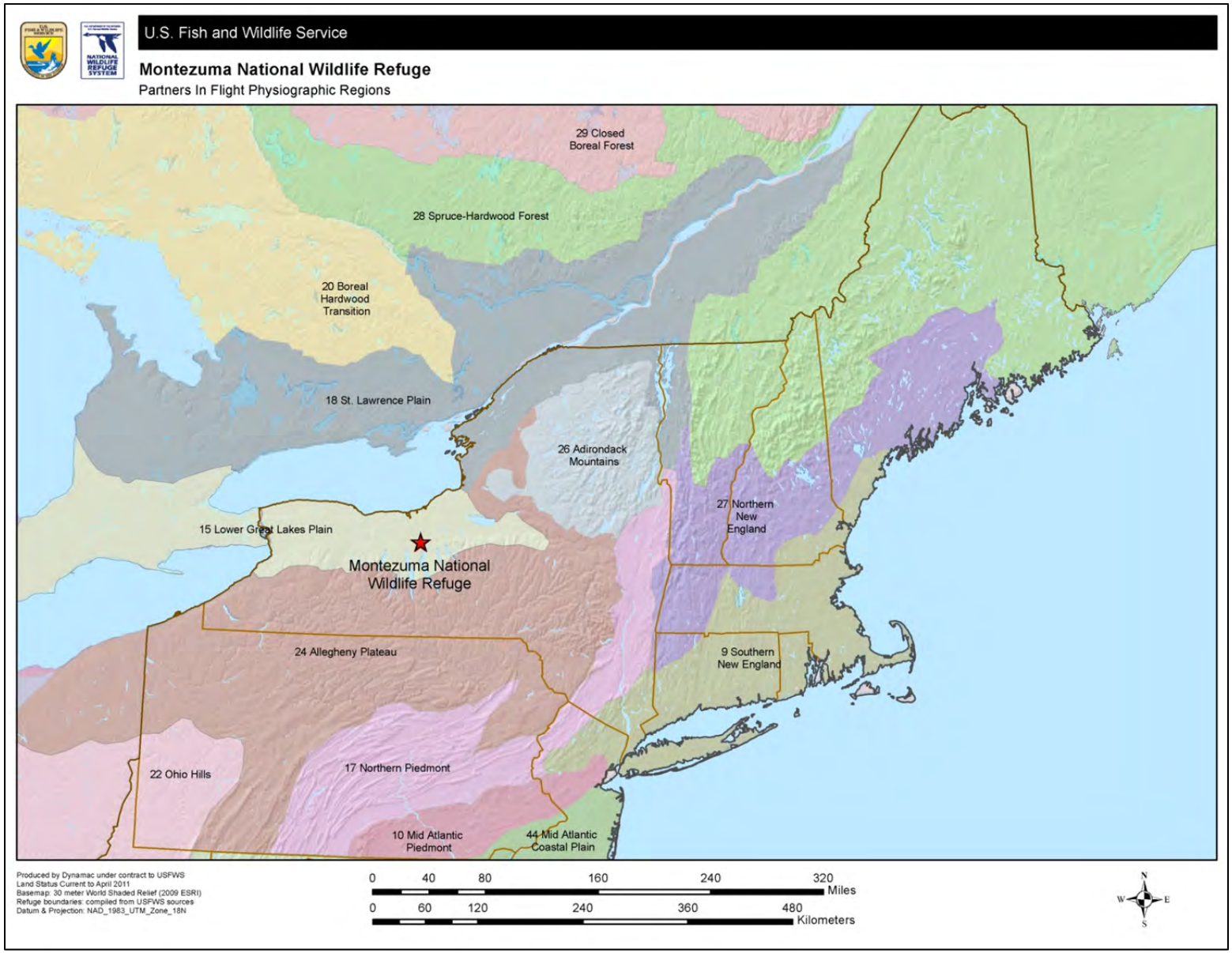
Ecological Role of Fire in the Region

Wildfire has not played a major role as a natural disturbance in shaping the ecosystems of BCR 13, with the possible exception of certain uncommon habitats, such as open grasslands, shrublands, or savannah found on rocky barrens (e.g., limestone bedrock) or other areas with shallow, drought-prone soils. Brown and Smith (2000) estimate that historically the region was subjected mainly to mixed severity fires (i.e., fires which vary between understory and stand replacement impacts, or cause selective tree mortality) at intervals of greater than 500 years. Runkle (1990) indicates in a generalized scheme for the Eastern U.S. that the historic, major disturbance in the deciduous forest of the Great Lakes region were "gaps" (mainly single tree death), rather than frequent wildfires or large wind events.

Therefore, the role of fire in restoring historic ecological conditions, such as on a large-scale in forested, wilderness areas, is limited in BCR 13. Prescribed fire is more appropriately used on national wildlife refuges in BCR 13 for small-scale habitat manipulation. Refuges in the region have primarily used prescribed fire to manipulate vegetation in freshwater impoundments and post-agricultural, successional habitats (USFWS 2009a).



Map 3.2. North American Bird Conservation Initiative Bird Conservation Region 13.



Map 3.3. Partners in Flight Physiographic Regions

Climate

The weather in the Great Lakes watershed is affected by the location and size of each lake, air masses from other regions, and the location within a large continental landmass. Each of the Great Lakes acts as a heat sink, absorbing heat when the air is warm and releasing it when the air is cold. This results in more moderate temperatures at areas near the shore than other locations at similar latitudes. The influence of external air masses varies seasonally. In the summer, the region is influenced mainly by warm humid air from the Gulf of Mexico, whereas in winter the weather is influenced more by Arctic and Pacific air masses (USEPA and Government of Canada 1995).

Lake Ontario provides the source of significant winter precipitation as it is very deep and almost never freezes. Cold air flowing over the lake is quickly saturated and produces the cloudiness and "lake effect" snow squalls that are well-known features of winter weather in the vicinity of the refuge. Snowfall is moderately heavy, with an annual average of approximately 66 inches. Wind velocities are moderate, but during winter months there are numerous days with sufficient winds to cause severe blowing and drifting of snow. The refuge area is generally cold and snowy in winter with an average temperature of 27 degrees Fahrenheit (°F) and an average low of 19 °F (see table 3.2). Summers are generally warm with an average temperature of 67 °F and an average high of 80 °F. Average annual precipitation is 36 inches and is well-distributed during the year (National Oceanographic and Atmospheric Administration [NOAA] 2010a).

Table 3.2. Average Temperature and Precipitation for 1971 to 2000 Around Auburn, New York (Source: NOAA 2010a).

Month	Temperature Averages for Auburn, NY 1971- 2000		50-Yr Average Precipitation Inches
	Average High (°F)	Average Low (°F)	
January	31	14	1.39
February	34	16	1.26
March	44	24	2.26
April	56	35	2.97
May	72	47	3.04
June	77	55	3.36
July	81	60	3.48
August	79	58	3.28
September	79	51	3.53
October	59	40	3.23
November	48	32	3.22
December	35	20	1.98
Average Totals	**57**	**38**	**32.98**

Climate Change

Secretarial Order 3226 (Amendment 1) requires that climate change impacts be considered and analyzed when planning or making decisions within the Department of the Interior (U.S. Secretary of the Interior 2009). This order serves as an opportunity for refuge system planners and managers to incorporate climate change impacts into each refuge's CCP.

There is consensus among the scientific community that global climate change, occurring in part as a result of emissions of carbon dioxide and other greenhouse gases from human activities, will lead to significant impacts across the U.S. (Wigley 2004). These may include increasing temperatures, altered rainfall patterns, and sea level rise. The effect of climate change on wildlife and habitats is expected to be variable and species specific, with a predicted general trend of ranges shifting northward and to higher elevations (Shugart et al. 2003). Nonnative species will likely increase (Walther et al. 2002). Within the Great Lakes region, substantial changes are anticipated, and according to a regional report on projected climate change and impacts, by 2025, spring and summer temperatures in the Great Lakes region are likely to be 3 to 4 °F above current averages (Kling et al. 2003). The amount and seasonal distribution of precipitation is expected to be altered as well; precipitation is expected to increase between 10 and 20 percent, with winter and spring rain increasing and summer rain decreasing by up to 50 percent. These changes in precipitation may result in more frequent floods and droughts. Uncertainty about the future effects of climate change requires refuge managers to use adaptive management (e.g., adjusting regulations, shifts in active habitat management, or changing management objectives) to maintain healthy ecosystems in light of unpredictability (Inkley et al. 2004). Refuge managers can plan and respond to changing climate conditions. Options include managing for diverse and extreme weather conditions (e.g., drought and flood); maintaining healthy, connected, genetically diverse wildlife populations; and (where applicable) protecting coastal wetlands to accommodate sea level rise (see Inkley et al. 2004 for more recommendations).

Hydrology

The refuge receives water from direct precipitation, runoff from the hilly areas bordering the west side of the refuge, three streams originating to the west of the refuge, and several springs within refuge boundaries. Two streams, Black Brook and White Brook, flow directly into Tschache Pool. Black Brook is the major contributor to this impoundment with a drainage area of 12,580 acres. White Brook has a drainage area of 5,760 acres. Esker Brook, with a drainage area of 2,090 acres, flows into North Spring Pool (USFWS undated).

The refuge includes a salt spring located in Black Lake within the Main Pool. Inland salt marshes are globally endangered plant communities (Eallonardo 2009 personal communication). The Black Lake Salt Marsh, one of four in the MWC, was identified by Weigand and Eames in 1925 and is listed as a rare community by the New York Natural Heritage Program.

Surface water concerns include water quality, artificially maintained water levels generated by the operation of the NYS Canal System and surface water supply for current and future wetland impoundments. Ground water resources in the MWC are located in the consolidated (bedrock) and unconsolidated glacial deposits. Nearly all the ground water in this area is derived from precipitation that is absorbed by the bedrock. Unconsolidated sand and gravel deposits produce

the best yield of water for wells in the region. Overall, hydrological data for the MWC is lacking, and more detailed information is needed (Ducks Unlimited 2000).

Geology and Topography

Post-glacial geologic features dominate the landscape surrounding the refuge. The topography is represented by formations such as drumlins, eskers, kames, and kettles, and is gently sloping to rolling. The refuge lies over an old, flat lakebed at the northern end of the Cayuga Lake Basin. The broad, flat basins are interrupted by classic drumlin formations, oblong hills of 60 to 150 feet high with a north-south orientation resulting from glacial deposits. The flat basins below the 380-foot contours are the location of the existing and historical Montezuma Marshes (Ducks Unlimited 2000).

Soils

The refuge region is generally underlain by a combination of limestone and limestone/shale bedrock. These calcareous rocks result in the highly productive glacial till found throughout the Montezuma wetlands area. Three major soil groups are found within the MWC. The largest group is comprised of various types of muck (lake bottom and marsh organic materials) occurring at or below the 380-foot contour interval. The Ontario soil association in the drumlin zones and the Odessa-Schoharie Fulton-Lucal association found in the southwestern corner of the MWC characterize the remaining area (Ducks Unlimited 2000).

A soil profile of the refuge wetlands would reveal an upper layer of deep Carlisle muck and sedimentary peat over a Chara and shell marl. The subsoil in this area of the old lake basin is compact blue clay. The upland soils are derived from calcareous glacial till. The well-drained sandy loams include pockets of Palmyra gravelly loam, Ontario loam, Poygan silty clay loam, Schoharie silty clay loam, and Wayland silty loam (U.S. Department of Agriculture [USDA] Soil Conservation Service and Cornell University Agricultural Experiment Station 1972). Table 3.3 lists refuge soils.

Table 3.3. Soil Types on Montezuma NWR.

Soil Symbol	Soil Name	Description
CeB	Cazenovia silt loam (3 to 8 percent slopes)	Moderately well-drained, medium textured, and moderately fine textured soils that formed in glacial till having a high content of clayey shale and in calcareous glacial till in which a deposit of lacustrine clay has been incorporated.
CIA	Collamer silt loam (0 to 2 percent slopes)	Moderately well-drained, medium textured soils that formed in lacustrine deposits of alkaline or calcareous silt or very fine sand that is high in content of silt.
Ed	Edwards muck (level or nearly level)	Organic soils that formed in mixed woody, grassy or sedgy material underlain by white to light gray calcareous marl at a depth of 10 to 40 inches.
Fn	Fonda mucky silty clay loam (level or depressional)	Very poorly drained, moderately fine textured soils that developed in lacustrine deposits of gray, brown, or reddish, calcareous clay containing occasional bands of

Soil Symbol	Soil Name	Description
		silt and very fine sand.
LcA	Lakemont silty clay loam (0 to 2 percent slopes)	Poorly drained, moderately fine textured soils that formed in calcareous, reddish, lacustrine clay and silty clay.
LtB	Lima silt loam (3 to 8 percent slopes)	Deep, moderately well-drained soils that formed in strongly calcareous, medium textured glacial till.
Ma	Madalin and Odessa silty clay loam (level or depressional)	Deep, poorly drained soils that formed in calcareous, gray and brown clay and silty clay in glacial lakes.
Md	Made land, tillable	Areas in which the original soil has been moved or disturbed, and the original surface layer and subsoil are not evident. Most areas consist of material that was dredged during the straightening and deepening of the NYS Canal System.
Mr	Muck, deep (0 to 1 percent slopes)	Organic soil formed in a mixture of wood, grass, or sedgy material; strongly acid to alkaline; the organic layer ranges from 40 inches to as much as 17 feet in depth. The organic layer is underlain by mineral soil material or by white, highly calcareous marl.
Ms	Muck, shallow (0 to 2 percent slopes)	Organic soil formed in a mixture of wood, grass, or sedgy material; strongly acid to alkaline; the organic layer ranges from 10 to 40 inches in depth.
OdA	Odessa silt loam (0 to 2 percent slopes)	Deep, somewhat poorly drained soils that formed in calcareous, reddish, lacustrine clay and silt.
OnB	Ontario loam (2 to 8 percent slopes)	Deep, medium textured, well-drained soils that formed in strongly calcareous, firm glacial till. The glacial till is derived mainly from sandstone, limestone, and some shale, and contains sufficient red sandstone or red shale to impart a reddish hue.
OnC	Ontario loam (8 to 15 percent slopes, eroded)	Commonly occurs in long, narrow strips on the sides or tops of drumlins. Seventy-five percent of most areas are so eroded that the surface layer consists partly of material from the subsoil.
OnD	Ontario loam (15 to 28 percent slopes, eroded)	Typical for the Ontario series but is generally thinner over calcareous till. These soils typically occur on the sides of drumlins. Most of the slopes are single, although a few are hilly and complex.
OvA and OvB	Ovid silt loam (0 to 3 percent slopes and 3 to 8 percent slopes)	Deep, somewhat poorly drained soils that have a moderately fine textured subsoil. These soils formed in reddish glacial till derived from mixed limestone and red alkaline or calcareous clay shale or from appreciable amounts of reworked red lacustrine clay mixed with limestone and shale.

Soil Symbol	Soil Name	Description
SeB	Schoharie silt loam (2 to 6 percent slopes)	Deep, moderately well-drained and well-drained soils derived from calcareous reddish clay and silt. The surface layer is commonly silt loam, but there are a few small areas of very fine sandy loam.
Sn	Sloan silt loam (level or depressional)	Deep, poorly drained and very poorly drained, medium textured and moderately fine textured soils that form in slightly acid to mildly alkaline, recent alluvium. These soils typically have little or no structure.
Source: USDA Soil Conservation Service and Cornell University Agricultural Experiment Station 1972		

Air Quality

The EPA collects emissions data for three air pollutants—carbon monoxide, sulfur dioxide, and particulate matter—and three precursors/promoters of air pollutants—volatile organic compounds, nitrogen oxides, and ammonia. That data are summarized in the Air Quality System database, the EPA repository of air pollutant monitoring data, which reports the number of days when air quality was good, moderate, unhealthy for sensitive groups, or unhealthy (for everyone), by counties with air quality monitoring stations. We are using data for Wayne County, the nearest county which monitors air quality, for a general evaluation of air quality at the refuge. The following data were collected in 2008: Wayne County—89 percent good, 10 percent moderate, and 1 percent unhealthy for sensitive groups (0 unhealthy days) (EPA 2008).

Water Quality

The Finger Lakes of New York are essential to the health, well-being, and economy of the region. It is estimated that these lakes contain 8.1 trillion gallons of freshwater. Combined, their watersheds are 2,630 square miles (Halfman and O'Neill 2009). These lakes are a source of Class AA drinking water to the 1.5 million residents in the surrounding communities. Water quality varies across the Finger Lakes. Skaneateles, Canandaigua, and Keuka Lakes are oligotrophic and have the best water quality. Seneca, Owasco, Cayuga, Honeoye, and Otisco Lakes are mesotrophic to eutrophic and have lower levels of water quality. Nutrient sources in the watershed stem from both point and nonpoint sources, including wastewater treatment facilities, erosion along stream banks, and agricultural runoff (Halfman and O'Neill 2009). Water quality issues of concern within the Finger Lakes include water supply, swimming, and fish consumption. Among pollutants of concern are nutrients, sediments, priority organics, pathogens, and salts (Callinan 2001).

The refuge is closest to Cayuga Lake, the second largest of the Finger Lakes in volume, and has the largest watershed. The lake is 38.2 miles in length, has a maximum width of 3.5 miles, and contains 95.3 miles of shoreline. The drainage basin is 785 square miles. Cayuga Lake drains through the Oswego River system into Lake Ontario. The quality of water in Cayuga Lake is dependent on the quality of water that enters it from tributaries and runoff within the watershed. Cayuga Lake is subject to contamination from both point and nonpoint sources that may enter

the lake through runoff from tributaries or directly into the lake itself (Genesee/Finger Lakes Regional Planning Council and EcoLogic 2000).

Recommendations for Cayuga Lake include: (1) control of nutrient (particularly phosphorus) and sediment loads within the Cayuga Lake watershed; (2) continuation of periodic monitoring of aquatic biota for chlorinated organic chemicals; and (3) monitoring zebra mussels to understand population dynamics and assess the ecological effects associated with this invasive exotic species (Callinan 2001).

Environmental Contaminants

A 1995 draft report summarized the existing contaminant information related to Montezuma NWR (USFWS 1995). This summary included a list of baseline studies, nearby hazardous waste sites, monitoring sites, and history of pesticide use on the refuge. The Service also has been acquiring mucklands from willing sellers for restoration of wetland and upland habitats in the MWC. Some surveys of these lands have detected the presence of contaminants.

Stoll (1988) sampled water quality, sediments, and wildlife species within refuge impoundments and adjacent canals and streams to determine the presence and extent of contaminants. Dichlorodiphenyltrichloroethane (DDT), Polychlorinated Biphenyls (PCBs), and dieldrin were found in turtle and fish tissue samples. Although these compounds were not detected in sediment samples, these chemicals and other pesticides were found in samples from some refuge tracts, such as the Sandhill Crane Unit (USFWS 1999). It was concluded that levels of metals and organics were not a cause for concern, although there is some evidence that adverse effects to ecosystem function are occurring and levels of arsenic, zinc, and copper in agricultural mucklands were above baseline conditions and in some place above the State's "severe effect" level (USFWS 1999). Contaminant uptake by wildlife is dependent on the contaminant, the other contaminants present, the species involved, and the chemistry of the soil and water (NYSDEC 1998). Soils with a high carbon content and large proportions of fines in sediments (such as in the mucklands) can bind a higher amount of contaminants and therefore have a higher capacity of limiting the amount of contaminants available for uptake by wildlife. Thresholds suggested by Long and Morgan (1990) may be more applicable to the mucklands than the Statewide thresholds. The cumulative concentrations of arsenic, copper, and zinc show some correlation with a decrease in algae species richness (USFWS 1999). To reduce the potential exposure of trust resources to contaminants, a management strategy was drafted for muckland restoration and acquisition related to contaminant issues (USFWS 1999).

Noise

The presence of high- and low-speed roadways scattered throughout the refuge results in some traffic noise being within hearing distance of many refuge areas. Ambient noise levels on and around the refuge are generally similar to other rural locations in central New York except for along Interstate 90. The effect on wildlife from the noise generated on the NYS Thruway is believed to be minimal due to its relative uniformity of volume and timing, although it negatively affects visitors. Most areas on the refuge (e.g., Knox-Marsellus, Esker Brook Trail) are sufficiently buffered from noise to allow visitors a pleasant experience.

Visual Resources

The refuge offers an excellent option for central New Yorkers seeking an aesthetically pleasing landscape to visit. There is much to be gained from experiencing a picturesque sunrise or sunset over the grasslands and marshes of Montezuma NWR. The abundance and diversity of wildlife associated with these open spaces significantly enhances the outdoor experience.

Transportation and Utility Corridors

The refuge is intersected or adjacent to several major roads and utility corridors. The NYS Thruway crosses the refuge at the Main Pool impoundment. In addition, several State highways, as well as numerous county and town roads run through or along refuge lands. Two railroads operate in the area, and the NYS Canal System and the Cayuga-Seneca Canal are two major waterway transportation routes through the area. Utility corridors that transverse or border refuge lands include four power lines (over 115 Kilo volt), three major underground telephone lines, and several oil and gas pipelines.

Biological Environment

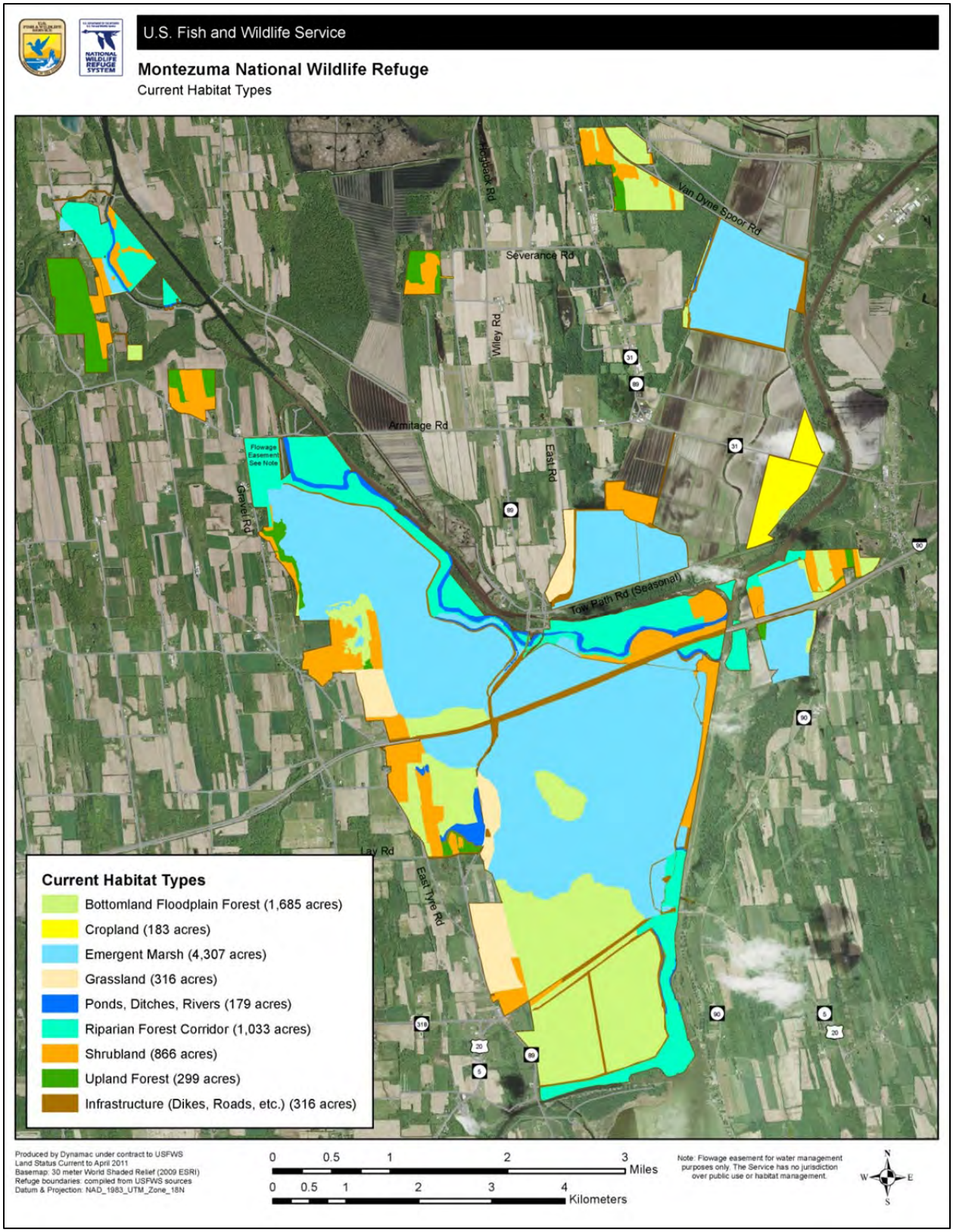
Habitat Types

The refuge supports the following habitats: emergent marsh, open water, mudflat, forested wetland, upland forest, grassland, and early successional uplands and wetlands (table 3.4 and map 3.4).

Table 3.4. Habitats on Montezuma NWR.

Habitat Type	Acres[1]	Percent
Emergent Marsh	4,307	46.9
Bottomland Floodplain Forest	1,685	18.3
Riparian Forest Corridor	1,033	11.2
Scrub/Shrub	866	9.4
Upland Forest (all successional stages)	299	3.3
Cropland	183	2.0
Grassland	316	3.5
Ponds, Ditches, Rivers	179	1.9
Infrastructure (dikes, facilities, trails, etc.)	316	3.5
Total	**9,184**	**100.0**

[1]Acreages are current as of October 2012.



Map 3.4. Montezuma National Wildlife Refuge Current Habitat Types as of October 2012.

Wetlands

The three major types of wetlands at Montezuma NWR, according to Cowardin et al. (1979), are aquatic bed, emergent wetland, and forested wetland. Aquatic bed refers to wetlands and deepwater habitats that are dominated by plants which grow primarily on or below the water surface. Emergent wetlands are characterized by rooted herbaceous hydrophytes and usually occur in calm, shallow water. Forested wetlands are dominated by various water-tolerant tree species, with minimal understory. These habitat types provide numerous benefits, including flood protection by acting as sponges which absorb excess water; improved water quality by filtering toxins introduced by agricultural runoff; and diverse habitat for wildlife (EPA 2001).

Emergent Marsh, Open Water, and Shallow Water/Mudflats

The most common habitat type on the refuge is emergent marsh. Emergent marsh is a wetland dominated by erect herbaceous plants such as cattails and smartweeds (*Polygonum* spp.). Historically, habitat conditions in these marshes were dictated by the weather, which influenced water levels and flow rates in the Seneca and Clyde Rivers. For example, a particularly wet season or a series of wet years, would have resulted in higher water levels in the marshes and more open water relative to vegetative cover. Similarly, a drought year would have resulted in lower water levels and more vegetative growth. The Seneca and Clyde Rivers have since been dredged and straightened and continue to drain the historic marshes. The water levels and flow rates are largely controlled by the NYS Canal Corporation rather than natural fluctuations. This control has a consequence of moderating the variation and timing of high and low water. As a result, habitats within the refuge would develop into more forested wetlands and uplands, and less emergent marsh due to the lack of periodic flooding. It is for this reason that wetlands on the refuge are impounded and refuge staff manipulate the water levels. The impounded wetlands are managed to mimic natural hydrologic fluctuations and provide optimal habitat for species of conservation concern.

This effort began in the late 1930s, when the U.S. Bureau of Biological Survey (the precursor to the U.S. Fish and Wildlife Service) began acquiring the southern portion of the Montezuma Marsh. Shortly after Montezuma NWR was established in 1938, the Civilian Conservation Corps began work on a series of low dikes to reflood the main marsh (now called the Main Pool). In 1939, diking operations were continued to impound the flows of White and Black Brooks, to reflood a small portion of the former marshes, and to create a water source to refill the Main Pool, thus creating Tschache Pool. Today, the refuge has 14 manageable impoundments totaling more than 4,000 acres of freshwater emergent marsh, open water, and mudflat habitat (table 3.5 and map 3.5).

This dike system allows us to maintain many of our marsh units at “flood” stage for long periods and through a range of weather conditions. However, biologists have learned that after prolonged high water, emergent vegetation dies back and open water dominates. At this stage of the marsh’s life, it is less productive and provides little habitat for wildlife (e.g., waterfowl, marshbirds, shorebirds, muskrats). Draining the water out of the marsh at this time mimics a natural drought, exposes mudflats for shorebirds during their migration if timed properly, and allows plants to grow. When the marsh is reflooded, the resulting habitat is ideal for a variety of wildlife. Annual moist-soil vegetation is an important food source for migrating waterfowl, and

perennial vegetation provides important cover not only for waterfowl but also for breeding marshbirds, such as rails, bitterns, and terns.

Table 3.5. Emergent Marsh and Open Water/Mudflat Impoundments on Montezuma NWR.

Impoundment Name	Acres[1]
Main Pool	1,657
Tschache Pool	1,160
Sandhill Crane Unit	448
Knox-Marsellus Marsh	236
Jackson	215
May's Point Pool	199
Puddler Marsh	98
North Spring Pool	91
Millennium Marsh	69
Visitor Center Wetland	26
Benning Marsh	18
Shorebird Flats	18
Box Elder Bog	10
Lesser Yellowlegs Unit	8
Display Pool	2
Total	**4,255**

[1]Acreages are current as of October 2012.

Forested Wetlands (Bottomland Hardwoods)

Bottomland hardwoods comprise 1,685 acres at Montezuma NWR. Most of the forest on Montezuma NWR is forested wetland. Dominant vegetation includes red and silver maple, American elm (*Ulmus americana*), green ash, and swamp white oak. The understory is sparse, and includes common winterberry, northern spicebush, and highbush blueberry (*Vaccinium corymbosum*). These understory shrubs are largely confined to hummocks. Species common to the transitional zones between hummocks and vernal pools include sensitive fern, marsh fern (*Thelypteris palustris*), skunk cabbage, and false nettle (*Boehmeria cylindrical*) (Ducks Unlimited 2000).

The largest stand of forested wetland on the refuge includes two green tree reservoirs, the 344-acre Unit 17 East and the 266-acre Unit 17 West, collectively called Unit 17. Unit 17 is south of Routes 5 and 20 and separates the northern terminus of Cayuga Lake from the extensive emergent marsh system on the refuge. The Service created these two green tree impoundments in 1965 to benefit nesting, resting, and feeding waterfowl. Flooding of these impoundments was terminated in 1977 because extended flooding into the growing season resulted in damaging the overstory (USFWS 2008b). Long periods of managed flooding stressed mature trees and prevented germination and survival of seeds and seedlings. Water level management now focuses on more closely following a natural hydrologic period for a bottomland forest community in this region.

Uplands

Most of the upland habitat on Montezuma NWR is maintained in an early successional stage (grassland or scrub-shrub fields) through active management. Succession is set back in these areas through a variety of management techniques, including mowing, burning, disking, planting, hydroaxing, and chemical treatment.

Grasslands

The refuge maintains four grassland units totaling 316 acres to support grassland-dependent species. These units support warm season grasses, cool season grasses, some forbs, small shrubs, and some woody species. These fields require long-term maintenance including frequent mowing, herbicide applications, and prescribed burning to control invasive plants and other nondesirable plants including woody shrubs. Common plant species include Timothy grass, smooth brome, reed canary grass, Canada thistle (*Cirsium arvense*), goldenrod (*Solidago* spp.), switchgrass, big bluestem, and Indiangrass.

Shrublands

Refuge shrublands are diverse from location to location with dominant plants including goldenrod, gray dogwood (*Cornus racemosa*), Morrow's honeysuckle (*Lonicera morrowii*), and common buckthorn. Only two tracts on the refuge are actively maintained in this early successional state. Other shrubland areas will need to be managed to set back succession.

Forests

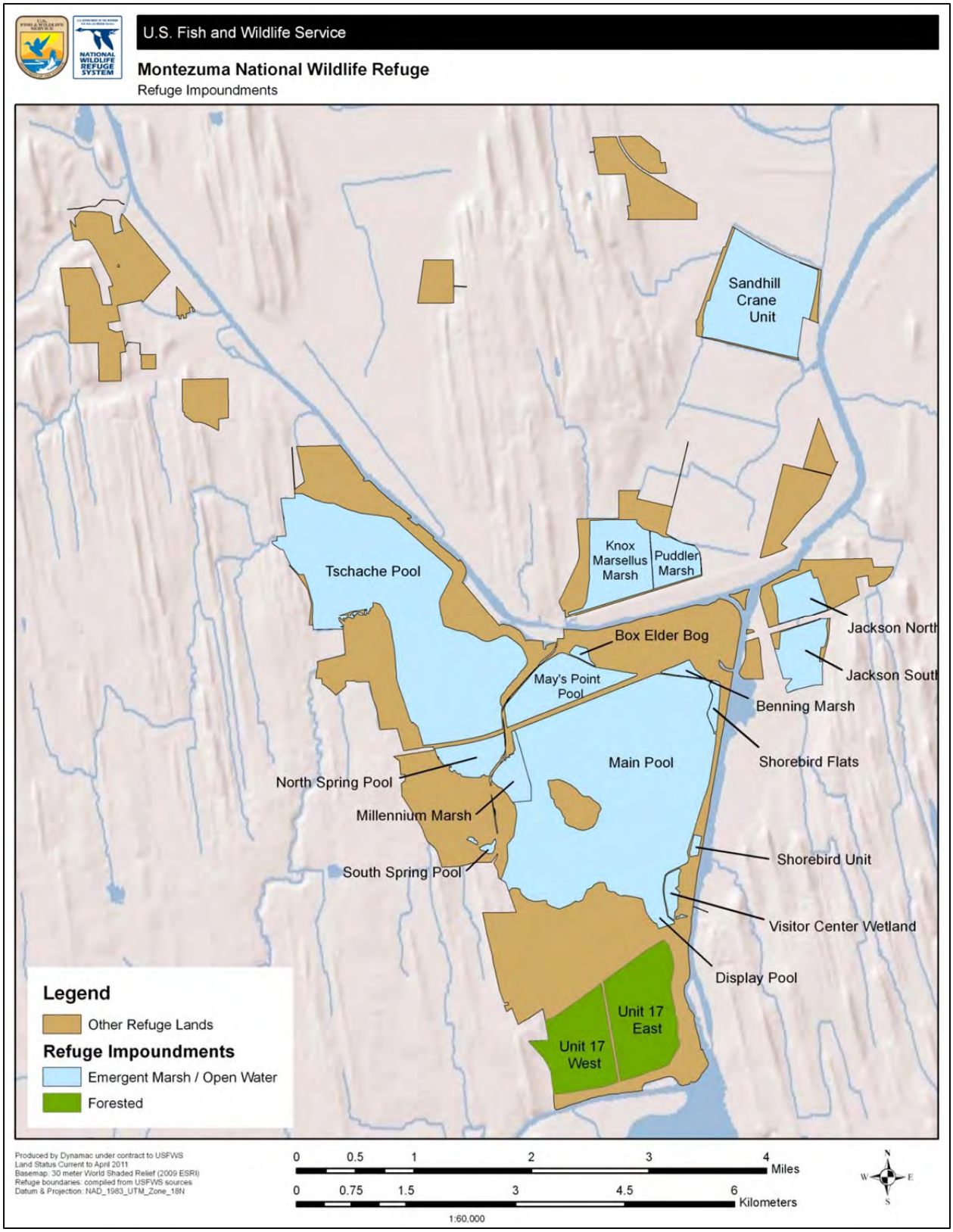
Upland forested sites are mostly successional forests dominated by black walnut (*Juglans nigra*), black willow (*Salix nigra*), and green ash occurring on former agricultural fields. Most of the mature forested sites on the refuge are wetlands. However, good examples of mature upland forest sites include the Beech-Maple Knoll Research Natural Area, the upland portions of the Cerulean Forest, and the 176-acre Nash Forest (refer to USFWS 2008b for more details). These sites require little to no maintenance but should be monitored for invasive plants and deer impacts.

Croplands

Newly acquired farmlands are frequently enrolled in the refuge's cooperative farming program to provide a smoother transition for both the farmer and the refuge. This is a means to keep fields open and relatively free of invasive plants in preparation for conversion to native plants. We have found this use to be appropriate and compatible (see appendix B). We control cooperative farming on refuge lands by issuing special use permits. Cooperative farmers are not allowed to plant potatoes, as they require large amounts of herbicides, fungicides, and pesticides. With prior approval, farmers are permitted to apply fertilizers and herbicides, but genetically modified crops are prohibited.

Cooperative farmers provide other in-kind services including:

- Mowing refuge grasslands to prevent brush encroachment.
- Seeding refuge fields.
- Plowing, disking, and cultipacking upland fields prior to planting permanent grass cover.
- Purchasing grass seed for planting in refuge upland fields.
- Maintaining the tops and slopes of dikes.



Map 3.5. Impoundments on Montezuma National Wildlife Refuge.

Special Designations

Special designations on the refuge include Research Natural Areas (RNAs) and a National Natural Landmark (NNL). Currently, the refuge does not contain designated wilderness.

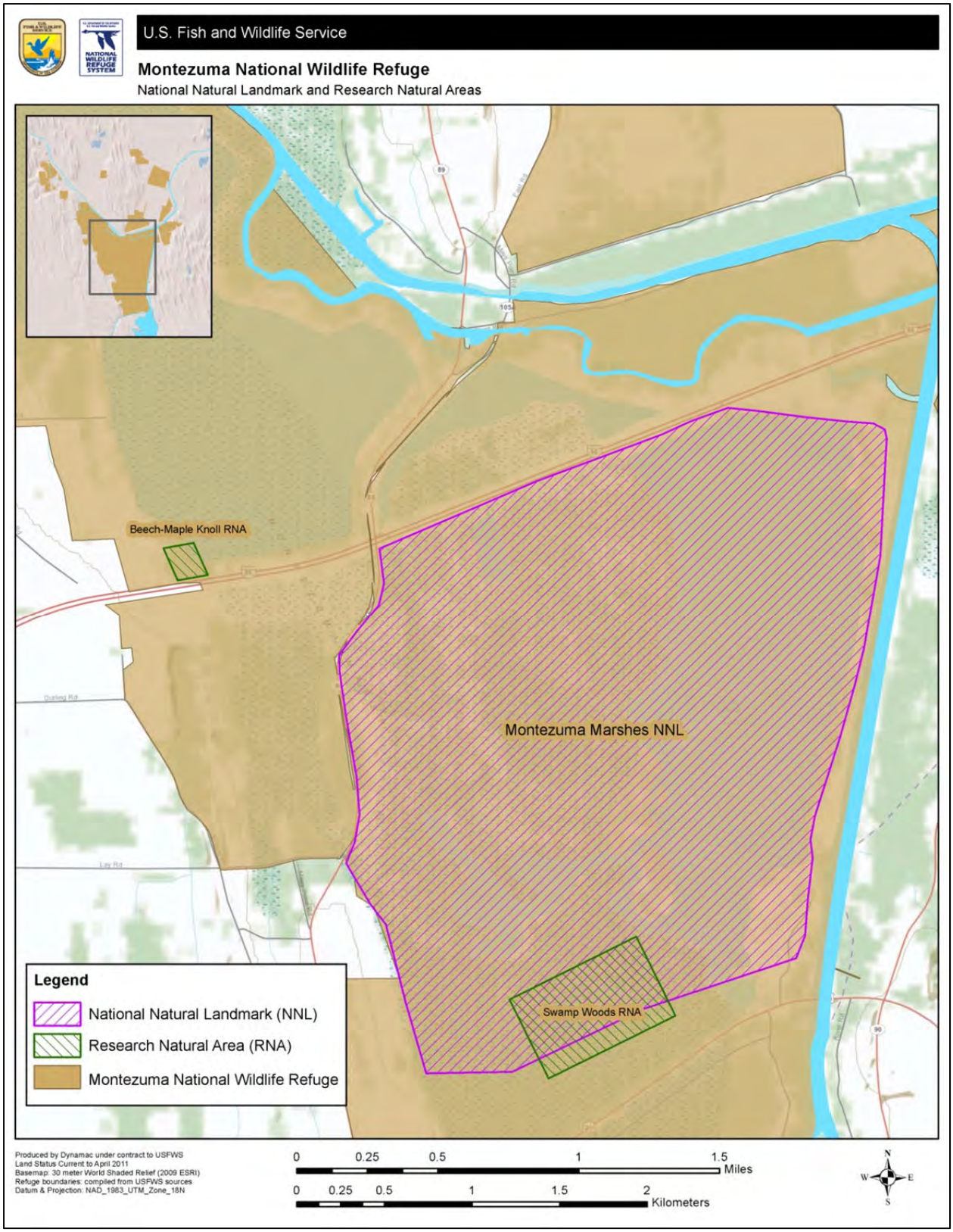
Research Natural Areas

The refuge has two designated RNAs (map 3.6), approved in 1967. The Beech-Maple Knoll RNA is an 8-acre tract located southwest of Tschache Pool. A prime example of a mature, northern hardwood beech-maple forest cover type, the beech-maple association provides a unique habitat type not found elsewhere on the refuge. Unfortunately, regeneration of this cover type has been negatively impacted by heavy deer browsing in this area (Rawinski 2010a personal communication).

The Swamp Woods RNA is a tract of approximately 100 acres located southwest of the Main Pool. It is an unusual stand because it is the last remaining undisturbed example of swamp woodland on the refuge. It was once the common woodland type found on muck soils throughout the historic Montezuma marshes, but has now become rare due to draining and clearing of muckland for farming. The vegetation of interest includes black ash (*Fraxinus nigra*), American elm, red maple, and white oak (*Quercus alba*).

National Natural Landmark

In 1973, a 2,100-acre portion of the refuge was designated as the Montezuma Marshes NNL by the National Park Service under the provisions of the Historic Sites Act of 1935 (map 3.6). The refuge was incorporated in the registry because it possesses exceptional value in illustrating the natural history of the U.S. A large section of the Main Pool, including Maple Island and Black Lake, is representative of conditions in the original marsh in which broad expanses of cattail marsh were interspersed with old river channels and ponds. This area serves as a resting and feeding area for migrating waterfowl and provides nesting habitat for many species of ducks, herons, other waterbirds, neotropical migrant songbirds, and bald eagles (*Haliaeetus leucocephalus*). The Swamp Woods RNA is part of the Montezuma Marshes NNL. The New York State Thruway forms the northern border of the landmark. Habitat fragmentation resulting from the thruway and pipelines are the greatest threat to this NNL.



Map 3.6. Montezuma National Wildlife Refuge National Natural Landmark and Research Natural Areas.

Plants and Animals

Birds

The bird list for Montezuma NWR includes 320 species that have been identified on the refuge since its creation in 1938. Of these, 117 species of birds are known to nest on the refuge. The New York Important Bird Area Program recognized the MWC for providing stopover and foraging habitat for one of the largest concentrations of waterfowl in the Northeast. Wading birds and shorebirds are also observed during spring and fall migration (National Audubon Society 2011). The MWC also harbors a suite of nesting bird species of conservation concern including pied-billed grebe (*Podilymbus podiceps*), least bittern (*Ixobrychus exilis*), osprey (*Pandion haliaetus*), bald eagle (*Haliaeetus leucocephalus*), black tern (*Chlidonias niger*), sedge wren (*Cistothorus platensis*), and cerulean warbler (*Dendroica cerulean*). In addition, most of the forested wetlands in this region were historically cleared or drained so the bird species that use this habitat are of conservation concern. Montezuma NWR supports this habitat type along with many breeding birds associated with these forests, including sharp-shinned hawk (*Accipiter striatus*), black-billed cuckoo (*Coccyzus erythropthalmus*), eastern wood-pewee (*Contopus virens*), wood thrush (*Hylocichla mustelina*), cerulean warbler, rose-breasted grosbeak (*Pheucticus ludovicianus*), and Baltimore oriole (*Icterus galbula*).

The MWC was part of a national program called MAPS (Monitoring Avian Productivity and Survivorship) from 1999 through 2004. The major objective of the MAPS program is to contribute to the avian population monitoring system for North American landbird species by providing data necessary to estimate population size, post-fledging productivity, adult survivorship, and recruitment into the adult population. The Montezuma MAPS station was located in early successional habitat (shrubland), and the most common species captured during the breeding seasons in 1999, 2000, and 2001 were song sparrow (*Melospiza melodia*), yellow warbler (*Dendroica petechia*), and gray catbird (*Dumetella carolinensis*).

Important Bird Area

The MWC has been identified as a globally significant Important Bird Area in New York State by the National Audubon Society (2011). The IBA program is an international bird conservation initiative to identify and conserve the most important places for birds. IBAs are identified according to standardized, scientific criteria through a collaborative effort among state, national, and international nongovernmental conservation organizations (NGOs), state and Federal government agencies, local conservation groups, academics, grassroot environmentalists, and birders. IBAs are sites that provide essential habitat for one or more species of birds. They include sites for breeding, wintering, and/or migrating birds, and may be a few acres or thousands of acres, but usually they are discrete sites that stand out from the surrounding landscape. IBAs may include public or private lands, or both, and they may be protected or unprotected. The MWC IBA is noted for its diversity of habitats, hosting one of the largest migratory concentrations of waterfowl in the Northeast, as one of the most significant stopover and foraging locations for shorebirds in upstate New York, and as a site for many breeding at-risk species.

In 1997 the NYSDEC established the Bird Conservation Area (BCA) Program modeled after the IBA program. The BCA program safeguards and enhances bird populations and their habitats on

State-owned lands and waters. The Northern Montezuma Wildlife Management Area is a BCA within the complex (Burger et al. 2005). This designation ensures that bird conservation concerns are a priority in management plans.

Waterfowl

The Montezuma NWR supports one of the largest migratory concentrations of waterfowl in the Northeast. On the refuge, impoundments are managed to provide optimal habitat for migrating waterfowl. During fall migration, waterfowl require large amounts of carbohydrate-rich foods to aid their migration and build up their energy reserves. The refuge periodically drains impoundments in the spring to promote the growth of moist-soil vegetation; seeds of these plants provide a readily available source of carbohydrates. In advance of fall migration, wetlands that have been drawn down are reflooded in preparation for the arrival of waterfowl.

Spring migrant waterfowl require large amounts of protein-rich foods to prepare them for the remainder of their northward migration. Invertebrate populations thrive on the residual annual vegetation resulting from the previous year's drawdown, and they emerge as soon as temperatures rise sufficiently to melt the ice. Additionally, this protein-rich diet is supplemented by carbohydrate-rich seeds produced by annual plants during previous years which are still available the following spring to northward migrating waterfowl.

High counts of the most abundant waterfowl species of conservation concern on the refuge reported by birders and volunteers for the years 1990 to 2010 are shown in table 3.6.

Table 3.6. Peak Daily Estimates of the Most Abundant Waterfowl Species of Conservation Concern on Montezuma NWR from 1990 to 2010 (*www.ebird.org* and USFWS, unpublished data).

Species	Spring Migration		Fall Migration	
	Approximate Peak Date	Peak Estimate	Approximate Peak Date	Peak Estimate
Tundra swan (*Cygnus columbianus*)	Beginning of March	600	Late November	1,800
Canada goose (*Branta canadensis*)	Beginning of March	18,500	Beginning of December	31,300
Canvasback (*Aythya valisineria*)	Mid-March	12,000	November	8,000
Green-winged teal (*Anas crecca*)	Late April	2,514	Late October	7,043
Mallard (*Anas platyrhynchos*)	Beginning of March	625	Late November	3,500
Northern pintail (*Anas acuta*)	Beginning of March	2,650	Beginning of December	4,000
Redhead (*Aythya americana*)	Mid-March	5,000	Mid-October	250

Montezuma NWR also supports breeding waterfowl. During 2004, refuge staff and volunteers recorded more than 100 waterfowl broods, an increase of nearly 20 percent over the 2003 nesting season (USFWS, unpublished data). The most common nesting waterfowl on the refuge are Canada goose, mallard, wood duck, and blue-winged teal.

Shorebirds

The Montezuma Marsh basin was historically the most significant migratory stopover site for shorebirds in upstate New York and is still considered one of the most important inland shorebird sites in the Northeast. On the refuge, water levels in some impoundments are managed seasonally to provide exposed mudflats for foraging shorebirds (see the refuge's habitat management plan for additional details; USFWS 2008b). High counts of the most abundant shorebirds on the refuge reported by birders and volunteers for the years 1990 to 2010 are shown in table 3.7.

Table 3.7. Peak Daily Estimates of the Most Abundant Shorebird Species on the Montezuma NWR from 1990 to 2010 (*www.ebird.org*).

Species	Spring Migration		Fall Migration	
	Approximate Peak Date	Peak Estimate	Approximate Peak Date	Peak Estimate
Semipalmated plover (*Charadrius semipalmatus*)	Beginning of May	300	Beginning of August	273
Greater yellowlegs (*Tringa melanoleuca*)	Late April	105	Late September	162
Lesser yellowlegs (*T. flavipes*)	Beginning of May	200	Late July	800
Semipalmated sandpiper (*Calidris pusilla*)	Beginning of June	555	Late August	558
Least sandpiper (*C. minutilla*)	Beginning of May	1,701	Late July	1,350
Pectoral sandpiper (*C. melanotos*)	Beginning of May	55	Late August	365
Dunlin (*C. alpine*)	Late May	272	Mid-October	432
Short-billed dowitcher (*Limnodromus griseus*)	Late May	50	Late August	350

Marsh and Wading Birds

Emergent marsh impoundments on the refuge support a diversity of marsh nesting birds. Callback surveys conducted during 2009 and 2010 confirmed breeding by American bittern (*Botaurus lentiginosus*), least bittern, pied-billed grebe, Virginia rail (*Rallus limicola*), sora (*Porzana carolina*), American coot (*Fulica americana*), and common moorhen (*Gallinula chloropus*).

Black terns produced approximately 500 young on the refuge in 1958. By the early 1990s, there were none nesting on the refuge, probably due to the purple loosestrife invasion and declining black tern populations Statewide because of habitat loss. By 1998, black terns were nesting on the refuge again in low numbers. In 2009, 22 nesting pairs were observed on Tschache Pool (USFWS 2008b).

A nesting colony of great blue herons (*Ardea herodias*) has been present on the refuge many years throughout the history of the refuge. Nest colonies move, and the rookeries have been in various locations on the refuge, including Maple Island, Tschache Pool, and Unit 17 East. Black-crowned night-herons (*Nycticorax nycticorax*) also nested on the refuge in the 1980s.

Sandhill Crane

In the U.S., by the 1930s the sandhill crane (*Grus canadensis*) population was nearly decimated across its range (USFWS 2008b). Sandhill cranes were first observed on the complex during spring migration in 1999. In 2003, a few cranes were observed during migration and the first confirmed breeding occurred. A pair with young was observed again in the 2004 through 2010 breeding seasons. Today the population has recovered to 650,000 birds and several states including New York, Pennsylvania, Ohio, and Iowa, which are part of a range expansion (USFWS 2008b).

Landbirds

One-day migration counts were conducted on the MWC in May from 1994 to 1997. The following species of concern were observed: osprey, bald eagle, northern harrier (*Circus cyaneus*), peregrine falcon (*Falco peregrinus*), sharp-shinned hawk, common nighthawk (*Chordeiles minor*), chimney swift (*Chaetura pelagica*), northern flicker (*Colaptes auratus*), horned lark (*Eremophila alpestris*), willow flycatcher (*Empidonax traillii*), wood thrush, brown thrasher (*Toxostoma rufum*), blue-winged warbler (*Vermivora cyanoptera*), cerulean warbler, prothonotary warbler (*Protonotaria citrea*), scarlet tanager (*Piranga olivacea*), rose-breasted grosbeak, field sparrow (*Spizella pusilla*), bobolink, eastern meadowlark (*Sturnella magna*), rusty blackbird (*Euphagus carolinus*), and Baltimore oriole.

Within the last 2 to 3 years, NYSDEC and the Service have been conducting winter raptor surveys. Many raptors have been identified on the refuge including two State-listed species, the short-eared owl and northern harrier. They were found to be using grasslands and marshes on the refuge and in the MWC. Recent radio telemetry records of a short-eared owl show use of the refuge's Main Pool.

The Service also conducted a breeding bird survey on the refuge in 1995. The 10 most frequently recorded species were song sparrow, American robin (*Turdus migratorius*), yellow warbler, common yellowthroat (*Geothlypis trichas*), red-winged blackbird (*Agelaius phoeniceus*), eastern wood-pewee, brown-headed cowbird (*Molothrus ater*), swamp sparrow (*Melospiza georgiana*), veery (*Catharus fuscescens*), and wood thrush.

Breeding bird surveys were conducted in Units 17 East and West and the Main Pool Forest from 2007 to 2010. The following species of concern at the time were detected: Baltimore oriole, hooded merganser (*Lophodytes cucullatus*), northern flicker, rose-breasted grosbeak, scarlet tanager, wood duck (*Aix sponsa*), song sparrow, willow flycatcher, and wood thrush. In 2007, wood thrush was the third most abundant species found in all units combined, after American robin and eastern wood-pewee, and was present at half of the points surveyed.

Breeding bird surveys focused on grassland breeding birds were conducted in four grassland tracts from 2007 to 2010. The following grassland obligate species were detected: bobolink, grasshopper sparrow (*Ammodramus savannarum*), sedge wren, vesper sparrow (*Pooecetes gramineus*), eastern meadowlark, and savannah sparrow (*Passerculus sandwichensis*).

Breeding bird surveys focused on shrubland breeding birds were conducted in five shrubland tracts in 2009 and 2010. The following species of conservation concern were detected: northern

flicker, rose-breasted grosbeak, song sparrow, willow flycatcher, savannah sparrow, black-billed cuckoo, blue-winged warbler, Baltimore oriole, cerulean warbler, wood thrush, and field sparrow.

Cerulean Warbler

The MWC is one of four sites in New York with exceptional numbers of cerulean warblers recorded during the Cerulean Warbler Atlas Project (*http://www.birds.cornell.edu/cewap/*). This warbler is among the highest priority landbirds for conservation in the U.S. based on a small total population size and a significant decline in Breeding Bird Survey (BBS) trend throughout its range (minus 4.2 percent per year since 1966) (Rosenberg et al. 2000). On the MWC the cerulean warbler occurs in riparian, forested wetlands. Despite the extensive agricultural landscape, the MWC supports the second highest concentration of cerulean warblers in New York (Rosenberg et al. 2000). The largest number of singing males (87) was found at the Howland's Island area, 77 males were found around and west of May's Point Pool, and 40 males were found in the Mud Lock area south of Routes 5 and 20. Cerulean warblers also were found on Maple Island, in the Seneca Trail area, and along the Clyde River.

Bald Eagle

Prior to the 1950s more than 70 pairs of bald eagles nested in New York State, but by the 1960s only one active nest remained. In the 1970s New York led the national recovery of the bald eagle by reintroducing young wild birds into new artificial nest sites. Between 1976 and 1980, 23 young eagles were reintroduced and fledged at Montezuma NWR. After two released birds successfully nested off the refuge in 1980, the program expanded to three more sites in New York. The first wild pair of eagles nested again on Montezuma NWR in 1987, after a 30-year absence. Two pairs nested on the refuge in 1994. Most of the eagle activity on the refuge occurs around Tschache Pool, the site of two of the three active nesting territories. However, adult and immature eagles use the refuge throughout the year. While the Main Pool was draining to encourage vegetative growth in 2007, 59 bald eagles were counted in one morning in early June.

Mammals

The most commonly observed mammal species at Montezuma NWR include eastern cottontail (*Sylvilagus floridanus*), woodchuck (*Marmota monax*), gray squirrel (*Sciurus carolinensis*), muskrat (*Ondatra zibethicus*), red fox (*Vulpes vulpes*), raccoon (*Procyon lotor*), mink (*Neovison vison*), beaver (*Castor canadensis*), and white-tailed deer (*Odocoileus virginianus*).

Recently, the New York River Otter Project has assisted in the expansion of the otter range into western New York. Over 270 otters were released in the western regions of the State between 1995 and 2000. In fall 1995, the first year of the New York River Otter Project, 21 river otters (*Lontra canadensis*) were released at 3 different locations in the northern MWC. Otters had been missing from this area for more than 100 years because of habitat loss and overharvesting. Now there are several otter territories on the refuge.

Small mammals, such as the meadow vole (*Microtus pennsylvanicus*), shrews, and moles are abundant on managed grasslands and provide important prey items for other species of concern.

The importance of flooded forests and emergent wetlands on the refuge as summer bat habitat has been recently documented through acoustic surveys in cooperation with NYSDEC. Preliminary results suggest exceptionally high concentrations of big brown bats (*Eptesicus fuscus*) along the Main Pool and tri-colored bats (*Perimyotis subflavus*) throughout the complex.

Reptiles and Amphibians

Sleggs (1997) conducted a baseline inventory of reptiles and amphibians on the refuge in 1995 and 1996 using various methods including evening audio surveys for frogs and toads, visual encounter surveys, and live-trapping using pitfalls, drift fences, funnel traps, minnow traps, and aquatic hoop traps. Frogs and toads recorded during this survey included American toad (*Bufo americanus*), gray treefrog (*Hyla versicolor*), spring peeper (*Pseudacris crucifer*), western chorus frog (*Pseudacris triseriata*), bullfrog (*Rana catesbeiana*), green frog (*R. clamitans*), wood frog (*R. sylvatica*), and northern leopard frog (*R. pipiens*). Salamanders included mudpuppy (*Necturus maculosus*), Jefferson/blue spotted salamander (*Ambystoma jeffersonianum-laterale*) hybrid, and northern two-lined salamander (*Eurycea bislineata*). Spotted salamanders (*Ambystoma maculatum*) also have been documented. Turtles observed during the survey included snapping turtle (*Chelydra serpentine*), common musk turtle (*Sternotherus oderatus*), midland (*Chrysemys picta marginata*), and eastern painted turtles (*C. p. picta*). Documented snakes include northern water snake (*Nerodia sipedon*), northern brown snake (*Storeria dekayi dekayi*), and eastern garter snake (*Thamnophis sirtalis*).

The refuge has potential habitat for a number of other reptile and amphibian species including eastern newt (*Notophthalmus viridescens*), northern dusky salamander (*Desmognathus fuscus*), Allegheny mountain dusky salamander (*D. ochrophaeus*), four-toed salamander (*Hemidactylium scutatum*), eastern red-backed salamander (*Plethodon cinereus*), pickerel frog (*Rana palustris*), spotted turtle (*Clemmys guttata*), wood turtle (*Glyptemys insculpta*), milksnake (*Lampropeltis triangulum*), brown snake (*Storeria dekayi*), eastern ribbon snake (*Thamnophis sauritus*), and smooth green snake (*Liochlorophis vernalis*) (Gibbs et al. 2007). The New York Natural Heritage Program determined that habitat for the federally listed, threatened, State-endangered bog turtle (*Glyptemys muhlenbergii*) does not exist on the refuge (Sechler 2008).

Fish

Foust (2003) conducted a baseline inventory of fish on Montezuma NWR in July 2003; most previous fisheries information for the refuge was anecdotal. Electrofishing and minnow traps were used to sample fish in portions of the Erie and Cayuga-Seneca canal systems, Seneca River, Old Seneca River, Main Pool, and numerous tributaries and ponds. The fish habitat within the refuge consists of manmade canal systems with few natural water bodies. The canals provide a relatively homogenous habitat that is typically turbid with minimal aquatic vegetation.

Foust captured 37 species, 26 genera, 15 families, and 10 orders of fish. Only one species, brown bullhead (*Ameiurus nebulosus*), was present in all sample sites. The most commonly encountered species were common carp (*Cyprinus carpio*), golden shiner (*Notemigonus crysoleucas*), bluegill (*Lepomis macrochirus*), brown bullhead, and yellow perch (*Perca flavescens*). The most abundant fish, common carp, represented 20 percent of the total catch within the refuge. The less altered areas of the Seneca River provided the most diverse fish assemblage (24 species) with bluegill being the most abundant. The most common species in the Main Pool was golden shiner

followed by goldfish (*Carassius auratus auratus*). The nutrient rich pool had an organic substrate but the water was relatively clear, providing a nursery ground for golden shiners, goldfish, brown bullhead, and yellow perch. Larger carp are denied access to the Main Pool by a fish deterrent wheel at the outflow. Despite turbid conditions and few macrophytes, the Cayuga-Seneca and Erie Canals support a relatively diverse fish population (Foust 2003).

Invertebrates

Invertebrates are abundant on the refuge and play an integral role as a food source and in maintaining the ecological balance of several refuge ecosystems. The refuge has not yet conducted a systemic inventory of all invertebrate species.

Threatened and Endangered Species (Federal and State)

The federally and State-listed endangered Indiana bat (*Myotis sodalis*) has been found on Howland's Island on the NYSDEC Northern Montezuma WMA and likely occurs on the refuge.

In addition to hundreds of relatively more common wildlife species, refuge habitats support breeding or critical migratory populations of several other State-listed, endangered or threatened species (i.e., lake sturgeon (*Acipenser vulvescens*), pied-billed grebe, bald eagle, black tern, short-eared owl (*Asio flammeus*), northern harrier, least bittern, peregrine falcon, sedge wren, and possibly common tern). The bald eagle is no longer federally listed, but remains State-listed and under the protection of the Bald and Golden Eagle Protection Act, the Migratory Bird Treaty Act, and the Lacey Act. State-listed species of special concern found during the breeding season on the refuge also include cerulean warbler, red-shouldered hawk (*Buteo lineatus*), sharp-shinned hawk, Cooper's hawk (*Accipiter cooperii*), horned lark, vesper sparrow, grasshopper sparrow, American bittern, osprey, and possibly blue-spotted and Jefferson salamanders, and spotted and wood turtles.

In addition to the rare bird species, the New York Natural Heritage Program reported from the refuge the blue-tipped dancer damselfly (*Argia tibialis*) as a rare invertebrate, and holly-leaved naiad (*Najas marina*) as a State-listed endangered plant (Young 2010).

Rare Plants and Significant Ecological Communities

The New York Natural Heritage Program tracks rare species and rare or exemplary ecological communities in the State. The program provided a list of rare plants and significant ecological communities known to occur on or near the refuge (see appendix A). The New York Natural Heritage Program considers three vegetation associations at Montezuma NWR to be significant occurrences of natural communities: floodplain forest, silver maple-ash swamp, and red maple-hardwood swamp (Edinger et al. 2002).

The Seneca River Montezuma Floodplain Forest extends 12 miles from the Howland's Island Unit of Northern Montezuma WMA south to the north end of Cayuga Lake. This floodplain forest is considered significant due mainly to its extensive range. Patches at Montezuma NWR occur between the Clyde River and Erie Canal, and along the Seneca River. Despite being discontinuous, this floodplain forest remains one of the largest examples of floodplain forests in the State.

The silver maple-ash swamp is a small example of what is an uncommon natural community type in New York. This occurrence includes 102 acres of the Cerulean Forest Unit. This basin swamp is dominated by silver maple and black ash with an understory dominated by northern spicebush. This swamp is significant due to being in good condition, with good species and structural diversity. Common buckthorn is present on the periphery of this swamp, and is a threat to the ecological integrity. This swamp also has the potential to contain rare plant species such as shellbark hickory (*Carya laciniosa*), a threatened S2 species of concern in New York.

The red maple-hardwood swamp is the 456-acre Main Pool Forest that contains the Swamp Wood Natural Area. This swamp is dominated by red maple, with green ash present in the canopy. The understory is dominated by northern spicebush, highbush blueberry, skunk cabbage, and false nettle. There are very few exotics in this swamp, with only common buckthorn occurring in significant abundance on the periphery (Sechler 2008).

Invasive Species

Invasive species are organisms that are introduced into a nonnative ecosystem and which cause, or are likely to cause, harm to the economy, environment, or human health. Invasive species affect native populations of animals and plants through various means, including competition, predation, altered ecosystem processes, and new disease/parasite vectors, often resulting in reduced biodiversity and requiring costly control efforts (Simberloff 2000, Pimental et al. 2004).

Invasive Plants

Table 3.8 lists invasive plant species occurring on and around Montezuma NWR.

Table 3.8. Invasive Plant Species On and Around Montezuma NWR.

Common Name	Species	Comment
Norway maple	*Acer platanoides*	
Tree of heaven	*Ailanthus altissima*	
Garlic mustard	*Alliaria petiolata*	
Burdock	*Arctium* sp.	
Japanese barberry	*Berberis thunbergii*	
Flowering rush	*Butomus umbellatus*	
Nodding plumeless thistle	*Carduus nutans*	Occurs in Yates and Tompkins Counties but not known to occur on refuge.
Carline thistle	*Carlina vulgaris*	
Oriental bittersweet	*Celastrus orbiculatus*	
Knapweed	*Centaurea sp*	
Canada thistle	*Cirsium arvense*	
Bull thistle	*Cirsium vulgare*	
European (pale) swallow-wort	*Cynanchum rossicum*	
Autumn olive	*Elaeagnus umbellata*	
Giant hogweed	*Heracleum mantegazzianum*	Occurs in Cayuga and Wayne Counties but not known to occur on refuge.

Common Name	Species	Comment
Common (European) frogbit	*Hydrocharis morsus-ranae*	
Pale yellow Iris	*Iris pseudacorus*	
Nonnative bush honeysuckles	*Lonicera* spp.	
Purple loosestrife	*Lythrum salicaria*	Effectively managed with biological control agents.
Yellow sweetclover	*Melilotus officinalis*	
Japanese stiltgrass	*Microstegium vimineum*	
Eurasian watermilfoil	*Myriophyllum spicatum*	
Princess tree	*Paulownia tomentosa*	Occurs in Tompkins County but not known to occur on refuge.
Reed canary grass	*Phalaris arundinacea*	
Nonnative common reed	*Phragmites australis*	
Japanese knotweed	*Polygonum cuspidatum*	
Curly pondweed	*Potamogeton crispus*	
Fig buttercup	*Ranunculus ficaria*	Occurs in Cayuga County but not known to occur on refuge.
Common buckthorn	*Rhamnus cathartica*	
Black locust	*Robinia pseudoacacia*	
Multiflora rose	*Rosa multiflora*	
Wine raspberry	*Rubus phoenicolasius*	Occurs in Cayuga and Wayne Counties but not known to occur on refuge.
Water chestnut	*Trapa natans*	Occurs in Seneca River on the Northern Montezuma Wildlife Management Area but not known to occur on refuge.

Invasive Animals

The most invasive animal species on the refuge is the common carp, which destroys wetland vegetation and causes high turbidity in refuge wetlands. The round goby (*Neogobius melanostomus*) has recently been documented within the MWC. This nonnative fish can displace native fish, eat their eggs and young, and take over optimal habitat. The European starling (*Sturnus vulgaris*) and the house sparrow (*Passer domesticus*) are the two most common invasive bird species found on the refuge. They compete with native species for nest sites. Other invasive wildlife species occurring on the refuge include the mute swan (*Cygnus olor*), feral and free-roaming cats, and the Norway rat (*Rattus norvegicus*). Feral pigs are in Cortland and Wayne Counties but have not been seen on the refuge. Trumpeter swans (*Cygnus buccinator*) currently breeding on the refuge are the result of releases from captive breeding programs. Their status as a native bird in New York State is unclear (McGowan 2008). However, their population is increasing rapidly in the area, as a result of several human introductions. Their impact is unknown at this time but warrants further monitoring or research. The number of resident population Canada geese is increasing in the area. Their impact on refuge habitats may need to be monitored.

Cultural and Historical Resources

To complement the CCP process, we commissioned an archaeological overview of Montezuma NWR that was completed in 2010 (GAI Consultants 2010). The following is summarized from this document.

Archaeological and Historical Resources

The archaeological record within the Montezuma NWR offers evidence of thousands of years of settlement by Native Americans, and of later occupations by European-Americans during the historical period. The variety within this record is indicated by previously documented archaeological sites, although no comprehensive testing program has been completed at the refuge. Within the approved acquisition boundary, the refuge contains nine known Native American sites, all in the southeastern portion of the refuge. These sites represent occupations that began as early as 8,000 years ago, and occurred until the period of European contact. Historical map research suggests that there may be more than 100 European-American archaeological sites within the approved acquisition boundary, which have the potential to provide insights into settlement that occurred after the eighteenth century. Human settlement in all periods was concentrated in the upland areas contiguous to the Montezuma Marsh. Human activities most profoundly affected the lands within the refuge between the mid-nineteenth century and the early twentieth century, with the construction of the Erie Canal and dredging for a later canal system. These developments lowered the level of the Montezuma Marsh and opened large new areas to farming.

Native American Archaeological Resources

The availability of natural resources influenced Native American settlement at Montezuma NWR. The combination of resources was shaped over time by patterns in the geology and ecology of the Finger Lakes region.

The first human inhabitants of the region were the Paleo-Indians, who entered the Northeast approximately 11,500 years ago. Organized in small bands, the Paleo-Indians were highly mobile people who used a specialized toolkit of fluted spear points and distinctive scrapers. The environment that they knew was cool and dry. Their landscape was vegetated in a white pine-oak forest, and was populated by temperate terrestrial animals, which included many species still seen in the region today. Some displaced boreal species may have been present as well.

The successors to the Paleo-Indians were the Native Americans of the Early Archaic period, which occurred between about 9,500 and 8,000 years ago. These people knew a climate that was increasingly warm and humid and an environment where woodlands were dominated by beech, hickory, hemlock, birch, and oak. This change in vegetation was accompanied by shifts in animal populations in the Finger Lakes region. The Native Americans modified their technologies in response, adopting new forms of corner-notched and side-notched spear points, and using spear-throwing devices to launch projectiles over greater distances than was possible by hand. As forests of deciduous trees closed in over the landscape, previously barren zones offered attractive resources, such as hazelnuts, hickory nuts, butternuts, and some tuberous plants. The innovative subsistence strategies practiced by the people of the Early Archaic led them to adjust their

system of settlement, as they used longer-term occupations, and took advantage of resources that were seasonally available and found in a wider variety of locations.

During the Middle Archaic period, between 8,000 and 5,000 years ago, a climatic warming trend prevailed, marked by subepisodes that were moister or drier. Oak and hickory became the dominant tree species, and by the end of the period, mixed deciduous forests prevailed, similar in composition to those seen in the region today. Mass products, such as acorns and nuts, were both nutritious and easily stored, and became a key source of food. Native Americans of the Middle Archaic period devised a variety of contracting-stem and side-notched projectile points that were suitable for hunting and fishing, and supplemented their tool kits with grinding and milling stones, ground-stone axes, drills, and wood-working tools such as adzes and celts. Archaeological evidence for Middle Archaic settlement has been recorded at the refuge.

Between 5,000 and 3,000 years ago, Native American populations grew in size and social complexity, and the settlement system became more sedentary. There was a profusion of artifact styles, as projectile points included broad spear variants, notched broad spears, and narrow-bladed, stemmed forms. Stone bowls were fashioned from steatite. Distinct cultural groups, or traditions, emerged throughout the region during the Late Archaic, and the people of these traditions adopted contrasting settlement systems.

The greater Woodland period, which archaeologists divide into three subperiods, began approximately 3,000 years ago and continued until the era of first contact with Euro-Americans. The Early Woodland period, between about 3,000 and 2,300 years ago, saw the introduction of fired clay pottery and the Native American occupation of large villages located in the floodplains of major rivers. The use of storage pits and larger habitation structures indicates that these larger settlements supported long-term occupations. People evidently used smaller sites in upland settings for specialized and seasonal purposes, such as hunting for deer and turkey, and harvesting nuts and wild plant foods. There was considerable continuity in settlement locations between the Early Woodland period and the Middle Woodland period, which occurred between about 2,300 and 1,200 years ago, indicating that Native American subsistence strategies and settlement systems persisted during a time of climatic stability. Several sites at the refuge were occupied during the Early and Middle Woodland periods.

The Late Woodland period, from 1,200 to 500 years ago, marked the final centuries before contact between Native Americans and European explorers. The Owasco culture flourished in south-central New York. Starting about A.D. 900, maize horticulture was adopted by Native American societies in the region. Hunting, gathering, and fishing remained important subsistence activities, which shaped the annual cycle. After A.D. 1300, the storage of surplus crops enabled the establishment of permanent hamlets and larger villages. An increase in the Native American population between A.D. 1300 and 1400 may have led to competition between neighboring groups. Nucleated settlements were frequently enclosed in palisades, indicating that territorial conflicts may have flared. Village sites were marked by deep cultural deposits and many storage pits, suggesting the accumulation of surplus crops and increased sedentism. The population of Iroquois tribes apparently grew dramatically after A.D. 1450.

Located within the eastern side of the Montezuma approved acquisition boundary, Kipp Island was one of the most important Native American settlement locations ever identified in New York State. The site contained evidence of a large village, burial mound, and an extensive burial ground, and was occupied between 500 and 5,000 years ago. During the Contact period, the Cayuga Tribe of the Iroquois Nation occupied the vicinity of the refuge, and apparently had a settlement on Kipp Island during the mid-seventeenth century.

In summary, the inventory of pre-Contact Native American settlement locations at the refuge includes nine sites, with evidence of occupation as early as 8,000 years ago. Several of the sites were reoccupied multiple times during different time periods, suggesting that they offered access to natural resources that remained important over time. These sites are not well understood archaeologically and most have never been subject to systematic subsurface testing, so their dimensions, integrity, and levels of significance are unknown. Numerous additional Native American sites likely await discovery within the approved acquisition boundary.

Historic Archaeological Resources

Jesuit missionaries were active in Iroquois territory during the middle and late seventeenth century. During the eighteenth century, however, the lands that would form Cayuga County were a backwater from the colonial perspective. Shortly before 1790, the Cayuga were formally divested of their territory, and the lands were organized into townships. Many properties were given to veterans of the Continental Army as payment for military service.

The European settlement of the counties surrounding the refuge had various effects on the landscape after 1800. The first settlement occurred in the uplands adjoining the vast expanse of the Montezuma Marsh. Upland forests were cleared to create fertile farm fields. Farmers produced potatoes and wheat, and established apple orchards. Local watercourses were dammed for small sawmills and grist mills. The leaves of the cattail plant were harvested for paper production in local mills. The Montezuma Marsh itself, however, was considered a “waste of swamp” with tracts of “stagnant waters” that remained “unredeemed.”

This changed by the mid-nineteenth century, when the exploitation and draining of the marshes began in earnest. Construction of the New York State Canal System had a lasting influence in the Seneca Basin. The Erie Canal ushered in a canal boom in the 1820s, and several lateral canals were opened. The canal network was enlarged between 1835 and the mid-twentieth century to accommodate heavier barge and boat traffic. Between 1905 and 1918, engineers decided to abandon much of the original artificial channel. Rivers that the canal had been constructed to avoid were now channelized. Moreover, engineers created a lock-and-dam system. When it opened in 1918, the complex was renamed the New York State Barge Canal. The Barge Canal construction lowered the water level in the Montezuma Marsh by an average of 2 feet, enabling the fertile marsh muck to be farmed. This new agricultural land was highly productive, but it was difficult to cultivate and was subject to flooding. Farmers tended to maintain homesteads in the adjacent uplands, and there was little residential settlement within the dredged marsh zones. Recent research referring to historical maps suggests that there may be more than 100 European-American archaeological sites within the Montezuma approved acquisition boundary, which have the potential to provide insights into European-American settlement that occurred after the eighteenth century. The existence of archaeological deposits has not been verified. Historical

features related to the Erie Canal, including a canal segment and a canal viaduct, have been recorded within the refuge.

As with possible Native American resources, it is likely that a program of systematic archaeological survey that addressed the refuge as a whole would identify numerous additional sites.

European Settlement

The name "Montezuma" was first used in 1806 when Dr. Peter Clark named his hilltop home "Montezuma" after the Mexico City palace of the Aztec Emperor by the same name. Eventually the Marsh, the Village, and the refuge all acquired the name.

Europeans did not extensively settle the New York portion of the Lower Great Lakes Plain until after the American Revolution. Settlers discovered large areas of potentially productive farmland. Clearing of the presettlement forests in area uplands for farming and fuelwood occurred in the early to mid-1800s. By the end of the 19th century, less than 20 percent of the original forest remained in many of the landscapes within this region (Zipperer et al. 1990). Forest cover began to increase in the early 1900s as farms were abandoned.

Socioeconomic Environment

For the purposes of this environmental assessment, the socioeconomic area of interest (AOI) includes Cayuga, Seneca, and Wayne Counties.

Population Demographics

The refuge is at the north end of Cayuga Lake in the Finger Lakes region of New York State. Although the population of New York grew by approximately 8 percent between 1990 and 2009 (table 3.9), the counties in the area of interest had relatively slow population growth or their population declined over a similar timeframe. Seneca County grew by approximately 1 percent between 1990 and 2009, while Wayne County increased by about 5 percent between 1990 and 2000, but then experienced a decrease of 2.6 percent from 2000 to 2009 (U.S. Census Bureau 2010). The population of Cayuga County declined by about 3 percent during that timeframe. These trends mirror those seen in much of the rural areas of the State and across the nation (Johnson 2006).

Table 3.9. Population Changes Between 1990 and 2009 in Area of Interest.

	1990	2000	2009
Cayuga County	82,313	81,963	79,526
Seneca County	33,683	33,342	34,049
Wayne County	89,123	93,765	91,291
State of New York	17,990,455	18,976,457	19,541,453
Source: US Census Bureau 2010			

Employment rates in Seneca and Wayne Counties decreased by approximately 2 percent between 2000 and 2009, while they increased slightly in Cayuga County and across the State of New

York (U.S. Census Bureau 2010). The average per capita income in 2009 for Cayuga, Seneca, and Wayne Counties is $22,593, or 30 percent less than the average per capita income for the State.

According to the U.S. Census Bureau (2010), approximately 5 percent of the population in Cayuga, Seneca, and Wayne Counties is 5 years of age or younger; approximately 20 percent of the population is between the ages of 5 and 19; approximately 77 percent is age 18 years or older; and about 14 percent of the area's population is 65 years or older.

The percentage of nonwhite and/or Hispanic populations in Cayuga, Seneca, and Wayne Counties ranges from 6.5 to 8 percent, with African Americans comprising about 4 percent, Asians comprising less than 1 percent, and Hispanics comprising close to 3 percent (U.S. Census Bureau 2010). Minority populations have increased slightly since 2000, while the percentage of populations identified as White has declined by more than 1 percent (U.S. Census Bureau 2010). Regional population trends show a pattern of population decline in upstate New York. On average, the population of the Finger Lakes region has declined by about 3.9 percent between 1990 and 2000 (New York State Comptroller's Office 2004). Based on these trends, it is anticipated that minority populations will continue to grow slowly in the region.

The average household income in the area ranges from $45,571 to $52,351, with Wayne County at the higher end. Single female parents with children under 18 years of age comprise about 7 percent of households in the area. From a transportation perspective, the majority of commuters (approximately 80 percent) rely on a personal vehicle, whereas only about 1 percent use public transportation (U.S. Census Bureau 2010).

Economic Activity

In terms of economic activity, the three counties are very similar. The major industries are education, healthcare, and manufacturing, accounting for at least 20 percent of the jobs in each county. Retail trade and construction make up approximately 12 percent and 6 percent, respectively in each county. Agriculture, forestry, mining and other related activities only make up about 3 percent of jobs in these three counties (U.S. Census Bureau 2010).

Land use in the tri-county area is dominated by agriculture. In Cayuga County, more than 1,010 farms cover over 60 percent of Cayuga County, with approximately 259,300 acres under cultivation. Livestock, dairy, and cash crops are the primary products (Cayuga County Chamber of Commerce 2010). For Seneca County, in 2003 there were 127,000 acres in farms, 61 percent of the county's total 207,944 acres. The leading products sold were: dairy products, grains and dry beans, cattle and calves, fruits and nuts, and hogs and pigs (Cornell University Cooperative Extension 2010). In 2007, Wayne County had 938 farms on 168,000 acres, or 45 percent of the county's land area. Apples are among the primary crop, with other important products including cherries and other tree fruit, onions and potatoes produced on the county's mucklands, dairy products, grain and vegetables (Wayne County Agricultural Development Board 2009).

County-specific data regarding the economics of wildlife-related recreational opportunities were not available during the preparation of this report. However, the Service has prepared several reports (the latest in 2006; USFWS and U.S. Department of Commerce 2006), which summarize

the expenditures associated with various wildlife-related activities. Most participants engaged in wildlife watching (84 percent), followed by fishing (25 percent), and hunting (12 percent). (Note: the sum of these exceeds 100 percent as many participants engaged in more than one activity.) During 2006, State residents and nonresidents spent $3.5 billion on wildlife recreation in New York. The majority of that total was spent on equipment ($1.6 billion), followed by trip-related expenditures ($1.5 billion), licenses, contributions, land ownership and leasing, and other items ($491 million). Roughly one-third of all people engaged in wildlife activities in New York were nonresidents. Compared to 1996, the number of participants engaged in fishing and hunting declined, as did associated expenditures. During that same 10-year period, wildlife watching increased, but associated expenditures declined. Full reports (1996, 2001, and 2006) can be viewed online at: *http://www.census.gov/prod/www/abs/fishing.html*.

Oil and Gas Development

The U.S. has a long history of oil and gas development. In the last ten years, innovations in horizontal drilling and hydraulic fracturing have made extracting natural gas reserves from previously known shale formations (or shale plays) more economical (EIA 2011). There are at least two shale plays in New York that are thought to be major sources of natural gas: Marcellus Shale and Utica Shale (EIA 2012). Marcellus Shale stretches from West Virginia to southern New York State (USGS Marcellus Shale Assessment Team 2011), ending south of the refuge. Of more concern to Montezuma NWR is the Utica Shale formation. This formation is larger and deeper than the Marcellus Shale formation. It stretches from northeast Kentucky to central New York State (including the refuge), and west to include most of Ohio (Ryder 2008).

Oil and gas reserves are currently extracted from shale using horizontal drilling and hydraulic fracturing (also called fracking) (see EIA 2012 for a more thorough discussion of how oil and gas are produced from shale). Environmental effects of these methods are not well documented at this time; however, there are concerns about potential effects particularly related to water resources. USGS (2009) has identified three major concerns related to hydraulic fracturing: 1) it requires substantial amounts of water for well construction, 2) movement of heavy equipment during well construction in rural areas can degrade small watersheds, and 3) large quantities of potentially contaminated water and fluids recovered from wells need to be disposed of safely. In addition, there is some concern that injection of wastewater from hydraulic fracturing into deep wells (one method of disposal) can cause earthquakes large enough to be felt and cause damage (USGS 2009). As with more conventional oil and gas operations, there are also concerns about potential negative effects from gas well blowouts, infrastructure development, and water and soil contamination from transport, storage, and disposal of chemicals and waste (Zoback et al. 2010).

The Federal Bureau of Land Management administers an active oil and gas project which involves a Farmers Home Administration property currently managed by the refuge. The drill site is located outside of the property, but subsurface resources underneath the property are within the project's affected area (see chapter 3, Monitoring Oil and Gas Development for additional information).

In New York State, installation of new natural gas wells has slowed dramatically while NYSDEC prepares a general environmental impact statement to address statewide effects of

drilling for natural gas in Marcellus Shale (NYSDEC 2012). NYSDEC is expected to release the final environmental impact statement and associated regulations soon.

Employment and Per Capita Personal Income

Levels of employment and personal income provide important indications of the economic condition of an area. In terms of employment levels, Cayuga and Wayne Counties were very similar in 2008 (table 3.10). The number of jobs in Seneca County was roughly half of those estimated in Cayuga County and Wayne County, respectively. Total employment in the AOI was slightly less than 1 percent of those estimated in the State during 2008. Between 2000 and 2008, employment levels shifted most dramatically in Seneca County (a 27 percent decline) and Wayne County (a 56 percent increase). Overall, the AOI exhibited a 12 percent increase in the number of jobs since 2008, which was similar to what was seen across the State. It should be noted that these data represent information that was collected during the early stages of the economic recession, and current data are likely to show lower employment rates than those depicted for 2008 in table 3.10. Median personal incomes were relatively similar for each of the three counties in the AOI. The difference between the counties is how per capita income levels changed since 2000. Personal incomes increased 41 percent in Cayuga County, and a dramatic 114 percent in Seneca County. Personal incomes declined in Wayne County by 12 percent during the 8-year timeframe. Overall, personal incomes in the AOI increased, albeit less than the State (27 percent versus 41 percent), as seen in table 3.10.

Table 3.10. Employment and Personal Income Statistics for Cayuga, Seneca, and Wayne Counties, New York in 2008.

Region	Employment		Median Personal Income	
	Jobs	Percent Change Since 2000	$	Percent Change Since 2000
Cayuga County	37,733	+8	31,820	+41
Seneca County	16,790	-27	31,286	+114
Wayne County	38,548	+56	34,353	-12
Area Total	93,071	+12		
New York State	11,289,001	+9	48,809	+41

Source: U.S. Department of Commerce 2010

Refuge Administration

Staffing

Presently, staffing on the refuge consists of eight permanent, full-time positions: a refuge manager, deputy refuge manager, park ranger (visitor services manager), park ranger (visitor services), wildlife biologist, administrative officer, tractor operator, and maintenance worker (refer to appendix C). In addition, up to three temporary positions (biological technicians and park rangers) may be filled on a seasonal basis.

Funding

The funding for the refuge is allocated via the Service's Northeast Regional Office located in Hadley, Massachusetts. Operational funding includes salaries, supplies, utilities, fuel, surveys, management activities and all other operational activities that are not funded by special projects. Base maintenance funds that are used to repair vehicles, equipment, and facilities generally have been stable over the past 5 years. The replacement of vehicles, larger pieces of equipment (e.g., tractor, backhoe), or larger facilities (buildings) are funded as projects. Annual funding fluctuates according to the number and size of special projects funded that year (e.g., vehicle or equipment replacement, visitor service enhancements, and facility improvements).

Facilities and Infrastructure

Facilities include the refuge headquarters, visitor contact station, maintenance shop, vehicle barn, equipment shed, public restrooms, and several other support buildings. The refuge maintains 3.5 miles of paved roads, and approximately 30 miles of unpaved roads. In addition, several miles of berms and numerous water control structures are maintained. Public use facilities include the visitor contact station, as well as two viewing towers, three viewing platforms, three pulloffs (overlooks), and approximately 5.5 miles of trails.

Volunteers

Volunteers, through their contributions of time, skills, and efforts, are an integral component of the success of the refuge. Volunteers staff the visitor contact station, store, and information booths at festivals. In addition, they serve as roving naturalists and participate in Montezuma Alliance for the Restoration of Species and Habitats (MARSH!) work days (invasive plant control and native plant establishment). Other tasks performed include gardening, wildlife surveys, duck banding, maintenance, and data entry. For volunteers that spend several days or weeks working on refuge projects (such as college interns), there are two camper pads with hookups and a bunkhouse. Volunteer efforts have increased significantly during the last few years, from 3,609 hours logged in 2008 to 8,323 hours in 2010.

Distributing Refuge Revenue Sharing Payments

Since 1935, the Service has made refuge revenue sharing payments to counties or towns containing lands under its administration. The actual amount of the payments is determined by formulas specified in the Revenue Sharing Act (16 U.S.C. 715s) and annual funding appropriated by Congress. The formulas used to determine payments to local municipalities are based on the number of acres in each municipality and the appraised value of refuge lands in their jurisdiction. Currently for Montezuma NWR, we make revenue sharing payments to Cayuga County, and the towns of Seneca Falls, Tyre, Clyde, Galen, and Savannah. Between fiscal years 2005 and 2009, combined payments to all municipalities have averaged about $14,500 per year.

Refuge Public Use

Special Use Permits, Including Research

Special use permits (SUPs) are issued to individuals, organizations, and agencies that request the use of refuge facilities or resources beyond what is available to the public. To ensure that

wildlife disturbance is minimized, special conditions and restrictions are identified for each request. Since 2002, the refuge has issued an average of 13 permits per year, with specified periods ranging from 1 day to 1 year, depending on the nature of the request. Each request is individually reviewed.

The refuge supports research activities when they are compatible with the refuge purposes, and help gain knowledge and understanding to benefit management goals and objectives. Refuge staff, graduate students, conservation organizations, and others have conducted numerous research projects on the refuge.

Land Protection and Conservation

The refuge is actively engaged in land protection efforts, having acquired over 1,100 acres since 1999 (see table 1.1 in chapter 1). Lands being targeted are in the MWC, as they become available from willing sellers. In addition to obtaining lands in fee title, the refuge has purchased several conservation easements. This land protection strategy is an alternative way of protecting wildlife habitat without purchasing the land outright. A conservation easement allows the refuge to protect wildlife habitat on a property that remains in private ownership. The refuge, for example, may purchase rights from the property owner that restrict certain uses. However, other activities, such as farming, forestry, hunting and fishing, could continue when they are consistent with conservation goals.

Partnerships

Throughout most of its history, the refuge has combined its resources with others to form a wide array of outstanding partnerships to advance common conservation objectives, including land acquisition, control of exotics, threatened and endangered species recovery, research, interpretation and education, and enhanced wildlife observation and photography opportunities. These partners include New York State Department of Environmental Conservation, Audubon New York and the Montezuma Audubon Center, Ducks Unlimited, The Nature Conservancy, The Friends of the Montezuma Wetlands Complex (Friends), Cayuga Lake Scenic Byway, Montezuma Winery, USDA agencies, US DOI agencies, NYS Canal Corporation, NYS Thruway Authority, New York State Department of Transportation (NYSDOT), local and county government offices within Seneca, Wayne and Cayuga Counties, regional sportsmen's clubs and bird clubs, local school districts, private landowners, and individual volunteers. The refuge has worked very closely with a broad array of regional universities to host student and faculty research projects on the refuge and establish various partnerships. The colleges and universities that the refuge has worked with the most include: Cornell University, SUNY Environmental Science and Forestry, Finger Lakes Community College, Rochester Institute of Technology, and Hobart and William Smith College.

Visitor Services

The purpose of the visitor services program is to provide opportunities for appropriate and compatible wildlife-dependent recreation to enable the public to enjoy the refuge. Between 2006 and 2010, the refuge has averaged 143,000 annual visits per year. Visitors to the refuge can observe and photograph wildlife, fish, hunt, and participate in environmental education and interpretation. See map 4.2 for major public use facilities, such as observation towers, trails, etc. Table 3.11 illustrates the number of visits for the six major public uses that are provided on the

refuge. In 2006 the Service's Northeast Region identified areas of emphasis for all of its refuges (USFWS 2006a). Wildlife observation, photography, and environmental interpretation were identified as areas of emphasis for the Montezuma NWR. For additional information on how the Service administers public uses on the refuge, please see appendix B, Findings of Appropriateness and Compatibility Determinations.

Table 3.11. Visits[1] to Montezuma National Wildlife Refuge Between 2006 and 2010.

Type of Visit[2]	2006	2007	2008	2009	2010
Visitor Contact Station	11,696	15,525	14,846	15,234	16,938
Waterfowl Hunt	600	563	352	152	355
Big Game Hunt	1,351	1,371	1,909	1,893	1,897
Fishing	4,072	4,224	3,972	3,922	3,937
Wildlife Observation and Photography	112,720	116,600	117,021	127,790	123,404
Environmental Education	524	1,986	854	949	818
Interpretive Program	480	612	922	1,450	702
Special Events	-	480	493	715	1,040
Total	131,443	141,361	140,369	152,105	149,091

[1] A refuge visit is defined as, "the entry of one person onto a Refuge System station to engage in one recreational or educational activity. …One visitor could account for several visits" (USFWS 2005a).

[2] Visitor numbers are based on direct counts by refuge staff, volunteers, a traffic counter, and a counter at the visitor contact station. Some estimation and professional judgment is used to determine visits for wildlife observation and photography, interpretation, and fishing using methods in chapter 2 of the National Wildlife Refuge System Visitation Estimation Workbook (USFWS 2005a).

Wildlife Observation and Photography Opportunities

The refuge offers numerous opportunities for wildlife observation and photography, including a 3-mile long Wildlife Drive, a photography blind, nearly 4 miles of walking trails, a floating boat dock, and several observation areas (see map 4.2). Visitors have the opportunity to view and photograph a variety of habitats and wildlife. In addition, there is currently an annual photography contest coordinated by the Friends.

Hunting

Hunting at Montezuma NWR is guided by a Hunting Plan written in 2005 and by an Annual Hunt Program document. Refuge hunting is limited to white-tailed deer and waterfowl hunting and generally follows regulations set by the New York State Department of Environmental Conservation. Detailed hunting rules and regulations are included in the Code of Federal Regulations (50 CFR) and in handouts prepared by refuge staff on an annual basis. White-tailed deer hunting occurs on 95 percent of refuge upland and forest habitats and is conducted through the issuance of self-serve refuge permits. The refuge waterfowl hunt is managed through a reservation system and is partially administered by the Friends. The refuge determines the seasons, locations, and regulations of the hunt and the Friends are responsible for administering the hunt and collecting the waterfowl hunt fee.

Fishing

Access to fishing spots from refuge lands is limited. Fishing follows New York State seasons and regulations. The refuge has one universally accessible fishing pier at May's Point, along the

Seneca River (also known as the Cayuga-Seneca Canal), with parking for about 10 cars. Additionally, the refuge provides access to the NYSDEC-owned Seneca River fishing site on Route 20, across from the refuge headquarters entrance. Fishing opportunities are not provided in impoundments on the refuge. The refuge does not have jurisdiction over canal waters, but can provide access to the canals for the purpose of fishing.

Environmental Education and Interpretation

Environmental education is currently not an area of emphasis for Montezuma NWR, and with limited staff the focus is on providing opportunities for wildlife observation, photography and environmental interpretation. Staff and volunteers accommodate groups requesting programs when time permits. The refuge partners with the MAC which has a focus on environmental education. Refuge staff work with MAC environmental educators to create programs for visitors and school groups throughout the MWC.

Environmental interpretation is an area of emphasis on the refuge, second to wildlife observation. Interpretive panels and the complexwide “Guide by Cell” cellphone tour (funded by the Friends), along with the refuge’s Wildlife Watching Guide, convey not only orientation information, but also refuge messages about its history and management. Special guest speaker programs are offered every other month as part of the Nature of Montezuma Series, in cooperation with the MAC, and supported by the Friends. Guided interpretive bus tours are given by refuge staff upon request and as part of the Wildflowers and Wine Festival in June and the National Wildlife Refuge Week Celebration in October. Winter program series, such as the Montezuma Book Club and Eco-Chat, have also been used as platforms for environmental interpretation.

Chapter 4

Doug Racine

Widgeons

Management Direction and Implementation

- **Introduction**
- **General Refuge Management**
- **Conducting Additional NEPA Analysis**
- **Refuge Goals, Objectives, and Strategies**

Introduction

Refuge goals are intentionally broad, descriptive statements of the desired future condition of refuge resources. By design, they define the targets of our management actions in prescriptive rather than quantitative terms. They also describe the refuge purpose and our vision, and provide a foundation for developing specific management objectives and strategies.

Objectives are steps toward achieving a goal and further define management targets in measurable terms. They provide the basis for developing the strategies that monitor refuge accomplishments and evaluate progress. "Writing refuge Management Goals and Objectives: A Handbook" (USFWS 2004a) recommends writing "SMART" objectives that possess five properties: (1) specific; (2) measurable; (3) achievable; (4) results-oriented; and (5) time-fixed.

Where possible, we incorporated the principles of SHC in the development of our objectives and strategies. According to "Strategic Habitat Conservation: Final Report of the National Ecological Assessment Team" (USFWS 2006b): "This approach focuses on the ability of the landscape to sustain species as expressed in measurable objectives. Developing a strategy to attain a biological outcome, such as a population objective, requires documented and testable assumptions to determine whether the objective is met." Not only will this approach ensure refuges are contributing to the NWRS and USFWS mission and goals in a strategic, standardized, and transparent way, it also helps refuges ensure that they contribute to local and regional conservation priorities and goals as well.

A rationale accompanies each objective to explain its context and importance. We will use the objectives described later in this chapter to write the refuge step-down plans.

Next we identified strategies, or the actions, tools, and techniques we may use to achieve each objective. The list of strategies in each objective represents the suite of actions we propose to implement. We will evaluate most of them further as to how, when, and where we should implement them when we write our refuge step-down plans. We will measure our successes by how well our strategies achieve our objectives and goals.

We believe the management goals, objectives, and strategies described below provide the best combination of actions to meet the Refuge System mission and policies, meet the refuge purposes, vision, goals, and respond to public issues. It emphasizes management of emergent marsh habitats and for priority bird species of conservation concern in the BCR 13 and PIF 15 plans and the New York State CWCS. In addition, under this plan we will enhance our current level of: (1) visitor services, (2) species inventory and monitoring, (3) law enforcement, and (4) partnerships.

General Refuge Management

There are some actions we will take in managing Montezuma NWR over the next 15 years that are required by law or policy, or represent actions that have undergone previous NEPA analysis, public review, agency review, and approval. Others may be administrative actions that do not necessarily require public review, but we want to highlight them in this public document. They may also be actions we believe are critical to achieving the refuge's purpose, vision, and goals.

All of the following actions, which we discuss in more detail below, are current practices or policies that will continue:

- Continuing land protection by purchasing fee title and conservation easements from willing sellers, and accepting donations, within the current, approved acquisition boundary.
- Using an adaptive management approach where appropriate.
- Monitoring and controlling invasive species.
- Monitoring and abatement of diseases affecting wildlife and forest health.
- Monitoring and controlling pest plants and animals.
- Facilitating or conducting biological research and investigations.
- Protecting threatened and endangered species.
- Responding to climate change.
- Providing refuge staffing and administration.
- Distributing refuge revenue sharing payments.
- Protecting cultural resources.
- Providing wildlife–dependent recreational opportunities.
- Completing findings of appropriate use and compatibility determinations.
- Allowing cooperative farming.
- Conducting wilderness reviews.

Protecting Land and Refuge Expansion

As of October 2012, the Service was authorized to protect 19,510 acres. At that time, we had acquired 9,184 of those acres in fee title and conservation easements. We will continue to work with willing sellers and in partnership with other agencies and organizations to acquire lands within the current acquisition boundary. Hence, we are unable to predict the exact size, type, and location of lands that may come under our management within the next 15 years. As new lands are acquired, we will evaluate their potential for habitat restoration and will determine appropriate habitats (i.e., emergent marsh, forest, shrubland, grassland) based on soils, surrounding habitat, current vegetation community, and landscape level priorities. We will continue to comply with all applicable laws, regulations, and Executive Orders as we acquire and restore new lands.

As part of this CCP, we have expanded the current approved acquisition boundary. Specific parcels are identified in a Land Protection Plan (LPP) which has been updated in conjunction with this document (see appendix F). In 1991, an EIS was completed for the Northern Montezuma Wetlands Project which proposed a joint State and Service acquisition boundary

encompassing 49,150 acres (USFWS and NYSDEC 1991). Following the EIS, an LPP was developed in 1994 to establish the expanded acquisition boundary (USFWS 1994). In cooperation with NYSDEC, we are proposing to increase the refuge's acquisition boundary by approximately 1,223 acres. We expanded the boundary to avoid a patchwork of State and Federal ownership that would be confusing for the public and to improve management capabilities by allowing us to better connect previously acquired parcels.

We intend to acquire, from willing sellers, interests in 1,431 acres near the northeast section of the refuge. This includes: 1) 1,223 acres which we have recently added to the refuge's current approved acquisition boundary, and 2) two parcels (totaling about 208 acres) that were previously added to the approved acquisition boundary but have not been acquired (see table F.4 and map F.4). We estimate that it will cost about $2.2 million (in 2010 dollars) to acquire those 1,431 acres (as full fee simple or conservation easements). This estimate is based on the following assumptions:

- All fee simple lands purchased are privately owned and primarily farmland, totaling approximately 1,255 acres. We used a median estimated price of $1,750 per acre for farmland, based on estimates of land value completed between 2008 and 2009. Thus, the cost of acquiring all the farmland in this area will be 1,255 acres × $1,750/acre = $2,196,250.
- All conservation easements will be forested wetlands totaling about 176 acres. We used a median price of $300/acre for forested wetlands. Conservation easements typically cost approximately 75 percent of the full fee title value. Hence, the cost of acquiring all the available conservation easements will be 176 acres × $300/acre × 0.75 = $39,600.

As part of the refuge expansion, we assume the Service will acquire some structures, most of which will not support the refuge or Service mission and will be slated for demolition. Prior to any demolition activity, the refuge will comply with the NHPA. For structures older than 50 years in age, we will evaluate the structure's eligibility for listing in the National Register of Historic Places in consultation with the Regional Historic Preservation Officer (RHPO) and the SHPO. If any structures are found to be eligible for listing, we will work with our RHPO and SHPO to complete comprehensive documentation and any other legal requirements prior to demolition or alteration.

Structures we are likely to obtain include single-family homes and farm buildings. Some buildings that are in excellent condition could be used for refuge quarters, equipment storage, or a visitor contact facility, although we did not identify that as an objective in this CCP. Although we have not conducted a facilities survey on all 1,431 acres, we estimate, on average, to demolish one building for every four parcels we purchase in fee. We will address parcels we obtain by easement on a case-by-case basis. The most cost-effective way to remove a structure is usually for the refuge staff or a contractor to demolish it, although other methods will be used, where available and appropriate (e.g., local fire department burning for training, etc.). Tables 4.1 and 4.2 below show the anticipated costs. We have also identified the costs associated with posting signs for boundaries and seasonal closures. We identify the contaminant costs as Level 1 surveys for most parcels, although we recommend some soil testing because of the possibility of

contamination from previous land uses such as agriculture. We do not anticipate acquiring any contaminated sites because they will require substantial funding for remediation.

Table 4.1. Estimated One-time Costs Associated with Operating and Maintaining Lands in the Expansion Area for Montezuma National Wildlife Refuge.

Estimated One-Time Operating Costs	Costs in Dollars
Establish new impoundments and water control structures	$150,000
Post informational, regulatory, boundary signs	$5,000
Demolition of houses/small buildings	$40,000
Demolition of barns	$10,000
Hazardous Materials Inventory and abatement (all structures)	$20,000
Contaminant (level 1) studies and soil testing	$10,000
Construction of public use sites (trails, blinds)	$5,000
Construction/improvement of parking areas	$5,000
New kiosks/exhibits	$5,000
Construction of Wildlife Drive Extension	$50,000
Total Estimated One-Time Operations Cost	**$300,000**

*These costs assume the full implementation of the final CCP. These estimates do not include requirements for NHPA compliance.

Table 4.2. Estimated Annual Costs Associated with Operating and Maintaining Lands in the Expansion Area for Montezuma National Wildlife Refuge.

Estimated Annual O&M Costs	Costs in Dollars
Waterfowl impoundment maintenance and Management	$2,000
Habitat inventories	$2,000
General maintenance of public use facilities	$5,000
Mowing and haying	$1,000
Total Estimated Annual O&M Cost	$10,000
Estimated Annual Refuge Revenue Sharing Payment*	$5,000

*These costs assume the full implementation of the final CCP and 100 percent of eligible reimbursement.

Historic Habitat Conditions

Under this plan we will study historic habitat conditions to inform our habitat restoration. Past and ongoing land use patterns have greatly altered ecological communities. In many areas, land cover conversion has so dramatically changed former vegetative communities that historic

conditions have become difficult to detect (e.g., conversion of marsh to forest to agriculture). Effective landscape restoration requires a thorough understanding of the historic conditions.

Impacts to Wildlife from Highways

Under this plan we will assess wildlife and highway interactions through specific studies, likely conducted in collaboration with outside researchers. Refuge lands span a large area that is intersected by the NYS Thruway, as well as other smaller roads. In addition to causing direct mortality, roads and highways can alter the behavior of some wildlife species. Some species avoid roads, potentially causing their populations to become isolated. Based on the results of studies, we will consider constructing wildlife underpasses or mitigate the impacts of roads in other ways as feasible.

Hydrological Studies

As detailed in chapter 3, the area's hydrology has been dramatically altered due to the construction of the NYS Canal System, levees, and drainage ditches. Because wetlands require water, it is important for the refuge to understand the hydrology. Therefore, we will study surface and subterranean hydrology to determine water availability and quality and adjust management as needed.

Adaptive Management

We will employ an adaptive management approach for improving resource management by added flexibility in management to allow us to respond to new information, spatial and temporal changes and environmental events, whether foreseen or unforeseen, or other factors that influence management. Our goal is to be able to respond quickly to any new information or events. The need for flexible or adaptive management is very compelling today because our present information on refuge species and habitats is incomplete, provisional, and subject to change as our knowledge base improves.

We will continually evaluate management actions, both formally and informally, through monitoring or research, to consider whether our original assumptions and predictions remain valid. In that way, management becomes a proactive process of learning what really works. Secretarial Order No. 3270 provides guidance on policy and procedures for implementing adaptive management in departmental agencies. In 2007, an intradepartmental working group developed a guidebook to assist managers and practitioners. This adaptive management guidebook was updated in 2009 (Williams et al. 2009). It defines adaptive management, the conditions under which we should consider it, and the process for implementing it and evaluating its effectiveness.

The guidebook defines adaptive management as, "a decision process that promotes flexible decision-making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood."

For the refuge, monitoring key resources and management actions and outcomes, will be critical to implementing an adaptive management process. Ongoing restoration and impounded wetlands management activities are examples of refuge programs where an adaptive management approach will continue to be implemented and refined. Thus, adaptive management promotes

flexible decision-making through an iterative learning process that responds to uncertainties, new information, monitoring results, and the natural variability in ecosystems. It is designed to facilitate more effective decisions and enhanced benefits. The refuge manager will be responsible for changing management actions and strategies if they do not produce the desired conditions. Significant changes from what we present in our final CCP may warrant additional NEPA analysis and public comment.

Generally, we can increase monitoring and research that support adaptive management without additional NEPA analysis, assuming the activities, if conducted by nonrefuge personnel, are determined compatible by the refuge manager in a compatibility determination. Many of our objectives identify monitoring elements. Our Inventory and Monitoring Plan (IMP) will determine future survey efforts and prioritize inventory and monitoring efforts (see "Inventory and Monitoring Plan" under "Developing Refuge Step-down Plans" below).

Strategic Habitat Conservation

Strategic Habitat Conservation is a framework that uses adaptive management to redefine broad scale conservation from the general pursuit of conserving "more" habitat and species, to a more planned approach. As discussed in chapter 1 under "Conservation Plans and Initiatives Guiding the Proposed Action," the goal of strategic habitat conservation is to set specific population objectives for species that are limited in some way by habitat, and to use targeted habitat management approaches to meet those objectives. Inherent in the process is a continual evaluation of outcomes and approaches, with the intent to adapt the overall strategy in response to changing circumstances and new information.

Managing Invasive Species

Over the past several decades, government agencies, conservation organizations, and the public have become more aware of the negative effects of invasive species. Many plans, strategies, and initiatives target the more effective management of invasive species (e.g., USFWS 2004b, National Wildlife Refuge Association 2002). The establishment and spread of invasive species is a significant problem that reaches across all habitat types. For the purposes of this discussion, we use the following definition of invasive species (Service Manual 750 FW 1; USFWS 2011): "alien species whose introduction does or is likely to cause economic or environmental harm, or harm to human health. Alien species, or nonindigenous species, are species that are not native to a particular ecosystem."

The spread of invasive species threatens the biological diversity, integrity, and environmental health of all refuge habitats. We referred to the National Wildlife Refuge System Invasive Species Management Strategy released in May 2004 (USFWS 2004b) for additional tools, processes, and strategies. This report is complemented by an invasive species survey of refuges completed in 2004 as well (Simonson et al. 2004). These reports together give both a status review and a management strategy for combating invasive species. The Refuge System biological discussion database and relevant workshops continually provide new information and updates on recent advances in control techniques. Sources of funding are available, both in the Service budget and through competitive grants, to conduct inventory and control programs.

Guidance is derived from several laws and regulations. These and other information on managing invasive species on refuges can be found at: *http://www.fws.gov/invasives*.
The National Wildlife Refuge System Invasive Species Management Strategy recommends the following priority order of action for invasive species management:

1) Prevent invasion of potential invaders.
2) Eradicate new and/or small infestations.
3) Control and/or contain large established infestations.

The following actions are preferred strategies for the refuge:

1) Incorporate invasive species prevention in all facilities and construction projects.
2) Incorporate invasive species prevention in impoundment design and management.
3) Minimize disturbances in habitats dominated by native species.
4) Evaluate native habitat management activities with respect to their potential to accidentally introduce or increase the spread of invasive species and modify our habitat management operations to prevent increasing invasive species populations.
5) Map and monitor invasive species populations and control efforts.
6) Remove the parent sources of highly invasive species (e.g., species that are high seed producers or vigorous rhizome producers).
7) Eradicate new and/or small infestations by facilitating early detection and rapid response.
8) Prioritize the control of established infestations as follows:
    a. Smallest scale of infestation.
    b. Poses greatest threat to land management objectives.
    c. Greatest ease of control.
9) When limited resources prevent the treatment of entire populations, prioritize control as follows:
    a. Treat the smallest infestations (satellite populations).
    b. Treat infestations on pathways of spread.
    c. Treat the perimeter and advancing front of large infestations.
10) Restore altered habitats and reintroduce native plants.
11) Develop an integrated pest management plan to guide the prevention, control, or eradication of invasive species. This plan will comprehensively evaluate all management options, including defining threshold/risk levels that will initiate management actions.

Within the past 5 years we have worked to control the following invasive plants, listed in alphabetical order by common name: autumn olive, bull thistle, (nonnative) bush honeysuckles, Canada thistle, common buckthorn, common (European) frogbit, (nonnative) common reed, European (pale) swallow-wort, flowering rush, garlic mustard, Japanese knotweed, Japanese stiltgrass, multiflora rose, Oriental bittersweet, purple loosestrife, tree of heaven, and yellow sweetclover.

Controlling Pest Plants and Animals

At times, native plants and animals interfere with management objectives. The Refuge Manual (7 RM 14.4A; USFWS 1989) defines a pest as “Any terrestrial or aquatic plant or animal which interferes, or threatens to interfere, at an unacceptable level, with the attainment of refuge

objectives or which poses a threat to human health." This definition could include the invasive species defined above, but in this section, we describe some situations involving native species and the conditions under which we will initiate control.

An integrated approach to pest control uses various methods, including natural, biological, cultural, mechanical, and chemical controls. For example, although muskrats can be beneficial in maintaining marsh interspersed with open water, at high densities they can damage habitat and infrastructure (their burrows can undermine levees). To maintain muskrat densities at optimal levels, the refuge issues special use permits to commercial trappers, allowing them to remove muskrats in specific parts of the refuge.

1) We will determine the need for site-specific control based on the potential to affect our management objectives for a given area.
2) We will employ integrated pest management techniques when a species is having a significant impact on an area resulting in major habitat replacement and loss of natural habitat structure or processes. As with all management actions, we will monitor results to ensure we are achieving management objectives.

Integrated Pest Management (IPM)

In controlling pests, whether invasive or native species, we use an integrated approach. The Service Manual (USFWS 2011) defines integrated pest management as "A dynamic approach to pest management which utilizes a full knowledge of a pest problem through an understanding of the ecology of the pest and ecologically related organisms and through continuous monitoring of their populations. Once an acceptable level of pest damage is determined, control programs are carefully designed using a combination of compatible techniques to limit damage to that level."

In accordance with Service guidelines, an integrated pest management approach will be utilized, where practicable, to eradicate, control, or contain pest and invasive species on the refuge. An IPM approach will underline all decisions on control of invasive species. IPM will involve using methods based upon effectiveness, cost, and minimal ecological disruption, which considers minimum potential effects to nontarget organisms and the refuge environment. Pesticides may be used where physical, cultural, and biological methods or combinations thereof, are impractical or incapable of providing adequate control, eradication, or containment. Furthermore, pesticides will be used primarily to supplement, rather than as a substitute for, practical and effective control measures of other types. If a pesticide is needed on the refuge, the most specific (selective) chemical available for the target species will be used unless considerations of persistence or other environmental and/or biotic hazards will preclude it.

The refuge's IPM plan will be written within 5 years of the approval of this CCP and will be on file at the refuge headquarters when complete. The IPM is a step-down plan from the CCP and supplements both the CCP and HMP with documentation on how to manage invasive or pest species.

Monitoring and Abating Wildlife and Plant Diseases

The Service has not yet published its manual chapter on Disease Prevention and Control. In the meantime, we derive guidance on this topic from the Refuge Manual and specific directives from

the Director of the Service or the Secretary of the Interior. The Refuge Manual (7 RM 17.3; USFWS 1989) lists three objectives for the prevention and control of disease:

1) Manage wildlife populations and habitats to minimize the likelihood of the contraction and contagion of disease.
2) Provide for the early detection and identification of disease mortality when it occurs.
3) Minimize the losses of wildlife from outbreaks of disease.

The Service published these objectives in 1982. Since then, in addition to diseases that cause serious mortality among wildlife, diseases transmitted through wildlife to humans have received more attention. One serious wildlife disease that receives considerable attention worldwide is avian influenza. Of particular concern is the highly pathogenic Eurasian form (H5N1). The refuge completed an Avian Influenza Surveillance and Contingency Plan in 2006. Monitoring efforts for this disease, which has not been detected in North America at this time, are coordinated at the Atlantic Flyway and national levels.

These are the general strategies for preventing or controlling disease:

1) Continue to conduct disease surveillance in conjunction with other fieldwork.
2) Cooperate with other agencies, particularly NYSDEC and USDA, by providing access for sampling and following protocols in the event of an outbreak.
3) Inform volunteers and others who work in the field about the dangers of zoonotic diseases transmitted through wildlife to humans and measures to avoid contracting them (e.g., Lyme disease).
4) Monitor habitats for indicators of the increased occurrence of pests or disease. For example, note changes in the seasonal timing (phenology) of flowering or fruiting that do not appear to be linked to global climate change, physical damage, decay, weakening, sudden death, particularly of major host species, and changes in wildlife use of habitats, such as the absence of breeding birds.
5) Follow the protocols in national, state, and refuge disease prevention and control plans.

Biological and Ecological Research and Investigations

The Refuge Manual and the Service Manual both contain guidance on conducting and facilitating biological and ecological research and investigations on refuges. In 1982, the Service published three objectives in the Refuge Manual for supporting research on units of the Refuge System (4 RM 6.2; USFWS 1989):

1) To promote new information and improve the basis for, and quality of, refuge and other Service management decisions.
2) To expand the body of scientific knowledge about fish and wildlife, their habitats, the use of these resources, appropriate resource management, and the environment in general.
3) To provide the opportunity for students and others to learn the principles of field research.

In 2006, the Service Manual provided supplemental guidance on the appropriateness of research on refuges: “We actively encourage cooperative natural and cultural research activities that

address our management needs. We also encourage research related to the management of priority general public uses. Such research activities are generally appropriate. However, we must review all research activities to decide if they are appropriate or not. Research that directly benefits refuge management has priority over other research" (603 FW 1.10 D (4); USFWS 2011).

All research conducted on the refuge must be determined in writing to be both appropriate and compatible, unless we determine it to be an administrative or management activity. We expect opportunities to conduct research on the refuge to arise under this plan and we propose to employ the following research-related strategies:

1) Seek qualified researchers and funding to help answer refuge-specific management questions.
2) Participate in appropriate multi-refuge studies conducted in partnership with the USGS or other entity.
3) Coordinate with partners to initiate or conduct research on priority issues identified at local and regional scales.
4) Facilitate appropriate and compatible research by providing temporary housing and equipment, if available, for persons conducting fieldwork.

All researchers will be required to submit detailed research proposals following the guidelines established by Service policy and refuge staff. Through the use of SUPs, the refuge identifies the schedules for progress reports, the criteria for determining when a project should cease, and the requirements for publication or other interim and final reports. All publications will acknowledge the Service and the role of Service staff as key partners in funding or operations.

Responding to Climate Change

Climate change is an issue of increasing public concern because of its potential effects on land, water, and biological resources. The issue was pushed to the forefront in 2007 when the International Panel on Climate Change (IPCC), representing the world's leading climate scientists, concluded that it is "unequivocal" that the Earth's climate is warming, and that it is "very likely" (a greater than 90 percent certainty) that the heat-trapping emissions from the burning of fossil fuels and other human activities have caused "most of the observed increase in globally averaged temperatures since the mid-twentieth century" (IPCC 2007). The Northeast is already experiencing rising temperatures, with potentially dramatic warming expected later this century under some model predictions. According to the Northeast Climate Impacts Assessment team, "continued warming, and more extensive climate-related changes to come could dramatically alter the region's economy, landscape, character, and quality of life (Frumhoff et al. 2006). For additional information on effects of climate change on the Great Lakes region, refer to the chapter 3, "Climate Change" section. In response to the growing threat of climate change, the Service developed a strategic plan (USFWS 2010b) titled "Rising to the Urgent Challenge: Strategic Plan for Responding to Accelerating Climate Change," which establishes a basic framework within which the Service will work as part of the larger conservation community to help ensure the sustainability of fish, wildlife, plants and habitats in the face of accelerating climate change. The plan details specific steps the Service will take during the next 5 years to implement and identifies three key strategies to address climate change:

- Adaptation—Minimizing the impact of climate change on fish and wildlife through the application of cutting-edge science in managing species and habitats.
- Mitigation—Reducing levels of greenhouse gases in the Earth's atmosphere.
- Engagement—Joining forces with others to seek solutions to the challenges and threats to fish and wildlife conservation posed by climate change.

Under this plan, the refuge will work to first understand how climate change might be affecting hydrology, habitats, and wildlife. The information yielded from baseline surveys and monitoring efforts will then be used to develop specific adaptation and mitigation strategies to minimize the impacts of a changing climate on refuge resources. As part of this process, the refuge will continue to evaluate results of plant and wildlife surveys every 5 years and may coordinate with the National Phenology Network to document potential changes related to climate change on the refuge and broader geographic scales.

Protecting Cultural Resources

As a Federal land management agency, we are entrusted with protecting historic structures and archaeological sites on our land which are eligible for, or listed on, the National Register of Historic Places. Service archaeologists in the regional office keep an inventory of known sites and structures, and ensure that we consider them in planning new ground disturbing or structure altering changes on the refuge. This applies not only to refuge lands, but also on lands affected by refuge activities. We consult with the New York State Historic Preservation Office (SHPO) concerning projects which might affect sites and structures, and conduct archaeological or architectural surveys when needed. Projects can usually be redesigned to avoid affecting National Register eligible sites or structures.

Under this plan, we will conduct an evaluation of the potential for our projects to impact archaeological and historical resources as appropriate; we will continue to consult with the Service's archaeologists and the respective SHPO. This will be especially important for those projects that include moving or displacing soil or removing buildings. A pre-project evaluation of activities will ensure we comply with section 106 of the National Historic Preservation Act. That compliance may require any or all of the following: a State Historic Preservation Records survey, literature review, or field survey.

Wildlife-dependent Recreation Program

The overarching goal of the National Wildlife Refuge System's wildlife-dependent recreation policy is to enhance wildlife-dependent recreation opportunities, and to provide access to quality visitor experiences, while managing refuges to conserve fish, wildlife, plants, and their habitats. The Refuge Improvement Act designated six priority public uses on national wildlife refuges. These are: hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation. Currently all six priority public uses are supported to some degree on the refuge.

Several criteria are provided to ensure quality, wildlife-dependent recreation on national wildlife refuges by the General Guidelines for Wildlife-Dependent Recreation, Service Manual, 605 FW 1 (USFWS 2011). As established in the Service Manual, quality, wildlife-dependent recreation:

1) Promotes safety of participants, other visitors, and facilities.
2) Promotes compliance with applicable laws and regulations and responsible behavior.
3) Minimizes or eliminates conflict with fish and wildlife population or habitat goals or objectives in an approved plan.
4) Minimizes or eliminates conflicts with other compatible wildlife-dependent recreation.
5) Minimizes conflicts with neighboring landowners.
6) Promotes accessibility and availability to a broad spectrum of the American people.
7) Promotes resource stewardship and conservation.
8) Promotes public understanding and increases public appreciation of America's natural resources and our role in managing and conserving these resources.
9) Provides reliable/reasonable opportunities to experience wildlife.
10) Uses facilities that are accessible to people and blend into the natural setting.
11) Uses visitor satisfaction to help to define and evaluate programs.

The USGS in collaboration with the Service periodically conducts visitor surveys for selected refuges nationwide. Between October 23 and November 6, 2010, with help from our volunteers, the refuge requested contact information from visitors. The USGS then contacted and interviewed participants. This process was repeated on the refuge in March and April 2011. The information collected will be presented in a report made available to the public. This effort allows for a better understanding of visitors' recreational, educational and informational experiences, and measures satisfaction with current services, access, and facilities. The refuge will use information obtained by the USGS visitor survey to help improve its public use programs.

In recent years, the Service has recognized the importance of connecting children with nature. Scholars and health care professionals are suggesting a link between a disconnection with the natural world and some physical and mental problems in our nation's youth (Louv 2005). With local partners, we intend to promote connecting children and families with nature in all of our compatible recreational and educational programming.

Appropriateness and Compatibility Determinations

Chapter 1 describes the requirements for determinations of appropriateness and compatibility. Appendix B includes appropriateness and compatibility determinations consistent with implementing this CCP. Some of these are already approved, while others were presented in the draft CCP/EA for review and comment. Appendix B of the final CCP includes all approved findings of appropriateness and compatibility determinations. These activities were evaluated based on whether or not they contribute to meeting or facilitating refuge purposes, goals, and objectives. As noted above, environmental education and interpretation, wildlife observation and photography, hunting, and fishing, are the priority wildlife-dependent uses of the Refuge System. According to Service Manual 605 FW 1 (USFWS 2011), those uses should receive preferential consideration in refuge planning and management before the refuge manager analyzes other recreational opportunities for appropriateness and compatibility.

Activities Not Allowed

As specified in the Refuge Administration Act, we cannot, "initiate or permit a new use of a refuge or expand, renew, or extend an existing use of a refuge" unless we have determined that the use is compatible. In addition, certain uses are generally or specifically prohibited on refuges by Service regulation (see 50 C.F.R. §27 for details). Therefore, the refuge is closed to public uses except those specified in this plan. Upon request, the refuge manager determines in writing appropriateness and, if applicable, compatibility for nonpriority public uses. To date, Montezuma NWR has not needed to prepare any formal determinations of appropriateness where the public use was found not to be appropriate or compatible.

Activities Allowed

In addition to the six priority public uses, we have determined that some other public uses are appropriate and compatible on refuge lands under certain conditions. Some of these are ongoing uses of the refuge, and are occurring under existing, completed findings of appropriateness and compatibility determinations (e.g., cooperative farming). Others are existing uses that we are proposing to modify somewhat (e.g., pedestrian access) or are new public uses (e.g., turkey hunting). Some nonpriority public uses will also continue to be authorized (e.g., vehicular traffic on the refuge, dog walking). These activities are discussed in more detail later in this chapter. Appendix B contains current versions (where a new or modified use is proposed) of the findings of appropriateness and compatibility determinations for public use activities authorized or proposed for authorization on the refuge.

Refuge Staffing and Administration

Our proposals in this document do not constitute a commitment for funding or staffing increases. Congress determines our annual budgets, and our Washington Headquarters and regional offices distribute these funds to the individual Service offices and refuges.

Permanent Staffing and Operational Budgets

Under this plan, our objective is to sustain levels of annual funding and staffing that allow us to achieve refuge purposes, as interpreted by the goals, objectives, and strategies in the CCP. Often, many highly visible projects are conducted through special project funds that typically have a 1- to 2-year duration. Although those funds are very important, their flexibility is limited because we cannot use them for any other priority projects that may arise. Additionally, we cannot anticipate when or if we will receive these funds.

In response to declines in operational funding nationwide, we developed the "Strategic Workforce Plan for the National Wildlife Refuge System in Region 5" (Phase 2; January 16, 2007) to support a new base budget approach. Its goal is a maximum of 75 percent of a refuge station budget to cover salaries and fixed costs, while the remaining 25 percent or more will be operating and maintenance funds. Our strategy is to improve the capability of each refuge manager to do the project work of the highest priority, and not to have the refuge budget tied up in inflexible, fixed costs. Unfortunately, in a level or declining budget environment, that also may have implications for the level of permanent staffing.

We will seek to fill positions which we believe are necessary to accomplish our highest priority projects and are within the guidelines of the new base budget approach. The staffing requests will provide depth in our biological, visitor services and law enforcement programs (see appendix C for proposed staffing charts). We identify our recommended priority order for new staffing in the Refuge Operations Needs System (RONS) tables in appendix D.

Facilities Construction and Maintenance

Under this plan, we will continue to make incremental progress in constructing new, modest, high quality visitor services facilities, such as interpretive and informational signs and small contact stations (e.g., kiosks and pavilions). We have identified the need for additional directional signs both on and offsite.

Refuge Operating Hours

Under this plan we will continue to open the refuge for public use from one half-hour before official sunrise to one half-hour after sunset, 7 days a week, to ensure visitor safety and protect refuge resources. However, the refuge manager does have the authority to issue special use permits to allow non-Service visitors access outside those periods. For example, we may permit access for research personnel or hunters at different times, or organized groups to conduct nocturnal activities, such as wildlife observation and educational and interpretive programs.

Protecting Resources and Ensuring Visitor Safety

Currently the refuge does not have a law enforcement officer on staff. However, a Service Zone Officer and NYSDEC officers provide law enforcement support on the refuge; and the refuge provides a NYSDEC officer with office space. Under this plan, law enforcement support will continue to be provided in collaboration with our regional Zone Officer and the NYSDEC.

Special Use Permits

This plan will require the refuge manager to evaluate activities that require SUPs for their appropriateness and compatibility on a case-by-case basis. All commercial uses require SUPs.

Conducting a Wilderness Review

The Refuge System planning policy requires that we conduct a wilderness review during the CCP process. The first step is to inventory all refuge lands and waters the Service owns in fee title. Our inventory of this refuge determined that no areas meet the eligibility criteria for a wilderness study area as defined by the Wilderness Act. Therefore, we did not further analyze the refuge's suitability for wilderness designation. See appendix G for the results of the wilderness inventory. The refuge will undergo another wilderness review in 15 years as part of the next comprehensive conservation planning process.

Cooperative Farming

We will continue to use cooperative farming while we work to convert former and current agricultural lands into native habitats in support of the Service policy on Biological Integrity, Diversity and Environmental Health (601 FW 3; USFWS 2011). The use of cooperative farming, as an interim measure, will keep fields open in preparation for conversion to native plants and

will help keep these areas from being colonized by nonnative, invasive species. It has been an integral component of refuge habitat restoration and management.

As of 2010, the cooperative farming program included 367 acres. In lieu of paying rent for the use of refuge farm fields, the cooperator supports the accomplishment of our habitat management objectives by performing farming-related activities (e.g., disking, planting, mowing, and purchasing supplies) in support of our annual habitat management program and activities. The program will adhere to the general conditions for cooperative farming programs listed in the Refuge Manual (6 RM 4 Exhibit 1; USFWS 1989). In addition, participants in the refuge's cooperative farming program are not allowed to cultivate genetically modified crops on refuge lands.

Cooperators must have prior approval of the refuge manager before applying any pesticide, and they must supply the refuge manager at least 3 months before farming with: the common name of the pesticide, the EPA Registration Number, the application rate, the number of applications, method(s) of applications, application period, and target pests. At the time of application, cooperators must complete a pesticide spray record furnished by the refuge. Those records provide the refuge information on trace residues and improve pest control practices.

Under this plan, no refuge units are identified for inclusion in the cooperative farming program. We intend to phase out this program as we work toward full compliance with refuge system policies on biological integrity, diversity, and environmental health. However, as we acquire new lands or as we identify currently owned tracts for restoration, we likely will need to use the cooperative farming program as a strategy toward achieving our habitat restoration goals. As a result, we expect the conversion of cropland to native habitats to be a gradual process that may not be complete within 15 years of this plan's approval.

Monitoring and Enforcing Farmers Home Administration Interests

From the late 1980s to the mid-1990s, the Farmers Home Administration (FmHA) acquired many properties throughout the country through foreclosure sales. Under the terms of a memorandum of understanding between FmHA and the Service, a review team consisting of their staff, our staff, staff from USDA Natural Resources Conservation Service, and staff from USDA Agricultural Stabilization and Conservation Service evaluated those properties for their conservation value. Based on those evaluations, and before reselling the properties, the FmHA placed permanent conservation easements on most of these properties to protect important habitats. FmHA retained full ownership in a smaller number of the properties. The responsibility for monitoring and enforcing those easements and managing the retained properties rests with the Service, which has usually delegated it to the manager of the closest refuge.

Montezuma NWR currently administers a variety of FmHA interests, including lands owned in fee and easements. Several buildings are located on these lands, including an office and shop area. There is also one staff member stationed there. One of these properties is located near oil and gas extraction activities. See section on Monitoring Oil and Gas Development for additional information.

Under this plan, the responsibility for administering these properties will remain with the refuge manager at Montezuma NWR for now. It is difficult to predict how much time and effort administering these interests will require in the future. Currently, most of these properties are visited by refuge staff opportunistically, in response to land owner calls. Refuge staff visit some properties with more active partnerships more often. If we were to begin sustained and systematic monitoring of those easements, rather than only the current opportunistic enforcement, the time commitment would be substantially greater than it has been to date. We do not anticipate having the staff available to monitor all of these interests on a regular basis.

We will implement the following strategies to meet our obligations on FmHA properties:

- Respond to reports of violations or possible violations as we learn of them. Work with landowners and partners to cooperatively resolve and remedy any violations. If necessary, work with the Northeast Region Solicitor's Office or Assistant U.S. Attorney's Office to ensure remediation and future compliance.
- We will continue to maintain existing partnerships and maintain existing staff and infrastructure on these parcels.

Monitoring Oil and Gas Development

As discussed in chapter 2, there are several shale plays in the Northeast. The U.S. Energy Information Administration (EIA) estimates that the Northeast accounts for 63 percent of the technically recoverable shale gas reserves in the U.S. (EIA 2011). EIA (2012) projects that by 2035 almost 50 percent of the natural gas produced in the U.S. will come from shale plays. In comparison, only 23 percent of the natural gas produced in the U.S. came from shale plays in 2010 (EIA 2012).

Because of the ongoing demand for energy, advances in drilling, and substantial estimated oil and gas reserves in the area, we expect interest in oil and gas development in the area surrounding the refuge to increase over the next 5 to 15 years. The Service classifies oil and gas extraction as natural resource extractions, and these activities are governed by several laws, regulations, and policies. Except for Alaska, federally owned oil and gas rights on Refuge System lands are not available for leasing (43 CFR 3101.5-1) except where drainage occurs (43 CFR 3100.2). Drainage is defined as a process where petroleum resources in a geologic formation in land controlled by, in this case the Service, are depleted by the extraction of petroleum from the same formation by an operation located on adjacent land of another owner (43 CFR 3100.2).

In some instances others own oil and gas rights to Refuge System lands. In those cases, the owner of the oil and gas rights has the right to sell, lease, explore for, and remove those minerals subject to the terms by which that interest was acquired or reserved and to the State laws governing protection of the surface and the rights of the surface owner (43 CFR 3100.2). We work closely with these parties when they exercise these rights to minimize disturbance and damage to refuge resources.

At Montezuma NWR, the U.S. Government acquired interests in lands as early as 1937, so status of subsurface rights is not well known for all properties. A report from the U.S. General

Accounting Office (GAO 2003) made several recommendations on how the Service could better manage oil and gas activities on Refuge System lands. We considered those recommendations in developing the strategies listed below.

Strategies:

- Continue to monitor existing oil and gas extraction project near one FmHA easement where drainage is occurring.
- As recommended by a recent report (GAO 2003), review existing deeds and appropriate realty documents to determine subsurface mineral right status on current Montezuma NWR lands. If mineral rights are reserved on refuge lands, consider acquiring them from willing sellers.
- Keep abreast of NYSDEC's development of general regulations on natural gas extraction.
- Request to be involved in the permitting process for any projects proposed within a mile of the refuge lands or interests.
- Coordinate with the Service's NYES office on natural gas extraction issues that may affect refuge.
- Collect and use baseline data on water quality and refuge resources to assist in determining potential effects of resource extraction if needed.

Developing Refuge Step-down Plans

Service planning policy identifies 25 step-down plans that may be applicable on any given refuge. We have identified several additional plans below as the most relevant to this planning process for the refuge, and we have prioritized their completion. Several are ongoing as part of the refuge CCP, but others will be completed under this plan and the associated level of funding and staffing will be provided to complete them.

We describe the most relevant step-down plans in more detail below. To keep them relevant we will modify and update them as we obtain new information. The completion of these plans supports all refuge goals.

The following step-down plans have been prepared for the refuge:

- Annual Habitat Work Plan (AHWP), completed annually.
- Chronic Wasting Disease Surveillance and Contingency Plan, completed in 2005.
- Avian Influenza Surveillance and Contingency Plan, completed in 2007.
- Habitat Management Plan, completed in 2008.
- Fire Management Environmental Assessment (see appendix H).

The following step-down management plans are scheduled to be completed for the refuge after completion of the CCP:

- Inventory and Monitoring Plan, within 2 years of CCP approval.
- Safety Management Plan, updated within 1 year of CCP approval (completed in 2005).
- Visitor Services Management Plan, within 1 year of CCP approval.
- Law Enforcement Management Plan, within 5 years of CCP approval.

- Cultural Resources Management Plan, within 5 years of CCP approval.
- Integrated Pest Management Plan, within 5 years of CCP approval.

Habitat Management Plan

A HMP is a dynamic working document that provides refuge managers with a decision-making process, guidance for the management of refuge habitat, and consistency for habitat management on refuge lands. Each plan incorporates the role of refuge habitat in international, national, regional, tribal, state, ecosystem, and refuge goals and objectives; guides analysis of specific habitat management strategies to achieve habitat goals and objectives; and utilizes key data, scientific literature, expert opinion, and staff expertise. Specifically, the HMP defines management areas and treatment units, identifies the type or method of treatment, establishes the timing for management actions, and defines how we will measure success over the next 15 years. We used the biological goals in the HMP as a guide for developing the CCP goals. Additionally, many of the HMP objectives and strategies were used in the CCP. After a public comment and review period, the refuge finalized the HMP in 2008 (USFWS 2008b).

Annual Habitat Work Plan

The AHWP is an essential component of an adaptive management approach. Each year, we generate an AHWP that outlines specific management activities for that year. It details incremental tasks in support of goals and objectives and identifies habitat management strategies outlined in the CCP and HMP to be completed within the plan year. Typically, AHWPs evaluate progress toward achieving the habitat objective(s) from the present management strategies and prescriptions and provide an analysis of results. They also evaluate the response of the resources of concern as well as nontarget resources to the habitat management strategies and prescriptions. They provide an analysis of monitoring results identifying the positive and negative impacts of each prescribed strategy. The refuge uses this information to help select the management strategies with the most positive effect on refuge resources as a whole.

Inventory and Monitoring Plan

The IMP for the refuge is a priority for completion upon CCP approval and is vital for measuring our success in meeting the objectives. The IMP will outline methods to assess whether our original assumptions and proposed management actions support our habitat and species objectives. The IMP may also be used to monitor the potential effects of global climate change on refuge habitats and wildlife populations or to support landscape level monitoring. We will continue modifying existing protocols, adding new ones, and dropping old ones as necessary to inform adaptive management decisions and to address changing management priorities. As with all of our activities, the degree to which we can conduct monitoring and inventories depends on the availability of resources, including refuge funding and staff, and the contributions of partners and volunteers. Our IMP will also establish priorities for our inventory and monitoring efforts. The results of inventories and monitoring will provide us with more information on the status of our natural resources and allow us to make more informed management decisions.

Visitor Services Plan

Every national wildlife refuge is required to complete a visitor services step-down plan which will help focus visitor services efforts. It is a priority for completion upon CCP approval. Visitor

services plans encompass all aspects of visitor services on the refuge, including wildlife observation and photography, environmental interpretation, environmental education, hunting, fishing, outreach, and signage. The visitor services plan will identify themed messages and topics that will apply to all environmental education and interpretation programming. The plan will also identify strategies, and establish evaluation criteria for all visitor services. Careful planning will provide the visiting public with opportunities to enjoy and appreciate fish, wildlife, plants, and other refuge resources. As a result, the visiting public will develop an understanding and will build an appreciation of each individual's role in the environment today and into the future.

Distributing Refuge Revenue Sharing Payments

As described in chapter 3, we have provided funding in the form of shared revenues to the towns of Tyre, Seneca Falls, Clyde, Galen, Savannah, and Montezuma. Those annual payments are calculated by formula determined by, and with funds appropriated by, Congress. Under this plan we will continue or discontinue those payments in accordance with the law, commensurate with changes in the appraised market value of refuge lands, or new appropriation levels dictated by Congress.

Additional NEPA Analysis

For all major Federal actions, NEPA requires site-specific analysis and disclosure of their impacts, either in a categorical exclusion, EA, or EIS. Generally, those include the administrative actions listed in chapter 4. Most of the major actions in this CCP were fully analyzed in the draft CCP/EA and are described in enough detail to comply with NEPA, and will not require additional environmental analysis. Although this list is not all-inclusive, the following projects fall into that category:

- Inventory and Monitoring Plan.
- Controlling invasive plants.
- Implementing a predator or pest management program.
- Opening the Wildlife Drive to limited bicycle and pedestrian use.
- Construction of small kiosks, signs, photography blinds, and other small-scale visitor facilities.
- Enhancing our offsite priority public use program.

Refuge Goals, Objectives, and Strategies

Habitat Management

Emergent marsh management will remain the focus on the refuge, but we will take a more active approach to habitat restoration compared to the current management. We will focus efforts on improving existing emergent wetland habitat and restoring additional acres. The primary target for restoration will be formerly farmed mucklands; however, we will evaluate restoration projects to determine the most appropriate habitat to target for restoration based on soils, vegetation, surrounding habitats, and landscape scale needs. Therefore, we will restore grasslands, shrublands, and wetland and riparian forests where appropriate. More upland forest will be promoted through succession or planting native species. Additionally, grassland management will focus on creating larger patches with less edge, resulting in fewer grassland

units overall, but with higher quality habitat in the remaining units for focal species. Map 4.1 shows the target habitats under this plan, and table 4.5 shows current and projected acreages.

Inventories and Monitoring

We will develop an IMP for the refuge that will include flexibility to modify, add, or remove protocols as needed to address changing information, priorities, and needs. In addition to continuing wildlife and plant surveys, the refuge will:

- Map and monitor additional invasive species populations and control efforts.
- Monitor vegetation in refuge impoundments per the Integrated Waterbird Monitoring and Management Program.
- Map the bathymetry of all the refuge impoundments that have not previously been mapped.
- Conduct breeding bird surveys in additional forested habitats.
- Monitor general habitat conditions in reforestation areas.
- Monitor vegetative response to management actions in refuge scrub/shrub habitats.
- Conduct American woodcock singing ground surveys on refuge.
- Monitor vegetative response to management actions in refuge grasslands.
- Map vernal pools.
- Conduct a reptile and amphibian inventory.
- Conduct small mammal surveys to assess species and population status.
- Work with the NYSDEC to ensure that the closest existing American woodcock singing ground survey routes are completed each year in support of the national survey coordinated by the Division of Migratory Birds.

Visitor Services

Under this plan, opportunities for visitors to participate in priority public uses will increase. Added trails, viewing areas, and photography blinds will support additional opportunities for wildlife observation and photography (see map 4.2). In addition, the refuge will develop a formal, curriculum-based environmental education program. Environmental interpretation will be enhanced through construction of a new visitor contact station, updated interpretive displays, and associated services (e.g., more guided programs and lectures, additional roving naturalists, etc.). Hunting opportunities will be increased and enhanced (e.g., the refuge will be opened to new goose hunts and turkey hunting, and will provide more accessible sites; see maps 4.3, 4.4, and 4.5). Fishing opportunities will be increased by providing additional access to canal waters for anglers. Dog walking will be restricted to the refuge's headquarters area and Seneca Trail.

With expanded opportunities under this plan, we anticipate an increase in visitation. Table 4.3 shows estimated visitation growth for the next 15 years.

Table 4.3. Current and Future Estimated Visitation for Montezuma NWR.

PRIORITY PUBLIC USE	CURRENT ESTIMATE	PROPOSED 15-YEAR GOAL
Visitor Contact Station Visits		
Visitor Contact Station Visits	16,938	25,410
Wildlife Observation and Photography		
Wildlife Observation	63,000	94,000
Wildlife Photography	60,404	91,110
Environmental Interpretation		
Self-Guided Uses (Interpretive panels, Guide by Cell, refuge brochures)	Numbers currently captured in Observation and Photography and visitor contact station Visits counts	105,260 *(noted as a subset of Wildlife Observation and Photography and Visitor contact station Visits count, so that 50 percent of those visitors also participate in self-guided environmental interpretation; not double counted in total)*
Guided Interpretive Programs (talks, tours)	702	1,050
Special Events		
Special Events	1,040	2,000
Hunting		
Waterfowl Hunting	355	1,000[1]
White-tailed Deer Hunting	1,897	2,500
Turkey Hunting	N/A	300
Fishing		
Fishing	3,937	4,570
Environmental Education		
Self-Guided Environmental Education	818	1,000
Staff-Guided Environmental Education	N/A	300
Partner-Guided Environmental Education	N/A	700
Total Refuge Visitation and Participation	**149,091**	**223,940**

[1] This number includes projected hunters participating in Canada and snow goose hunts.

Refuge Administration

In 2008, the Service approved a national staffing model which identifies the number of staff needed at each refuge or refuge complex throughout the country. The goal of this model was to quantify staffing and law enforcement resource needs. The model indicated that Montezuma NWR should have 14 permanent positions, including two law enforcement positions. Under this plan, we will increase the staff from the current eight permanent positions to 14 permanent positions by adding the following six positions: facilities manager, maintenance worker, wildlife

biologist, two law enforcement park rangers, and a student trainee (biology) (see appendix C for the proposed staffing chart).

Under this plan, we will also collocate the refuge staff and staff from the Service's NYES office on the refuge. New facilities will be needed to accommodate collocation, the increase in staff, and expanded visitor services opportunities. To meet these needs, we propose the following: 1) construct a new administrative building that will accommodate the NYES staff and refuge staff, and construct a stand-alone visitor contact station or expand the current visitor contact station; or 2) construct a combined administrative and visitor facility to accommodate staff and visitor service needs. This combined facility could be one or two stories, depending on site selection. The proposed facilities will provide adequate office space, as well as provide additional space for an enhanced visitor center and shop and storage space for heavy equipment (see objective 4.2 for proposed criteria and appendix J for standard conceptual design plans).

Objectives and Strategies to Meet Refuge Goals

Goal 1: Provide, enhance, and restore where possible, freshwater emergent marsh, open water wetland, and mudflat habitats to benefit native wildlife and plant communities, particularly migrating waterfowl, shorebirds, and breeding marshbirds.

Discussion

The continued existence and management of the NYS Canal System is to maintain an artificially low water table, giving rise to the need to create and manage impoundments to provide freshwater emergent marsh, open water wetland, and mudflat habitats.

Strategies

Strategies that apply to all objectives under this goal include (see USFWS 2008a for additional details and maps):

- Restore up to 188 acres of emergent marsh, open water wetland, and mudflat habitat.
- Manage furbearers in marshes to minimize muskrat damage to dikes and to maintain water level management capabilities.
- Map the bathymetry of each impoundment not previously mapped to correlate water gage readings with actual water depths.
- Enhance at least 75 additional acres of the Dry Marsh (53 more acres than current management).
- Consider creating openings in other cattail monocultures (using Dry Marsh techniques).
- Compared to the refuge's current management, restore 132 additional acres of emergent marsh, open water wetland, and mudflat habitats.
- Work with the NYS Canal Corporation to learn when water levels will be altered to allow for more efficient management of refuge impoundments.
- Explore the feasibility of restoring hydrologic connectivity at Knox-Marsellus Marsh, Puddler Marsh, and the Stowell Property by connecting directly to the canal system.
- Explore the feasibility of improving connectivity of the Knox-Marsellus Marsh to the grassland habitat on its western edge.

Monitoring Elements

- Continue to maintain records of proposed and actual water levels for each impoundment at least two times per month.

Objective 1.1 Emergent (Hemi) Marsh – Migrating Waterfowl (Dabbling Ducks, especially Pintail and American Black Duck)

Over the life of the plan, annually provide a minimum of 2,000 acres of spring (March through April) and fall (September through November) waterfowl migration and staging habitat consisting of shallow flooded wetlands (less than 12 inches deep) with a target of at least 25 percent cover of annual and 25 percent cover of perennial vegetation dominated by native species with high waterfowl food value.

Rationale

The refuge is one of the most important migratory stopover sites for waterfowl in the Northeast. Each year more than 700,000 waterfowl pass through the MWC, including over 500,000 Canada geese, 15,000 snow geese (*Chen caerulescens*), 100,000 mallards, and 25,000 black ducks (*Anas rubripes*) (Burger and Liner 2005). This objective will benefit waterfowl during spring and fall migration, especially dabbling ducks, including several species listed as priorities in the BCR 13 Plan (ACJV 2007) and the New York State CWCS (NYSDEC 2005a), such as American black duck, mallard, northern pintail, and wood duck.

Waterfowl require large amounts of carbohydrate-rich foods to aid them in their fall migration to wintering grounds. In addition, they need large amounts of energy to sustain them as cooler temperatures drain their energy reserves. Seed production in moist-soil units as a result of wetland drawdowns provides a readily available source of carbohydrates. These drawdowns are conducted in the spring to ensure the greatest amount of annual vegetation and highest species diversity will result. Typically, annual species need a minimum of a 60-day growing period to produce seeds. In advance of fall migration, wetlands that have been drawn down are reflooded in preparation for the arrival of waterfowl. Ideally, water levels are kept to 12 inches or less as this depth has been found to provide the best foraging habitat for most dabbling duck species. Dabbling ducks will forage on these areas until they continue their fall migration or until ice conditions force them to move to open water elsewhere.

Spring migrant waterfowl require large amounts of protein-rich foods to prepare them for the remainder of their northward migration. Invertebrate populations thrive on the residual annual vegetation resulting from the previous year's drawdown, and they emerge as soon as temperatures rise sufficiently to melt the ice. Additionally, this protein-rich diet is supplemented by carbohydrate-rich seeds produced by annual plants during previous years which are still available the following spring to northward migrating waterfowl.

Under this plan, of the total 4,444 current acres of marsh habitat, we will manage a minimum of 2,000 acres to provide emergent marsh habitat for migrating waterfowl. This is 500 more acres than the current management. As more resources become available for management (e.g., increased staff), the acreage of high quality emergent marsh habitat will increase. We will continue to provide this habitat, primarily to support migrating dabbling ducks, like the

American black duck. Under this plan, we will expand restoration efforts to increase the amount of suitable habitat for priority species.

The canal system is the source of much of the water that we use to manage impoundments. Therefore, we plan to work with the NYS Canal Corporation to gain a better understanding of the water level regime in the canal system, so that we can better plan our impoundment flooding and draining events.

Strategies

Strategies are the same as those listed under goal 1.

Monitoring Elements

- Maintain records of proposed and actual water levels for each impoundment at least two times per month.
- Conduct waterfowl surveys during spring and fall migration to determine bird response to management.
- Annually monitor the response of moist-soil vegetation.
- Continue to monitor purple loosestrife response to bio control.
- Support the Division of Migratory Birds by banding ducks as needed.
- Monitor and control carp, if necessary, in impoundments.
- Monitor the impacts of nonnative herbivores, such as resident population Canada geese and mute swans, on emergent marsh vegetation and control populations if necessary to protect habitat.

Objective 1.2 Emergent Marsh – Breeding Marshbirds

Over the life of the plan, annually provide a minimum of 2,000 acres of habitat for breeding marshbirds consisting of 50 percent well-interspersed emergent vegetation and 50 percent open water, stable water levels throughout the breeding season, and abundant nest substrates.

Rationale

Similar to the rationale described under objective 1.1, we will expand marsh restoration efforts to benefit breeding marshbirds, several of which are declining regionally.

The American bittern, black tern, pied-billed grebe, and least bittern are listed as priorities in the BCR 13 Plan (ACJV 2007) and are species of greatest conservation concern in the New York State CWCS (NYSDEC 2005a). The black tern is listed as endangered and pied-billed grebe and least bittern are listed as threatened in New York. The abundance of these three breeding species was included as an important criterion in designating the MWC as an Important Bird Area in New York.

Pied-billed grebes, least bitterns, and black terns generally nest in vegetation over deeper water (greater than 12 inches) adjacent to or near open water for foraging. Large patches of open water also provide habitat for a variety of diving ducks such as canvasback, greater scaup (*Aythya marila*), and lesser scaup (*Aythya affinis*), also listed as priorities in the BCR 13 Plan and the New York State CWCS. Large wetlands with substantial amounts of open water also provide

ideal roosting areas for migrating Canada geese. Geese on the refuge include birds from the Atlantic and Southern James Bay populations, which are ranked highest priority in the BCR 13 Plan. Other bird species, including bald eagle and osprey, also utilize open waters on the refuge, predominantly as foraging areas during the ice-free months.

Conversely, species such as American bittern and Virginia rail are usually associated with shallower water areas supporting a slightly more robust vegetation component with less open water. These species stand in water to forage, thus restricting them to areas where water levels are less than 4 inches deep. These habitats are generally found on the edges of the deeper areas described above.

Strategies

In addition to the strategies listed under goal 1 and objective 1.1, we will:

- Enhance up to 32 acres of the Dry Marsh.
- Restore up to 188 acres of emergent marsh, open water wetland, and mudflat habitat.
- Manage furbearers in marshes to minimize muskrat damage to dikes and to maintain water level management capabilities.
- Gradually draw down impoundments in the spring, to encourage vegetative growth on an as needed basis.
- Create openings or hemi-marsh conditions, where needed.
- Postpone summer drawdowns until after marshbirds have fledged if they are breeding in an impoundment.
- Provide tern nesting platforms when needed.
- Drain impoundments in the spring on a rotation with a long enough interval between drawdowns to provide open water habitat.
- Manage furbearers in marshes to provide an appropriate mix of vegetation and open water and to ensure adequate muskrat houses for marshbird nest sites.
- Provide 500 additional acres of habitat for breeding marshbirds.

Monitoring Elements

In addition to the monitoring elements listed under goal 1 and objective 1.1, we will continue to:

- Maintain records of proposed and actual water levels for each impoundment at least two times per month.
- Annually monitor moist-soil vegetation response.
- Conduct breeding marshbird callback surveys to determine bird response to management.
- Conduct black tern nesting colony surveys annually.

Objective 1.3 Shallow Water Mudflats – Migrating Shorebirds

Over the life of the plan, provide a minimum of 100 acres of shallow water wetlands (less than 4 inches deep) and mudflats with sparse (less than 15 percent) vegetation from April through November to benefit migrating shorebirds.

Rationale

Inland shorebirds utilize shallow water mudflats on the refuge during migration. Under this plan, our management efforts will continue to support this group of birds, many of which are declining across the region. We will work to increase the suitability and availability of this habitat, potentially allowing a greater number of shorebirds to utilize the refuge.

Most shorebirds using the Great Lakes region are long-distance migrants that require stopover sites to replenish their fat reserves and meet the high energy demands of migration. These staging areas require shallow water and/or mudflat habitats with sparse vegetation, undisturbed roosting areas, and abundant invertebrate food resources. In this region, these conditions can occur in various habitats including natural and managed wetlands, lakeshore, sand and gravel bars, reservoirs, and flooded agricultural fields.

Variable climatic conditions common to inland areas make natural or unmanaged shorebird habitat unpredictable compared to coastal regions. Precipitation and hydrology patterns are highly variable from year to year and in different locations. In addition, loss of wetlands because of urban development, hydrological disturbance, and agriculture has reduced the amount of habitat in the region. With the ability to manage water levels, despite these unpredictable conditions, the refuge can contribute significantly to providing habitat for migrating shorebirds.

Fifteen shorebird species that are of conservation concern in the Upper Mississippi Valley/Great Lakes Shorebird Plan pass through the refuge each year. The populations of these species are known or believed to be small or declining, and they are experiencing other known or potential threats (de Szalay et al. 2000). Because the refuge supports a variety of migrating shorebirds and the southbound migration is protracted with adults leaving their breeding grounds first followed later by juveniles, ideal habitat needs to be provided for almost 8 months per year. With the ability to manage water levels, the refuge can contribute to providing mudflats and shallow water through this entire timeframe.

Strategies

In addition to the strategies listed under goal 1, we will:

- Flood units for at least 30 days prior to ice up.
- Flood units for at least 30 days prior to usual shorebird arrival date.
- Not keep impoundments flooded for more than 4 continuous months prior to shorebird migration.
- Improve habitat quality by grading approximately 8 acres.
- Assess the feasibility of restoring additional shorebird habitat.
- Conduct gradual spring drawdowns to expose mudflats during the spring shorebird migration.
- Maintain high water until mid-summer to stunt vegetative growth, then slowly draw down the impoundment to expose mudflats in time for fall migration.
- Stagger the drawdown schedule of different impoundments through the spring and fall migrations, to expose mudflats through the entire migration periods.
- Shallowly disk dry vegetated units in summer prior to flooding.

- Control invasive plants prior to disking units.

Monitoring Elements

In addition to the monitoring elements listed under goal 1, we will:

- Annually monitor habitat conditions in response to management.
- Conduct shorebird surveys during spring and fall migration to determine response to management.

Goal 2: Restore and maintain forested wetlands, riparian forests along the Seneca and Clyde Rivers, and upland forests to benefit priority native species, including songbirds, bats, and important plant communities.

Discussion

Under this plan the refuge will increase efforts to reduce fragmentation of forested habitats. It also aims to increase efforts to reduce the negative impacts caused by overabundant deer. Although deer are native and provide many benefits, they can cause damage to forests at high densities due to their browsing habits (Rawinski 2008). It is particularly important to maintain appropriate numbers of deer in reforestation areas, as high numbers of this species can seriously impact reforestation efforts by browsing on naturally occurring and planted seedlings and saplings. The refuge is currently working with the U.S. Forest Service to study the effects of deer on forested habitats and with the NYSDEC to estimate the density of deer in the vicinity of the refuge. Under this plan, the refuge will work with the NYSDEC to maintain the herd within carrying capacity. The NYSDEC Deer Management Assistance Program (DMAP) is one such tool available to eligible landowners and managers. DMAP permits, issued by NYSDEC, enable the taking of additional antlerless deer, a strategy which has been shown to be an important component of a deer management program by controlling targeted populations. Further details about this program can be obtained at NYSDEC's Web site: *http://www.dec.ny.gov/animals/33973.html*.

Strategies

The following strategies apply to all objectives under this goal:

- Plant only tree species for which the refuge is in the middle or northern edge of their range to mitigate the impacts of climate change.
- Promote the reforestation of artificial forest openings, areas surrounding forest peninsulas, gaps between isolated forest tracks, and riparian corridors to create more forest interior for area-sensitive species.
- Rely on natural tree fall gaps within mature forests to create a multilayered forest structure with dead and down woody debris.
- Implement recovery efforts, in cooperation with the Service's New York Ecological Services (NYES) office and the NYSDEC, for the Indiana bat and other bat species occurring on the refuge.

- Rely on natural tree fall gaps within mature forests to increase sun exposure for potential roost trees for bats.
- Reduce the impact of deer herbivory by working with the NYSDEC DMAP.
- Within 5 years of plan approval, work with partners to determine the need for bat houses on the refuge and install where appropriate if deemed worthwhile.
- Plant other species of native trees adjacent to ash trees in existing forest units to mitigate the impacts of the emerald ash borer (*Agrilus planipennis*).
- Evaluate options for forest management in light of new invasive species such as the emerald ash borer and the Asian longhorned beetle (*Anoplophora glabripennis*).

Monitoring Elements

The following monitoring elements apply to all objectives under this goal:

- Conduct forest health assessments including number of snags and cavities to determine if silvicultural prescriptions are needed.
- Monitor tree survival in reforestation areas.
- Monitor deer herbivory impacts.
- Monitor for the presence of the emerald ash borer.
- Conduct acoustic bat surveys.
- Monitor deer populations.
- Monitor general habitat conditions in reforestation areas.
- Identify and map vernal pools.
- Inventory reptiles and amphibians.
- Conduct breeding bird surveys in forested tracts in addition to Unit 17 and the Main Pool Forest.

Objective 2.1 Forested Wetlands – Cerulean Warbler, Wood Thrush, Wood Duck, Bats

Over the life of the plan, maintain and restore, as necessary, a minimum of 1,941 acres of mature forested wetlands and areas converting to mature bottomland floodplain forest dominated by native species to provide foraging and breeding habitat for migratory songbirds, cavity nesting waterfowl, amphibians, and bats.

Rationale

Under this plan we propose to improve the habitat quality of Unit 17 (on the southern end of the refuge, see map 3.5), the largest forested wetland tract on the refuge, possibly by breaching or removing parts of the surrounding dike system. This impounded forest is likely to benefit from a more natural hydrological regime that allows the soils to dry more frequently and for longer periods than is currently occurring. The feasibility of this approach will be examined.

The species composition within all the forested wetland tracts on the refuge is poised to be highly altered by the approaching emerald ash borer, a nonnative invasive insect that causes 100 percent mortality in ash trees. Green ash is codominant with red and silver maple in refuge bottomland floodplain forests. Black ash also is common in these areas. The refuge will plant other native tree species in the affected units to mitigate this loss (USDA 2010).

Strategies

In addition to the strategies listed under goal 2, within 5 years we will:

- Allow approximately 30 acres of existing shrublands to naturally convert to bottomland floodplain forest.
- Stop flooding the interior of Unit 17 East and Unit 17 West during the growing season.
- Keep the ditches surrounding Unit 17 East and Unit 17 West flooded.
- Rely on natural tree cavities for nest sites for wood ducks and other cavity nesters.
- Evaluate which newly acquired mucklands could be restored to bottomland hardwood forest.
- Control invasive plants and plant native trees and shrubs to reforest the mowed-grass dike separating Unit 17 East and Unit 17 West.
- Reduce the impact of deer herbivory on forested habitats by working with DMAP to obtain additional antlerless deer tags and then possibly requiring hunters to take an antlerless deer prior to an antlered deer.

In addition to the strategies listed above, within 10 years we will:

- Study the feasibility of draining and reforesting North and South Spring Pools.
- Study the desirability of breaching the dikes in Unit 17 and do it if it will improve habitat conditions or minimize needed management.
- Allow succession to occur or plant native trees to restore an additional 227 acres of floodplain forest, compared to the current management.

Monitoring Elements

Same as those listed under goal 2.

Objective 2.2 Riparian Forest Corridor – Cerulean Warbler, Bald Eagle, Bats

Over the life of the plan, maintain and restore, as necessary, up to 1,197 acres of riparian forest corridor (at least 490 feet wide) along the Seneca and Clyde Rivers. These areas will be dominated by native species to achieve connectivity of forested habitats, to protect the water quality of the rivers, and to provide foraging and breeding habitat for migratory songbirds, cavity nesting waterfowl, bald eagles, amphibians, and bats.

Rationale

Under this plan the refuge will increase efforts to reduce fragmentation of this habitat and will protect and restore additional acres to benefit species that use this habitat.

Although riparian habitats generally occupy small areas on the landscape, they are often more diverse and have more plants and animals than adjacent upland areas. Riparian areas help control nonpoint source pollution by holding and using nutrients and reducing sedimentation, supply food, cover, and water for many species, and serve as migration routes and stopping points between habitats for a variety of wildlife. Riparian vegetation shades streams to optimize light and temperature conditions for aquatic plants, fish, and other animals.

Water levels within the NYS Canal System are the result of timed water releases managed by the NYS Canal Corporation. Despite these hydrological alterations and numerous habitat disturbances resulting from the NYS Canal System, the New York Natural Heritage Program designated the Seneca River Montezuma Floodplain Forest a significant natural community. This forest extends 12 miles from the Howland's Island Unit of Northern Montezuma Wildlife Management Area south through the refuge to the north end of Cayuga Lake. This floodplain forest is considered significant mainly due to its extensive range. Patches in the refuge occur between the Clyde River and Erie Canal, and along the Seneca River. Despite being discontinuous, this floodplain forest remains one of the largest examples of floodplain forests in the State.

Refuge staff is currently working to reforest areas along the Clyde and Seneca Rivers. Increased connectivity between forested tracts will benefit a host of species, particularly those that prefer forest interiors. This objective could benefit the wood turtle, a species of greatest conservation need in New York that relies on healthy riparian habitats. It will also benefit the bald eagle, a threatened species in the State that breeds in trees and artificial structures adjacent to waterways where they forage for fish.

Strategies

In addition to the strategies listed under goal 2, we will:

- Restore approximately 44 acres of riparian forest, including the Seneca Trail area, by planting native tree and shrub saplings and seedlings and by direct seeding of native plants, including woody and herbaceous species.
- Rely on natural tree cavities for nest sites for wood ducks and other cavity nesters.
- Limit visitor access near bald eagle nests during the nesting season to minimize disturbance.
- Restore and maintain at least 120 additional acres of riparian forest compared to the current management.
- Control reed canary grass and plant native species to promote succession along riparian corridors.

Monitoring Elements

All of the monitoring elements that apply to this objective are listed under goal 2.

Objective 2.3 Mature Upland Forest – Cerulean Warbler, Wood Thrush, Bats

Over the life of the plan, promote the succession of native upland plant communities to mature forest on at least 507 acres to benefit migratory breeding birds including wood thrush and cerulean warbler.

Rationale

Although mature upland forest comprises a small component of the refuge (given the refuge's low-lying characteristics), it is nonetheless important to several priority species. Under this plan we will choose tracts to maintain as forest or to reforest based on their proximity to other forested tracts (e.g., forested wetlands and forests in other ownership) to reduce fragmentation of the landscape, provide travel corridors, and benefit interior, forest-dwelling species.

Strategies

Strategies will be the same as those listed under goal 2, except we will:

- Use a combination of natural succession and active restoration to increase mature upland forest on the refuge by 264 acres compared to current habitats.
- Maintain approximately 28 acres as shrubland rather than allowing them to convert to upland forest because these areas are adjacent to croplands and early successional habitat.

Monitoring Elements

In addition to the elements listed under goal 2, we will:

- Monitor vegetation for negative impacts caused by excessive deer herbivory.

Goal 3: Manage grassland and shrubland habitats primarily to benefit bird species of conservation concern.

Objective 3.1 Shrublands – Shrubland Birds and Migrating Songbirds

Over the life of the plan, provide a minimum of 396 acres of shrubland habitat dominated by native species consisting of an equal mix of shrubs and herbaceous vegetation with or without scattered trees to provide breeding habitat for shrubland-dependent birds, and to provide food sources for migrating songbirds.

Rationale

The refuge will focus shrubland habitat management on units where this early successional habitat type does not cause increased fragmentation of the landscape. Shrubland units that are currently surrounded by forest will be reforested (e.g., the Esker Thicket). Units with a lot of edge due to surrounding land uses will be maintained as shrublands. Maintaining some shrubland habitat will benefit species that depend on this habitat type. However, as described in chapter 1, much of the landscape around Montezuma NWR was once late successional forest. Currently this area is dominated by agricultural lands interspersed with wetlands and forest fragments. Consolidating shrubland habitat and reforesting shrubland patches within or adjacent to existing forested areas will decrease habitat fragmentation in forested areas of the refuge, while still maintaining foraging habitat for migrating songbirds and supporting shrubland-dependent species.

A range of habitat types are included under shrubland habitat ranging from brushy old field conditions to regenerating forests to more naturally maintained, relatively stable shrublands associated with wetlands. Refuge shrublands support the following high priority bird species in the BCR 13 Plan: blue-winged warbler, American woodcock, brown thrasher, and field sparrow. Managing small areas (less than 20 acres) of shrubland habitat can be effective for many shrubland-dependent birds. A habitat generalist, the blue-winged warbler uses a variety of successional habitats, including woodland clearings, forest edges, and old fields (Dunn and Garrett 1997).

Breeding brown thrashers prefer dense woody vegetation associated with shrub thickets, hedgerows, forest edges, or mid-successional forests (Cade 1986). Field sparrows prefer woody edges and dry to slightly mesic, moderately tall grasslands with moderately abundant litter and a shrub component. Optimal habitat characteristics includes areas greater than 5 acres containing dense, moderately tall grass, low to moderate shrub density with 50 to 75 percent of shrubs less than 5 feet tall, and shrub cover between 15 to 35 percent (Sousa 1983).

Typically, shrublands represent a successional stage that is transforming to forest. Without active management, larger trees will begin to dominate, and forest with a more open understory will develop. For shrubland to be maintained, succession needs to be "set back," by mechanical or chemical means. By staggering treatments of shrublands between units, the refuge will provide a mosaic of this habitat in different stages of succession, increasing spatial heterogeneity and providing a range of microhabitats that can be utilized by a diversity of species. Even smaller patches of shrub habitat can be valuable since shrub dependent birds are not typically sensitive to habitat patch size and many will use small patches of shrub habitat (Watts 2000).

Actual amount if shrubland habitat on the refuge will likely be greater than the 396 acres we intend to actively manage. Patches of early successional habitat already exist and will continue to be present within existing forests. These canopy gaps have not been mapped or included in the target acreage for shrublands. Some of these open areas resulted from natural disturbance (e.g., beaver activity), some are human-related (e.g., maintenance of a powerline right of way). Indeed, the following species of conservation concern that use early successional habitats were detected during breeding bird surveys in two forested units on the refuge (Unit 17 and the Main Pool Forest Unit) from 2007 to 2011: American woodcock, Baltimore oriole, northern flicker, song sparrow, and willow flycatcher. Unfortunately, we are poised to lose great chunks of our forest canopy over the course of the next 15 years as a result of the emerald ash borer. The U.S. Forest Service identified white ash as a dominant tree in four of the ten forest stands surveyed on the refuge for a Forest Health Assessment in 2010. The legacy of the emerald ash borer will be to create significant gaps in the forest canopy leading to considerable patches of early successional habitat within forested habitats not only on the refuge but statewide. In New York State, there are approximately 900 million ash trees, and 10 percent of the trees in New York's hardwood forests are ash. As these trees die, forest gaps and early successional habitats will increase throughout the state. These should benefit not only species that require early successional habitats but also the postbreeding success of forest interior species. The management challenge will be to promote native vegetation in these areas so they do not become dominated by nonnative, invasive species.

Strategies

To accomplish objective 3.1, we will:

- Brush hog every 5 years.
- Use selective herbicide application to maintain shrubland habitats with vegetative cover that has about equal abundance of herbs and patches of shrubs.
- Within 5 years of CCP approval consolidate shrubland habitat by converting approximately 57 acres of grasslands to shrublands by planting native shrubs.
- Use prescribed fire to maintain shrubland habitats.

Monitoring Elements

To accomplish objective 3.1, we will:

- Conduct American woodcock singing ground surveys.
- Conduct breeding bird and vegetation surveys in refuge shrublands.

Objective 3.2 Grasslands – Grassland Dependent Birds, especially short-eared owl and bobolink

Over the life of the plan, continue to maintain a minimum of 287 acres of grassland habitat in patches greater than 50 acres primarily for grassland obligate nesting birds and wintering raptors (especially short-eared owl).

Rationale

Under this plan grasslands will be reduced in acreage. The units that will no longer be managed for grassland habitat are poor quality and have not had many grassland obligate species using them. During breeding bird surveys from 2008 through 2010, the only grassland obligate breeding birds detected were two savannah sparrows and one bobolink in 2009, one savannah sparrow in 2008, and one savannah sparrow in 2010 (USFWS undated). Because grassland habitat takes more resources to maintain and larger patches of grassland habitat are more valuable to wildlife than smaller patches, we will focus habitat management on larger, higher quality patches of grassland habitat. Smaller patches will be enhanced to become shrubland or mature forest, depending on site characteristics.

One of the primary goals of the grassland management program is to manage larger units adjacent to or surrounded by open habitats as grasslands, thereby reducing habitat fragmentation. Fragmented natural communities are subjected to high rates of invasion by nonnative and invasive species, changes in microclimate, and other factors that result in further degradation (Lindenmayer and Fischer 2006). These consequences of fragmentation can be classified as "edge effects." Though beneficial to some species, pronounced edges can be detrimental to others, and the intensity and severity of edge effects tend to be inversely related to the ratio of the area compared to its perimeter or "edge" (Soule 1986). This means that smaller habitat fragments have proportionally more edges.
Populations of grassland birds are declining as their habitats are converted to agricultural, residential, and other urban uses. Norment (2002) identifies a need to approach grassland bird conservation in the Northeast with, "particular wisdom and care." He notes that despite the relatively recent (last 200 years) rise and fall of grassland habitats and associated birds in the Northeast, the region may still be important for these species given their continental decline and habitat loss in the core of their ranges in the Midwest.

Refuge grasslands provide breeding habitat for songbirds and wintering habitat for raptors. The short-eared owl depends on grasslands in winter for foraging and roosting and is endangered in New York State, a species of medium concern in BCR 13, and included in the Service's Region 5 and national lists of birds of conservation concern. The northern harrier is threatened in New York State and is a species of medium concern in BCR 13; this bird not only forages over grasslands in winter but also relies on grasslands (and emergent marsh) for breeding.

Based on Statewide land cover data and the relative abundance of breeding grassland birds relative to other parts of the State, the refuge was identified as a grassland focus area by Audubon New York (Morgan and Burger 2008). They went on to prioritize the following "focus area target species:" vesper sparrow, grasshopper sparrow, horned lark, savannah sparrow, and wintering short-eared owl. Savannah sparrows are common on the refuge, not listed in other conservation plans, and not addressed in this plan but will benefit from habitat management actions that benefit other grassland obligate breeding birds. Horned larks breed in drained impoundments and are not addressed in this CCP.

Refuge grasslands have the potential to support a number of grassland obligate nesting birds of conservation concern including bobolink and Eastern meadowlark, both medium priority species in the BCR 13 Plan (ACJV 2007) and listed in the New York State CWCS (NYSDEC 2005a); sedge wren, a threatened species in New York, and vesper sparrow, a species of special concern in the State. Table 4.4 shows habitat requirements of grassland obligate nesting birds that are likely to breed on the refuge (Morgan and Burger 2008).

Table 4.4. Habitat Requirements of Grassland Obligate Breeding Birds of Conservation Concern Likely to Breed on the Refuge.

Species	Field Size	Shrub Tolerance	Forb Component	Litter Depth	Vegetation Height
Northern harrier	≥ 75 acres	1 to 5 percent cover	10 percent cover	No preference	≥ 23.5 inches
Bobolink	≥ 25 acres	< 1 percent cover	50 percent cover	1 to 1.5 inches	12 to 16 inches
Eastern meadowlark	≥ 40 acres	2 to 3 percent cover	20-30 percent cover	1 to 2.5 inches	8 to 16 inches
Sedge wren	≥ 25 acres	3 to 8 percent cover	≤ 10 percent cover	0.5 to 1.5 inches	≥ 31.5 inches
Vesper sparrow	≥ 25 acres	< 1 percent cover	High when overall vegetation density is low.	≤ 0.5 inches	≤ 8 inches

Refuge grasslands are a mix of managed warm and cool season fields. Big bluestem, switchgrass, and goldenrod dominate the warm season grasslands. Timothy grass, smooth brome, bluegrass (*Poa* spp.), and reed canary grass are common in cool season grasslands. Canada thistle is a problem in all refuge grasslands. Grasslands are currently managed using a combination of mowing, chemical spraying, haying, and prescribed burns. The objectives of this management are to control unwanted vegetation and woody growth and to maintain nesting and wintering habitat for a diversity of priority grassland birds. Refuge grassland units range in size from 55 to 136 acres.

Strategies

To accomplish objective 3.2, we will:

- Manage grasslands to provide larger areas of habitat with minimal edge, less surrounding forest, and more surrounding open habitats (e.g., old fields and emergent wetlands). This includes converting up to 47 acres of shrubland to grassland to create larger, contiguous grassland patches.

- Maintain cool season grassland areas by mowing or haying in the late summer, provided that no nesting grassland-dependent birds are detected in the target field during a July survey, or absent a July survey, between August 15 and October 15.
- Control goldenrod by mowing when it is in the bud stage.
- Use prescribed fire in the spring to encourage the growth of warm season grasses where warm season grasses and goldenrod are sparse.
- Remove hedgerows and small patches of trees to increase connectivity of open habitats.
- Evaluate growing season management options such as mowing, haying, or burning for approximately 110 acres of shrub and grasslands to reduce warm season grass cover and increase species and structural diversity.
- Remove hedgerows, shrubs, and trees among grassland patches to create larger, contiguous grassland habitat (see USFWS 2008b for details).
- Begin a summer haying program, as needed, to reduce the density of warm season grasses and goldenrod.

Monitoring Elements

To accomplish objective 3.2, we will:

- Monitor grassland units for vegetative response to management actions.
- Study small mammals in grasslands in winter to determine composition and relative abundance of prey species for wintering raptors.

Goal 4: Ensure visitors of all abilities and varied interests participate in and enjoy the refuge's opportunities for wildlife observation, interpretation, photography, and environmental education. Motivate them to value, support, and contribute to the refuge, Montezuma Wetlands Complex, and National Wildlife Refuge System. Increase their understanding of wetlands and wetland functions, and help them become better environmental stewards.

Monitoring Elements Common to All Goal 4 Objectives

Strategies listed will be entered into the refuge's Refuge Annual Performance Plan (RAPP), according to the listed yearly measures (within 1 year, within 10 years, etc.). Refuge staff is held accountable for progress and completion of projects listed in RAPP each year. Listing in RAPP prioritizes these projects above others that may present themselves at a later date.

Objective 4.1 Wildlife Observation and Photography

Over the life of the plan, provide at least 10 additional opportunities for wildlife observation and photography.

Rationale

Wildlife observation and photography are two of the six priority public uses required by the Refuge Improvement Act to receive enhanced consideration on refuges. The refuge provides opportunities to view and photograph wildlife in natural settings at nature trails and overlooks (map 4.2). The refuge has historically been a popular birding site and has been recognized as an Important Bird Area by the National Audubon Society. It is a stopover point for migratory

waterfowl and attracts hundreds of thousands of birds during migration. The refuge's diverse habitat also attracts songbirds, shorebirds, raptors, marshbirds, reptiles, amphibians, and mammals.

The 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation indicates that over 3.8 million people participated in wildlife-watching activities in the State of New York during 2006 and spent more than $1.5 billion on activities and equipment related to wildlife watching (USFWS 2006). Providing a high quality wildlife observation and photography on the Refuge promotes visitor appreciation and support for refuge programs, while also benefitting the local economy.

Under this plan, opportunities for wildlife observation and photography will be increased, as outlined in the strategies below. Connecting the Wildlife Drive with the MAC will increase visitation and exposure to both sites and give the public a greater sense that these two entities are part of a larger complex. Likewise, potential future trails that connect the refuge to area trails will help develop a greater understanding and appreciation for the recreational and conservation value that the region has to offer, and will provide more opportunities to experience upland habitats at a closer range. We also plan to open the Wildlife Drive seasonally to bicycles, which will allow a larger audience to experience the refuge.

Because much of the refuge consists of inaccessible wetlands and sensitive areas (i.e., used by easily disturbed foraging and resting migratory waterfowl), opportunities for wildlife observation and photography will be increased through the addition of an observation tower, discovery areas, photography blinds, pulloffs, etc. All these improvements will increase viewing from the edges of habitats.

We are always striving to find new ways to connect people with nature. To that end, under this plan, we propose to develop discovery areas. These are designated areas on the refuge, most likely adjacent to existing trails, where visitors are allowed to go off trail to freely explore nature. In some areas, seasonal restrictions may be necessary to protect natural resources or visitor safety, and will be at the refuge manager's discretion.

We will also work to better orient, inform, and guide the visiting public, and help create a more fulfilling wildlife observation and photography experience through a variety of means, including additional roving naturalists, trailheads, updated orientation information, etc.

Strategies

We will continue to:

- Maintain current visitor facilities such as observation towers, trails, the Wildlife Drive, observation areas, and photography blinds.
- Maintain special structures like martin condos, bluebird boxes, and osprey nesting platforms.
- Maintain wildflower and native plant gardens.
- Support Friends' photography contest and calendar.

- Staff the visitor contact station daily from the middle of March through November (weekends: 10 a.m. to 4 p.m., weekdays: 10 a.m. to 3 p.m.).
- Provide roving refuge naturalist program (currently two volunteers).
- Seasonally update the refuge's 1610 AM radio message to reflect current refuge conditions and seasons.
- Maintain and update the refuge's Web site to reflect current refuge conditions and happenings.
- Develop and promote a Family Nature Club at the refuge.

Within 1 to 5 years we will:

- Extend the visitor contact station hours to 10 a.m. to 6 p.m., 7 days a week, from mid-March through November.
- Repair the existing photography blind, located off of the Wildlife Drive.
- Work with the established Friends photography club to increase use by photographers, and enlist members as volunteers.
- Enlist local photographers to adopt refuge photography blind sites within 1 year of plan approval, and as new sites are developed.
- Every 1 to 3 years after approval of this plan, evaluate refuge orientation information (Web site, maps, brochures, signage) to ensure clarity/readability, accuracy of information, and that FWS standards are met.
- Create trailhead areas at all refuge trail locations.
- Expand the proposed Oxbow Trail.
- Build an observation area or tower at the Dry Marsh restoration site.
- Develop two discovery areas: one along the southwest corner of the refuge north of 5 and 20 and the other to be determined.
- Develop a second photography blind site.
- Develop at least two new wildlife observation trails.

Within 7 to 10 years we will:

- Develop products and programs to better orient visitors to the Knox-Marsellus Marsh.
- Explore connecting with Cayuga-Seneca and Erie Canalway trails.
- Construct up to four new pulloffs for observation and photography opportunities.
- Extend Wildlife Drive to connect to MAC.

Over the life of the plan we will:

- Continue to maintain and update the refuge's Web site to reflect current refuge conditions and happenings.
- Train in-house staff to maintain the Web site and increase content.
- Upon plan approval, open the Wildlife Drive to bicycles and pedestrian use in the summer.
- Expand the roving refuge naturalist program (to an additional 4 to 5 volunteers) and time schedule.

- Provide updates to the refuge's 1610 AM radio message to reflect current refuge conditions, seasons, and special events, and increase local radio station signs. Current updates should occur seasonally (April, July, September/October, December).

Objective 4.2 Environmental Education

Within 5 years, develop an Environmental Education Program that meets New York State learning standards for grades pre-kindergarten through grade 12.

Rationale

Environmental Education is one of the six priority public uses required by the Refuge Improvement Act to receive enhanced consideration on refuges. Due to our small staff and available funding we look to partnerships to provide quality environmental education programs. Two environmental education centers exist within 20 miles of the refuge (Montezuma Audubon Center and Seneca Meadows Environmental Education Center); we will continue to work with these partners toward quality environmental education programs.

Local schools are incorporating wildlife and wetland topics into their curriculums to meet science-based standards of learning and help students understand scientific concepts, principles and theories pertaining to their physical setting and living environment. The refuge can provide educational materials as well as an outdoor laboratory to augment the teachers' existing curriculum and tie into NYS learning standards.

Providing high quality environmental education on the refuge promotes visitor appreciation and support for refuge programs. The Refuge System's guiding principles for environmental education programs are detailed in the Service Manual (605 FW 6; USFWS 2011) and include:

- Teach awareness, understanding, and appreciation of our natural and cultural resources and conservation history.
- Allow program participants to demonstrate learning through refuge-specific stewardship tasks and projects that they can carry over into their everyday lives.
- Establish partnerships to support environmental education both onsite and offsite.
- Support local, state, and National education standards through environmental education on refuges.
- Assist refuge staff, volunteers, and other partners in obtaining the knowledge, skills, and abilities to support environmental education.
- Provide appropriate materials, equipment, facilities, and study locations to support environmental education.
- Give refuges a way to serve as role models in the community for environmental stewardship.
- Minimize conflicts with visitors participating in other compatible wildlife-dependent recreation activities.

Under this plan, opportunities for environmental education will be increased based on increasing demand for guided environmental education programs and on Service Policy 605 FW 1 (USFWS 2011). We will develop a formal, curriculum-based environmental education program that meets

Federal and New York State education standards. Each course of study will include, at a minimum, a plan of instruction that details what students need to know, how they will learn it, what the instructor's role is, and the context in which the teaching and learning take place. We will further facilitate and support environmental education on the refuge by building a new visitor contact station (which is currently too small to adequately support environmental education and other programs) and expand environmental education partnerships.

Strategies

Over the life of this plan we will:

- Construct a new stand-alone visitor contact station or combined administrative and visitor facility (see appendix J for standard conceptual design plans). The new facility will include a classroom and conference room, a multipurpose room, a kitchen, enhanced visitor center shop, and added storage space for heavy equipment. At this time, the location and exact nature of the necessary facilities have not been determined and funding has not been identified. Under this plan, site selection will be based on the following criteria (if applicable):
    - Sufficient buildable area
    - Sufficient wetland buffers
    - Access or ability to create access to suitable water and sewer
    - Proximity to a major road
    - Visibility of Service buildings from road
    - Site impacts of buildings and parking areas
    - View and access to trails, wildlife observation areas, and other visitor resources
- Incorporate at least one refuge field trip into partners' environmental education programs.
- Evaluate the need for an amphitheater or pavilion to conduct outdoor classes.
- Work to partner with home-school groups to help facilitate environmental education.
- Develop environmental education curricula for pre-kindergarten through grade 12 that meet NYS standards for learning; curricula will offer self-guided options for teachers, as well as some refuge-guided options to be used at the refuge manager's discretion.

Objective 4.3 Environmental Interpretation

Over the life of the plan, expand the environmental interpretation program by updating at least three refuge brochures to reflect current information and FWS graphics standards, producing 5 to 10 new interpretive products, and developing at least one new program series.

Rationale

Interpretation is one of the six priority public uses required by the Refuge Improvement Act to receive enhanced consideration on refuges. The guiding principles of the Refuge System's interpretive programs (FW 605 7; USFWS 2011) are to:

- Promote visitor understanding of, and increase appreciation for, America's natural and cultural resources and conservation history by providing safe, informative, enjoyable, and accessible interpretive opportunities, products, and facilities.

- Develop a sense of stewardship leading to actions and attitudes that reflect interest and respect for wildlife resources, cultural resources, and the environment.
- Provide quality interpretive experiences that help people understand and appreciate the individual refuge and its role in the Refuge System.
- Provide opportunities for quality recreational and interpretive experiences consistent with criteria describing quality found in 605 FW 1.6 (USFWS 2011).
- Assist refuge staff, volunteers, and community support groups in attaining knowledge, skills, and abilities in support of interpretation.
- Minimize conflicts with visitors participating in other compatible wildlife-dependent recreational activities.

According to the National Association for Interpretation (NAI), interpretation is a mission-based communication process that forges emotional and intellectual connections between the interests of the audience and the meanings inherent in the resource. The refuge can reach nearly 150,000 visitors yearly through interpretive programs including activities, talks, publications, audio-visual media, signs, and exhibits that convey key natural and cultural resources messages to visitors. After participating in refuge interpretive programs, visitors should be able to understand their relationships to, and impacts on, these resources.

Strategies

We will continue to:

- Update, when there are major changes in information, the refuge's Wildlife Watching Guide and Bird Brochure.
- Update interpretive panels on the refuge periodically.
- Plan and implement special guest speaker programs (about six per year) such as the "Nature of Montezuma" Program lecture series.
- Provide the "Guide by Cell" automated cell phone tour, in partnership with the Friends, Montezuma Audubon Center, and NYSDEC.
- Host winter program series like the recent Montezuma Book Club and Eco-Chat Program.

Within 1 to 5 years we will:

- Update the refuge's general brochure to reflect current refuge information.
- Develop a general refuge PowerPoint presentation for use in the visitor contact station and offsite.
- Participate in the NAI Interpreter Certification Process to train volunteers and new visitor services staff in Environmental Interpretation.
- Update existing interpretive panels and include new ones.
- Replace the existing brochures for the Esker Brook Trails and the Bald Eagle Story.

Within 7 to 10 years we will:

- Construct a new visitor contact station or expand the current visitor contact station (see details under strategies for objective 4.2).
- Build interpretive displays connecting with MAC in the visitor contact station.
- Develop a DVD series about the refuge for use in the visitor contact station and at outreach events.
- Develop and produce a series of brochures and podcasts (available for download from either the refuge Web site or Friends' Web site) to interpret refuge resources and recreational opportunities.

Within 15 years we will:

- Create interpretive exhibits for the visitor contact station.

Over the life of the plan we will:

- Expand program series like the Montezuma Book Club and Eco-Chat Programs.

Goal 5: Provide opportunity for hunters and anglers to enjoy and support hunting and fishing on the refuge and increase their understanding of the regional environmental importance of the refuge and of the greater Montezuma Wetland Complex.

Objective 5.1 Waterfowl Hunting

Over the life of the plan, allow access for hunting of waterfowl (including Canada and snow goose) in accordance with New York State regulations and consistent with sound biological principles to provide participants with reasonable harvest opportunities, uncrowded conditions, and minimal conflicts with other users.

Rationale

As discussed previously, hunting is one of the six priority public uses required by the Refuge Improvement Act to receive enhanced consideration on refuges. Hunting is a popular and traditional activity in the area and a management tool to keep wildlife populations at healthy numbers to maintain healthy habitats. In general, the demand for hunting on public land has increased as private lands have become less available for hunting. We manage our waterfowl hunt program with the intent to provide opportunities for compatible wildlife-dependent recreation as required by Refuge Improvement Act and permit use of a sustainable natural resource.

The refuge hunting public has requested additional hunting opportunities for waterfowl, including increased access, universal accessibility, and the addition of goose hunting during the resident Canada goose season and the late snow goose seasons. Opening portions of the northeast section of the refuge to hunting for the regular waterfowl season at the refuge manager's discretion will help meet these needs. Opening these additional areas to hunting will occur only

when the refuge manager judges there to be sufficient quality habitat available that can be accessed by hunters on foot or by boat without disturbing sensitive species or impinging upon other priority public uses. In accordance with Federal law and Service policy, we may only allow hunting of migratory game birds on no more than 40 percent of refuge land purchased through the Migratory Bird Conservation Fund, unless we find that opening up more land to hunting will benefit the species (16 U.S.C. 668dd(d)(1)(A), National Wildlife Refuge System Administration Act; 16 U.S.C. 703-712, Migratory Bird Treaty Act; and 16 U.S.C. 715a-715r, Migratory Bird Conservation Act). Nearly all of the refuge lands were purchased with through the Migratory Bird Conservation Fund.

The Service analyzed the impacts of the additional Canada goose and snow goose seasons in the Final Environmental Impact Statement: Resident Canada Goose Management (USFWS 2005b) and the Final Environmental Impact Statement: Light Goose Management (USFWS 2007c), respectively. The additional Canada goose hunt days and areas will contribute to the Service goal of reducing the resident Canada goose population in the Atlantic Flyway from more than one million to 620,000 and the Service and the NYSDEC goal of reducing the number of resident population Canada geese in the State, estimated at 257,000 (*http://www.dec.ny.gov/animals/67311.html*), to at or below 85,000 birds (USFWS 2005b). The additional snow goose hunt days and areas will contribute to the Service goal to reduce the population of lesser snow geese by 50 percent from the level observed in the late 1990s (USFWS 2007c).

The proposed actions for hunting at Montezuma NWR have been developed and analyzed in an environmental assessment (see appendix E). We will develop a detailed hunt plan and will complete an opening package for the refuge hunt program, prior to opening the refuge to these additional hunting opportunities.

In 2010, the NYSDEC and partners opened the Tim Noga Memorial youth and universally accessible blind. This blind is located within the MWC, on the Colvin Marsh, Northern Montezuma Wildlife Management Area, State Route 89, Savannah, NY. The blind is open to youth hunters and their mentors, as well as hunters with disabilities (must possess a NYS Department of Motor Vehicle plate or parking permit for People with Severe Disabilities) and their assistants. The blind is available for use during the first split of the NYS Waterfowl Hunting Season for the Western Zone (typically mid-October through early December), on Tuesdays, Thursdays, Saturdays, and Sundays. Reservations for use of the blind are taken by refuge staff as part of the refuge's reservation system. No reservations for the Tim Noga Memorial youth and universally accessible blind were requested for the 2010 or 2011 waterfowl hunting seasons.

Strategies

We will expand the waterfowl hunt program as described under alternative B of the "Montezuma NWR Hunt Program EA" (appendix E) as follows (also see map 4.3).

We will continue to:

- Promote waterfowl hunting opportunities on the refuge via press releases, Web site information, information boards, email, phone and personal communication with the public.
- Follow NYSDEC waterfowl hunting regulations, as well as special refuge regulations.
- Cooperate with the Friends to administer the waterfowl hunting program.
- Provide access to Tschache Pool for waterfowl hunting.
- Implement the waterfowl hunting permitting system.
- Offer NYSDEC waterfowl identification courses for adults and for youth.
- Participate in the NYSDEC Youth Waterfowl Hunt.
- Work with the NYSDEC to promote hunter education programs and disseminate outreach materials.
- Partner with the NYSDEC to help provide universal access to waterfowl hunters within the MWC, using the existing Tim Noga Memorial youth and universally accessible blind as an example.

Within 2 years of plan approval, we will:

- Permit waterfowl hunting on the refuge during the first split on Tuesdays, Thursdays, and Saturdays only, as long as the migratory game bird season dates for the Western Zone remain the same (i.e., late October through the beginning of December for the first split and late December through the beginning of January for the late split).
- Open portions of the northeast section of the refuge, to waterfowl hunting during the regular season at the refuge manager's discretion, these areas will correspond to those that could be opened to the late snow goose seasons and the resident Canada and late snow goose seasons (see map 4.3).
- Open some refuge grasslands for the "early" or "resident" Canada goose hunting season (generally September 1 through 25).
- Coordinate with farmers in the refuge's cooperative farming program to open designated areas for the "early" or "resident" Canada goose hunting season (generally September 1 through 25).
- Open designated areas of the Main Muck to snow goose hunting during the late (winter) snow goose hunting season (generally late January through the beginning of March) and the Light Goose Conservation Order (generally the beginning of March through mid-April).

Over the 15 year life of the plan, we will:

- Open newly acquired lands, where approved by the refuge manager, to waterfowl hunting.
- Develop one to two universal access points on the refuge, and enlist waterfowl hunters as volunteers to help fund, build, and maintain universal access areas.

Monitoring Elements

Hunter numbers will be calculated by directly counting the number of permits used and reservations filled each day during the hunting seasons. The quality and safety of the hunts will

be monitored via direct observation by refuge and law enforcement staff, law enforcement activities, and direct communication with hunters (in person, by phone, or by email), as well as direct communication with refuge neighbors.

Objective 5.2 Deer Hunting

Over the life of the plan, allow access for hunting of white-tailed deer in accordance with New York State regulations and consistent with sound biological principles to provide participants with reasonable harvest opportunities, uncrowded conditions, and minimal conflicts with other users.

Rationale

Similar to waterfowl hunting above, hunters at the refuge have requested additional hunting opportunities for white-tailed deer including increased access and universal accessibility. In addition, NYSDEC has recently completed a management plan for white-tailed deer (NYSDEC 2011). Per the Refuge Improvement Act and Service policy, we will work with NYSDEC in implementing our hunt program, including implementing appropriate aspects of this new plan (e.g., establishing youth hunt events).

Currently, the deer population on the refuge is high enough that negative effects on refuge habitats are apparent (Rawinski 2010). Approximately 220,000 deer are harvested from the State of New York each year (NYSDEC 2011), however accurate live populations are difficult to estimate. Deer overpopulation can lead to outbreaks of devastating diseases such as hemorrhagic disease, bluetongue, and chronic wasting disease (Demarais et al. 2000), and browsing pressure on landscapes, vegetation, and crops, and severe habitat degradation (Cypher and Cypher 1988). Furthermore, overpopulation can lead to starvation, more numerous car-deer collisions, and poorer herd health overall. Regulated hunting has proven to be an effective deer population management tool and has been shown to be the most efficient and least expensive technique for removing deer and maintaining deer at desired levels (Northeast Deer Technical Committee 2009). Increasing opportunities for deer hunting by expanding the program will include Sunday hunting which will lengthen the archery season to coincide with the State opener. If deer populations continue to be high, we will work with the NYSDEC to manage a more effective hunt through their DMAP to have a beneficial impact on the overall health of the deer herd in the area.

The proposed actions for hunting on the refuge have been developed and analyzed in an environmental assessment (see appendix E, Montezuma NWR Hunt Program EA). We will develop a detailed hunt plan and will complete an opening package for the refuge hunt program, if warranted by Federal regulations. These actions will be implemented in accordance with NEPA.

Strategies

We will expand the deer hunt program as described under alternative B of the “Montezuma National Wildlife Refuge Hunt Program EA” (appendix E) as follows (see also map 4.4):

- Send out press releases, update Web site information, information boards, and communicate with the public through email, phone, and personal communication.

- Provide access to designated deer hunting areas on the refuge.
- Open the Seneca Trail area at the refuge manager's discretion.
- Maintain and post no hunting zones.
- Follow NYSDEC hunting regulations and specific refuge regulations.
- Work with the NYSDEC to promote hunter education programs and disseminate outreach materials related to current and future NYSDEC programs (e.g., benefits of nontoxic ammunition).
- Except for Esker Brook Trail area, the refuge archery season will open with the State season (usually mid-October), rather than waiting until November 1. Esker Brook Trail area will continue to open November 1 to minimize conflicts with other refuge users.
- Sunday hunting will be allowed for all deer hunt seasons.
- The Wildlife Drive will be closed to other users and open to hunters beginning December 1.
- Seneca Trail area will be open to late season archery hunting every year (usually mid to late December for about 9 days).
- The Main Pool and Tschache Pool will be open to deer hunters when they are frozen.
- When deer densities are high, the refuge will work with the NYSDEC DMAP to maximize the harvest of female deer.
- If the deer harvest remains below desired levels after the DMAP is implemented, the refuge will explore options to provide additional hunter access to areas where deer densities are high.
- Within 1 year of plan approval, improve the universally accessible site for deer hunters.
- Within 1 year of plan approval, increase the number of hunters allowed to use firearms on the refuge from 150 to 175. As additional lands are acquired, total permits issued will equal approximately 1 permit for every 50 refuge acres, based on the refuge's hunt EA (see appendix E) and annual hunt plan.
- Within 2 years of plan approval, work with the NYSDEC to develop and implement a youth deer hunt program on the refuge.
- Within 7 years of plan approval, develop three new universal access points and standards for obtaining a refuge universal access permit for deer hunters on the refuge, and enlist deer hunters as volunteers to help site, build, and maintain the universal access area.

Monitoring Elements

Deer hunter numbers will be calculated by directly counting the number of permits used each day during the hunting seasons. The quality and safety of the hunts will be monitored via direct observation by refuge and law enforcement staff, law enforcement activities, and direct communication with hunters (in person, by phone, or by email), as well as direct communication with refuge neighbors.

Objective 5.3 Fishing

Provide opportunities for fishing on the refuge in a manner that minimizes conflicts between fishing and biological resources, particularly nesting birds, and provide participants with reasonable harvest opportunities, uncrowded conditions, and minimal conflict with other users.

Rationale

Access to fishing is limited on the refuge. Under this plan we will work to expand and improve visitors' fishing experience on the refuge in support of the Refuge Improvement Act. We propose to provide increased access to fishing areas along the canal. In addition, we will work to develop and offer specific informational materials to anglers, and will increase efforts to promote fishing in other ways as further described in the strategies below.

The Refuge Improvement Act identifies fishing as one of the six priority wildlife-dependent public uses. It states, "Compatible wildlife-dependent recreation is a legitimate and appropriate general public use of the [Refuge] System."

According to the 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation approximately 741,000 residents and nonresidents participated in fishing in New York during 2006 (USFWS 2006). Approximately 247,000 more anglers fished in the Great Lakes. Anglers spent more than $925 million on activities and equipment related to fishing during 2006.

Providing high quality fishing opportunities on the refuge promotes visitor appreciation and support for refuge programs. According to Service policy (605 FW 3; USFWS 2011), the guiding principles for our fishing program include the following:

- Effectively maintain healthy and diverse fish communities and aquatic ecosystems through the use of scientific management techniques.
- Promote visitor understanding of, and increase visitor appreciation for, America's natural resources.
- Provide opportunities for quality recreational and educational experiences consistent with criteria describing quality found in 605 FW 1.6 (USFWS 2011).
- Encourage participation in this tradition deeply rooted in America's natural heritage and conservation history.
- Minimize conflicts with visitors participating in other compatible wildlife-dependent recreational activities.

As with hunting, we recognize fishing as a healthy, traditional outdoor past time. It, too, promotes public understanding and appreciation of natural resources and their management on all lands and waters in the Refuge System. Although refuge-owned waters are not open to fishing, the adjacent canal system offers opportunities for anglers. As described in "Chapter 3, Existing Environment," the refuge does not allow fishing in the impoundments to minimize disturbance to sensitive species. We provide fishing access to the canal waters, which are State-owned navigable waters. New York State fishing regulations apply.

Strategies

To accomplish objective 5.3, we will:

- Continue to maintain and provide fishing access at May's Point.
- In cooperation with NYSDEC, continue to maintain and provide fishing access at the boat launch site south of U.S. Highway 20, across from the refuge entrance.

- Update the refuge fishing information on the refuge's Web site and profile page as needed.
- Within 2 years of plan approval, develop a fishing plan for the refuge.
- Develop and implement a Family Fishing Day within 5 years of plan approval.
- Within 10 years of plan approval, open at least two additional fishing areas within the refuge.
- Upon development of additional refuge fishing areas, develop and produce a refuge fishing brochure.
- Within 12 years of plan approval, develop an interpretive sign for refuge fishing access points.
- Over the life of the plan, annually promote fishing opportunities on the refuge.

Monitoring Elements

Angler numbers will be calculated using a combination of trail and traffic counters and estimation according to the National Wildlife Refuge System Visitor Estimation Handbook (USFWS 2005a). Strategies listed will be entered into the refuge's RAPP, according to the listed yearly measures (within 1 year, within 10 years, etc.). Refuge staff is held accountable for progress and completion of projects listed in RAPP each year. Listing in RAPP prioritizes these projects above others that may present themselves at a later date.

Objective 5.4 Turkey Hunting

Over the life of the plan, allow access for hunting of turkey during the youth and fall hunt seasons in accordance with New York State regulations and consistent with sound biological principles to provide participants with reasonable harvest opportunities, uncrowded conditions, and minimal conflicts with other users.

Rationale

Historically, turkeys were abundant in New York State during the 1600s. However, uncontrolled hunting and deforestation resulted in their population crash (Roberts et al. 2011). They were re-established in New York by 1957, but occupied only the extreme southwest portion of the State. At this same time, the NYSDEC live trapped and transferred turkey to areas of the State that were capable of sustaining a population. Numbers have increased dramatically from an estimated 2,000 in 1959 to over 65,000 in 1990 (Roberts et al. 2011).

Refuge lands currently consist of 88 percent wetland habitat, which is not typically used by turkeys. Oak mast is the most important fall and winter food for wild turkeys (Dickson 1990); however, oak trees are rare at the refuge. No recent turkey population studies have been conducted on the refuge. Although turkeys are present, sightings on refuge property are infrequent. Turkeys are spotted regularly on adjacent uplands due to the large amount of agricultural cropland on which they thrive.

As discussed elsewhere in this document, hunting is one of the priority public uses identified for refuges. Service policy also states that, where practicable, we should make our hunt regulations consistent with state regulations. The NYSDEC has requested we consider providing opportunities for turkey hunting. While suitable turkey habitat on the refuge is somewhat limited,

there is sufficient land for us to consider opening the refuge to hunting. Opening these additional areas to hunting will occur only when the refuge manager judges there to be sufficient quality habitat available that can be accessed by hunters without disturbing sensitive species or impinging upon other priority public uses.

The proposed actions for hunting at Montezuma NWR have been developed and analyzed in an environmental assessment (see appendix E, Hunt Program EA). We will develop a detailed hunt plan and will complete an opening package for the refuge hunt program, if warranted. These actions will be implemented in accordance with NEPA.

Strategies

We will expand the hunt program to include youth and fall turkey hunting as described under alternative B of the "Montezuma NWR Hunt Program EA" (appendix E) as follows:

Prior to opening the refuge to turkey hunting, an information meeting, Web site articles, handouts, and press releases will be developed to inform the public about the turkey hunt, special refuge regulations, and hunting on refuges. Refuge turkey hunting maps and regulations will be posted on the refuge's Web site, and mailed or emailed upon request. All information related to hunting on the refuge will be posted at the refuge's hunter check station prior to the seasons' openings.

Youth Turkey Hunting:

- During the NYS youth turkey hunt (usually in late April), turkey hunting will be permitted according to State regulations in designated areas throughout the refuge. Hunting will not be permitted in areas closed to hunting to protect facilities and structures, certain habitats, and select public use areas. See map 4.5 for designated hunting areas.
- Daily permits will be required. The number of permits will be set annually by the refuge manager and will be based on maximizing hunt opportunities, providing for a quality hunt experience, demand, minimizing disturbance to sensitive wildlife and plant species, and balancing other public use demands and the administrative work load. Currently we will permit a maximum of 14 hunt groups (mentor and youth(s)) per day, based on the above criteria.
- There will be no hunt fee.
- Hunting season dates, hours, implement restrictions, bag limits, etc. will follow State regulations. However, the refuge manager reserves the right to restrict hunt season dates and bag limits in the future, as needed, to achieve various refuge management goals.
- Implementing the refuge's youth turkey hunt will depend on a commitment from partners to mentor youth hunters. We will work with partners to recruit and sign up youth hunters and their mentors for this hunt.
- Youth hunters and their mentors may be required to attend an orientation program conducted by the refuge, in cooperation with partners. The orientation will review hunter safety, turkey calling, equipment, ethics, and sportsmanship, as well as conservation and messages about the Refuge System.

Fall Turkey Hunting:

- Turkey hunting will be permitted in areas open to deer hunting. The Wildlife Drive will not be open to turkey hunting because fall turkey season usually ends in November, before the Wildlife Drive opens to hunting. The Wildlife Drive will be open to fall turkey hunting if the State extends the turkey season into December. See map 4.5 for designated hunting areas.
- Daily permits will be required. The number of permits will be set annually by the refuge manager and will be based on maximizing hunt opportunities, providing for a quality hunt experience, demand, minimizing disturbance to sensitive wildlife and plant species, and balancing other public use demands and the administrative work load. Currently we will set the daily permit limit at a maximum of 40 per day, based on the above criteria.
- There will be no reservation system; it will be a first come, first served basis each hunt day until the day's permits are all taken.
- There will be no hunt fee.
- Hunting season dates, hours, weapon restrictions, bag limits, etc. will follow State regulations. However, the refuge manager reserves the right to adjust hunt season dates and bag limits in the future, as needed, to achieve various refuge management goals.

Monitoring Elements

The number of turkey hunters will be calculated by directly counting the number of permits used each day during the hunting seasons. The quality and safety of the hunts will be monitored via direct observation by refuge and law enforcement staff, law enforcement activities, and direct communication with hunters (in person, by phone, or by email), as well as direct communication with refuge neighbors.

Goal 6: Increase awareness and cooperation among State and Federal agencies, local communities, environmental organizations, universities and other partners. Help them understand the role of the refuge and the Montezuma Wetlands Complex in the community, and encourage participation in achieving the goals, vision and mission of the complex.

Objective 6.1 Refuge Partnerships

Over the life of the plan, continue to work with NYSDEC, TNC, Audubon New York, and other partners to promote ecotourism opportunities on the refuge, and within the Montezuma Wetlands Complex.

Rationale

Although the refuge has cultivated several strong partnerships, it recognizes that there are other entities in the region with which it can partner, with mutual benefits, and with the aim of promoting ecotourism. Some of these are listed in the strategies below.

Strategies

To accomplish objective 6.1, we will:

- Maintain existing relationships with the Seneca, Cayuga, and Wayne Counties tourism offices, as well as with the Cayuga Lake Scenic Byway.
- Maintain existing relationships with NYSDEC, TNC, Audubon New York, Ducks Unlimited, Cornell Lab of Ornithology, and others.
- Partner with local services and attractions to create area tour packages and promotions.
- Accommodate various media outlets.
- Partner with interviews conducted by NYS Canal Corporation in promotion of tourism opportunities.
- Within 3 years of plan approval, develop new partnerships (i.e., Rosamond Gifford Zoo at Burnett Park in Syracuse and the Seneca Park Zoo in Rochester, Savannah Dhu, NYS Thruway, NPS, NYS Canal Corporation, NYSDOT).
- Within 5 years of plan approval, join the New York State Visitors and Convention Bureau.
- Within 5 years of plan approval, join the Finger Lakes Tourism Alliance.
- Over the life of the plan, outreach to motor-coach tour associations.
- Over the life of the plan, provide offsite programs to a broad variety of civic organizations, upon request.

Monitoring Elements

Strategies listed will be entered into the refuge's RAPP, according to the listed yearly measures (within 1 year, within 10 years, etc.). Refuge staff is held accountable for progress and completion of projects listed in RAPP each year. Listing in RAPP prioritizes these projects above others that may present themselves at a later date.

Objective 6.2 Refuge Partnerships – Collaboration on Biological Monitoring and Research and Habitat Management and Restoration

Over the life of the plan, continue to work with NYSDEC, TNC, Audubon New York, USGS, and other partners to accomplish mutual biological monitoring, research, habitat management, and restoration goals and objectives on the refuge, within the MWC, and within the Upper Midwest and Great Lakes LCC.

Rationale

The Service is committed to using sound science in its decision-making and is focusing on the use of strategic habitat conservation (SHC) to accomplish this goal. SHC incorporates biological planning, conservation design, conservation delivery, monitoring, and research in an ongoing process that changes and evolves. The intention is for refuges to work with partners to achieve landscape level conservation. To ensure we are putting science in the right places, the Service and USGS have developed a national geographic framework for implementing strategic habitat conservation at landscape scales. The framework provides a platform upon which the Service can work with partners to connect project- and site-specific efforts to larger biological goals and outcomes across the continent. The framework serves as a base geography for Landscape Conservation Cooperatives, which are management-science partnerships that inform integrated

resource management actions addressing climate change and other stressors within and across landscapes. LCCs are fundamental units of planning and science capacity to help us carry out the functional elements of SHC. Montezuma NWR is part of the Upper Midwest and Great Lakes LCC. Through the use of SHC and by working with partners, the refuge can make better management decisions at the refuge level and therefore make a greater contribution to landscape level conservation.

Strategies

To accomplish objective 6.2, we will:

- Participate in MWC partner meetings to reestablish contact, seek new partners, share information, and collaborate on new projects.
- Seek qualified researchers and funding to address specific refuge questions.
- Work with partners to host the Montezuma Wetlands Complex Research Symposium every 7 years.
- Participate in appropriate multi-refuge studies conducted in partnership with USGS.
- Facilitate logistical support for researchers.
- Consider assisting with funding a temporary project coordinator to support and develop partnership opportunities (including organizing the MWC Research Symposium- see last bullet).
- Work with partners to reinvigorate the Montezuma Research Institute.
- Work with partners to increase the frequency of the MWC Research Symposium from every 7 years to every 3 years.

Objective 6.3 Refuge Partnerships – Friends Group

Over the life of the plan, continue to support the Friends of the Montezuma Wetlands Complex.

Rationale

Across the nation, Friends groups provide invaluable time and expertise to the Refuge System. At Montezuma NWR, the Friends of the Montezuma Wetlands Complex contributes thousands of hours annually to support the refuge with visitor service activities, invasive plant removal, surveys, and other important tasks.

Strategies

To accomplish objective 6.3, we will continue to:

- Effectively communicate with the Friends by participating in Friends' meetings and coordinating with Friends members as needed.
- Provide logistical support for Friends activities (e.g., assist with their quarterly newsletter, annual member events, calendar, and photography contest).
- Provide space and logistical support for the Friends' nature store.
- Inform the Friends on how they can further assist the refuge.
- Attend Friends Board meetings.
- Help expand the Friends group to increase membership, levels of activities, and support for refuge management activities.

Objective 6.4 Refuge Partnerships – Volunteers

Over the life of the plan, continue to implement volunteer programs that connect people with nature and support refuge needs.

Rationale

Volunteers are integrated into all aspects of Montezuma's management including maintenance, habitat management, visitor services, and outreach programs. Their hard work and enthusiasm enhances the programs we can offer. In fact, many of the Service's visitor use programs at Montezuma NWR are supported by the Friends of the Montezuma Wetlands Complex and volunteers, thus making it feasible for the refuge to offer these programs.

Strategies

To accomplish objective 6.4, we will:

- Conduct the Montezuma Alliance for the Restoration of Species and Habitats volunteer program.
- Explore avenues for funding to implement a phenology project volunteer program.
- Recruit and train visitor contact station and roving naturalist volunteers, as well as volunteers to support the refuge's biological and maintenance programs.
- Cooperate with the Student Conservation Association to recruit and train volunteers and generate additional support for the biological program, refuge operations, and maintenance.
- Within 5 years of plan approval, work with the Friends group and MWC partners to form volunteer committees to help meet refuge and complex management and public use needs.
- Within 10 years of plan approval, work with tourism bureaus and other partners to develop an ecotourism committee covering Seneca, Wayne, and Cayuga (and possibly other) Counties.

Objective 6.5 Refuge Partnerships – Outreach

Over the life of the plan, expand outreach efforts to share refuge news and management projects with local media outlets, partners, Friends, and visitors.

Rationale

Effective outreach depends on open and continuing communication and collaboration between the refuge and its many publics. Effective outreach involves determining and understanding the issues, identifying audiences, listening to stakeholders, crafting messages, selecting the most effective delivery techniques, and evaluating effectiveness. If conducted successfully, the results we achieve will further refuge purpose(s) and the Refuge System mission. Under this plan, refuge staff will focus on expanding outreach efforts to increase awareness and understanding of refuge management projects and volunteer and recreational opportunities.

Strategies

To accomplish objective 6.5, we will continue to:

- Prepare and distribute press releases about refuge events and activities.
- Accommodate various media outlets with interviews and information.
- Maintain the refuge Web site.
- Provide links to Friends' Web site.
- Provide links to other Web sites.
- Participate in onsite and offsite fairs/festivals (four per year).
- Partner with tourism agencies, nonprofit organizations, and other entities.
- Sit on the Board of Directors for Cayuga Lake Scenic Byway.
- Offer programs in partnership with the Cayuga Lake Watershed Network.
- Conduct tours with The Nature Conservancy and other organizations on request.
- Plan a birding event with the Cayuga Wine Trail.
- Coordinate events with area birding groups.

Within 1 year we will:

- Offer a guided refuge tour to local news media personnel and discuss their preferred methods of information sharing each spring and fall thereafter.
- Increase outreach with local news media beyond press releases.
- Optimize the refuge Web site to help improve its standing on internet search engines.
- Evaluate the refuge's capabilities to use podcasts via its Web site (podcasts are currently on the Friends of the Montezuma Wetlands Complex Web site, *www.friendsofmontezuma.org*).

Within 5 to 7 years we will:

- Regularly participate in additional festival events in New York State.
- Distribute refuge brochures and event calendars to local businesses, attractions, visitor/welcome centers, and tourism bureaus.

Within 15 years we will:

- Partner with a local media outlet to develop and run a regular media spot about the refuge.

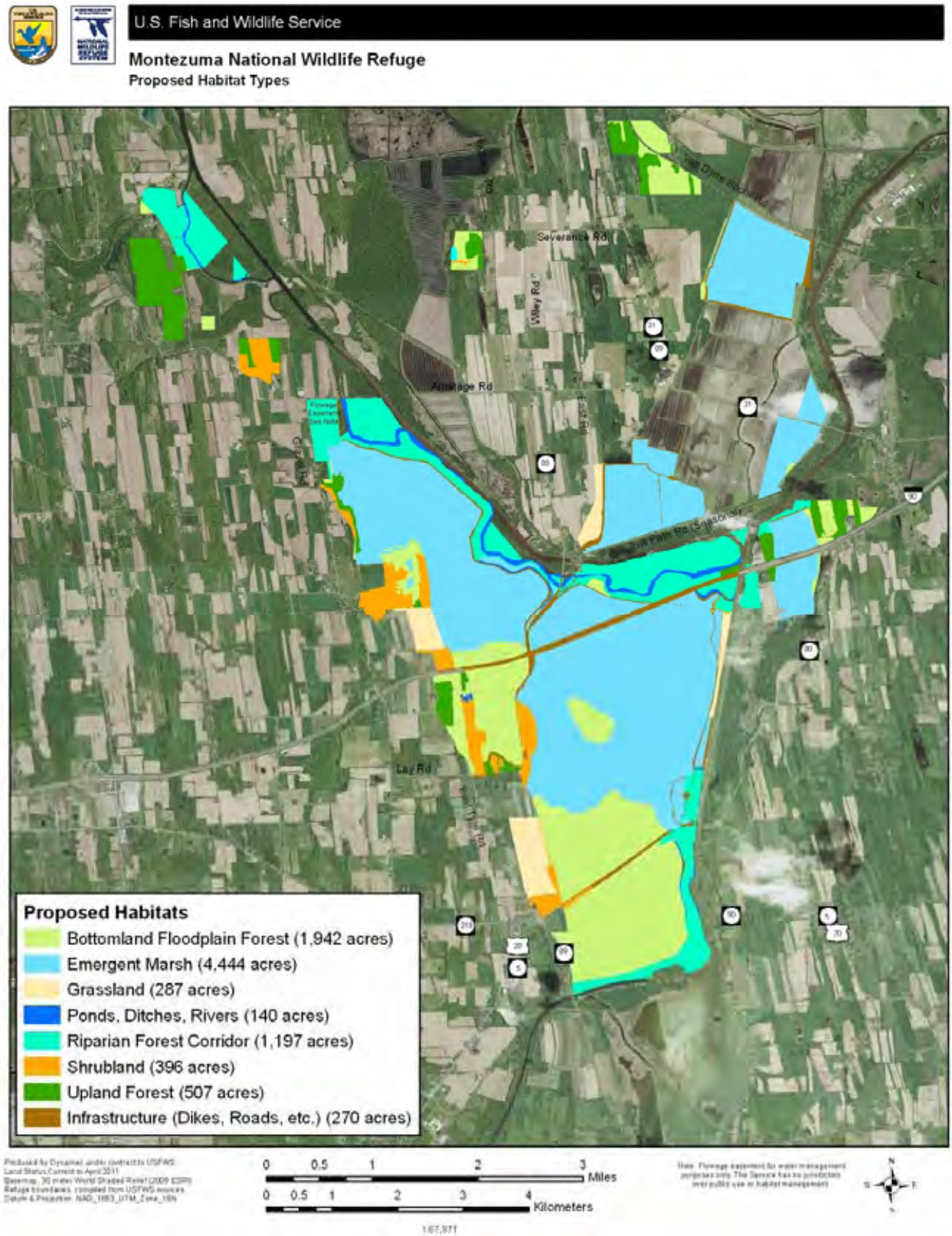
Over the life of the plan we will:

- Work with partners to communicate more frequently with local officials regarding the refuge and the MWC.
- Use new media (like Facebook and Twitter) to promote the refuge, as allowed by the Department of the Interior and the Service.

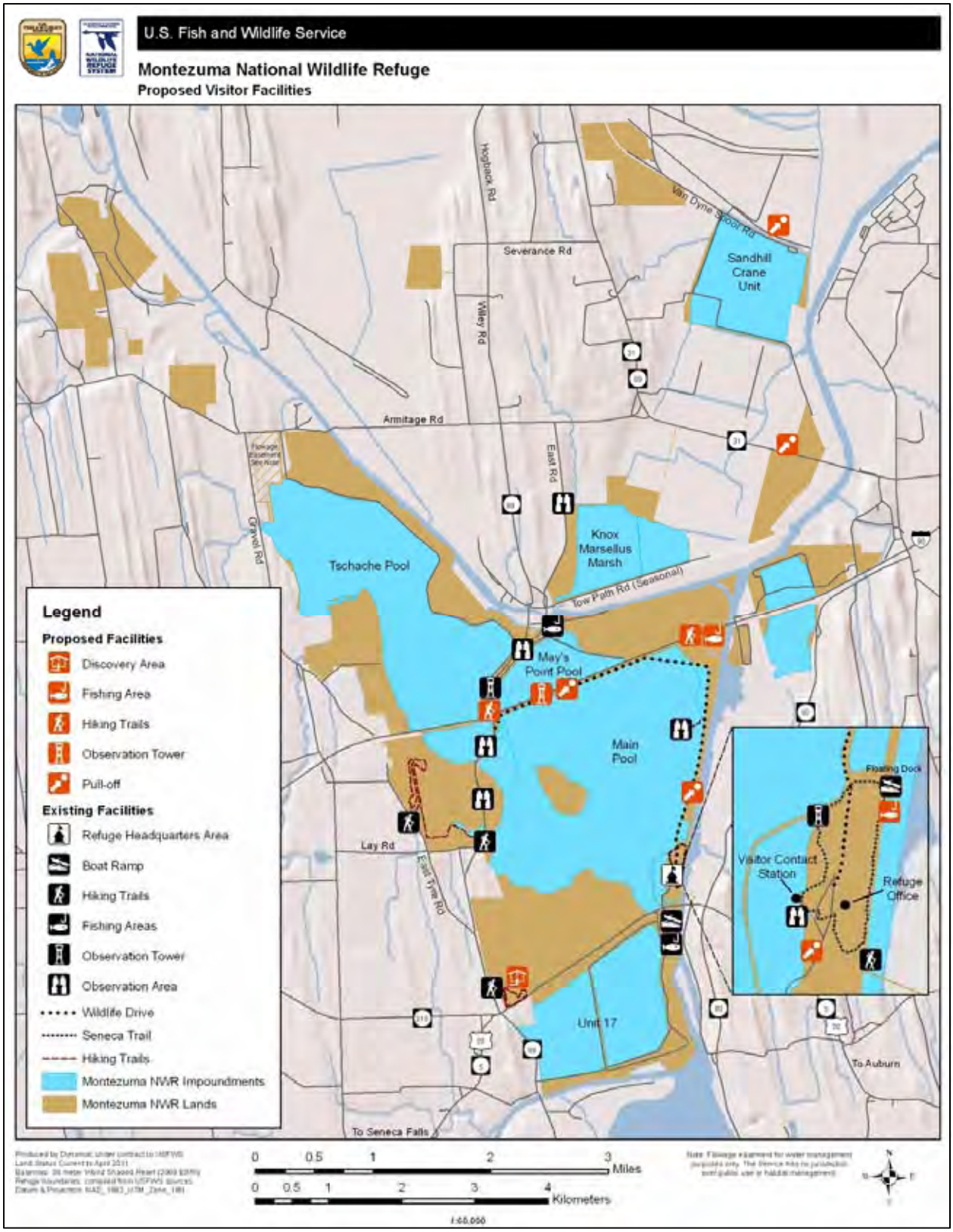
Table 4.5. Current and Projected Acreages for Montezuma National Wildlife Refuge Habitats.

Habitat Type	Acreage[1]	
	Current	Projected
Emergent Marsh	4,307	4,444
Ponds, ditches, rivers	179	140
Bottomland Floodplain Forest	1,685	1,942
Riparian Forest Corridor	1,033	1,197
Upland Forest	299	507
Shrublands	866	396
Grasslands	316	287
Croplands	183	0
Infrastructure	316	271
Total	**9,184**	**9,184**

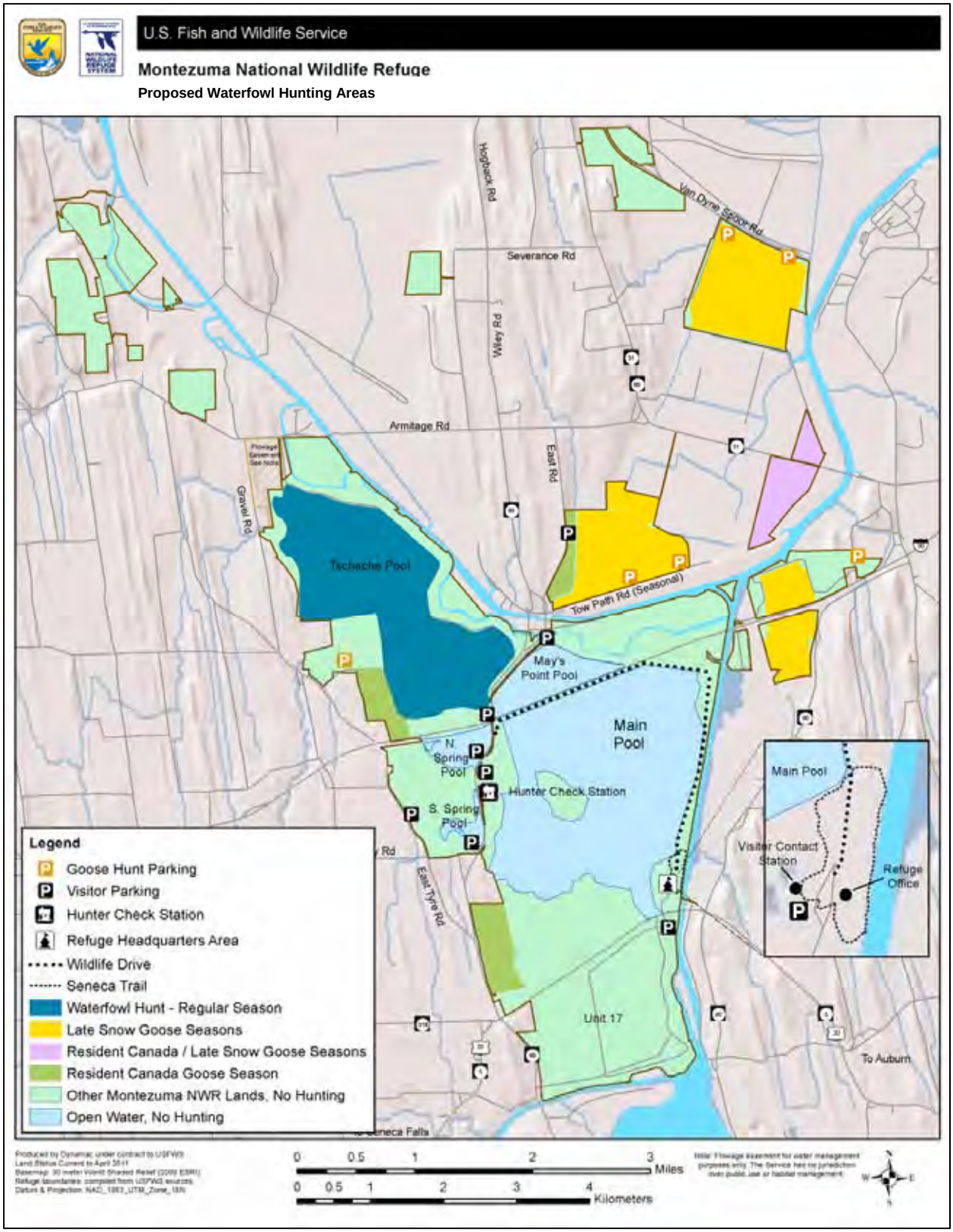
[1]Acreages are current as of October 2012.



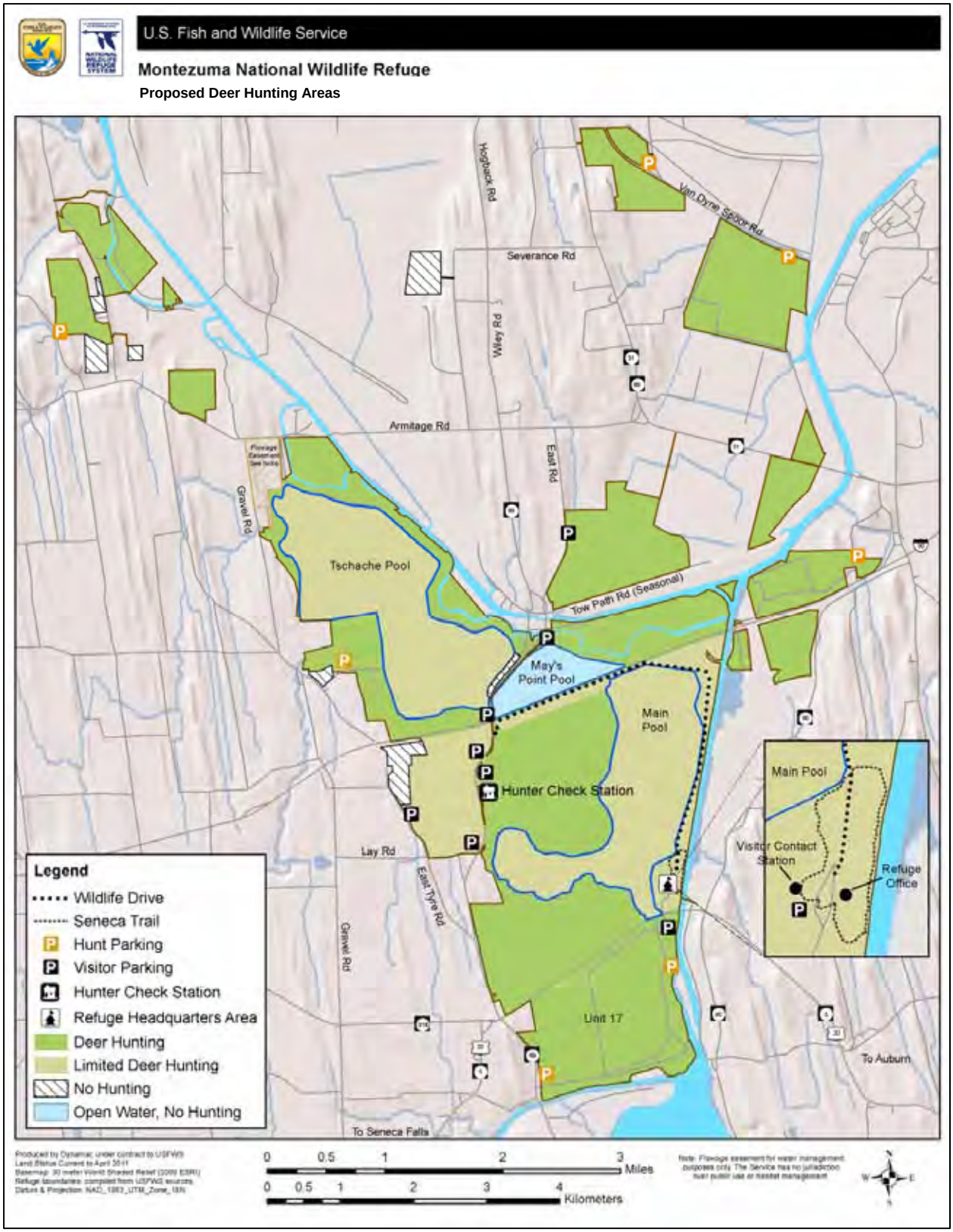
Map 4.1. Proposed Habitat Types on Montezuma NWR.



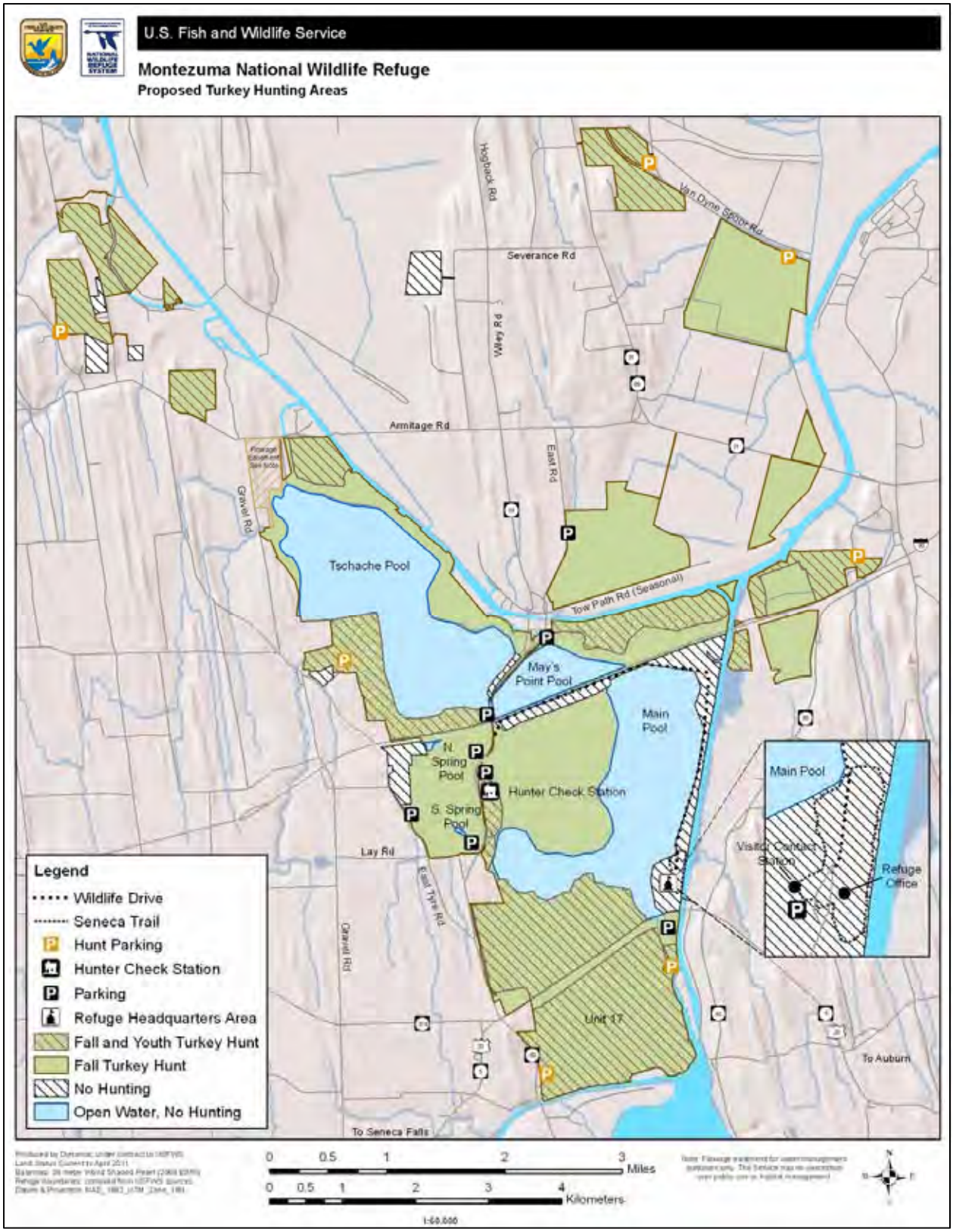
Map 4.2. Proposed Visitor Facilities on Montezuma NWR.



Map 4.3. Proposed Waterfowl Hunting Areas on Montezuma NWR.



Map 4.4. Proposed Deer Hunting Areas on Montezuma NWR.



Map 4.5. Proposed Turkey Hunting Areas on Montezuma NWR.

Chapter 5

John Mosesso/USFWS

Spotted turtle

Consultation and Coordination

- **Introduction**
- **Planning to Protect Land and Resources**
- **Partners Contacted for Refuge Planning**
- **Contact Information**

Introduction

We presented in chapter 1, figure 1.1, the steps in the comprehensive conservation planning process and how it integrates NEPA requirements including public involvement. This chapter describes how we engaged others in developing this CCP and how we plan to continue consulting and coordinating with others in the future. In chronological order, it details our efforts to encourage the involvement of the public and conservation partners, the partnership of other Federal and State agencies, civic, public, and private conservation and education organizations, and user groups. It also identifies who contributed in writing the plan or significantly contributed to its contents.

It does not detail the dozens of informal discussions the refuge manager and his staff have had over the last 2 years where the CCP was a topic of conversation. Those involved a wide range of audiences, including local community leaders and other residents, refuge neighbors, refuge visitors, and other interested individuals. During those discussions, the refuge manager and his staff often would provide an update on our progress and encourage comments and other participation.

According to Service policy, we must review and update our final CCP at least once every 15 years. We may update the plan sooner, if we determine that we need to markedly change management direction or our Director or Regional Director deems it necessary. If so, we will once again announce our revised planning and encourage your participation.

Planning to Protect Land and Resources

January and February 2010
We began the CCP process for Montezuma NWR by developing a draft timeline for completing the CCP, and discussing the current status of the refuge, important issues that need to be addressed in the CCP, and the status and sources of data for the analysis.

March 2010
Our refuge planning began formally on March 3 and 4, 2010, with a conference call between refuge staff, regional office staff, and contractors. Two of the major outcomes of the meeting were revising the timeline for the project and determining when and how we should involve others. We held an internal scoping meeting, site visit, and field review to identify issues, concerns, management ideas, and data sources for the development of the CCP and analysis of management strategies.

April 2010
In April, we established a core team to include refuge managers and staff from the refuge, regional planners, and a representative from NYSDEC at Northern Montezuma Wildlife Management Area. We published and distributed our first CCP newsletter and an issues workbook. These were sent (via email or U.S. Postal Service) to over 430 individuals. This

information was also posted on the CCP Web site: *http://www.fws.gov/northeast/planning/Montezuma/ccphome.html*.

May 2010

On May 7, 2010, we formally initiated our public scoping by publishing a Notice of Intent (NOI) in the *Federal Register* (75 FR 25286) stating we intended to prepare a CCP and EA for Montezuma NWR.

On May 17, 2010, we held a core team meeting to prepare for the public meeting. On May 18, 2010, we held two public scoping meetings at the refuge to identify public issues and concerns, share the draft vision statement and tentative goals, describe the planning process and explain how people could become involved and stay informed about the process. Attendees included 24 members of the public, refuge and regional Service staff, a NYSDEC representative, and the CCP consultant.

On May 24, 2010, invitations to a tribal and agency workshop were sent to over 50 individuals representing 13 Federal, State, local agencies, and tribes. Prior to the workshop, agendas and background information on the refuge were sent to the invitees.

June and July 2010

The Service held a State and Federal Agencies and Tribal scoping meeting at the MAC in Savannah, NY, on June 23, 2010, to seek advice from our State partners, and other technical experts on what resources of conservation concern in the project area should be management priorities. This interagency meeting initiated consultation with our State and Federal partners to identify resources of concern and potential issues that needed to be addressed in the CCP. The following agencies and/or groups were represented: Cayuga County Planning, Friends of the Montezuma Wetlands Complex, National Park Service (Erie Canalway National Heritage Corridor), NYSDEC, New York State Canal Corporation, NYS Thruway Authority, town of Tyre (Code Enforcement), and U.S. Forest Service (Finger Lakes National Forest).

The official public scoping period ended on June 30, 2010, and a summary of public scoping newsletter was posted to the CCP Web site and sent via email and the U.S. Postal Service in July 2010. That newsletter shared our draft vision and goals, provided an update on CCP activities, and summarized the key issues the Service would address in the CCP/EA.

August 2010 through March 2012

From August through December 2010, the planning team worked together to analyze comments and evaluate alternative management options that would help achieve the refuge's purposes and draft goals. Over the course of three workshop-style meetings, the core team developed the basic framework for what is proposed within the draft CCP/EA. We decided we would include a small expansion of the refuge as part of the draft CCP/EA, so we developed and distributed our third CCP newsletter showing what areas we were considering including and to provide opportunities for public comment on this aspect of the plan.

March 2012 through Spring 2013

We completed "Step E: Prepare Draft Plan and NEPA document," by publishing our Notice of Availability (NOA) in the *Federal Register* announcing the release of the draft CCP/EA, preparing and distributing a newsletter, and by distributing the document for public review. During the 30-day period of public review which ended June 21, we held two public meetings at the refuge to obtain comments. We also received comments by regular mail and electronic mail. After the comment period ended, we reviewed and summarized all of the comments we received in order to develop our responses, which are included as appendix K.

We compiled the final CCP, including the final LPP as an appendix, for review by the Regional Chief of Refuges and Regional Solicitor's Office before submitting it to the Regional Director for review and approval. The Regional Director determined that all NEPA compliance requirements and submitted the LPP to the Service's Director for review and approval. The Service's Director approved the LPP in January 2013. The Regional Director determined a Finding of No Significant Impact (FONSI) is appropriate, and has certified that the final CCP meets agency compliance requirements, achieves refuge purposes, and helps fulfill the mission of the Refuge System. With an affirmative FONSI, approval of the LPP, and other positive findings, the Regional Director has approved the final CCP. In spring 2013, we published another NOA in the *Federal Register* to announce the availability of the final plan. That completes "Step F: Prepare and Adopt a Final Plan." We then began "Step G: Implement Plan, Monitor and Evaluate."

Updating Various Constituents on our Progress

The refuge has provided updates on the CCP process to the local community and other constituents through a variety of methods. Following the release of the NOI, the public was informed and public comments were solicited through a variety of additional mechanisms. The CCP process information was posted on the CCP planning Web site. In addition, news releases requesting public input as part of the draft CCP/EA scoping process were sent to 49 local and regional newspapers. A flyer requesting input and advertising the public meetings was made available at the refuge visitor contact station. Lastly, public scoping newsletters and public meeting invitations were sent (via email or U.S. Postal Service) to over 430 individuals (private citizens, interest groups, academia, and representatives of local, State, and Federal agencies, and Tribes, etc.).

Partners Contacted for Refuge Planning

Refuge programs enjoy a great deal of support from outside the Service in many areas, including: conducting biological surveys, enhancing public use and refuge programs, restoring habitat, and protecting land. Our partnerships will continue to expand under the increasing interest in conserving refuge resources. Since May 2010, we have contacted the following partners to apprise them of the planning process and encourage their involvement.

- All County ATV Club
- Amphibian Ark
- Applied Ecological Services, Inc.
- Army Corps of Engineers
- Audubon New York
- Bass Pro Shops
- Biodiversity Research Institute
- Bird Coalition of Rochester
- Canandaigua Lake Duck Hunters, Inc.
- Cayuga County Department of Planning and Economic Development
- Cayuga County Soil and Water Conservation District
- Cayuga County Tourism
- Cayuga Lake Scenic Byway
- Cayuga Lake Watershed Network
- Cayuga Lake Wine Trail
- Cayuga Nation
- Conservation Alliance of New York
- Cornell Lab of Ornithology
- Cornell Plantations
- Cornell University
- Division of Fish, Wildlife, and Marine Resources, NYSDEC Region 8
- Ducks Unlimited, Inc.
- Duke University
- Eaton Bird Society
- Falcon Sportsman's Club
- Finger Lakes Community College
- Finger Lakes Land Trust
- Finger Lakes National Forest
- Friends of the Montezuma Wetlands Complex
- Frontenac Fowlers
- Great Swamp Conservancy
- Green Mountain National Forest
- Institute for Environmental Learning
- Iroquois National Wildlife Refuge
- Jackson Farmers, Inc.
- Lake Plains Waterfowl Association
- McGrath and Associates Carp Angling Services
- Mesa Engineering Incorporated
- Montezuma Audubon Center
- Montezuma Winery
- Morrisville State College
- National Park Service
- National Park Service Erie Canalway National Historic Corridor
- New York Corporate Wetlands Partnership
- New York State Canal Corporation
- New York State Department of Environmental Conservation
- New York State Department of Transportation
- New York State Office of Parks, Recreation, and Historic Preservation
- New York State Thruway Authority
- New York State Trappers Association
- New York Wild
- North West New York Dairy, Livestock, and Field Crops Team
- Onandaga Nation
- Onondaga County Federation of Sportsmens Clubs
- Pheasants Forever
- Rochester Birding Association
- Rochester Institute of Technology
- Rosamond Gifford Zoo
- Seneca County Chamber of Commerce
- Seneca County Federation of Sportsmens Clubs
- Seneca County Planning and Community Development Department

- Seneca Meadows Environmental Education Center
- Seneca Museum of Waterways and Industry
- Seneca Park Zoo
- Seneca-Cayuga Tribe of Oklahoma
- SUNY Brockport
- SUNY Cobleskill
- SUNY College of Environmental Science and Forestry
- SUNY Cortland
- The Nature Conservancy
- The Plantsmen Nursery
- Trout Unlimited
- US Geological Survey
- USDA Forest Service
- USDA Natural Resources Conservation Service
- USFWS Atlantic Coast Joint Venture
- USFWS Ecological Services, New York Field Office
- USFWS Great Lakes Fisheries Resources Office
- Wayne County Planning Department
- White Oak Nursery
- Wild Turkey Federation
- Women's Rights National Historic Park

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Chapter 6

Doug Racine

Cedar waxwing over Knox-Marsellus Marsh

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Doug Racine

Guide by Cell stop near the Esker Brook Trails

Glossary & Acronyms

Glossary

accessibility — the state or quality of being easily approached or entered, particularly as it relates to complying with the Americans With Disabilities Act.

accessible facilities — structures accessible for most people with disabilities without assistance; facilities that meet UFAS standards; ADA-accessible [e.g., parking lots, trails, pathways, ramps, picnic and camping areas, restrooms, boating facilities (docks, piers, gangways), fishing facilities, playgrounds, amphitheaters, exhibits, audiovisual programs, and wayside sites.].

adaptation — adjustment to environmental conditions.

adaptive management — focuses on learning and adapting, through partnerships of managers, scientists, and other stakeholders who learn together how to create and maintain sustainable ecosystems. Adaptive management: helps science managers maintain FLEXIBILITY in their decisions, knowing that uncertainties exist and provides managers the latitude to change direction will improve UNDERSTANDING of ecological systems to achieve management objectives is about taking ACTION to improve progress towards desired outcomes. (Source: Williams, B.K., R.C. Szaro, and C.D. Shapiro. 2007. Adaptive Management: The U.S. Department of the Interior Technical Guide. Adaptive Management Working Group, U.S. Department of the Interior, Washington, DC.)

aggregate — many parts considered together as a whole.

agricultural land — open land, now or recently orchards, pastures, or crops.

alternative — a reasonable way to fix an identified problem or satisfy a stated need [40 CFR 1500.2 (see“management alternative”)].

appropriate use — a proposed or existing use on a refuge that meets at least one of the following three conditions:

1. The use is a wildlife-dependent one.
2. The use contributes to fulfilling the refuge purpose(s), the System mission, or goals or objectives described in a refuge management plan approved after October 9, 1997, the date the National Wildlife Refuge System Improvement Act was signed into law.

3. The use has been determined appropriate as specified in section 1.11 of that act.

approved acquisition boundary — a project boundary that the Director of the U.S. Fish and Wildlife Service approves upon completion of the planning and environmental compliance process. An approved acquisition boundary only designates those lands which the Service has authority to acquire or manage through various agreements. The approval of an acquisition boundary does not grant the Service jurisdiction or control over lands within the boundary, and it does not make lands within the refuge boundary part of the National Wildlife Refuge System. Lands do not become part of the System until the Service buys them or they are placed under an agreement that provides for their management as part of the System.

anadromous fish — from the Greek, literally "up-running;" fish that spend a large portion of their life cycle in the ocean and return to freshwater to breed.

aquatic — growing in, living in, or dependent upon water.

aquatic barrier — any obstruction to fish passage.

area of biological significance — see "special focus area".

avian — of or having to do with birds.

avifauna — all birds of a given region.

barrier — see "aquatic barrier".

basin — the land surrounding and draining into a water body (see "watershed").

benthic — living at, in, or associated with structures on the bottom of a body of water.

best management practices	land management practices that produce desired results. [Note: Usually describing forestry or agricultural practices effective in reducing nonpoint source pollution, like reseeding skidder trails or not storing manure in a flood plain. In their broader sense, practices that benefit target species.]
biological diversity or biodiversity	the variety of life and its processes and includes the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur.
biological integrity	biotic composition, structure, and functioning at genetic, organism, and community levels comparable with historic conditions, including the natural biological processes that shape genomes, organisms and communities.
biodiversity conservation	the goal of conservation biology, which is to retain indefinitely as much of the earth's biodiversity as possible, with emphasis on biotic elements most vulnerable to human impacts.
biota	the plant and animal life of a region.
breeding habitat	habitat used by migratory birds or other animals during the breeding season.
buffer species	alternate prey species exploited by predators when a more preferred prey is in relatively short supply; i.e., if rabbits are scarce, foxes will exploit more abundant rodent populations.
buffer zones	land bordering and protecting critical habitats or water bodies by reducing runoff and nonpoint source pollution loading; areas created or sustained to lessen the negative effects of land development on animals, plants, and their habitats.
candidate species	plants and animals for which the U.S. Fish and Wildlife Service has sufficient information on their biological status and threats to propose them as endangered or threatened under the Endangered Species Act (ESA), but for which development of a proposed listing regulation is precluded by other higher priority listing activities (Source: *http://www.fws.gov/endangered/factsheets/candidate_species.pdf*).

canopy the layer of foliage formed by the crowns of trees in a stand. For stands with trees of different heights, foresters often distinguish among the upper, middle and lower canopy layers. These represent foliage on tall, medium, and short trees. The uppermost layers are called the overstory.

categorical exclusion (CE, CX, CATEX) pursuant to the National Environmental Policy Act (NEPA), a category of Federal agency actions that do not individually or cumulatively have a significant effect on the human environment [40 CFR 1508.4].

CFR the Code of Federal Regulations.

community the locality in which a group of people resides and shares the same government.

community type a particular assemblage of plants and animals, named for its dominant characteristic.

compatible use "The term 'compatible use' means a wildlife-dependent recreational use or any other use of a refuge that, in the sound professional judgment of the Director, will not materially interfere with or detract from the fulfillment of the mission of the System or the purposes of the refuge."—National Wildlife Refuge System Improvement Act of 1997 [Public Law 105-57; 111 Stat. 1253]

compatibility determination a required determination for wildlife-dependent recreational uses or any other public uses of a refuge.

comprehensive conservation plan (CCP) mandated by the 1997 Refuge Improvement Act, a document that provides a description of the desired future conditions and long-range guidance for the project leader to accomplish purposes of the refuge system and the refuge. CCPs establish management direction to achieve refuge purposes. [P.L. 105-57; FWS Manual 602 FW 1.4]

concern see "issue".

conifer a tree or shrub in the phylum Gymnospermae whose seeds are borne in woody cones.

connectivity community occurrences and reserves have permeable boundaries and thus are subject to inflows and outflows from the surrounding

	landscape. Connectivity in the selection and design of nature reserves relates to the ability of species to move across the landscape to meet basic habitat requirements. Natural connecting features within the ecoregion may include river channels, riparian corridors, ridgelines, or migratory pathways.
conservation	managing natural resources to prevent loss or waste. [Note: Management actions may include preservation, restoration, and enhancement.]
conservation agreements	written agreements among two or more parties for the purpose of ensuring the survival and welfare of unlisted species of fish and wildlife or their habitats or to achieve other specified conservation goals. Participants voluntarily commit to specific actions that will remove or reduce threats to those species.
conservation easement	a nonpossessory interest in real property owned by another imposing limitations or affirmative obligations with the purpose of returning or protecting the property's conservation values.
conservation status	assessment of the status of ecological processes and of the viability of species or populations in an ecoregion.
consultation	a type of stakeholder involvement in which decision makers ask stakeholders to comment on proposed decisions or actions.
cool-season grass	an introduced grass for crop and pastureland that grows in spring and fall and is dormant during hot summer months.
cooperative agreement	a usually long-term habitat protection action, which can be modified by either party, in which no property rights are acquired. Lands under a cooperative agreement do not necessarily become part of the National Wildlife Refuge System.
critical habitat	according to U.S. Federal law, the ecosystems upon which endangered and threatened species depend.
cultural resources	these consist of above-ground, architectural resources (structures), below-ground, archaeological resources (Native American or historical sites), artifacts, and other resources to which the criteria of eligibility for listing in the National Register of Historic Places may be applied. These resources are subject to protection under the National Historic

	Preservation Act (NHPA) and other applicable laws and regulations.
cultural resource overview	a comprehensive document prepared for a field office that discusses, among other things, project prehistory and cultural history, the nature and extent of known cultural resources, previous research, management objectives, and archaeological sensitivity (i.e., the likelihood for unrecorded sites) on a refuge-wide basis.[An overview should reference or incorporate information from a field offices background or literature search described in section VIII of the Cultural Resource Management Handbook (FWS Manual 614 FW 1.7).]
database	a collection of data arranged for ease and speed of analysis and retrieval, usually computerized.
dedicated open space	land to be held as open space forever.
degradation	the loss of native species and processes due to human activities such that only certain components of the original biodiversity persist, often including significantly altered natural communities.
designated wilderness area	an area designated by Congress as part of the National Wilderness Preservation System. [FWS Manual 610 FW 1.5 (draft)]
desired future condition	the qualities of an ecosystem or its components that an organization seeks to develop through its decisions and actions.
digitizing	the process of converting maps into geographically referenced electronic files for a geographic information system (GIS).
distribution pattern	the overall pattern of occurrence for a particular conservation target. In ecoregional planning projects, often referred to as the relative proportion of the target's natural range occurring within a given ecoregion (e.g., endemic, limited, widespread, disjunct, peripheral).
disturbance	any relatively discrete event in time that disrupts ecosystem, community, or population structure and changes resources, substrate availability, or the physical environment.

donation a citizen or group may wish to give land or interests in land to the Service for the benefit of wildlife. Aside from the cost factor, these acquisitions are no different than any other means of land acquisition. Gifts and donations have the same planning requirements as purchases.

easement a non-possessory interest in real property that permits the holder to use another's land for a specified purpose. It may also impose limitations or affirmative obligations on the holder of the land subject to the easement. An agreement by which landowners give up or sell one of the rights on their property [e.g., landowners may donate rights-of-way across their properties to allow community members access to a river (see"conservation easement").]

ecological integrity native species populations in their historic variety and numbers naturally interacting in naturally structured biotic communities. For communities, integrity is governed by demographics of component species, intactness of landscape-level ecological processes (e.g., natural fire regime), and intactness of internal community processes (e.g., pollination).

ecological processes a complex mix of interactions among animals, plants, and their environment that ensures maintenance of an ecosystem's full range of biodiversity. Examples include population and predator-prey dynamics, pollination and seed dispersal, nutrient cycling, migration, and dispersal.

ecoregion a territory defined by a combination of biological, social, and geographic criteria, rather than geopolitical considerations; generally, a system of related, interconnected ecosystems.

ecosystem a natural community of organisms interacting with its physical environment, regarded as a unit.

ecotourism visits to an area that maintains and preserves natural resources as a basis for promoting its economic growth and development.

edge effect the phenomenon whereby edge-sensitive species are negatively affected near edges by factors that include edge-generalist species, human influences, and abiotic factors associated with habitat edges. Edge effects are site-specific and factor-specific and have variable depth effects into habitat fragments.

emergent wetland wetlands dominated by erect, rooted, herbaceous plants.

endangered species — a Federal or State listed protected species in danger of extinction throughout all or a significant portion of its range.

endemic — a species or race native to a particular place and found only there.

environment — the sum total of all biological, chemical, and physical factors to which organisms are exposed.

environmental education — curriculum-based education aimed at producing a citizenry that is knowledgeable about the biophysical environment and its associated problems, aware of how to help solve those problems, and motivated to work toward solving them.

environmental health — the composition, structure, and functioning of soil, water, air, and other abiotic features comparable with historic conditions, including the natural abiotic processes that shape the environment.

environmental assessment — (EA) a public document that discusses the purpose and need for an action, its alternatives, and provides sufficient evidence and analysis of its impacts to determine whether to prepare an environmental impact statement or a finding of no significant impact (q.v.) [see also 40 CFR 1508.9].

environmental impact statement — (EIS) a detailed, written analysis of the environmental impacts of a proposed action, adverse effects of the project that cannot be avoided, alternative courses of action, short-term uses of the environment versus the maintenance and enhancement of long-term productivity, and any irreversible and irretrievable commitment of resources [see also 40 CFR 1508.11].

eutrophic — a body of water (lake, pond, etc.) rich in mineral and organic nutrients that support an abundance of plant life, particularly algae, which reduces the dissolved oxygen content and may cause the extinction of other organisms.

evaluation — examination of how an organization’s plans and actions have turned out—and adjusting them for the future.

exemplary community type — an outstanding example of a particular community type.

extinction	the termination of any lineage of organisms, from subspecies to species and higher taxonomic categories from genera to phyla.
extirpated	status of a species or population that has completely vanished from a given area but that continues to exist in some other location.
exotic species	a species that is not native to an area and has been introduced intentionally or unintentionally by humans; not all exotics become successfully established.
fauna	all animal life associated with a given habitat, country, area or period.
Federal land	public land owned by the Federal Government, including national forests, national parks, and national wildlife refuges.
Federal trust resources	a resource that the Government holds in trust for the people through law or administrative act. [Note: A Federal trust resource is one for which responsibility is given wholly or in part to the Federal Government by law or administrative act. Generally, Federal trust resources are nationally or internationally important no matter where they occur, like endangered species or migratory birds and fish that regularly move across state lines. They also include cultural resources protected by Federal historic preservation laws, and nationally important or threatened habitats, notably wetlands, navigable waters, and public lands like state parks and national wildlife refuges.]
federally listed species	a species listed either as endangered, threatened, or a species at risk (formerly, a “candidate species”) under the Endangered Species Act of 1973, as amended.
fee title acquisition	the acquisition of most or all of the rights to a tract of land; a total transfer of property rights with the formal conveyance of a title. While a fee-title acquisition involves most rights to a property, certain rights may be reserved or not purchased, including water rights, mineral rights, or use reservation (e.g., the ability to continue using the land for a specified time period, such as the remainder of the owner’s life).
Finding of No Significant Impact	(FONSI) supported by an environmental assessment, a document that briefly presents why a Federal action will have no significant effect on the human environment, and for which an environmental impact statement, therefore, will not be prepared [40 CFR 1508.13].

fire regime the characteristic frequency, intensity, and spatial distribution of natural fires within a given ecoregion or habitat.

flora all the plants found in a particular place.

floodplain flat or nearly flat land that may be submerged by floodwaters; a plain built up or in the process of being built up by stream deposition.

flyway any one of several established migration routes of birds.

focal species a species that is indicative of particular conditions in a system (ranging from natural to degraded) and used as a surrogate measure for other species of particular conditions. An element of biodiversity selected as a focus for conservation planning or action. The two principal types of targets in Conservancy planning projects are species and ecological communities.

focus areas see “special focus areas”.

forested land land dominated by trees. (For impacts analysis in CCPs, we assume all forested land has the potential for occasional harvesting; we assume forested land owned by timber companies is harvested on a more intensive, regular schedule.)

forested wetlands wetlands dominated by tree.

fracking see “hydraulic fracturing”.

fragmentation the disruption of extensive habitats into isolated and small patches. Fragmentation has two negative components for biota: the loss of total habitat area; and, the creation of smaller, more isolated patches of habitat remaining.

geographic information system (GIS) a computerized system to compile, store, analyze and display geographically referenced information [e.g., GIS can overlay multiple sets of information on the distribution of a variety of biological and physical features.]

grant agreement the legal instrument used when the principal purpose of the transaction is the transfer of money, property, services, or anything of value to a recipient in order to accomplish a public purpose of support or stimulation authorized by Federal statute and substantial involvement

	between the Service and the recipient is not anticipated (see also "cooperative agreement") (Grants and Cooperative Agreement Act at 31 U.S.C. § 6305).
grassland	a habitat type with landscapes dominated by grasses and with biodiversity characterized by species with wide distributions, communities being relatively resilient to short-term disturbances but not to prolonged, intensive burning or grazing. In such systems, larger vertebrates, birds, and invertebrates display extensive movement to track seasonal or patchy resources.
groundwater	water in the ground that is in the zone of saturation, from which wells and springs and groundwater runoff are supplied.
guild	a group of organisms, not necessarily taxonomically related, that are ecologically similar in characteristics such as diet, behavior, or microhabitat preference, or with respect to their ecological role in general.
habitat	the place or type of site where species and species assemblages are typically found and/or successfully reproduce. [Note: An organism's habitat must provide all of the basic requirements for life, and should be free of harmful contaminants.]
habitat block	a landscape-level variable that assesses the number and extent of blocks of contiguous habitat, taking into account size requirements for populations and ecosystems to function naturally. It is measured here by a habitat-dependent and ecoregion size-dependent system.
habitat conservation	protecting an animal or plant habitat to ensure that the use of that habitat by the animal or plant is not altered or reduced.
habitat fragmentation	the breaking up of a specific habitat into smaller, unconnected areas. [Note: A habitat area that is too small may not provide enough space to maintain a breeding population of the species in question.]
historic conditions	the composition, structure and functioning of ecosystems resulting from natural processes that we believe, based on sound professional judgment, were present prior to substantial human-related changes to the landscape.

hydraulic fracturing	the fracturing of rock at depth with fluid pressure. Hydraulic fracturing at depth may be accomplished by pumping water into a well at very high pressures.
hydrologic or flow regime	characteristic fluctuations in river flows.
hydrology	the science of waters of the earth: their occurrences, distributions, and circulations; their physical and chemical properties; and their reactions with the environment, including living beings.
Hydroperiod	the length of time and portion of year the wetland holds ponded water.
impoundment	a body of water, such as a pond, confined by a dam, dike, floodgate, or other barrier, which is used to collect and store water for future use.
indicator species	a species used as a gauge for the condition of a particular habitat, community, or ecosystem. A characteristic or surrogate species for a community or ecosystem.
indigenous	native to an area.
indigenous species	a species that, other than a result as an introduction, historically occurred or currently occurs in a particular ecosystem.
interpretive facilities	structures that provide information about an event, place, or thing by a variety of means, including printed, audiovisual, or multimedia materials [e.g., kiosks that offer printed materials and audiovisuals, signs, and trail heads.]
interpretive materials	any tool used to provide or clarify information, explain events or things, or increase awareness and understanding of the events or things [e.g., printed materials like brochures, maps or curriculum materials; audio/visual materials like video and audio tapes, films, or slides; and, interactive multimedia materials, CD-ROM or other computer technology.]
invasive species	a nonnative species whose introduction causes or is likely to cause economic or environmental harm or harm to human health.
inventory	a list of all the assets and liabilities of an organization, including physical, financial, personnel, and procedural aspects.

invertebrate any animal lacking a backbone or bony segment that encloses the central nerve cord.

issue any unsettled matter that requires a management decision [e.g., a Service initiative, an opportunity, a management problem, a threat to the resources of the unit, a conflict in uses, a public concern, or the presence of an undesirable resource condition.].
[Note: A CCP should document, describe, and analyze issues even if they cannot be resolved during the planning process (FWS Manual 602 FW 1.4).]

land protection plan (LPP) a document that identifies and prioritizes lands for potential Service acquisition from a willing seller, and also describes other methods of providing protection. Landowners within project boundaries will find this document, which is released with environmental assessments, most useful.

land trusts organizations dedicated to conserving land by purchase, donation, or conservation easement from landowners.

landform the physical shape of the land reflecting geologic structure and processes of geomorphology that have sculpted the structure.

landscape a heterogeneous land area composed of a cluster of interacting ecosystems that are repeated in similar form throughout.

landscape approach an approach to managing for species communities that focuses on landscape patterns rather than processes and manages landscape elements to collectively influence groups of species in a desired direction. This approach assumes that by managing a landscape for its components, the naturally occurring species will persist.

large patch communities that form large areas of interrupted cover. Individual occurrences of this community type typically range in size from 20 to 2,000 hectares. Large patch communities are associated with environmental conditions that are more specific than those of matrix communities, and that are less common or less extensive in the landscape. Like matrix communities, large patch communities are also influenced by large-scale processes, but these tend to be modified by specific site features that influence the community.

late-successional species, assemblages, structures, and processes associated with mature natural communities that have not experienced significant disturbance for a long time.

limiting factor an environmental limitation that prevents further population growth.

limits of acceptable change a planning and management framework for establishing and maintaining acceptable and appropriate environmental and social conditions in recreation settings.

management alternative a set of objectives and the strategies needed to accomplish each objective [FWS Manual 602 FW 1.4].

management concern see “issue” and “migratory nongame birds of management concern”.

management opportunity see “issue”.

management strategy a general approach to meeting unit objectives.
[Note: A strategy may be broad, or it may be detailed enough to guide implementation through specific actions, tasks, and projects (FWS Manual 602 FW 1.4).]

marshlands areas interspersed with open water, emergent vegetation (hydrophytes), and terrestrial vegetation (phreatophytes).

matrix forming (or matrix community) communities that form extensive and contiguous cover may be categorized as matrix (or matrix-forming) community types. Matrix communities occur on the most extensive landforms and typically have wide ecological tolerances. They may be characterized by a complex mosaic of successional stages resulting from characteristic disturbance processes (e.g., New England northern hardwood-conifer forests). Individual occurrences of the matrix type typically range in size from 2000 to 500,000 hectares. In a typical ecoregion, the aggregate of all matrix communities covers, or historically covered, as much as 75-80 percent of the natural vegetation of the ecoregion. Matrix community types are often influenced by large-scale processes (e.g., climate patterns, fire), and are important habitat for wide-ranging or large area-dependent fauna, such as large herbivores or birds.

mesic	a type of habitat characterized by a moderate or well-balanced supply of moisture.
mesotrophic	a body of water (lake, pond, etc.) having a moderate amount of plant growth.
Migratory nongame birds of management concern	species of nongame birds that (a) are believed to have undergone significant population declines; (b) have small or restricted populations; or (c) are dependent upon restricted or vulnerable habitats.
mission statement	a succinct statement of the purpose for which the unit was established; its reason for being.
mitigation	actions to compensate for the negative effects of a particular project [e.g., wetland mitigation usually restores or enhances a previously damaged wetland or creates a new wetland.]
monoculture	when one species dominates over all other species. It refers to an area that is covered primarily or solely by one plant species. In agriculture and forestry, it refers to the planting of only one crop type or tree species over a large area. Also used to describe dense stands of invasive or exotic plants that have out-competed and excluded native plants.
mosaic	an interconnected patchwork of distinct vegetation types.
National Environmental Policy Act of 1969	(NEPA) requires all Federal agencies to examine the environmental impacts of their actions, incorporate environmental information, and use public participation in planning and implementing environmental actions. [Federal agencies must integrate NEPA with other planning requirements, and prepare appropriate NEPA documents to facilitate better environmental decision-making (see also 40 CFR 1500).]
National Wildlife Refuge System	(Refuge System) all lands and waters and interests therein administered by the Service as wildlife refuges, wildlife ranges, wildlife management areas, waterfowl production areas, and other areas managed to preserve a national network for the conservation and management of fish, wildlife and plant resources of the U.S., for the benefit of present and future generations (National Wildlife Refuge System Improvement Act, 16 USC 668dd).

native	a species that, other than as a result of an introduction, historically occurred or currently occurs in a particular ecosystem.
native plant	a plant that has grown in the region since the last glaciation, and occurred before European settlement.
natural disturbance event	any natural event that significantly alters the structure, composition, or dynamics of a natural community: e.g., floods, fires, and storms.
natural range of variation	a characteristic range of levels, intensities, and periodicities associated with disturbances, population levels, or frequency in undisturbed habitats or communities.
neotropical migrant	birds, bats, or invertebrates that seasonally migrate between the Nearctic and Neotropics.
nonconsumptive, wildlife-oriented recreation	wildlife observation and photography and environmental education and interpretation (see also “wildlife-oriented recreation”).
nonnative species	see “exotic species”.
nonnative, invasive species	nonnative species that has been introduced into an area and, because of its aggressive growth and lack of natural predators, displace native species.
nonpoint source pollution	a diffuse form of water quality degradation in which wastes are not released at one specific, identifiable point but from a number of points that are spread out and difficult to identify and control.
non-forested wetlands	wetlands dominated by shrubs or emergent vegetation.
nonpoint source	a diffuse form of water quality degradation produced by erosion of land that causes sedimentation of streams, eutrophication from nutrients and pesticides used in agricultural and silvicultural practices, and acid rain resulting from burning fuels that contain sulfur.
Notice of Availability	(NOA) an announcement we publish in the Federal Register that we have prepared an environmental impact statement or an environmental assessment and that it is available for public review and comment.

Notice of Intent	(NOI) an announcement we publish in the Federal Register that we will prepare and review an environmental impact statement [40 CFR 1508.22].
objective	see “unit objective”.
obligate species	a species that must have access to a particular habitat type to persist.
old fields	areas formerly cultivated or grazed, where woody vegetation has begun to invade. [Note: If left undisturbed, old fields will eventually succeed into forest. Many occur at sites marginally suitable for crops or pasture. They vary markedly in the Northeast, depending on soil and land use and management history.]
outdoor education	educational activities that take place in an outdoor setting.
outdoor education project	any cooperative venture that combines financial and staff resources to develop outdoor education activities like labs, field trips, surveys, monitoring, or sampling.
palustrine wetlands	the Palustrine system includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 percent.
Partners for Wildlife Program	a voluntary, cooperative habitat restoration program among the Service, other government agencies, public and private organizations, and private landowners to improve and protect fish and wildlife habitat on private land while leaving it in private ownership.
partnership	a contract or agreement among two or more individuals, groups of individuals, organizations, or agencies, in which each agrees to furnish a part of the capital or some service in kind (e.g., labor) for a mutually beneficial enterprise.
passive management	protecting, monitoring key resources and conducting baseline inventories to improve our knowledge of the ecosystem.
payment in lieu of taxes	The Federal government, similar to states and local municipalities, is exempt from paying taxes. The Refuge Revenue Sharing Act (16 U.S.C. 715s) as amended, provides for payments to local municipalities

	in lieu of taxes, using revenues derived from the sale of products from refuges.
point source	a source of pollution that involves discharge of waste from an identifiable point, such as a smokestack or sewage-treatment plant.
population	an interbreeding group of plants or animals. The entire group of organisms of one species.
population monitoring	assessing the characteristics of populations to ascertain their status and establish trends on their abundance, condition, distribution, or other characteristics.
prescribed fire	the application of fire to wildland fuels, either by natural or intentional ignition, to achieve identified land use objectives [FWS Manual 621 FW 1.7].
priority (general) public use	a compatible wildlife-dependent recreational use of a refuge involving hunting, fishing, wildlife observation and photography, or environmental education and interpretation.
private land	land owned by a private individual or group or non-government organization.
private organization	any non-government organization.
proposed wilderness	an area of the Refuge System that the Secretary of the Interior has recommended to the President for inclusion in the National Wilderness Preservation System.
protection	mechanisms like fee title acquisition, conservation easements, or binding agreements with landowners that ensure land use and land management practices will remain compatible with maintaining species populations at a site (see also “long-term”).
public	individuals, organizations, and non-government groups; officials of Federal, State, and local government agencies; Native American tribes, and foreign nations—includes anyone outside the core planning team, those who may or may not have indicated an interest in the issues, and those who do or do not realize that our decisions may affect them.

public involvement offering an opportunity to interested individuals and organizations whom our actions or policies may affect to become informed; soliciting their opinions. We thoroughly study public input, and give it thoughtful consideration in shaping decisions about managing refuges.

public involvement plan long-term guidance for involving the public in the comprehensive planning process.

public land land owned by the local, State, or Federal Government.

rare species species identified for special management emphasis because of their uncommon occurrence within a watershed.

rare community types plant community types classified as rare by any state program; includes exemplary community types.

recharge refers to water entering an underground aquifer through faults, fractures, or direct absorption.

recommended wilderness areas studied and found suitable for wilderness designation by both the Director (FWS) and Secretary (DOI), and recommended by the President to Congress for inclusion in the National Wilderness System [FWS Manual 610 FW 1.5 (draft)].

Record of Decision (ROD) a concise public record of a decision by a Federal agency pursuant to NEPA.
[Note: A ROD includes:

- The decision.
- All the alternatives considered.
- The environmentally preferable alternative.
- A summary of monitoring and enforcement, where applicable, for any mitigation.
- Whether all practical means have been adopted to avoid or minimize environmental harm from the alternative selected (or if not, why not).]

refuge goals "descriptive, open-ended, and often broad statements of desired future conditions that convey a purpose but do not define measurable units" (Writing Refuge Management Goals and Objectives: A Handbook, FWS January 2004).

refuge purposes "the terms 'purposes of the refuge' and 'purposes of each refuge' mean

	the purposes specified in or derived from the law, proclamation, executive order, agreement, public land order, donation document, or administrative memorandum establishing, authorizing, or expanding a refuge, refuge unit, or refuge subunit" (National Wildlife Refuge System Improvement Act of 1997).
refuge lands	lands in which the Service holds full interest in fee title or partial interest like an easement.
regenerating	establishing a new age class. Silviculture does this in a way that controls the species composition, seedling density, and other characteristics consistent with the landowner's objectives.
relatively intact	the conservation status category indicating the least possible disruption of ecosystem processes. Natural communities are largely intact, with species and ecosystem processes occurring within their natural ranges of variation.
relatively stable	the conservation status category between vulnerable and relatively intact in which extensive areas of intact habitat remain, but local species declines and disruptions of ecological processes have occurred.
restoration	management of a disturbed or degraded habitat that results in the recovery of its original state [e.g., restoration may involve planting native grasses and forbs, removing shrubs, prescribed burning, or reestablishing habitat for native plants and animals on degraded grassland.]
riparian	referring to the interface between freshwater habitats and the terrestrial landscape.
riparian forest	forested land along a stream or river.
riparian habitat	habitat along the banks of a stream or river [see also note above].
riverine	within the active channel of a river or stream.
riverine wetlands	generally, all the wetlands and deepwater habitats occurring within a freshwater river channel not dominated by trees, shrubs, or persistent emergent.

rotation the period of time from establishment of an even-aged stand until its maturity.

runoff water from rain, melted snow, or agricultural or landscape irrigation that flows over a land surface into a water body (see also “urban runoff”).

scale the magnitude of a region or process. Refers to both spatial size, for example, a (relatively small-scale) patch or a (relatively large-scale) landscape; and a temporal rate—for example, (relatively rapid) ecological succession or (relatively slow) evolutionary speciation.

seral stage the series of transitory plant communities that develop during ecological succession from bare ground to the climax stage.

Service presence Service programs and facilities that it directs or shares with other organizations; public awareness of the Service as a sole or cooperative provider of programs and facilities.

shale play a geologic formation of shale that has the potential to allow commercial extraction of oil and gas resources.

shrublands habitats dominated by various species of shrubs, often with many grasses and forbs.

silviculture tending and regenerating forest stands to realize sought after benefits and sustain them over time.

site improvement any activity that changes the condition of an existing site to better interpret events, places, or things related to a refuge [e.g., improving safety and access, replacing nonnative with native plants, refurbishing footbridges and trailways, and renovating or expanding exhibits.]

small patch communities that form small, discrete areas of vegetation cover. Individual occurrences of this community type typically range in size from 1 to 50 hectares. Small patch communities occur in very specific ecological settings, such as on specialized landform types or in unusual microhabitats. The specialized conditions of small patch communities, however, are often dependent on the maintenance of ecological processes in the surrounding matrix and large patch communities. In many ecoregions, small patch communities contain a disproportionately large percentage of the total flora, and also support a

specific and restricted set of associated fauna (e.g., invertebrates or herpetofauna) dependent on specialized conditions.

source population a population in a high-quality habitat where the birth rate greatly exceeds the death rate, and the excess individuals emigrate.

spatial frame within an ecoregion, natural terrestrial communities may be categorized into three functional groups on the basis of their current or historical patterns of occurrence, as correlated with the distribution and extent of landscape features and ecological processes. These groups are identified as matrix communities, large patch communities, and small patch communities.

special focus area an area of high biological value.
[Note: We normally direct most of our resources to SFAs that were delineated because of: the presence of Federal-listed endangered and threatened species, species at risk (formerly, "candidate species"), rare species, concentrations of migrating or wintering waterfowl, or shorebird stopover habitat; their importance as migrant landbird stopover or breeding habitat; the presence of unique or rare communities; or the presence of important fish habitat.]

species the basic category of biological classification intended to designate a single kind of animal or plant. Any variation among the individuals may be regarded as not affecting the essential sameness, which distinguishes them from all other organisms.

Species assemblage the combination of particular species that occur together in a specific location and have a reasonable opportunity to interact with one another.

species at risk a general term referring to species listed under the Federal Endangered Species Act (ESA), as well as for unlisted species that are declining in population. Sometimes the term is used interchangeably with "species of concern." Such species, unless already listed under ESA, receive no legal protection and use of the term does not necessarily imply that a species will eventually be proposed for listing (Source: *http://www.fws.gov/endangered/glossary.html*).

species of concern an informal term referring to a species that might be in need of conservation action. This may range from a need for periodic monitoring of populations and threats to the species and its habitat, to the necessity for listing as threatened or endangered under the

	Endangered Species Act. Such species receive no legal protection and use of the term does not necessarily imply that a species will eventually be proposed for listing (Source: *http://www.fws.gov/endangered/glossary.html*).
species diversity	usually synonymous with "species richness," but may also include the proportional distribution of species.
species richness	a simple measure of species diversity calculated as the total number of species in a habitat or community.
stand	an area of trees with a common set of conditions (e.g., based on age, density, species composition, or other features) that allow a single management treatment throughout .
state agencies	natural resource agencies of state governments.
state land	state-owned public land.
state-listed species	see also "federally listed species".
step-down management plan	a plan for dealing with specific refuge management subjects, strategies, and schedules, e.g., cropland, wilderness, and fire [FWS Manual 602 FW 1.4].
stopover site	habitat where birds rest and feed during migration.
strategy	a specific action, tool, technique, or combination of actions, tools, and techniques for meeting unit objectives.
strategic management	the continual process of inventorying, choosing, implementing, and evaluating what an organization should be doing.
succession	the natural, sequential change of species composition of a community in a given area.
surface water	all waters whose surface is naturally exposed to the atmosphere, or wells or other collectors directly influenced by surface water.
sustainable development	the attempts to meet economic objectives in ways that do not degrade the underlying environmental support system. Note that there is

	considerable debate over the meaning of this term - we define it as "human activities conducted in a manner that respects the intrinsic value of the natural world, the role of the natural world in human well-being, and the need for humans to live on the income from nature's capital rather than the capital itself."
terrestrial	living on land.
territory	an area over which an animal or group of animals establishes jurisdiction.
thinning	reducing the density of trees in a stand primarily to improve the growth and condition of residual trees and prevent mortality. The term describes treatments in immature even-aged stands that do not attempt to establish regeneration.
threatened species	a Federal listed, protected species that is likely to become an endangered species in all or a significant portion of its range.
tiering	incorporating by reference the general discussions of broad topics in environmental impact statements into narrower statements of environmental analysis by focusing on specific issues [40 CFR 1508.28].
tributary	a stream or river that flows into a larger stream, river, or lake, feeding it water.
turbidity	refers to the extent to which light penetrates a body of water. Turbid waters are those that do not generally support net growth of photo-synthetic organisms.
understory	the lower layer of vegetation in a stand, which may include short trees, shrubs, and herbaceous plants.
uneven-aged	a stand having three or more age classes of trees with distinctly different ages.
unfragmented habitat	large, unbroken blocks of a particular type of habitat.
unit objective	desired conditions that must be accomplished to achieve a desired outcome.

[Note: Objectives are the basis for determining management strategies, monitoring refuge accomplishments, and measuring their success. Objectives should be attainable, time-specific, and stated quantitatively or qualitatively (FWS Manual 602 FW 1.4).]

upland dry ground (i.e., other than wetlands).

urban runoff water from rain, melted snow, or landscape irrigation flowing from city streets and domestic or commercial properties that may carry pollutants into a sewer system or water body.

vision statement a concise statement of what the unit could achieve in the next 10 to 15 years.

watchable wildlife program [Note: A watchable wildlife program is one that helps maintain viable populations of all native fish and wildlife species by building an active, well informed constituency for conservation. Watchable wildlife programs are tools for meeting wildlife conservation goals while at the same time fulfilling public demand for wildlife-dependent recreational activities (other than sport hunting, sport fishing, or trapping).]

watershed the geographic area within which water drains into a particular river, stream, or body of water. A watershed includes both the land and the body of water into which the land drains.

watershed networks systems for sharing educational information, like curriculum development projects, student activities, and ongoing data gathering; a combination of telecommunications and real-life exchanges of information.

wetlands lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. These areas are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted to life in saturated soil conditions.

wilderness study areas lands and waters identified by inventory as meeting the definition of wilderness and being evaluated for a recommendation they be included in the Wilderness System (see also “recommended wilderness”). [Note: A wilderness study area must meet these criteria:

1. Generally appears to have been affected primarily by the forces of

nature, with the imprint of man's work substantially unnoticeable.
2. Has outstanding opportunities for solitude or a primitive and unconfined type of recreation.
3. Has at least 5,000 contiguous, roadless acres, or sufficient size to make practicable its preservation and use in an unimpaired condition. (FWS Manual 610 FW 1.5 (draft)).]

wilderness — see also "designated wilderness".

wildfire — a free-burning fire requiring a suppression response; all fire other than prescribed fire that occurs on wildlands [FWS Manual 621 FW 1.7].

wildland fire — every wildland fire is either a wildfire or a prescribed fire [FWS Manual 621 FW 1.3].

wildlife-dependent recreational use — a use of a national wildlife refuge involving hunting, fishing, wildlife observation and photography, or environmental education and interpretation (National Wildlife Refuge System Administration Act of 1966).

wildlife management — manipulating wildlife populations, either directly by regulating the numbers, ages, and sex ratios harvested, or indirectly by providing favorable habitat conditions and alleviating limiting factors.

wildlife-oriented recreation — recreational activities in which wildlife is the focus of the experience. ["The terms 'wildlife-dependent recreation' and 'wildlife-dependent recreational use' mean a use of a refuge involving hunting, fishing, wildlife observation and photography, or environmental education and interpretation."—National Wildlife Refuge System Improvement Act of 1997]

Acronyms

ACRONYM	FULL NAME
ACJV	Atlantic Coast Joint Venture
ADA	Americans with Disabilities Act
AHWP	Annual Habitat Work Plan
AOI	Area of Interest
AP	Atlantic Population (Canada geese)
ARPA	Archeological Resources Protection Act of 1960
ATV	All-terrain vehicle
BBS	Breeding Bird Survey
BCC	Birds of Conservation Concern
BCR	Bird Conservation Region
BIDEH	Biological integrity, diversity, and environmental health
BMP	Best management practice
CAA	Clean Air Act
CATEX	Categorical exclusion
CCC	Civilian Conservation Corps
CCMP	Comprehensive Conservation and Management Plan
CCP	Comprehensive Conservation Plan
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CWCS	Comprehensive Wildlife Conservation Strategy
CWD	Chronic wasting disease
DDT	**D**ichloro**d**iphenyl**t**richloroethane (pesticide)
DMAP	Deer Management Assistance Program
DU	Ducks Unlimited
EA	Environmental assessment
EE	Environmental education
EIA	U.S. Energy Information Administration
EPA	U.S. Environmental Protection Agency
ESA	Federal Endangered Species Act
FmHA	Farmers Home Administration
FONSI	Finding of No Significant Impact
FTE	Full time equivalent
FY	Fiscal year

ACRONYM	FULL NAME
GAO	U.S. General Accounting Office
GHG	Greenhouse gas
GIS	Geographic information system
GTR	Green tree reservoir
HMP	Habitat management plan
IBA	Important Bird Area
IMP	Inventory and monitoring plan
IPCC	Intergovernmental Panel on Climate Change
IPM	Integrated pest management
LCC	Landscape Conservation Cooperative
LE	Law enforcement
LWCF	Land and Water Conservation Fund
LPP	Land protection plan
MAC	Montezuma Audubon Center
MANEM	Mid-Atlantic/New England/Maritimes region
MAPS	Monitoring avian productivity and survivorship
MARSH!	Montezuma Alliance for the Restoration of Species and Habitats
MBCF	Migratory Bird Conservation Fund
MBTA	Migratory Bird Treaty Act
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MWC	Montezuma Wetlands Complex
NABCI	North American Bird Conservation Initiative
NAI	National Association for Interpretation
NAS	National Audubon Society
NAWCP	North American Waterbird Conservation Plan
NAWMP	North American Waterfowl Management Plan
NEPA	National Environmental Policy Act of 1969
NGO	Non-governmental organization
NHCR	National State Agency Herpetological Conservation Report
NHPA	National Historic Preservation Act of 1966
NNL	National Natural Landmark
NOA	Federal Register Notice of Availability
NOAA	National Oceanic and Atmospheric Administration

ACRONYM	FULL NAME
NOI	Federal Register Notice of Intent
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NWR	National wildlife refuge
NWPS	National Wilderness Preservation System
NWRS	National Wildlife Refuge System
NYDEC	New York Department of Environmental Conservation
NYDOT	New York Department of Transportation
NYES	New York Ecological Services
NYS	New York State
NYSWAP	New York State Wildlife Action Plan
ORV	Off-road vehicle
PCB	Polychlorinated biphenyl (pesticide)
PEB	Proposed Expansion Boundary
PIF	Partners in Flight
RAPP	Refuge Annual Performance Plan
RHPO	Regional Historic Preservation Office
RNA	Research Natural Area
RONS	Refuge Operations Needs System
SAMMS	Service Assist Maintenance Management System
SCA	Student Conservation Association
SCEP	Student Career Experience Program
SELO	Southeast Lake Ontario
SGCN	Species of Greatest Conservation Need
STEP	Student Temporary Employment Program
SHC	Strategic Habitat Conservation
SHPO	State Historic Preservation Office
SUP	Special use permit
SWG	State Wildlife Grant Programs
THPO	Tribal Historic Preservation Officers
TNC	The Nature Conservancy
UMGL	Upper Midwest/Great Lakes
UMVGL	Upper Mississippi Valley/Great Lakes
USDA	U.S. Department of Agriculture

ACRONYM	FULL NAME
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WMA	Wildlife Management Area

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American coots on refuge impoundment

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Appendix A

Doug Racine

Northern harrier

Species and Habitats of Conservation Concern at Montezuma National Wildlife Refuge

Resources of Concern

Given the multitude of purposes, mandates, policies, regional, and national plans that can apply to a refuge, there is a need to identify the resources of concern and then prioritize those resources that the refuge is best suited to focus on in its management strategies. The comprehensive list of resources of concern (table A.1) outlined in this section was derived from those resources identified in the Habitat Management Plan (USFWS 2008) and updated with more recent information available during the development of this draft Comprehensive Conservation Plan (CCP).

Table A.1. Comprehensive List of Resources of Concern for Montezuma NWR.

Species*	Seasons on Refuge[1]	Federal T&E[2]	New York T&E[3]	USFWS BCC Region 5[4]	USFWS BCC National[4]	BCR 13[5]	Partners in Flight[6]	Shorebird Plan-Atlantic Flyway[7]	Waterbird Plan[8]	Waterfowl Plan[9]	NY Comprehensive Wildlife Conservation Strategy Priorities[10]	NY NHP S Rank
WATERBIRDS												
American bittern	B-U, M-O			X		H			H		X	
Black-crowned night heron	B-U, M-U					M			M		X	
Black tern	B-U, M-U		E			M			M		X	S2
Common moorhen	B-C, M-C								M			
Common tern	B-O, M-O		T			H			L		X	
King rail	B-R, M-R		T			H	IB		H		X	
Least bittern	B-O, M-0		T	X		M			H		X	
Pied-billed grebe	B-C, M-C		T	X		M			H		X	S3
Sora	B-U, M-U								H			
Virginia rail	B-C, M-C, W-R					M			M			
WATERFOWL												
American black duck	B-C, M-A, W-C					H H	IB			H (H)	X	
Blue-winged teal	B-C, M-C					M				MH (ML)		
Canada goose Atl/SJBP	M-A, W-C					H H				(H)	X	
Canvasback	B-R, M-C, W-R					H					X	
Common goldeneye	M-U					H H						
Common merganser	M-C,W-U					M				L (L)		
Greater scaup	M-C					H				(H)	X	
Green-winged teal	M-C, B-O									ML		

Species*	Seasons on Refuge[1]	Federal T&E[2]	New York T&E[3]	USFWS BCC Region 5[4]	USFWS BCC National[4]	BCR 13[5]	Partners in Flight[6]	Shorebird Plan-Atlantic Flyway[7]	Waterbird Plan[8]	Waterfowl Plan[9]	NY Comprehensive Wildlife Conservation Strategy Priorities[10]	NY NHP S Rank
										(ML)		
Hooded merganser	M-C, B-U, W-O									H (L)		
Lesser scaup	M-C					H H				(H)	X	
Long-tailed duck	M-R					H H					X	
Mallard	M-A, B-C, W-C					M				H (M)	X	
Northern pintail	M-C, B-O					H				M (M)	X	
Redhead	M-C, B-O					M						
Ruddy duck	M-C, B-O										X	
Tundra swan	M-C,W-C					H				(H)		
Wood duck	M-C, B-C					H				H (H)	X	
SHOREBIRDS												
American golden plover	M-U					H		M C			X	
American woodcock	M-C, B-C					H	IA	HC			X	
Black-bellied plover	M-U					M		M C			X	
Buff-breasted sandpiper	M-O			X	X	H		HC			X	
Dunlin	M-C				X	M		M C			X	
Greater yellowlegs	M-C					M		HC			X	
Hudsonian godwit	M-R			X	X	M		M C			X	
Least sandpiper	M-C					M		M C				
Lesser yellowlegs	M-C			X	X			LC				
Pectoral sandpiper	M-C					M		LC				
Red knot	M-U			X	X	M		M C			X	
Sanderling	M-U					M		M C			X	
Semipalmated sandpiper	M-C			X	X	M		M C			X	
Short-billed dowitcher	M-C			X	X	H		HC			X	
Solitary sandpiper	M-U			X	X	H		M C				

Species*	Seasons on Refuge[1]	Federal T&E[2]	New York T&E[3]	USFWS BCC Region 5[4]	USFWS BCC National[4]	BCR 13[5]	Partners in Flight[6]	Shorebird Plan-Atlantic Flyway[7]	Waterbird Plan[8]	Waterfowl Plan[9]	NY Comprehensive Wildlife Conservation Strategy Priorities[10]	NY NHP S Rank
Upland sandpiper	M-R, B-R		T	X	X	M	IB	HC			X	
Whimbrel	M-R			X	X	M		HC				
Wilson's phalarope	M-U					M		HC				
Wilson's snipe	M-U, B-U					M		MC				
LANDBIRDS												
Bald eagle	B-C, M-C, W-C		T	X	X						X	S2 S3
Baltimore oriole	M-C, B-C					M	IIA					
Bay-breasted warbler	M-C			X	X	M						
Black-billed cuckoo	M-O, B-O					H	IIA				X	
Black-throated blue warbler	M-C					M						
Blue-winged warbler	M-U, B-O			X	X	H	IB				X	
Bobolink	M-U, B-U					M	IIA				X	
Brown thrasher	M-O, B-O					H					X	
Canada warbler	M-U			X	X	M	IB				X	
Cerulean warbler	M-C, B-C		SC	X	X	HH	IB				X	
Chimney swift	M-U, B-U					M						
Common nighthawk	M-O										X	
Cooper's hawk	M-U, B-U, W-U		SC								X	
Eastern meadowlark	M-U, B-R, W-R					M					X	
Field sparrow	M-U, B-U, W-R					H	IIA					
Golden-winged warbler	M-O			X	X	HH	IB				X	
Grasshopper sparrow	M-R, B-R					M	IIC				X	
Henslow's sparrow	M-R, B-R		T	X	X	HH	IB				X	
Horned lark	M-O, B-O, W-O		SC								X	
Long-eared owl	M-R,W-R										X	
Northern flicker	M-C, B-C, W-U					M						

Species*	Seasons on Refuge[1]	Federal T&E[2]	New York T&E[3]	USFWS BCC Region 5[4]	USFWS BCC National[4]	BCR 13[5]	Partners in Flight[6]	Shorebird Plan-Atlantic Flyway[7]	Waterbird Plan[8]	Waterfowl Plan[9]	NY Comprehensive Wildlife Conservation Strategy Priorities[10]	NY NHP S Rank
Northern goshawk	M-R,W-R										X	
Northern harrier	M-C, B-U, W-U		T			M					X	S3
Osprey	M-C, B-C										X	
Prairie warbler	M-R			X	X	M						
Peregrine falcon	M-O		E	X	X						X	
Prothonotary warbler	M-R, B-R				X	M	IB				X	
Red-headed woodpecker	M-O			X	X	M	IB				X	
Red-shouldered hawk	M-O		SC								X	
Rose-breasted grosbeak	M-C, B-C					M	IIB					
Rusty blackbird	M-U			X	X	M					X	
Scarlet tanager	M-C, B-C					M	IIA				X	
Sedge wren	M-R, B-R		T	X			IIC				X	S3
Sharp-shinned hawk	M-U, B-U, W-U		SC								X	
Short-eared owl	M-R,W-R		E	X	X	M	IB				X	S2
Song sparrow	M-C, B-C, W-O					M						
Vesper sparrow	M-O, B-O		SC								X	
Whip-poor-will	M-R			X							X	
Willow flycatcher	M-C, B-C				X	M	IA				X	
Wood thrush	M-C, B-C			X	X	H	IA				X	
Yellow-breasted chat	M-R										X	
MAMMALS												
Eastern red bat											X	
Eastern small-footed bat											X	
Hoary bat											X	
Indiana bat		E	E								X	
River otter											X	
Silver-haired bat											X	
AMPHIBIANS[11]												
Blue-spotted salamander											X	

Species*	Seasons on Refuge[1]	Federal T&E[2]	New York T&E[3]	USFWS BCC Region 5[4]	USFWS BCC National[4]	BCR 13[5]	Partners in Flight[6]	Shorebird Plan-Atlantic Flyway[7]	Waterbird Plan[8]	Waterfowl Plan[9]	NY Comprehensive Wildlife Conservation Strategy Priorities[10]	NY NHP S Rank
Common mudpuppy											X	
Jefferson salamander											X	
Western chorus frog											X	
REPTILES												
Spotted turtle			SC								X	
Wood turtle			SC								X	
FISH												
Lake sturgeon			T								X	
INVERTEBRATES												
Blue-tipped dancer												S1
PLANTS												
Golden dock			E									S1
Holly-leaved naiad			E									S1
ECOLOGICAL COMMUNITIES												
Floodplain forest												S2 S3
Inland salt marsh												S1

[1]Seasons on the refuge: B=Breeding, W=Wintering, M=Migration, A=Abundant, C=Common, U=Uncommon, O=Occasional, R=Rare.
[2]Federal T&E = Federal Endangered Species List: T=Threatened, E=Endangered, C=Candidate.
[3]State T&E = State of New York Threatened and Endangered Species List: T=Threatened, E=Endangered, SC=Special Concern.
[4]U.S. Fish and Wildlife Service Division of Migratory Birds. Birds of Conservation Concern for Region 5 (Northeast) December 2008.
[5]BCR 13 = Bird Conservation Region 13: Lower Great Lakes/St. Lawrence Plain. HH=Highest Priority, H=High Priority, M=Medium Priority (ACJV 2007).
[6]Partners in Flight Landbird Priorities for the Lower Great Lakes Plain (Dettmers and Rosenberg 2003). IA=High continental concern and high regional responsibility; IB=High continental concern and low regional responsibility; IIA=High regional concern; IIB=high regional responsibility; IIC=High regional threats.
[7]Upper Mississippi Valley/Great Lakes Regional Shorebird Conservation Plan (de Szalay et al. 2000). HI=highly imperiled species; HC=species of high concern; MC=species of moderate concern; LC=species of low concern
[8]Upper Mississippi Valley/Great Lakes Watershed Conservation Plan. Priorities: HI=Highly Imperiled; H=High; M=Moderate; L=Low; NR=Not at Risk; TD=To be Determined.
[9]North American Waterfowl Management Plan: Atlantic Coast Joint Venture Waterfowl Implementation Plan Revision, June 2005 Priorities: H=High; MH=Moderately High; M=Moderate; ML=Moderately Low; L=Low. Example: H(H) = Breeding (Nonbreeding).
[10]New York State Comprehensive Wildlife Conservation Strategy (2005). X=Species of greatest conservation concern
[11]Presence on refuge based on information from the New York State Amphibian and Reptile Atlas Project 1990-1999.

Priority Resources of Concern

A focus of this CCP is to provide guidance in prioritizing management strategies for species and their associated habitats. The comprehensive list of resources of concern (table A.1) contains a large number of species with a broad array of habitat needs. To guide us in prioritizing this list and selecting focal species, we used criteria listed in the draft handbook for identifying refuge resources of concern and management priorities (USFWS 2009) as follows:

- Species were rejected if they cannot be supported by current or restorable refuge capabilities.
- Species were rejected if they do not respond well to management.
- Species were rejected if they do not represent the condition of larger natural communities.
- Species selected were listed in the most conservation plans for a particular habitat type.
- The BCR 13 plan and NY State listings (e.g., endangered, threatened, special concern, or species of greatest conservation need) were particularly useful.
- Only one species per habitat type and season was selected (all forest types were combined with two focal species assigned).

Table A.2. Focal Species by Habitat, Required Habitat Structure, and other Benefiting Species of Concern on Montezuma NWR.

Habitat Type	Focal Species	Habitat Structure	Other Benefiting Species of Concern
Freshwater Emergent Wetlands	American black duck	Shallow, emergent wetlands of reeds, sedges, pondweed, floating-leaved plants, that are rich in invertebrates (Longcore et al. 2000). Present on refuge year-round.	American bittern, black-crowned night heron, black tern, common tern, horned grebe, king rail, least bittern, Virginia rail, blue-winged teal, Canada goose Atl/SJBP, canvasback, common goldeneye, common merganser, greater scaup, green-winged teal, hooded merganser, lesser scaup, long-tailed duck, mallard, northern pintail, redhead, ruddy duck, tundra swan, bald eagle, northern harrier, osprey, peregrine falcon, short-eared owl, river otter, spotted turtle.
	Pied-billed grebe*	Semi-permanent hemimarsh (emergent vegetation and open water mix ~ 50:50) with water depth > 10 in. > 0.2 ha (0.5 acre). (Wires et al. 2010).	

Habitat Type	Focal Species	Habitat Structure	Other Benefiting Species of Concern
Inland Mudflats/ Shallow Water	Short-billed dowitcher	Mostly open water < 2 in. deep with some mixed emergent vegetation (de Szalay et al. 2000). At Montezuma, migrates through in April/May with a peek in the last two weeks of May, also migrates through in low numbers in July, and from August to September with a peak in the last week of August (*www.ebird.org*).	Blue-winged teal, Canada goose Atl/SJBP, green-winged teal, mallard, northern pintail, American golden-plover, black-bellied plover, buff-breasted sandpiper, dunlin, greater yellowlegs, Hudsonian godwit, least sandpiper, lesser yellowlegs, pectoral sandpiper, red knot, sanderling, semipalmated sandpiper, short-billed dowitcher, solitary sandpiper, whimbrel, Wilson's phalarope, Wilson's snipe, bald eagle, peregrine falcon.
Forest	Cerulean warbler	In BCR 13, breed in lake plain bottomland and riparian forests characterized by sycamore, cottonwood, silver, and red maple. Also associated with mature, late-successional forests (ACJV 2007). The MWC is an important breeding area.	American black duck, black-crowned night-heron, common goldeneye, hooded merganser, wood duck, American woodcock, bald eagle, Baltimore oriole, bay-breasted warbler, black-billed cuckoo, black-throated blue warbler, brown thrasher, Canada warbler, Cooper's hawk, prothonotary warbler, rose-breasted grosbeak, red-headed woodpecker, red-shouldered hawk, rose-breasted grosbeak, rusty blackbird, scarlet tanager, sharp-shinned hawk, willow flycatcher, Indiana bat, silver-haired bat, spotted turtle, wood turtle, blue-spotted salamander, Jefferson salamander, river otter
	Wood thrush	Typically associated with mature, late successional forests. May prefer edges and forest patches in proximity to openings (ACJV 2007).	
Scrub/Shrub	Blue-winged warbler	Both upland and wetland old, brushy fields with a well-developed shrub component (ACJV 2007). Present on the refuge during migration and breeding seasons.	American black duck, American woodcock, Baltimore oriole, brown thrasher, field sparrow, golden-winged warbler, northern flicker, red-headed woodpecker, song sparrow, willow flycatcher, yellow-breasted chat spotted turtle, western chorus frog
Grassland	Short-eared owl	Present on the refuge in winter. Short-eared owls generally require large expanses of open land with low vegetation, such as grasslands or low-structured open shrublands, for hunting during winter (Holt and Leasure 1993). Vole abundance has been linked directly to habitat utilization (Dechant et al.1998).	Eastern meadowlark, grasshopper sparrow, Henslow's sparrow, horned lark, northern harrier, sedge wren, song sparrow, upland sandpiper, vesper sparrow, willow flycatcher, spotted turtle, western chorus frog

Habitat Type	Focal Species	Habitat Structure	Other Benefiting Species of Concern
	Bobolink	Fields > 25 acres with medium to low vegetation density, a 50:50 mix of grasses and forbs, very few shrubs (< 1 percent), overall vegetation height of 11 to 16 in., and leaf litter 1 to 2 in. (Morgan and Burger 2008). Present on the refuge during migration and breeding seasons.	

*Four species were closely compared for marshbird breeding habitat: American bittern, least bittern, pied-billed grebe, and black tern. All of these species are listed in at least four of eight conservation plans/lists. All are listed in the New York State CWCS and the BCR 13 plan. Least bittern and black tern were not selected because they occur in low abundances in BCR 13 relative to other BCRs. The pied-billed grebe was selected because it is more easily detected and currently more abundant than the American bittern on the refuge so may be more useful as an indicator species for the entire group as all four species use similar habitats. Also, the pied-billed grebe is believed to be more vulnerable to climate change than the American bittern so monitoring this species may be more useful for monitoring climate change impacts on the refuge.

High and Moderate Priority Habitat Types

Refuge management is most often focused on restoring, managing or maintaining habitats, or certain habitat conditions, to benefit a suite of plants and animals associated with a particular habitat. Under Montezuma NWR's Habitat Management Plan (USFWS 2008), high and moderate priority habitats were identified based on several factors including: site capability, historic conditions, current vegetation, the prevalence of that habitat type across the landscape, and the conservation needs of wildlife associates. As part of this process limiting factors were also identified that affect the refuge's ability to maintain these habitats (see table A.3).

Table A.3. High and Moderate Priority Habitats on Montezuma NWR in Priority Order.

High Priority Habitat Types	Reason for Selecting as a High Priority	Limiting Factors for Maintaining this Habitat
Freshwater emergent marsh	The refuge has over 4,000 acres of this habitat within 13 manageable impoundments. More than 600,000 migrating ducks and geese feed and rest in these areas annually. American and least bitterns, black tern, pied-billed grebe, and Virginia rail are priority species in BCR 13 that nest here. These are foraging areas for bald eagles and migrating waterfowl during drawdowns. Emergent marsh is the habitat type containing the most priority species listed in the BCR 13 plan. Emergent marsh is uncommon regionally and requires active management to maintain This habitat also provides valuable breeding ground for other wildlife and numerous ecological benefits.	Natural hydrology has been altered. Requires water level manipulation; controlling dense monotypic stands of cattails; affected by weather; requires maintenance of dikes and water control structures; inflow of water and undesirable species from canal system and contaminants are of concern. Requires muskrat control.
Inland mudflats	The refuge is identified as a critical inland area for shorebird migration including many BCR 13 priority species. Mudflats are uncommon	Requires water level manipulation to remove or prohibit vegetative growth. Other limiting factors include:

High Priority Habitat Types	Reason for Selecting as a High Priority	Limiting Factors for Maintaining this Habitat
	natural occurrences regionally but can be created in impoundments.	contaminants, invasive species, flooding and drought. Also requires maintenance of dikes and water control structures.
Forested Wetlands*	Supports native forest community and associated species including wood duck, cerulean warbler and other priorities within BCR 13. Riparian corridors provide good connectivity and important summer habitat for bats.	Hydrology has been altered. Invasive species, overbrowsing by deer, and water quality are concerns.
Upland Forest*	Supports several BCR 13, New York State CWCS, and other plans' priority species. Historically, clayplain and sandplain forest dominated the area. Nearly 95 percent of this habitat in the BCR has been lost to agriculture.	Invasive species and overbrowsing by deer.
Scrub/Shrub*	Supports several BCR 13, New York State CWCS, and other plans' priority species.	Invasive species, succession and contaminants are factors. Restoration may be a requirement in some cases. Active management is required to maintain in this intermediate stage.
Grasslands*	Supports several BCR 13, New York State CWCS, and other plans' priority species.	Requires intensive management to maintain in grassland condition. Invasive species, succession and contaminants are factors.

*Vernal pools exist in some or all of these habitat types on the refuge. Vernal pools are ephemeral wetlands that fill annually from precipitation, runoff, and rising groundwater. Vernal pools are essential habitat for portions of the life cycles of many species and are indispensable to biodiversity, both locally and globally.

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Appendix B

Dr. Thomas G. Barnes

Variegated fritillary

Findings of Appropriateness and Compatibility Determinations

Appropriate Use and Compatibility Determinations

603 FW 1
Exhibit 1

Finding of Appropriateness of a Refuge Use

Refuge Name: Montezuma National Wildlife Refuge

Use: Bicycle Travel

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes X No _____

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____ **Appropriate** X

Refuge Manager: Thomas Jasikoff Date: 8/23/2012

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use.
If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence.
If found to be Appropriate, the refuge supervisor must sign concurrence:

Refuge Supervisor: [signature] Date: 9/3/12

A compatibility determination is required before the use may be allowed.

Justification for a Finding of Appropriateness of a Refuge Use

Refuge Name: Montezuma National Wildlife Refuge

Use: Bicycle Travel

Narrative

Bicycling will be permitted only along the refuge's Wildlife Drive during low wildlife-use periods (Memorial Day to mid-August each year).

In 1994, a Compatibility Determination (CD) authorizing the continued use of a "Motorized Trail (Wildlife Drive)" was approved. This use was limited to the Main Pool Dike, known as the Wildlife Drive. This use has been allowed on designated roads since refuge establishment in 1938.

Montezuma Refuge's Wildlife Drive supports wildlife-dependent public uses including wildlife photography, wildlife observation, environmental education, and interpretation. The Wildlife Drive is interpreted and provides an opportunity to reach visitors for the purpose of wildlife education. Designated roads for vehicular and bicycle travel will provide the public with an opportunity to experience the diversity of habitats and wildlife that characterize the refuge without significant environmental consequences at current levels of use. The Wildlife Drive enhances public access and provides increased opportunity to participate in priority public uses.

The Wildlife Drive is linear in fashion, creating disturbance within a narrow band and for relatively short periods as vehicles move through an area. Refuge experience exhibits that birds do become habituated to the continued disturbance. Potential short-term impacts include wildlife disturbance resulting from increasing human activities facilitated by vehicular and bicycle access into wildlife habitat. It is anticipated that there will be temporal disturbances to wildlife species using habitat on or directly adjacent to the designated vehicular route.

603 FW 1
Exhibit 1

Finding of Appropriateness of a Refuge Use

Refuge Name: Montezuma National Wildlife Refuge

Use: Dog Walking

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

When we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not he found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes X No_____

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate_____ **Appropriate** X

Refuge Manager: Thomas Josiloff Date: 8/23/2012

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use.
If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence.
If found to be Appropriate, the refuge supervisor must sign concurrence:

Refuge Supervisor: [signature] Date: 9/3/12

A compatibility determination is required before the use may be allowed.

Justification for a Finding of Appropriateness of a Refuge Use

Refuge Name: Montezuma National Wildlife Refuge

Use: Dog Walking

Narrative

Dog walking on the refuge has been allowed for several years, as long as dogs were leashed and under the owner's control. However, since issues with unleashed dogs in more remote areas of the refuge have led to increased wildlife disturbance, we are proposing to limit dog walking to the refuge headquarters area and 1-mile Seneca Trail, where staff presence is more pronounced and visitor behavior is more effectively monitored and enforced. Because the refuge headquarters area and Seneca Trail are located in already highly disturbed areas, the potential impacts to wildlife and their habitats are minimal.

We will require that dogs be kept on a 6-foot leash and under the owner's control at all times to ensure visitor safety and resource protection in these areas. In addition, the Seneca Trail will be closed seasonally to accommodate osprey (*Pandion haliaetus*) nesting season, which coincides with cerulean warbler activity in that area. Total trail closure during that time will offer resource protection, while still allowing visitors to have their dogs in the headquarters area to enjoy wildlife observation, photography, and interpretation.

Limiting leashed dog walking to the headquarters area and Seneca Trail will not materially interfere with or detract from the mission of the National Wildlife Refuge System or the purposes for which the refuge was established, and will not place undue burden on the refuge's available resources.

603 FW 1
Exhibit 1

Finding of Appropriateness of a Refuge Use

Refuge Name: Montezuma National Wildlife Refuge

Use: Cross-country Skiing and Snowshoeing

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes X No ___

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____ **Appropriate** X

Refuge Manager: Howard Jassoff Date: 8/23/2012

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use.
If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence.
If found to be Appropriate, the refuge supervisor must sign concurrence:

Refuge Supervisor: [signature] Date: 9/3/12

A compatibility determination is required before the use may be allowed.

Justification for a Finding of Appropriateness of a Refuge Use

Refuge Name: Montezuma National Wildlife Refuge

Use: Cross-country Skiing and Snowshoeing

Narrative

Cross-country skiing and snowshoeing are historic uses of the refuge. They provide visitors engaged in priority public uses, such as wildlife photography, wildlife observation, environmental education, and interpretation, access to the refuge in winter. Designated routes for cross-country skiing and snowshoeing provide the public with an opportunity to experience the diversity of habitats and wildlife that characterize the refuge without significant environmental consequences at current and projected levels of use.

It is anticipated that under current and projected conditions and use levels, cross-country skiing and snowshoeing on the refuge will not cause any significant direct or indirect impacts to threatened or endangered species. Routes designated for this use are preexisting roads and trails, some of which have been in existence for many years. No new habitat clearing will be required to accommodate these activities; however, some vegetation clearing will be required within the trail corridor. Routes designated for these uses are considered safe under current and projected conditions and levels of use. Cross-country skiing and snowshoeing are viewed as effective and justifiable methods of access that enable the public to discover, experience, and enjoy the refuge and participate in priority public uses.

A CD for pedestrian travel on the refuge was also approved in 1994, but did not include allowing cross-country skiing and snowshoeing on the Wildlife Drive. We propose to allow these two uses on the Wildlife Drive when conditions allow and outside of the State deer hunting season. The Wildlife Drive will be closed to cross-country skiing and snowshoeing from December 1 through the end of the State deer hunting season.

603 FW 1
Exhibit 1

Finding of Appropriateness of a Refuge Use

Refuge Name: Montezuma National Wildlife Refuge

Use: Vehicular Travel

This form is not required for wildlife-dependent recreational uses, take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	**YES**	**NO**
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes X No _____

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate _____ **Appropriate** X

Refuge Manager: Thomas Jaselloff Date: 8/23/2012

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use.
If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence.
If found to be Appropriate, the refuge supervisor must sign concurrence:

Refuge Supervisor: [signature] Date: 9/3/12

A compatibility determination is required before the use may be allowed.

Justification for a Finding of Appropriateness of a Refuge Use

Refuge Name: Montezuma National Wildlife Refuge

Use: Vehicular Travel

Narrative

In 1994, a Compatibility Determination (CD) authorizing the continued use of a "Motorized Trail (Wildlife Drive)" was approved. This use was limited to the Main Pool Dike, known as the Wildlife Drive. This use has been allowed on designated roads since refuge establishment in 1938.

The refuge's Wildlife Drive supports wildlife-dependent public uses including wildlife photography, wildlife observation, environmental education, and interpretation. The Wildlife Drive is interpreted and provides an opportunity to reach multiple vehicle occupants for the purpose of wildlife education. Designated roads for vehicular travel will provide the public with an opportunity to experience the diversity of habitats and wildlife that characterize the refuge without significant environmental consequences at current levels of use. The Wildlife Drive enhances public access and provides increased opportunity to participate in priority public uses, including mobility-impaired persons.

The Wildlife Drive is linear, creating disturbance within a narrow band and for relatively short periods as vehicles move through an area. Refuge staff experience is that birds do become habituated to the continued disturbance. Potential short-term impacts include wildlife disturbance resulting from increasing human activities facilitated by vehicular access into wildlife habitat. It is anticipated that there will be temporal disturbances to wildlife species using habitat on or directly adjacent to the designated vehicular route.

603 FW 1
Exhibit 1

Finding of Appropriateness of a Refuge Use

Refuge Name: Montezuma NWR

Use: Cooperative Farming

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes X No _____

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:
Not Appropriate _____ **Appropriate** X

Refuge Manager: Tom Jaselskis Date: Jan. 23, 2007

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use.
If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence.
If found to be Appropriate, the refuge supervisor must sign concurrence:

Refuge Supervisor: _____ Date: 1-31-07

A compatibility determination is required before the use may be allowed.

Justification for a Finding of Appropriateness of a Refuge Use

Refuge Name: Montezuma NWR

Use: Cooperative Farming

Narrative

We propose to use cooperative farming as an interim measure to keep fields open in preparation for conversion to native plants, as a means to help us properly establish newly converted early successional habitats and newly restored wetlands, and to allow us to control invasive plant species on the refuge. Our cooperative farming program is an integral component of our overall habitat restoration and management efforts as we work toward full compliance with refuge system policies on compatible uses and biological integrity, diversity, and environmental health.

The refuge continues to acquire land as it becomes available. In the past 15 years, we have acquired 2,600 acres. The majority of the land we purchase is planted in corn, soybeans, or potatoes at the time of purchase. We generally allow land owners to continue farming through the year of the purchase and one year following our acquisition to provide for a smoother acquisition both for the farmer and the refuge. This provides an extra year of income for the farmer and gives us a year to prepare to restore the farm to native vegetation. We occasionally allow a farmer to continue farming more than one year after our acquisition to give us more time to plan restoration activities and acquire necessary funding (e.g., for grass seed, dike construction, water control structures, etc.).

The cooperative farming program increases our ability to manage and restore wetland and adjacent habitats because farmers participating in the program assist with habitat maintenance and restoration in lieu of rental payments. The cooperative farming program fosters the continued private involvement in the refuge by facilitating personal relationships between refuge staff and local farmers. By conducting services on the refuge in lieu of rental payments, local farmers become involved in on-the-ground habitat restoration and management.

COMPATIBILITY DETERMINATION

Use: Bicycle Travel

Refuge Name: Montezuma National Wildlife Refuge

Date Established: September 12, 1938

Establishing and Acquisition Authorities:
The U.S. Fish and Wildlife Service acquired lands to be established as the Montezuma National Wildlife Refuge (Montezuma Refuge, refuge) under Executive Order 7971 and established the refuge in 1938 under the authority of the Migratory Bird Conservation Act of 1929 (16 U.S.C. 715).

Purpose(s) for which Established:
"…as a refuge and breeding ground for migratory birds and other wildlife…" (Executive Order 7971).

"…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (16 U.S.C. 715d).

National Wildlife Refuge System Mission:
To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

Description of Use:

(a) What is the use? Is the use a priority public use?
The use is bicycle travel on Montezuma Refuge. This is not a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57). Bicycling will provide increased access for visitors to engage in priority public uses. Also, the refuge believes that by allowing this use, persons engaged in bicycling for its own sake will be exposed to the refuge and the Refuge System, which will foster an understanding of the mission of the refuge and the National Wildlife Refuge System (Lyons 1982).

(b) Where will the use be conducted?
The use will be allowed on the access road to the visitor center and along the Wildlife Drive only. Since the establishment of the refuge in 1938, the public has been allowed to operate vehicles on the Main Impoundment Dike (3.5 miles). This route has long been known as the Wildlife Drive and provides access to the refuge for all, including those with disabilities. This road currently provides vehicular access from State Route 5 and U.S. Route 20 to State Route 89. Access on the subject road provides the public with an opportunity to experience refuge wildlife and plant communities in a diversity of habitats but the main focus is the 1,657-acre Main Pool,

which provides emergent marsh habitat for a variety of waterbirds. The road has existing hard-packed surfaces.

(c) When will the use be conducted?

Klein (1993) supports previous reports (Vaske et al. 1983, Vos et al. 1985, Freddy et al. 1986) that indicate out-of-vehicle activity is more disruptive to wildlife, particularly waterbirds, than vehicular traffic, and that photographers are most likely to approach wildlife and are, therefore, causing the most disturbance. The Wildlife Drive is open annually to vehicular access until it is closed on November 30. Daily hours of use are between one half hour before sunrise and one half hour after sunset when the refuge is open to the public. The general pattern of vehicle travel shows visitation is higher on weekends than weekdays. Most vehicular access occurs during the peak of spring and fall waterfowl migration (mid-March through mid-May and mid-September through mid-November, figures B.1 to B.3). Opportunities exist year-round for environmental education and interpretation. Due to the potential for higher disturbance to wildlife by out-of-vehicle activity, bicycling will only be permitted during low wildlife-use periods of the year, namely, summer (Memorial Day to mid-August) (figures B.1 to B.3). Opening and closing dates will be determined by the refuge manager depending on migration timing and habitat conditions. During the summer, as opposed to migration periods, it is less important for birds to build up their fat reserves and conserve energy. Summer is also the period of time when vegetation along the Wildlife Drive and in the Main Pool offer optimum cover, so that if wildlife should flee due to human disturbance, they will have to travel less distance to find cover than they will in spring or fall.

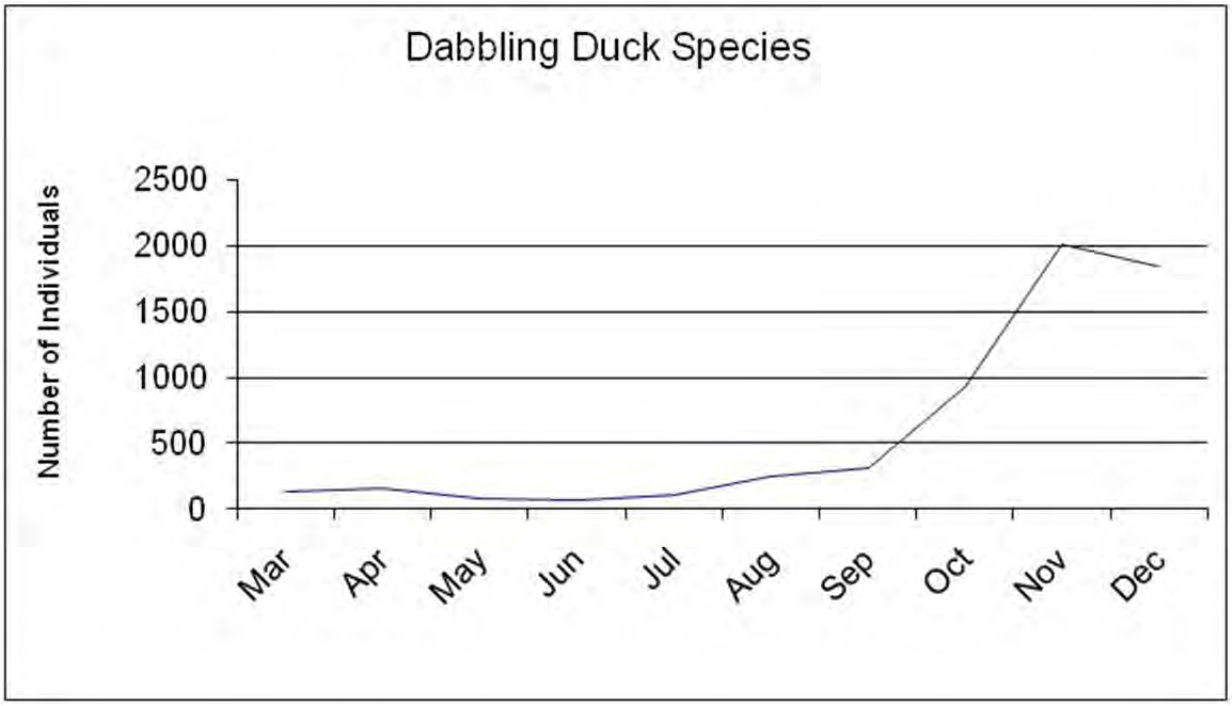

Figure B.1. Average Number of Individuals for all Dabbling Duck Species per Month Observed on the Montezuma National Wildlife Refuge, 1997 to 1999 (Sleggs et al. 2000).

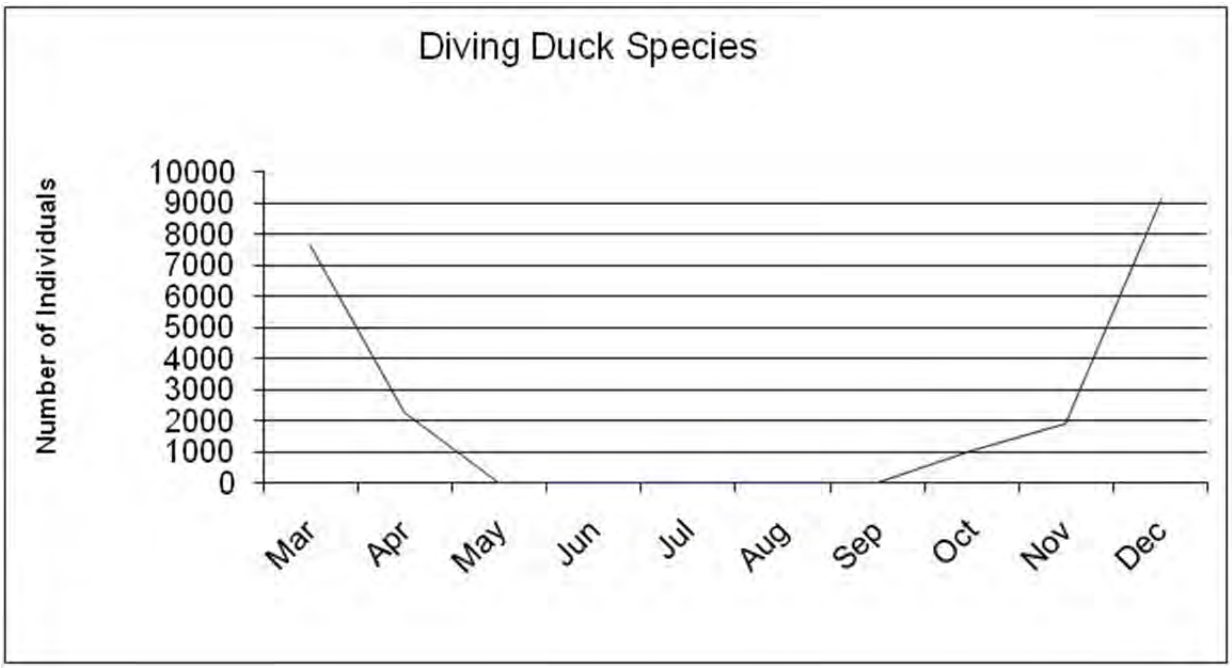

Figure B.2. Average Number of Individuals for all Diving Duck Species per Month Observed on the Montezuma National Wildlife Refuge, 1997 to 1999 (Sleggs et al. 2000).

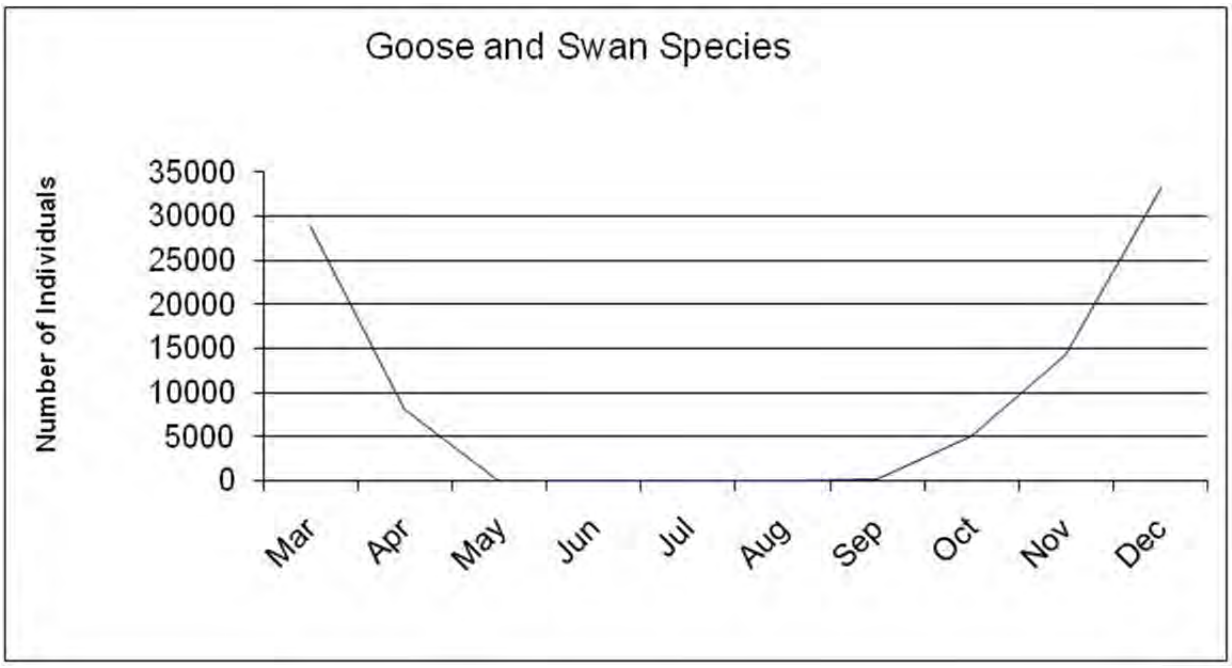

Figure B.3. Average Number of Individuals for all Goose and Swan Species per Month Observed on the Montezuma National Wildlife Refuge, 1997 to 1999 (Sleggs et al. 2000).

(d) How will the use be conducted?
Cyclists will either travel to the refuge by bicycle and enter at public entry points or transport bicycles by vehicle or boat if traveling along the adjacent canals and depart from designated parking and boat landing areas. Travel is limited to designated roads and parking areas, where road width can accommodate the safe passage of other users. The Wildlife Drive is typically designated as one-way traffic and has sufficient viewing distance for bicyclists and automobile drivers, alike, to detect other users and maneuver to accommodate them.

Posted information and maps will identify the routes open for bicycle and vehicular travel and explain permitted public uses. Current designated wildlife observation trails on the refuge are described in the refuge's "Wildlife Watching Guide."

Bicycling will occur on individual and group bases. To accommodate other users and promote a positive wildlife observation experience, we will encourage smaller group sizes (e.g., 10 people or less). Groups larger than 10 persons will be required to contact the refuge office prior to visiting the Wildlife Drive so the refuge can determine whether the group will require a special use permit.

Vehicular access on the refuge is conducted according to applicable provisions of 50 CFR 27.31 General Provisions Regarding Vehicles and New York State law. To promote safe vehicle operation, to reduce the risk of vehicular collisions with other users and wildlife, and to enhance opportunities for wildlife observation, vehicle travel is subject to a maximum speed of 15 miles per hour. The Wildlife Drive accommodates one-way traffic only, unless a portion of the roadway is closed for maintenance.

Refuge staff will continue to record visitor numbers, types of access, user interactions, and potential safety concerns. Safety and information signs will be installed and maintained as necessary. The Wildlife Drive is maintained in such a manner as is practical to minimize environmental effects such as erosion and sedimentation and to provide safe conditions for public access.

(e) Why is this use being proposed?
One of the secondary goals of the Refuge System is to provide opportunities for the public to develop an understanding for wildlife wherever those opportunities are compatible. Many visitors participating in this activity will be directly engaged in the priority public uses which are identified in the National Wildlife Refuge Improvement Act of 1997.

Public demand for bicycling along the Wildlife Drive has existed for 10 years or more. The use of bicycles can provide increased opportunity for public participation in and access to priority public uses such as fishing, wildlife observation and photography, and environmental education and interpretation. Bicycling provides visitors without an automobile a way to view the refuge's diverse biological assets. This exposure may lead to a better understanding of the importance and value of the Refuge System to the environment and the American people.

Availability of Resources:
The resources necessary to provide and administer this use are available within current and anticipated refuge budgets. Staff time associated with administration of this use is related to assessing the need for road maintenance and repair, conducting such repairs or overseeing such repairs by contractors, maintaining associated road infrastructure, maintaining traffic counters and recording related data, analyzing use patterns, monitoring potential impacts of the use on refuge resources and visitors, and providing information to the public about the use. Aside from providing safe and quality priority public uses, road maintenance will be necessary to facilitate refuge management activities by staff.

Refuge vehicles are needed to effectively administer the use. Personnel of the maintenance staff perform the maintenance and repair of refuge roads and associated structures. The refuge has heavy equipment including a motor grader, dump truck, bulldozer, backhoe, 4×4 farm tractor, skid steer loader, and front-end loader. A maintenance facility exists and is needed to repair refuge vehicles and equipment and to construct necessary signs, kiosks, gates, and other maintenance operations.

These activities will be conducted in conjunction with and are not additive to the activities outlined in the refuge's "Vehicular Travel to Facilitate Priority Public Uses" compatibility determination. Based on a review of the budget allocated for recreational use management, funding is adequate to ensure compatibility and to administer and manage the recreational use listed.

Anticipated Impacts of the Use:
The presence of vehicles and people biking on refuge roads can lead to displacement of animals from the road, although disturbance usually is a negligible influence on large mammal distributions and movements (Purdy et al. 1987, Boyle and Samson 1985). The effects on other forms of wildlife appear to be short term with the exception of breeding bird communities. A study by Miller et al. (1998) indicates that species composition and nest predation was altered adjacent to trails in both forested and grassland habitats. It appears that species composition changes are due to the presence of humans and not the trail or roadway itself. On the other hand, nest predation does appear to be a function of the trail which allows access to mammalian nest predators. Several studies showed that in areas where human activity was common and frequent (as is true on the refuge's Wildlife Drive), birds were less disturbed than those in areas where humans were uncommon (Miller et al. 2001). The refuge will continue its proven management strategies of educating trail and roadway users regarding how their activities affect wildlife and how to modify their use to minimize impacts on wildlife (Miller et al. 1998, Klein 1993).

The use of trails and gravel roads could lead to soil compaction, exposure of tree roots, and the modification of plant species 3 to 6 feet on either side of the trail which is a function of soil compaction, invasive species, and direct trampling of plants (Kuss 1986). The refuge will continue its road maintenance and erosion control, and user education to protect plant species and habitats along trails and roadways. Use of the Wildlife Drive could pose a threat to endangered or threatened species if such were found utilizing habitat near the road location. In this case, the road use will be monitored and evaluated for such threats and management action will be taken to ensure habitat protection. There are no federally listed species along the Wildlife

Drive at this time. Potential conflict with priority public uses will be minimized by using information and orientation signs, other media, and personal communication with visitors to inform the various users about current public uses. Roadway use will be restricted when the area is open to hunting.

The refuge believes that with proper management, bicycling will not result in any short- or long-term impacts that will adversely affect the purpose of the refuge or the mission of the National Wildlife Refuge System.

Public Review and Comment:
As part of the comprehensive conservation planning process (CCP) for Montezuma Refuge, this compatibility determination was available for public review and comment for 30 days concurrent with the release of our draft CCP and environmental assessment.

Determination (check one below):

Use	is Not Compatible
X	Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. Bicycle travel along the Wildlife Drive is limited to refuge public use hours—one half hour before sunrise to one half hour after sunset.

2. Bicycling will only be permitted during summer when fewer migratory birds are present. Dates will be determined seasonally by the refuge manager depending on migration timing and habitat conditions.

3. Signs necessary for visitor information, safety, and traffic control will be installed and maintained as necessary.

4. The refuge will continue with its outreach program to promote public awareness and compliance with refuge public use regulations.

5. In order to provide for visitor safety and maintain a high quality setting for wildlife observation, a speed limit of 15 miles per hour will be imposed for all traffic.

6. The provisions for vehicle travel on national wildlife refuges as contained in applicable provisions of 50 CFR 27.31, General Provisions Regarding Vehicles, will be implemented including: establishing designated routes of travel that are conveyed to the public through signs and/or maps, assimilation of state laws and regulations governing the operation and use of vehicles, no operation of vehicles while under the influence of intoxicating beverages or controlled substances, reasonable and prudent operation, maximum speed limit, prohibition of vehicles producing excessive noise or visible pollutants, requirements for properly operating muffler, brakes, brake lights, headlight and tail lights, vehicle operators must be properly licensed, vehicles must be properly

registered, licensed, and inspected, and vehicle operators must not obstruct the free movement of other vehicles.

7. Conditions that risk or will likely risk public safety and/or resource protection will be identified and appropriate action will be promptly taken to correct such conditions.

8. The refuge's step-down plan for public use will be developed to include a section on the management and administration of bicycling on the refuge's roadway system.

Justification:
Bicycling was determined to not be compatible in a 1994 CD. We propose to allow bicycling now because it has become a popular mode of alternate transportation, because we now have a seasonal boat landing dock to serve visitors from the canal (most boaters traveling the canal get around by bicycle when they come ashore), and because bicycling promotes a healthy lifestyle in the outdoors and allows us to connect with a new audience. There has been a demand from individuals and biking groups (namely, Erie Canal bike tours), to use the Wildlife Drive. The U.S. Fish and Wildlife Service and the National Wildlife Refuge System maintain goals of providing opportunities for wildlife viewing and photography, as well as environmental interpretation. Allowing the use of the Wildlife Drive by persons bicycling for its own sake will have the secondary benefit of providing these visitors a chance to view wildlife and their habitats, which will further the mission of the Service. These users may take the time to learn more about the refuge while they pursue their activity and become more avid supporters of wildlife and the National Wildlife Refuge System.

The impacts of this use during the interim period, and subject to the stipulations above, are not expected to materially interfere with or detract from the mission of the National Wildlife Refuge System or the purposes for which the refuge was established. This use does not pose significant adverse effects on trust species or other refuge resources and will not interfere with other uses being conducted on the refuge, or cause an undue administrative burden for the interim period identified.

Signature: Refuge Manager: Thomas Joseloff 8/23/2012
(Signature and Date)

Concurrence: Regional Chief: Sam B. Hamm 9/12/2012
(Signature and Date)

Mandatory 10-year Re-evaluation Date: 9/12/2022

Literature Cited:

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Freddy, D.J., W.M. Bornaugh, and M.C. Fowler. 1986. Responses of mule deer to disturbance by persons afoot and in snowmobiles. Wildlife Society Bulletin 14: 63-68.

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Miller, S.G., R.L. Knight, and C.K. Miller. 2001. Wildlife Responses to Pedestrians and Dogs. Wildlife Society Bulletin 29(1): 124-132.

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Vos, D.K., R.A. Ryder, and W.D. Graul. 1985. Response of breeding great blue herons to human disturbance in northcentral Colorado. Colonial Waterbirds 8: 13-22.

COMPATIBILITY DETERMINATION

Use: Dog Walking

Refuge Name: Montezuma National Wildlife Refuge

Date Established: September 12, 1938

Establishing and Acquisition Authorities:
The U.S. Fish and Wildlife Service acquired lands to be established as the Montezuma National Wildlife Refuge under Executive Order 7971 and established the refuge in 1938 under the authority of the Migratory Bird Conservation Act of 1929 (16 U.S.C. 715).

Purpose(s) for which Established:
"…as a refuge and breeding ground for migratory birds and other wildlife…" (Executive Order 7971).

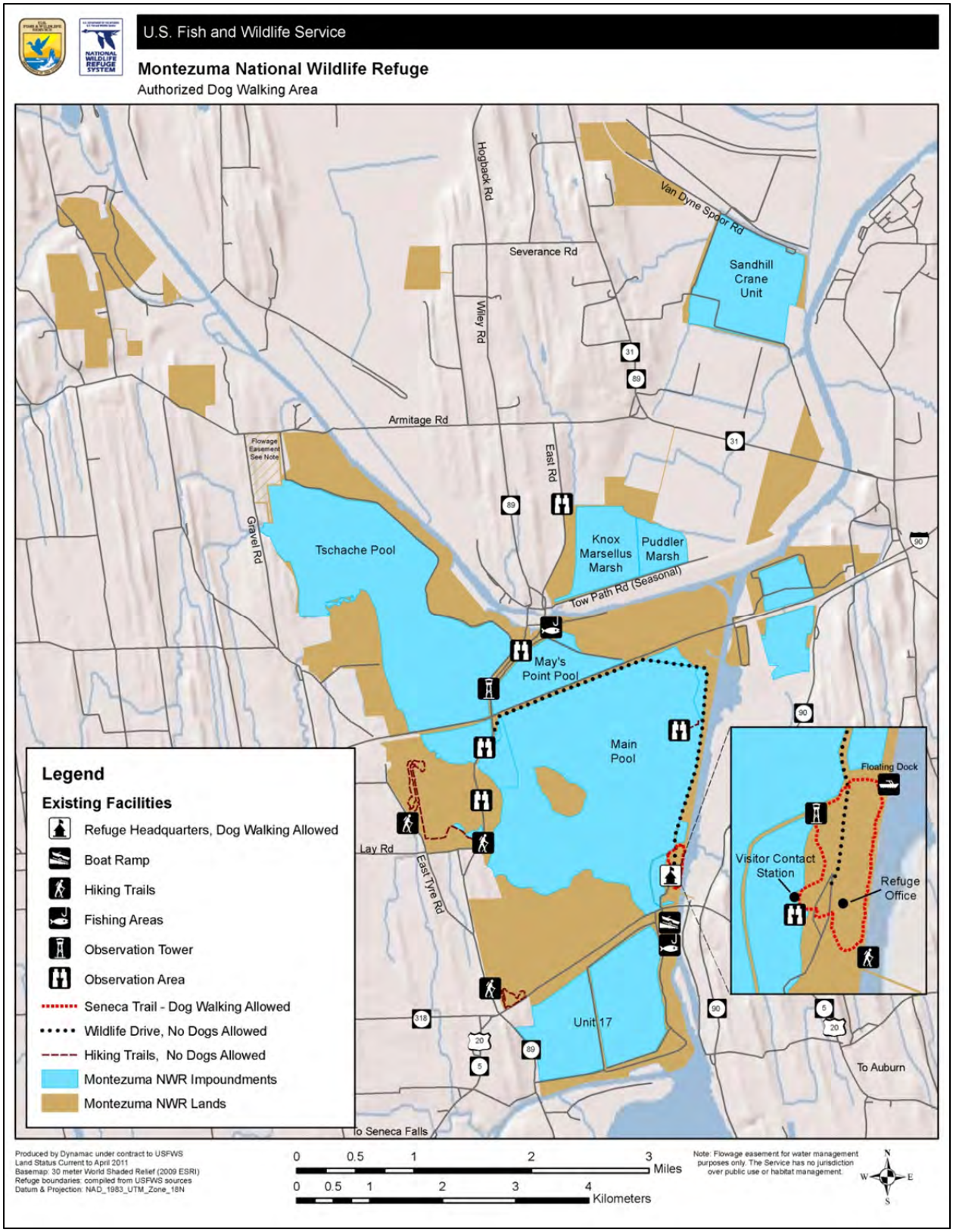
"…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (16 U.S.C. 715d).

National Wildlife Refuge System Mission:
To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

Description of Use:

(a) What is the use? Is the use a priority public use?
The use is dog walking. Dog walking is not a priority public use of National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57).

(b) Where will the use be conducted?
Dog walking will be conducted around the refuge headquarters area and on the 1-mile Seneca Trail only (map B.1). Dog walking on the refuge has been allowed for several years, as long as dogs were leashed and under the owner's control. However, since issues with unleashed dogs in more remote areas of the refuge have led to increased wildlife and visitor disturbance, we are proposing to limit dog walking to the refuge headquarters area and Seneca Trail, where staff presence is more pronounced and visitor behavior is more effectively monitored and enforced. Because the refuge headquarters area and Seneca Trail are located in already highly disturbed areas, the potential impacts to wildlife and their habitats are minimal.



Map B.1. Montezuma National Wildlife Refuge Authorized Dog Walking Area (see inset map).

(c) When will the use be conducted?
Dog walking will be permitted year-round around the refuge headquarters area. A portion of the Seneca Trail is closed to all visitor use during osprey (*Pandion haliaetus*) nesting season (typically June into August, depending when eggs are laid; this time of trail closure also coincides with high cerulean warbler activity along the Seneca Trail). The Seneca Trail is also closed to dog walking and other public uses when open to deer hunting (i.e., in winter months when other public use is not in high demand). Dog walking will be restricted to when the refuge is open, one half hour before sunrise to one half hour after sunset.

(d) How will the use be conducted?
Dog walkers will be allowed to walk their dogs only when the dog is attached to a 6-foot (or less) leash and the dog walker is in control of the leash and dog. All dog walkers with properly leashed dogs will be restricted to the refuge headquarters area and the Seneca Trail. Dog owners will be required to pick up after their dogs.

(e) Why is this use being proposed?
Dog walking has historically been allowed on the refuge, as long as the dog was on a 10-foot leash and under the owner's control. In recent years, increased disturbance to wildlife and other visitors has occurred in more remote areas of the refuge due to off-leash dogs. It is difficult for the current staff to monitor dog walking in remote areas of the refuge. Limiting dog walking to an already-disturbed area with a higher concentration of staff and volunteers will accommodate both resource protection and visitor satisfaction.

Availability of Resources:
The resources necessary to provide and administer this use are available within current and anticipated refuge budgets. Staff time associated with administration of this use is related to assessing the need for parking area and trail maintenance and repair, conducting such repairs or overseeing such repairs by contracted work, analyzing use patterns, monitoring potential impacts of the use on refuge resources and visitors, and providing information to the public about the use.

These activities will be conducted in conjunction with and are not in addition to the activities outlined in the refuge's "Cross-country Skiing and Snowshoeing" and "Wildlife Observation, Photography, Environmental Education, and Interpretation" compatibility determinations. Based on a review of the budget allocated for recreational use management, funding is adequate to ensure compatibility and to administer and manage the recreational use listed.

Anticipated Impacts of the Use:
Because the refuge headquarters area and Seneca Trail are already highly disturbed areas (with buildings, parking areas, lawn, boat traffic along the adjacent canal), dogs will be restrained by a leash and under the control of their owners, owners will be required to pick up after their dogs, and there is a higher level of staff presence as compared to more remote areas on the refuge, the potential impacts to wildlife and their habitats are minimized. In addition, the Seneca Trail has been and will continue to be at least partially closed to all visitors during the osprey nesting season, which coincides with cerulean warbler nesting season. This trail is also closed to dog walking and other public uses during part of the deer hunting season.

The presence of dogs may displace foraging birds (Lafferty 2001), disrupt their nesting behavior (Langston et al. 2007, Lord et al. 2001, Taylor et al. 2007), or destroy nests (Nol and Brooks 1982). These affects appear to be most pronounced for species that nest or feed on the ground. The presence of dogs may also reduce both bird diversity and abundance (Banks and Bryant 2007). The visual presence of dogs may alter the physiology and behavior of mammals (Miller et al. 2001) and their persistent scent may displace mammalian predators (George and Crooks 2006, Lenth et al. 2008, Reed and Merenlender 2008).

Miller et al. (2001) showed that the presence of a pedestrian is the additive factor in disturbing wildlife when comparing wildlife response to dog-alone, pedestrian-alone, and dog-on-leash treatments. Flush distance and distance moved were almost always greater when activities occurred off trail versus when the same activities occurred on trail, suggesting that where recreational activities occurring on-trail are frequent and spatially predictable, animals will likely habituate to activity in these locations.

Studies have shown that when visitors speak to refuge or wildlife area personnel and understand how restrictions will help wildlife, they are more likely to support restrictions (Purdy et al. 1987, Harris et al. 1995, Klein 1993). The emphasis on how human activities affect wildlife can lead people to associate their actions with either benefitting or harming wildlife, and they will thus develop a conservation ethic. Such an ethic can minimize the number of wildlife-human conflicts occurring in natural areas (Knight and Temple 1995). While staff presence occurs sporadically on more remote public use areas on the refuge (e.g., Esker Brook and South Spring Pool Trails), staff and volunteers are regularly in the headquarters and Seneca Trail area. Regular contact with visitors occurs daily, leading to increased support of restrictions in these areas, as studied by Purdy et al. (1987), Harris et al. (1995), and Klein (1993). An initial increase in staff presence at more remote public use areas on the refuge may be necessary upon the restriction of dog walking in those areas in order to inform visitors of new rules and reasons for those rules, thereby gaining support for the restrictions.

The role of dogs in wildlife diseases is poorly understood. However, dogs host endo- and ecto-parasites, and can contract diseases from or transmit diseases to wild animals. In addition, dog waste is known to transmit diseases that may threaten the health of some wildlife and other domesticated animals. Domestic dogs potentially can introduce various diseases and transport parasites into wildlife habitats (Sime 1999). To mitigate these potential issues, visitors with dogs will not only be restricted to the trail or developed area, but will also be required to pick up after their dogs, alleviating some risk of dogs transmitting disease to wildlife.

The refuge believes that with the proper management, dog walking in this limited area of the refuge will not result in any short- or long-term impacts that will adversely affect the purpose of the refuge or the mission of the National Wildlife Refuge System.

Public Review and Comment:
As part of the comprehensive conservation planning process (CCP) for the Montezuma Refuge, this compatibility determination was available for public review and comment for 30 days concurrent with the release of our draft CCP and environmental assessment.

Determination (check one below):

Use	is Not Compatible
X	Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. Dog walking is limited to the refuge headquarters area and Seneca Trail, during refuge public use hours—one half hour before sunrise to one half hour after sunset—year-round around the headquarters area and subject to seasonal closure along the Seneca Trail.

2. Dogs must be on a maximum 6-foot lead and under control of their owners at all times.

3. Visitors with dogs will be required to clean up after their dogs during each visit (i.e., pick up and dispose of feces).

4. Signs necessary for visitor information will be installed and maintained as necessary.

5. The refuge will continue with its outreach program to promote public awareness and compliance with refuge public use regulations.

6. Conditions that are or would risk public safety or resource protection will be identified and appropriate action will be promptly taken to correct such conditions.

7. The refuge's step-down plan for public use will be developed to include a section on the management and administration of dog walking.

Justification:

Dog walking on the refuge has been allowed for several years, as long as dogs were leashed and under the owner's control. However, since issues with unleashed dogs in more remote areas of the refuge have led to increased wildlife disturbance, we are proposing to limit dog walking to the refuge headquarters area and 1-mile Seneca Trail, where staff presence is more pronounced and visitor behavior is more effectively monitored and enforced. Because the refuge headquarters area and Seneca Trail are located in already highly disturbed areas and offer more of a park-like setting, the potential impacts to wildlife and their habitats are minimized.

We will require that dogs be kept on a leash 6 feet long, or shorter, and under the owner's control at all times to provide for the visitor safety and resource protection warranted in these areas. In addition, some or all of the Seneca Trail will be closed annually to accommodate osprey nesting season, which coincides with cerulean warbler activity in that area, and during part of the deer hunting season (as described above). Total trail closure during that time will offer resource protection, while still allowing visitors to have their dogs in the headquarters area to enjoy wildlife observation, photography, and interpretation.

Limiting leashed dog walking to the headquarters area and Seneca Trail, and employing the stipulations listed above, will not materially interfere with or detract from the mission of the

National Wildlife Refuge System or the purposes for which the refuge was established, and will not place undue burden on the refuge's available resources.

Signature: Refuge Manager: Howard Jaeckel 8/23/2012
(Signature and Date)

Concurrence: Regional Chief: Scott B. Kahn 9/12/2012
(Signature and Date)

Mandatory 10-year Re-evaluation Date: 9/12/2022

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COMPATIBILITY DETERMINATION

Use: Cross-country Skiing and Snowshoeing

Refuge Name: Montezuma National Wildlife Refuge

Date Established: September 12, 1938

Establishing and Acquisition Authorities:
The U.S. Fish and Wildlife Service acquired lands to be established as the Montezuma National Wildlife Refuge under Executive Order 7971 and established the refuge in 1938 under the authority of the Migratory Bird Conservation Act of 1929 (16 U.S.C. 715).

Purpose(s) for which Established:
"…as a refuge and breeding ground for migratory birds and other wildlife…" (Executive Order 7971).

"…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (16 U.S.C. 715d).

National Wildlife Refuge System Mission:
To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

Description of Use:

(a) What is the use? Is the use a priority public use?
The uses are cross-country skiing and snowshoeing. These are not priority public uses of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57). However, they can facilitate visitor participation in priority public uses including wildlife observation and photography and interpretation.

(b) Where will the use be conducted?
Since the establishment of the refuge in 1938, cross-country skiing and snowshoeing have been allowed on the refuge's system of roads and trails. We anticipate offering about 8.5 miles of roads and trails for these uses.

Esker Brook Trails	2.5 miles
Orchard Trail	0.75 miles
Brook Trail	0.5 miles
Ridge Trail	0.5 miles
Esker Pond Loop	0.33 miles
South Spring Pool Trail	1 mile
Seneca Trail	1 mile

Swampside Trail	1 mile
Wildlife Drive (winter)	3.75 miles
Photography Blind Trail (closed during waterfowl banding season)	0.1 mile
Entrance Road (paved headquarters area)	0.33 miles
Oxbow Trail (proposed)	0.75 miles

These trails and roads provide the public with an opportunity to experience refuge wildlife and plant communities in a diversity of habitats and facilitate priority public uses such as wildlife observation, wildlife photography, environmental education, and interpretation.

(c) When will the use be conducted?
Cross-country skiing and snowshoeing will be allowed on designated trails and roads when there is sufficient snow to support these activities. Daily use hours are between one half hour before sunrise and one half hour after sunset when the refuge is open to the public. Most cross-country skiing and snowshoeing will occur in mid-December through mid-March.

To minimize potential conflicts and ensure public safety, the Wildlife Drive and some trails are closed to the public, except for hunters, during the white-tailed deer (*Odocoileus virginianus*) hunting season. The Wildlife Drive will be closed to cross-country skiing and snowshoeing when it is open for hunting (December 1 to the end of the State deer hunting season).

Although cross-country skiing and snowshoeing generally occur during times of year when wildlife use is low on the refuge, occasionally the refuge manager may adjust opening and closing depending on habitat conditions and potential wildlife impacts, particularly on wintering waterfowl (see figures B.4 through B.6). Information about public use openings and closures will be posted at the refuge visitor contact station and on the refuge Web site at: *www.fws.gov/r5mnwr*.

(d) How will the use be conducted?
Cross-country skiing and snowshoeing is currently allowed on the refuge. Visitors engaged in these activities typically park vehicles at refuge parking areas. These uses will be conducted in accordance with the stipulations necessary to ensure compatibility. In some cases, cross-country skiers and visitors snowshoeing may share trails and roads with other users.

Information kiosks, refuge publications and the Web site, and refuge and visitor contact station staff will identify the roads and trails open for cross-country skiing and snowshoeing. The refuge recently published a "Wildlife Watching Guide" brochure which describes the refuge's trails and opportunities. Parking lots have been constructed at all existing trailheads. An average of 67 inches of snow falls at Montezuma. No snow removal is conducted on refuge trails, the Wildlife Drive, or parking areas, with the exception of the visitor contact station parking area and Esker Brook trailhead, where snow is removed periodically, when feasible.

Safety and information signs will be installed and maintained as necessary. Designated roads and trails will be maintained in such a manner as is practical to minimize environmental effects such as erosion and sedimentation and to provide safe conditions for public access.

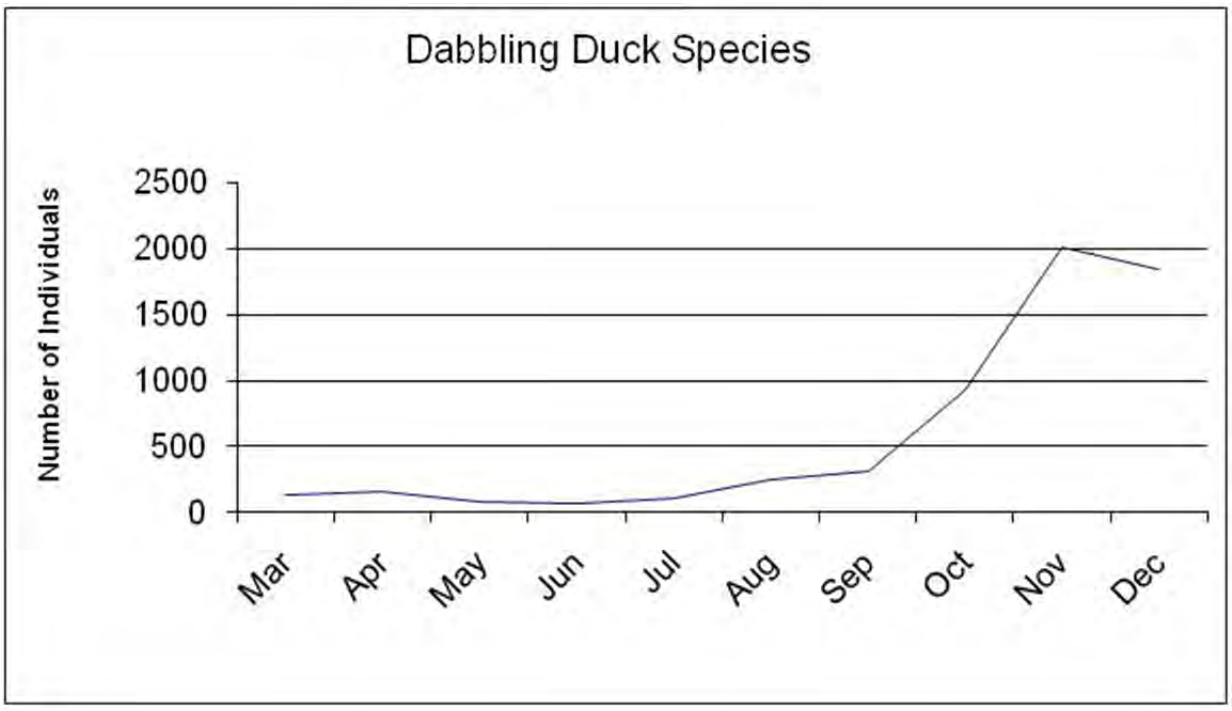

Figure B.4. Average Number of Individuals for all Dabbling Duck Species per Month Observed on the Montezuma National Wildlife Refuge, 1997 to 1999 (Sleggs et al. 2000).

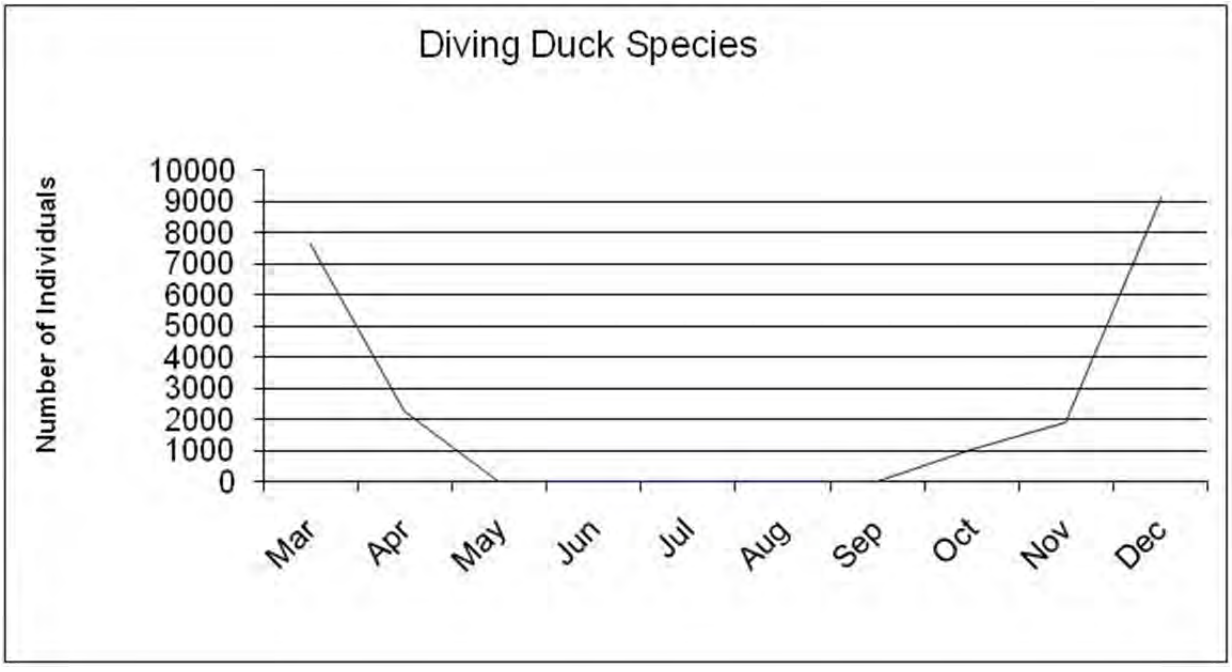

Figure B.5. Average Number of Individuals for all Diving Duck Species per Month Observed on the Montezuma National Wildlife Refuge, 1997 to 1999 (Sleggs et al. 2000).

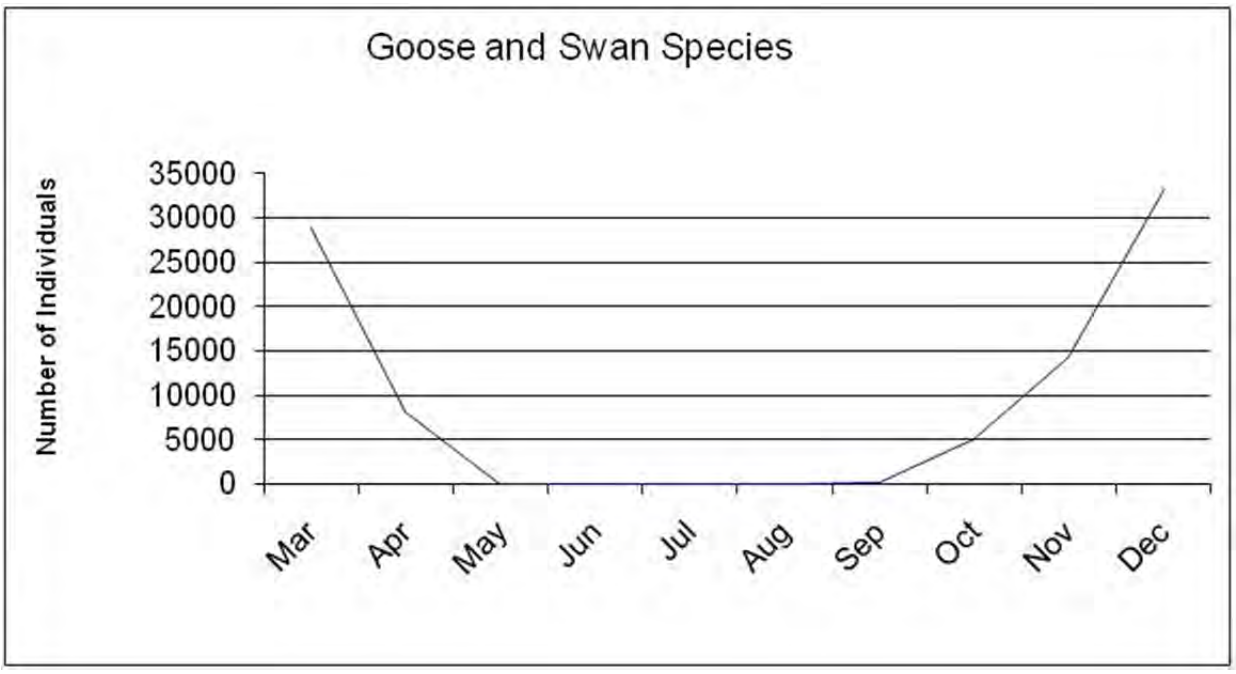

Figure B.6. Average Number of Individuals for all Goose and Swan Species per Month Observed on the Montezuma National Wildlife Refuge, 1997 to 1999 (Sleggs et al. 2000).

(e) Why is this use being proposed?

Cross-country skiing and snowshoeing are existing public uses on the refuge. When confined to designated routes, they are relatively unobtrusive means for visitors to participate in priority public uses during the wintertime, including wildlife observation and photography, interpretation, and environmental education. The existing routes for these uses provide the public with an opportunity to view the diversity of habitats and wildlife that characterize the refuge without significant environmental consequences at current and projected levels of use. Refuge trails are designed to support opportunities for wildlife and wildlands observation, photography, walking and hiking, cross-country skiing and snowshoeing, and sightseeing.

Availability of Resources:

With the exception of staff time necessary to administer and maintain it, the trail system is self-sustaining. Staff hours to manage the trail system in FY 2006 totaled 2,160 hours or the equivalent of approximately 1 full-time employee at the GS-11 salary level.

Welcome and Orient Visitors	280 hours
Wildlife Observation	120 hours
Wildlife Photography	80 hours
Environmental Education	120 hours
Interpretation Program	360 hours
Maintenance of the above facilities	1,200 hours

Based on existing refuge expenditures for managing visitor use, funding is adequate at the current level of use and to administer and manage the subject use.

Anticipated Impacts of the Use:
In general, negative effects on habitat and wildlife associated with these activities are considered minimal. Most wildlife species are less active during winter months, sensitive migratory birds have largely left the refuge, and it is not breeding season for any of the wildlife that may be present. The refuge does not groom or maintain trails in the winter. Cross-country skiing and snowshoeing are limited to winter and require sufficient snow cover to allow access. Surface water and soil may be frozen for at least a portion of this time, most vegetation is dormant, and sensitive habitat will largely be protected by a surface layer of snow. In addition, skis and snowshoes are designed to distribute weight, decreasing potential for eroding soils near waterways. Skiing and snowshoeing are limited to established roads and trails, and no recreational snowmobiles are allowed. More detailed discussion of the impacts of cross-country skiing and snowshoeing as reported in the literature and through field investigations are described below.

Impacts to Plants: Public use, such as cross-country skiing, and snowshoeing, can have indirect impacts to plants by compacting soils and diminishing soil porosity, aeration and nutrient availability that affect plant growth and survival (Kuss 1986). Hammitt and Cole (1998) note that compaction limits the ability of plants to re-vegetate affected areas. Repeated public use can directly impact plants by crushing the plants themselves. Rare plants with limited site occurrence are particularly susceptible to such impacts. Plants growing in wet or moist soils are the most sensitive to disturbance from trampling effects (Kuss 1986). Foot travel may increase root exposure and trampling effects, however it is anticipated that under current levels of use the incidence of these problems will be minor. Designated routes for these consist of existing trails, many with hardened surfaces or are existing trails that have been used for many years. Designated routes do not have any known occurrences of rare plant species on their surface that will be impacted by this use. Continuing to allow cross-country skiing and snowshoeing on these routes is not likely to cause any significant impacts to plants or plant communities because these uses generally occur during the winter (i.e., outside of plant growing season) and when the ground is covered in several inches of snow.

Impacts to Soils: Soils can be compacted and eroded as a result of continued use of trails. It is anticipated that some very minor soil erosion could occur as a result of continuing to allow cross-country skiing and snowshoeing on designated routes. Under current levels of use and because these activities occur during the winter when refuge soils are covered by several inches of snow, impacts to soils (e.g., erosion and compaction) are not likely to be significant.

Hydrologic Impacts: Roads and trails can affect the hydrology of an area, primarily through alteration of drainage patterns. It is anticipated that the designated existing roads and trails will continue to influence hydrology regardless of cross-country skiing and snowshoeing. Maintenance will be required to create adequate and proper drainage to avoid a hydrologic impact. Based on the current level of use, these uses are not likely to significantly increase erosion, incision, or stream alteration. Therefore, no significant hydrologic impacts are anticipated from this use.

Wildlife Impacts: Disturbances vary with the wildlife species involved and the type, level, frequency, duration, and the time of year such activities occur. Whittaker and Knight (1998) noted that wildlife response can include attraction, habituation, and avoidance. These responses can have negative impacts to wildlife such as mammals becoming habituated to humans making them easier targets for hunters. Human induced avoidance by wildlife can prevent animals from using otherwise suitable habitat.

Trails, including cross-country skiing and snowshoeing trails, can disturb wildlife outside the immediate trail corridor (Trails and Wildlife Task Force 1998, Miller et al. 2001). Miller et al. (1998) found bird abundance and nesting activities (including nest success) increased as distance from a recreational trail increased in both grassland and forested habitats. Bird communities in this study were apparently affected by the presence of recreational trails, where "generalists" (e.g., American robins (*Turdus migratorius*)) were found near trails and "specialist" species (e.g., grasshopper sparrows (*Ammodramus savannarum*)) were found farther from trails. Nest predation was also found to be greater near trails (Miller et al. 1998).

Disturbance can cause shifts in habitat use, abandonment of habitat, and increased energy demands on affected wildlife (Knight and Cole 1991). Flight in response to disturbance can lower nesting productivity and cause disease and death. Knight and Cole (1991) suggest recreational activities occurring simultaneously may have a combined negative impact on wildlife. Hammitt and Cole (1998) conclude that the frequent presence of humans in wildland areas can dramatically change the normal behavior of wildlife mostly through "unintentional harassment."

Seasonal sensitivities can compound the effect of disturbance on wildlife. For example, cross-country skiing can displace large mammals and other wildlife from their wintering areas, thereby consuming large amounts of stored fat reserves (Cassier et al. 1992). Hammitt and Cole (1998) noted that females with young (such as white-tailed deer) are more likely to flee from a disturbance than those without young. Cross-country skiing and snowshoeing can also lead wildlife species to avoid certain areas (Gaines et al. 2002). Some uses, such as snowshoeing in order to observe wildlife, are directly focused on viewing certain wildlife species and can cause more significant impacts during the breeding season and winter months.

Cross-country skiing and snowshoeing also cause snow compaction. Compacted snow can alter predator-prey relationships by providing predators with packed snow routes which allow them to access areas they are usually excluded from (Gaines et al. 2002). Compacted snow can also negatively impact small mammal species that travel through or live in tunnels under the snow. This can either indirectly impact species, by altering travel routes, or directly impact species, by crushing or suffocating individuals (Gaines et al. 2002).

We anticipate that there will be temporal disturbances to wildlife species using habitat on or directly adjacent to the designated cross-country skiing and snowshoeing routes. Long-term impacts may include certain wildlife species avoiding trail corridors as a result of these uses over time. However, negative effects on wildlife are expected to be minimal because many migratory birds are not present and most resident species are not breeding or raising young during the time of year when cross-country skiing and snowshoeing occur. Additionally, many mammal species are less active during winter months. As discussed previously, cross-country skiing and

snowshoeing are limited to winter months and require sufficient snow levels to allow access. Requirements for skiers to remain on designated trails also reduce the impact of recreational activities on wildlife (Miller et al 2001).

We will take all necessary measures to mitigate any negative effects on wildlife associated with skiing and snowshoeing. We will evaluate roads, trails, and activities periodically to assess potential negative effects. If evidence of unacceptable adverse effects is observed, we will curtail or discontinue activities as needed. We will post and enforce refuge regulations, and establish, post, and enforce closed areas as needed.

Threatened and Endangered Species Impacts:
It is anticipated that under current conditions and use levels, cross-country skiing and snowshoeing will not cause any significant direct or indirect impacts to threatened or endangered species. Routes designated for this use are preexisting roads and trails, some of which have been in existence for many years. No new habitat clearing will be required to accommodate pedestrian activities; however some vegetation clearing will be required within the trail corridor.

User Conflicts:
Conflicts between trail users range from concerns over personal safety to certain user groups feeling that they should be given priority over other groups based on past history or other reasons. Conflicts between groups are not significant at Montezuma Refuge. This is likely due to the relatively low number of users in the area, as compared with heavy use and conflict sites reported in the literature. To minimize conflicts between trail users and hunters, some of the trails are closed during the deer hunting season, and some of the areas with trails are closed to hunting. The refuge manager reserves the right to close the Wildlife Drive to cross-country skiing and snowshoeing at any time if necessary to ensure public safety or to minimize user conflicts.

Providing safe routes for wildlife-dependent activities is an important consideration for wildlife observation trails on the refuge. Safety considerations include ability to maintain a trail to allow safe use and timing of various uses such as wildlife observation and hunting activities. Routes designated for these uses are considered safe under current conditions and levels of use. Further monitoring of these uses will help the refuge manager determine if changes are necessary to improve visitor safety. The uses are viewed as an effective and justifiable method of access that enables the public to discover, experience, and enjoy the refuge and participate in priority public uses.

Public Review and Comment:
As part of the comprehensive conservation planning process (CCP) for the Montezuma Refuge, this compatibility determination was available for public review and comment for 30 days concurrent with the release of our draft CCP and environmental assessment.

Determination (check one below):

Use	is Not Compatible
X	Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. Cross-country skiing and snowshoeing are restricted to refuge open hours from one half hour before sunrise to one half hour after sunset.
2. Cross-country skiing and snowshoeing are allowed on designated trails when there is sufficient snow to support these uses. Cross-country skiing and snowshoeing are allowed along the Wildlife Drive, when conditions allow, except from December 1 to the end of the State's hunting season.
3. Cross-country skiing and snowshoeing on roads open to vehicular travel will be permitted subject to vehicles having the right-of-way.
4. Signs necessary for visitor information, safety, and traffic control will be installed and maintained.
5. The refuge will continue its outreach program to promote public awareness and compliance with refuge public use regulations.

All routes designated for these uses will be annually inspected for maintenance needs. Road and trail conditions that require immediate maintenance will be identified and appropriate action will be taken to correct such conditions.

Justification:
Cross-country skiing and snowshoeing have been determined to be compatible provided the stipulations necessary to ensure compatibility are implemented, and the use does not negatively impact visitor safety and resource protection. Under such conditions, the use is not expected to materially interfere with or detract from the mission of the National Wildlife Refuge System nor diminish the purposes for which the refuge was established, will not pose significant adverse effects on refuge resources, will not interfere with public use of the refuge, nor cause an undue administrative burden.

Signature: Refuge Manager: Howard Jassmann 8/23/2012
(Signature and Date)

Concurrence: Regional Chief: Scott B. Kahan 9/12/2012
(Signature and Date)

Mandatory 10-year Re-evaluation Date: 9/12/2022

Literature Cited:

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COMPATIBILITY DETERMINATION

Use: Vehicular Travel to Facilitate Priority Public Use

Refuge Name: Montezuma National Wildlife Refuge

Date Established: September 12, 1938

Establishing and Acquisition Authorities:
The U.S. Fish and Wildlife Service acquired lands to be established as the Montezuma National Wildlife Refuge (Montezuma Refuge, refuge) under Executive Order 7971 and established the refuge in 1938 under the authority of the Migratory Bird Conservation Act of 1929 (16 U.S.C. 715).

Purpose(s) for which Established:
"…as a refuge and breeding ground for migratory birds and other wildlife…" (Executive Order 7971).

"…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (16 U.S.C. 715d).

National Wildlife Refuge System Mission:
To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

Description of Use:

(a) What is the use? Is the use a priority public use?
The use is vehicular travel to facilitate priority public uses of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57), on Montezuma Refuge. Priority public uses of the National Wildlife Refuge System are hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation. Vehicles are legally licensed cars, trucks, and road-legal motorcycles and do not include all-terrain vehicles and snowmobiles, which are prohibited on the refuge. Vehicular travel supports a variety of priority public uses such as wildlife observation, wildlife photography, environmental education, and interpretation.

(b) Where will the use be conducted?
Since the establishment of the refuge in 1938, the public has been allowed to operate vehicles on the Main Impoundment Dike (3.5 miles). This route has long been known as the Wildlife Drive and provides access to the refuge, including those with disabilities. This road provides vehicular access from State Route 5 and U.S. Route 20 to State Route 89. Vehicular access on the Wildlife Drive also provides the public with an opportunity to experience refuge wildlife and plant communities in a diversity of habitats. The road has existing hard-packed surfaces.

(c) When will the use be conducted?
The Wildlife Drive is open annually to vehicular access until it is closed on November 30. An average of 67 inches of snow falls annually at Montezuma Refuge. No snow removal is conducted on the Wildlife Drive. Daily hours of use are between one half hour before sunrise and one half hour after sunset, when the refuge is open to the public. The general pattern of vehicle travel shows visitation is higher on weekends than weekdays. Most vehicular access occurs during the peak of spring and fall waterfowl migration (mid-March through mid-May and mid-September through mid-November). A photography blind overlooking the Main Pool is accessible only from the Wildlife Drive. Additionally, the Wildlife Drive is self-interpreted and a proposed hiking trail (Oxbow Trail) will also be accessible from the drive. Opportunities exist year-round for environmental education and interpretation.

(d) How will the use be conducted?
Vehicular access on the refuge will be conducted according to applicable provisions of 50 CFR 27.31 General Provisions Regarding Vehicles and New York State law. Vehicle travel will be subject to a maximum speed of 15 miles per hour to promote safe vehicle operation, to reduce the risk of vehicular collisions with other users and wildlife, and to enhance opportunities for wildlife observation. The Wildlife Drive accommodates one-way traffic only, unless a portion of the roadway is closed for maintenance.

Vehicles must be properly licensed and registered, properly equipped, and legal for street travel by New York State law. Parking is available at the visitor contact station, and along the Wildlife Drive at the photography blind and the planned Oxbow Trail trailheads. At current levels of use, these facilities are adequate to handle parking in an efficient and safe manner. We are proposing to construct up to three new pulloffs along the Wildlife Drive, one along Route 31, and one along Van Dyne Spoor Road within 10 years of CCP approval to accommodate an expected increase in visitor (and vehicle) use. Safety and information signs have been installed and are maintained as necessary. The Wildlife Drive and pulloffs will be maintained in such a manner as is practical to minimize environmental effects such as erosion and sedimentation and to provide safe conditions for public access.

(e) Why is this use being proposed?
Vehicular use of designated roads on the refuge has been allowed since refuge establishment and enhances public access and provides increased opportunity to participate in priority public uses. Vehicular use of refuge roads allows enhanced opportunities for mobility-impaired persons to engage in priority public uses. Designated roads for vehicular travel will provide the public with an opportunity to experience the diversity of habitats and wildlife that characterize the refuge without significant environmental consequences at current levels of use.

Availability of Resources:
The resources necessary to provide and administer this use are available within current and anticipated refuge budgets. Staff time associated with administration of this use is related to assessing the need for road maintenance and repair, conducting such repairs or overseeing such repairs by contracted work, maintaining associated road infrastructure, maintaining traffic counters and recording related data, analyzing use patterns, monitoring potential impacts of the use on refuge resources and visitors, and providing information to the public about the use. Aside

from providing safe and quality priority public uses, road maintenance will be necessary to facilitate refuge management activities by staff.

Refuge vehicles are needed to effectively administer the use. Personnel of the maintenance and biological staff perform the maintenance and repair of refuge roads and associated structures. The refuge has heavy equipment including a motor grader, dump truck, bulldozer, backhoe, 4×4 farm tractor, skid steer loader, and front-end loader. A maintenance facility exists and is needed to repair refuge vehicles and equipment and to construct necessary signs, kiosks, gates, and other maintenance operations.

Based on a review of the budget allocated for recreational use management, funding is adequate to ensure compatibility and to administer and manage the recreational use listed.

Anticipated Impacts of the Use:
Potential long-term direct impacts of vehicle access include pollution, sedimentation, wildlife disturbance due to vehicular traffic, and wildlife mortality (road kills). Potential short-term direct impacts include noise and minor downstream sedimentation from dust and erosion. Indirect impacts include wildlife disturbance resulting from increasing human activities facilitated by vehicular access into wildlife habitat. A positive indirect impact of this use is increased public support for the refuge. Because the Wildlife Drive has been in existence for many years and that the habitat loss is narrow and linear rather than in one large section, impacts to wildlife and plant species are not expected to be significant.

Soil Impacts: Roads promote soil erosion, primarily from sediment runoff following rains and during snowmelt. Although, the subject road is gravel and thus allows some direct penetration of precipitation into the soil, it is anticipated that some soil erosion will occur as a result of the continued use of the designated vehicle route. Maintenance operations to reduce soil erosion and sedimentation will be performed by the refuge as necessary. Based on current conditions and use, the designated vehicle route is not likely to cause significant increases in erosion and sedimentation.

Invasive Species Impacts: Roads can facilitate the introduction and spread of invasive and exotic plant species. These invasions result from the use of foreign material to construct and maintain roads, and from transport via motor vehicles traveling on roads. Based on current levels of use it is anticipated that no significant increases in invasive plant species will occur as a result of this use.

Pollution and Noise Impacts: Motor vehicles emit pollutants, create noise, and their use can disturb wildlife and humans. Pollutants from vehicle exhausts include hydrocarbons, nitrous oxide, and carbon monoxide. Such pollutants can negatively impact air and water quality that can have negative effects on plants, wildlife, and aquatic resources. The emission level of pollutants from automobiles on the Wildlife Drive is unknown. Noise levels from motor vehicles on the refuge have not been documented. Several major thorough-fares run through the refuge, such as Interstate 90, over which the refuge has no jurisdiction.

Noise from motor vehicles primarily results from the sound of tires on the gravel road surface and from metallic sounds of body and chassis vibration. It is anticipated that pollution and noise impacts from vehicle travel under current levels will not significantly impact refuge resources or visitor experiences.

Wildlife Impacts: Roads facilitate human access into wildlife habitat. Vehicular traffic and associated human activity can cause disturbances to wildlife. Those disturbances vary with the wildlife species involved and the type, level, frequency, duration and the time of year those activities occur. One study indicates that the avoidance response in birds increases as the level of human disturbance increases (Klein 1993); however, several studies have found that vehicular traffic is less disruptive than out of vehicle activity (Vaske et al. 1983, Freddy et al. 1986, Klein 1993). Van der Zande et al. (1980) found that roads could cause disturbance to bird species up to 600 meters from "quiet rural roads." Birds and mammals are commonly observed within sight of refuge roads.

Negative effects on refuge wildlife associated with vehicle travel are expected to be minor for a variety of reasons. The relatively low volume of traffic and maintenance operations of refuge roads compared to other area roads likely minimizes the effect of these roads on refuge wildlife populations. Vehicle travel will be limited to daylight hours following refuge regulations therefore disturbances during the evening when mammalian species are most active will be minimal. Additional disturbance to birds is expected to be minimal because noise associated with vehicular traffic is common in the area, vehicle travel is confined to the Wildlife Drive, the entrance road, and parking areas which are located along the periphery of the areas where birds are concentrated, and the vehicles themselves likely act as mobile blinds, resulting in reduced compared to other human activities as noted above. Based on observations since the opening of the Wildlife Drive in 1938, road kills and disturbance to wildlife are negligible. Public support for refuge programs resulting from viewing opportunities provided by the Wildlife Drive is significant.

Public Review and Comment:
This is an existing use of the refuge, and a compatibility determination (CD) was submitted for public review and comment in February 2007. We have updated this CD as part of the comprehensive conservation planning process (CCP) for the Montezuma Refuge. This updated compatibility determination was available for public review and comment for 30 days concurrent with the release of our draft CCP and environmental assessment.

Determination (check one below):

Use	is Not Compatible
X	Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. Vehicle travel along the Wildlife Drive is limited to refuge public hours (one half hour before sunrise to one half hour after sunset).
2. Signs necessary for visitor information, safety, and traffic control will be installed and maintained as necessary.
3. The refuge will continue with its outreach program to promote public awareness and compliance with refuge public use regulations.
4. In order to provide for visitor safety and maintain a high quality setting for wildlife observation, a speed limit of 15 miles per hour will be imposed.
5. The provisions for vehicle travel on national wildlife refuges as contained in applicable provisions of 50 CFR §27.31, General Provisions Regarding Vehicles, will be implemented including: establishing designated routes of travel that are conveyed to the public through signs and/or maps, assimilation of state laws and regulations governing the operation and use of vehicles, no operation of vehicles while under the influence of intoxicating beverages or controlled substances, reasonable and prudent operation, maximum speed limit, prohibition of vehicles producing excessive noise or visible pollutants, requirements for properly operating muffler, brakes, brake lights, headlight and tail lights, vehicle operators must be properly licensed, vehicles must be properly registered, licensed, and inspected, and vehicle operators must not obstruct the free movement of other vehicles.
6. Conditions that are or will risk public safety will be identified and appropriate action will be promptly taken to correct such conditions.

Justification:

Vehicle access to facilitate priority public use has been determined to be compatible provided the provisions of 50 CFR §27.31 are implemented, and the use does not exceed thresholds necessary for visitor safety and resource protection. This use has been determined to be compatible at existing levels of use if managed in a manner that does not result in hazards to visitors, cause significant degradation to plant communities and wildlife habitats, or significantly disturb wildlife.

The impacts of this use, subject to the stipulations above, are not expected to materially interfere with or detract from the mission of the National Wildlife Refuge System or the purposes for which the refuge was established. This use does not pose significant adverse effects on trust species or other refuge resources and will not interfere with other uses being conducted on the refuge or cause an undue administrative burden for the interim period identified.

Signature: Refuge Manager: Howard Josie 8/23/2012
(Signature and Date)

Concurrence: Regional Chief: Scott B. Kahan 9/12/2012
(Signature and Date)

Mandatory 10-year Re-evaluation Date: 9/12/2022

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Compatibility Determination

Use: Furbearer Management—Economic Use

Refuge Name: Montezuma National Wildlife Refuge

Date Established: September 12, 1938

Establishing and Acquisition Authorities:
The U.S. Fish and Wildlife Service acquired lands to be established as the Montezuma National Wildlife Refuge under Executive Order 7971 and established the refuge in 1938 under the authority of the Migratory Bird Conservation Act of 1929 (16 U.S.C. 715).

Purposes for which Established:
"…as a refuge and breeding ground for migratory birds and other wildlife…" (Executive Order 7971).

"…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (16 U.S.C. 715d).

National Wildlife Refuge System Mission:
To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

Description of Use:

(a) What is the use? Is the use a priority public use?
The use is furbearer management. Furbearers are considered a renewable natural resource with cultural and economic values. Furbearer management through trapping is considered to have economic value since the furs can be sold, and is an existing economic use of a renewable natural resource. Pursuant to refuge regulations at 50 C.F.R. 29.1, since this activity is considered to have economic value, we must determine if it is compatible with and contributes to the refuge purposes or the mission of the National Wildlife Refuge System. Trapping is used on the refuge as a management tool and therefore a description of the annual program is included as an appendix to the Annual Habitat Work Plan. The trapping program is an integral part of the refuge biological program, but it is not a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57).

(b) Where will the use be conducted?
Furbearer management is conducted in most areas of the refuge. Occasionally, trapping is not permitted in certain areas to allow furbearer populations to increase. Trapping is not permitted within 100 feet of open nature trails to reduce the potential for conflicts. A description of authorized trapping areas is provided to trappers annually.

(c) When will the use be conducted?
Furbearer management is conducted in accordance with New York State trapping seasons. At this time, trapping for upland species, including raccoon (*Procyon lotor*), red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), skunk (*Mephitis mephitis*), coyote (*Canis latrans*), opossum (*Didelphis virginiana*), and weasel (*Mustela* spp.), is from late October through mid-February, and trapping for beavers (*Castor canadensis*), muskrats (*Ondatra zibethicus*), and mink (*Neovison vison*) is from late-November through mid-February. The refuge is a State registered marsh so the muskrat season may be extended on an annual basis to facilitate habitat management or resource protection as needed. The annual occurrence of furbearer management within the Montezuma Refuge is at the discretion of the refuge manager and depends on the population size of the targeted species and management objectives.

(d) How will the use be conducted?
Furbearer management is conducted in accordance with New York State (NYS) trapping regulations. Each refuge trapper is issued a special use permit (SUP) requiring him or her to follow State and refuge regulations. The refuge is divided into trapping units, which are awarded to licensed trappers via a closed bid system. Only one trapper with a helper is allowed in each unit. Identifying trapping units allows the refuge to modify furbearer management according to the conditions specific to each unit. For example, trapping may be prohibited in certain areas to allow populations to increase. Zoning also provides higher quality trapping experiences by preventing overlap between trappers. By identifying locations where specific trappers are permitted on the refuge, enforcement of refuge and State regulations is facilitated.

The refuge requires a harvest report from each trapper following the close of the trapping season. The report includes data about the trapping effort, the time span of trapping by species, the number of target and nontarget species harvested, the refuge areas trapped, and remarks on observations of wildlife or other noteworthy ecological information. These data can provide a basis for catch-per-unit effort and population trend analyses.

Trappers must follow State regulations regarding legal traps including river otter avoidance techniques. At this time, they may utilize foothold, body-gripping, and box or cage traps. Snares are prohibited for trapping. Each method is qualified under State regulation as to trap size and types of allowable sets in order to protect nontarget species.

Access for trapping on the refuge is by highway vehicle, by foot (primarily walking and snowshoeing), and by nonmotorized boat. Travel on the refuge by ATVs and snowmobiles is prohibited at all times.

(e) Why is this use being proposed?
Furbearer management is a tool primarily used to maintain habitat for priority wildlife species. Removal of harvestable furbearers has a beneficial effect by protecting refuge infrastructure such as dikes and water control structures from damage, thus ensuring management capabilities over wetlands. These benefits minimize the need to commit refuge resources to achieve quality habitat conditions.

A regulated upland and wetland furbearer management program on the refuge also affords a mechanism to collect survey and monitoring information or contribute to research on furbearer (and other wildlife) occurrence, activity, movement, population status, and ecology. By maintaining a trained, experienced group of trappers, the Service can use their skills and local knowledge to perform or assist in valuable management or research functions, for example controlling predator populations or disease outbreaks if needed. Trappers who participate in the refuge program assist refuge staff in achieving habitat management objectives, such as maintaining emergent vegetation in marshes to provide habitat for breeding marshbirds and migrating waterfowl. Refuge trappers typically have a stake in proper habitat and wildlife conservation and protection of the ecological integrity of the refuge so they can continue trapping from year to year. Accordingly, they are valuable assets for the refuge manager in providing onsite reports concerning the fundamental status of habitat, wildlife, and refuge conditions.

Availability of Resources:
Resources are available under current staffing and budgets to administer the program (table B.1). Additionally, maintaining appropriate levels of furbearers on an annual basis assists in ensuring that major failures in refuge infrastructure do not occur (e.g., dike collapse), thus reducing large expenditures of funds to repair infrastructure.

Table B.1. Annual Cost of Furbearer Management Program.

Identifier	**Cost**
Prepare and submit annual trapping program to include in annual habitat work plan including an evaluation of the previous year's program.[1]	$700
Maintain trapper mailing list. Develop and mail trapping information to potential bidders.	$350
Open bids, assign units, notify trappers, and issues permits.	$700
Enforce furbearer trapping laws and regulations.	$700
Total Annual Cost	**$2,450**

[1]Wildlife and habitat monitoring costs are not included here.

Anticipated Impacts of the Use:
The impacts of furbearer management on the purposes of the refuge and the mission of the Refuge System can be either direct or indirect, and may have negative, neutral, or positive impacts on refuge resources.

Migratory Birds:
Because of the temporal separation of furbearer management activities and migratory birds using the refuge, direct negative impacts on those resources by trappers are negligible (i.e., large concentration of migratory birds are not here during trapping season). Indirect positive impacts on migratory birds result from habitat modifications resulting from the furbearer management program.

Refuge Habitats:
Through careful management of the furbearer management program, trapping activities positively impact high priority wildlife species by improving habitat quality. For example, muskrat trapping is conducted where a hemi-marsh is the desired habitat condition for waterfowl and breeding marshbirds. If muskrats were not trapped from these units, they will decrease the vegetative cover so that the unit will no longer be as high of quality for these breeding marshbirds or migrating waterfowl. Muskrat trapping is prohibited in areas where vegetation needs to be removed to provide open water or mudflats for priority wildlife species such as migrating shorebirds. Beaver trapping is conducted to reduce damage to water control structures. It is imperative that water control structures are in working order to provide appropriate water levels for target wildlife.

Furbearers:
Trapping furbearers removes individuals from the population. New York State Department of Environmental Conservation (NYSDEC) annually sets trapping regulations to maintain healthy furbearer population levels and to sustain this renewable resource. Statewide harvest of these species is carefully monitored to help understand population trends. On the refuge, the furbearer management program aims to maintain furbearer populations at levels compatible with refuge habitat objectives.

Very few individuals of nontarget species are taken through this trapping program (an average of 1.5 individuals per year for the past four seasons). Traps are set specifically around areas of targeted species activity to reduce the risk of taking species other than targeted species. The experience of the trappers and the selection of the appropriate trap size reduce nontarget captures (Northeast Furbearer Resources Technical Committee 1996, Boggess et al. 1990).

Cumulative Effects:
Several studies have examined the effects of recreationists on birds using shallow water habitats adjacent to trails and roads through wildlife refuges and coastal habitats in the eastern U.S. (Burger 1981, 1986, Klein 1993, Burger et al. 1995, Klein et al. 1995, Rodgers and Smith 1995, 1997, Burger and Gochfeld 1998). Overall, the existing research clearly demonstrates that disturbance from recreational activities always have at least temporary effects on the behavior and movement of birds within a habitat or localized area (Burger 1981, 1986, Klein 1993, Burger et al.1995, Klein et al. 1995, Rodgers and Smith 1997, Burger and Gochfeld 1998). The findings that were reported in these studies are summarized as follows in terms of visitor activity and avian response to disturbance.

Presence: Birds avoided places where people were present and when visitor activity was high (Burger 1981, Klein et al. 1995, Burger and Gochfeld 1998).

Distance: Disturbance increased with decreased distance between visitors and birds (Burger 1986), though exact measurements were not reported.

Approach Angle: Visitors directly approaching birds on foot caused more disturbance than visitors driving by in vehicles, stopping vehicles near birds, and stopping vehicles and getting out without approaching birds (Klein 1993). Direct approaches may also

cause greater disturbance than tangential approaches to birds (Burger and Gochfeld 1981, Burger et al. 1995, Knight and Cole 1995, Rodgers and Smith 1995, 1997).

Type and Speed of Activity: Joggers and landscapers caused birds to flush more than fishermen, clammers, sunbathers, and some pedestrians, possibly because the former groups move quickly (joggers) or create more noise (landscapers). The latter groups tend to move more slowly or stay in one place for longer periods, and thus birds likely perceive these activities as less threatening (Burger 1981, 1986, Burger et al. 1995, Knight and Cole 1995). Alternatively, birds may tolerate passing by with unabated speed whereas if the activity stops or slacks birds may flush (Burger et al. 1995).

Noise: Noise caused by visitors resulted in increased levels of disturbance (Burger 1986, Klein 1993, Burger and Gochfeld 1998), though noise was not correlated with visitor group size (Burger and Gochfeld 1998).

In determining compatibility, the cumulative effects of all public uses are considered. Primarily due to the season of use, disturbance from trappers is not expected to significantly increase the disturbance to wildlife. Trappers are afield during a period of the year when nearly all wildlife breeding activity has ceased. Additionally, much of the marsh trapping activity occurs when refuge wetlands are iced over and minimal wildlife is present in the area.

Public Review and Comment:
As part of the comprehensive conservation planning (CCP) process for the Montezuma Refuge, this compatibility determination was available for public review and comment for 30 days concurrent with the release of our draft CCP and environmental assessment.

Determination (check one below):

Use	is Not Compatible
X	Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:
The furbearer management program will be reviewed annually to assess its effectiveness and to ensure and that wildlife populations and habitat quality are managed appropriately. In addition, the following conditions will apply:

1. Permittees must comply with all conditions of the SUP and all NYS trapping regulations.

2. Trappers, when requested by law enforcement officers, must display for inspection their State trapping license, SUP, trapping equipment, and all animals in their possession.

3. No traps shall be placed in muskrat houses or push-ups. No traps should be placed on floating logs or other floating material.

4. Ingress to and egress from the refuge shall only be by routes of travel designated by the refuge manager or his or her designee.

5. Permittees shall, no later than 10 days after the last day of the refuge trapping season, submit to the refuge manager a completed trapping report form provided with the SUP. This form documents the number of each species of animals taken and the location where the animals were taken, including nontarget species.

6. No chunk bait may be used (i.e., only liquid or paste baits). Vegetable matter is permitted as bait on muskrat traps under the ice only. No terrestrial trapping is permitted on mowed areas of dikes. Trapping along the dikes may be further restricted if the need arises.

7. Unless otherwise stated by the refuge manager, the refuge trapping season will run concurrently with the State season.

8. Traps must be checked at least once every 24 hours.

9. Every effort must be made to prevent the capture of nontarget species.

Justification:
Regulated trapping is recognized by the Service as an effective, legitimate, and ecologically sound wildlife population and habitat management method on national wildlife refuges. Trapping seasons and limits are established by the State and adopted by the refuge to protect wildlife populations from over harvest.

Maintaining furbearer populations at levels conducive to management of the refuge's habitats for waterfowl and other high priority wildlife species benefits the mission of the refuge and the National Wildlife Refuge System. The right population size and distrubution of muskrats and beavers allows for effective management of refuge marshes to create and maintain a hemi-marsh conditon favored by many priority wildlife species. Excessive numbers of muskrats and beavers can compromise refuge infrastructure because of burrowing into dike systems by muskrats and damaging water control structures by beavers.

As stated previously, a regulated upland and wetland furbearer management program on the refuge also affords a mechanism to collect survey and monitoring information or contribute to research on furbearer (and other wildlife) occurrence, activity, movement, population status, and ecology. The Service can also use trappers and their local knowledge to perform or assist in valuable management or research functions.

Furbearers are a renewable natural resource with cultural and economic values (Andelt et al. 1999, Boggess et al. 1990, Northeast Furbearer Resources Technical Committee 1996, Payne 1980). Several human dimensions studies have documented trapper profiles, cultural aspects of trapping, and the socioeconomic role of trapping in the U.S. (Andelt et al. 1999, Boggess et al. 1990, Daigle et al. 1998). A regulated trapping program on the refuge fosters the appreciation of wildlife and nature, a greater understanding of ecological relationships, stewardship of natural resources, and intergenerational passage of the methodologies of renewable resource use.

Furbearer management is not a priority public use; however, it is a wildlife-dependent activity in which family members and friends often participate and share joint experiences that broaden appreciation of natural resources and ecological awareness and can be used to help educate the public about the refuge. This use will not materially infere with or detract from the fulfillment of the National Wildlife Refuge System mission and the purposes for which the refuge was established. Rather, the furbearer management program will contribute to the purposes of the refuge and the mission of the National Wildlife Refuge System by providing biological information about furbearers on the refuge and protecting refuge infrastructure and habitats.

Signature: Refuge Manager: Howard M. Jaeckel 09/14/2012
(Signature and Date)

Concurrence: Regional Chief: Scott B. Kahn 9/18/2012
(Signature and Date)

Mandatory 10-year Re-evaluation Date: 9/18/2022

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COMPATIBILITY DETERMINATION

Use: Fishing

Refuge Name: Montezuma National Wildlife Refuge

Date Established: September 12, 1938

Establishing and Acquisition Authorities:
The U.S. Fish and Wildlife Service acquired lands to be established as the Montezuma National Wildlife Refuge under Executive Order 7971 and established the refuge in 1938 under the authority of the Migratory Bird Conservation Act of 1929 (16 U.S.C. 715).

Purpose(s) for which Established:
"…as a refuge and breeding ground for migratory birds and other wildlife…" (Executive Order 7971).

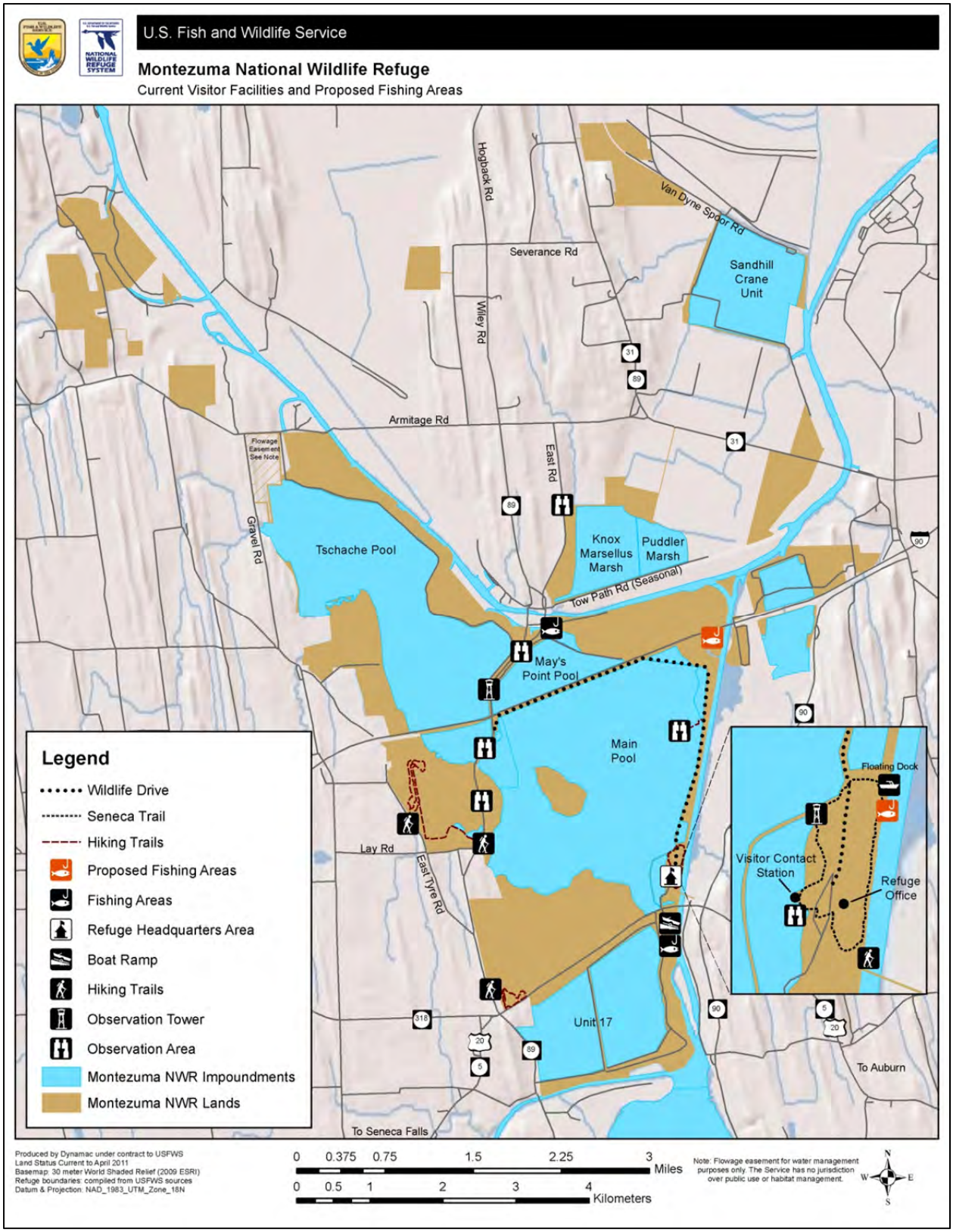
"…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (16 U.S.C. 715d).

National Wildlife Refuge System Mission:
To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

Description of Use:

(a) What is the use? Is the use a priority public use?
The use is fishing, which is the act or sport of catching fish. There is no fishing allowed directly in waters within the refuge boundary proper, however recreational fishing and fishing access is allowed from the shoreline and the banks of refuge lands adjacent to waters owned and regulated by New York State. As such, fishing is allowed from designated areas along refuge shorelines in New York State waters. Fishing is a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997.

(b) Where will the use be conducted?
Fishing is not authorized in refuge impoundments; however, we provide fishing access to New York State Canal System waters. Fishing access for recreational fishing will be permitted at specific areas on the refuge designated as public fishing sites (refer to map B.2). These sites include the following: (1) the boat launch site south of U.S. Highway 20, across from the refuge entrance, with fishing access to the Seneca-Cayuga Canal. This site has been open as a fishing access point for many years and is operated by the refuge under a cooperative agreement with New York State Department of Environmental Conservation (NYSDEC); (2) May's Point



Map B.2. Montezuma National Wildlife Refuge Current Visitor Facilities and Proposed Fishing Areas.

Fishing Access Site at the end of South May's Point Road with access to the New York State Canal System; (3) along the banks of the Seneca Trail and from the floating dock in the refuge headquarters area, with fishing access to the Seneca-Cayuga Canal; and (4) along the banks of the proposed Oxbow Trail on the Wildlife Drive, with access to both the Clyde River Oxbow and the Seneca-Cayuga Canal.

(c) When will the use be conducted?
Fishing will be conducted during New York State open fishing seasons in accordance with Federal regulations and State fresh water fishing guidelines. Anglers fishing from refuge fishing access sites must check the NYS fishing regulations and guidelines for when open season occurs for each species being fished and caught. Visitor access hours on the refuge are one half hour before sunrise to one half hour after sunset.

(d) How will the use be conducted?
We will continue to conduct the use according to State and Federal regulations. Federal regulations in 50 CFR pertaining to the National Wildlife Refuge System Administration Act, as well as existing, refuge specific regulations will apply. However, the refuge manager may, upon annual review of the fishing program, impose further restrictions on fishing or recommend that some or all fishing access sites on the refuge be closed. We will restrict fishing if it becomes inconsistent with other, higher priority refuge programs or endangers refuge resources or public safety.

We will continue to maintain the existing fishing areas at Mays Point Pool and on Unit 17 (see map B.2). In addition, we will maintain a fishing area near the proposed Oxbow Trail and will maintain the boat dock near the Seneca Trail.

Additional specifics on how fishing will be implemented on the refuge are included in the refuge's public fishing plan, completed in 1993. Staff are currently revising the plan, and intend to complete revisions within 2 years of CCP approval.

(e) Why is the use being proposed?
Fishing is one of the priority uses outlined in the Refuge System Improvement Act of 1997. The Service supports and encourages priority uses when they are appropriate and compatible on national wildlife refuge lands. Fishing is also a traditional form of wildlife-oriented recreation that many national wildlife refuges can accommodate. Montezuma Refuge has the opportunity to provide public fishing opportunities in a manner and location that will offer high quality, wildlife-dependent recreation and maintain the level of current fish and wildlife values.

Availability of Resources:
The following breakdown shows the estimated amount of funds needed to administer the Recreational Fishing Program:

News releases, publications, fishing regulations, fact sheets		$ 250
Signs (purchase and annual installation)		$ 250
Staff time	$	250
Law Enforcement	$1,000	
Total Annual Cost	$1,750	

Anticipated Impacts of the Use:
Some potential impacts of fishing include:

- **Accidental or deliberate introductions of nonnative fish** that may negatively impact native fish, wildlife, or vegetation. The refuge will continue to provide educational outreach and signage on this subject, and try to minimize impacts associated with nonnative species introductions, if they occur. Artificial lures are preferred.

- **Negative impacts to waterfowl and other wildlife from lost fishing gear may include ingestion of lead sinkers, hooks, lures, litter, or entanglement in fishing line or hooks.** Lost fishing tackle may harm waterfowl, eagles, and other birds externally by catching on, and tearing skin. Fishing line may also become wrapped around body parts and hinder movement (legs, wings), impair feeding (bill), or cause a constriction with subsequent reduction of blood flow and tissue damage. Entangled animals may become snagged by an object above or below the water surface, from which they are unable to escape. Birds may also ingest sinkers, hooks, floats, lures, and fishing line. Ingested tackle may be toxic or cause damage or penetration of the mouth or other parts of the digestive tract that may result in impaired functioning or death. There have not been any documented cases of this occurring on the refuge. However, the refuge will continue to provide education and outreach on the hazards of fishing tackle.

- **Disturbance of wildlife** (particularly osprey (*Pandion haliaetus*) and breeding waterfowl) due to fishing, although disturbance is expected to be minimal. Fishing seasons in New York coincide, in part, with spring and early summer nesting and brood-rearing periods for many species of aquatic-dependent birds. Anglers may disturb resting and foraging birds by approaching too closely. Flushing may expose eggs to predation or cooling, resulting in egg mortality. The refuge will continue to seasonally close areas around sensitive sites to fishing. Public outreach and placement of warning signs will also be continued.

- **Negative impacts to water quality** from human waste and litter. Public outreach and education on littering and proper waste disposal will lessen potential negative water quality impacts. Litter barrels provided by the refuge maintenance staff are checked and emptied regularly during the fishing season.

- **Bank and trail erosion** from human activity and foot traffic may increase aquatic sediment loads in the canals and rivers, or alter riparian or lakeshore habitat/vegetation in ways harmful to fish or other wildlife. Trails will be monitored and may be modified, restored, or closed, if conditions warrant. Since all refuge fishing occurs from the shoreline, trails adjacent to canals and rivers will be monitored in order to reduce trail erosion due to fishing-related foot traffic.

- **Illegal fishing** resulting in overharvest. Law enforcement presence will reduce this type of activity.

- **Conflicts between anglers and other user groups.** There may be some conflicts

between anglers and birders. If other conflicts should arise, the refuge may need to place additional constraints on public uses to minimize conflicts. Management actions may include but are not limited to: education and outreach, zoning (in space and/or time), and separating user groups.

Public Review and Comment:
As part of the comprehensive conservation planning process (CCP) for the Montezuma Refuge, this compatibility determination was available for public review and comment for 30 days concurrent with the release of our draft CCP and environmental assessment.

Determination (check one below):

Use	is Not Compatible
X	Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. We will manage the public fishing program in accordance with Federal and State regulations and review it annually to ensure that wildlife and habitat management goals are achieved and that the program is providing a safe, high quality outdoor experience for participants. Therefore, adherence to the regulations stated herein will ensure compatibility with the purpose for which the refuge was established.

2. Access to refuge lands is permitted only between one half hour before sunrise and one half hour after sunset.

3. All anglers 16 years of age or older (unless exempt per State regulations) and fishing on the refuge must hold a valid New York State fishing license. All anglers must comply with all State fishing regulations (*http://www.dec.ny.gov/outdoor/7917.html*). Individuals fishing on the refuge are subject to the inspection of licenses, fishing equipment, fish creels and containers, vehicles, and their contents by Federal or State officers.

4. Neither fishing nor the use of canoes, motorized boats, or other nonmotorized boats for fishing are allowed on refuge impoundments.

5. Prohibited Activities:
   a. Fishing by means of chumming with fish eggs.
   b. The use of unlawful baitfish, gaffs, grappling hooks and spears.
   c. Fishing while under the influence or possession of alcoholic beverages.
   d. Commercial fishing on the refuge.
   e. Camping, overnight parking, open fires, littering, and the willful destruction of vegetation.

Justification:
Montezuma Refuge is located in a rural area between Syracuse and Rochester, NY. Fishing is a traditional and well established activity on the refuge that satisfies a public demand. It has

minimal conflicts with other types of public uses that may occur on the refuge. Fishing is a wildlife-dependent priority public use with minimal impact on refuge resources. It is consistent with the purposes for which the refuge was established, the Service policy on fishing, the National Wildlife Refuge System Improvement Act of 1997, and the broad management objectives of the National Wildlife Refuge System.

This use will not materially interfere with or detract from the mission of the Refuge System or diminish the purposes for which the refuge was established. It will not cause an undue administrative burden. Annual adjustments can be made in the fishing program to ensure its continued compatibility.

Signature: Refuge Manager: Howard Josiloff 8/23/2012
(Signature and Date)

Concurrence: Regional Chief: Scott B. Kahn 9/12/2012
(Signature and Date)

Mandatory 15-year Re-evaluation Date: 9/12/2027

COMPATIBILITY DETERMINATION

Use: Big Game Hunting (white-tailed deer)

Refuge Name: Montezuma National Wildlife Refuge

Date Established: September 12, 1938

Establishing and Acquisition Authority:
The U.S. Fish and Wildlife Service (USFWS) acquired lands to be established as the Montezuma National Wildlife Refuge under Executive Order 7971 and established the refuge in 1938 under the authority of the Migratory Bird Conservation Act of 1929 (16 U.S.C. 715).

Purpose(s) for which Established:
"…as a refuge and breeding ground for migratory birds and other wildlife…" (Executive Order 7971).

"…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (16 U.S.C. 715d).

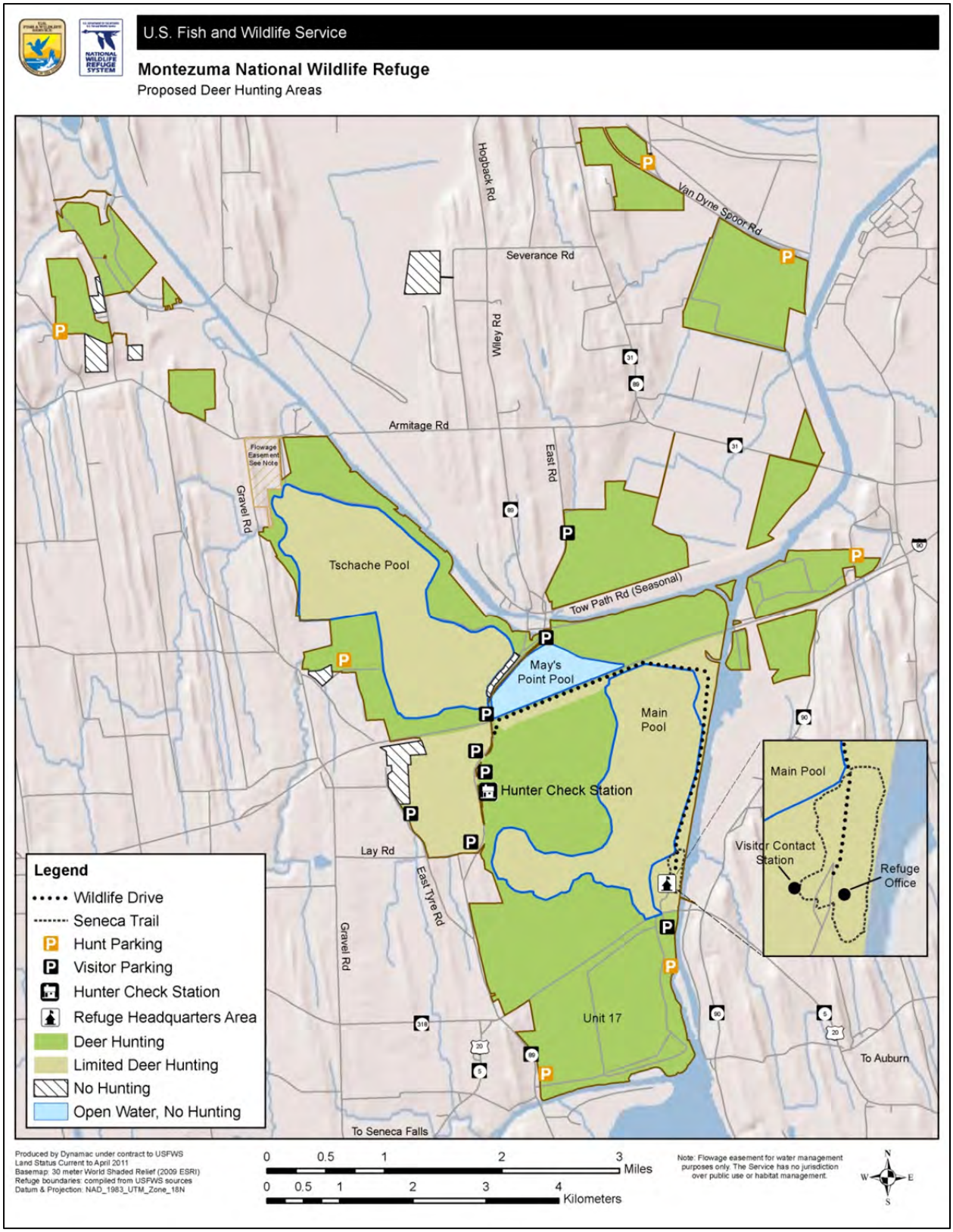
National Wildlife Refuge System Mission:
To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

Description of Use:

(a) What is the use? Is the use a priority public use?
The use is big game hunting for white-tailed deer (*Odocoileus virginianus*). Hunting is a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997.

(b) Where will the use be conducted?
Deer hunting will be permitted throughout the entire refuge, except areas closed to hunting to protect facilities and structures, certain habitats, and select public use areas (see map B.3).

(c) When will the use be conducted?
Hunting will be conducted during New York State big game seasons in accordance with Federal and State regulations. We will allow hunting during all State deer seasons (i.e., archery, regular, and muzzleloader). Typically bow-hunting is open from mid-October to mid-November and then again for a week in December (after the regular season closes). The regular (i.e., shotgun) season is typically mid-November to mid-December. Muzzleloader season is typically during the same time as the late bow-hunting season, one week in December.



Map B.3. Montezuma National Wildlife Refuge Proposed Deer Hunting Areas.

Currently hunting does not occur on the refuge before November 1, regardless of the start of the State seasons. This was done to avoid conflict between hunters and other visitors at the Esker Brook Trails. We propose to open the refuge to hunting with the New York State opener (typically mid-October), but keep the Esker Brook Trail area closed to hunting until November 1. Hunting hours are sunrise to sunset. We may adjust hunt season dates and bag limits in the future as needed to achieve balanced wildlife population levels within habitat carrying capacities.

(d) How will the use be conducted?

We will continue to conduct the use according to State and Federal regulations. Federal regulations in 50 C.F.R. pertaining to the National Wildlife Refuge System Administration Act, as well as existing, refuge specific regulations will apply. However, the refuge manager may, upon annual review of the hunting program, impose further restrictions on hunting, recommend that the refuge be closed to hunting, or further liberalize hunting regulations up to the limits of state regulations. We will restrict hunting if it endangers refuge resources or public safety.

During the 2009 and 2010 opening day of the regular deer season, the refuge filled its maximum allowable amount of 150 individuals registered for hunting on opening day. Quality of hunting experience as well as providing ample hunting room per hunter will continue to be achieved by regulating, via the permit system, the number of hunters on a given day.

The total huntable area has increased over the years as new lands have been acquired by the refuge (table B.2). The refuge currently limits the daily number of archery permits to 300 and firearms to 150. This limit in firearms permits was implemented in 2000 and has not increased, despite an increase in refuge acreage (table B.2).

Table B.2. History of Land Acquisition at Montezuma National Wildlife Refuge through October 2012.

Acquisition Date	Acreage
1937	2,564
1938	2,354
1939	544
1940	444
1941	279
1942	34
1945	6
1959	176
1963	27
1965	16
1993	53
1995	397
1996	186
1997	54
1998	608
1999	142
2000	87

Acquisition Date	Acreage
2001	387
2002	75
2004	80
2005	106
2006	64
2007	381
2008	26
2009	63
2012	31
Total	**9,184**

The refuge will continue to use the following formula to determine the total number of permits to safely issue during firearms season:

White-tailed deer hunting permits will vary year to year for the refuge. For firearms season, permits will be calculated based on the following equation:

TPI = (TRA)/50 where,
TPI = Total Permits Issued
THA = Total Refuge Acreage
50 = constant (50 acres per hunter for firearms season)

The need to calculate TPI is a result of the refuge acquiring new properties. More huntable acreage means more deer, which should result in more permits issued. The constant is based on the formula the refuge has used from the beginning of its firearms hunt.

All persons hunting on the refuge must first hold a valid State hunting license, and must then obtain a daily refuge hunting permit. One general refuge hunting permit will be used for all refuge deer hunt programs. Individuals hunting on the refuge are subject to the inspection of permits, licenses, hunting equipment, game bagged, and vehicles and their contents by enforcement officers.

All areas of the refuge are open during the hunting season except safety zones and areas specifically closed to hunting. Currently, no hunting zones include but are not limited to: the immediate areas around the refuge office headquarters area, refuge impoundments, along the Wildlife Drive, and adjacent to Wood Marsh Road. Permission must be obtained from refuge personnel to enter a no hunting zone for the purpose of tracking, and/or retrieving legally taken game animals.

We propose to open the Seneca Trail area to late season archery hunting, as deer tend to congregate around the office area. We will close the Wildlife Drive to other public uses beginning December 1 and will allow hunting in this area. Once impoundments are frozen over, including the Main Pool, these areas will be open to deer hunting.

While many hunters use the refuge to hunt deer, more do so during the regular firearm season than any other season. The heaviest usage is during the first full week of the regular firearm season and on Saturdays (there is no Sunday hunting currently on the refuge).

Hunters with disabilities who possess a New York State disabled hunting license, Golden Access, or America the Beautiful Access Pass may qualify for special accommodations. They must apply in person and show proof of permanent disability.

(e) Why is the use being proposed?
Hunting is one of the priority uses outlined in the Refuge System Improvement Act of 1997. The Service supports and encourages priority uses when they are appropriate and compatible on national wildlife refuge lands. Hunting is used in some instances to manage wildlife populations. It is also a traditional form of wildlife-oriented recreation that many national wildlife refuges can accommodate.

Availability of Resources:
The following breakdown shows the estimated amount of funds needed to administer the Deer Hunt Program:

News releases, publications, hunt regulations, permits			$1,400
Signs (purchase and annual installation)			$ 250
Staff time (check station staffing, maintenance)		$1,250	
Law Enforcement	$1,500		
Total Annual Cost	$4,400		

Anticipated Impacts of the Use:
The following anticipated impacts are expected. For more specific impacts, including a cumulative impact analysis, please refer to the refuge's final hunt program environmental assessment, appendix E, in the refuge's final CCP (USFWS 2013).

In much of the Northeast, deer populations continue to increase and have reached densities in some areas that are above the carrying capacity of the habitat. A deer harvest is essential in helping to maintain the herd at or below the carrying capacity of its habitat. When deer overpopulate, they overbrowse their habitat, and can completely change the species composition of a forest, in addition to reducing its overall biodiversity (Côté et al. 2004). Tree seedlings can be killed by overbrowsing, limiting recruitment. The failure of forests to regenerate due to overbrowsing by deer will have negative impacts on future resident and migratory populations of native wildlife

Overbrowsing by deer can also affect nesting songbirds in upland areas. A study conducted in Pennsylvania showed that both species diversity and abundance declined in areas with high densities of deer as a result of reduced nesting habitat (deCalesta 1994). Additionally, deer overpopulation can lead to outbreaks of devastating diseases such as hemorrhagic disease, bluetongue, and chronic wasting disease. Furthermore, overpopulation leads to starvation, more numerous car-deer collisions, and poorer herd health overall. Regulated hunting has proven to be an effective deer population management tool and has been shown to be the most efficient and least expensive technique for removing deer and maintaining deer at desired levels (Northeast Deer Technical Committee 2009).

Deer have restricted home ranges and continued local hunting efforts will not affect regional populations. The New York State Department of Environmental Conservation (NYSDEC) has divided the state into geographical units, called Wildlife Management Units (WMUs) to set hunting seasons and regulations. The refuge is in WMUs 8J, 8F, and 7F. The total number of deer harvested in these WMUs in the last 55 years (1954 to 2010) has been increasing steadily, indicating a likely increase in the overall deer population (figure B.7). State deer density estimates for this region are approximately 20 per square mile and have been increasing across New York State in the last few years, based on harvest data (*http://www.dec.ny.gov/*). Based on the refuge's total acreage (9,184 acres), there are nearly 300 deer inhabiting the refuge lands.

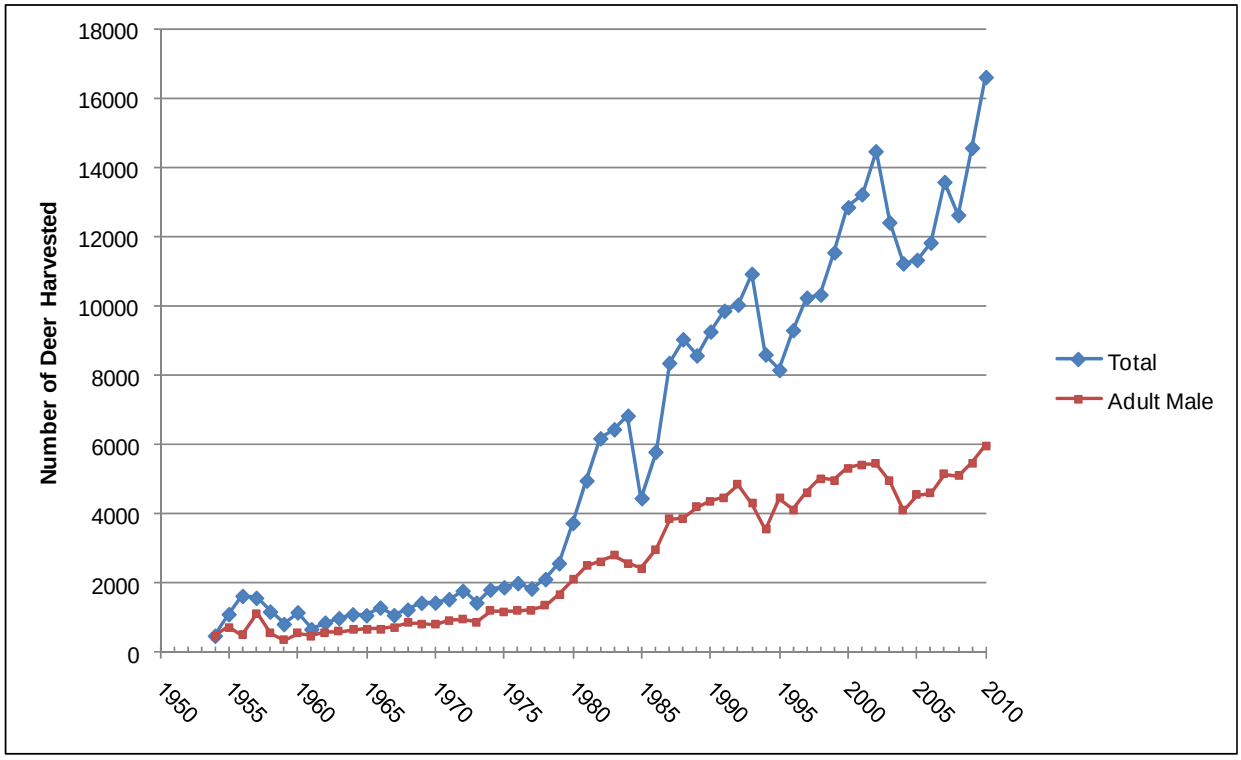


Figure B.7. Total Number of Deer Harvested in WMUs 7F, 8F, and 8J Between 1954 and 2010.

However, the refuge's population is likely higher than that range due to the amount of dense cover available to deer. Refuge and NYSDEC staff initiated deer population surveys on the refuge in 2011. Preliminary data indicate there are approximately 32 deer per square mile (Kautz, 2012). The two most important factors affecting refuge deer numbers and movements are farming practices on adjacent agricultural lands and the severity of winter weather. The refuge's large tracts of hardwood bottomlands and cattail swales provide cover for many deer, as evidence by overbrowsing (Rawinski 2010).

The total number of deer harvested on the refuge from 2000 through 2009 is 777. This averages out to approximately 78 deer harvested annually. The deer population in the vicinity of the refuge is still considered higher than optimal, indicating that current hunting levels are not affecting the population substantially (NYSDEC 2009). This information confirms that decades of deer hunting on the refuge and surrounding private lands has not had a local cumulative

adverse effect on the deer population. Therefore, continuing to allow hunting on the refuge should not have negative cumulative impacts on the deer herd; but instead, should support better overall herd health and maintain or increase habitat biodiversity.

Because the refuge has been open to hunting for many years and because hunting has occurred on parcels for many years before their purchase by the Service, we expect no additional impacts. There may be temporary impacts on other species of wildlife during the deer season. However, in the case of migratory waterfowl, deer hunters will cause little disturbance to them in the marshes where the birds feed and rest since most deer hunting takes place in upland habitats. Additionally, shotgun deer hunting will only occur on the refuge for a couple of weeks which will give the birds an opportunity to feed and rest undisturbed in those areas before and after the season.

Some disturbance of nontarget wildlife species and impacts on vegetation may occur. However, those impacts should be minimal, because big game hunting is regulated by the refuge, occurs outside the breeding season, and specific refuge regulations prohibit the use of ATVs, off-road vehicle travel, permanent stands and blinds, camping, and fires, which are most likely to significantly damage vegetation. Hunting and the associated hunter activity likely will cause the direct disturbance of nontarget birds, but only for the short term. Many of refuge impoundments are either closed to hunting, or impractical to hunt because of the difficulty of access. There is no anticipated impact on endangered or threatened species on the refuge either.

Although conflicts between user groups can arise, that does not appear to be a significant issue at the present levels of use. The Esker Brook trails are closed to nonhunters beginning November 1 to prevent disturbance amongst user groups. In other areas, some users may be impacted by the presence and noise associated with shotgun and muzzleloader hunting which occurs on the entire refuge.

In the future, we may need to further manage public use to minimize conflicts and ensure public safety, should significant conflicts become evident. That may include public outreach or further zoning to separate user groups.

Public Review and Comment:
As part of the comprehensive conservation planning process (CCP) for the Montezuma Refuge, this compatibility determination was available for public review and comment for 30 days concurrent with the release of our draft CCP and environmental assessment.

Determination (check one below):

Use	is Not Compatible
X	Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:
We will manage the hunt program in accordance with Federal and State regulations and review it annually to ensure that wildlife and habitat management goals are achieved and that the program is providing a safe, high quality hunting experience for participants. Therefore, adherence to the regulations highlighted above for each hunting program will ensure compatibility with the purpose for which the refuge was established.

1. During the regular deer season (firearms), all big game hunters must wear in a conspicuous manner on head, chest and back a minimum of 400 square inches of solid-colored hunter orange clothing or material and must be visible from 360 degrees.

2. Vehicles must be parked off the lane of travel and clear of gates.

3. ATVs and snowmobiles are not allowed.

4. Canoes and other nonmotorized boats are not allowed on refuge impoundments. Boats are permitted in the Clyde and Seneca Rivers; however, much of the river has a "No discharge of firearms" restriction. Guns that are to be transported within this zone must be unloaded. Deer hunting from canoes and boats is not permitted anywhere on the river.

5. Temporary, portable tree stands and ground blinds are acceptable and must be removed daily. Permanent tree stands and ground blinds are prohibited. Hunters cannot use screw-in steps, nails, spikes, wire, or bolts as climbing or hanging devices to attach a stand to a tree.

6. Prohibited Activities:
    a. Using illuminating devices, including automobile headlights, for the purpose of spotlighting game species.
    b. Being under the influence or possessing alcoholic beverages while hunting.
    c. Possessing axes, hatchets, saws, nails, tacks, paint or flagging for the marking of trees and shrubs.
    d. Commercial guiding on the refuge.
    e. Camping, overnight parking, open fires, and littering.

Justification:
Montezuma Refuge is located in a rural area between Syracuse and Rochester, NY. Hunting is a traditional and well established activity on the refuge. It has minimal conflicts with other types of public uses that may occur on the refuge. Hunting satisfies a recreational need, but hunting on national wildlife refuges is also an important, proactive management action that can prevent over population and the deterioration of habitat. It helps to keep deer populations within the carrying capacity of the habitat, thus reducing excessive damage to vegetation caused by overbrowsing.

Hunting is a wildlife-dependent priority public use with minimal impact on refuge resources. It is consistent with the purposes for which the refuge was established, the Service policy on hunting, the National Wildlife Refuge System Improvement Act of 1997, and the broad management objectives of the National Wildlife Refuge System.

This use will not materially interfere with or detract from the mission of the National Wildlife Refuge System or the purposes for which the refuge was established. It will not cause an undue administrative burden. Annual adjustments can be made in the hunting program to ensure its continued compatibility.

Signature: Refuge Manager: Howard Jaeckel 8/23/2012
(Signature and Date)

Concurrence: Regional Chief: Scott B. Klarl
(Signature and Date)

Mandatory 15-year Re-evaluation Date: 9/12/2027

Literature Cited:

Côté, S.D., T.P. Rooney, J. Tremblay, C. Dussault, and D.M. Wallter. 2004. Ecological impacts of deer overabundance. Annual Review of Ecology, Evolution, and Systematics 35: 113-147.

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COMPATIBILITY DETERMINATION

Use: Waterfowl Hunting

Refuge Name: Montezuma National Wildlife Refuge

Date Established: September 12, 1938

Establishing and Acquisition Authorities:
The U.S. Fish and Wildlife Service acquired lands to be established as the Montezuma National Wildlife Refuge under Executive Order 7971 and established the refuge in 1938 under the authority of the Migratory Bird Conservation Act of 1929 (16 U.S.C. 715).

Purpose(s) for which Established:
"…as a refuge and breeding ground for migratory birds and other wildlife…" (Executive Order 7971).

"…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (16 U.S.C. 715d).

National Wildlife Refuge System Mission:
To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

Description of Use:

(a) What is the use? Is the use a priority public use?
The use is waterfowl hunting. Hunting is a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997.

(b) Where will the use be conducted?
For the New York State migratory game bird season, waterfowl hunting will be permitted in Tschache Pool and potentially in designated units in the northeast portion of the refuge (i.e., the Main Muck) or the Jackson Property (see map B.4).

Goose hunting will be permitted during the New York State seasons for Canada geese (*Branta canadensis*) and snow geese (*Chen caerulescens*). Both species will be able to be hunted on regular waterfowl hunting areas (i.e., Tschache Pool and possibly portions of the Main Muck or the Jackson Property) during the New York State migratory game bird season. Refuge agricultural lands and grasslands may be open to Canada goose hunting during the September season, and snow geese will be able to be hunted in the refuge's "main muck" during the late snow goose hunting season (generally late January to the beginning of March) and the expanded Light Goose Conservation Order (generally the beginning of March through mid-April (see map B.5)).

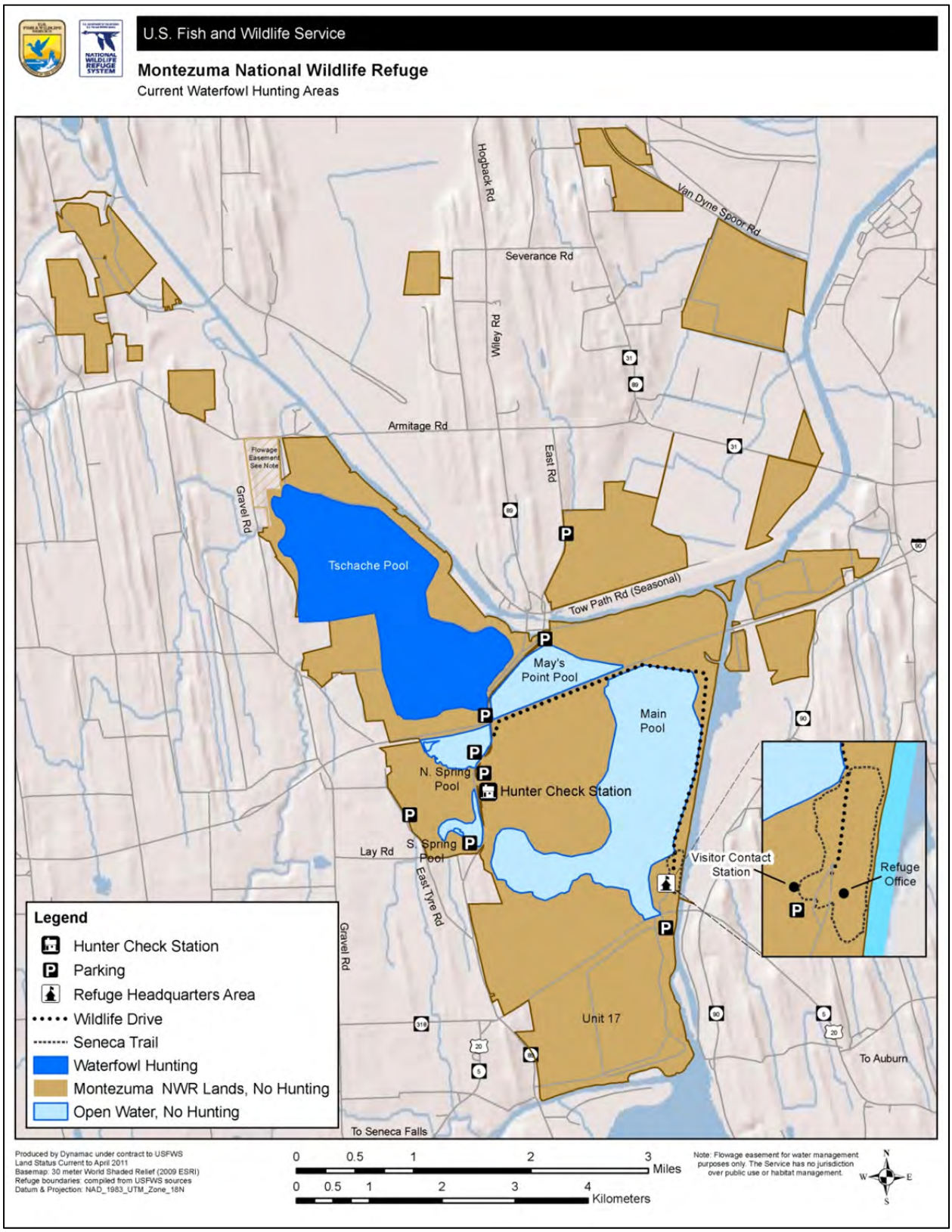
As stated in Service Manual 605 FW 2: "If a refuge, or portion thereof, has been designated, acquired, reserved, or set apart as an inviolate sanctuary, we may only allow hunting of migratory game birds on no more than 40 percent of that refuge, or portion, at any one time unless we find that taking of any such species in more than 40 percent of such area will be beneficial to the species (16 U.S.C. 668dd(d)(1)(A), National Wildlife Refuge System Administration Act; 16 U.S.C. 703-712, Migratory Bird Treaty Act; and 16 U.S.C. 715a-715r, Migratory Bird Conservation Act)." This applies to nearly all Montezuma Refuge lands. We estimate no more than 29 percent of the refuge will be open to waterfowl hunting within a given year. It is likely less than 29 percent of the refuge will be open to waterfowl hunting annually, because of limited access and unsuitable habitat conditions in some areas.

Youth Hunt:
The refuge hosts a Youth Waterfowl Identification Course and refuge orientation for junior hunters between 12 to 15 years of age. A New York State Youth Waterfowl Hunt is held annually, typically during the second weekend of October; the refuge opens Tschache Pool to youth hunting on the Saturday of that weekend. Other areas may be open for the New York State Youth Waterfowl Hunt each year, at the refuge manager's discretion. The number of participants in the Youth Waterfowl Hunt will be limited. Otherwise, youth may hunt waterfowl in the same areas of the refuge open to and during the regular waterfowl hunt.

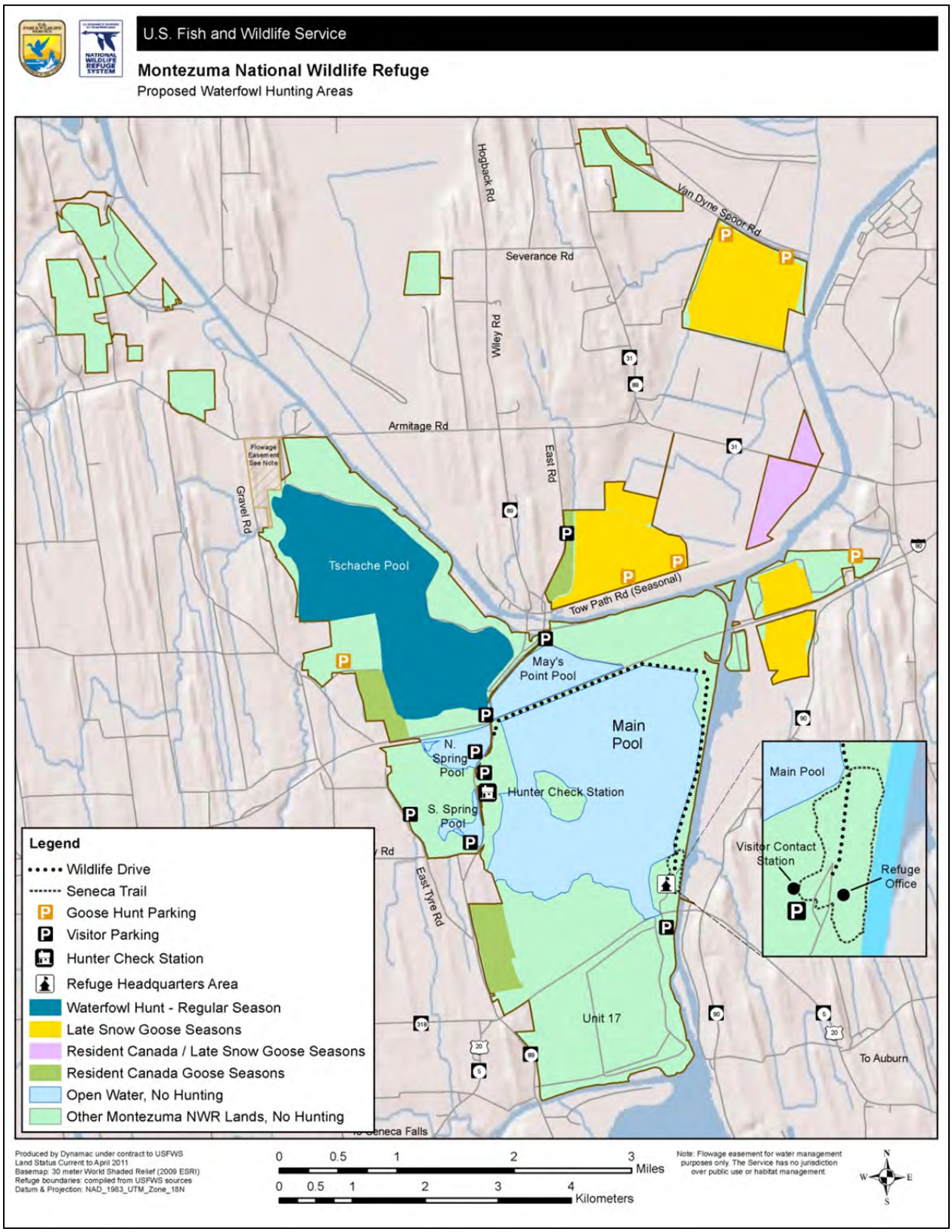
(c) When will the use be conducted?
As long as the migratory game bird season dates for the Western Zone remain the same (i.e., late October through the beginning of December for the first split, and late December through the beginning of January for the late split), waterfowl hunting will be permitted on the refuge during the first split on Tuesdays, Thursdays and Saturdays only. If the Western Zone season dates change dramatically, then the refuge manager will determine when the refuge will be open in accordance with Federal and State regulations. Hunting hours on the refuge will be from one half hour before sunrise to noon, and hunters must check out of the hunting areas by 1 p.m.

Goose hunting will be permitted daily during New York State designated goose seasons for the Western Zone. New York State seasons are listed at: *http://www.dec.ny.gov/outdoor/28503.html*. Hunting hours will be one half hour before sunrise to sunset for the Canada and snow goose seasons.

Youth Hunt:
The youth waterfowl identification course and hunt orientation will be held in late September or early October, before the youth waterfowl hunt. A youth waterfowl hunt will be held on the Saturday of the New York State designated Youth Days, usually two weeks prior to the regular waterfowl season. Hunting will occur from one half hour before legal sunrise until noon. Check out will be no later than 1 p.m.



Map B.4. Montezuma National Wildlife Refuge Current Waterfowl Hunting Areas.



Map B.5. Montezuma National Wildlife Refuge Proposed Waterfowl Hunting Areas.

(d) How will the use be conducted?

We will continue to conduct the use according to State and Federal regulations. Federal regulations in 50 CFR pertaining to the National Wildlife Refuge System Administration Act, as well as existing, specific refuge regulations will apply. However, the refuge manager may, upon annual review of the hunting program, impose further restrictions on hunting, recommend that the refuge be closed to hunting, or further liberalize hunting regulations up to the limits of state regulations. We will restrict hunting if it becomes inconsistent with other, higher priority refuge programs or endangers refuge resources or public safety.

All persons hunting on the refuge must hold a valid New York State hunting license and also obtain a refuge hunting permit. Permits are obtained during check-in on the day of the hunt. Individuals hunting on the refuge are subject to the inspection of permits, licenses, hunting equipment, game bagged, boats, vehicles, and their contents by Federal or State officers.

For the regular season, a telephone reservation system is set up to reserve a hunting area and permit for the waterfowl hunt days. Hunters must check-in with refuge staff at the hunter check station on the day of their hunt, show their hunting license, signed duck stamp and proof of passing a New York State or special refuge out-of-state Waterfowl Identification Course.

During the Resident Canada Goose season, the Late Snow Goose season, and the Light Goose Conservation Order, hunters will obtain their permits at the hunter check station daily, on a first-come, first-served self-serve basis. There will not be a reservation system for the goose hunts.

Only State-permitted firearms will be permitted to hunt waterfowl. Hunters may use only approved nontoxic shot. During the regular season, waterfowl hunters will be limited to 15 shells per hunter per day.

Canoes and other nonmotorized boats are required for the regular waterfowl season hunt and may be permitted for designated goose hunting areas, to be determined by the refuge manager via the annual hunt program. Dogs are allowed for hunting of migratory birds during designated seasons only, and strongly suggested for hunting on Tschache and other pools.

Hunters with disabilities possessing, or who qualify for, a New York State disabled hunting license, Golden Access, or America the Beautiful Access Pass may qualify for special accommodations. We issue a nonambulatory or youth hunt permit for waterfowl hunting in partnership with the New York State Department of Environmental Conservation Northern Montezuma Management Area for the Tim Noga Memorial Blind. Hunters may contact the refuge office for more information. They must show proof of disability upon check-in.

No hunting zones will be posted around the refuge areas closed to hunting. Permission must be obtained from refuge personnel to enter a “no hunting” zone or closed area for the purpose of tracking and/or retrieving legally taken game animals. Designated waterfowl hunting areas will be published in the annual hunt program and on refuge hunting regulation sheets at the beginning of each season.

Vehicles are only allowed on established roads marked open for vehicular travel. Vehicles must be parked off the lane of travel and clear of gates. Hunters will be required to check out and turn in a refuge harvest report at the end of each hunt day.

Fee:
There will be a $10 fee per waterfowl hunt reservation for the regular season, which is administered by a Cooperative Agreement with the Friends of the Montezuma Wetlands Complex.

Youth Hunt:
Youth that want to participate in the youth waterfowl hunt must pre-register via the refuge's telephone reservation system; reservations are taken on a first-come, first-served basis. The program is free but space is limited, allowing two youth hunters per reservation. Youth must hold a valid New York State hunting license and proof of passing the New York State or refuge-issued out-of-state Waterfowl Identification Course, and must be accompanied by a parent/guardian who possesses a valid New York State hunting license, proof of passing a New York State or refuge-issued Waterfowl Identification Course, and a signed duck stamp.

(e) Why is the use being proposed?
Hunting is one of the priority uses outlined in the Refuge System Improvement Act of 1997. The Service supports and encourages priority uses when they are appropriate and compatible on national wildlife refuge lands. Hunting is used in some instances to manage wildlife populations. It is also a traditional form of wildlife-oriented recreation that many national wildlife refuges can accommodate.

Availability of Resources:
The refuge has adequate funds to administer the waterfowl hunt program. The Cooperative Agreement with the Friends of the Montezuma Wetlands Complex generates funds to put directly back into the hunting program. The following breakdown shows the estimated amount of funds needed to administer the program.

Table B.3. Annual Cost of Administering the Waterfowl Hunt.

	Staff Hours	Hunt Costs	Fee Money Collected
Check-in/Check Station	60	$ 1,500.00	$ 1,920.00
Law Enforcement	10	$ 350.00	
Planning	20	$ 500.00	
Public Information	10	$ 250.00	
Postage	--	$ 40.00	
Supplies	--	$ 735.00	
Data Collection	10	$ 250.00	
Maintenance-Facilities	5	$ 125.00	
Maintenance-Vehicles	2	$ 50.00	
Utilities		$ 25.00	
TOTALS	**136**	**$ 3,825.00**	**$ 1,920.00**

Anticipated Impacts of the Use:
Anticipated impacts from hunting migratory birds on the refuge follow; for more specific impacts, including a cumulative impact analysis, please refer to the refuge's final hunt program environmental assessment, appendix E, in the refuge's final comprehensive conservation plan (USFWS 2013).

The Service manages migratory birds on a flyway basis and states establish hunting regulations in each state based on flyway data and the regulations framework provided by the Service. The Atlantic Flyway and the State of New York regulations apply to the waterfowl hunting program at the Montezuma Refuge. The refuge hunting regulations, which are more restrictive than State and other Federal regulations, limit hunt days and hunting hours, and include shot shell restrictions, etc. These refuge-specific restrictions are in place to help provide a quality hunting experience for refuge hunters. Hunting will reduce the number of birds in the flyway, within allowable limits, as determined by state and federal agencies. Hunting and the associated hunter activities likely will cause the direct disturbance of nontarget birds, but only for the short term. There is no anticipated impact on endangered or threatened species on the refuge.

Waterfowl hunting is a very popular, longstanding public use on the refuge. Most areas of the refuge are open to some form of hunting (waterfowl or deer) during hunting season except areas posted with safety zone or "no hunting" zone signage. Although conflicts between user groups can arise, that does not appear to be a significant issue at the present levels of use. In the future, we may need to manage public use to minimize conflicts and insure public safety, should significant conflicts become evident. That may include public outreach or zoning to separate user groups. Conflicts between hunters can also occur. Competition among hunters for choice sites is keen, and can lead to unsafe or unethical behavior. Thus far, this has been addressed through outreach and law enforcement to ensure quality, safe hunting conditions for all hunters.

Because the refuge has been open to hunting for many years, and hunting occurred in the area for many years before the establishment of the refuge, we expect no additional impacts. Some disturbance of nontarget wildlife species and impacts on vegetation may occur. However, those impacts should be minimal, because migratory game bird hunting is regulated by the refuge, occurs outside the breeding season and specific refuge regulations prohibit the use of ATVs, off-road travel, permanent stands and blinds, camping and fires, which are most likely to significantly damage vegetation.

Human disturbance to migrating birds and other wildlife using the open waters and marshes on the Montezuma Refuge will occur as a result of hunting activity. Migratory waterfowl generally minimize time in flight and maximize foraging time because flight requires considerably more energy than any other activity, except egg laying. Human disturbance associated with hunting includes loud noises and rapid movements such as those produced by shotguns and other human activity. This disturbance, especially when repeated over a period of time, can cause waterfowl to change food habits, feed only at night, lose weight, or desert feeding areas. These impacts from disturbance can be reduced by the presence of adjacent sanctuary areas allowing birds to feed and rest relatively undisturbed. Sanctuaries or nonhunt areas have been identified as the most common strategy to reduce disturbance caused by hunting. Prolonged and extensive disturbances may cause large numbers of waterfowl to temporarily or permanently leave disturbed areas (Madsen 1995, Paulus 1984). Thus, sanctuary areas are very important to

minimize disturbance to waterfowl populations to ensure their continued use of the refuge. The temporary impacts of waterfowl hunting are mitigated by the presence of adjacent refuge habitat where hunting does not occur, where birds can feed and rest undisturbed. Refuge regulations ensure that areas of inviolate sanctuary remain free of disturbance throughout the season.

Additionally, waterfowl hunting (except for geese during goose only seasons) occurs 3 days per week on the refuge which gives the birds an opportunity to feed and rest undistributed on nonhunting days in hunting locations. Intermittent hunting (nonhunt days) can minimize disturbance (Fox and Madsen 1997). It is common for NWRs to manage hunt programs with nonhunt days. The proposed waterfowl hunt will be intermittent.

Boating activity associated with hunting during the fall and winter can alter distribution, reduce use of particular habitats or entire areas by waterfowl and other birds, alter feeding behavior and nutritional status, and cause premature departure from areas (Knight and Cole 1995). Boating and hunter activity will also cause some level of soil disturbance, erosion, foot traffic in sensitive marsh habitats, among other physical effects. Nonmotorized boats (virtually no wake) and limiting the number of hunters will serve to help reduce these impacts.

The long-term average of the number of waterfowl harvested per hunter per day since 1990 on the refuge is 2.3. This equates to just over 800 birds being harvested per year on the refuge. The waterfowl most often harvested by hunters on the refuge are mallard (*Anas platyrhynchos*), wigeon (*A. americana*), and green-wing teal (*A. crecca*).

An increased take of snow geese will contribute to the beneficial impacts to other waterfowl species that are expected as a result of a decrease in the snow goose population (USFWS 2007).

The activity of waterfowl hunters has little impact on other refuge visitors. Some users may be impacted by the presence and noise associated with waterfowl hunting.

Public Review and Comment:
As part of the comprehensive conservation planning process for the Montezuma Refuge, this compatibility determination was available for public review and comment for 30 days concurrent with the release of our draft CCP and environmental assessment.

Determination (check one below):

Use	is Not Compatible
X	Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:
We will manage the hunt program in accordance with Federal and State regulations, and review it annually to ensure that wildlife and habitat management goals are achieved and that the program is providing a safe, high quality hunting experience for participants. Therefore, adherence to the regulations highlighted above will ensure compatibility with the purpose for which the refuge was established.

1. All persons hunting on the refuge must hold a valid New York State hunting license and must obtain a refuge hunting permit. Permits are obtained during check-in on the day of the hunt. A telephone reservation system is set up to reserve a hunting area and permit for the waterfowl hunt days. Hunters during the regular migratory bird season must check-in with refuge staff at the hunter check station on the day of their hunt, show their hunting license, signed duck stamp and proof of passing a New York State or special refuge out-of-state Waterfowl Identification Course. Hunters during the Resident Canada Goose season, the Late Snow Goose season, and the Light Goose Conservation Order, will obtain their permits at the hunter check station daily, on a first-come, first-served self-serve basis. There will not be a reservation system for these hunts.

2. Individuals hunting on the refuge are subject to the inspection of permits, licenses, hunting equipment, game bagged, boats, vehicles, and their contents by Federal or State officers.

3. Only State-permitted firearms will be permitted to hunt waterfowl. Hunters may use only approved nontoxic shot. Waterfowl hunters will be limited to 15 shells per hunter per day during the regular season.

4. Canoes and other nonmotorized boats are required for the regular waterfowl season hunt and may be permitted for designated goose hunting areas, to be determined by the refuge manager via the annual hunt program.

5. Dogs are allowed for hunting of migratory birds during designated seasons only, and strongly suggested for hunting on Tschache and other pools.

6. Hunters with disabilities possessing, or who qualify for, a New York State disabled hunting license, Golden Access, or America the Beautiful Access Pass may qualify for special accommodations. We issue a nonambulatory or youth hunt permit for waterfowl hunting in partnership with the New York State Department of Environmental Conservation Northern Montezuma Management Area for the Tim Noga Memorial Blind. Hunters may contact the refuge office for more information. They must show proof of disability upon check-in.

7. No hunting zones will be posted around the refuge areas closed to hunting. Permission must be obtained from refuge personnel to enter a “no hunting” zone or closed area for the purpose of tracking and/or retrieving legally taken game animals. Designated waterfowl and goose hunting areas will be published in the annual hunt program and on refuge hunting regulation sheets at the beginning of each season.

8. Hunters will be required to check out and turn in a refuge harvest report at the end of each hunt day.

9. Vehicles are only allowed on established roads marked open for vehicular travel. Vehicles must be parked off the lane of travel and clear of gates.

10. Prohibited Activities:
    a. Using illuminating devices, including automobile headlights, for the purpose of spotlighting game species.
    b. Use or possession of alcoholic beverages or illegal drugs while hunting; hunting while under the influence of alcoholic beverages or illegal drugs is not permitted.
    c. Possession of axes, hatchets, saws, nails, tacks, paint, or flagging for the marking of trees and shrubs.
    d. Use of tree stands.
    e. Commercial guiding on the refuge.
    f. Use of ATVs and snowmobiles.
    g. Camping, overnight parking, open fires, and littering.

11. There will be a $10 fee per waterfowl hunt reservation during the regular season, which is administered by a Cooperative Agreement with the Friends of the Montezuma Wetlands Complex.

12. Youth that will like to participate in the youth waterfowl hunt must pre-register via the refuge's telephone reservation system; reservations are taken on a first-come, first-served basis. The program is free but space is limited, allowing two youth hunters per reservation. Youth must hold a valid New York State hunting license and proof of passing the New York State or refuge-issued out-of-state Waterfowl Identification Course, and must be accompanied by a parent/guardian who possesses a valid New York State hunting license, proof of passing a New York State or refuge-issued Waterfowl Identification Course, and a signed duck stamp.

Justification:
Montezuma Refuge is located in a rural area between Rochester and Syracuse, NY. Hunting is a traditional and well established activity on the refuge. It does not conflict with other types of public uses that may occur on the refuge. Hunting satisfies a recreational need, but hunting on national wildlife refuges is also an important, proactive management action that can prevent over population and the deterioration of habitat.

Hunting is a wildlife-dependent priority public use with minimal impact on refuge resources. It is consistent with the purposes for which the refuge was established, the Service policy on hunting, the National Wildlife Refuge System Improvement Act of 1997, and the broad management objectives of the National Wildlife Refuge System.

This use will not materially interfere with or detract from the mission of the Refuge System nor diminish the purposes for which the refuge was established. It will not cause an undue administrative burden. Annual adjustments can be made in the hunting program to ensure its continued compatibility.

Signature: Refuge Manager: Howard Jasinski 8/23/2012
(Signature and Date)

Concurrence: Regional Chief: Scott B. Kerr 9/12/2012
(Signature and Date)

Mandatory 15-year Re-evaluation Date: 9/12/2027

Literature Cited:

Fox, A.D., and J. Madsen. 1997. Behavioral and distributional effects of hunting disturbance on waterbirds in Europe: implications for refuge design. Journal of Applied Ecology 34: 1-13.

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COMPATIBILITY DETERMINATION

Use: Turkey Hunting

Refuge Name: Montezuma National Wildlife Refuge

Date Established: September 12, 1938

Establishing and Acquisition Authorities:
The U.S. Fish and Wildlife Service (USFWS) acquired lands to be established as the Montezuma National Wildlife Refuge (NWR) under Executive Order 7971 and established the refuge in 1938 under the authority of the Migratory Bird Conservation Act of 1929 (16 U.S.C. 715).

Purpose(s) for which Established:
"…as a refuge and breeding ground for migratory birds and other wildlife…" (Executive Order 7971).

"…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (16 U.S.C. 715d).

National Wildlife Refuge System Mission:
To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

Description of Use:

(a) What is the use? Is the use a priority public use?
The use is turkey hunting. Hunting is a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997. The use being proposed includes a youth turkey hunt and fall turkey hunt.

(b) Where will the use be conducted?
Turkey hunting will be permitted in designated areas throughout the entire refuge, except areas closed to hunting to protect facilities and structures, certain habitats, and select public use areas. See map B.7 for designated hunting areas.

(c) When will the use be conducted?
Hunting will be conducted during New York State (NYS) turkey seasons in accordance with Federal and State regulations. The youth turkey hunt will be held during the NYS youth hunting season, which is typically the third or fourth weekend in April. Hunting hours are one half hour before sunrise to noon. The fall turkey hunt will be held during the NYS fall turkey hunting season which is generally during the months of October and November. Hunting hours are sunrise to sunset.

Season dates, hunting hours, weapon restrictions and all regulations will match those set by NYS. However, the refuge manager reserves the right to adjust hunt season dates and bag limits in the future, as needed, to achieve various refuge management goals.

(d) How will the use be conducted?

The youth turkey hunt is open to youths ages 12 to 15 and will be dependent on a commitment from partners to mentor youth hunters. Youth hunters and their mentors may be required to attend an orientation program conducted by the refuge, in cooperation with partners. The orientation will review hunter safety, turkey calling, equipment, ethics, and sportsmanship, as well as conservation and messages about the refuge system. All junior hunters must be accompanied by an adult both at the orientation and during the day of the hunt. Adult mentors are required to have a valid NYS hunting license for turkey, but may not hunt.

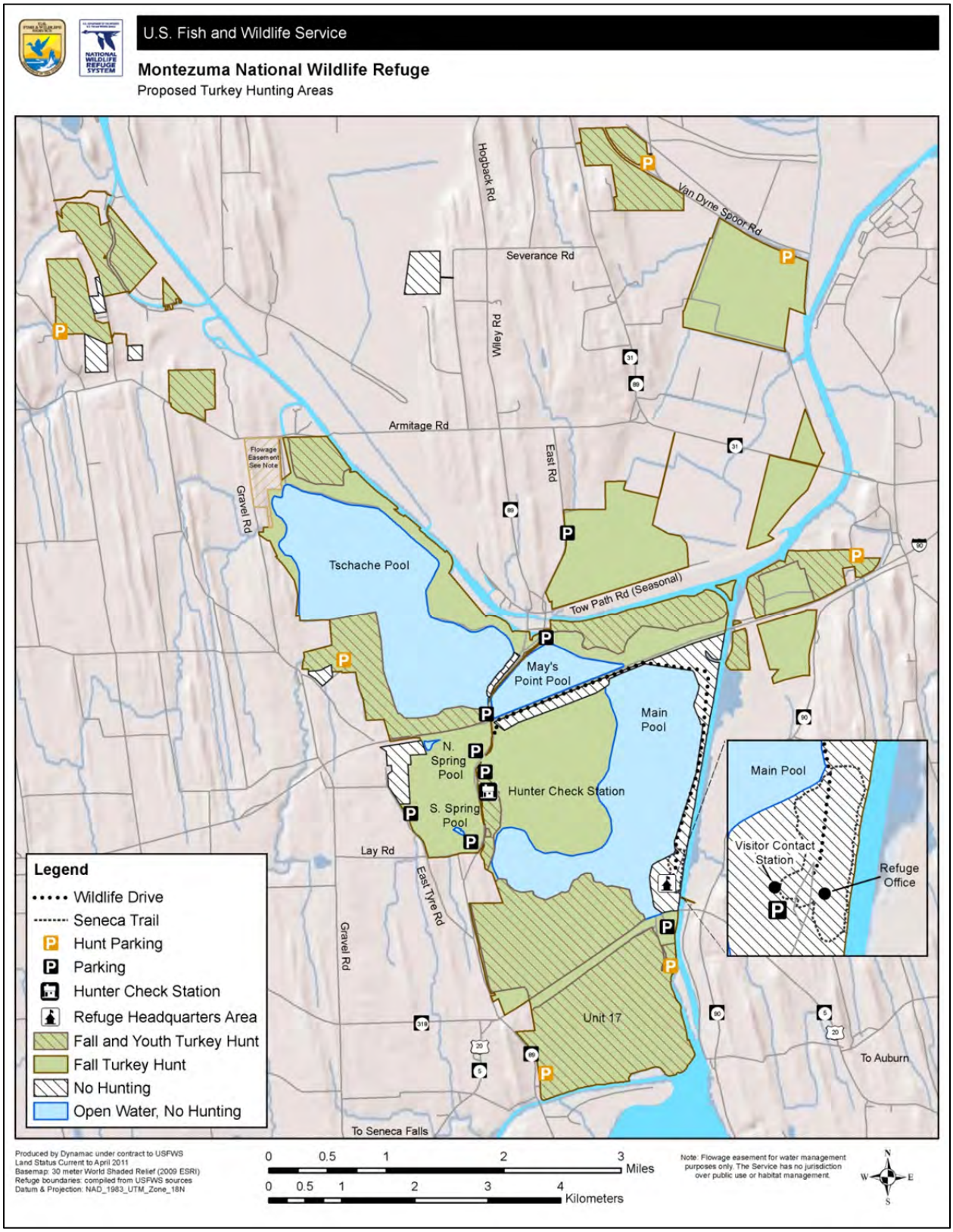
Designated areas will be open to youth hunters and their mentors during the NYS youth turkey hunt. The areas open and the number of groups permitted will be designated annually by the refuge manager, but will not exceed 14 groups during the youth hunt (see map B.6) and 40 permits during the fall season (see map B.6). These numbers are based on maximizing hunt opportunities, providing for a quality hunt experience, demand, minimizing disturbance to sensitive wildlife and plant species, and balancing other public use demands and the administrative work load. In addition to NYS requirements, youth hunters will be required to turn in a refuge harvest report.

Designated areas open for fall turkey hunting will include those areas open for deer hunting. The Wildlife Drive will not be open to turkey hunting because fall turkey season usually ends in November, before the Wildlife Drive opens to deer hunting. The Wildlife Drive will be open to fall turkey hunting if the State extends the turkey season into December. The refuge manager will also set the annual number of hunt permits annually. Turkey hunters will be required to possess a daily refuge hunt permit and turn in a refuge harvest report each time they hunt.

Prior to opening the refuge to turkey hunting, an information meeting, website articles, handouts, and press releases will be developed to inform the public about the turkey hunt, special refuge regulations, and hunting on wildlife refuges. Refuge turkey hunting maps and regulations will be posted on the refuges website, and mailed or emailed upon request. All information related to hunting on the refuge will be posted at the refuge's hunter check station prior to the seasons' openings.

(e) Why is the use being proposed?

Hunting is one of the priority uses outlined in the Refuge System Improvement Act of 1997. The Service supports and encourages priority uses when they are appropriate and compatible on national wildlife refuge lands. Hunting is a traditional form of wildlife-oriented recreation that many wildlife refuges can accommodate. Hunting can instill a unique understanding and appreciation of wildlife, their behavior, and their habitat needs.



Map B.6. Turkey Hunting Areas on Montezuma National Wildlife Refuge.

Availability of Resources:
The resources necessary to provide and administer this use are available with in current and anticipated refuge budgets. The following breakdown shows the estimated amount of funds needed to administer the turkey hunt program:

News releases, publications, hunt regulations, permits			$1,000
Signs (purchase and annual installation)			$ 500
Staff time (check station staffing, maintenance)		$1,500	
Law Enforcement	$1,500		
Total Annual Cost	$4,500		

Anticipated Impacts of the Use:
The following anticipated impacts are expected; for more specific impacts. including a cumulative impact analysis. please refer to Appendix E, Montezuma National Wildlife Refuge Final Hunt Program Environmental Assessment in the refuge's final CCP (USFWS 2013).

Turkeys have restricted home ranges and continued local hunting efforts will not affect regional populations. Turkey hunters will cause little disturbance to migratory waterfowl since most turkey hunting occurs in upland habitats and waterfowl inhabit marshes and wetlands. Many refuge impoundments are either closed to hunting, or impractical to hunt because of the difficulty of access.

The impacts of youth turkey hunting on nontarget species on the refuge in the spring will be minimal due to the small number of permits issued and the secretive nature of this hunting activity. Further, these impacts will be minimal, because hunting is regulated by the refuge, occurs outside the breeding season, and specific refuge regulations prohibit the use of ATVs, off-road vehicle travel, permanent stands and blinds, camping, and fires, which are most likely to significantly damage vegetation.

There will be little anticipated impact on endangered or threatened species on the refuge as these sensitive areas will not be open to turkey hunting. Annual surveys will occur to identify sensitive areas, such as bald eagle nesting sites and heron rookeries. The refuge manager will ensure little disturbance to these areas by closing them to hunting.

The youth turkey hunt will only occur for a few days in the early spring and the areas hunting will be limited based on sensitive wildlife and plant species, demand, and suitable turkey habitat. Fall turkey hunting will occur on the refuge simultaneously with deer hunting, which is also outside of the breeding season.

Although conflicts between user groups can arise, this does not appear to be a significant issue at the present levels of use. To minimize conflicts, the Esker Brook trails will remain closed to hunting in the spring and a portion of the fall, but will be opened to hunting beginning November 1 until the close of deer season, generally mid-December.

In other areas, some users may be impacted by the presence and noise associated with shotgun hunting which occurs on the entire refuge. Turkey and deer hunting will occur in the fall simultaneously, but hunters will likely spread themselves out, with no major impacts on one another.

In the future, we may need to further manage public use to minimize conflicts and ensure public safety, should significant conflicts become evident. That may include public outreach or further zoning to separate user groups.

Public Review and Comment:
As part of the comprehensive conservation planning process (CCP) for the Montezuma Refuge, this compatibility determination was available for public review and comment for 30 days concurrent with the release of our draft CCP and environmental assessment.

Determination (check one below):

Use	is Not Compatible
X	Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. The use will be conducted according to State and Federal regulations. Federal regulations in 50 CFR pertaining to the National Wildlife Refuge System Administration Act as well as existing refuge specific regulations will apply. However, the refuge manager may, upon annual review of the hunting program, impose further restrictions on hunting, recommend that the refuge be closed to hunting, or further liberalize hunting regulations up to the limits of state regulations. We will restrict hunting if it endangers refuge resources or public safety; we may restrict hunting if it poses significant user conflicts.

2. All persons hunting on the refuge must possess a valid state hunting license, obtain a daily refuge hunt permit, and turn in a refuge harvest report at the end of each hunt day. Individuals hunting on the refuge are subject to the inspection of permits, licenses, hunting equipment, game bagged, and vehicles and their contents by law enforcement officers.

3. Temporary, portable tree stands and ground blinds are acceptable and must be removed daily. Permanent tree stands and ground blinds are prohibited. Hunters cannot use screw-in steps, nails, spikes, wire, or bolts as climbing or hanging devices to attach a stand to a tree.

4. Hunters with disabilities who possess a NYS disabled hunting license, Golden Access, or America the Beautiful Access Pass may qualify for special accommodations. They must apply in person and show proof of permanent disability.

5. Permission must be obtained from refuge personnel to enter a no hunting zone or closed area for the purpose of tracking and/or retrieving legally taken game animals. Weapons

may not be discharged within, into, or across a no hunting zone or closed area; or from on or across any refuge road. Hunting from within 500 feet of any open hiking trail or from within 500 feet of any resident or refuge building is prohibited.

6. We will review this use annually to ensure that wildlife and habitat management goals are achieved and that the program is providing a safe, high quality hunting experience for participants. Therefore, adherence to the regulations highlighted above for each hunting program will ensure compatibility with the purpose for which the refuge was established.

Justification:
Montezuma Refuge is located in a rural area between Syracuse and Rochester, NY. Hunting is a traditional and well established activity on the refuge. It has minimal conflicts with other types of public uses that may occur on the refuge. Hunting satisfies a recreational need and promotes understanding and appreciation of natural resources.

Hunting is a wildlife-dependent priority public use with minimal impact on refuge resources. It is consistent with the purposes for which the refuge was established, the Service policy on hunting, the National Wildlife Refuge System Improvement Act of 1997, and the broad management objectives of the National Wildlife Refuge System.

We do not expect this use to materially interfere with or detract from the mission of the Refuge System nor diminish the purposes for which the refuge was established. It will not cause an undue administrative burden. Annual adjustments can be made in the hunting program to ensure its continued compatibility.

Signature: Refuge Manager: Thomas Gaudiff 8/23/2012
(Signature and Date)

Concurrence: Regional Chief: Sam B. Hamilton 9/12/2012
(Signature and Date)

Mandatory 15-year Re-evaluation Date: 9/12/2027

Literature Cited:

United States Fish and Wildlife Service (USFWS). 2012. Montezuma National Wildlife Refuge Comprehensive Conservation Plan. U.S. Fish and Wildlife Service, Montezuma National Wildlife Refuge, Seneca Falls, NY.

COMPATIBILITY DETERMINATION

Use: Wildlife Observation, Photography, Environmental Education, and Interpretation

Refuge Name: Montezuma National Wildlife Refuge

Date Established: September 12, 1938

Establishing and Acquisition Authorities:
The U.S. Fish and Wildlife Service acquired lands to be established as the Montezuma National Wildlife Refuge under Executive Order 7971 and established the refuge in 1938 under the authority of the Migratory Bird Conservation Act of 1929 (16 U.S.C. 715).

Purpose(s) for which Established:
"…as a refuge and breeding ground for migratory birds and other wildlife…" (Executive Order 7971).

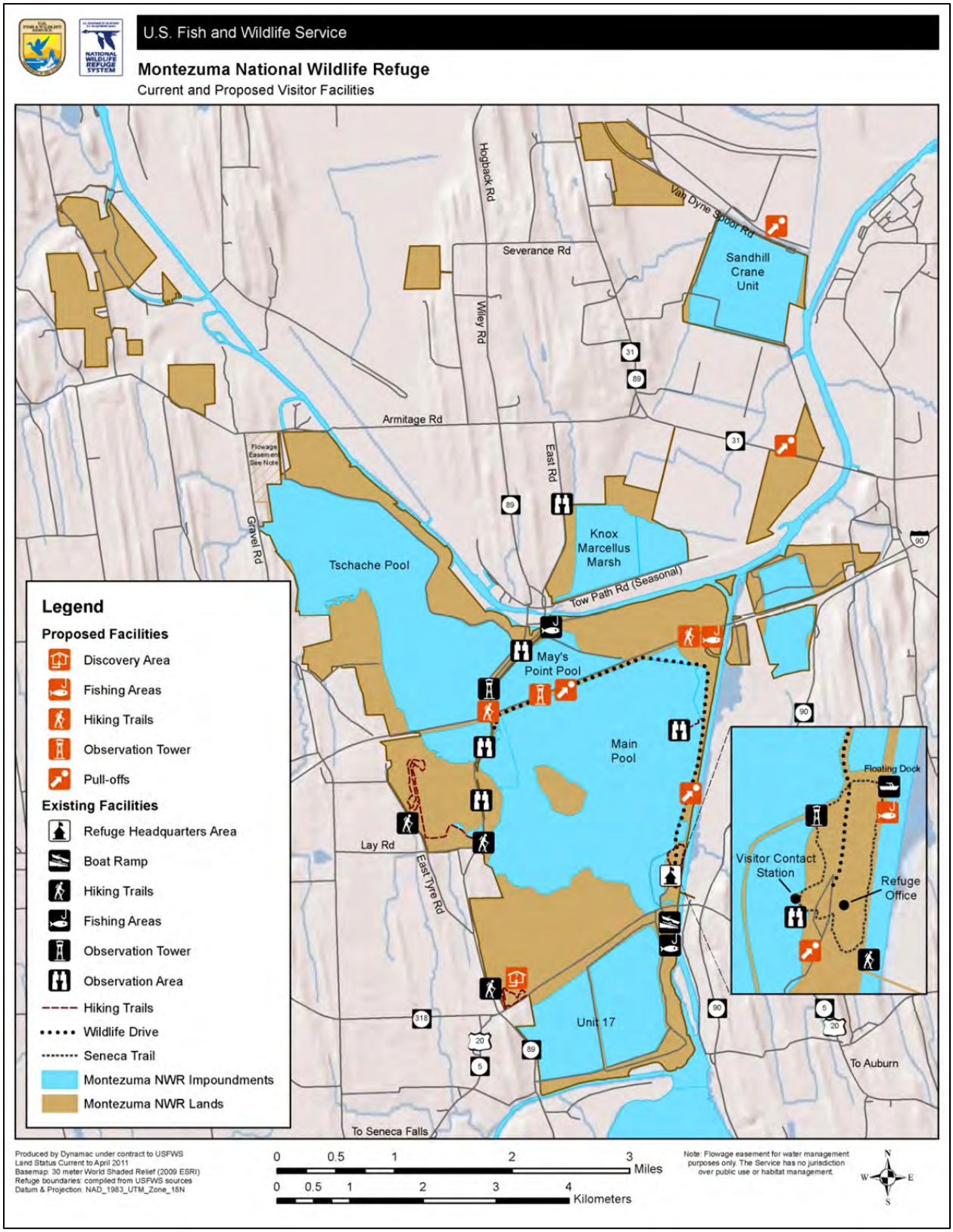
"…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (16 U.S.C. 715d).

National Wildlife Refuge System Mission:
To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

Description of Use:

(a) What is the use? Is the use a priority public use?
The uses are wildlife observation, photography, environmental interpretation, and environmental education. Wildlife observation, photography, environmental interpretation, and environmental education are priority public uses of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), and the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57).

(b) Where will the use be conducted?
Wildlife observation, photography, environmental interpretation, and environmental education will be allowed to occur on designated roads, trails, overlooks, and visitor contact facilities throughout the refuge (see map B.7 for current and proposed facilities). Self-conducted activities should take place at the visitor contact station, Seneca Trail and associated viewing tower and platform, Wildlife Drive, and about 8.5 miles of trails and roads (see below). We also propose to open the Wildlife Drive to pedestrians and bicyclists (see separate compatibility determination for "Bicycle Travel") in the summer.



Map B.7. Montezuma National Wildlife Refuge Current and Proposed Visitor Facilities.

The refuge offers about 8.5 miles of roads and trails open to these and other public uses.

Esker Brook Trails	2.5 miles
Orchard Trail	0.75 miles
Brook Trail	0.5 miles
Ridge Trail	0.5 miles
Esker Pond Loop	0.33 miles
South Spring Pool Trail	1 mile
Seneca Trail	1 mile
Swampside Trail	1 mile
Wildlife Drive (winter)	3.75 miles
Photography Blind Trail (closed during waterfowl banding season)	0.1 mile
Entrance Road (paved headquarters area)	0.33 miles
Oxbow Trail (proposed)	0.75 miles

Wildlife observation will take place incidentally in other areas, such as along State routes bisecting the refuge. Staff and volunteer-led presentations, program introductions, and exhibits will be conducted at the refuge visitor contact station. Guided interpretive programs will mainly take place in areas generally open to public visitation; special guided programs may take place in otherwise closed areas at the refuge manager's discretion, such as, but not limited to, Unit 17, or the field adjacent to the Montezuma Winery.

A photography blind exists along the Wildlife Drive and is open year-round, except when the Wildlife Drive is closed during the hunting season. Additional photography blinds will be placed and managed at the refuge manager's discretion, in coordination with refuge photographers.

Two annual refuge events include a June Wildflowers and Wine celebration in partnership with the Montezuma Winery and the October National Wildlife Refuge Week celebration. Guided bus tours of the refuge, as well as guided walking tours are part of each celebration.

Bus tours typically follow the Wildlife Drive, while walking tours utilize South Spring Pool Trail or the Tschache Pool dike road. Interpretive programs for the public are offered throughout the year, in conjunction with the Friends of the Montezuma Wetlands Complex (Friends) and the Montezuma Audubon Center, in the refuge visitor contact station and at trails and overlooks. Other programs held at the refuge include waterfowl identification classes and youth hunt orientations, which are in cooperation with the New York State Department of Environmental Conservation.

The new dry marsh restoration along the Wildlife Drive will offer not only increased opportunities for wildlife observation and photography, but will also lend itself to environmental interpretation and education as a way to illustrate current management projects, as well as refuge habitats and inhabitants.

The refuge's "Guide by Cell" cellphone tour offers guided interpretation not only within the Montezuma Refuge, but throughout the Montezuma Wetlands Complex (MWC). Funded by the Friends, the cell phone tour offers visitors a chance to hear messages at certain points within the MWC, as well as opportunities to give feedback.

(c) When will the use be conducted?
Self-directed wildlife observation, photography, environmental education, and interpretation will be allowed on the refuge daily, year-round, from one half hour before sunrise to one half hour after sunset, unless a conflict with a management activity or an extenuating circumstance necessitates deviating from these procedures. Refuge conducted programs, like conducting night interpretive programs, may take place outside of the regular refuge hours. These activities will be led by refuge staff or in cooperation with a refuge partner. As mentioned above, we propose to open the Wildlife Drive to pedestrians (hiking and walking) during the summer.

The refuge manager reserves the right to close trails and roads during events affecting human safety (e.g., severe weather or during hunting season) or to minimize negative impacts to wildlife and fish species or rare plants (nesting season and other sensitive times of the year). Currently, the Seneca Trail is partially closed during osprey (*Pandion haliaetus*) nesting season and during the late archery hunting season (which lasts for approximately 9 days in mid to late December); Esker Brook and South Spring Pool trails are closed during the refuge's white-tailed deer (*Odocoileus virginianus*) hunting season.

(d) How will the use be conducted?
Visitors engaged in wildlife observation, photography, environmental education, and interpretation will generally travel by foot, either by walking or hiking, in designated areas and along designated refuge trails and roads. Visitors to the refuge will typically park at refuge parking areas. Other visitors engaged in these uses may also travel by car and bicycle (see separate compatibility determinations for "Vehicular Travel to Facilitate Priority Public Use" and "Bicycle Travel") or by cross-country skis and snowshoes (see separate compatibility determination for "Cross-country Skiing and Snowshoeing"). The objectives and strategies found in goal 4 of the proposed action has been incorporated into the final CCP.

Information kiosks, refuge publications and the Web site, and refuge and visitor contact station staff will identify the roads and trails open for pedestrian travel and explain the public uses that are allowed on the refuge. The refuge recently published a "Wildlife Watching Guide" brochure which describes the refuge's trails and opportunities. Parking lots have been constructed at all existing trailheads. An estimated 35,000 pedestrian visits are made to the refuge annually. Safety and information signs will be installed and maintained as necessary. Designated roads and trails will be maintained in such a manner as is practical to minimize environmental effects such as erosion and sedimentation and to provide safe conditions for public access.

Refuge staff will be responsible for onsite evaluations to resolve public use issues and conflicts; monitor and evaluate impacts; maintain boundaries and signs; meet with adjacent landowners and interested public; recruit volunteers and special guest presenters; prepare and present interpretive programs; maintain existing trails and overlooks; revise leaflets and develop new ones; install kiosks and continually update kiosk information; develop needed signage; organize and conduct refuge events; conduct regularly scheduled programs for the public; display offsite exhibits at local events; develop relationships with media; provide law enforcement and respond immediately to public inquiries.

Constructing a new facility will provide more space for conducting onsite interpretive and education programs, exhibits, Friends' nature store, and a meeting room. Proposed facilities are discussed under chapter 4, goal 4 of the CCP (USFWS 2013). Adding access to new areas for observation, photography, interpretation, and education will require development of trails and trailheads, viewing areas (i.e., blinds, parking space, platforms), and/or programs. Areas newly interpreted may require the construction of a kiosk, or may simply require a post to hold the appropriate cell phone tour sign. Proposed discovery areas will allow visitors to have off-trail access during certain times of the year in designated areas. Additional information can be found within the Montezuma Refuge CCP.

Access to the New York State Canal System allows visitors an off-refuge opportunity to view refuge wildlife and habitats, especially from the launch area on Route 20, across from the refuge headquarters entrance, and along Route 89 just north of the Tschache Pool parking area. Canal waters open to the public run adjacent to refuge properties.

(e) Why is this use being proposed?

Wildlife observation, wildlife photography, environmental education, and interpretation are priority public uses as defined by The National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57), and, if compatible, are to receive enhanced consideration over other general public uses. These uses will be conducted to provide compatible educational and recreational opportunities for visitors to enjoy the resource and to gain understanding and appreciation for fish and wildlife, wildland ecology and the relationships of plant and animal populations within the ecosystem, and wildlife management. They will enhance the public's knowledge of natural resource management programs and ecological concepts for better understanding the problems facing our natural resources, what effect the public has on wildlife resources, and to learn about the Service's role in conservation. Additionally, the public will be aware of biological facts upon which Service management programs are based, and to foster an appreciation as to why wildlife and wildlands are important to them. The authorization of these uses will produce a more informed public and advocates for Service programs. Likewise, these uses will provide opportunities for visitors to observe and learn about wildlife and wildlands at their own pace, in an unstructured environment, and to observe wildlife habitats firsthand.

Professional and amateur photographers will also be provided opportunities to photograph wildlife in their natural habitats. Photographic opportunities will result in increased publicity and advocacy for Service programs. These uses will also provide wildlife-dependent, wholesome, safe, outdoor recreation in a scenic setting, with the realization that those who come strictly for recreational enjoyment will be enticed to participate in the more educational facets of the public use program, and can then become advocates for the refuge and the Service.

Availability of Resources:

The refuge has a maintained trail system in place to support priority public uses. Allowing wildlife observation, wildlife photography, environmental education, and interpretation on these trails will not increase the maintenance or operational needs. The Wildlife Drive is the main refuge road used by visitors for a variety of public uses, thus maintenance of this facility is ongoing and no additional needs will be required.

The following breakdown shows the estimated amount of funds needed to administer the program.

Table B.4. Annual Costs to Administer These Four Activities.

Identifier	Cost
Trail/Road Maintenance*	$10,000
Maintain Kiosks	$5,000
News releases, brochures, fact sheets	$10,000
Program development and implementation	$5,000
Routine Maintenance and Staff Days	$10,000
Hosting Special Events	$10,000
Law Enforcement	$5,000
Total Cost	**$55,000**

*Refuge trails and roads are maintained for a variety of activities. Costs shown are a percentage of total costs for trail/road maintenance on the refuge and are reflective of the percentage of trail/road use for this activity. Volunteers account for some maintenance hours and help to reduce overall cost of the program.

Additional funding will be needed to expand the visitor contact station. This funding will be obtained through Service and regional procedures. The development of additional wildlife viewing facilities/areas and trails will also require funding. The refuge's annual public use budget, supplemented by grant funding, will address this need. Facilities and/or trails will be developed as funding allows.

Anticipated Impacts of the Use:
Wildlife observation and photography, environmental education, and interpretation can produce positive or negative impacts to the refuge's wildlife and habitats. In general, visitors engaged in these uses will be traveling by foot, either by walking or hiking, in designated areas and along designated trails and roads. The positive effects include providing visitors with a better appreciation and more complete understanding of the wildlife and habitats associated with Montezuma Refuge. This can translate into more widespread and stronger support for the refuge, the National Wildlife Refuge System, and the Service, as well as wildlife conservation in general.

The negative effects of these uses include impacts to plants, soils, hydrology and wildlife from both visitors walking and hiking on the refuge and from building and maintaining public use facilities. The expansion of the visitor contact station will impact more ground area. However, the new facility is expected to stay within previously disturbed ground. Developing new trail/trailhead and observation/photography areas will increase traffic to specific parts of the refuge. Outside of the removal of vegetation, soil, and temporary impacts during construction, the remaining annual disturbance associated with these facilities are described below.

Impacts to Plants: Pedestrian travel can have indirect impacts to plants by compacting soils and diminishing soil porosity, aeration and nutrient availability that affect plant growth and survival (Kuss 1986). Hammitt and Cole (1998) note that compaction limits the ability of plants to re-vegetate affected areas. Repeated foot travel can directly impact plants by crushing the plants

themselves. Rare plants with limited site occurrence are particularly susceptible to such impacts. Plants growing in wet or moist soils are the most sensitive to disturbance from trampling effects (Kuss 1986). Moist and wet soil conditions are present at Montezuma Refuge, particularly during spring and early summer.

It is anticipated that allowing this use will cause vegetation loss on designated routes. Foot travel may increase root exposure and trampling effects, however it is anticipated that under current levels of use the incidence of these problems will be minor. Designated routes for pedestrian travel consist of existing trails, many with hardened surfaces or are existing trails that have been used for many years. Designated routes do not have any known occurrences of rare plant species on their surface that will be impacted by this use. Continuing pedestrian travel on these routes is not likely to cause any significant impacts to plants or plant communities.

Impacts to Soils: Soils can be compacted and eroded as a result of continued use of pedestrian routes (Cole and Landres 1995). It is anticipated that some soil erosion will occur as a result of continuing pedestrian access on designated routes. Under current levels of use, impacts to soils (erosion, compaction) are not likely to be significant.

Hydrologic Impacts: Roads and trails can affect the hydrology of an area, primarily through alteration of drainage patterns. It is anticipated that the designated existing roads and trails will continue to influence hydrology regardless of pedestrian travel. Maintenance will be required to create adequate and proper drainage to avoid a hydrologic impact. Based on the current level of use, pedestrian travel is not likely to significantly increase erosion, incision, or stream alteration. Therefore, no significant hydrologic impacts are anticipated from this use.

Wildlife Impacts: Disturbances vary with the wildlife species involved and the type, level, frequency, duration and the time of year such activities occur. Disturbance can cause shifts in habitat use, abandonment of habitat, and increased energy demands on affected wildlife (Knight and Cole 1991). Flight in response to disturbance can lower nesting productivity and cause disease and death. Knight and Cole (1991) suggest recreational activities occurring simultaneously may have a combined negative impact on wildlife. Hammitt and Cole (1998) conclude that the frequent presence of humans in wildland areas can dramatically change the normal behavior of wildlife mostly through “unintentional harassment.” Whittaker and Knight (1998) noted that wildlife response can include attraction, habituation, and avoidance. These responses can have negative impacts to wildlife such as mammals becoming habituated to humans making them easier targets for hunters. Human induced avoidance by wildlife can prevent animals from using otherwise suitable habitat.

Trails can disturb wildlife outside the immediate trail corridor (Trails and Wildlife Task Force 1998, Miller et al. 2001). Miller et al. (1998) found bird abundance and nesting activities (including nest success) increased as distance from a recreational trail increased in both grassland and forested habitats. Bird communities in this study were apparently affected by the presence of recreational trails, where “generalists” (e.g., American robins (*Turdus migratorius*)) were found near trails and “specialist” species (e.g., grasshopper sparrows (*Ammodramus savannarum*)) were found farther from trails. Nest predation was also found to be greater near trails (Miller et al. 1998).

On the refuge, it is anticipated that there will be temporal disturbances to wildlife species using habitat on or directly adjacent to the designated pedestrian routes. These disturbances are likely to be short-term and infrequent based on current levels of use. Sedimentation impacts will likely be minor as a result of foot travel. Long-term impacts may include certain wildlife species avoiding trail corridors as a result of this use over time. These impacts are not likely to significantly affect wildlife populations along these routes based on the current use pattern.

Seasonal sensitivities can compound the effect of disturbance on wildlife. Examples include regularly flushing birds during nesting or causing mammals to flee during winter months, thereby consuming large amounts of stored fat reserves. Hammitt and Cole (1998) noted that females with young (such as white-tailed deer) are more likely to flee from a disturbance than those without young. Some uses, such as bird observation, are directly focused on viewing certain wildlife species and can cause more significant impacts during the breeding season and winter months. Pedestrian use along the Wildlife Drive during the summer months is not anticipated to significantly increase disturbance to wildlife. The Wildlife Drive is already a well-traveled route via motor vehicle. Waterfowl use of the refuge significantly drops during the summer months, when pedestrian use will be expected to be highest, according to visitor trends.

Visitors engaged in wildlife observation and photography, environmental education, and interpretation have the potential to impact shorebird, waterfowl, and other migratory bird populations feeding and resting near the trails during certain times of the year. Human disturbance to migratory birds has been documented in many studies in different locations. Conflicts arise when migratory birds and humans are present in the same areas (Boyle and Samson 1985). Response of wildlife to human activities includes: departure from site (Owen 1973, Burger 1981, Kaiser and Fritzell 1984, Korschen et al. 1985, Henson and Grant 1991, Kahl 1991, Klein 1993), use of sub-optimal habitat (Erwin 1980, Williams and Forbes 1980), altered behavior (Burger 1981, Korschen et al. 1985, Morton et al. 1989, Ward and Stehn 1989, Havera et al. 1992, Klein 1993), and increase in energy expenditure (Morton et al. 1989, Belanger and Bedard 1990). McNeil et al. (1992) found that many waterfowl species avoid disturbance by feeding at night instead of during the day.

Studying the effects of human visitation on waterbirds at J.N. "Ding" Darling Refuge, Klein (1989) found resident waterbirds to be less sensitive to disturbance than migrants; she also found that sensitivity varied according to species and individuals within species. Ardeids were quite tolerant of people but were disturbed as they took terrestrial prey; great blue herons (*Ardea herodias*), tricolored herons (*Egretta tricolor*), great egrets (*Casmerodius albus*), and little blue herons (*Egretta caerulea*) were observed to be disturbed to the point of flight more than other birds. Kushlan (1978) found that the need of these birds to move frequently while feeding may disrupt interspecific and intraspecific relationships. In addition, Batten (1977) and Burger (1981) found that wading birds were extremely sensitive to disturbance in the northeastern U.S.

Klein (1993), in studying waterbird response to human disturbance, found that as intensity of disturbance increased, avoidance response by the birds increased and that out-of-vehicle activity to be more disruptive than vehicular traffic; Freddy et al. (1986) and Vaske et al. (1983) also found the latter to be true. In regards to waterfowl, Klein (1989) found migratory dabbling ducks to be the most sensitive to disturbance and migrant ducks to be more sensitive when they first arrived in the late fall, than later in winter. She also found gulls and sandpipers to be

apparently insensitive to human disturbance, with Burger (1981) finding the same to be true for various gull species.

For songbirds, Gutzwiller et al. (1994) found that singing behavior of some species was altered by low levels of human intrusion. Some studies have found that some bird species habituate to repeated intrusion; frequently disturbed individuals of some species have been found to vocalize more aggressively, have higher body masses, or tend to remain in place longer (Cairns and McLaren 1980). Disturbance may affect the reproductive fitness of males by hampering territory defense, male attraction, and other reproductive functions of song (Arcese 1987). Disturbance, which leads to reduced singing activity, will make males rely more heavily on physical deterrents in defending territories which are time and energy consuming (Ewald and Carpenter 1978).

Several studies have examined the effects of recreationists on birds using shallow-water habitats adjacent to trails and roads in the eastern U.S. (Burger 1981, Burger 1986, Klein 1993, Burger et al. 1995, Klein et al. 1995, Rodgers and Smith 1995, 1997, Burger and Gochfeld 1998). Overall, the existing research clearly demonstrates that disturbance from recreation activities always have at least temporary effects on the behavior and movement of birds within a habitat or localized area (Burger 1981, 1986, Klein 1993, Burger et al. 1995, Klein et al. 1995, Rodgers and Smith 1997, Burger and Gochfeld 1998). The findings that were reported in these studies are summarized as follows in terms of visitor activity and avian response to disturbance.

Presence: Birds avoided places where people were present and when visitor activity was high (Burger 1981, Klein et al. 1995, Burger and Gochfeld 1998).

Distance: Disturbance increased with decreased distance between visitors and species (Burger 1986), though exact measurements were not reported.

Approach Angle: Visitors directly approaching birds on foot caused more disturbance than visitors driving by in vehicles, stopping vehicles near birds, and stopping vehicles and getting out without approaching birds (Klein 1993). Direct approaches may also cause greater disturbance than tangential approaches to birds (Burger and Gochfeld 1981, Burger et al. 1995, Knight and Cole 1995, Rodgers and Smith 1995, 1997).

Type and Speed of Activity: Joggers and landscapers caused birds to flush more than fishermen, clammers, sunbathers, and some pedestrians, possibly because the former groups move quickly (joggers) or create more noise (landscapers). The latter groups tend to move more slowly or stay in one place for longer periods, and thus birds likely perceive these activities as less threatening (Burger 1981, 1986, Burger et al. 1995, Knight and Cole 1995). Alternatively, birds may tolerate passing by with unabated speed whereas if the activity stops or slacks birds may flush (Burger et al. 1995).

Noise: Noise caused by visitors resulted in increased levels of disturbance (Burger 1986, Klein 1993, Burger and Gochfeld 1998), though noise was not correlated with visitor group size (Burger and Gochfeld 1998).

In determining compatibility, the cumulative effects of all public use on trails are considered. Due to the spatial and seasonal limitations put on these activities and that historical records show both increasing wildlife (Note: management projects such as dry marsh restoration in the Main Pool affected wildlife survey numbers in 2010) and visitor use, disturbance from wildlife observers, photographers and those partaking in environmental education and interpretation is not expected to greatly increase the disturbance to wildlife.

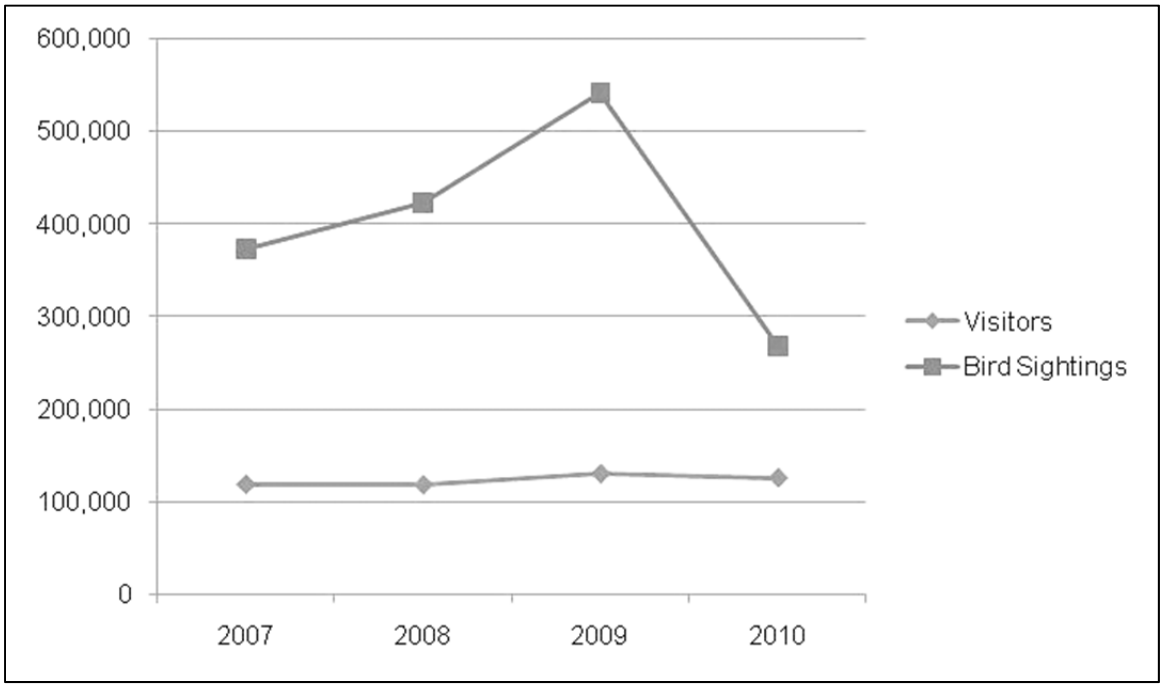


Figure B.8. Visitor Use and Waterbird Survey Count from 2007 to 2010.

Public Review and Comment:
As part of the comprehensive conservation plan process for the Montezuma Refuge, this compatibility determination was available for public review and comment for 30 days concurrent with the release of our draft CCP and environmental assessment.

Determination (check one below):

_____	Use is Not Compatible
X	Use is Compatible with Following Stipulations

Stipulations Necessary to Ensure Compatibility:

1. Signs necessary for visitor information, safety, and traffic control will be installed and maintained.

2. Access from the Wildlife Drive to trails and facilities along the drive (Seneca Trail crossing, photography blind access, and the planned Oxbow Trail) is permitted from designated areas (parking areas, or directly from the Wildlife Drive in the summer months).

3. These uses are restricted to refuge open hours from one half hour before sunrise to one half hour after sunset.

4. Areas may be closed to the public permanently, temporarily, or seasonally for reasons such as resource protection and visitor safety, or to conduct management actions.

5. The refuge will continue its outreach program to promote public awareness and compliance with refuge public use regulations.

6. Pedestrian travel on roads open to vehicular travel (i.e., the Wildlife Drive) will be permitted subject to vehicles having the right-of-way.

7. Pedestrian travel along the Wildlife Drive is permitted during the summer months based on the refuge manager's discretion (the refuge manager will take into consideration visitor safety, user conflict, and resource protection).

8. Almost all nonstaff environmental education and interpretative activities will be limited to the headquarters area or designated nature trails to minimize habitat destruction or disturbance to wildlife.

9. Special use permits will be issued for nonstaff environmental education and interpretation programs, and for wildlife photography, that the refuge staff have determined to not be effective in designated nature trails areas and still in-line with minimal widlife disturbance.

All routes designated for public access will be annually inspected for maintenance needs. Road and trail conditions that require immediate maintenance will be identified and appropriate action will be taken to correct such conditions.

Justification:

Wildlife observation and photography, environmental education, and interpretation are priority wildlife-dependent uses for the National Wildlife Refuge System through which the public can develop an appreciation for fish and wildlife (Executive Order 12996, March 25, 1996 and The National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57)).

The Service's policy is to provide expanded opportunities for these uses when compatible and consistent with sound fish and wildlife management and ensure that they receive enhanced attention during planning and management. Allowing wildlife observation, photography, environmental education, and interpretation at Montezuma Refuge will not materially interfere with or detract from the mission of the National Wildlife Refuge System or the purposes for which the refuge was established as evidenced by the impact analysis that shows this use will not compromise our ability to achieve the goals and objectives set forth under the Montezuma Refuge CCP. In fact, allowing these uses supports those goals and objectives and the Service's Mission.

Signature: Refuge Manager: Thomas Gasiloff 8/23/2012
(Signature and Date)

Concurrence: Regional Chief: 9/12/2012
(Signature and Date)

Mandatory 15-year Re-evaluation Date: 9/12/2027

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COMPATIBILITY DETERMINATION

Project Title: Cooperative Farming

Station Name: Montezuma National Wildlife Refuge

Date Established: September 12, 1938

Establishing Authorities:

The U.S. Fish and Wildlife Service acquired lands to be established as the Montezuma National Wildlife Refuge under Executive Order 7971 and established the Refuge in 1938 under the authority of the Migratory Bird Conservation Act of 1929 (16 U.S.C. §715).

Purpose for which Established:

"…as a refuge and breeding ground for migratory birds and other wildlife…" (Executive Order 7971).

"…for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." (16 U.S.C. §715d).

National Wildlife Refuge System Mission:

To administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

Description of Proposed Use:

The following questions and answers provide a concise description of the proposed use.

1. What is the use? Is the use a priority public use?

The use is cooperative farming. Cooperative farming is not a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997.

2. Where would the use be conducted?

We would allow this use on the Furman, Nash, and Waugh Tracts, located in Seneca and Wayne Counties, New York. The 186-acre Furman Tract is a recently acquired parcel that straddles Route 31 in Seneca and Wayne Counties. The tract includes 173 acres of

farmland situated between privately owned farms and the Seneca River. The area proposed for use is the 173-acre farm. This tract is open to white-tailed deer hunting and furbearer trapping.

The Nash Property includes 211 acres west of Tyre Road. The area proposed for use is 15 acres. Two 4-acre fields were planted in soybeans as part of the cooperative farming program in 2006 and will be converted to shrubland in 2007. Other habitats on the Nash Property include shrubland and early successional forest.

The Waugh Tract includes 128 acres east of East Tyre Road and surrounding Wood Marsh Road. The area proposed for use is 33 acres. An additional 6-acre field was planted in soybeans as part of the cooperative farming program in 2006 and will be converted to grassland in 2007. Other habitats on and surrounding the Waugh Tract include grassland, shrubland, and early successional forest.

Other, yet un-acquired tracts and currently owned tracts in need of restoration may be temporarily added to the cooperative farming program pending conversion to native habitats.

3. When would the use be conducted? Farming would occur from spring through fall via planting and harvesting of large grains (corn and soybeans). Corn and soybeans are typically planted in May or June and harvested in October or November. Application of fertilizer, manure, and pesticides occurs before and after planting, but prior to harvest.

4. How would the use be conducted? We would manage the farming program through a cooperative agreement with a local farmer. We followed guidance from the Refuge Manual in selecting the individual with which to enter into an agreement. Field rental rates are determined by taking the average of rates from the local area. Rather than making cash payments, the cooperator conducts farming-related services on the refuge of an amount equal to the amount of rent. Farming-related services eligible for inclusion into the agreement are: providing native grass and other native seed, planting, plowing, disking, mowing, and applying herbicide. The cooperative farming agreement is a component of the refuge's annual habitat management program and activities conducted by the cooperator support the accomplishment of refuge habitat management objectives.

We follow best management practices in the implementation of the cooperative farming program. We prepare pesticide use proposals for application of all pesticides, and only those that are shown to not impact fish and wildlife resources are approved.

A request for the justifiable use of genetically modified seed has been forwarded to the appropriate approval authority. Genetically modified seed will only be utilized in the farming program after such said approval has been granted. Roundup ™ Ready soybeans are widely-used on farms around the refuge. We have reviewed the literature on the effects of Roundup Ready soybeans, and of glyphosate herbicide, on fish and wildlife resources and can find no definitive studies that show that use of these products, as is proposed herein, would materially affect refuge or System purposes.

According to a 2002 USDA report, adoption of GE (genetically engineered) crops including Bt cotton and herbicide tolerant corn, cotton and soybeans, resulted in a decline of 19.1 million-acre treatments in 1997. This equated to a decline of about 2.5 million pounds of active ingredients. While the pounds of active ingredients such as glyphosate increased on soybeans fields, "this substitution displaced other synthetic herbicides that are nearly three times as toxic to humans and that persist in the environment twice as long as glyphosate" (Fernandez-Cornejo and McBride 2002).

5. Why is the use being proposed? We propose to use cooperative farming as an interim measure to keep fields open in preparation for conversion to native plants, as a means to help us properly establish newly converted early successional habitats and newly restored wetlands, and to allow us to control invasive plant species on the refuge. Our cooperative farming program is an integral component of our overall habitat restoration and management efforts as we work toward full compliance with refuge system policies on compatible uses and biological integrity, diversity, and environmental health.

The refuge continues to acquire land as it becomes available. In the past 15 years, we have acquired 2,600 acres. The majority of the land we purchase is planted in corn, soybeans, or potatoes at the time of purchase. We generally allow land owners to continue farming through the year of the purchase. We occasionally allow a farmer to continue farming more than one year after our acquisition to give us more time to plan restoration activities and acquire necessary funding (e.g., for grass seed, dike construction, water control structures, etc.). We do not allow cooperative farmers to plant potatoes as they require large amounts of herbicides, fungicides, and pesticides.

The Draft Environmental Impact Statement to establish the Montezuma Wetlands Complex was released for public review and comment in May 1990, and the Final Environmental Impact Statement was released in June 1991. The following statements pertaining to farming are contained in the Final Environmental Impact Statement, and reflect Service policies at the time of complex establishment:

> "On lands in the project boundary now currently in agricultural production, the continued use of these lands in this manner will be encouraged on uplands areas because of their values to wildlife" (page 11).
>
> "The current and future use of agriculture within the project area will continue" (page 13).
>
> "On public land in the project area, the use of private agriculture is a legitimate land use and can be used effectively as a tool to manage vegetation. Agricultural land that becomes part of the project should continue to be made available

> through cooperative agreements to interested local farmers for crop production" (page 16).
>
> "With such a large percentage of farmland within the project area, it is inevitable that agricultural impacts will be felt. Farmlands will be purchased and converted back to wetlands wherever feasible. Upland areas, where purchased, may be converted to nesting cover and other habitat types. Lands purchased and left in farming will very likely have management restrictions which may dictate mowing schedules, crop rotations, and other activities. Purchased mucklands that continue in active agriculture will be managed to maximize soil conservation by such practices as winter cover crops and hedges to reduce wind erosion" (page 98).

In 1997, Congress passed the National Wildlife Refuge System Improvement Act. Among the provisions of the Act were directives concerning compatibility and the biological integrity, diversity and environmental health of the refuge system. New refuge system policies on Compatibility, and Biological Integrity, Diversity and Environmental Health (Integrity Policy) were issued in 2000 and 2001, respectively. The Integrity Policy directed that refuge habitats be managed to support historic conditions, defined as the "composition, structure, and functioning of ecosystems resulting from natural processes that we believe, based on sound professional judgment, were present prior to substantial human related changes to the landscape." Further, the policy states that "we do not allow refuge uses or management practices that result in the maintenance of non native plant communities unless we determine there is no feasible alternative for accomplishing refuge purpose(s)." The policy uses farming to illustrate this directive:

> "For example, where we do not require farming to accomplish refuge purpose(s), we cease farming and strive to restore natural habitats."

Montezuma National Wildlife Refuge, as part of the Northern Montezuma Wetlands Complex, aims "to protect, enhance, and restore one of New York's premier wetland complexes." Restoration of emergent wetlands on newly acquired muck farms often requires significant early investment, including dike construction, water management planning, and purchase and installation of water control structures.

Montezuma National Wildlife Refuge is in the midst of preparing a habitat management plan that will provide a long-term vision and specific guidance on managing habitat for the resources of concern at the refuge. As part of the planning analysis, we are conducting investigations into the contributions of this refuge to ecosystem and landscape scale wildlife and biodiversity conservation. As a result of the habitat management plan, the refuge likely will continue managing for a diversity of habitats in addition to emergent wetlands, including swamps, forested uplands, shrublands, and grasslands.

Successful establishment of native shrublands and forests requires a significant amount of time and money to control non-native, invasive species. We are currently researching best management practices (e.g., allowing fields to naturally succeed vs. planting) for shrubland and forest establishment. Maintenance of shrubland habitats also requires

intensive management to prevent the incursion of invasive species. Shrublands will be managed primarily by herbicide treatment of invasive and tree species. Forest habitat maintenance is less labor intensive at this time as there are fewer forest-adapted invasive plants in this area. However, we are currently evaluating optimal water level management in impounded swamps for native tree regeneration as well as breeding bird use, particularly species of concern such as the cerulean warbler.

Grassland establishment also requires significant early investment, including field preparation, planting, invasive species control, and general weed control to establish the stands. Maintenance of grassland fields also requires intensive management to keep out woody plant species, control invasive species, reduce the build-up of thatch, and maintain the vigor of the grasses. We maintain grassland fields by prescribed burning, mowing, disking, and application of approved herbicides.

Upland fields that are taken out of agricultural production and not immediately prepared for native habitat restoration often become infested with invasive plant species such as Canada thistle (*Cirsium arvense*) and Tartarian honeysuckle (*Lonicera tatarica*), making reclamation of these fields much more difficult and expensive.

We have used the cooperative farming program to help us achieve many of these habitat management activities. The cooperators have assisted with dike construction, field preparation, seeding, mowing, disking, and invasive species control to help prepare upland fields for restoration and to establish new emergent wetland impoundments and new grassland fields. Because we are still in the process of fully restoring former agricultural fields, we propose phasing out our cooperative farming program gradually. In 2006, we had 662 acres in the cooperative farming program. We restored 427 of these acres to emergent wetland in 2006 and intend to restore 8 acres to shrubland and 6 acres to grassland (part of a large grassland complex) in 2007. We will keep 221 acres in the cooperative farming program in 2007. We intend to phase these fields out of the farming program. However, as we acquire new lands within the Montezuma Wetlands Complex or as we identify currently-owned tracts for restoration, we may need to use the cooperative farming program as an interim measure prior to habitat restoration.

In the interim, lands that remain in agriculture will not be as beneficial to migratory birds and other wildlife as they would be if restored to native vegetation. They will have no value as breeding habitat. However, these fields do have value as foraging areas for birds throughout the year. Muck farms in the program are flooded after harvest, and large numbers (>10,000) of waterfowl have been observed feeding on waste grain in these flooded fields.

It is clear that, when viewed in the context of the overall habitat management status and capacity of the refuge, cooperative farming as it is being practiced, and for the limited duration proposed, contributes to the purposes of the refuge and the mission of the refuge system by significantly adding to the refuge's ability to successfully restore and manage native habitats over the long term.

Availability of Resources: With the exception of staff time necessary to administer it, the cooperative farming program is self sustaining. The disking, planting, mowing, herbicide application, and other farming practices used to help restore native habitats are conducted in exchange for use of the land for agricultural production. Staff hours to manage 662 acres of cropland in FY 2006 totaled 80 hours. Staff hours to restore 555 acres in FY 2006 totaled 900 hours.

Anticipated Impacts on Refuge Purpose: Prior to the completion of our Comprehensive Conservation Plan, we are using the objectives set forth in the Northern Montezuma Wetlands Project Environmental Impact Statement finalized in 1991. They are as follows:

(1) Provide increased protection and enhancement of wetland habitats and adjacent lands within the project area in recognition of the area's significant value as a major waterfowl and migratory bird staging area in the Atlantic Flyway.

(2) Provide increased protection of existing nesting and feeding habitats of endangered, threatened, and special concern species of wildlife, and create and enhance additional habitats for these species to help ensure the viability of these species' populations in New York State.

(3) Restore drained wetlands to their original wetland state whenever and wherever it is feasible, legal, and practical to do so within the project area.

(4) Improve accessibility to this wetland complex for compatible wildlife-related public recreation, education, and research.

(5) Maximize the production of waterfowl and other selected wetland wildlife through implementation of proven management techniques to provide additional nesting and breeding habitat in the project area.

(6) Foster the continued private involvement in the protection, management, and enhancement of the area's wildlife resource.

(7) Provide protection for rare biotic communities existing within project boundaries.

In terms of the impacts related specifically to interim refuge objectives, purchase of agricultural land by the Service increases habitat protection. Although enhancement of wetland habitats and adjacent lands does not occur on lands within the farming program, the cooperative farming program allows the refuge to enhance other lands within our boundary.

With regard to species of concern, the farming operations on the refuge are continuing activities at their current locations. There will be no additional impact to species of concern above what has occurred historically.

The cooperative farming program increases our ability to manage and restore wetland and adjacent habitats because farmers participating in the program assist with habitat maintenance and restoration in lieu of rental payments.

One of the fields in the cooperative farming program in 2005 and 2006 was included in the lands in the refuge waterfowl hunt, providing improved accessibility for compatible wildlife-related public recreation.

The cooperative farming program fosters the continued private involvement in the refuge by facilitating personal relationships between refuge staff and local farmers. By conducting services on the refuge in lieu of rental payments, local farmers become involved in on-the-ground habitat restoration and management.

Lands containing rare biotic communities will not be included in the cooperative farming program.

Public Review and Comment: A news release announcing the availability of this determination for a 30-day public review and comment period was issued to the following media outlets and individuals on December 15, 2006:

The Post-Standard	Democrat and Chronicle
The Ithaca Journal	Finger Lakes Times

No public comments were received.

Determination (check one below):

_____ **Use is Not Compatible**

__X__ **Use is Compatible With the Following Stipulations**

Stipulations Necessary to Ensure Compatibility:

The cooperative farming program on the Furman, Nash, and Waugh Tracts will be phased out entirely within five years, unless new circumstances arise at which time a new compatibility determination will be required.

Newly acquired lands and degraded habitats in need of restoration may be entered into the cooperative farming program as needed.

The program will adhere to general conditions for cooperative farming programs as listed in the Refuge Manual (6 RM 4 Exhibit 1).

All operations on refuge cropland are to be carried out in accordance with the best farming and soil conservation practices.

The cooperator must have prior approval of the Refuge Manager before the application of any pesticide. The cooperator must supply the Refuge Manager, at least three months prior to farming, a label containing common name, application rate, number, and methods, and target pests. The cooperator, at the time of application, is required to complete a pesticide spray record furnished by the refuge.

Justification

The Final Environmental Impact Statement to establish the Northern Montezuma Wetlands Complex provides for the use of cooperative farming as a viable resource management opportunity in the management of the refuge. The use of cooperative farming as an interim measure will keep fields relatively invasive-free in preparation for conversion to native plants, and will help us to properly establish grasslands, shrublands, forests, and impounded emergent wetlands.

The refuge cooperative farming program is an integral component of the refuge's overall habitat restoration and management efforts. In lieu of paying rent for the use of refuge farm fields, the cooperators support the accomplishment of refuge habitat management objectives by performing farming-related services related to our annual habitat management program and activities. Farming-related services include assisting with dike construction, providing native grass and other native seed, planting, plowing, disking, mowing, and applying herbicide.

In accordance with 50 CFR 29.1, cooperative farming, as described in this compatibility determination, significantly contributes to the mission, purposes, goals, and objectives of the Montezuma NWR and the National Wildlife Refuge System mission.

Prepared: Refuge Biologist: _____ 1/18/07
(Signature and Date)

Signature: Refuge Manager: _____ 1/19/07
(Signature and Date)

Concurrence: Regional Chief: _____ 2/6/07
(Signature and Date)

Mandatory 10- year Re-evaluation Date: 2/6/17

Literature Cited

Fernandez-Cornejo, Jorge and William D. McBride. 2002. Adoption of Bioengineered Crops. USDA, Agriculture Economic Report No. 810, Washington, D.C.

USFWS and NYSDEC. 1991. Northern Montezuma Wetlands Project. Final Environmental Impact Statement, Newton Corner, MA.

USWFS. 2001. Policy on Biological Integrity, Diversity, and Environmental Health. Fish and Wildlife Manual, 601 FW 3, Washington, D.C.

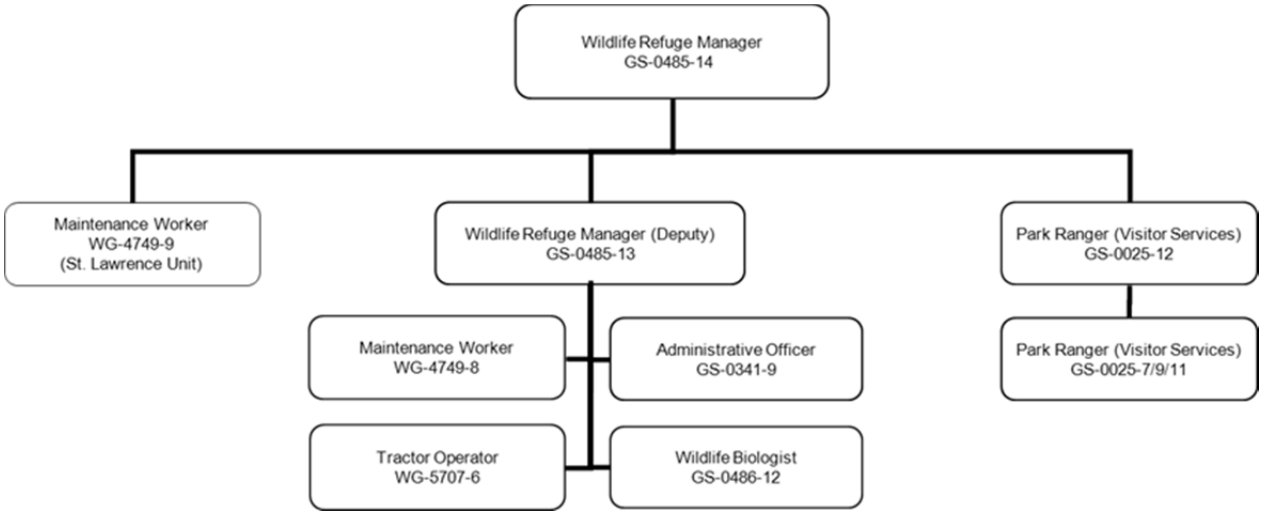
Appendix C

USFWS

USFWS employee collecting data

Refuge Staffing Charts

U.S. Fish and Wildlife Service
Montezuma National Wildlife Refuge
Current Approved Staff

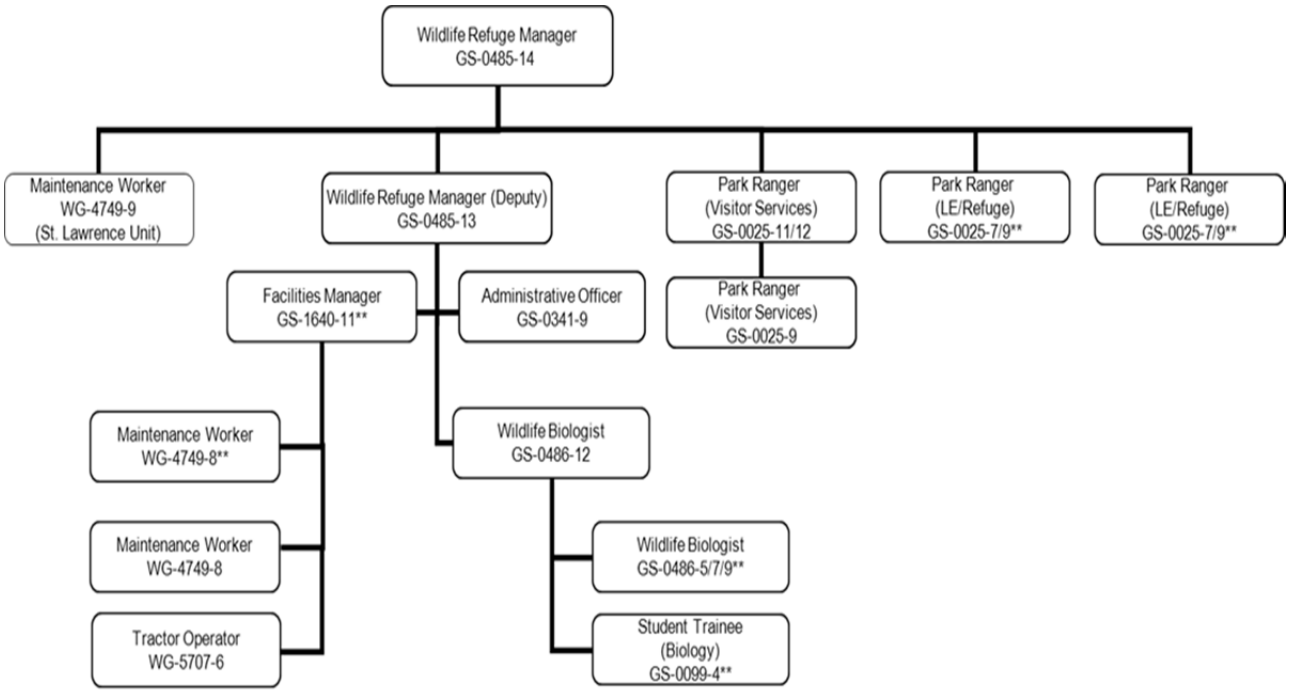


Temps and Contractors

1 GS-5 Bio-Tech (Temp)

2 GS-4 Bio-Tech (Term)

U.S. Fish and Wildlife Service
Montezuma National Wildlife Refuge
Proposed Staff



Temps and Contractors

3 GS-5 Bio Tech (Temp) - 1 New
1 GS-7 Bio Tech (Temp) – New
1 GS-4 Bio Tech (Term)

**= proposed new positions

Appendix D

USFWS

Dry Marsh restoration work

Refuge Operations Needs (RONS) and Service Asset Maintenance Management Systems (SAMMS)

Table D.1. Current RONS Projects for Montezuma National Wildlife Refuge.

Project Title	**Costs ($1,000)**	**Refuge Rank**	**FTE* (personnel)**
Restore 2,000 Acres of Wetland Habitat (Assistant Manager GS-11)	118.458	1	1.0
Increase Public Awareness Along the Interstate 90 Corridor (Park Ranger GS-09)	97.911	2	1.0
Battling Invasive Species Using Our Local Community Members (Biological Science Technician GS-05)	45.901	3	1.0
Support Wetland Restoration and Visitor Services (Maintenance Worker WG-08)	77.65	4	1.0
Responding to Accelerated Climate Change: Inventory and Monitoring (Biological Science Technician GS-07)	59.47	5	1.0
Provide Greater Leadership for Expanding Operations (Maintenance Leader WS-11)	117.149	6	1.0
Breaking Up Broken Landscapes: Providing Key Habitat for Our Dwindling Grassland Birds	33	7	
Getting the Message Out Through Video Media	47	8	
Provide Visitor, Resource, and Facility Protection (Law Enforcement) (Park Ranger LE GS-09)	150	9	1.0
Provide Visitor, Resource, and Facility Protection (Law Enforcement) (Park Ranger LE GS-09)	150	10	1.0
TOTAL	**896.539**		**8.0**

**FTE: full-time equivalent*

Table D.2. Proposed RONS Projects for Montezuma National Wildlife Refuge.

Project Title	**Costs ($1,000)**	**Refuge Rank[1]**	**FTE[2] (personnel)**
Restore 2,000 Acres of Wetland Habitat (Wildlife Biologist GS-5/7/9)	118.458	1	1.0
Support Wetland Restoration and Visitor Services (Maintenance Worker WG-08)	77.65	2	1.0
Responding to Accelerated Climate Change: Inventory and Monitoring (Temp. Biological Science Technician GS-7)	59.47	3	.5
Provide Greater Leadership for Expanding Operations (Facilities Manager GS-11)	117.149	4	1.0
Battling Invasive Species Using Our Local Community Members (Student Trainee Biology GS-4)	45.901	5	1.0
Restoring our Mucklands (Temp Biological Science Technician GS-5)	51.00	6	.5
Breaking Up Broken Landscapes: Providing Key Habitat for Our Dwindling Grassland Birds	33	7	
Getting the Message Out Through Video Media	47	8	
Provide Visitor, Resource, and Facility Protection (Law Enforcement) (Park Ranger LE GS-09)	150	9	1.0
Provide Visitor, Resource, and Facility Protection (Law Enforcement) (Park Ranger LE GS-09)	150	10	1.0
TOTAL			**7.0**

[1] *Ranking based only on these proposed RONS projects. Actual ranking may differ when updating existing RONS projects.*

[2] *FTE: full-time equivalent*

Table D.3. SAMMS Projects for Montezuma National Wildlife Refuge.

Project Title	**Costs ($1,000)**	**Refuge Rank**
EXISTING FACILITIES		
Repair Observation Tower and Trail	57.9	1
Remove Unit 17 Spillway	43.5	2
Relocate 1.5 miles of the Main Pool Wildlife Road	750	3
Rehabilitate Roof, Deck Railing, Doors, Displays, Signs and Restroom at Visitor Contact Area	50	4
Rehabilitate Millenium Marsh Dike	75	5
Rehabilitate Deteriorated Benning Marsh Dike	29	6
Replace Three (3) Water Control Structures	300	7
Remove Deteriorated Unit 17 Cross Dike	30	8
Rehabilitate Severely Degraded Puddler Dike	120	9
Rehabilitate Deteriorated Wildlife Drive South	198	10
Rehabilitate Deteriorated Foster Malone West Dike	120	11
Rehabilitate 1960s Check Station	26	12
Demolish Mesumeci Building	10.1	13
Rehabilitate Main Pool Dike	258	14
Replace Deteriorated Seneca Spillway Water Control Structures	98	15
Rehabilitate Deteriorated Foster Malone East Dike	120	16
Rehabilitate Knox Marsellus Dike	575	17
Rehabilitate 1960s Shop Storage Building	26	18
Rehabilitate Vehicle Storage Building	26	19
Rehabilitate Severely Eroded Esker Brook Trail System	75	20
Rehabilitate Tschache Spillway (Drop) Head Wall	38	21
Repair the Clarks Ridge Access Road/Parking Lots/Signing	26	22
Rehabilitate May's Point Viewing Parking Lot	37	23
Rehabilitate South Spring Pool Trail and Water Control Structure	26	24
Rehabilitate 1940s Residence	33	25
Rehabilitate Tschache Pool Pump House	26	26
Rehabilitate Deteriorated Quarters 2 (Landschoot)	50	27
Rehabilitate Deteriorated Quarters 2 Garage (Landschoot)	30	28
Rehabilitate Deteriorated Knox Marcellus Entrance Road	12	29
Rehabilitate Deteriorated Knox Marsellus West Dike	110	30
Rehabilitate Aging Building Fire and Security System	10	31
Rehabilitate Northern Dikes in Unit 17	37	32
Rehabilitate Tschache Pool Dike South Embankment Phase II - DU Contract	165	33
NEW FACILITIES		
Construct Cayuga-Seneca Trailway at Montezuma	200	1
Construct Interpretative Kiosks at Esker Brook and Tschache Pool	50	2

Appendix E

Mitch Virnig/USFWS

Young waterfowl hunter

Montezuma National Wildlife Refuge Hunt Program Environmental Assessment

Montezuma National Wildlife Refuge
Hunt Program Environmental Assessment

Table of Contents

I. Introduction

The Montezuma National Wildlife Refuge (Montezuma NWR, refuge) lies at the north end of Cayuga Lake in the heart of the Finger Lakes region of central New York State (NYS) (map E.1) and currently includes 9,184 acres[1]. The refuge manages 14 impoundments that provide more than 4,000 acres of freshwater wetland habitat to more than 1,000,000 waterfowl, as well as a diversity of shore, wading, and songbirds each year. A diversity of marsh and wading birds breed here, including bitterns, rails, black terns, and grebes, along with several pairs of bald eagles.

Montezuma NWR is part of a larger 50,000-acre Montezuma Wetlands Complex (MWC) that encompasses public and private lands. The NYS Department of Environmental Conservation (NYSDEC) also manages 8,000 acres of public lands for wildlife and public use in the MWC. Audubon New York maintains an education center in the MWC and has highlighted the area as a globally significant Important Bird Area due to its value for migratory birds, breeding marshbirds, and other species. Those other species include Federal trust species, such as shorebirds and neotropical migrant songbirds (passerines). The MWC is one of the most significant stopover sites for shorebirds in upstate New York, regularly hosting 1,000 or more individuals of 25 species. The refuge area supports the second largest population of cerulean warblers in New York—a species of high conservation concern that breeds in riparian, forested wetlands, a habitat that was drained or cleared in many other areas.

Montezuma NWR was established by Executive Order 7971 on September 12, 1938, "...as a refuge and breeding ground for migratory birds and other wildlife..." Since then, we have acquired lands under the authority of the Migratory Bird Conservation Act (16 U.S.C. 715-715r), as amended, "...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds."

Recently, the U.S. Fish and Wildlife Service (Service, we, our) began developing a Comprehensive Conservation Plan (CCP) for Montezuma NWR. A CCP provides strategic management for a refuge for 15 years, addressing a wide range of refuge activities including everything from habitat management, to facilities (maintenance and new construction), to public uses. Through the CCP process, we have identified six goals for the refuge:

Goal 1: Provide, enhance, and restore where possible, freshwater emergent marsh, open water wetland, and mudflat habitats to benefit native wildlife and plant communities, particularly migrating waterfowl, shorebirds, and breeding marshbirds.

Goal 2: Restore and maintain forested wetlands, riparian forests along the Seneca and Clyde Rivers, and upland forests to benefit priority native species, including songbirds, bats, and important plant communities.

Goal 3: Manage grassland and shrubland habitats primarily to benefit bird species of conservation concern.

[1]Acreages are current as of October 2012.

Goal 4: Ensure visitors of all abilities and varied interests participate in and enjoy the refuge's opportunities for wildlife observation, interpretation, photography and environmental education. Motivate them to value, support, and contribute to the refuge, Montezuma Wetlands Complex, and National Wildlife Refuge System. Increase their understanding of wetlands and wetland functions, and help them become better environmental stewards.

Goal 5: Provide opportunities for hunters and anglers to enjoy and support hunting and fishing on the refuge and increase their understanding of the regional environmental importance of the refuge and of the greater Montezuma Wetland Complex.

Goal 6: Increase awareness and cooperation among State and Federal agencies, local communities, environmental organizations, universities and other partners. Help them understand the role of the refuge and the Montezuma Wetlands Complex in the community, and encourage participation in achieving the vision of the complex.

These goals are consistent with refuge purposes, the National Wildlife Refuge System (Refuge System) mission and goals, the Service mission and policies, the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee; Refuge Administration Act) as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57; 111 Stat. 1253; Refuge Improvement Act).

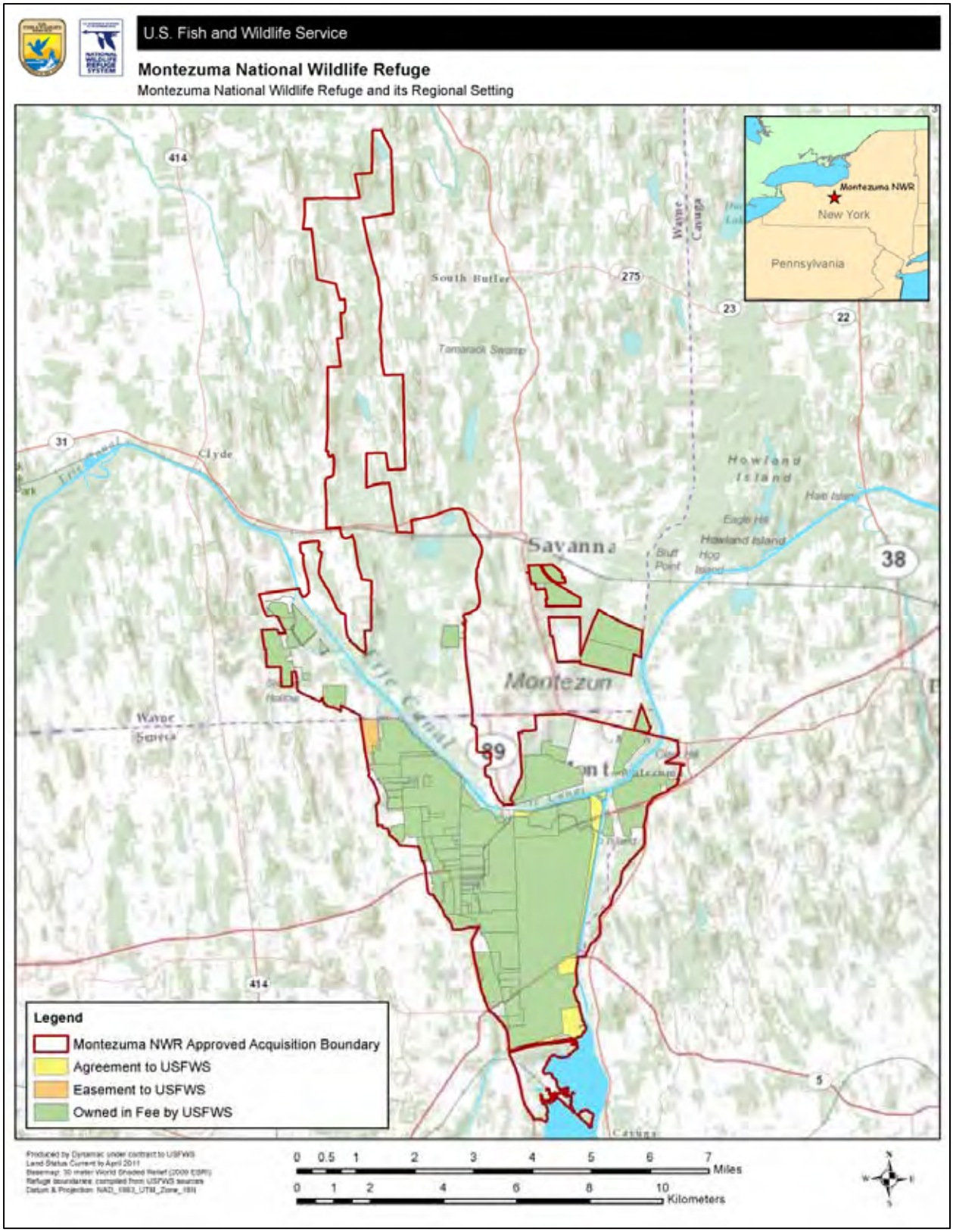
As required by the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321 et seq.; 83 Stat. 852), we have prepared this Environmental Assessment (EA) for Montezuma NWR's hunt program. NEPA regulations require an evaluation of a reasonable range of alternatives, and a description of their foreseeable impacts on the socioeconomic, physical, biological, and cultural environments in the project area. The range of alternatives must include a proposed (or preferred) action, no action, and, if deemed appropriate, one or more other reasonable alternatives.

II. Purpose of, and Need for, the Proposed Action

In 1997, the Refuge Improvement Act prepared the way for a renewed vision for the future of the Refuge System where:

- Wildlife comes first.
- Refuges are anchors for biodiversity and ecosystem-level conservation.
- Lands and waters of the Refuge System are biologically healthy.
- Refuges are national and international leaders in habitat management and wildlife conservation.

The Refuge Improvement Act also identifies six wildlife-dependent priority public uses: hunting, fishing, wildlife observation and photography, and environmental education and interpretation. The act specifies that these public uses are to receive enhanced consideration on national wildlife refuges.



Map E.1. Montezuma National Wildlife Refuge and its Regional Setting.

A. Proposed Action

The Service proposes to update the hunt program at the Montezuma NWR to be consistent with the goals, objectives, and strategies established in the refuge's CCP and support the refuge purposes, Refuge System mission, Service mission, and Refuge Improvement Act.

B. Purpose

The purpose of the refuge's hunt program is to encourage the use of refuge lands for wildlife-dependent public recreation and to be consistent with the goals, objectives, and strategies identified in the refuge's CCP. Allowing hunting on the refuge provides an opportunity to make visitors aware of resource issues, management plans, and how the refuge contributes to the Refuge System and Service mission. In addition, we are required to manage wildlife-dependent recreation, including hunting, in strict accordance with all applicable Federal laws and regulations and, to the extent practicable, consistent with applicable State and Tribal laws (605 FW 2, 50 CFR Subchapter C).

The Service strives to provide hunting opportunities on refuges which: (1) promote the safety of participants, other visitors, and facilities; (2) promote compliance with applicable laws and regulations and responsible behavior; (3) minimize or eliminate conflict with fish and wildlife population or habitat goals or objectives in an approved plan; (4) minimize or eliminate conflicts with other compatible wildlife-dependent recreation; (5) minimize conflicts with neighboring landowners; (6) promote accessibility and availability to a broad spectrum of the American people; (7) promote resource stewardship and conservation; (8) promote public understanding and increases public appreciation of America's natural resources and our role in managing and conserving these resources; (9) provide reliable and reasonable opportunities to experience wildlife; (10) use facilities that are accessible to people and blend into the natural setting; and (11) use visitor satisfaction to help define and evaluate programs (605 FW 1.6).

C. Need for the Proposed Action

The current refuge hunt plan was approved in 1989, over 20 years ago. Since that time, the refuge's land base has grown and wildlife populations and habitats have changed. Also, Congress has passed the Refuge Improvement Act, and the Service has developed and implemented new policies and guidance. As part of the CCP process, we are reevaluating the refuge's hunt program based on comments received from the public and our partners, issues identified by Service staff, and the goals, objectives, and strategies identified in the CCP.

Hunting is a popular and traditional activity in the area and an important management tool to keep wildlife populations healthy, to maintain healthy habitats, and to collect biological data on game species. Hunting can instill a unique understanding and appreciation of wildlife, their behavior, and their habitat needs. We manage our hunting programs to help promote understanding and appreciation of natural resources and their management on lands and waters in the Refuge System.

The Service encourages the development of hunting programs on national wildlife refuges when they are compatible with the refuge's legal purpose, biologically sound, affordable, properly

coordinated with other refuge programs, and fit the Service description of a quality hunt. For the purposes of this document, we are defining quality hunts as those which are planned, supervised, conducted, and evaluated to promote positive hunting values and ethics such as fair chase and sportsmanship. At Montezuma NWR, we rely on close cooperation and coordination with the NYSDEC in developing and managing hunting opportunities on the refuge.

III. Alternatives Considered but not Fully Developed

During the alternatives development process, the following alternatives were discussed, but were not fully developed.

A. Closing the Refuge to all Hunting

Hunting is an historic use of refuge lands, and has been allowed on the refuge since 1957. There are many laws, policies, establishment documents, and other mandates that we use to guide public use programs on the refuge. The Refuge Improvement Act identifies hunting as one of six priority public uses that are to receive enhanced consideration in refuge planning. The others are fishing, wildlife observation and photography, and environmental education and interpretation. Our mandate is to provide high-quality opportunities for those priority uses when they are compatible with refuge purposes, goals, and other management priorities. The Refuge Improvement Act does not establish a hierarchy among the six priority uses, but requires us to facilitate them when they are compatible and appropriate.

Executive Order No. 13443 (August 16, 2007), "Facilitation of Hunting Heritage and Wildlife Conservation," reinforces the importance of hunting for recreational and management purposes on national wildlife refuges. That order directs the Department of the Interior and other Federal land management agencies to "facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitat." It also states that Federal agencies are to "manage wildlife and wildlife habitats on public lands in a manner that expands and enhances hunting opportunities, including through the use of hunting in wildlife management planning." Lastly, one of the objectives specified in the 1991 Northern Montezuma Wetlands Project Final Environmental Impact Statement which authorized the refuge expansion is to improve "accessibility to this wetland complex for compatible wildlife-related public recreation, education, and research" (USFWS and NYSDEC 1991).

The purpose of this document is to update the refuge's hunt program to be consistent with refuge purposes, and the goals, objectives, and strategies as described in the refuge's CCP, and to support the Refuge System mission, Service mission, and Refuge Improvement Act. Closing the refuge to all hunting would not meet the purpose of this document because: 1) it would not satisfy goal 5 of the CCP to provide opportunities for hunters and anglers to enjoy and support hunting and fishing on the refuge, 2) it would not support the objectives of the 1991 Northern Montezuma Wetlands Project Final Environmental Impact Statement, and 3) it would not support the provision of the Refuge Improvement Act that identifies hunting as one of the six priority public uses that should receive enhanced consideration in refuge planning if they are compatible.

B. Reducing Hunt Opportunities on the Refuge

There are many laws, policies, establishment documents, and other mandates that we use to guide public use programs on the refuge. In addition to the mandates described in the above section "Closing the Refuge to all Hunting," Service policy requires regulations permitting hunting of wildlife within the Refuge System to be, to the extent practicable, consistent with state fish and wildlife laws, regulations, and management plans (605 FW 2). Hunting is an historic use of the refuge, and we have found implementing the current hunt program to be practicable since it was initiated in 1989.

The purpose of this document is to update the refuge's hunt program to be consistent with refuge purposes, and the goals, objectives, and strategies as described in the refuge's CCP, and to support the Refuge System mission, Service mission, and Refuge Improvement Act. Reducing hunting opportunities on the refuge would not meet the purpose of this document because: 1) it would not satisfy the objectives and strategies under goal 5 of the CCP, and 2) it would not support the Service's policy to be consistent with state fish and wildlife laws, regulations, and management plans where practicable.

IV. Alternatives Considered

A. Summary of the Alternatives

NEPA requires that we evaluate a reasonable range of alternatives for managing the hunt program at Montezuma NWR before selecting an alternative for implementation. This section outlines our process for formulating alternatives, describes features common to all alternatives, and provides a description of the three alternatives we analyzed in detail. These three alternatives include the following:

- Alternative A—Current Management. Alternative A satisfies the NEPA requirement for a "no action" alternative. It describes our current hunt program, and serves as a baseline for comparing and contrasting the other alternatives and how well each meets the purpose of and need for a hunt program that is consistent with the CCP.

- Alternative B—Service-preferred Alternative. This alternative would expand the hunt program by providing additional opportunities for white-tailed deer (*Odocoileus virginianus*), waterfowl, and youth and fall turkey (*Meleagris gallopavo*) hunting. Alternative B is our preferred alternative and the action that we recommend for final selection.

- Alternative C—Spring Turkey Hunt. This alternative would include the hunt expansions described under alternative B and further expand the hunt program by administering a spring turkey hunt.

These alternatives reflect management approaches based on existing wildlife populations, Federal, State, and refuge regulations, the refuge's purposes, endangered species concerns,

Service policies and guidance, and safety considerations. We believe these three alternatives represent a reasonable range as required by the NEPA.

B. Description of Alternatives

1. Actions Common to all Alternatives

Hunting on the refuge would be conducted within the framework of applicable Federal and State laws and regulations, as well as refuge regulations to ensure safety, practice sound management, comply with legal mandates, ensure compatibility with the purposes for which the refuge was established, and provide a quality hunting experience.

2. Alternative A—Current Management

Hunting has been authorized on the refuge since 1957. Current hunting activities and methods permitted on the refuge were initially established in 1989 through a refuge hunting plan (USFWS 1989). Refuge staff complete a new annual hunt plan each year detailing specifics for that year's hunt program.

Under this alternative, the refuge would continue to offer deer and waterfowl hunting. Participants must have a valid NYS hunting license and follow NYS laws and NYSDEC regulations including discharge, possession limits, manner of taking, tagging, reporting, etc.

Since hunting was first opened at Montezuma NWR, the refuge has managed the hunt program through a hunt permit system administered at a hunter check station (per 605 FW 2.7). The check station provides many benefits to the hunt program. The close contact with hunters has allowed the refuge to collect biological information such as the gathering of harvest data and the collection of samples for disease monitoring, such as avian influenza, in recent years. In addition, the permit system provides for a higher quality hunt by limiting the number of hunters per 605 FW 1.6. The close contact that refuge staff has with hunters provides for outreach opportunities, so hunters are more aware of applicable regulations minimizing unintentional violations.

Refuge-specific hunting regulations for each hunt category are listed below.

Deer Hunting:
Under alternative A, the following current regulations would continue:

1) Deer hunting on the refuge would continue to begin on November 1, after the mid-October opener of the NYS seasons and ends when the NYS seasons end.

2) The refuge would continue to be open to all seasons offered in New York, which include early archery, firearms, and late archery/muzzleloader. Permitted hunting implements follow State regulations.

3) For all deer hunting seasons, permits and parking passes would continue to be required and could be picked up daily at the refuge's hunter check station, located at 1095 Route 89, Seneca Falls, New York.

4) Hunters would continue to be required to carry their refuge hunt permit on their person.

Parking passes would need to be displayed on vehicle dashboards when hunters are afield. Permits and parking passes would continue to be available at the Route 89 check station from refuge personnel or on a self-service basis from the permit box. Permits are a different color each day.

5) For all deer hunting seasons, we would continue to not allow advanced scouting, and boats or canoes would continue to not be allowed on refuge waters.

6) Hunters would continue to be required to remove tree stands at the end of each hunt day. Screw-in tree steps would continue to be prohibited.

7) For the firearms, or regular season, hunters would continue to be required to wear at least 400 square inches (2,600 square centimeters) of solid blaze orange on the head, chest and back (minimum of a hat and vest). Camouflage orange or red would not be permitted.

8) Sunday deer hunting would continue to be prohibited.

9) The Wildlife Drive, Main Pool, and Tschache Pool would continue to be closed to deer hunting. Seneca Trail would also be closed to deer hunting unless the refuge manager specifically opens it (see map E.2 for hunting areas under alternative A).

Waterfowl Hunting:

1) Hunting of waterfowl would continue to be allowed, at the refuge manager's discretion, on designated areas of the refuge in accordance with State regulations (see map E.2). The refuge would continue to be open for waterfowl hunting on Tuesday, Thursday, and Saturday mornings until noon during the first split of the State's regular waterfowl season (generally late October to early December).

2) The refuge would continue to participate in the NYS Youth Waterfowl Hunt Program by offering a Youth Waterfowl Identification Course, as well as by hosting a youth waterfowl hunt on Tschache Pool on the Saturday of the State's Youth Waterfowl Hunt weekend.

3) Boats would continue to be required while hunting on designated refuge impoundments. We would continue to limit boats to one boat per reservation. Motors on boats would continue to be prohibited. Hunters would continue to be allowed to select where to hunt within the designated hunting area once they are on the water. Parking sites would continue to be selected by the hunter when placing their reservation.

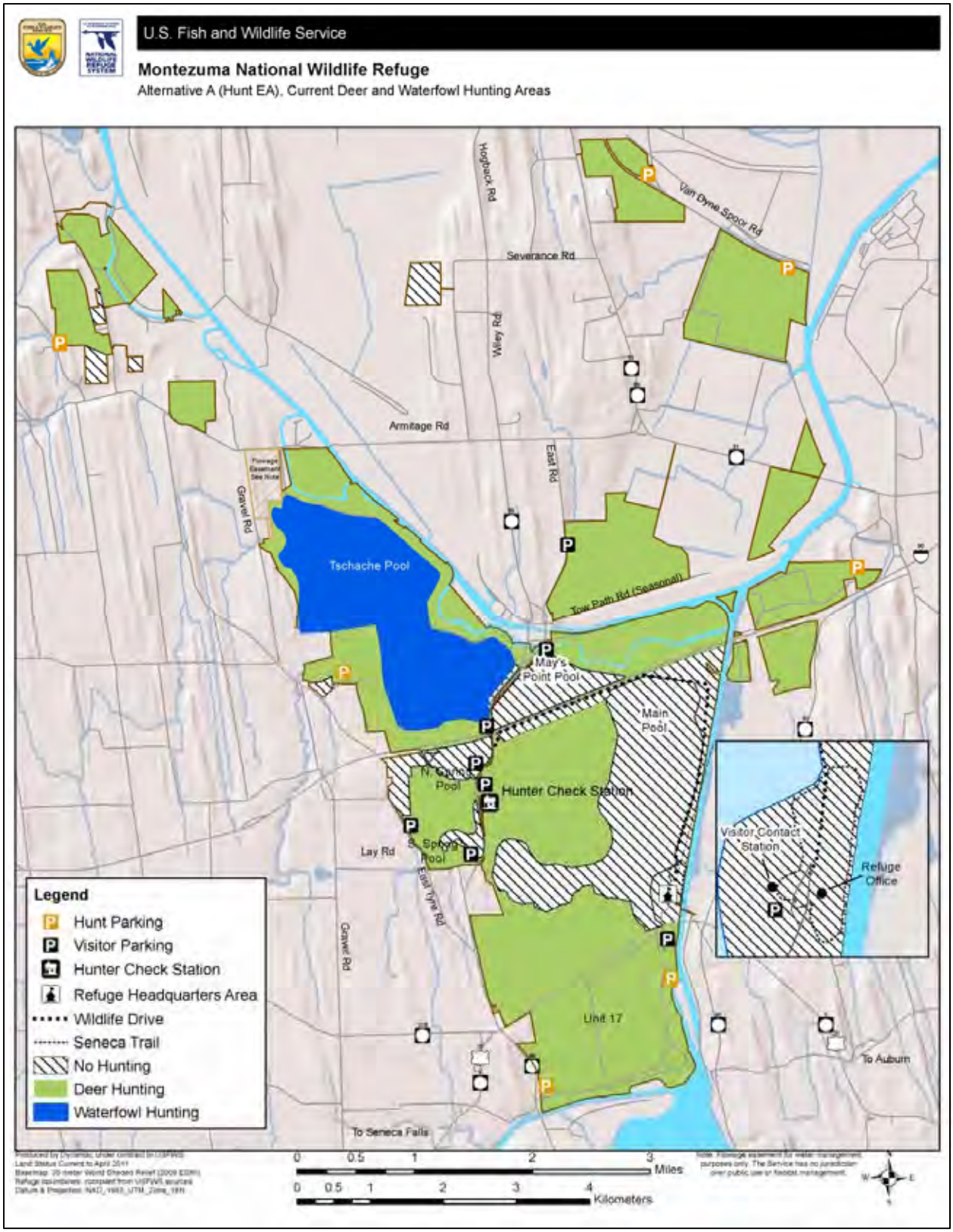
4) Hunting would continue to be by permit only via reservation system. There would continue to be a limit of 20 reservations per day with a maximum of two people per reservation. All reservations would continue to be first-come, first-served. Persons with a reservation may bring one companion. Hunters would continue to reserve the parking area of their choice when making their hunt reservation.

5) All hunters with reservations (and their companions) would be required to check in at least 1 hour before legal shooting time (currently legal shooting time is 0.5 hours before sunrise; so check-in would be required by 1.5 hours before sunrise). If hunters do not check in at least one hour before legal shooting time, their reservation could be forfeited. Check-in would continue to be at the hunter check station on Route 89. Hunt permits would continue to cost $10 per reservation.

6) All waterfowl hunters would continue to be required to successfully complete the NYS Waterfowl Identification Course, the Montezuma Nonresident Waterfowl Identification Course, or a suitable nonresident State Waterfowl Identification Course to hunt on the refuge. Hunters would continue to be required to show proof of waterfowl identification course completion each time they hunt.

While not under the Service's jurisdiction, we expect the Seneca and Clyde Rivers adjacent to the refuge would continue to be closed to waterfowl hunting. These areas have been closed to hunting since 1957. Although these waters are managed by the NYS Canal Corporation, they were closed per the request of the refuge. At that time, there were safety and access issues with hunters. This area has remained closed to provide a buffer around the refuge and preclude trespass of waterfowl hunters on portions of the river within or near the refuge.

Canada Goose (Branta canadensis*) Hunting:*
Waterfowl hunters would continue to be allowed to take Canada geese during the first split of the State's regular waterfowl season. All Federal, State, and refuge regulations would continue to apply.



Map E.2. Hunting Areas on Montezuma NWR for Alternative A, Current Management

3. Alternative B—Service-preferred Alternative

Under this alternative, the refuge would expand the current hunt program in several ways. Hunting would continue to occur per Federal and State regulations, with some minor exceptions related to managing a quality hunt. The hunt program would apply to lands now a part of the refuge and lands added to the refuge in the future.

Deer Hunting:

Under alternative B, the refuge deer hunt program would be the same as alternative A except for the following changes (see map E.3 for proposed hunt areas):

1) Except for Esker Brook Trail area, the refuge archery season would open with the State season (usually mid-October), rather than waiting until November 1. Esker Brook Trail area would continue to open November 1 to minimize conflicts with other users.

2) Sunday hunting would be allowed for all deer hunt seasons.

3) The upland areas adjacent to the Wildlife Drive would be open to hunters beginning December 1.

4) Seneca Trail area would be open for the late archery season every year (usually mid to late December for about 9 days).

5) The Main Pool and Tschache Pool, when frozen, would be open to deer hunting.

6) When deer densities are high, the refuge would work with the NYSDEC Deer Management Assistance Program (DMAP) to maximize the harvest of female deer. An "earn a buck" or similar incentive program may be implemented if harvested sex ratios do not meet our objectives under voluntary incentives. Additional antlerless tags, up to the maximum allowed by State regulations, would be supplied to hunters by the refuge.

7) Increase the number of hunters allowed to use firearms on the refuge from 150 to 175, based on the following formula: TPI = (TRA)/50 where,
   TPI = Total Permits Issued
   TRA = Total Refuge Acreage
   50 = constant (approximately 50 acres per hunter for firearms)
   This number may change as additional acreage is added to refuge ownership.

8) We would work with the NYSDEC to promote hunter education programs and disseminate outreach materials related to current and future NYSDEC programs (e.g., benefits of nontoxic ammunition).

9) If the NYSDEC designates a Youth Deer Hunt, we would open portions of the refuge to youth deer hunting and implement a youth deer hunt program.

10) We would increase the number of universal access points on the refuge. We would enlist deer hunters as volunteers to help build and maintain universal access areas.

Waterfowl Hunting – Regular Season:
Under alternative B, the refuge regular waterfowl hunt program would be the same as alternative A except for the following (see map E.4 for proposed hunt areas):

1) As long as the migratory game bird season dates for the NYSDEC Western Zone remain the same (i.e., late October through the beginning of December for the first split and late December through the beginning of January for the late split), waterfowl hunting would be permitted on designated areas of the refuge during the first split on Tuesdays, Thursdays, and Saturdays only. If the Western Zone season dates change dramatically, then the refuge manager would determine when the refuge would be open in accordance with Federal and State regulations.

2) Portions of the northeast section of the refuge would be opened annually at the refuge manager's discretion during the first split on Tuesdays, Thursdays, and Saturdays only or at the refuge manager's discretion if the season dates change. Additional areas that may be opened to the regular waterfowl hunt season correspond to those that would be opened to the late snow goose seasons and the resident Canada and late snow goose seasons (see map E.4). Opening these additional areas to hunting would occur only when the refuge manager determines there is sufficient quality habitat available that can be accessed by hunters on foot or by boat without disturbing sensitive species or conflicting with other priority public uses.

3) Newly acquired lands, where approved by the refuge manager, also may be opened to waterfowl hunting. Opening these areas would be subject to the same criteria as those listed above.

*Canada and Snow Goose (*Chen caerulescens*) Hunting:*
Under alternative B, the refuge Canada and snow goose hunt program would be the same as alternative A except for the following:

1) Some refuge grasslands would be opened for the "early" or "resident" Canada goose hunting season (generally September 1 through 25, see map E.4).

2) We would coordinate with farmers in the refuge's cooperative farming program to open designated areas for the "early" or "resident" Canada goose hunting season (generally September 1 through 25, see map E.4).

3) Portions of the Main Muck would be open for snow goose hunting during the late snow goose hunting season (generally late January to the beginning of March) and the expanded Light Goose Conservation Order (generally the beginning of March through mid-April; see map E.4). These hunts would be regulated differently than the regular waterfowl season as follows:
    a. Hunting would be permitted 7 days per week.
    b. There would be no reservation system.
    c. There would be no fee for a hunt permit.

d. There would be no limit to the number of shot shells per hunter.
e. Hunters would have the option to hunt at any time during legal shooting hours.
f. Successful completion of a waterfowl identification course would not be required.

As with other refuge hunts, all State and Federal regulations apply. Per current State regulations, use of recorded or electrically amplified calls or sounds is allowed and use of shotguns capable of holding more than three shells is allowed during the Conservation Order (generally mid-March to mid-April). All other stipulations of alternative A would apply, including the requirement for hunters to check-in at the Hunter Check Station on Route 89.

Turkey Hunting:
Prior to opening the refuge to turkey hunting, an information meeting, Web site information, handouts, and press releases would be developed to inform the public about the turkey hunt, NYSDEC regulations, special refuge regulations, and hunting on refuges. Refuge turkey hunting maps and regulations would be posted on the refuge's Web site, and mailed or emailed upon request. All information related to hunting on the refuge would be posted at the refuge's hunter check station prior to the seasons' openings.

Youth Turkey Hunting

1) During the NYS youth turkey hunt (usually in late April), young hunters would be permitted to hunt turkeys according to State regulations in designated areas of the refuge (see map E.5). Hunting would not be permitted in areas closed to hunting to protect facilities and structures, certain habitats, and select public use areas.

2) Daily permits would be required. The number of daily permits would be set by the refuge manager each year based on available hunting area(s), maximizing hunt opportunities, providing for a quality hunt experience, public demand, minimizing disturbance to sensitive wildlife and plant species, balancing other public use demands, and the administrative work load. Under current conditions, we would permit 14 hunt groups (mentor and youth(s)) per day, based on the above criteria.

3) Participants would be required to make a reservation.

4) There would be no hunt fee.

5) Hunting season dates, hours, weapon restrictions, bag limits, etc. would follow Federal and State regulations. However, the refuge manager reserves the right to restrict hunt season dates and bag limits in the future, as needed, to achieve various refuge management goals.

6) Every year, implementing the refuge's youth turkey hunt would depend on a commitment from partners to mentor youth hunters. We would work with partners to recruit and sign up youth hunters and their mentors for this hunt.

7) Youth hunters and their mentors may be required to attend an orientation program

conducted by the refuge, in cooperation with partners. The orientation would include hunter safety, turkey calling, equipment, ethics, and sportsmanship, conservation and information about the refuge system, and other topics relevant to the hunt, Service, or refuge resources.

Fall Turkey Hunting

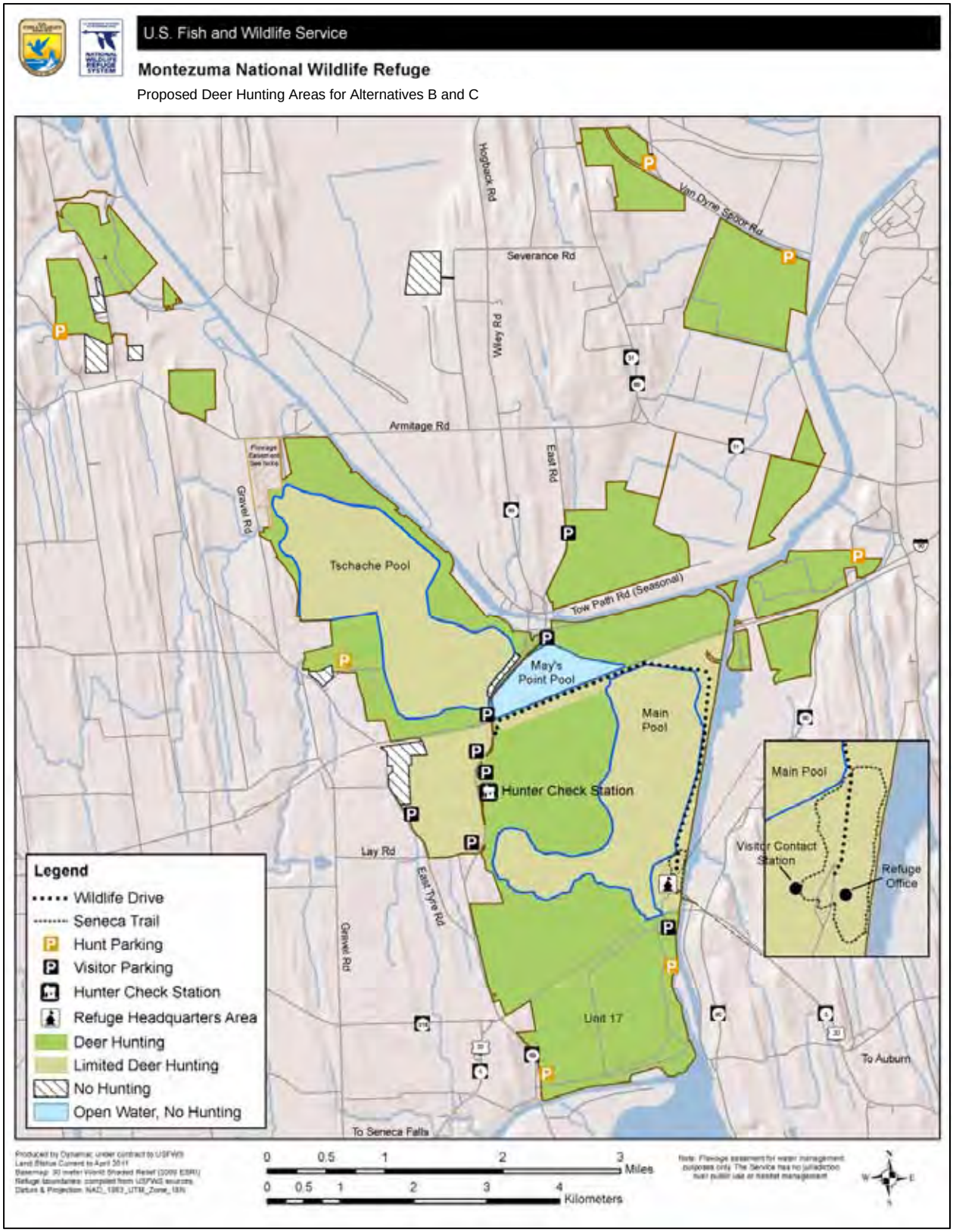
1) Fall turkey hunting would be permitted in areas open to deer hunting. The Wildlife Drive would not be open to turkey hunting because fall turkey season usually ends in November, before the Wildlife Drive opens to hunting. The Wildlife Drive would be open to fall turkey hunting if the State extends the turkey season into December. See map E.5 for designated hunting areas.

2) Daily permits would be required. The number of daily permits would be set by the refuge manager each year based on available hunting area(s), maximizing hunt opportunities, providing for a quality hunt experience, public demand, minimizing disturbance to sensitive wildlife and plant species, balancing other public use demands, and the administrative work load. Under current conditions, we would allow 40 permits per day, based on the above criteria.

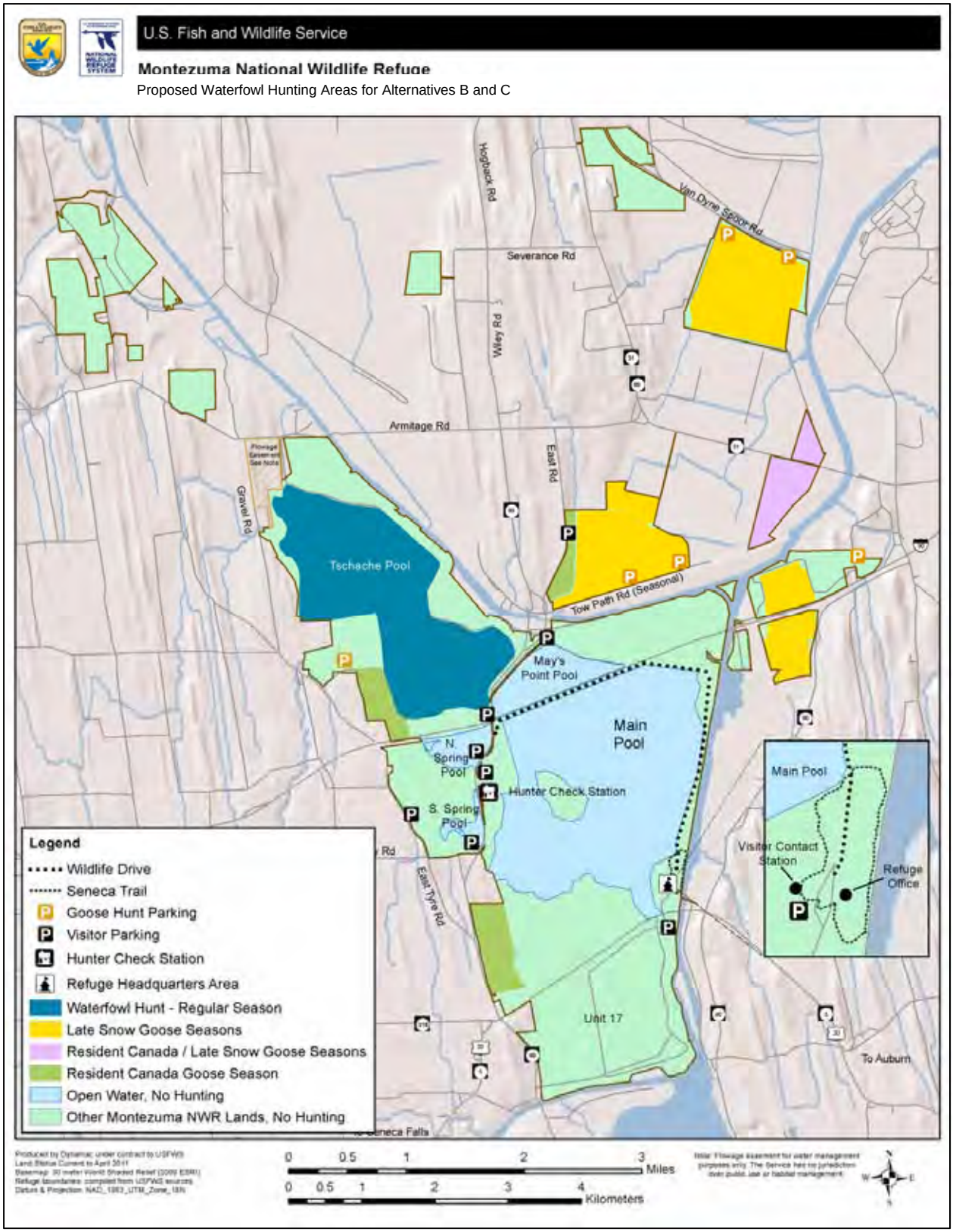
3) There would be no reservation system. Permits would be available on a first-come, first-served basis each hunt day until the day's permits are all taken.

4) There would be no hunt fee.

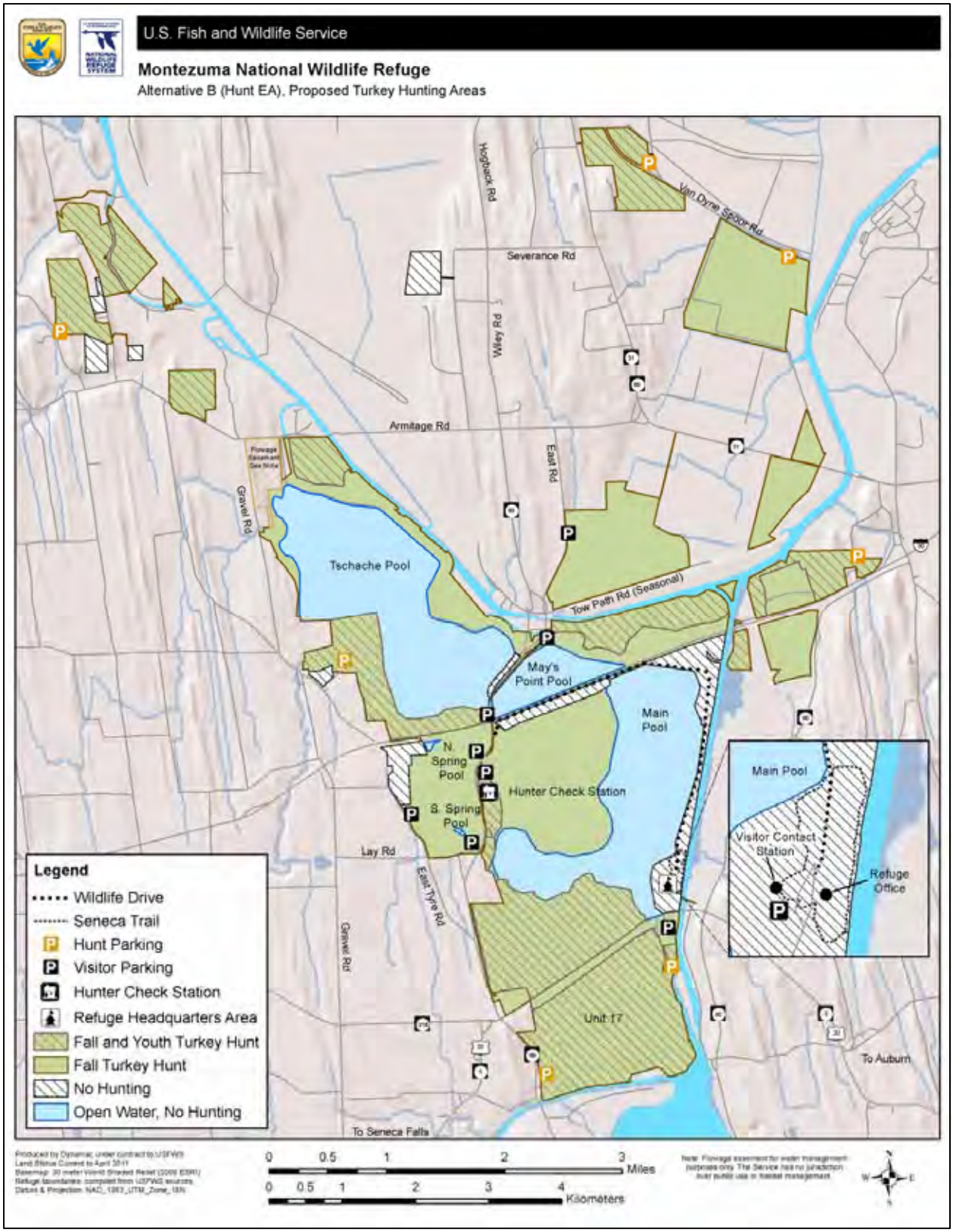
5) Hunting season dates, hours, weapon restrictions, bag limits, etc. would follow refuge and State regulations. The refuge manager reserves the right to restrict hunt season dates and bag limits in the future, as needed, to achieve various refuge management goals.



Map E.3. Proposed Deer Hunting Areas on Montezuma NWR for Alternatives B and C.



Map E.4. Proposed Waterfowl Hunting Areas on Montezuma NWR for Alternatives B and C.



Map E.5. Proposed Turkey Hunting Areas at Montezuma NWR for Alternative B, Service-preferred Alternative.

4. Alternative C—Spring Turkey Hunt: Expand current waterfowl and deer hunting opportunities and administer youth, spring and fall turkey hunts

Under this alternative, the expanded hunts proposed in alternative B would be implemented. In addition, parts of the refuge would be open to spring turkey hunting according to NYS regulations. As with alternative B, the hunt program would apply to current refuge lands and properties acquired in the future.

Spring Turkey Hunting:

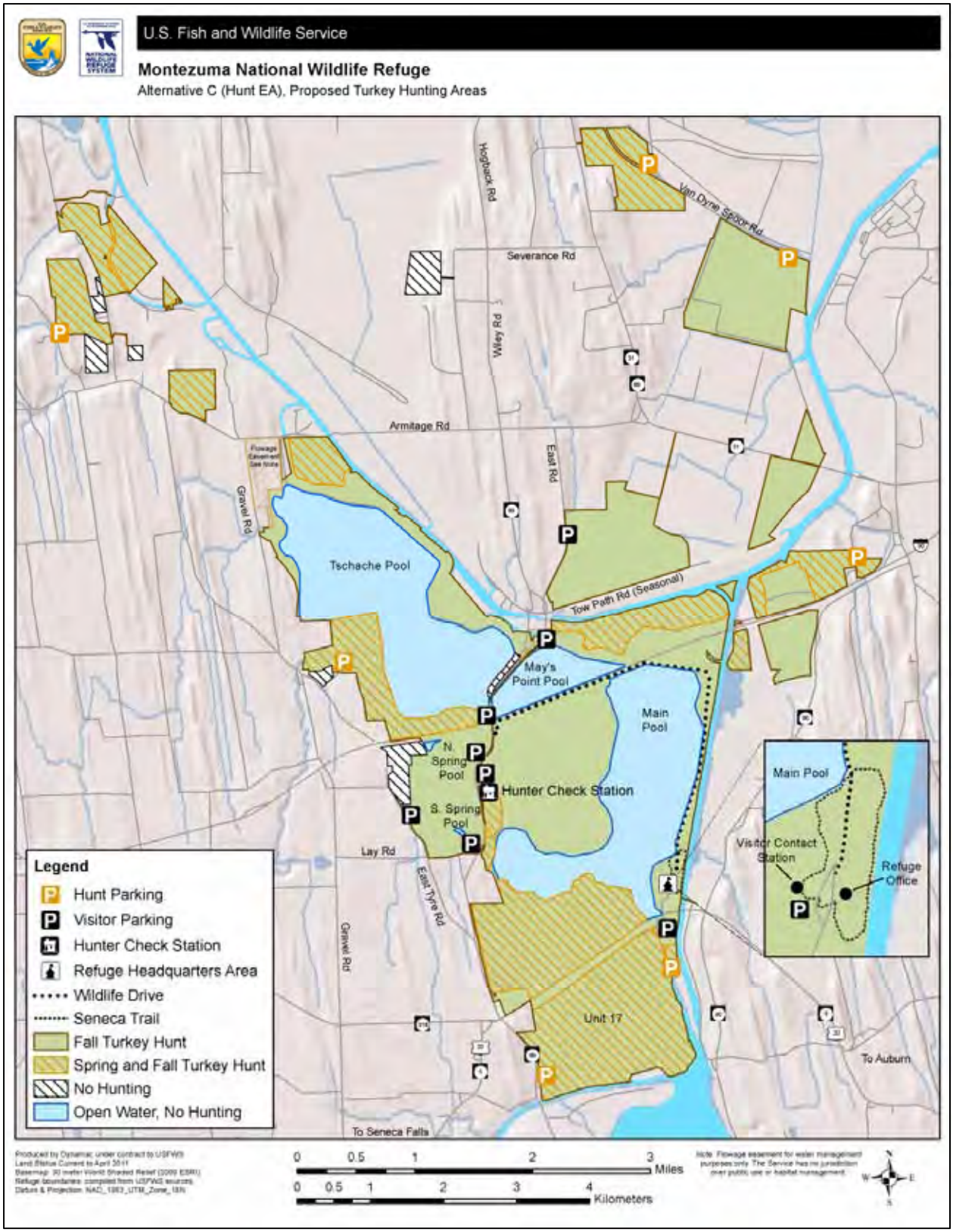
1) Turkey hunting would be permitted in designated areas of the refuge except areas closed to hunting to protect facilities and structures, certain habitats, and select public use areas. See map E.6 for designated hunting areas.

2) Daily permits would be required. The number of daily permits would be set by the refuge manager each year based on available hunting area(s), maximizing hunt opportunities, providing for a quality hunt experience, public demand, minimizing disturbance to sensitive wildlife and plant species, balancing other public use demands, and the administrative work load. It would match the number of permits issued for the youth hunt, which would currently be 14 hunt groups per day, based on the above criteria.

3) There would be no reservation system. Permits would be available on a first-come, first-served basis each hunt day until the day's permits are all taken.

4) There would be no hunt fee.

5) Hunting season dates, hours, weapon restrictions, bag limits, etc. would follow refuge and State regulations. The refuge manager reserves the right to restrict hunt season dates and bag limits in the future, as needed, to achieve various refuge management goals.



Map E.6. Proposed Turkey Hunting Areas on Montezuma NWR for Alternative C, Spring Turkey Hunt.

V. Affected Environment

The physical environment of the Montezuma NWR has been fully described in the refuge's Habitat Management Plan (USFWS 2008), as well as the Montezuma NWR Draft Comprehensive Conservation Plan and Environmental Assessment (draft CCP/EA) (USFWS 2012). These descriptions are incorporated by reference, with the affected resource areas summarized here. There are many resources of concern on the refuge, including federally listed, threatened and endangered species, State-listed threatened and endangered species, species of concern, and significant ecological communities. For a list of the refuge's resources of concern, please see appendix A of the draft CCP/EA (USFWS 2012).

The scope of the affected environment analyses and discussion is limited to resident wildlife, migratory birds, federally listed, endangered species, socioeconomic resources, other refuge wildlife-dependent recreation, refuge facilities, cultural resources, refuge environment, and the local community. All of these resources were determined to be potentially impacted positively or negatively by a hunting program.

A. Resident Wildlife

1. Mammals

The refuge supports a diversity of mammal species that contribute to the ecological, economic and aesthetic value of the refuge. A total of 43 species of mammals have been recorded on the refuge for at least a portion of the year. The most commonly observed mammal species include eastern cottontail (*Sylvilagus floridanus*), woodchuck (*Marmota monax*), gray squirrel (*Sciurus carolinensis*), white-tailed deer (*Odocoileus virginianus*), and numerous furbearers.

Eastern cottontail rabbits utilize agricultural fields, grasslands and scrub-shrub habitats. Although formal surveys have not been performed, the population status of eastern cottontail appears to be healthy.

Woodchucks are commonly seen around central New York in old farm fields and other tall grass areas. With minimal woodchuck habitat on the refuge, populations appear to be healthy.

Gray squirrels are present at Montezuma NWR, but they are likely uncommon due to the low abundance of oak and hickory trees. No recent population studies on gray squirrels have been conducted on the refuge.

White-tailed deer are an edge specialist, thriving on habitat that contains grassland, agricultural fields, and wooded cover in close proximity. The refuge provides ample habitat for deer. Approximately 220,000 deer are harvested from the State of New York each year (NYSDEC 2011a) however live populations are difficult to estimate accurately. It is evident that the population is large due to the negative effect the deer exhibit on refuge habitat (i.e., browse damage on herbaceous and woody plants) (Rawinski 2010 personal communication). Further, recent trends (1991 to 2006) have demonstrated that deer hunters in the State of New York are

declining (Aiken 2010). The number of refuge archery hunt visits follows this trend; whereas gun hunt visits on the refuge are increasing.

Furbearers on the refuge include muskrat (*Ondatra zibethicus*), American beaver (*Castor canadensis*), American mink (*Neovison vison*), striped skunk (*Mephitis mephitis*), weasel (*Mustela* sp.), raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana*), red and gray fox (*Vulpes vulpes* and *Urocyon cinereoargenteus*), and coyote (*Canis latrans*). These species are all managed through the refuge's Trapping Program. Healthy populations of these species exist at the refuge as well as throughout the northeastern U.S. and Canada (NFRTC 2000). In addition, river otter (*Lontra canadensis*) are present on the refuge with a growing population as a result of restoration efforts throughout western New York. They are a protected species due to their relatively low numbers.

The importance of flooded forests and emergent wetlands on the refuge as summer bat habitat has been recently documented through acoustic surveys in cooperation with NYSDEC. Preliminary results suggest exceptionally high concentrations of big brown bats (*Eptesicus fuscus*) along the Main Pool and tri-colored bats (*Perimyotis subflavus*) throughout the complex. Other species detected include: silver-haired bat (*Lasionycteris noctivagans),* eastern red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), and little brown bat (*Myotis lucifugus***)**.

2. Reptiles and Amphibians

Sleggs (1997) conducted a baseline inventory of reptiles and amphibians on the refuge in 1995 and 1996 using various methods including evening audio surveys for frogs and toads, visual encounter surveys, and live-trapping using pitfalls, drift fences, funnel traps, minnow traps, and aquatic hoop traps. Frogs and toads recorded during this survey include American toad (*Bufo americanus*), gray treefrog (*Hyla versicolor* and *H. chrysoscelis*), spring peeper (*Pseudacris crucifer*), western chorus frog (*Pseudacris triseriata triseriata*), bullfrog (*Rana catesbeiana*), green frog (*Rana clamitans melanota*), wood frog (*Rana sylvatica*), and northern leopard frog (*Rana pipiens*). Salamanders included mudpuppy (*Necturuns maculosus*), blue spotted/Jefferson salamander (*Ambystoma laterale* and *Ambystoma jeffersonianum*), and northern two-lined salamander (*Eurycea bislineata*). Spotted salamanders (*Ambystoma maculatum*) also have been documented. Turtles observed during the survey included snapping turtle (*Chelydra serpentine*), common musk turtle (*Sternotherus odoratus*), midland and eastern painted turtles (*Chrysemys picta marginata* and *C. picta picta*). Documented snakes include northern water snake (*Nerodia sipedon sipedon*), northern brown snake (*Storeria dekayi dekayi*), and eastern garter snake (*Thamnophis sirtalis sirtalis*). The refuge has potential habitat for a number of other reptile and amphibian species including eastern newt (*Notophthalmus viridescens*), northern dusky salamander (*Desmognathus fuscus*), Allegheny mountain dusky salamander (*D. ochrophaeus*), four-toed salamander (*Hemidactylium scutatum*), eastern red-backed salamander (*Plethodon cinereus*), pickerel frog (*Rana palustris*), spotted turtle (*Clemmys guttata*), wood turtle (*Glyptemys insculpta*), milksnake (*Lampropeltis triangulum*), eastern ribbon snake (*Thamnophis sauritus*), and smooth greensnake (*Liochlorophis vernalis*) (Gibbs et al. 2007).

3. Turkey

Historically, turkeys were abundant in NYS during the 1600s. However, uncontrolled hunting and deforestation resulted in their population crash (Roberts et al. 2011). They were reestablished in New York by 1957, but occupied only the extreme southwest portion of the

State. At this same time, the NYSDEC live trapped and transferred turkeys to areas of the State that were capable of sustaining a population. Numbers have increased dramatically from an estimated 2,000 in 1959 to over 65,000 in 1990 (Roberts et al. 2011).

No recent population studies have been conducted on the refuge. Wetland habitats comprise 88 percent of refuge lands. Oak mast is the most important fall and winter food for turkeys (Dickson 1990); however, oak trees are not common at the refuge. Although turkeys are present, sightings on refuge property are infrequent. Turkeys are spotted regularly on adjacent uplands due to the large amount of agricultural cropland on which they thrive.

B. Migratory Species

1. Waterfowl (Ducks and Geese)

The Montezuma NWR supports one of the largest migratory concentrations of waterfowl in the Northeast. On the refuge, impoundments are managed to provide optimal habitat for migrating waterfowl. During fall migration, waterfowl require large amounts of carbohydrate-rich foods to aid their migration and build up their energy reserves. The refuge periodically drains impoundments in the spring to promote the growth of moist-soil vegetation; seeds of these plants provide a readily available source of carbohydrates. In advance of fall migration, wetlands that have been drawn down are reflooded in preparation for the arrival of waterfowl.

Spring migrant waterfowl require large amounts of protein-rich foods to prepare them for the remainder of their northward migration. Invertebrate populations thrive on the residual annual vegetation resulting from the previous year's drawdown, and they emerge as soon as temperatures rise sufficiently to melt the ice. Additionally, this protein-rich diet is supplemented by carbohydrate-rich seeds produced by annual plants during previous years which are still available the following spring to northward migrating waterfowl.

New York is situated within the Atlantic Flyway which had an estimated population of over one million resident Canada geese in 2009 (USFWS 2009). These geese take up residence on or near the refuge year round. A September hunt was developed in New York to aid in controlling the population of these resident populations.

2. Shorebirds

The Montezuma Marsh basin was historically the most significant migratory stopover site for shorebirds in upstate New York and is still considered one of the most important inland shorebird sites in the Northeast (Rosenberg 2011 personal communication). On the refuge, water levels on various impoundments are managed seasonally to provide exposed mudflats for foraging shorebirds.

Volunteers conducted weekly shorebird surveys on Montezuma NWR throughout the year in 2010. They detected 19 species and two peaks in abundance with almost 1,000 shorebirds detected in mid-August and again in mid-September. The most common species were least sandpiper (*Calidris minutilla*) and semipalmated sandpiper (*C. pusilla*).

3. Marsh and Wading Birds

Emergent marsh impoundments on the refuge support a diversity of marsh nesting birds. Callback surveys conducted during 2009 and 2010 confirmed breeding by American bittern (*Botaurus lentiginosus*), least bittern (*Ixobryshus exilis*), pied-billed grebe (*Podilymbus podiceps*), Virginia rail (*Rallus limicola*), sora (*Porzana carolina*), American coot (*Fulica americana*), and common moorhen (*Gallinula chloropus*).

Black terns (*Chlidonias niger*) produced approximately 500 young on the refuge in 1958. By the early 1990s, there were none nesting on the refuge, most likely due to the purple loosestrife (*Lythrum salicaria*) invasion and declining black tern populations regionwide, also due to habitat loss (USFWS 2008). By 1998, black terns were nesting on the refuge again in low numbers. In 2009, 22 nesting pairs were observed on Tschache Pool.

A nesting colony of great blue herons (*Ardea herodias*) has been present on the refuge many years throughout the history of the refuge. Nest colonies move, and the rookeries have been in various locations on the refuge, including Maple Island, Tschache Pool, and Unit 17 East.

Black-crowned night-herons form nesting colonies on the refuge intermittently. They have nested on Maple Island and in cattails in the Main Pool, and in 2011, a colony was observed in the Sandhill Crane Unit.

In the U.S., by the 1930s, the sandhill crane (*Grus canadensis*) population was nearly decimated across its range (USFWS 2008). Today the population has recovered to 650,000 birds. Sandhill cranes were first observed in the MWC during spring migration in 1999. In 2003, a few cranes were observed during migration and the first confirmed breeding occurred. A pair with young was observed again in the 2004 through 2010 breeding seasons. A pair of sandhill cranes bred on the refuge for the first time in 2011.

4. Land Birds

Many species of land birds find refuge in the different habitats Montezuma NWR offers. The following species of concern have been detected on the refuge: osprey (*Pandion haliaetus*), bald eagle (*Haliaeetus leucocephalus*), northern harrier (*Circus cyaneus*), peregrine falcon (*Falco peregrines*), sharp-shinned hawk (*Accipiter striatus*), short-eared owl (*Asio flammeus*), common nighthawk (*Chordeiles minor*), chimney swift (*Chaetura pelagic*), northern flicker (*Colaptes auratus*), horned lark (*Eremophila alpestris*), willow flycatcher (*Empidonax traillii*), wood thrush (*Hylocichla mustelina*), brown thrasher (*Toxostoma rugum*), blue-winged warbler (*Vermivora pinus*), cerulean warbler (*Dendroica cerulean*), prothonotary warbler (*Protonotaria citrea*), scarlet tanager (*Piranga olivacea*), rose-breasted grosbeak (*Pheucticus ludovicianus*), field sparrow (*Spizella pusilla*), bobolink (*Dolichonyx oryzivorus*), eastern meadowlark (*Sturnella neglecta*), rusty blackbird (*Euphagus carolinus*), and Baltimore oriole (*Icterus galbula*).

Within the last 2 to 3 years, NYSDEC and the Service have been conducting winter raptor surveys. Many raptors have been identified on the refuge including two State-listed species, the short-eared owl and northern harrier. They were found to be using grasslands and marshes on the refuge and in the MWC. Recent radio telemetry records of a short-eared owl show use of the refuge's Main Pool.

According to a 1995 breeding bird survey, the 10 most frequently recorded species were song sparrow (*Melospiza melodia*), American robin (*Turdus migratorius*), yellow warbler (*Dendroica petechia*), common yellowthroat (*Geothlypis trichas*), red-winged blackbird (*Agelaius phoeniceus*), eastern wood-pewee (*Contopus virens*), brown-headed cowbird (*Molothrus ater*), swamp sparrow (*Melospiza georgiana*), veery (*Catharus fuscescens*), and wood thrush (*Hylocichla mustelina*).

The MWC is one of four sites in New York with exceptional numbers of cerulean warblers recorded during the Cerulean Warbler Atlas Project (Rosenberg et al. 2000). This warbler is among the highest priority landbirds for conservation in the U.S. based on a small total population size and a significant decline in Breeding Bird Survey trend throughout its range (-4.2 percent per year since 1966) (Rosenberg et al. 2000). On the MWC, the cerulean warbler occurs in forested wetlands. Despite the extensive agricultural landscape, the MWC supports the second highest concentration of ceruleans in New York.

Prior to the 1950s more than 70 pairs of bald eagles nested in NYS, by the 1960s only one active nest remained. In the 1970s NYSDEC, in cooperation with the Service, led the national recovery of the bald eagle. From 1976 to 1980, 23 young eagles were released at Montezuma NWR. The first wild pair of eagles nested again at Montezuma NWR in 1987, after a 30-year absence. Adult and immature eagles use the refuge throughout the year. While the Main Pool was draining to encourage vegetative growth in 2007, 59 bald eagles were counted on one early June morning.

C. Federally Listed Species

Two federally listed species, the endangered Indiana bat (*Myotis sodalis*) and the threatened bog turtle (*Clemmys muhlenbergii*), are found on or near the refuge. The Indiana bat has been found on Howland's Island on the NYSDEC Northern Montezuma Wildlife Management Area and likely occurs on the refuge. Indiana bats roost under the peeling bark of dead and dying trees in wooded or semi-wooded areas during summer. Roost trees are likely to be exposed to direct sunlight throughout the day, and are commonly found in upland habitats or in floodplain forests.

The bog turtle is known to occur in the three counties that intersect on the refuge. However, the New York Natural Heritage Program determined that habitat for this species does not currently exist on the refuge (Sechler 2008).

D. Socioeconomic Setting

In the largely rural setting surrounding the refuge, hunting has always been a traditional recreational activity. During the 1980s and 1990s, hunting decreased in many states, including New York, with the overall number of hunters in the U.S. decreasing and not keeping pace with population growth.

Although the population of New York grew by approximately 8 percent between 1990 and 2009, the counties surrounding the Montezuma NWR had relatively slow population growth or their population declined over a similar timeframe. In terms of economic activity, the three counties

are very similar. The major industries are education, healthcare, and manufacturing, accounting for at least 20 percent of the jobs in each county (U.S. Census Bureau 2010).

Land use in the tri-county area is dominated by agriculture. More than 1,010 farms cover over 60 percent of Cayuga County, with approximately 259,300 acres under cultivation (Cayuga County Chamber of Commerce 2010). For Seneca County, in 2003 there were 127,000 acres in farms, 61 percent of the county's total 207,944 acres (Cornell University Cooperative Extension 2010). In 2007, Wayne County had 938 farms on 168,000 acres, or 45 percent of the county's land area (Wayne County Agricultural Development Board 2009).

County-specific data regarding the economics of wildlife-related recreational opportunities were not available during the preparation of this report. However, the Service has prepared several reports (USFWS 2006), which summarize the expenditures associated with various wildlife-related activities. Most participants engaged in wildlife watching (84 percent), followed by fishing (25 percent), and hunting (12 percent). You'll note that the sum of these exceeds 100 percent because many participants engaged in more than one activity.

During 2006, State residents and nonresidents spent $3.5 billion on all types of wildlife recreation in New York. The majority of that total was spent on equipment ($1.6 billion), followed by trip-related expenditures ($1.5 billion), licenses, contributions, land ownership and leasing, and other items ($491 million). Roughly one-third of all people engaged in wildlife activities in New York were nonresidents. Compared to 1996, the number of participants engaged in fishing and hunting declined, as did associated expenditures. During that same 10-year period, wildlife watching increased, but associated expenditures declined. Full reports (1996, 2001, and 2006) can be viewed online at: *http://www.census.gov/prod/www/abs/fishing.html*.

Hunting has an important national and local economic impact. Hunters contribute to the local economy by purchasing gasoline, food, lodging, ammunition, etc. Approximately 566,000 residents and nonresidents participated in hunting in New York in 2006. That group spent more than $715 million on activities and equipment related to hunting (USFWS 2006). With the proposed expansion of the hunt program at Montezuma NWR, it is likely that additional refuge visitors, and refuge visits, would bring more money into the local economy.

E. Other Wildlife Dependent Recreation

The purpose of the Visitor Services Program is to provide opportunities for appropriate and compatible wildlife-dependent recreation that enable the public to enjoy the refuge. The refuge provides wildlife-dependent recreational opportunities while recognizing that wildlife conservation is the first priority of the Refuge System. Per the Refuge Improvement Act, the six priority public uses of the Refuge System are hunting, fishing, wildlife observation and photography, and environmental education and interpretation (*http://www.fws.gov/policy/605fw1.html*). The Service develops wildlife-dependent recreation programs based on the following criteria:

1) Promotes safety of participants, other visitors, and facilities.
2) Promotes compliance with applicable laws and regulations and responsible behavior.

3) Minimizes or eliminates conflict with fish and wildlife population or habitat goals or objectives in an approved plan.
4) Minimizes or eliminates conflicts with other compatible wildlife-dependent recreation.
5) Minimizes conflicts with neighboring landowners.
6) Promotes accessibility and availability to a broad spectrum of the American people.
7) Promotes resource stewardship and conservation.
8) Promotes public understanding and increases public appreciation of America's natural resources and our role in managing and conserving these resources.
9) Provides reliable/reasonable opportunities to experience wildlife.
10) Uses facilities that are accessible to people and blend into the natural setting.
11) Uses visitor satisfaction to help define and evaluate programs.

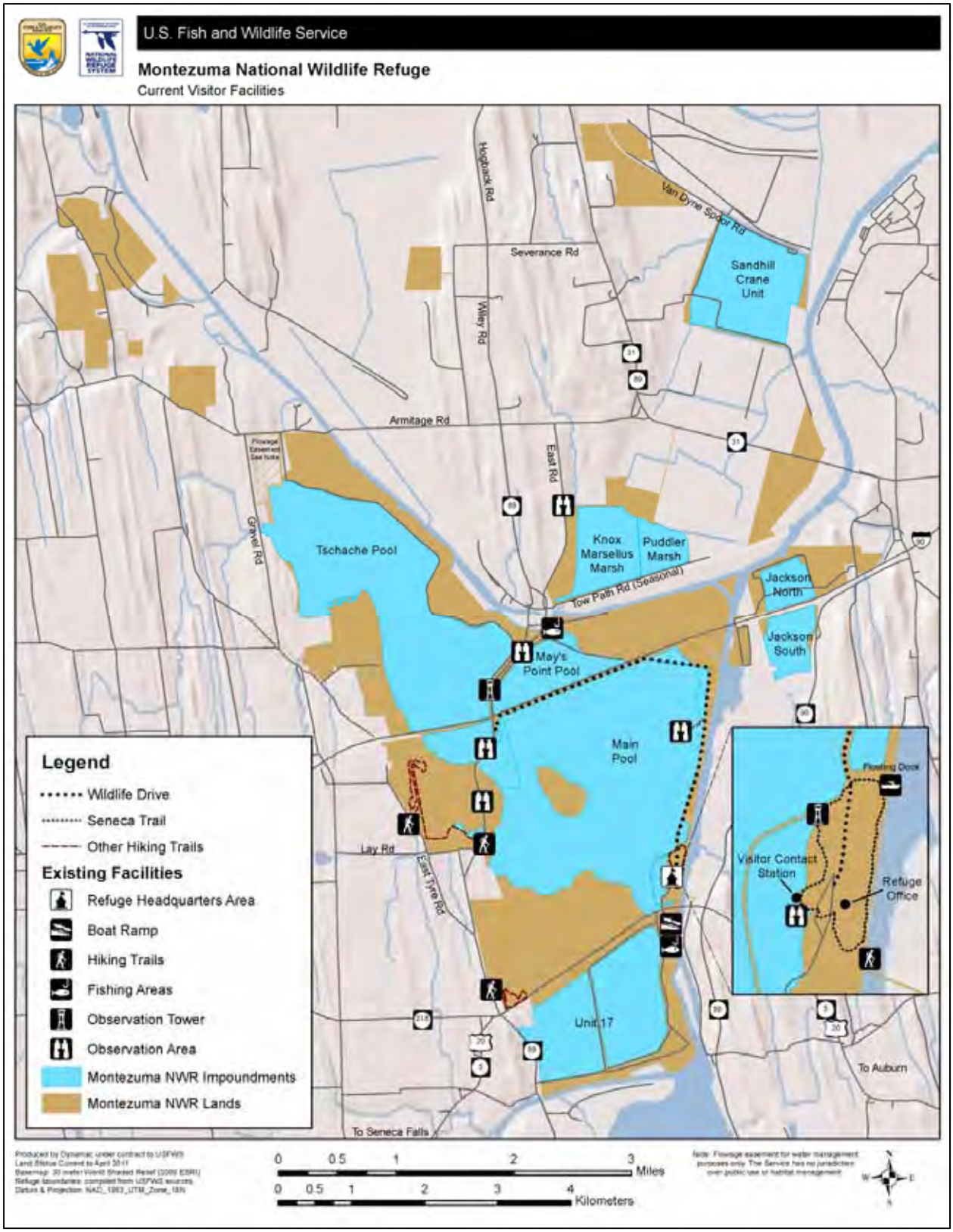
The refuge hosts an average of 143,000 annual visits (5-year average) and facilitates opportunities for all six priority public uses. Map E.7 shows the major public use facilities on the refuge, such as observation towers and trails. Table E.1 shows the estimated number of visits for the six priority public uses that are allowed on the refuge.

Table E.1. Visits[1] to Montezuma National Wildlife Refuge Between 2006 and 2010.

Type of Visit[2]	2006	2007	2008	2009	2010
Visitor Contact Station	11,696	15,525	14,846	15,234	16,938
Waterfowl Hunt	600	563	352	152	355
Big Game Hunt	1,351	1,371	1,909	1,893	1,897
Fishing	4,072	4,224	3,972	3,922	3,937
Wildlife Observation and Photography	112,720	116,600	117,021	127,790	123,404
Environmental Education	524	1,986	854	949	818
Interpretive Program	480	612	922	1,450	702
Special Events	-	480	493	715	1,040
Total	131,443	141,361	140,369	152,105	149,091

[1] A refuge visit is defined as "the entry of one person onto a Refuge System station to engage in one recreational or educational activity. … One visitor could account for several visits" (USFWS 2005a).

[2] Visitor numbers are based on direct counts by refuge staff, volunteers, a traffic counter, and a counter at the visitor contact station. Some estimation and professional judgment are used to determine visits for wildlife observation and photography, interpretation, and fishing using methods in chapter 2 of the National Wildlife Refuge System Visitation Estimation Workbook (USFWS 2005a).



Map E.7. Current Montezuma National Wildlife Refuge Visitor Facilities.

Hunting is just one aspect of a broad education and recreation program on the refuge which strives to increase public awareness of wise wildlife and habitat stewardship. Refuge visitors seek high quality public access and public use opportunities.

1. Wildlife Observation and Photography Opportunities

In 2005, the Northeast Region Visitor Services Review Team identified visitor programs of emphasis for each refuge. Wildlife observation is one of two areas of emphasis for Montezuma NWR. The refuge offers numerous opportunities for wildlife observation and photography, including a Wildlife Drive, photography blind, walking trails, a floating boat dock, and observation areas throughout the refuge. Visitors have the opportunity to view and photograph a variety of habitats and wildlife. In addition, there is currently an annual photography contest coordinated by the Friends of the Montezuma Wetlands Complex (Friends). In the visitor contact station, visitors can view osprey nesting activities via an osprey cam; this is also available during the osprey breeding season, online at: *http://www.friendsofmontezuma.org*.

2. Environmental Education and Interpretation

Environmental interpretation is the second area of emphasis identified for the refuge. Interpretive panels and the complexwide "Guide by Cell" cellphone tour (funded by the Friends), along with the refuge's Wildlife Watching Guide, convey not only orientation information, but also information about the refuge's history and management. Special guest speaker programs are offered every other month as part of the Nature of Montezuma Series, in cooperation with the Montezuma Audubon Center (MAC) and supported by the Friends. Guided interpretive bus tours are given by refuge staff upon request and as part of the Wildflowers and Wine Festival in June and the National Wildlife Refuge Week Celebration in October. An annual guided interpretive walk on International Migratory Bird day highlights refuge work on cerulean warbler habitat. Winter program series, such as the Montezuma Book Club and Eco-Chat, have also been used as platforms for environmental interpretation.

Environmental education is not an area of emphasis for the refuge; with limited staff, the focus is on wildlife observation and environmental interpretation. The visitor services manager (with the help of volunteers) accommodates groups requesting programs when time permits. Other opportunities for visitors to engage in environmental education exist nearby at facilities where the main purpose is environmental education. The MAC is one of those facilities located in the MWC. The visitor services manager works with MAC environmental educators to create programs that include visits to both sites. The Seneca Meadows Environmental Education Center is another facility located just outside of the MWC and is growing in the number and variety of environmental education programs offered.

3. Fishing

Public fishing access is provided at both the May's Point fishing access area and the Seneca River site on Routes 5 and 20, near the refuge headquarters. Both areas follow State seasons and regulations. There is a universally accessible fishing platform at May's Point. Both sites are very popular for anglers.

F. Refuge Facilities

Refuge facilities are spread out in different locations. The refuge headquarters is situated north of State Routes 5 and 20 adjacent to the Seneca River and includes the main office, the visitor contact station, the main shop, storage buildings, a small office locally called the fur house, a public restroom, a viewing platform and tower, as well as a floating dock on the Seneca River. The refuge subheadquarters is located west of the Main Pool along Route 89 and encompasses the hunter check station, a public restroom, a house (quarters) for seasonal employees, and a small garage. There is also a second house (quarters) and garage on the Clyde River just south of the village of Clyde.

The refuge maintains 3.5 miles of paved roads, and approximately 30 miles of unpaved roads, mostly consisting of impoundment dikes. Several miles of dikes and numerous water control structures are maintained. Public use facilities include the visitor contact station, two viewing towers, three viewing platforms, three pulloffs/overlooks, two fishing access sites, two public restrooms, and approximately 5.5 miles of trails.

G. Cultural Resources

The body of Federal historic preservation laws has grown dramatically since the enactment of the Antiquities Act of 1906. Several themes recur in these laws, their promulgating regulations, and more recent Executive Orders. They include: 1) each agency is to systematically inventory the historic properties on their holdings and to scientifically assess each property's eligibility for the National Register of Historic Places; 2) federal agencies are to consider the impacts to cultural resources during the agencies' management activities and seek to avoid or mitigate adverse impacts; 3) the protection of cultural resources from looting and vandalism are to be accomplished through a mix of informed management, law enforcement efforts, and public education; and, 4) the increasing role of consultation with groups, such as Native American tribes, in addressing how a project or management activity may impact specific archaeological sites and landscapes deemed important to those groups. The Service, like other federal agencies, is legally mandated to inventory, assess, and protect cultural resources located on those lands that the agency owns, manages, or controls. The Service's cultural resource policy is delineated in the Service Manual section 614 FW 1-5 and 126 FW 1-3 (available at: *http://www.fws.gov/policy/manuals/*).

Service acquisition of land with known or potential archaeological or historical sites provides two major types of protection for these resources: protection from damage by federal activity and protection from vandalism or theft. The National Historic Preservation Act requires that any actions by a Federal agency which may affect archaeological or historical resources be reviewed by the Service's Regional Historic Preservation Officer as well as the State Historic Preservation Office, and that the identified effects must be avoided or mitigated. The Service's policy is to preserve these cultural, historic, and archaeological resources in the public trust, and avoid any adverse effects wherever possible.

Land acquisition by the Service provides some degree of protection to significant cultural and historic resources. Archaeological surveys and other information collected on the refuge indicate that there are several cultural resource sites at Montezuma NWR. These sites, while

located in hunting zones, are relatively unknown locations that are buried, therefore no impacts from hunters are anticipated.

H. Refuge Environment (Vegetation/Habitat Types)

The refuge supports the following habitats: emergent marsh, open water, inland mudflat, bottomland floodplain forest, scrub/shrub, upland forest, cropland, grassland, and developed infrastructure. The refuge consists of approximately 88 percent wetlands (including emergent marsh, open water, mudflats, bottomland floodplain forest, canal, rivers, ditches, ponds, and portions of grassland and shrubland habitats) and 12 percent uplands.

Cowardin (1965) compiled an annotated list of vascular plants on the refuge. He notes in his introduction that the most important plant communities on the refuge are bottomland hardwood forests and cattail (*Typha* spp.) marsh. See table E.2 and map E.8 for more information about refuge habitats.

Table E.2. Habitats on Montezuma NWR.

Habitat Type	Acres[1]	Percent
Emergent Marsh	4,307	46.9
Bottomland Floodplain Forest	1,685	18.3
Riparian Forest Corridor	1,033	11.2
Scrub/Shrub	866	9.4
Upland Forest (all successional stages)	299	3.3
Cropland	183	2.0
Grassland	316	3.4
Canals/Rivers/Ditches/Ponds	179	1.9
Infrastructure (dikes, facilities, trails, etc.)	316	3.4
Total	**9,184**	100

[1]Acreages are current as of October 2012.

1. Wetlands

The three major types of wetlands on the refuge, according to Cowardin et al. (1979), are aquatic bed, emergent wetland, and forested wetland. Aquatic bed refers to wetlands and deepwater habitats that are dominated by plants which grow primarily on or below the water surface. Emergent wetlands are characterized by rooted herbaceous hydrophytes and usually occur in calm, shallow water. These habitat types provide numerous benefits, including flood protection by acting as sponges which absorb excess water; improved water quality by filtering toxins introduced by agricultural runoff; and diverse habitat for wildlife (EPA 2010). The ratio of aquatic bed to emergent wetland on the refuge is dependent on water level management in refuge impoundments.

2. Uplands
Most of the upland habitat on the refuge is maintained in an early successional (grassland and shrublands) stage through active management. Succession is set back in these areas through a variety of management techniques, including mowing, burning, disking, planting, hydroaxing, and chemical treatment.

3. Rare Plants and Significant Ecological Communities
The New York Natural Heritage Program tracks rare species and rare or exemplary ecological communities in the State. The program provided a list of rare plants and significant ecological communities known to occur on or near the refuge (see appendix A). The New York Natural Heritage Program considers three vegetation associations at Montezuma NWR to be significant or exemplary occurrences of natural communities: Floodplain Forest, Silver Maple-Ash Swamp, and Red Maple-Hardwood Swamp. Several other rare species (appendix A) and plant communities (appendix B) are documented on or near the refuge.

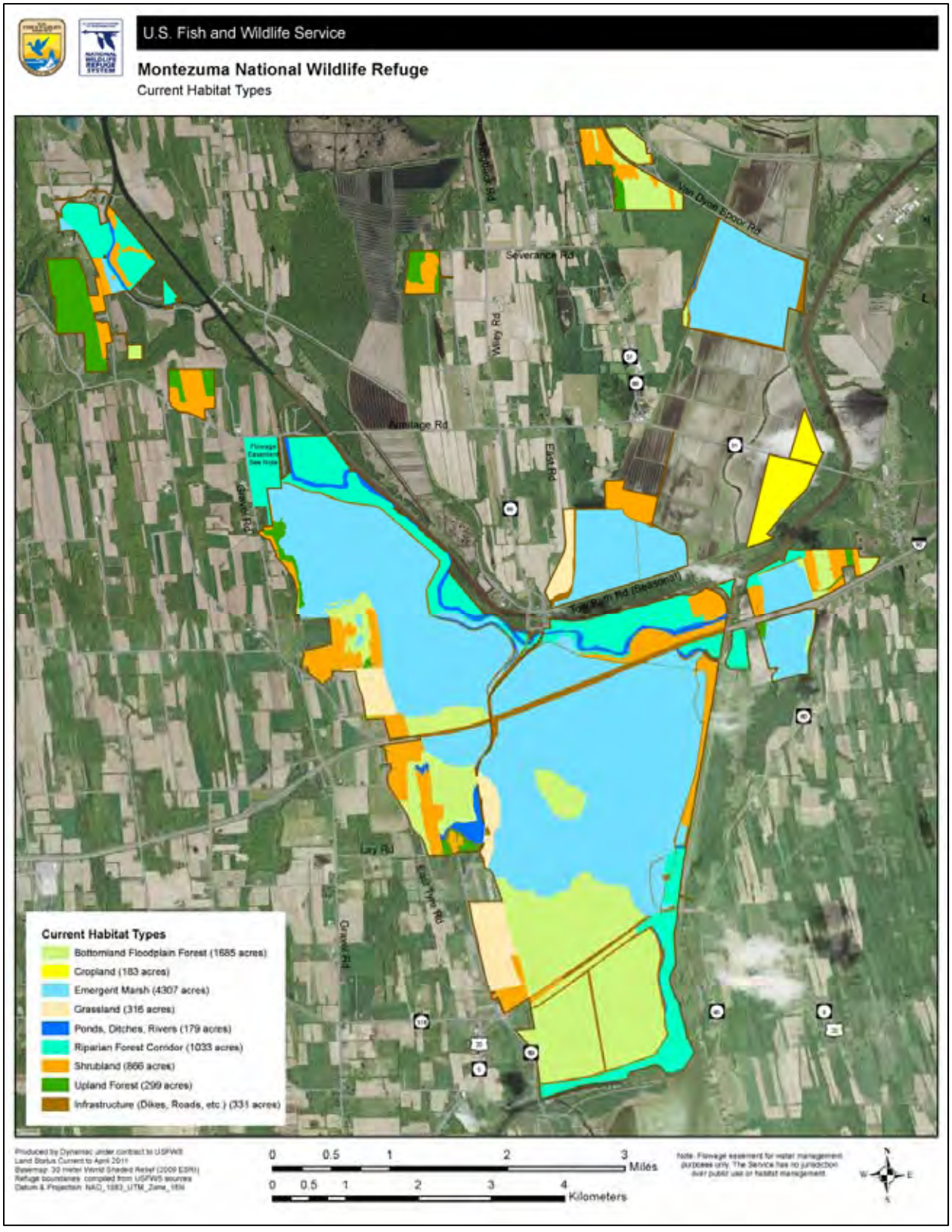
I. Community
The Montezuma NWR is nestled in the heart of NYS's Finger Lakes region. Visitors come from all over to enjoy the beauty and recreational opportunities of the lakes and surrounding landscapes. While agriculture is prevalent, in more recent years wineries have been increasing, making the Finger Lakes New York's largest wine producing region.

The refuge is located on the northern end of the second largest finger lake, Cayuga Lake. The lake is approximately 38 miles in length with the city of Ithaca at its southern tip, where Cornell University is located.

The NYS Thruway or Interstate 90 traverses the heart of the refuge. Nearly equidistant, 60 miles to the east and west are the cities of Syracuse and Rochester, respectively. The immediate area surrounding the refuge is largely rural with smaller towns dominating, such as Seneca Falls, Savannah, and Montezuma. Ten miles to the east is the city of Auburn.

The refuge lies within the Southeast Lake Ontario Basin (SELO Basin). The SELO Basin covers 4.3 million acres (all or part of 19 counties) in west central New York from Rochester east to the mouth of Stony Creek and south encompassing the Finger Lakes. Important habitat types within the SELO Basin include emergent marsh, riparian forest, and grassland. According to the EPA's land classification, 50 percent of the SELO Basin is forested. The rest of the land area is dominated by agriculture, 24 percent in row crops and 16 percent in hay or pasture. Forty-five percent of the 1.7 million people that live in the SELO Basin are in and around Syracuse. The population of the Basin is expected to continue to decline (NYSDEC 2005).

The NYS Comprehensive Wildlife Conservation Strategy identified conservation priorities within the major watershed basins of the State (NYSDEC 2005). The watershed basin boundaries are taken from the U.S. Geological Survey (USGS) 4-digit Hydrologic Unit Codes. The refuge is within an area of broad, flat wetland basins at the north and south ends of "finger lakes," interspersed with oval-shaped hills (drumlins) left by the glaciers.



Map E.8. Current Habitats of Montezuma National Wildlife Refuge.

Much of the lands in and around the MWC are in private ownership dominated by muck farms. The major crops are corn, potatoes, onions, beans, wheat, and hay. Muck is the organic soil from drained wetlands, exposed across large areas when the canals were created during the height of agriculture in the 1800s and 1900s. Muck farming was an important part of farming in New York and other states. Onions, potatoes, celery, and carrots grow especially well on these soils. However, today the most commonly grown crops in this area are corn, soybeans, and potatoes.

VI. Environmental Consequences

The scope of analysis for the environmental consequences is limited to those resources that could be impacted by the proposed action and its alternatives, specifically, the natural environment, vegetation communities, wildlife populations, wildlife-dependent recreation, and the local economy. NEPA requirements associated with constructing additional infrastructure (e.g., pulloffs, hunting blinds, accessible sites) are either addressed in the draft CCP/EA or will be addressed separately as needed. Therefore, we do not address impacts associated with these activities in this document. Implementation of other aspects of the hunting program, under any of the three alternatives presented, is not expected to have effects on the Montezuma NWR cultural or visual resources, or land use. Since areas surrounding Montezuma NWR are traditionally heavily hunted areas, there should be no increase in traffic resulting from opening the refuge to public hunting. Therefore no impacts are anticipated from traffic congestion or to air quality from vehicular emissions.

A. Anticipated Direct and Indirect Impacts

The refuge hunt program is expected to have an overall beneficial impact on wildlife as hunting provides opportunities for visitors to become interested in and enjoy quality wildlife and outdoor experiences and potentially learn about, understand, and support natural resource protection and management. Local populations of game animals will be managed to levels supported by available food and cover.

1. Soils

Impacts on soils under alternative A—Current Management
Under all alternatives, hunters would continue to be allowed to hunt off trail; however, vegetation trampling and associated soil erosion and compaction are expected to be minimal. Hunting is controlled through special use permits, and refuge staff is not aware of any adverse effects to water quality or hydrology associated with this activity to date. Parking areas for hunting are located in upland areas to minimize risks of erosion and impacts to sensitive wetland habitats. We would continue to monitor the refuge for potential impacts and would take steps to limit access or close areas as needed to protect resources.

Impacts on soils under alternative B—Service-preferred Alternative
In addition to the impacts discussed under alternative A, we would be opening additional areas of the refuge to hunting and opening the refuge to new hunting seasons (e.g., turkey hunting). Similar to alternative A, the number of hunters for each season would be controlled through special use permits. This allows refuge staff to protect refuge resources and ensure a quality hunt

by limiting the number of daily permits issued. The maximum number of daily hunt permits that can be issued is based on a variety of factors, including areas open to hunting. This ensures that the number of hunters is kept at levels that have only negligible impacts on refuge resources, including soils. We would continue to monitor the refuge for potential impacts and would take steps to limit access or close areas as needed to protect resources.

Impacts on soils under alternative C—Spring Turkey Hunt
In addition to the impacts discussed under alternatives A and B, we would be opening the refuge to the NYS spring turkey hunt season. As described under alternative B, the maximum number of daily hunt permits that can be issued is based on a variety of factors, including areas open to hunting. This ensures that the number of hunters is kept at levels that have only negligible impacts on refuge resources, including soils. We would continue to monitor the refuge for potential impacts and would limit access or close areas as needed to protect resources.

2. Water Quality

Impacts on water quality under alternative A—Current Management
Hunters would continue to be allowed to hunt off trail; however, vegetation trampling and associated soil erosion and possible impacts to water quality are expected to be minimal. Hunting is controlled through special use permits, and refuge staff is not aware of any adverse effects to water quality or hydrology associated with this activity to date. Only nonmotorized boats are allowed in impoundments for waterfowl hunting, so there would be no risk of chemical contamination from boat motors in refuge waters. Parking areas for hunting are located in upland areas to minimize risks of erosion and runoff into area waterways. We would continue to monitor the refuge for potential impacts and would take steps to limit access or close areas as needed to protect resources.

Impacts on water quality under alternative B—Service-preferred Alternative
In addition to the impacts discussed under alternative A, we would be opening additional areas of the refuge to hunting and opening the refuge to new hunting seasons (e.g., turkey hunting). Similar to alternative A, the number of hunters for each season would be controlled through special use permits. This allows refuge staff to protect refuge resources and ensure a quality hunt, by limiting the number of daily permits issued. The maximum number of daily hunt permits that can be issued is based on a variety of factors, including areas open to hunting. This ensures that the number of hunters is kept at levels that have only negligible impacts on refuge resources, including water quality. We would continue to monitor the refuge for potential impacts and would take steps to limit access or close areas as needed to protect resources.

Impacts on soils under alternative C—Spring Turkey Hunt
In addition to the impacts discussed under alternatives A and B, we would be opening the refuge to the NYS spring turkey hunt season. As described under alternative B, the maximum number of daily hunt permits that can be issued is based on a variety of factors, including areas open to hunting. This ensures that the number of hunters is kept at levels that have only negligible impacts on refuge resources, including water quality. We would continue to monitor the refuge for potential impacts and would limit access or close areas as needed to protect resources.

3. Resident Wildlife

a. Mammals

Impacts on mammals under alternative A—Current Management

Deer hunting would continue at current levels under this alternative. Deer have restricted home ranges and continued local hunting efforts are not expected to affect regional populations. The NYSDEC has divided the State into geographical units of ecological and land use similarities, called Wildlife Management Units (WMUs) to set hunting seasons and regulations. The refuge is in WMUs 8J, 8F, and 7F. The total number of deer harvested in these WMUs in the last 55 years (1954 to 2010) has been increasing steadily, indicating a likely increase in the overall deer population (figure E.1). State deer density estimates for this region are approximately 20 per square mile and have been increasing across NYS in the last few years, based on harvest data (*http://www.dec.ny.gov/*). Deer hunting has been carefully managed and monitored by refuge staff and NYSDEC for many years with no observed negative impacts on the deer population as a whole. In fact as discussed previously, the local deer population is currently increasing; therefore, continued hunting is not expected to decrease the area's deer populations (NYSDEC 2011b).

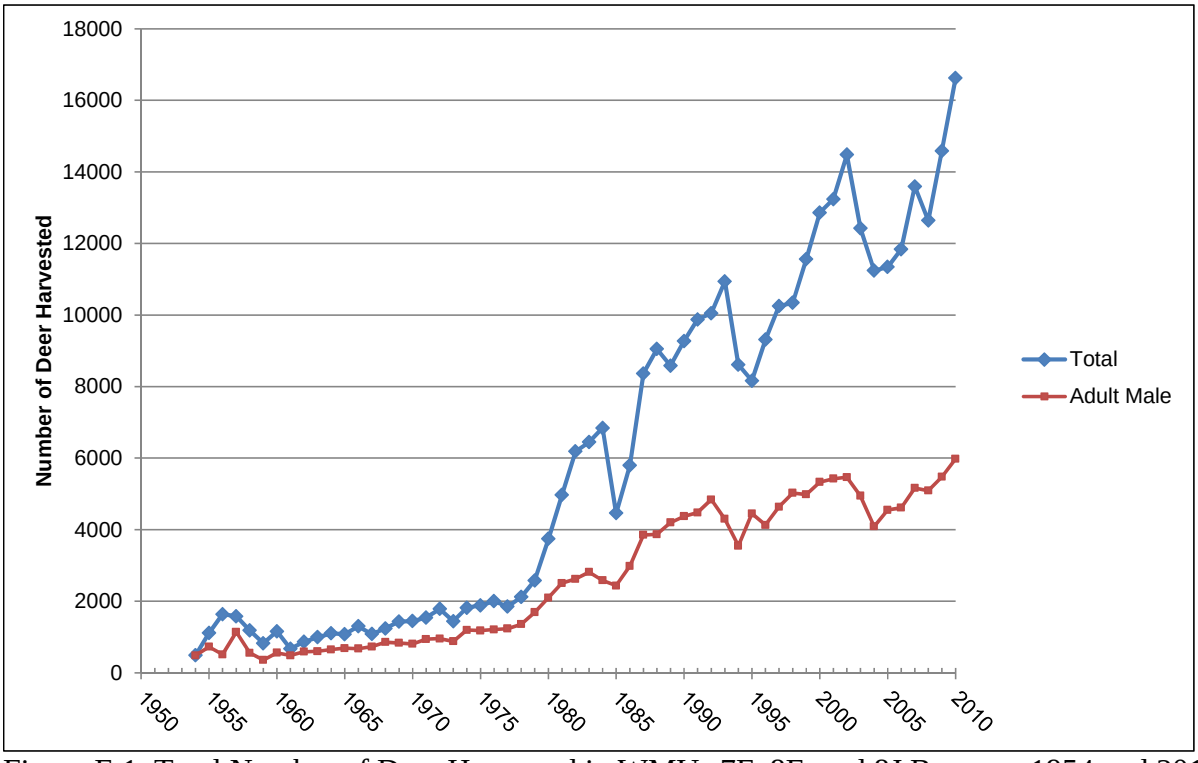


Figure E.1. Total Number of Deer Harvested in WMUs 7F, 8F, and 8J Between 1954 and 2010.

Based on the refuge's current acreage (9,184 acres), this deer density estimate would result in an estimate of nearly 300 deer on refuge lands. However, the refuge's deer population is likely higher than that estimate because of the prevalence of dense cover available to deer. Refuge and NYSDEC staff initiated deer population surveys on the refuge in 2011. Preliminary data indicate there are approximately 32 deer per square mile (Kautz 2012). The two most important factors affecting refuge deer numbers and movements are farming practices on adjacent agricultural lands and the severity of winter weather. During severe winters, the refuge serves as a sheltering area for deer from a distance of 8 to 10 miles (13 to 16 kilometers). The refuge's large tracts of hardwood bottomlands and cattail swales provide cover for deer, as evidenced by overbrowsing in these habitats (Rawinski 2010 personal communication).

Under alternative A, negative impacts to mammals resulting from high deer densities likely would occur. Studies have found that high densities of white-tailed deer have negative impacts on small mammals not only by altering the understory vegetation (e.g., Brooks and Healy 1988) but also by directly competing for acorns (e.g., McShea and Schwede 1993).

Under this alternative, the refuge's deer population would likely continue to increase, assuming it trends consistent with NYS harvest data. In much of the Northeast, deer populations continue to increase and have reached densities in some areas that are above the carrying capacity of the habitat. When deer overpopulate, they overbrowse their habitat, and can completely change the species composition of a forest, in addition to reducing its overall biodiversity (Côté et al. 2004). Tree seedlings can be killed by overbrowsing, limiting recruitment. The failure of forests to regenerate due to overbrowsing by deer would have negative impacts on future resident and migratory populations of native wildlife, including deer. Additionally, deer overpopulation can lead to outbreaks of devastating diseases such as hemorrhagic disease, bluetongue, and chronic wasting disease. Furthermore, overpopulation leads to starvation, more numerous car-deer collisions, and poorer herd health overall (Northeast Deer Technical Committee 2009).

Waterfowl hunting has been authorized on the refuge for decades, and refuge staff is not aware of any adverse effects on mammals associated with this activity. Therefore, anticipated direct, indirect, and cumulative impacts to mammal populations on the refuge from waterfowl hunts are expected to be negligible.

Impacts on mammals under alternative B—Service-preferred Alternative

Under alternative B, we would expect increased benefits to mammals compared to alternative A. Regulated hunting has proven to be an effective deer population management tool and has been shown to be the most efficient and least expensive technique for removing deer and maintaining deer at desired levels (Northeast Deer Technical Committee 2009). Increasing opportunities for deer hunting by expanding the program would include opening designated new areas to deer hunting (current lands and those acquired in the future), allowing Sunday hunting, and lengthening the archery season to coincide with the State opener.

As discussed under alternative A, the local deer population has been increasing. Deer overpopulation has had adverse impacts on refuge habitats and continued increases in the local deer population could lead to negative impacts on the health of the deer herd as well. The proposed increase in deer hunting is intended to reduce and stabilize the local deer population to maintain healthy densities of deer that also protect habitats. Also, if deer populations continue to

be high, we would work with the NYSDEC to manage a more effective hunt through their DMAP to have a beneficial impact on the overall health of the deer herd in the area (NYSDEC 2011b). These changes would improve our ability to manage and maintain the refuge's deer population at or below the refuge's carrying capacity. This would improve forest regeneration and development of the understory by decreasing deer browse pressure. Both of which would benefit the deer population and other mammal populations using these habitats on the refuge. Maintaining the deer population at beneficial levels could also benefit the deer population by decreasing risks of disease and starvation. We would continue to monitor deer hunting on the refuge and would work with NYSDEC to change the refuge's hunt program if needed to maintain healthy deer populations around the refuge.

We do not expect increased encounters with mammals resulting from the proposed goose hunts and youth and fall turkey hunts to have long-term adverse impacts to mammal populations. As described under "Soils" above, the maximum number of daily hunt permits that can be issued is based on a variety of factors, including areas open to hunting. This ensures that the number of hunters is kept at levels that have only negligible impacts on refuge resources. We would continue to monitor the refuge for potential impacts and would limit access or close areas as needed to protect resources.

Impacts on mammals under alternative C—Spring Turkey Hunt
Impacts to mammals under alternative C would be similar to those described under alternative B. The addition of spring turkey hunting could result in minor increases in disturbance to the refuge's mammal populations. Because the refuge controls the number of hunters and where they are allowed to hunt, adverse effects are expected to be minimal. We would continue to monitor the refuge for potential impacts and would limit access or close areas as needed to protect resources.

b. Reptiles and Amphibians

Impacts on reptiles and amphibians under alternative A—Current Management
It is possible that refuge visitors in areas occupied by reptiles and amphibians could have a negative impact on these species. For example, Garber and Burger (1995) found that after a previously protected area was opened to limited public recreation, two previously stable wood turtle populations were extirpated within 10 years. However, they speculate that these extirpations may have been caused by the construction of a new parking lot, removal and handling by recreationists, increased predation as a function of food waste and increased predators, and disturbance by dogs. Since these mechanisms are unlikely to be introduced as a result of hunting activities under alternative A, negative impacts, other than temporary displacement due to disturbance, are unlikely. Hunts would occur during a time of year when reptiles and amphibians are becoming inactive and thus the likelihood of hunter interaction is rare. We do not expect isolated encounters with reptiles and amphibians to have cumulative adverse impacts on these populations.

Impacts on reptiles and amphibians under alternative B—Service-preferred Alternative
Reptiles and amphibians are active in September, when a Canada goose hunt would occur. However, this hunt would be limited to agricultural lands and mowed fields with little use by reptiles and amphibians. Reptiles and amphibians are likely to be active on the Main Muck in

March and April when the snow goose season would be open. We do not expect isolated encounters with reptiles and amphibians to have cumulative negative effects on populations.

Reptiles and amphibians would be active during the youth turkey hunt in April. However, because the hunt would be limited to one weekend and there would be a limited number of hunters in a limited area of the refuge, we do not expect these isolated encounters with reptiles and amphibians to have cumulative negative effects on refuge populations.

Impacts on reptiles and amphibians under alternative C—Spring Turkey Hunt
Ficetola et al. (2006) compared species richness of amphibians and reptiles in wooded patches with different human disturbance levels. Disturbance was measured by the number of pedestrians on trails during early June. They found that species richness of reptiles was negatively correlated with disturbance. The relationship was similar but not significant for amphibians. The timing of the disturbance in this study is similar to the time when spring turkey hunting would occur on the refuge (currently May per State regulations). However, this study occurred at a park where visitor use is much greater than we expect as a result of a spring turkey hunt. Because the number of spring turkey hunters would be limited, we do not expect isolated encounters with reptiles and amphibians to have cumulative negative effects on populations.

c. Turkey

Impacts on turkey under alternative A—Current Management
Anticipated direct, indirect, and cumulative impacts to turkey populations on the refuge from current deer and waterfowl hunts are believed to be negligible. These are historic uses of the refuge and refuge staff is unaware of any adverse effects associated with these activities.

Impacts on turkey under alternative B—Service-preferred Alternative
In alternative B, the Service proposes to open turkey hunting during the youth and fall hunt seasons according to the State's regulations. New York has two turkey seasons: a spring season when only gobblers (males) are harvested, and a fall season when either sex is legal game. While individual turkeys would be harvested, NYSDEC annually sets the timing of the seasons, season lengths, and bag limits conservatively to ensure a sustainable harvest and to maintain healthy game population levels (*www.dec.ny.gov/outdoor/48823.html*). Expanding waterfowl and deer hunt areas and seasons on the refuge could have short-term adverse effects on turkeys by increasing disturbance. Because the daily numbers of deer and turkey hunters are limited and because the State manages hunt programs conservatively to maintain healthy populations of game species, we do not anticipate any adverse consequences on the wild turkey population.

Impacts on turkey under alternative C—Spring Turkey Hunt
Adverse impacts would be slightly greater than those described under alternative B, because the Service would open spring turkey hunting according to NYS regulations. However, the timing of the season, season length, and bag limits are set to minimize the risk of overharvest and adverse impacts on nesting hens and breeding behavior (*www.dec.ny.gov/outdoor/48823.html*). As discussed under alternative B, because the daily numbers of deer and turkey hunters are limited and the State manages hunt programs to maintain healthy populations of game species, no long-term adverse impacts to local or regional turkey populations are expected from expanding hunting opportunities on the refuge.

4. Migratory Species

a. Waterfowl (Ducks and Geese)

Impacts on waterfowl under alternative A—Current Management
Waterfowl are managed by flyways, which follow their major migratory routes. Their population trends are monitored by the Service through the collection of data including band recoveries, hunter questionnaires, wing returns, breeding population surveys, habitat surveys, and mid-winter waterfowl surveys (Caithhamer and Dobovsky 1995). The migratory waterfowl at Montezuma NWR are only part of the larger population of birds that are managed by the Service on a flyway basis. The Service designs the bag limits and season lengths for migratory waterfowl to maintain healthy populations of these species (USFWS 1988). Therefore, offering waterfowl hunting opportunities on the refuge as currently designed does not have an adverse impact on the overall waterfowl population.

Further, portions of the refuge remain closed to waterfowl hunting per legislation and subsequent Service policy (16 U.S.C. 668dd(d)(1)(A), National Wildlife Refuge System Administration Act; 16 U.S.C. 703-712, Migratory Bird Treaty Act; and 16 U.S.C. 715a-715r, Migratory Bird Conservation Act). These laws and this policy apply to those refuges, like Montezuma NWR, that have been designated, acquired, reserved, or set apart as inviolate sanctuaries. If a refuge, or portion thereof, is considered to be an inviolate sanctuary, refuge managers are required to restrict hunting of waterfowl to no more than 40 percent of the refuge unless it is found that taking of any species in more than 40 percent of the area would be beneficial to the species. We estimate that, under alternative A no more than 13 percent of the refuge would be open to waterfowl hunting within a given year.

Disturbance to waterfowl resulting from the deer hunt is minimal because the Main Pool and Tschache Pool, where most waterfowl are concentrated on the refuge, are closed to deer hunters.

Impacts on waterfowl under alternative B—Service-preferred Alternative
Under this alternative, the area open to waterfowl hunters during the regular season would be expanded to include additional restored emergent marsh habitats. Additional hunt locations may include portions of the Main Muck or the Jackson Property and would be determined annually depending on habitat conditions, hunter access, and to minimize impacts to nontarget species. Adverse impacts to waterfowl would increase as the hunt area increased but would still be under the protection of the Service's flyway-wide bag limits and season lengths, and spatially segregated from no-hunting areas, as described under alternative A. As discussed under alternative A, if a refuge, or portion thereof, is considered to be an inviolate sanctuary, refuge managers are required to restrict hunting of waterfowl to no more than 40 percent of the refuge unless it is found that taking of any species in more than 40 percent of the area would be beneficial to the species. Under alternative B, we estimate no more than 29 percent of the refuge would be open to waterfowl hunting within a given year. This number would likely be less as the refuge manager would only open additional areas after determining there is sufficient quality habitat available that can be accessed by hunters on foot or by boat without disturbing sensitive species or conflicting with other priority public uses.

Under this alternative, there would be expanded opportunities for goose hunting. Some of the refuge lands managed as grasslands or enrolled in the cooperative farming program would be open during the resident Canada goose season, and portions of the Main Muck and Jackson Property would be open for the late snow goose season and the Light Goose Conservation Order. The Service analyzed the impacts of the additional Canada goose and snow goose seasons in the Final Environmental Impact Statement: Resident Canada Goose Management (USFWS 2005) and the Final Environmental Impact Statement: Light Goose Management (USFWS 2007), respectively.

The additional Canada goose hunt days and areas would contribute to the Service goal of reducing the number of resident population Canada geese in the Atlantic Flyway from more than one million to 620,000 and the Service and NYSDEC goal of reducing the number of resident population Canada geese in the State from 257,000 (*http://www.dec.ny.gov/animals/67311.html*) to at or below 85,000 birds (USFWS 2005b). Resident geese, as their name implies, spend most of their lives in one area, although some travel hundreds of miles to wintering areas. In recent years, flocks resident geese have become year-round inhabitants of parks, waterways, residential areas, and golf courses in New York State, and too often, they are causing significant problems. Problems include over-grazed lawns, accumulations of droppings and feathers on play areas and walkways, nutrient loading to ponds, public health concerns at beaches and drinking water supplies, aggressive behavior by nesting birds, and safety hazards near roads and airports (NYSDEC and USDA 2007). In addition, studies have shown that when resident Canada goose populations are high, they can have profound negative impacts on wetland vegetation (Haramis and Kearns 2007, Laskowski et al. 2002).

The additional snow goose hunt days and areas would contribute to the Service goal to reduce the population of lesser snow geese by 50 percent from the level observed in the late 1990s (USFWS 2007). Some populations of snow geese have become so numerous that they are damaging their Arctic and sub-Arctic nesting habitats (Abraham and Jefferies 1997, Jano et al. 1998). These studies show that parts of the fragile tundra habitats where these geese traditionally nest are being seriously degraded or destroyed, primarily by overgrazing. Snow geese in the mid-continent region are showing signs of overpopulation in lower-than normal body size in both goslings (Cooch et al. 1991a, b) and adults (Reed and Plante 1997). Populations of other bird species that breed in the Arctic and sub-Arctic are declining; researchers believe these declines are caused, at least in part, by habitat degradation caused by snow goose populations (Rockwell et al. 1997 as cited in USFWS 2007).

Adverse impacts to other waterfowl resulting from the resident Canada goose season is not expected as the hunt would not occur in emergent marsh habitat and is before the peak of the waterfowl migration. Adverse impacts are not expected during the late snow goose season or the Light Goose Conservation Order as the snow goose migration through the area in late winter and early spring generally is rapid (Bellrose 1980, Ziemba 2011 personal observation) so the time window in which any impacts would occur to other species would be brief. However, an increased take of snow geese would contribute to the beneficial impacts to other waterfowl species that are expected as a result of a decrease in the snow goose population (USFWS 2007).

Under this alternative, deer hunting would be open on Sundays and begin with the State season (currently mid-October); however, no additional disturbance to waterfowl is expected as the Main Pool and Tschache Pool would remain closed to deer hunting until they are frozen and waterfowl have left the area.

Under this alternative, turkey hunting would be open during the youth (currently one weekend in April) and fall (currently October to mid-November) seasons. Turkey hunters would cause little disturbance to migratory waterfowl since there is little overlap in turkey and waterfowl habitat. Many refuge impoundments are either closed to hunting, or impractical to hunt because of the difficulty of access.

Impacts on waterfowl under alternative C—Spring Turkey Hunt
While there would be additional turkey hunters in the spring, impacts to waterfowl under alternative C would be similar to those described under alternative B as the same conditions apply.

b. Shorebirds

Impacts on shorebirds under alternative A—Current Management
Shorebirds are localized on the refuge, primarily occurring in refuge impoundments managed to provide mudflats during migration. The shorebird migrations are protracted and shorebirds may be present on the refuge from March into November. Adverse impacts to shorebirds under alternative A are not observed because hunting activities are spatially segregated from important shorebird stopover sites. When Tschache Pool has enough water to allow waterfowl hunting, it is too deep to provide shorebird habitat. Deer hunting on the refuge does not open until November 1, well past the peak shorebird migration.

Impacts on shorebirds under alternative B—Service-preferred Alternative
Impacts to shorebirds under this alternative are expected to be minimal. Areas with optimal conditions for waterfowl hunting would be open for this public use. These will be emergent marshes with high quality waterfowl habitat and deep enough water to provide hunter access. Shorebirds will be in areas with very shallow water and mudflats so will be spatially segregated from waterfowl hunting.

The lands that would be open during Canada and snow goose seasons are not heavily used by shorebirds. Under this alternative, deer hunting would be open on Sundays and begin with the State season (currently mid-October) and turkey hunting would be open during the youth (currently one weekend in April) and fall (currently October to mid-November) seasons. However, no additional disturbance to shorebirds is expected because hunters do not utilize shorebird habitat (i.e., mudflats).

Impacts on shorebirds under alternative C—Spring Turkey Hunt
While there would be additional turkey hunters in the spring, impacts to waterfowl under alternative C would be similar to those described under alternative B as the same conditions apply.

c. Marsh and Wading Birds

Impacts on marsh and wading birds under alternative A—Current Management
There has been little research assessing disturbance of nonhunted species associated with waterfowl hunting. Measures designed to provide sanctuary to waterfowl such as limiting hunt days, times, and areas also would benefit marsh and wading birds. If there were adverse impacts, they would be mitigated by bird sanctuary areas that secretive marshbirds and waders could utilize. Disturbance to marsh and wading birds resulting from the deer hunt is likely minimal because of the dates of the hunt and the locations where deer hunting is allowed.

Impacts on marsh and wading birds under alternative B—Service-preferred Alternative
As described under alternative A, measures designed to provide sanctuary to waterfowl such as limiting hunt days, times, and areas also would benefit marsh and wading birds. No adverse impacts are expected from the Resident Canada goose season because marsh and wading birds do not use the agricultural lands and mowed fields that would be hunted. Migrating marsh and wading birds may be displaced from the main muck during the snow goose seasons but alternative emergent marsh habitat is available for them in other refuge impoundments. No additional adverse impacts to marsh and wading birds are expected due to expanded deer hunting or fall turkey hunting opportunities as the Main Pool and Tschache Pool would remain closed until they are frozen when most marsh and wading birds have left the area. Turkey hunters would cause little disturbance to marsh and wading birds since turkey hunting does not occur in emergent marsh habitat and wooded areas with active heron rookeries would not be open to hunters.

Impacts on marsh and wading birds under alternative C—Spring Turkey Hunt
Spring turkey hunting could occur in forested wetlands where great blue herons and black-crowned night-herons (*Nycticorax nycticorax*) have had nesting colonies. Rodgers and Smith (1995) studied flushing distances of breeding colonial waterbirds caused by approaching pedestrians and recommended a 100 meter buffer around great blue heron and black-crowned night-heron colonies. However, hunt areas would be set annually by the refuge manager and would be based on minimizing disturbance to sensitive wildlife and plant species—these sensitive areas would be closed.

d. Landbirds

Impacts on landbirds under alternative A—Current Management
The cumulative effects of disturbance to nonhunted migratory birds are believed to be negligible under alternative A because the hunting season does not coincide with the nesting season.

Disturbance to the daily wintering activities of birds, such as feeding and resting, could occur at the current management level. For example, a number of raptors, including species of conservation concern, such as short-eared owl and northern harrier, forage over refuge grasslands during winter. Holmes et al. (1993) approached six species of wintering grassland raptors a total of 162 times and found that the birds being approached flushed 97 percent of the time. He did not follow up on this research to determine if these disturbances led to higher mortality or any measurable effect in the following year's reproductive rates. We do not believe hunters cause any cumulative impacts to wintering raptors in refuge grasslands at current times and levels of

access. Hunting ends in mid-December and the number of hunters decreases dramatically throughout the season.

Under alternative A, negative impacts to forest birds would likely occur due to continued degradation of the vegetation's physical structure and diversity as a result of overbrowsing by deer. Adverse impacts of overbrowsing on forest bird communities have been documented in a number of studies (see Latham et al. 2005 for a summary).

Impacts on landbirds under alternative B—Service-preferred Alternative
As stated under alternative A, overbrowsing by deer can have negative impacts on nesting songbirds in upland areas. A study conducted in Pennsylvania showed that both species diversity and abundance declined in areas with high densities of deer as a result of reduced nesting habitat (deCalesta 1994). Alternative B includes an expanded deer hunt; which would include working under the NYSDEC DMAP to increase the deer harvest. This would result in beneficial impacts on landbirds through the change to vegetation as a result of lower deer densities.

There would be increased presence in the field and possible displacement of birds due to disturbance by deer and turkey hunters under this alternative. Hunts would start earlier in the season and Sunday hunting would be permitted. However, we believe these temporary disturbance effects would be far outweighed by the beneficial impacts resulting from improved habitat conditions as the deer herd is reduced. Furthermore, the number of turkey hunters is going to be limited to lower densities.

Impacts on landbirds under alternative C—Spring Turkey Hunt
Birds are most vulnerable to disturbance during the breeding season (Gabrielson and Smith 1995); therefore, spring turkey hunting is more likely to have adverse impacts on passerines than the other hunt programs—which occur at other times of year. Indeed, several studies indicate that human presence during the breeding season can have a negative impact on avian breeding behavior in both forested (Gutzwiller and Anderson 1999, Gutzwiller et al. 1994) and grassland (Miller et al. 2001, Fernandez-Juricic et al. 2005) habitats. Also, many species show a greater reaction when people walk unpredictably in the landscape as opposed to on designated trails (Gabrielson and Smith 1995, Miller et al. 2001). However, due to the secretive and relatively sedentary nature of spring turkey hunting, impacts to breeding landbirds from turkey hunting is expected to be minimal.

5. Federally Listed Species

a. Indiana Bat

Currently, the Indiana bat is the only federally listed species on the refuge. It is currently listed as endangered. There are no known maternity colonies on the refuge, and no known hibernacula (overwintering area). The refuge does offer summer foraging and roosting habitat for this species.

Impacts on Indiana bats under alternative A—Current Management
Under alternative A, the lack of tree regeneration in some parts of the refuge may eventually have a negative impact on Indiana bats if roost trees become limiting in the area.

Impacts on Indiana bats under alternative B—Service-preferred Alternative
An increase in tree regeneration resulting from increased deer harvest under alternative B may have a positive impact on the Indiana bat.

Impacts on Indiana bats under alternative C—Spring Hunt
Same as under alternative B.

B. Anticipated Direct and Indirect Impacts of Alternatives on Refuge Programs, Facilities, and Cultural Resources

1. Other Wildlife Dependent Recreation

Impacts to other refuge wildlife-dependent recreation under alternative A—Current Management
The current hunt program was developed to work in synch with the five other priority wildlife-dependent public uses on the refuge. A demand for white-tailed deer and waterfowl hunting access has persisted since the hunt program's inception. Hunters account for 7.3 percent of the refuge's annual visitation, based on a 5-year average. Hunters are generally limited to areas otherwise closed to public use, and waterfowl hunting is limited to the morning hours, 3 days per week. Esker Brook and South Spring Pool Trails are closed to other users during the white-tailed deer season, beginning each year on November 1 and into December. Impact on other visitors is minimal since there are other refuge trails that remain open and the main attraction to the refuge at that time is viewing the waterfowl migration along the Wildlife Drive. This spatial separation minimizes contact and potential conflict among user groups. Refuge staff is unaware of any adverse impacts to other wildlife-dependent recreation from the current hunt program.

Table E.3. Cost of Administering the Montezuma National Wildlife Refuge Hunts in 2009.

	DEER ARCHERY		DEER FIREARMS		WATERFOWL		
	Staff Hours	Hunt Costs	Staff Hours	Hunt Costs	Staff Hours	Hunt Costs	Fee Money Collected
Check-in/Check Station	10	$ 322.00	15	$ 440.00	60	$ 1,500.00	$ 1,920.00
Law Enforcement	–	–	4	$ 100.00	4	$ 100.00	
Planning	4	$ 100.00	4	$ 100.00	20	$ 500.00	
Public Information	6	$ 170.00	7	$ 175.00	10	$ 250.00	
Postage	--	$ 8.00	--	$ 10.00	--	$ 40.00	
Supplies	--	$ 350.00	--	$ 400.00	--	$ 735.00	
Data Collection	10	$ 250.00	15	$ 375.00	10	$ 250.00	
Maintenance-Facilities	5	$ 125.00	5	$ 125.00	5	$ 125.00	
Maintenance-Vehicles	2	$ 50.00	2	$ 50.00	2	$ 50.00	
Utilities	--	$ 25.00	--	$ 25.00		$ 25.00	
TOTALS	**37**	**$ 1,400.00**	**77**	**$ 1,800.00**	**136**	**$ 3,575.00**	**$ 1,920.00**

ANNUAL TOTAL: $6, 775.00 - $1,920.00 = $4,855.00

Impacts to other refuge wildlife-dependent recreation under alternative B—Service-preferred Alternative

In 2005, the Northeast Regional Visitor Services Review Team identified visitor programs of emphasis for each refuge. The programs identified for this refuge were environmental interpretation and wildlife observation and photography. The refuge's visitor services program is designed to offer high quality wildlife-dependent recreation emphasizing wildlife observation and interpretation, with sufficient wildlife sanctuary, while minimizing conflicts among various users (*www.fws.gov/policy/605fw1.html*). Resource protection and wildlife-dependent recreation have existed at Montezuma NWR with minimal, if any, conflict. Areas may be closed or seasonally restricted to protect natural resources or provide for a greater degree of visitor safety; however, alternate sites would likely be available in other areas of the refuge. NYS deer and waterfowl hunting seasons would continue to be adhered to.

Under the proposed alternative, the number of hunters and the number of days the refuge is open to hunting would increase, and when deer densities are high, the refuge would work with the DMAP to maximize the harvest of female deer. Currently hunting does not occur on the refuge before November 1, regardless of the start of the State seasons. This was done to avoid conflict between hunters and other visitors at the Esker Brook Trails. The deer population in the vicinity of the refuge is still considered higher than optimal, indicating that current hunting levels are not affecting the population substantially and that the hunting program is not adversely affecting the deer population (NYSDEC 2009).

Implementation of DMAP would involve supplying additional antlerless tags to hunters by the refuge and would require closer contact with refuge hunters to ensure compliance if an "earn a buck" system is instituted. This process should be relatively seamless because refuge staff already manages the hunt program through a hunt permit system administered at the hunter check station. Negative impacts to other public use programs due to shifting resources to implement and administer this new program should continue to be minimal.

We propose to open the refuge to deer and turkey hunting with the NYS opener (typically early to mid-October), but keep the Esker Brook Trail area closed to hunting until November 1. The refuge would be opened to Sunday hunting throughout the NYS seasons. Hunting hours are sunrise to sunset for deer and fall turkey seasons. We may adjust hunt season dates and bag limits in the future as needed to achieve balanced wildlife population levels within habitat carrying capacities.

Those areas designated as open for deer season would also be open to fall turkey hunters (see map E.5). The areas open and the number of groups permitted would be designated annually by the refuge manager and would be based on maximizing hunt opportunities, providing for a quality hunt experience, demand, minimizing disturbance to sensitive wildlife and plant species, and balancing other public use demands and the administrative work load. Based on lands currently owned, the refuge would accommodate a maximum of 40 fall turkey hunters per day. In addition to NYS requirements, deer and turkey hunters would be required to turn in a refuge harvest report. The addition of turkey hunters on refuge lands should result in minimal conflict with other refuge users due to the small number of turkey hunters and the fact that these areas are already open to deer hunters.

We also propose to open the refuge to the NYS youth turkey hunt. The State youth turkey hunt is currently open to youths ages 12 to 15. Implementing the refuge's youth turkey hunt would be dependent on a commitment from partners to mentor youth hunters. Youth hunters and their mentors may be required to attend an orientation program conducted by the refuge, in cooperation with partners. The orientation would review hunter safety, turkey calling, equipment, ethics, and sportsmanship, as well as conservation and messages about the refuge system. All junior hunters must be accompanied by an adult both at the orientation and during the day of the hunt. Adult mentors are required to have a valid NYS hunting license for turkey, but may not hunt.

Designated areas would be open to youth hunters and their mentors during the NYS youth turkey hunt (see map E.5). The areas open and the number of groups permitted would also be designated annually by the refuge manager and would be based on maximizing hunt opportunities, providing for a quality hunt experience, public demand, minimizing disturbance to sensitive wildlife and plant species, balancing other public use demands, and the administrative work load. Based on lands currently owned, the refuge could accommodate a maximum of 14 youth hunting groups. In addition to NYS requirements, youth turkey hunters would be required to turn in a refuge harvest report. We expect minimal conflicts between youth turkey hunters and other refuge user groups because of the low number of turkey hunters, short season (currently 2-3 days), and because areas of the refuge that would be open to the spring youth hunt would be closed to other user groups during this season.

Implementing the fall turkey hunt should result in only minor increases to administrative costs because the fall turkey hunt would occur simultaneously with the deer hunt program when administrative resources are already focused on the refuge's hunting program. Therefore, minimal impacts other aspects of the refuge's public use program are expected due to implementing a fall turkey hunt.

The youth turkey hunt would occur for a limited time during the upswing of the refuge's high visitation period. Since the implementation of the youth turkey hunt is dependent on partner participation, refuge resources can be better balanced to accommodate it. Moreover, the benefits of conducting a youth hunt merit staff time. It offers opportunities for developing new partnerships, mentoring youth, and providing education about hunting, ethics, conservation, the refuge, and the National Wildlife Refuge System.

Visitation on the refuge peaks during the spring and fall bird migrations since the refuge is a prime birding area along the Atlantic Flyway. Historically, both waterfowl and white-tailed deer hunting have been permitted on the refuge from October through December (deer hunting running November and December). Under this alternative, the refuge would continue to minimize conflicts among different user groups and provide quality visitor experiences for both hunters and nonhunters by spatially segregating different uses.

Hunting would continue to be prohibited along the Wildlife Drive, including the Oxbow Trail, in October and November when the waterfowl migration is at its peak and use by wildlife observers and photographers is high. However, as opposed to under alternative A, the Wildlife Drive would be open to hunters and closed to other users beginning December 1. Also, the Seneca Trail would be open annually for the late archery season (usually mid to late December for about 9 days) and closed at this time to all other users. In order to accommodate fall birders who desire upland walking trail experiences, Esker Brook and South Spring Pool Trails would continue to remain open for wildlife observation, photography, environmental interpretation, and education and closed to hunting until November 1 each year. From November 1 through the rest of the white-tailed deer hunting seasons, the Esker Brook and South Spring Pool Trails would be closed to visitors, except to hunters with a valid refuge deer hunting permit, as has been the case historically on the refuge. All other hunting opportunities would continue to take place in areas not open to other recreational uses.

Restrictions on hunting implements follow NYS regulations and safety zones and are designed to ensure visitor safety and address public safety concerns. The refuge would reserve the right to close areas to hunting should it become necessary to facilitate other uses or safety, or to address resource protection and/or restoration.

Extending the hunting season, adding an additional weekly hunting day (Sunday), and increasing the number of hunters on the refuge would incur a minor additional impact on other wildlife-dependent uses on the refuge in terms of potential conflict between user groups. Some users may be impacted by the presence and noise associated with shotgun and muzzleloader hunting which occurs on the entire refuge. However, we don't expect the impact to be significant. Conflict between users does not appear to be a problem under current management practices, so

expanding hunting would not exacerbate any preexisting issue. In the future, if conflict should arise we may need to further manage public use to minimize conflicts and ensure public safety. That may include public outreach or further zoning to separate user groups.

By following Federal and State regulations, as well as refuge-specific regulations for hunting and other public uses, the proposed hunting program on the refuge is not likely to have significant impacts on other refuge wildlife-dependent recreation programs.

Impacts on other refuge wildlife-dependent recreation under alternative C—Spring Turkey Hunt
Impacts under alternative C would be similar to those stated above for alternative B. Under alternative C, spring turkey hunting would be permitted. When the refuge was initially open to hunting, small game hunting was permitted. This practice was ended due to lack of interest among refuge hunters. Over the years, there has been little to no demand for small game and turkey hunting. During the scoping process for the refuge's CCP, the demand for increased education and outreach was far greater than the number of requests for turkey hunting, and interested hunters already have opportunities to hunt turkeys during the spring and fall seasons nearby at the Northern Montezuma Wildlife Management Area.

Hunters have approached refuge staff, rather, to ask for increased access to areas for deer and waterfowl hunting, as well as for access during goose hunting seasons. Hunters have also asked for more universally accessible areas in order to accommodate a broader population of sportsmen.

The spring turkey hunt would occur at a time of high public use in other disciplines of the refuge's public use program. Requests for school programs and guided tours increase, festival planning and outreach events require staff time, increased visitation at the visitor center and other refuge facilities increase, and the refuge's main volunteer programs are in full swing. All of these activities demand administrative resources imperative to offering a well-balanced, high-quality public use program.

If the refuge adopted the habitat management objectives and strategies under alternative C of the Montezuma NWR Draft CCP, habitats and priorities on the refuge would change with more focus on forested habitats and forest-dependent wildlife and less focus on waterbirds. At that time, turkey hunting may prove to be a more fitting expansion of the refuge's hunt program. However, waterfowl hunting would likely continue as under alternative A rather than increase as under alternative B due to lack of emergent marsh habitat. This shift would be reflected in a shift of administrative resources towards turkey hunting, but would still maintain a balance in the refuge's Public Use Program.

2. Refuge Facilities

Impacts on refuge facilities under alternative A—Current Management
Hunting is conducted on foot by individuals or small groups. This direct impact of foot travel by hunters on the habitat is often different from that of other wildlife-dependent recreational users because hunters tend to travel in dispersed patterns over wide areas, minimizing the chances of negatively impacting sites. This is in contrast to the tendency of many other wildlife-dependent recreational users to congregate on a limited number of trails and observation areas.

Impact to refuge roads and trails from hunting activities would be minimal. Most of the refuge is only accessed by foot as units are not open for vehicle or off-road vehicle traffic. Parking areas would receive normal wear and tear from hunters as well as from other wildlife dependent recreation users.

Impacts on refuge facilities under alternative B—Service-preferred Alternative
The increased hunting opportunities associated with expanding the deer and waterfowl hunts are likely not to significantly impact refuge facilities. There may be additional parking areas required to expanded waterfowl and goose hunting, but the refuge has both the staff and equipment to make these minor improvements, therefore the costs should be negligible.

Impacts on refuge facilities under alternative C—Spring Turkey Hunt
Same as alternative B.

3. Cultural Resources

Impact to cultural resources from hunting activities on the refuge would be minimal for all alternatives because hunters tend to travel in dispersed patterns over wide areas, minimizing the chances of negatively impacting sites. Under each of the alternatives, the refuge would continue to protect known and unrecorded archaeological sites from unauthorized disturbance and looting. The Service's policy is to preserve cultural, historic, and archaeological resources in the public trust, and avoid any adverse effects wherever possible. Refuge staff would continue to work with our regional archaeologists and consult with the State Historic Preservation Officer and other parties as appropriate to ensure compliance with the National Historic Preservation Act and other applicable laws and regulations.

C. Anticipated Impacts of Proposed Action on Refuge Environment and Community

1. Refuge Environment (Vegetation/Habitats)

Impacts on habitats under alternative A—Current Management
The physical effects of hunting various game species on the vegetation of the refuge are believed to be minimal. The most destructive effects are typically from vehicular traffic. However, only certain dikes, short access roads, and parking areas are open to vehicular traffic, and these areas have minimal habitat values. All-terrain vehicles are not allowed on the refuge. Direct impacts to the refuge environment by hunters have been and are expected to be minimal; insignificant soil compaction as a result of foot traffic is an example.

Hunting is conducted by boat or on foot by individuals or small groups, sometimes accompanied by a hunting dog (waterfowl). This direct impact of foot travel by hunters on the habitat is often different from that of other wildlife-dependent recreation users because hunters tend to travel in very dispersed patterns over wide areas, minimizing the chances of negatively impacting sites (in contrast to the tendency of many other wildlife-dependent recreation users to congregate on a limited number of trails).

Overbrowsing by white-tailed deer on plant communities at Montezuma NWR is well documented. Deer are suppressing plant growth and succession, and deer browsing has defoliated trees and shrubs in many areas to a height of 6 feet and has suppressed regeneration of saplings and shrubs in others (Rawinski 2010 personal communication). Due to deer overbrowsing, the natural diversity of understory plants and natural abundance of woody species regeneration has been reduced, thus altering the habitat and potentially the wildlife diversity the refuge was created to protect. Continuing the current deer hunt would result in harvesting approximately the same number and sex ratio of deer and the continued decline of forested habitats on the refuge. As mature trees die and fall, they are being replaced by nonnative invasive species (e.g., common buckthorn (*Rhamnus cathartica*)). Therefore, alternative A is resulting in an adverse impact on some forested areas of the refuge. Adverse impacts to other habitat types have not been identified.

Impacts on habitats under alternative B—Service-preferred Alternative
Positive, indirect effects on the vegetation would result from a reduction in the white-tailed deer population. The negative impacts of dense deer populations on forest regeneration and the composition and diversity of the herbaceous understory have been well documented (see Latham et al. 2005 for a summary) and observed at Montezuma (Rawinski 2010 personal communication). Well-managed hunting can effectively control deer and produce striking changes in the forest vegetation (Behrend et al. 1970). Working with the NYSDEC DMAP, as proposed under alternative B, would have a beneficial impact on forested habitats on the refuge. We expect better regeneration of forest canopy species and an increase in the diversity of the herbaceous understory.

Impacts on habitats under alternative C—Spring Turkey Hunt
Same as under alternative B.

2. Community

Under each alternative, the refuge would provide socioeconomic benefits by providing a hunting program which would result in hunters spending money in the local area. The refuge also contributes money to local economies directly by purchasing goods and services within the local community in support of the hunt program.

Currently, more than 150,000 visitors annually come to the refuge. Hunters currently account for over 2,000 visitors (1,800 deer and 300 waterfowl). Hunters would continue to contribute to the local economy through consumption of goods and services, and other expenditures associated with hunt opportunities made available on the refuge.

A detailed analysis and discussion of how money associated with national wildlife refuges makes its way through local economies can be found in, “Banking on Nature 2006: The Economic Benefits to Local Communities of National Wildlife Refuge Visitation” (Carver and Caudill 2007). They estimated that, on average, approximately 4 dollars were generated in the local economy for every dollar spent by the Service.

The refuge would work closely with State, Federal, and private partners to minimize impacts to adjacent lands and associated natural resources; however, no indirect or direct negative impacts

are anticipated. Under alternatives B and C, the newly opened hunts would result in a net gain of public hunting opportunities positively impacting the general public, nearby residents, and refuge visitors. The refuge expects increased visitation and tourism to bring additional revenues to local communities but not a significant increase in overall revenue in any area.

D. Other Past, Present, Proposed, and Reasonably Foreseeable Hunts and Anticipated Impacts

Cumulative effects on the environment result from incremental effects of a proposed action when these are added to other past, present, and reasonably foreseeable future actions. While cumulative effects may result from individually minor actions, they may, viewed as a whole, become substantial over time. The proposed hunt has been designed to be sustainable through time given relatively stable conditions. Changes in refuge conditions, such as sizeable increases in refuge acreage or public use, are likely to change the anticipated impacts of the current proposal and may trigger a new assessment process.

The implementation of the alternative B—Proposed Action would have both direct and indirect effects. An example of an indirect effect is that new hunt site inclusion may result in increased public use, thus increasing vehicular traffic, disturbance, etc. However, the cumulative effects of these actions are not expected to be substantial, especially since hunting both at the refuge as well as the surrounding areas is already a popular activity, the number of hunters is controlled through special use permits, and measures will be taken to monitor and limit access if needed.

Since 1938, Montezuma NWR has grown to 9,184 acres, which include a wide diversity of habitats. This diversity of vegetation provides wildlife with high quality habitat, escape cover to provide safety from predators, including humans; shelter from weather related elements; resting areas; food; and water. The most important consideration in the maintenance of wildlife populations is the protection of their habitat, and protection within a large geographic area, as in the case of the 50,000-acre MWC, is the most effective.

The Service, NYSDEC, and other partners are all working to acquire and restore the historic Montezuma marshes and their adjacent uplands. Habitat restoration fulfills the Service's congressional mandate to preserve, restore, and enhance habitat for threatened and endangered species, songbirds, waterfowl, other migratory birds, resident wildlife, and plants. Habitat restoration would have a positive effect on wildlife populations on the refuge and in some cases well beyond the refuge borders.

Changes to the hunt program in the past decade have been made to open hunting on more land within the refuge. These lands were usually those that had been recently acquired and had been hunted historically. In addition, hunting is monitored, regulated, and designed to ensure that harvest does not reduce populations to unsustainable levels.

E. Anticipated Impacts if Individual Hunts are Allowed to Accumulate (Cumulative Impacts)

The Service has concluded that there would be no significant cumulative impacts on the refuge's wildlife populations, either hunted or nonhunted species, under any of the alternatives. The

Service has also concluded that the alternatives would not cumulatively impact the refuge environment or other refuge programs. This determination was based upon a careful analysis of potential environmental impacts of hunting on the refuge in combination with other habitat projects and visitor service actions.

Hunting is an appropriate wildlife management tool that can be used to manage wildlife populations. Some wildlife disturbance would occur during hunting seasons. Federal and State regulations and additional refuge restrictions, if needed, would minimize any negative impacts to wildlife populations using the refuge.

Hunters would be required to report take of deer, waterfowl, and turkey according to refuge and State regulations and would offer field observations of these and other wildlife. Field checks by refuge law enforcement officers would be planned, conducted, and coordinated with staff and other agencies to maintain compliance with regulations and assess species populations and numbers harvested. Wildlife surveys would be performed periodically to monitor populations of deer, waterfowl and other species of interest.

Montezuma NWR conducts hunting programs within the framework of State and Federal regulations. The proposed hunt proposal has been reviewed and is supported by the NYSDEC. Additionally, the refuge coordinates with the NYSDEC annually to maintain consistent regulations and programs.

VII. Consultation and Coordination

NYSDEC staff has helped write and review this document and support the regulated consumptive public use of the natural resources associated with Montezuma NWR. The Service also provided an in depth review by Regional Office personnel and staff biologists. This document is being released for public review and comment as part of the Montezuma NWR Draft CCP/EA.

VIII. Regulatory Compliance

Comprehensive Conservation Plan and Visitor Services Plan: The Montezuma NWR completed its Comprehensive Conservation Plan in February 2013. Step-down plans such as the Visitor Services Plan that tier off the CCP will follow. In the past, refuge management has been guided by the Station Management Plan.

Compatibility Determinations: Compatibility determinations for the hunt program at Montezuma NWR have been completed, and are included as appendix B of the final CCP (USFWS 2013).

National Environmental Policy Act Documentation: This Environmental Assessment meets the NEPA requirements.

Endangered Species Act Section 7 Evaluation: A Section 7 Evaluation was completed in conjunction with the refuge's CCP.

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X. Appendixes

Appendix A. New York Natural Heritage Program Survey of Rare Plant Species Within Cayuga, Seneca, and Wayne Counties. Exported from *www.dec.ny.gov*.

Common Name	Scientific Name	Distribution Status	State Protection Status
Northern False Foxglove	*Agalinis paupercula* var. *borealis*	Historically Confirmed	Threatened
Yellow Giant-hyssop	*Agastache nepetoides*	Recently Confirmed	Threatened
Woodland Agrimony	*Agrimonia rostellata*	Recently Confirmed	Threatened
Water-plantain	*Alisma gramineum*	Historically Confirmed	
Nodding Wild Onion	*Allium cernuum* var. *cernuum*	Recently Confirmed	Threatened
Hairy Angelica	*Angelica venenosa*	Possible but not Confirmed	
Puttyroot	*Aplectrum hyemale*	Possible but not Confirmed	Endangered
Dragon's Mouth Orchid	*Arethusa bulbosa*	Historically Confirmed	Threatened
Purple Milkweed	*Asclepias purpurascens*	Possible but not Confirmed	
Cooper's Milkvetch	*Astragalus neglectus*	Recently Confirmed	Endangered
Water-marigold	*Bidens beckii*	Historically Confirmed	Threatened
Smooth Bur-marigold	*Bidens laevis*	Possible but not Confirmed	Threatened
Seaside Bulrush	*Bolboschoenus maritimus* ssp. *paludosus*	Recently Confirmed	Endangered
Blunt-lobe Grape Fern	*Botrychium oneidense*	Historically Confirmed	Endangered
New England Northern Reedgrass	*Calamagrostis stricta* ssp. *inexpansa*	Historically Confirmed	Threatened
Tall Bellflower	*Campanulastrum americanum*	Historically Confirmed	
Purple Cress	*Cardamine douglassii*	Recently Confirmed	
Emmons' Sedge	*Carex albicans* var. *emmonsii*	Historically Confirmed	

Common Name	Scientific Name	Distribution Status	State Protection Status
Narrow-leaved Sedge	*Carex amphibola*	Historically Confirmed	Endangered
Brown Bog Sedge	*Carex buxbaumii*	Recently Confirmed	Threatened
Hair-like Sedge	*Carex capillaris*	Historically Confirmed	Endangered
Carey's Sedge	*Carex careyana*	Historically Confirmed	
Creeping Sedge	*Carex chordorrhiza*	Historically Confirmed	Threatened
Creeping Sedge	*Carex chordorrhiza*	Historically Confirmed	Threatened
Northeastern Sedge	*Carex cryptolepis*	Recently Confirmed	
Cypress-knee Sedge	*Carex decomposita*	Historically Confirmed	Endangered
Handsome Sedge	*Carex formosa*	Historically Confirmed	Threatened
Frank's Sedge	*Carex frankii*	Recently Confirmed	Endangered
Elk Sedge	*Carex garberi*	Historically Confirmed	Endangered
Northern Bog Sedge	*Carex gynocrates*	Historically Confirmed	Endangered
Cloud Sedge	*Carex haydenii*	Historically Confirmed	Endangered
James' Sedge	*Carex jamesii*	Historically Confirmed	Threatened
False Hop Sedge	*Carex lupuliformis*	Historically Confirmed	Rare
Troublesome Sedge	*Carex molesta*	Possible but not Confirmed	Threatened
Muhlenberg's Sedge	*Carex muehlenbergii* var. *enervis*	Possible but not Confirmed	
Black Sedge	*Carex nigra*	Possible but not Confirmed	Endangered
Reflexed Sedge	*Carex retroflexa*	Historically Confirmed	Endangered
Sartwell's Sedge	*Carex sartwellii*	Historically Confirmed	Threatened
Schweinitz's Sedge	*Carex schweinitzii*	Historically Confirmed	Threatened
Short's Sedge	*Carex shortiana*	Recently Confirmed	Endangered
Straw Sedge	*Carex straminea*	Historically Confirmed	Endangered
Willdenow's Sedge	*Carex willdenowii*	Historically Confirmed	Threatened
Big Shellbark Hickory	*Carya laciniosa*	Recently Confirmed	Threatened
Scarlet Indian-paintbrush	*Castilleja coccinea*	Historically Confirmed	Endangered

Common Name	Scientific Name	Distribution Status	State Protection Status
American Bittersweet	*Celastrus scandens*	Historically Confirmed	
Spreading Chervil	*Chaerophyllum procumbens*	Historically Confirmed	Endangered
Fairy Wand	*Chamaelirium luteum*	Historically Confirmed	Threatened
Red Pigweed	*Chenopodium rubrum*	Possible but not Confirmed	Threatened
Hair-pointed moss	*Cirriphyllum piliferum*	Recently Confirmed	
Button-bush Dodder	*Cuscuta cephalanthi*	Historically Confirmed	Endangered
Red-rooted Flatsedge	*Cyperus erythrorhizos*	Historically Confirmed	
Rusty Flatsedge	*Cyperus odoratus*	Historically Confirmed	
Schweinitz's Flatsedge	*Cyperus schweinitzii*	Possible but not Confirmed	Rare
Ram's-head Ladyslipper	*Cypripedium arietinum*	Historically Confirmed	Threatened
Lowland Fragile Fern	*Cystopteris protrusa*	Historically Confirmed	Endangered
Little-leaf Tick-trefoil	*Desmodium ciliare*	Possible but not Confirmed	Threatened
Nuttall's Tick-trefoil	*Desmodium nuttallii*	Possible but not Confirmed	Endangered
Small-flowered Tick-trefoil	*Desmodium pauciflorum*	Possible but not Confirmed	Endangered
Velvet Panic Grass	*Dichanthelium scoparium*	Historically Confirmed	Endangered
Log Fern	*Dryopteris celsa*	Historically Confirmed	Endangered
Angled Spikerush	*Eleocharis quadrangulata*	Recently Confirmed	Endangered
Three-ribbed Spikerush	*Eleocharis tricostata*	Historically Confirmed	Endangered
Salt-marsh Spikerush	*Eleocharis uniglumis* var. *halophila*	Historically Confirmed	Threatened
Smooth Scouring Rush	*Equisetum laevigatum*	Extirpated	Endangered
Narrow-leaf Cottongrass	*Eriophorum angustifolium* ssp. *angustifolium*	Historically Confirmed	Endangered
Rough Avens	*Geum virginianum*	Historically Confirmed	Endangered
Kentucky Coffee Tree	*Gymnocladus dioicus*	Recently Confirmed	Endangered
Common Mare's-tail	*Hippuris vulgaris*	Historically Confirmed	Endangered

Common Name	Scientific Name	Distribution Status	State Protection Status
Golden-seal	*Hydrastis canadensis*	Historically Confirmed	Threatened
Shrubby St. John's-wort	*Hypericum prolificum*	Recently Confirmed	Threatened
Twin-leaf	*Jeffersonia diphylla*	Historically Confirmed	Threatened
Butternut	*Juglans cinerea*	Historically Confirmed	
Creamy Wild-pea	*Lathyrus ochroleucus*	Possible but not Confirmed	
Salt-meadow Grass	*Leptochloa fusca* ssp. *fascicularis*	Recently Confirmed	Endangered
Violet Bush-clover	*Lespedeza frutescens*	Historically Confirmed	Rare
Large Twayblade	*Liparis liliifolia*	Historically Confirmed	Endangered
Southern Twayblade	*Listera australis*	Recently Confirmed	Endangered
Hoary Puccoon	*Lithospermum canescens*	Possible but not Confirmed	
Wild Lupine	*Lupinus perennis*	Historically Confirmed	
Basil-balm	*Monarda clinopodia*	Historically Confirmed	Endangered
Southern Water-nymph	*Najas guadalupensis* ssp. *olivacea*	Recently Confirmed	Endangered
Spiny Water-nymph	*Najas marina*	Historically Confirmed	Endangered
Oakes' Evening-primrose	*Oenothera oakesiana*	Possible but not Confirmed	Threatened
Ohio Goldenrod	*Oligoneuron ohioense*	Historically Confirmed	Threatened
Wiry Panic Grass	*Panicum flexile*	Historically Confirmed	Threatened
Swamp Lousewort	*Pedicularis lanceolata*	Historically Confirmed	Threatened
Swamp Smartweed	*Persicaria setacea*	Recently Confirmed	Endangered
Sweet Coltsfoot	*Petasites frigidus* var. *palmatus*	Recently Confirmed	Endangered
Heartleaf Plantain	*Plantago cordata*	Historically Confirmed	Threatened
Orange Fringed Orchid	*Platanthera ciliaris*	Historically Confirmed	Endangered
Hooker's Orchid	*Platanthera hookeri*	Historically Confirmed	Endangered
Eastern Prairie Fringed Orchid	*Platanthera leucophaea*	Historically Confirmed	Endangered
Slender Marsh Bluegrass	*Poa paludigena*	Historically Confirmed	Endangered
Woodland Bluegrass	*Poa sylvestris*	Historically Confirmed	Endangered

Common Name	Scientific Name	Distribution Status	State Protection Status
Erect Knotweed	*Polygonum erectum*	Historically Confirmed	Endangered
Northern Pondweed	*Potamogeton alpinus*	Historically Confirmed	Threatened
Spotted Pondweed	*Potamogeton pulcher*	Historically Confirmed	Threatened
Straight-leaf Pondweed	*Potamogeton strictifolius*	Historically Confirmed	Endangered
Bushy Cinquefoil	*Potentilla paradoxa*	Recently Confirmed	Endangered
Pink Wintergreen	*Pyrola asarifolia* ssp. *asarifolia*	Historically Confirmed	Threatened
Seaside Crowfoot	*Ranunculus cymbalaria*	Historically Confirmed	Endangered
Lake-cress	*Rorippa aquatica*	Historically Confirmed	Threatened
Golden Dock	*Rumex fueginus*	Historically Confirmed	Endangered
Pod Grass	*Scheuchzeria palustris*	Recently Confirmed	Rare
Slender Bulrush	*Schoenoplectus heterochaetus*	Historically Confirmed	Endangered
Low Nutrush	*Scleria verticillata*	Recently Confirmed	Endangered
Wild Pink	*Silene caroliniana* ssp. *pensylvanica*	Possible but not Confirmed	Exploitably Vulnerable
Michaux's Blue-eyed-grass	*Sisyrinchium mucronatum*	Recently Confirmed	Endangered
Bear's-foot	*Smallanthus uvedalius*	Historically Confirmed	Endangered
Small Bur-reed	*Sparganium natans*	Historically Confirmed	Threatened
Pink Wild Bean	*Strophostyles umbellata*	Historically Confirmed	Endangered
Slender Pondweed	*Stuckenia filiformis ssp. alpina*	Historically Confirmed	Endangered
Sheathed Pondweed	*Stuckenia filiformis ssp. occidentalis*	Historically Confirmed	Endangered
Northern Bog Aster	*Symphyotrichum boreale*	Recently Confirmed	Threatened
Lindley's Aster	*Symphyotrichum ciliolatum*	Historically Confirmed	Endangered
Tall White Aster	*Symphyotrichum lanceolatum* var. *interior*	Historically Confirmed	Endangered
White Basswood	*Tilia americana* var. *heterophylla*	Historically Confirmed	
Marsh Arrow-grass	*Triglochin palustre*	Historically Confirmed	Threatened
Nodding Trillium	*Trillium flexipes*	Historically Confirmed	Endangered
Nodding Pogonia	*Triphora trianthophora*	Historically Confirmed	Endangered
Spreading Globeflower	*Trollius laxus*	Historically Confirmed	Rare

Common Name	Scientific Name	Distribution Status	State Protection Status
Cork Elm	*Ulmus thomasii*	Historically Confirmed	Threatened
Hiddenfruit Bladderwort	*Utricularia geminiscapa*	Historically Confirmed	
Lesser Bladderwort	*Utricularia minor*	Possible but not Confirmed	Threatened
Marsh Valerian	*Valeriana uliginosa*	Historically Confirmed	Endangered
Goosefoot Corn-salad	*Valerianella chenopodiifolia*	Possible but not Confirmed	Endangered
Tall Ironweed	*Vernonia gigantea* ssp. *gigantea*	Possible but not Confirmed	Endangered
Neckweed	*Veronica peregrina* ssp. *xalapensis*	Recently Confirmed	
Culver's-root	*Veronicastrum virginicum*	Historically Confirmed	Threatened
Culver's-root	*Veronicastrum virginicum*	Historically Confirmed	Threatened
Northern Bog Violet	*Viola nephrophylla*	Possible but not Confirmed	Endangered

Appendix B. New York Natural Heritage Program Survey of Rare Natural Communities Within Cayuga, Seneca, and Wayne Counties. Exported from *www.dec.ny.gov*.

Natural Community	**Habitat Type**
Calcareous Shoreline Outcrop	Uplands
Dwarf Shrub Bog	Freshwater Nontidal Wetlands
Floodplain Forest	Freshwater Nontidal Wetlands
Great Lakes Aquatic Bed	Lakes and Ponds
Great Lakes Bluff	Uplands
Hemlock-Hardwood Swamp	Freshwater Nontidal Wetlands
Hemlock-Northern Hardwood Forest	Uplands
Inland Salt Marsh	Freshwater Nontidal Wetlands
Inland Salt Pond	Lakes and Ponds
Maple-Basswood Rich Mesic Forest	Uplands
Marl Fen	Freshwater Nontidal Wetlands
Medium Fen	Freshwater Nontidal Wetlands
Red Maple-Hardwood Swamp	Freshwater Nontidal Wetlands
Red Maple-Tamarack Peat Swamp	Freshwater Nontidal Wetlands
Rich Graminoid Fen	Freshwater Nontidal Wetlands
Rich Hemlock-Hardwood Peat Swamp	Freshwater Nontidal Wetlands
Rich Shrub Fen	Freshwater Nontidal Wetlands
Shale Cliff and Talus Community	Uplands
Shallow Emergent Marsh	Freshwater Nontidal Wetlands
Shrub Swamp	Freshwater Nontidal Wetlands
Silver Maple-Ash Swamp	Freshwater Nontidal Wetlands

Appendix F

USFWS

Great Blue Heron at Tschache Pool

U.S. Fish and Wildlife Service
Montezuma National Wildlife Refuge
Land Protection Plan

Table of Contents

List of Maps

List of Tables

Introduction, Purpose, and Scope

This Land Protection Plan (LPP) identifies lands for expanding Montezuma National Wildlife Refuge (NWR, refuge), as described in the U.S. Fish and Wildlife Service's (Service, we, our) final comprehensive conservation plan (CCP) for the refuge. Working with New York State Department of Environmental Conservation (NYSDEC), we delineated a project analysis area totaling approximately 2,156 acres of biologically important land in the Montezuma Wetlands Complex (MWC). The MWC is an area recognized for its role in the conservation of migratory birds, particularly waterfowl. The mission of the MWC is to protect, restore, enhance, and manage wildlife habitat; to preserve and restore ecological integrity for the long-term benefit for wildlife populations and society; and to serve as a model for landscape-level restoration and ecosystem management. The lands in the project analysis area have been identified for protection already and include lands currently owned by the Service and areas originally proposed for acquisition by New York State. Our main reason for proposing an expansion is to improve our ability to administer refuge boundaries by avoiding a patchwork of ownership between New York State and the Service.

The purposes of this LPP are to:

- Announce our intent to expand the boundary of the refuge.
- Provide landowners and the public with an outline of Service policies, priorities, and protection methods for land in the project area.
- Assist landowners in determining whether their property lies within the project area.
- Inform landowners about our long-standing policy of acquiring land only from willing sellers. We will not buy any lands or acquire easement rights if the owners are not interested in selling.

The LPP presents the methods the Service and interested landowners can use to accomplish their objectives for wildlife habitat. Map F.1 shows the previous approved refuge acquisition boundary, the project analysis area, and the land parcels in the project analysis area. A corresponding table (table F.4) identifies each parcel, its tax map number, acreage, and our priority and recommended option for acquiring and protecting its habitat.

The scope of this document is limited to the proposed acquisition of lands for the expansion of Montezuma NWR as identified in this document. It is not intended to cover the development or implementation of detailed, specific programs for the administration and management of those lands. Overall, we expect that new lands would be managed in much the same manner (with regards to natural resources, public use, etc.) as what is proposed in the refuge's final CCP.

Project Description

Original Approved Refuge Acquisition Boundary

The refuge lies in central New York, in Cayuga, Seneca, and Wayne Counties, between the cities of Rochester and Syracuse. We own 9,184[1] acres of the 19,510 acres in the previous approved acquisition boundary. Refuge habitats include emergent marshes, mudflats, open water, bottomland floodplain forest, old fields, shrublands, croplands, grasslands, and successional and mature upland forest. Signature species include a variety of waterfowl, shorebirds, and migratory songbirds, as well as bald eagle (*Haliaeetus leucocephalus*) and osprey (*Pandion haliaetus*).

In 1937, the Bureau of Biological Survey (the precursor to the Service) purchased lands just north of Cayuga Lake. This area had supported the "Montezuma Marsh." These lands were drained when the Seneca River was lowered by the construction of a lock and dam at the northern end of Cayuga Lake (Gable 2004). The following year, on September 12, 1938, the Montezuma Migratory Bird Refuge was established through Executive Order 7971, signed by President F.D. Roosevelt (3 FR 2235). Hence, migratory birds continue to be the primary focus of our management efforts, in accordance with the central purpose of the refuge, as defined by the executive order under which we were established, "...as a refuge and breeding ground for migratory birds and other wildlife...." For other lands acquired under the Migratory Bird Conservation Act (16 U.S.C. 715-715r), as amended, the purpose of acquisition was: "...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds."

The previous approved acquisition boundary of 19,510 acres is the result of the executive order that created the refuge, a major expansion of the boundary as detailed in an Environmental Impact Statement (EIS) conducted by the Service with NYSDEC acting as a co-lead agency (USFWS and NYSDEC 1991), and several minor expansions that were conducted via NEPA categorical exclusions. The 1991 EIS was prepared for the expansion of existing lands managed by the Service and the NYSDEC. Following guidelines drawn from the North American Waterfowl Management Plan (NAWMP 2004), this expansion addressed goals and objectives for accomplishing conservation and management within a 154,880-acre focus area.

Once an acquisition boundary is established, the Service can acquire lands under a variety of statutory authorities (Refuge Manual 3 RM 1.3). To date, the Service has acquired interests in 9,184 acres for the refuge under the following authorities (see table F.1):

1. Emergency Wetlands Resources Act of 1986 [16 U.S.C. 3901(b)]
2. Migratory Bird Conservation Act [16 U.S.C. 715d]
3. Fish and Wildlife Act of 1956 [16 U.S.C. 742f(a)(4)]

[1] Acreages are current as of October 2012.

Table F.1. History of Land Acquisition at the Montezuma NWR Through October 2012.

Acquisition Date	Acreage[1]	Funding Source[2]
1937	2,564	MBCF[2]
1938	2,354	MBCF
1939	544	MBCF
1940	444	MBCF
1941	279	MBCF
1942	34	MBCF
1945	6	None
1959	176	MBCF
1963	27	MBCF
1965	16	MBCF
1993	53	MBCF
1995	397	MBCF
1996	186	MBCF
1997	54	MBCF
1998	608	MBCF
1999	142	MBCF
2000	87	MBCF
2001	387	MBCF, LWCF[3]
2002	75	MBCF, LWCF
2004	80	LWCF
2005	106	LWCF
2006	64	MBCF
2007	381	MBCF
2008	26	LWCF
2009	63	MBCF
2012	31	MBCF
Total	**9,184**[4]	

[1] Acres are rounded to whole numbers. Includes lands that were donated to the U.S. Fish and Wildlife Service.
[2] MBCF – Migratory Bird Conservation Fund
[3] LWCF – Land and Water Conservation Fund
[4] Total includes about 402 acres that are held in conservation easements.

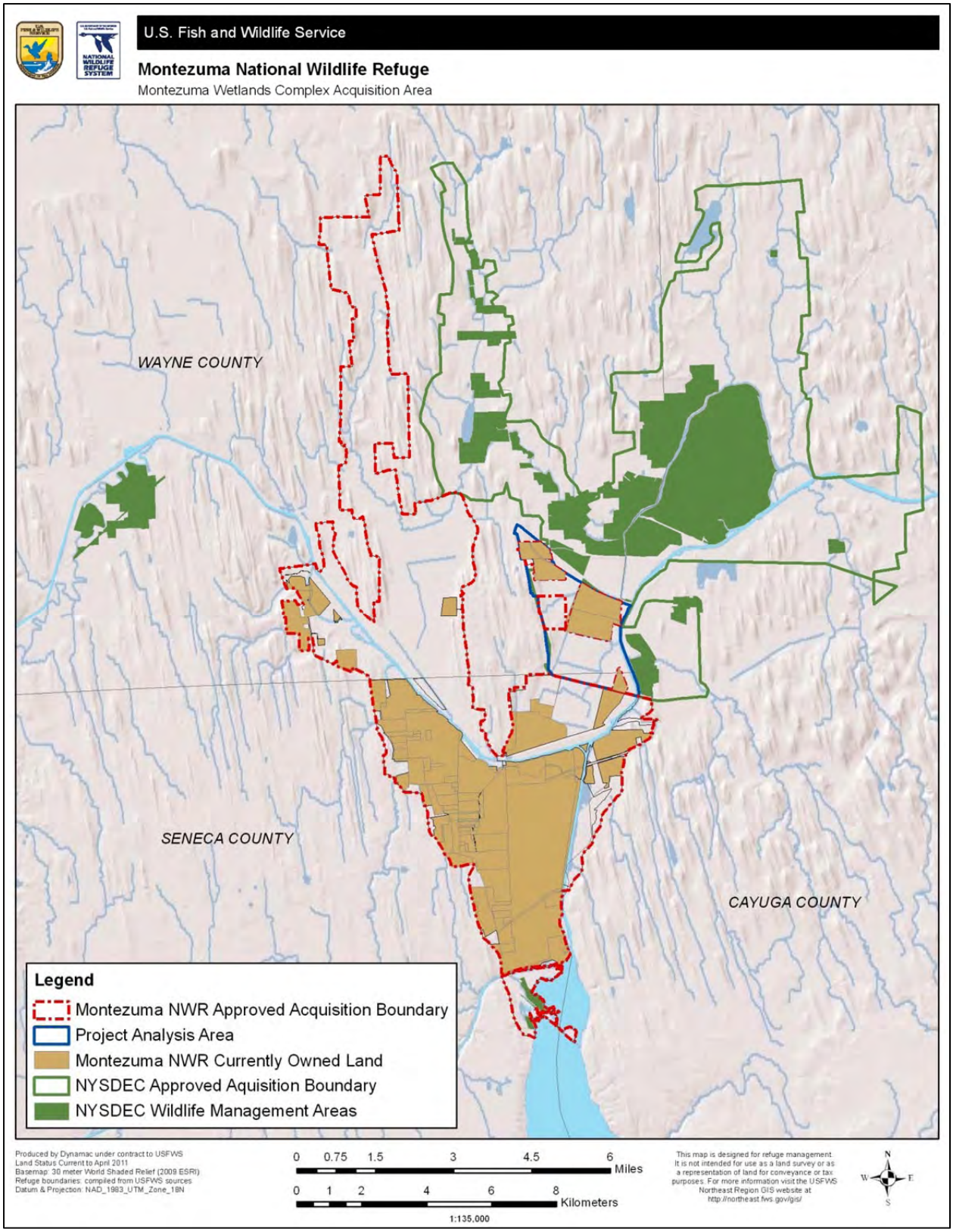
Project Analysis Area

The project analysis area is located in the MWC, between the towns of Savannah and Montezuma just north of the New York State Thruway (Interstate 90) and contains cultivated croplands (also known as mucklands), forests, and riparian areas (see map F.1). It lies in the project area identified by the Service and its partners in the 1991 EIS for the Northern Montezuma Wetlands Project (USFWS and NYSDEC 1991). The Record of Decision for the 1991 EIS established a joint Service and NYSDEC acquisition area of nearly 50,000 acres and a division line between the Federal area of interest and the State area of interest. The boundary of this division line was initially determined to be roughly the State Route 31 corridor in the eastern and central sections of three key drainage areas, with the entire westernmost drainage within the

Service area of interest. Areas to the north of this division line were designated for NYSDEC acquisition and management and areas to the south were designated for Service acquisition and management (see map F.1). The Service acquisition boundary was formalized through an LPP which was approved in 1994 (USFWS 1994). In recent years, in cooperation with NYSDEC, the Service has acquired certain parcels just north of State Route 31, in an area previously identified for acquisition by the State. This is how several units above State Route 31 have come under Service ownership. Two additional parcels north of State Route 31, totaling 208 acres, were added to the refuge's previous acquisition boundary, but we have yet to acquire interests in those parcels.

During internal scoping for the refuge's CCP, we examined the possibility of expanding the refuge's acquisition boundary. After consulting with NYSDEC, the two agencies agreed that an adjustment of the refuge's acquisition boundary would be beneficial. We worked closely with NYSDEC to identify additional parcels for Service acquisition. As stated previously, our intent was to facilitate management and avoid public confusion by consolidating ownership. We specifically excluded current NYSDEC lands, as those are already being managed for the protection of wildlife and public use. We have identified approximately 1,431 acres near the northeast section of the refuge for acquisition from willing sellers. This includes: (1) 1,223 acres which we have added to the refuge's approved acquisition boundary, and (2) two parcels (totaling about 208 acres) that were previously added to the approved acquisition boundary, but which were never actually acquired. This minor boundary expansion is made with the support and approval of NYSDEC (see attachment 2).

Much of the mucklands, once restored, would provide valuable wetlands which would support a variety of migratory waterfowl, shorebirds, and marshbirds. Similarly, riparian corridors may need to be reforested to further benefit wildlife. In addition, habitat fragmentation would be decreased, benefitting species that require large intact areas. Furthermore, the refuge already owns several parcels in the project analysis area, and acquiring the remaining parcels would consolidate the Service's land base, greatly simplifying management and avoiding a patchwork of State and Federal ownership that could be confusing to the public.



Map F.1. Montezuma Wetlands Complex Acquisition Area.

Status of Resources to be Protected

Wildlife and Habitat Resources

The MWC has been recognized as an important bird conservation area by many conservation organizations and has been highlighted in many conservation plans including: North American Bird Conservation Plan -Bird Conservation Region 13, Partners in Flight Plan, Audubon New York's Important Bird Area Program, and New York State Comprehensive Wildlife Conservation Strategy. Restoration of mucklands would improve the habitat not only for migrating ducks but also for breeding marshbirds, including species of conservation concern such as the pied-billed grebe (*Podilymbus podiceps*), least bittern (*Ixobrychus exilis*), American bittern (*Botaurus lentiginosus*), and black tern (*Chlidonias niger*). Most of the remaining lands are forested and dominated by ashes (*Fraxinus* spp.) and maples (*Acer* spp.). The forested tracts support species of conservation concern such as cerulean warbler (*Dendroica cerulean*), wood thrush (*Hylocichla mustelina*), bald eagle, and Baltimore oriole (*Icterus galbula*). Vegetation and wildlife inventories have not been completed on the privately owned parcels. Restoring these lands to forest, grassland, shrubland, or emergent marsh, would help connect these habitats with similar areas located on lands already owned by the Service (see map F.3) and our partners. The MWC also supports the second highest concentration of cerulean warblers in New York, with 87 singing males found in the Howland's Island area, 77 males found near May's Point Pool, and 20 males found in the Mud Lock area near Routes 5 and 20 (Rosenberg et al. 2000).

The MWC is already one of the largest staging areas for waterfowl migration in the Northeast, supporting over 700,000 birds that pass through on their spring and fall migrations. This includes 320 bird species, 117 of which are known to nest on the refuge. Refuge staff and volunteers conducted counts of migratory birds on the refuge 1 day a week during spring and fall migration from 1990 to 2010. During that time, highest daily counts for the following species were: 18,500 Canada geese, 12,000 canvasback ducks, and 2,650 northern pintails during spring migration and 31,300 Canada geese, 8,000 canvasback ducks, and 4,000 northern pintails during fall migration (*www.ebird.org* and USFWS, unpublished data).

Much of the land not yet owned by the Service in the area is muckland and is currently being farmed. The lands identified for acquisition includes 1,431 acres of non-refuge lands, 725 acres are cultivated crops (aka mucklands), and 28 acres are emergent herbaceous wetlands (see table F.5 for all of the habitat types). Because of their soil composition and the loss of wetland habitats within the region, we would likely restore the mucklands to emergent marsh after acquisition. There are 28 acres identified for acquisition that are currently categorized as emergent marsh, yielding a projected total of 753 acres of emergent marsh once all mucklands within the project analysis area are acquired and restored.

Based on data from the refuge's Main Pool collected in 2010 (USFWS, unpublished data), we estimated that the projected 753 acres of emergent marsh could support 11,750 migratory waterfowl in the spring, and about 23,000 migratory waterfowl in the fall. These estimates are based on daily high counts in the Main Pool, all species combined.

The refuge also provides important breeding habitat for marshbirds. The emergent marsh attracts several species of marshbirds, including rails, bitterns, and terns, and are an important food

source for migrating waterfowl. The number of marshbird pairs on the refuge was recorded during callback surveys in 2011 (see table F.2). Based on these data, the refuge is capable of supporting a maximum of 90 pairs of marshbirds per 100 acres of emergent marsh. Assuming all of the 725 acres of farmland within the project analysis area are restored to emergent marsh after acquisition and the existing 28 acres of emergent marsh remain, we estimate a maximum of 686 pairs of marshbirds could be supported by these lands (table F.2).

Table F.2. Estimated number of marshbird pairs per 100 acres of emergent marsh habitats on the Montezuma National Wildlife Refuge and estimated total number of marshbird pairs that could be supported in the expansion area, after restoration.

Species	Estimated # of pairs per 100 acres of marsh[1]	Estimated # of pairs within restored farmlands (753 acres of marsh)	New York State T&E[2]	USFWS BCC Region 5[3]	BCR 13[4]	Waterbird Plan[5]	NY Comprehensive Wildlife Conservation Strategy Priorities[6]
American Bittern	18.4	139		X	H	H	X
American Coot	7.4	56					
Black Tern	3.3	25	E		M	M	X
Common Gallinule	25.8	194				M	
Least Bittern	3.7	28	T	X	M	H	X
Pied-billed Grebe	22.1	166	T	X	M	H	X
Sora	5.2	39				H	
Virginia Rail	5.2	39			M	M	
Total	91.1	686					

[1] Estimate is based on 2011 breeding surveys at Montezuma National Wildlife Refuge (USFWS 2011, unpublished data).
[2] New York State T&E = State of New York Threatened and Endangered Species List: T=Threatened, E=Endangered, SC=Special Concern.
[3] U.S. Fish and Wildlife Service Division of Migratory Birds. Birds of Conservation Concern for Region 5, December 2008.
[4] BCR 13 = Bird Conservation Region 13: Lower Great Lakes/St. Lawrence Plain. HH=Highest Priority, H=High Priority, M=Medium Priority (ACJV 2007).
[5] Upper Mississippi Valley/Great Lakes Watershed Conservation Plan. Priorities: HI=Highly Imperiled; H=High; M=Moderate; L=Low; NR=Not at Risk; TD=To be Determined.
[6] New York State Comprehensive Wildlife Conservation Strategy (2005). X=Species of greatest conservation concern.

Other species will benefit from the woody wetlands and deciduous forest, which account for 453 acres of the project. Both land cover types provide diverse habitat for wildlife and support foraging and breeding habitat for a variety of waterfowl, such as the wood duck in woody wetlands, migratory songbirds, such as the cerulean warbler, and amphibians and bats. In

addition to these land cover types, pasture and hay land will most likely be restored to grassland, shrubland, or forest.

There are several other wildlife species located in the refuge and within the MWC that would benefit as well. Montezuma NWR has many mammal species, including river otters (*Lontra Canadensis)*, of which 21 were released at 3 different locations in the northern MWC in 1995 in an effort to reintroduce them to the area. Several frog, toad, snake, and turtle species have been recorded on the refuge, and there is potential for the refuge to provide habitat for a number of other reptile and amphibian species. Additionally, in 2003 a baseline fish inventory was conducted, which yielded 37 species of fish (Foust 2003).

Strategic Habitat Conservation

This land would help support strategic habitat conservation goals by helping to achieve specific population objectives for surrogate species in this region, once identified. By monitoring the number of waterfowl and other species on the refuge, refuge staff can continually evaluate these species to determine how refuge management and restoration efforts are contributing and to adjust conservation methods and practices if needed. Strategic habitat conservation allows the refuge to contribute to local and regional conservation priorities and goals by working with partners and the MWC. This allows the refuge to connect project- and site-specific efforts to larger biological goals and outcomes across the region and continent.

Threats to the Resource

The following section describes ongoing threats to natural resources in the vicinity of the project analysis area, based on information derived from the New York State Comprehensive Wildlife Conservation Strategy (NYSDEC 2005). This area lies in the much larger Southeast Lake Ontario Basin (see chapter 3 of the refuge's final CCP for a map and additional information on this landscape feature).

Habitat Loss and Degradation

The loss, alteration, and fragmentation of habitat all pose the greatest threats to wildlife in the Southeast Lake Ontario Basin (NYSDEC 2005). Fragmentation alters the habitat by breaking up large, contiguous blocks into smaller patches that are unsuitable for area-sensitive species. New roads fragment habitats and create barriers to animal movements between habitats. This threat affects both terrestrial and aquatic species, and includes hardening of the landscape with buildings and roads, but can also result from activities like land clearing and wetland draining for agriculture and mining. Although wetland drainage for agriculture is not presently occurring to a large extent in the basin, the impacts of past drainage are still an issue, particularly in the MWC and surrounding areas. Preserving and restoring the large, contiguous blocks of habitat that remain in the basin and maintaining their connectivity are crucial for the long-term viability of populations of area-sensitive wildlife. The discontinuity of emergent and forested wetlands, along with the loss of other suitable corridors, primarily affects species that are less likely to move between suitable habitats (e.g., amphibians, turtles). In addition, the alteration of waterways and wetlands, in combination with increased human encroachment into those riparian areas, affect all wetland-dependent species and species groups.

Contaminants and Degradation of Water Quality

Water quality dictates, to a large extent, the types and diversity of species that are able to thrive in a water body. Primary contaminants in the basin include road salt, sewage effluent, and pesticides. Chloride contamination from road salts is a concern in some of the smaller lakes and streams. Several of the lakes and many tributary streams receive discharge from sewage treatment plants in the basin. Those discharges contain nutrients, heavy metals, and endocrine (hormone) disrupting compounds. Low dissolved oxygen levels are a continuing problem for aquatic species in Onondaga Lake and the Seneca River, due in part to phosphorus loading from the county sewage treatment plant. Pesticide use on agricultural lands is of concern to reptiles, amphibians, insects, mussels, and freshwater crustacea. Agricultural pesticides are generally nonspecific in their action, often killing benign and beneficial invertebrate species (including pollinating insects) as well as the target pests. Amphibians are particularly susceptible to pesticides and other toxins. The emergence of West Nile Virus in the past few years and the persistence of Eastern Equine Encephalitis in central New York have led to widespread pesticide use in the control of mosquitoes in many wetland areas. These insecticides can be toxic to amphibians. These insecticides can also affect amphibians by depleting their natural food sources (NYSDEC 2005).

Invasive Species

Invasive (nonnative) species have the potential to negatively influence native species through habitat alteration (which can change ecological processes), resource competition, predation, or any combination of these factors. All major habitats in the basin are affected by invasive species. Notable invasive aquatic species include common carp (*Cyprinus carpio*), round goby (*Neogobius melanostomus*), lamprey (*Petromyzon marinus*), and zebra mussel (*Dreissena polymorpha*). Invasive terrestrial species include purple loosestrife (*Lythrum salicaria*), mute swan (*Cygnus olor*), and the emerald ash borer (*Agrilus planipennis*). Typically, invasive species cannot be eradicated once they become established, and perpetual and costly control efforts become an integral management component.

Some native species also can cause harm to the environment, usually as a result of high population densities due to human-induced habitat changes. For example, white-tailed deer (*Odocoileus virginianus*) numbers are considered higher than optimal in some areas, a result of increased habitat provided by patchwork of forests and fields, as well as other factors. When overabundant, deer can overbrowse areas, reducing the habitat value to other species, some of which may be rare. Other examples of native species that can be considered pests include muskrat (*Ondatra zibethicus*), beaver (*Castor Canadensis*), and Canada goose (*Branta canadensis*). As with deer, these species have benefitted from land cover alterations, declines in some predator populations, and other causes, allowing them to sometimes reach densities where they can become destructive to habitats, rare species, and infrastructure, requiring their populations to be managed at sustainable levels.

Climate Change

The climate and hydrology of the Great Lakes create unique environmental conditions that support a diversity of wildlife species and communities (TNC 2000). Substantial changes as a result of climate change are anticipated. It is projected that by 2025, spring and summer temperatures in the Great Lakes region are likely to be 3 to 4 °F above current averages (Kling et

al. 2003). Precipitation is also expected to increase between 10 and 20 percent, with winter and spring rain increasing and summer rain decreasing by up to 50 percent. These changes in precipitation may result in more frequent floods and droughts (Inkley et al. 2004).

As discussed in the refuge's CCP (USFWS 2012), refuge staff will work to first understand how climate change might be affecting hydrology, habitats, and wildlife. The information yielded from baseline surveys and monitoring efforts will then be used to develop specific adaptation and mitigation strategies to minimize the impacts of a changing climate on refuge resources. As part of this process, the refuge will continue to evaluate results of plant and wildlife surveys every 5 years and may coordinate with the National Phenology Network to document potential changes related to climate change on the refuge and broader geographic scales.

Continuing Partnership Effort

The threats to the resources described above make preserving land in the MWC crucial and challenging. We recognize the need to collaborate with other conservation organizations in the region, NYSDEC in particular, as they were the colead agency in the development of the Northern Montezuma Wetlands Project Final EIS (USFWS and NYSDEC 1991). The primary purpose of the EIS was to help protect portions of the MWC through partnerships. Many agencies, organizations and individuals (e.g., The Nature Conservancy, New York State Conservation Council, Farm Bureau) contributed to the EIS and are helping to implement it. We would continue to work with our partners to successfully implement the EIS and, if approved, this LPP.

Acquiring these additional lands would further the Service's mission by preserving and enhancing lands and waters in a manner that would conserve the natural diversity of fish, wildlife, plants, and their habitats for present and future generations. Acquiring these lands would also further the refuge's purposes. By restoring mucklands, reestablishing healthy forests, and reducing erosion, sedimentation and nonpoint source pollution, we would be able to maintain and enhance habitats for migratory birds, fish, and State and federally listed species. Furthermore, adding trails, wildlife observation areas, an auto tour route, fishing and hunting access points and lands, and interpretation and education would increase the opportunities for public, wildlife-dependent recreation. Without protection, those lands are unlikely to support (or be restored to support) fish and wildlife populations and, by default, would no longer support opportunities for compatible, wildlife-dependent recreation.

Action and Objectives

Authorities for Modifying the Refuge's Original Acquisition Boundary

We anticipate that the Service would continue to acquire lands under the same authorities that have been used to acquire lands in the past. Based on the refuge purpose, lands could also be acquired under several other statutory authorities, including but not limited to:

1. Refuge Recreation Act [16 U.S.C. 460K-1]
2. Endangered Species Act [16 U.S.C. 1534]

3. National Wildlife Refuge System Administration Act [16 U.S.C. 668dd(b)]

We expect that land acquisition within the expansion area would be funded in a manner similar to previous land acquisitions for the refuge.

Land Status of Project Analysis Area

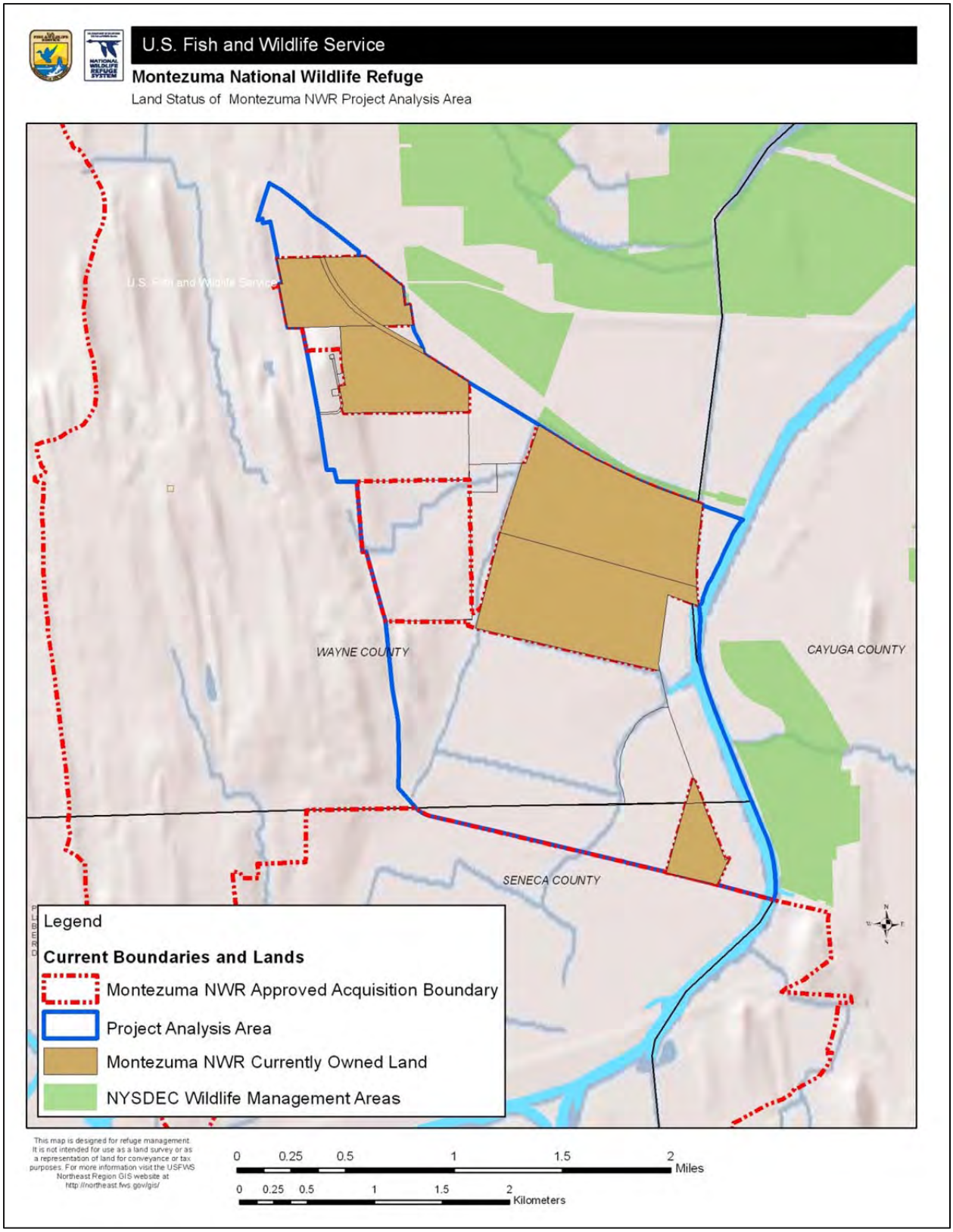
We analyzed a 2,166-acre area at the intersection of Cayuga, Seneca, and Wayne Counties depicted in map F.2. This area contains six parcels that are already owned by the refuge in fee title and total 735 acres, and two parcels totaling about 217 acres that were previously added to the refuge's approved acquisition boundary but which were never actually acquired. Although within the refuge's previous acquisition boundary, these two parcels are incorporated into this proposal as nonrefuge lands. There are 1,431 acres of nonrefuge lands that are under various other ownerships and would potentially be available for acquisition (see table F.3).

Table F.3. Land Status and Approximate Acreages for Tri-County Project Analysis Area.

Land Status in Project Analysis Area	Acreage (rounded to nearest acre)			
	Cayuga County	Seneca County	Wayne County	Total
Service-owned Lands	0	36	699	**735**
Nonrefuge Lands	27	196	1,208	**1,431**
			Total	**2,166**

Land Cover and Land Use

Although habitat types have been defined for lands owned by the refuge, vegetative community types were not available for unowned lands during development of this LPP. We used land cover types defined by the Multi-Resolution Land Characteristics (MRLC) Consortium (Homer et al. 2004) instead. The land cover data used was developed in 2001, and although land use alterations have resulted in some changes to the area's land cover, we believe it provides an adequate approximation of current conditions for the purposes of this LPP. Table F.4 summarizes the general types of land cover of the area within and around the project analysis area (see map F.3 for land cover types and distributions). In 2001, cultivated crops were the dominant land cover type, followed by woody wetlands, deciduous forest, and pasture/hay. Shrub/scrub, emergent herbaceous wetlands, and open water each contributed less than 5 percent of the total cover. These land cover types are found in similar percentages in the nonrefuge lands see table F.4).



Map F.2. Land Status of Project Analysis Area in Cayuga, Seneca, and Wayne Counties, NY.

Table F.4. Land Cover Acreages in the Project Analysis Area Located in Cayuga, Seneca, and Wayne Counties, New York.

Land Cover Type[1]	Entire Project Analysis Area (acres)	Percent	Nonrefuge Land (acres)s	Percent	Refuge Lands (acres)	Percent
Cultivated crops	1,208	56	725	51	471	64
Woody Wetlands	460	21	306	21	148	20
Deciduous Forest	176	8	117	8	66	9
Pasture/Hay	108	5	114	8	7	1
Developed Land	86	4	71	5	22	3
Shrub/scrub	64	3	56	4	7	1
Emergent Herbaceous Wetlands	43	2	28	2	7	1
Open Water	21	1	14	1	7	1
Total	**2,166**	**100%**	**1,431[2]**	**100%**	**735**	**100**

[1] ***Description of Land Cover Classes:***

Cultivated Crops—Areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton, and also perennial woody crops such as orchards and vineyards. Crop vegetation accounts for greater than 20 percent of total vegetation. This class also includes all land being actively tilled.

Deciduous Forest—Areas dominated by trees generally greater than 15 feet tall, and greater than 20 percent of total vegetation cover. More than 75 percent of the tree species shed foliage simultaneously in response to seasonal change.

Developed—Includes areas with a mixture of constructed materials and planted vegetation (lawns, city parks, golf courses, etc.). Impervious surfaces range from 20 to 100 percent of total cover.

Emergent Herbaceous Wetlands—Areas where perennial herbaceous vegetation accounts for greater than 80 percent of vegetative cover and the soil or substrate is periodically saturated with or covered with water.

Open Water—All areas of open water, generally with less than 25 percent cover of vegetation or soil.

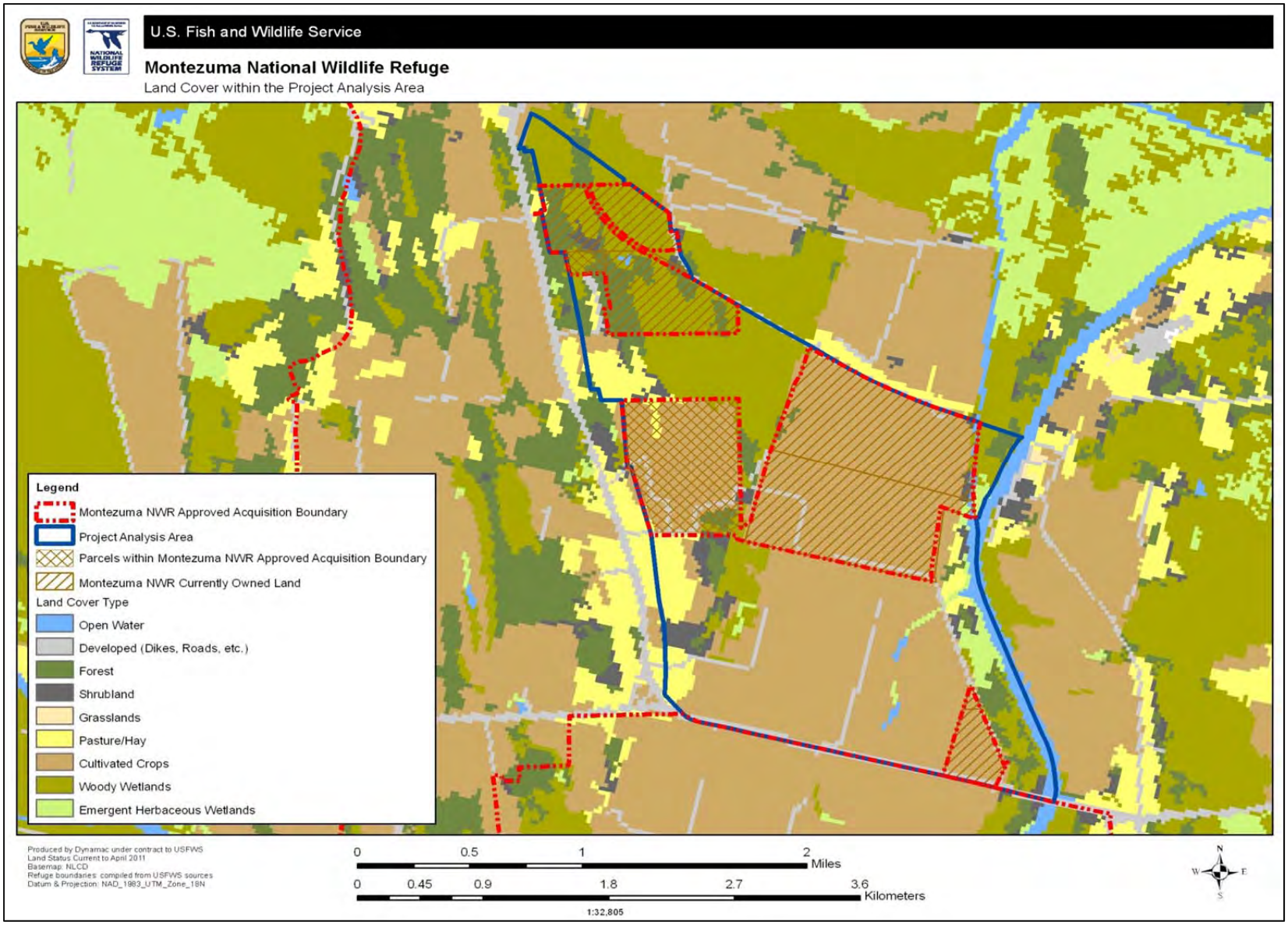
Pasture/Hay—Areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20 percent of total vegetation.

Shrub/Scrub—Areas dominated by shrubs; less than 15 feet tall with shrub canopy typically greater than 20 percent of total vegetation. This class includes true shrubs, young trees in an early successional stage, or trees stunted from environmental conditions

Woody Wetlands—Areas where forest or shrubland vegetation accounts for greater than 20 percent of vegetative cover and the soil or substrate is periodically saturated with or covered with water

Source: Homer et al. 2004

[2]This includes approximately 217 acres which were previously added to the refuge's acquisition boundary but which were never actually acquired.



Map F.3. Land Cover and Use Within the Project Analysis Area.

Land Protection Priorities

Most of the lands we have identified for future acquisition currently have (or could have, upon restoration) important resource values and high potential for helping support a range of migratory birds, in accordance with fulfilling the purpose of the refuge. Hence, our process for prioritizing future acquisitions is based on the current (or potential) value of priority habitats (e.g., emergent marsh or mucklands that can be restored, riparian habitats, etc.) which are described in detail in the CCP. In addition, we would also focus on areas adjacent to lands currently owned by the Service, thereby further ensuring habitat connectivity between the refuge and surrounding conservation lands. In general, the availability of land from willing sellers, and the availability of funding at that time would influence the actual order of land acquisition. However, as landowners offer us parcels, and as funds become available, we would base the priority for acquisition on several factors. Furthermore, our intention is to minimize the need to acquire residences and buildings on these lands, while protecting and restoring habitat, so we would evaluate those parcels on a case-by-case basis. We have assigned those lands one of the following three priority categories:

Priority 1: Parcels that are dominated by emergent marsh or mucklands (that can be restored).

Priority 2: Parcels that contain a high percentage of riparian wetlands.

Priority 3: Parcels adjacent to currently owned refuge lands.

Protection Options

We would use the following options to implement this LPP:

Option 1: No Service action

Option 2: Fee acquisition by the Service

Option 2: Less-than-fee acquisition by the Service

Option 3: Management of land owned by others

Service policy in acquiring land is to acquire only the minimum interest necessary to meet refuge goals and objectives, and acquire it only from willing sellers. Our proposal includes a combination of options 2, 3, and 4 above. We believe this approach offers a cost-effective way of providing the minimal level of protection needed to accomplish refuge objectives while also attempting to meet the needs of landowners.

Option 1. No Service Action

In option 1, we would not expand the refuge acquisition boundary or otherwise attempt to protect and manage additional habitat in the vicinity of the refuge. The draft CCP evaluated this option as part of alternative A, Current Management. We did not select this as our proposal because it would result in fragmented ownership between NYSDEC and the Service, and would likely decrease opportunities to conserve and restore these areas to benefit plants and animals within the MWC.

Option 2. Fee Acquisition

Under option 2, we would acquire parcels in fee title from willing sellers, thereby purchasing all rights of ownership. This option provides us the most flexibility in managing priority lands, and ensuring the protection in perpetuity of trust resources. Generally, the lands we would consider purchasing would require active management (e.g., wetland restoration, controlling invasive species, mowing or prescribed burning, planting, or managing for the six priority public uses). Hence, we anticipate that the use of fee acquisition would be the primary method through which we would protect lands identified herein.

Option 3. Less-than-fee Acquisition

Under option 3, we would protect and manage land by purchasing only a partial interest, typically in the form of a conservation easement. This option leaves the parcel in private (or other public) ownership, while allowing us control over the land use in a way that enables us to meet our goals for the parcel or that provides adequate protection for important adjoining parcels and habitats. Some of the lands along the Erie Canal and currently owned by the New York State Canal Corporation, could qualify as option 2 lands. The structure of such easements would provide permanent protection of existing wildlife habitats while also allowing habitat management or improvements and access to sensitive habitats, such as for endangered species or migratory birds. It may also allow for public use where appropriate. We would determine, on a case-by-case basis, and negotiate with each landowner, the extent of the rights we would be interested in buying. Those may vary, depending on the configuration and location of the parcel, the current extent of development, the nature of wildlife activities in the immediate vicinity, the needs of the landowner, and other considerations.

In general, any less-than-fee acquisition would maintain the land in its current configuration with no further subdivision. Easements are a property right, and typically are perpetual. If a landowner later sells the property, the easement continues as part of the title. Properties subject to easements generally remain on the tax rolls, although the change in market value may reduce the assessment. The Service does not pay refuge revenue sharing on easement rights. Where we identify conservation easements, we would be interested primarily in purchasing development and some wildlife management rights. Easements are best when:

- Only minimal management of the resource is needed, but there is a desire to ensure the continuation of current undeveloped uses and to prevent fragmentation over the long-term and in places where the management objective is to allow vegetative succession.
- A landowner is interested in maintaining ownership of the land, does not want it to be further developed, and would like to realize the benefits of selling development rights.
- Current land use regulations limit the potential for adverse management practices.
- The protection strategy calls for the creation and maintenance of a watershed protection area that can be accommodated with passive management.
- Only a portion of the parcel contains lands of interest to the Service.

The determination of value for purchasing a conservation easement involves an appraisal of the rights to be purchased, based on recent market conditions and structure in the area. “Acquisition Methods”, below, further describes the conditions and structure of easements.

Option 4. Management or Acquisition by Others

Although it is unlikely that we would rely heavily on this protection option for reasons previously discussed, we would consider it on a case-by-case basis.

Acquisition Methods

We may use three methods of acquiring either a full or a partial interest in the parcels identified for Service acquisition: (1) Purchase (e.g., complete title, or a partial interest like a conservation easement), (2) donations, and (3) exchanges.

Purchase

For most of the tracts in the boundary, the proposed method is listed as Fee or Easement; however, the method we ultimately use also depends on the landowner's wishes.

Fee purchase involves buying the parcel of land outright from a willing seller in fee title (all rights, complete ownership), as the availability of funding allows.

Easement purchase refers to the purchase of limited rights (less than fee) from an interested landowner. The landowner would retain ownership of the land, but would sell certain rights identified and agreed upon by both parties. The objectives and conditions of our proposed conservation easements would recognize lands for their importance to wildlife habitat or outdoor recreational activities, and any other qualities that recommend them for addition to the Refuge System.

Donation

We encourage donations in fee title or conservation easement in the approved areas. We are not aware currently of any formal opportunities to accept donations of parcels in our acquisition boundary.

Exchange

We have the authority to exchange land in Service ownership for other land that has greater habitat or wildlife value. Inherent in this concept is the requirement to get dollar-for-dollar value with, occasionally, an equalization payment. Exchanges are attractive because they usually do not require purchase funds; however, they also may be very labor intensive and take a long time to complete.

Service Land Acquisition Policy

Once a refuge acquisition boundary has been approved, we contact landowners within the approved acquisition boundary to determine whether any are interested in selling. If a landowner expresses an interest and gives us permission, and funding is available, a real estate appraiser would appraise the property to determine its market value. Once an appraisal has been approved, we can present an offer for the landowner's consideration.

Our long established policy is to work with willing sellers as funds become available. We would continue to operate under that policy. Appraisals conducted by Service or contract appraisers

must meet Federal as well as professional appraisal standards. Federal law requires us to purchase properties at their market value for highest and best use, which typically is based on comparable sales of similar types of properties.

Since the land in the acquisition boundary is already protected by the MWC, we based the acquisition boundary on maximizing administrative effectiveness. Once the acquisition boundary is approved, the Service has the authority to negotiate with landowners that may be interested or may become interested in selling their land in the future. With those internal approvals in place, the Service can react more quickly as important lands become available. Lands in that boundary do not become part of the refuge unless their owners sell or donate them to the Service.

A landowner may choose to sell land to the Service in fee simple and retain the right to occupy an existing residence. That is called a "life use reservation." It applies during the seller's lifetime, but can also apply for a specific number of years. At the time we acquire the parcel, we would discount from the appraised value of the buildings and land the value of the term of the reservation. The occupant would be responsible for the upkeep on the reserved premises. We would own the land, and pay revenue sharing to the appropriate taxing authority.

In rare circumstances, at the request of a seller, we can use "friendly condemnation." Although the Service has a long-standing policy of acquiring land only from willing sellers, it also has the power of eminent domain, as do other federal agencies. We use friendly condemnation when the Service and a seller cannot agree on property value, and both agree to allow a court to determine fair market value. When we cannot determine the rightful owner of a property, we also may use friendly condemnation to clear title. We do not expect to use friendly condemnation very often, if at all. We would not use condemnation otherwise, as it counters good working relations with refuge neighbors and the public.

Funding for Fee or Easement Purchase

Much of our funding for land acquisition at Montezuma NWR has come from the Migratory Bird Conservation Fund (MBCF), which derives from Federal Duck Stamp revenue. MBCF funds would be used for properties that include large tracts of emergent wetlands or cultivated lands that can be restored to wetlands and waters important for waterfowl. Another source of funding to purchase land is the Land and Water Conservation Fund (LWCF), which derives from certain user fees, the proceeds from the disposal of surplus federal property, the federal tax on motor boat fuels, and oil and gas lease revenues. About 90 percent of that fund now derives from outer continental shelf oil and gas leases. The Federal Government receives 40 percent of that fund to acquire and develop nationally significant conservation lands. LWCF funds would typically be used for to acquire land and easements that consist mainly of upland areas. Another potential source for funding in that category is the North American Wetland Conservation Act.

Estimated Acquisition Costs

In our previous approved acquisition boundary of 19,510 acres, approximately 244 parcels remain in private or other ownership and would potentially be available for purchase (fee title or conservation easement) from willing sellers. We have proposed acquisition from willing sellers of approximately 1,431 acres near the northeast section of the refuge. This includes: (1) 1,223 acres which we have recently added to the refuge's previous approved acquisition boundary, and

(2) two parcels (totaling about 208 acres) that were previously added to the approved acquisition boundary, but which were never actually acquired (see table F.4 and map F.4). We have estimated that it will cost about $2.2 million (in 2010 dollars) to acquire those 1,431 acres (as full fee simple or conservation easements). This estimate is based on the following assumptions:

- All fee simple lands purchased are privately owned and primarily farmland, totaling approximately 1,255 acres. We used a median estimated price of $1,750 per acre for farmland, based on estimates of land value completed between 2008 and 2009. Thus, the cost of acquiring all the farmland in this area will be 1,255 acres × $1,750/acre = $2,196,250.
- All conservation easements will be forested wetlands totaling about 176 acres. We used a median price of $300/acre for forested wetlands. Conservation easements typically cost approximately 75 percent of the full fee title value. Hence, the cost of acquiring all the available conservation easements will be 176 acres × $300/acre × 0.75 = $39,600.

Hence, our total estimated cost would be the costs of fee simple lands plus conservation easements or $2,196,250 + $39,600 = $2,235,850 to purchase all 1,431 acres.

It must be noted that these costs are outlined here only to provide an approximation based on currently available information and would likely change over time.

Coordination

Throughout the planning process for the draft CCP/EA, we solicited and carefully considered public comments on Service land acquisition. We worked with the State of New York, regional municipalities, local land trusts, and local and national conservation organizations who are directly involved in land protection strategies in New York.

We contacted all land owners with parcels identified for potential acquisition to inform them of this process. A draft of this LPP was available for public review and comment for 30 days, in conjunction with the refuge's draft CCP/EA. In addition, two public meetings were held during the public comment period to obtain input from interested agencies, organizations, and individuals on the draft CCP/ EA, including the draft LPP.

Socioeconomic and Cultural Impacts

We do not predict any significant adverse socioeconomic or cultural impacts. We believe there would be an overall positive effect on the socioeconomic environment as a result of the action outlined in the LPP. Were the Service to buy most of the lands identified for potential acquisition, positive benefits for communities in New York would include: towns benefiting from increased property values, increased watershed protection, maintenance of scenic values, and increased revenues for local businesses from refuge visitors who participate in bird watching, hunting, fishing, and wildlife observation.

There would likely be some adverse impacts, namely a decline of tax revenue to local towns (as lands come under Service ownership). The Refuge Revenue Sharing Act of June 15, 1935 (16

U.S.C. §715s) offsets some of the loss of local tax revenues from federal land ownership through payments to local taxing authorities. The refuge provides annual payments to taxing authorities, based on the acreage and value of refuge lands located within their jurisdiction. Money for these payments comes from the sale of oil and gas leases, timber sales, grazing fees, the sale of other Refuge System resources, and from Congressional appropriations, which are intended to make up the difference between the net receipts from the refuge revenue sharing fund and the total amount due to local taxing authorities. The actual refuge revenue sharing payment does vary from year to year, because Congress may or may not appropriate sufficient funds to make full payment. Recent revenue sharing payments to local towns have been less than what property taxes would have yielded. However, taken together, we believe there to be a net positive effect to the region.

We consider impacts of refuge activities on local communities when we purchase and restore land. We will work with interested local communities and towns as we develop our restoration plans to minimize or eliminate potential negative effects of refuge activities. We will continue to comply with all applicable Executive Orders, regulations, and laws, including NEPA and Executive Order 11988, Floodplain Management.

Expanding refuge lands would likely increase protection for existing and potential cultural resources in the area (USFWS 2010). Service ownership would protect unidentified or undeveloped cultural sites from disturbance or destruction. Our interpretation and environmental education programs would continue to promote public understanding and appreciation of the area’s rich cultural resources.

Attachment 1. Parcel Maps and Table

We have identified 1,431 acres near the northeast section of the refuge for acquisition from willing sellers. This includes: (1) 1,223 acres which we have added to the refuge's previous approved acquisition boundary, and (2) two parcels (totaling about 208 acres) that were previously added to the approved acquisition boundary, but which were never actually acquired. The parcel map (see map F.4) shows the lands identified for potential acquisition in each county. The corresponding table (see table F.5) lists each parcel, its tax map, block and lot number, acreage, our priority and recommended method for acquisition. The information is derived from the online databases for Cayuga, Seneca, and Wayne County tax offices. Please note that the acreage we derived from our GIS database may differ from the acreage on the county tax maps.

We would acquire either full or partial interest in land parcels, as available from willing sellers over time and as the availability of funding allows. Following are the definitions of the column headers in table F.5:

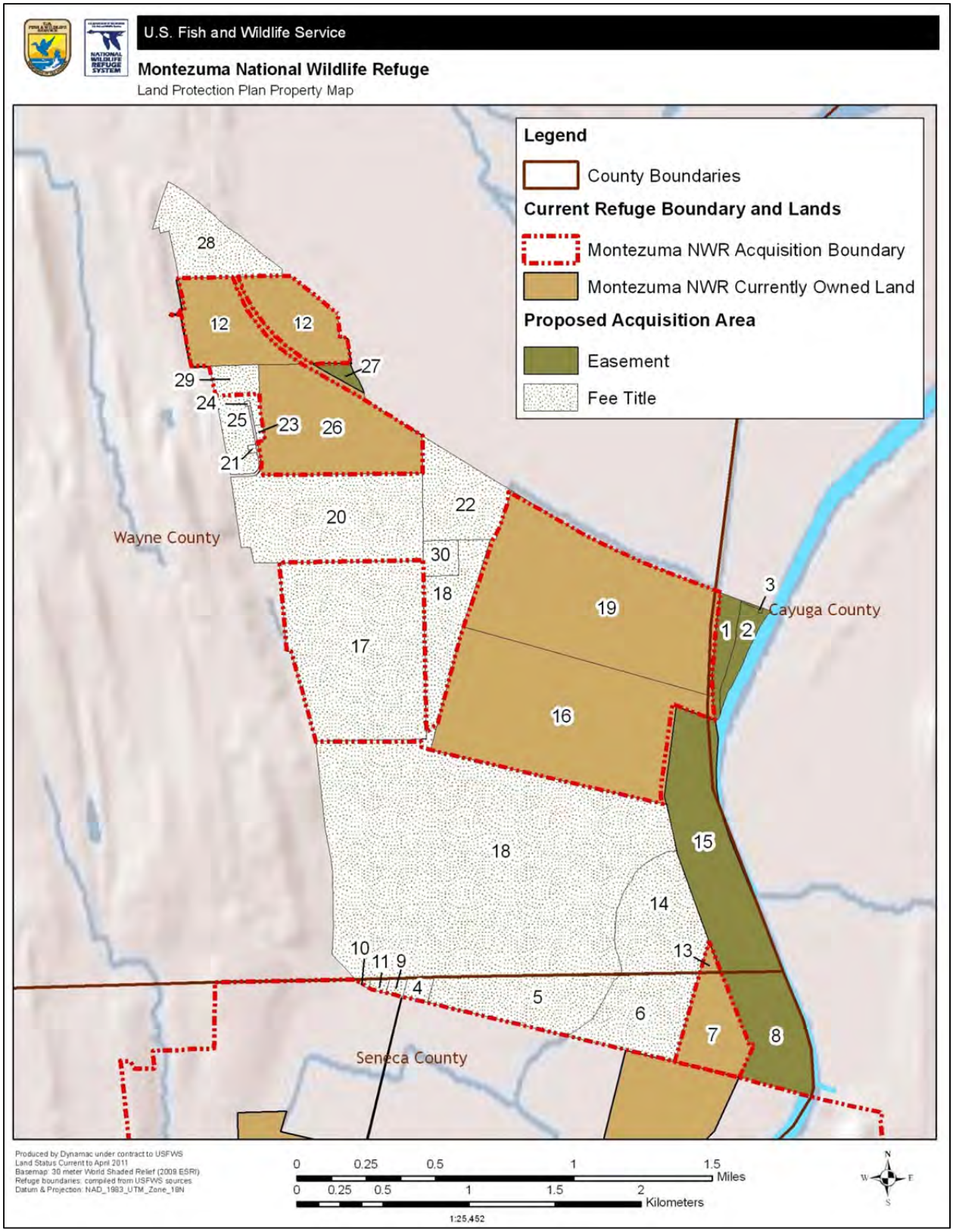
LPP Number	Our numerical identifier for each parcel in the acquisition boundary
Tax Map	County tax map number
Block Number	The block number on the tax map
Lot Number	The lot number on the tax map
Acres	GIS acres generated by Service cartographer (may differ from county tax maps)
Priority	See "Land Protection Priorities" section above for details
Acquisition Method	For lands in the acquisition boundary, whether we would acquire fee title or conservation easement (see discussion in "Acquisition Methods"), or if we are proposing to develop a management agreement
Potential Source(s) of Acquisition Funding	Which current sources of land conservation funds we believe would be most appropriate to fund acquisition of this parcel
Current Ownership	What type of entity currently owns the parcel, public (other federal, state, or county agencies or townships), public-USFWS (Service-owned property), or private (corporations, individuals, non-profit organizations).

Table F.5. Montezuma NWR Land Protection Parcel List.

LPP Number	County	Tax Map	Block/ Section Number	Lot Number	Acres	Priority	Acquisition Method	Type of Acquisition Funding	Current Ownership
1	Cayuga	73	1	1	14	2	Easement	MBCF	Public
2	Cayuga	74	1	2.1	12	2	Easement	MBCF, LWCF	Public
3	Cayuga	79	1	8	less than 1	2	Easement	MBCF, LWCF	Public
4	Seneca	4	1	15	4	1	Fee title	MBCF	Private
5	Seneca	4	1	1	62	1	Fee title	MBCF	Private
6	Seneca	4	1	2	72	1	Fee title	MBCF	Private
7	Seneca	4	1	3	36	N/A	N/A	MBCF	Public - USFWS
8	Seneca	4	1	4	54	2	Easement	MBCF, LWCF	Public
9	Seneca	4	1	14	2	1	Fee title	MBCF	Private
10	Seneca	4	1	12	less than 1	1	Fee title	MBCF	Private
11	Seneca	4	1	13	1	1	Fee title	MBCF	Private
12	Wayne	0	77111	598406	101	N/A	N/A	MBCF, LWCF	Public - USFWS
13	Wayne	0	78110	418189	2	NA	NA	MBCF	Public - USFWS
14	Wayne	0	78110	310265	77	1	Fee title	MBCF	Private
15	Wayne	0	78110	385428	90	2	Easement	MBCF, LWCF	Public
16	Wayne	0	78110	105659	243	NA	NA	MBCF	Public - USFWS
17[1]	Wayne	0	77110	716797	197	3	Fee title	MBCF	Private
18	Wayne	0	77110	986418	605	3	Fee title	MBCF, LWCF	Private
19	Wayne	0	78110	169860	240	NA	NA	MBCF	Public - USFWS
20	Wayne	0	77111	659029	93	3	Fee title	MBCF, LWCF	Private

LPP Number	County	Tax Map	Block/ Section Number	Lot Number	Acres	Priority	Acquisition Method	Type of Acquisition Funding	Current Ownership
21	Wayne	0	77111	513158	less than 1	3	Fee title	LWCF	Private
22	Wayne	0	77111	922071	54	3	Fee title	MBCF	Private
23	Wayne	0	77111	527189	1	3	Fee title	LWCF	Private
24	Wayne	0	77111	480254	less than 1	3	Fee title	MBCF	Private
25	Wayne	0	77111	453213	23	3	Fee title	MBCF, LWCF	Private
26	Wayne	0	77111	661215	113	NA	NA	MBCF, LWCF	Public - USFWS
27	Wayne	0	77111	678307	5	3	Easement	MBCF, LWCF	Public
28	Wayne	10	77111	422555	45	3	Fee title	MBCF, LWCF	Private
29[1]	Wayne	0	77111	453213	11	3	Fee title	MBCF, LWCF	Private
30	Wayne	0	77110	716797	10	3	Fee title	MBCF	Private

[1] Parcel previously added to refuge's approved acquisition boundary but not owned by the Service.



Map F.4. Cayuga, Seneca, and Wayne County Parcels Located within the Project Analysis Area.

Attachment 2. Letter of Support

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Fish, Wildlife & Marine Resources
625 Broadway, 5th Floor, Albany, New York 12233-4750
Phone: (518) 402-8924 •**Fax:** (518) 402-8925
Website: www.dec.ny.gov

Joe Martens
Commissioner

June 24, 2011

Mr. Tom Jasikoff
Refuge Manager
Montezuma National Wildlife Refuge
3395 Route 5/20 East
Seneca Falls, NY 13148-9778

Dear Mr. Jasikoff:

Thank you for writing to inform me about your Land Protection Plan (LPP) that would be incorporated into the Montezuma National Wildlife Refuge's Comprehensive Conservation Plan (CCP), currently under development.

You indicate that the LPP identifies a "new adjusted expansion boundary that would expand the refuge's current approved acquisition boundary by approximately 1400 acres…" I agree with your assessment that this will provide a strong strategic basis for future acquisition and habitat protection plans, and will help with future planning efforts for habitat management in collaboration with the State of New York.

Thus, I endorse your proposal to expand the acquisition boundary by about 1,400 acres, and I support the inclusion of this in your Land Protection Plan.

We view our collaborative efforts to protect and manage a variety of habitat types on the Montezuma Complex as an exemplary case study in effective state-federal relations. We look forward to working with you as the Montezuma National Wildlife Refuge CCP is drafted, and as we explore strategies to enhance wildlife-dependent recreational opportunities, and to manage and protect fish and wildlife habitats.

Thank you.

Sincerely,

Patricia Riexinger
Director
Fish, Wildlife & Marine Resources

c: Paul D'Amato, DEC Regional Director

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Appendix G

John and Karen Hollingsworth/USFWS

Wildflowers and nonnative purple loosestrife

Montezuma National Wildlife Refuge Wilderness Review

- **Introduction**
- **Minimum Wilderness Criteria**
- **Summary and Conclusion of Wilderness Inventory Findings**

Introduction

The purpose of a wilderness review is to identify and recommend to Congress the lands and waters of the National Wildlife Refuge System (Refuge System) that merit inclusion in the National Wilderness Preservation System. Wilderness reviews are required elements of Comprehensive Conservation Plans (CCP), are conducted in accordance with the national wildlife refuge (NWR, refuge) planning process outlined in the Fish and Wildlife Service Manual (602 FW 1 and 3), and include compliance with the National Environmental Policy Act (NEPA) and regulations on public involvement.

Wilderness Study Areas (WSAs) are areas that meet the criteria for wilderness identified in the Wilderness Act. Section 2(c) of the act gives the following definition:

> *A wilderness, in contrast with those areas where man and his works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions, and which 1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; 2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; 3) has at least 5,000 acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and 4) may also contain ecological, geological or other features of scientific, educational, scenic, or historical value.*

The wilderness review process has three phases: inventory, study, and recommendation. In the inventory phase, we identify lands and waters that meet the minimum criteria for wilderness as WSAs. In the study phase, we evaluate a range of management alternatives to determine whether a WSA is suitable for wilderness designation or management under an alternative set of goals and objectives that do not involve wilderness designation. In the recommendation phase, we forward a wilderness study report with recommendations on wilderness designation from the Director through the Secretary and the President to Congress. We prepare that report after our Regional Director has signed the record of decision for the final CCP.

We manage any areas recommended for designation to maintain their wilderness character in accordance with the management goals, objectives and strategies in the final CCP, until Congress makes a decision or we amend the CCP to modify or remove the wilderness proposal. If the inventory does not identify any areas that meet the WSA criteria, we document our findings in the administrative record for the CCP and end the study process. We will manage nonwilderness areas following the management direction outlined in the CCP.

Inventory Criteria

The wilderness inventory is a broad look at the planning area to identify WSAs. A WSA is a roadless area of undeveloped Federal land and water that meets the minimum criteria for wilderness as identified in Section2(c) of the Wilderness Act.

Minimum Wilderness Criteria

A WSA is required to be a roadless area or an island of any size, meet the size criteria, appear natural, and provide for solitude or primitive recreation.

Roadless—Roadless refers to the absence of improved roads suitable and maintained for public travel by means of motorized vehicles primarily intended for highway use. A route maintained solely by the passage of vehicles does not constitute a road.

The following factors were the primary considerations in evaluating the roadless criteria:

A. The area does not contain improved roads suitable and maintained for public travel by means of motorized vehicles primarily intended for highway use.

B. The area is an island, or contains an island that does not have improved roads suitable and maintained for public travel by means of motorized vehicles primarily intended for highway use.

C. The area is in federal fee title ownership.

Size—The size criteria can be satisfied if an area has at least 5,000 acres of contiguous, roadless, public land, or is sufficiently large that its preservation and use in an unimpaired condition is practicable.

The following factors were the primary considerations in evaluating the size criteria:

A. An area of more than 5,000 contiguous acres. State and private lands are not included in making this acreage determination.

B. A roadless island of any size. A roadless island is defined as an area surrounded by permanent waters or that is markedly distinguished from the surrounding lands by topographical or ecological features.

C. An area of less than 5,000 contiguous federal acres that is of sufficient size as to make practicable its preservation and use in an unimpaired condition, and of a size suitable for wilderness management.

D. An area of less than 5,000 contiguous acres that is contiguous with a designated wilderness, recommended wilderness, or area under wilderness review by another federal wilderness-managing agency such as the Forest Service, National Park Service, or Bureau of Land Management.

Naturalness—The Wilderness Act, section 2(c) defines wilderness as an area that, “generally appears to have been affected primarily by the forces of nature with the imprint of human work

substantially unnoticeable." The area must appear natural to the average visitor, rather than "pristine." The presence of historic landscape conditions is not required.

An area may include some human impacts provided they are substantially unnoticeable in the unit as a whole. In evaluating the naturalness criteria, we also consider significant hazards caused by humans, such as the presence of unexploded ordnance from military activity and the physical impacts of refuge management facilities and activities. An area may not be considered unnatural in appearance solely on the basis of the sights and sounds of human impacts and activities outside the boundary of the unit. We considered the cumulative effects of those factors, in conjunction with the size of the land base and its physiographic and vegetative characteristics in our evaluation of naturalness.

The following factors were the primary considerations in evaluating naturalness:

A. The area appears to have been affected primarily by the forces of nature with the imprint of human work substantially unnoticeable.

B. The area may include some human impacts provided they are substantially unnoticeable in the unit as a whole.

C. The presence of unexploded ordnance from military activity or the existence of other significant hazards caused by humans.

D. The presence of physical impacts of refuge management facilities and activities.

Solitude or Primitive and Unconfined Recreation—A WSA must provide outstanding opportunities for solitude or primitive and unconfined recreation. The area does not have to possess outstanding opportunities for both elements, and does not need to have outstanding opportunities on every acre. Further, an area does not have to be open to public use and access to qualify under this criteria; Congress has designated a number of wilderness areas in the Refuge System that are closed to public access to protect resource values.

Opportunities for solitude refer to the ability of a visitor to be alone and secluded from other visitors in the area. Primitive and unconfined recreation means nonmotorized, dispersed outdoor recreation activities that are compatible and do not require developed facilities or mechanical transport. These primitive recreation activities may provide opportunities to experience challenge and risk, self-reliance, and adventure.

These two elements are not well defined by the Wilderness Act, but can be expected to occur together in most cases. However, an outstanding opportunity for solitude may be present in an area offering only limited primitive recreation potential. Conversely, an area may be so attractive for recreation use that experiencing solitude is not an option.

The following factors were the primary considerations in evaluating outstanding opportunities for solitude or primitive unconfined recreation:

A. The area offers the opportunity to avoid the sights, sounds and evidence of other people. A visitor to the area should be able to feel alone or isolated.

B. The area offers nonmotorized, dispersed outdoor recreation activities that are compatible and do not require developed facilities or mechanical transport.

Supplemental Value—The Wilderness Act states that an area of wilderness may contain ecological, geological, or other features of scientific, educational, scenic or historical value. Supplemental values of the area are optional, but the degree to which their presence enhances the area's suitability for wilderness designation should be considered. The evaluation should be based on an assessment of the estimated abundance or importance of each of the features.

Summary and Conclusion of Wilderness Inventory Findings

Evaluating Roadless Criteria

The Montezuma NWR does not meet the roadless criteria. Refuge lands are bounded or divided by roads. A major highway, the New York State Thruway, runs east-west across the refuge, as does New York State Road 5 (NY 5)/US Route 20. In addition, NY 89 transects several refuge tracts, and NY 90 bounds refuge lands along part of the eastern boundary. The refuge also includes the 3-mile Wildlife Drive, as well as many service roads.

Evaluating Size Criteria

The refuge does not include any roadless areas of at least 5,000 acres, or roadless areas of sufficient size to preservation and use in an unimpaired condition. Furthermore, no lands within the refuge are contiguous to other agency-owned lands under review for wilderness areas.

Evaluating Naturalness Criteria

The refuge does not satisfy the naturalness criteria, as the area has been highly modified for human use with the arrival of European settlers. Prominent features of human origin are the NYS Canal System, which includes the Cayuga-Seneca Canal and the Erie Canal. These large waterways cut across large portions of the refuge and dramatically influence the area's hydrology. Constructed in the early 1800s, the canals drained area lands, dramatically lowering the water table.

Consequently, large areas that were formerly wetlands became arable, and the highly productive mucklands were actively farmed until they were acquired by the Service. After establishment, many of the former mucklands were converted to impoundments, utilizing existing farm dikes and other water control structures to intensively manage the land for the purposes of providing habitat for migratory birds and other wildlife. Currently, over 12 miles of dikes and at least 37 water control structures are found on the refuge.

In addition to water control structures and dikes, refuge infrastructure includes buildings and roadways that require regular maintenance. There are also overlooks, trails, signs, parking areas, two observation towers, and boundaries that are maintained. Facilities currently include the refuge headquarters and nearby visitor contact station, two shop/maintenance buildings, and an office (former fur house). There are also two houses, one with two garages and a barn and one with one garage that dot the landscape.

Because Montezuma NWR lies at the north end of 38-mile long Cayuga Lake, not only are there numerous roads that pass through the refuge and surrounding area, but also other transportation and utilities that traverse the area. In addition to the numerous roads described in the "Evaluating Roadless Criteria" section, two rails pass through the area. Furthermore, multiple power lines transect or run adjacent to refuge lands. Several telephone, gas, oil, and other utility conduits run through the refuge.

Evaluating Solitude or Primitive and Unconfined Recreation Criteria

The refuge does not meet criteria for solitude and primitive/unconfined recreation criteria. The number of annual visits to the refuge is currently estimated at almost 150,000 and is expected to increase over the next 15 years. The refuge consists primarily of inaccessible/off-limit wetlands with relatively few upland areas, and visitor use is concentrated on dike roads and upland trails. Consequently, even during times of the year when visitation is typically at its lowest, one is likely to see other people on the refuge, regardless of location. Waterways and other areas that can be accessed by boat consist of canals or flooded impoundments, neither of which is sufficiently large to allow visitors to experience solitude. Road noise is so great from the thruway and surrounding highways that virtually nowhere on the refuge is free from this disturbance.

Conclusion

Montezuma NWR does not meet the criteria for a WSA and should not be recommended for further evaluation of wilderness potential. An inventory of the refuge concluded that it does not meet the minimum requirements for wilderness with regard to roads, size, naturalness, and solitude or primitive/unconfined recreation. We will reevaluate this determination in 15 years with the revision of this CCP, or sooner if significant new information warrants a reevaluation. In summary, additional study is not warranted at this time.

Appendix H

USFWS

Prescribed fire

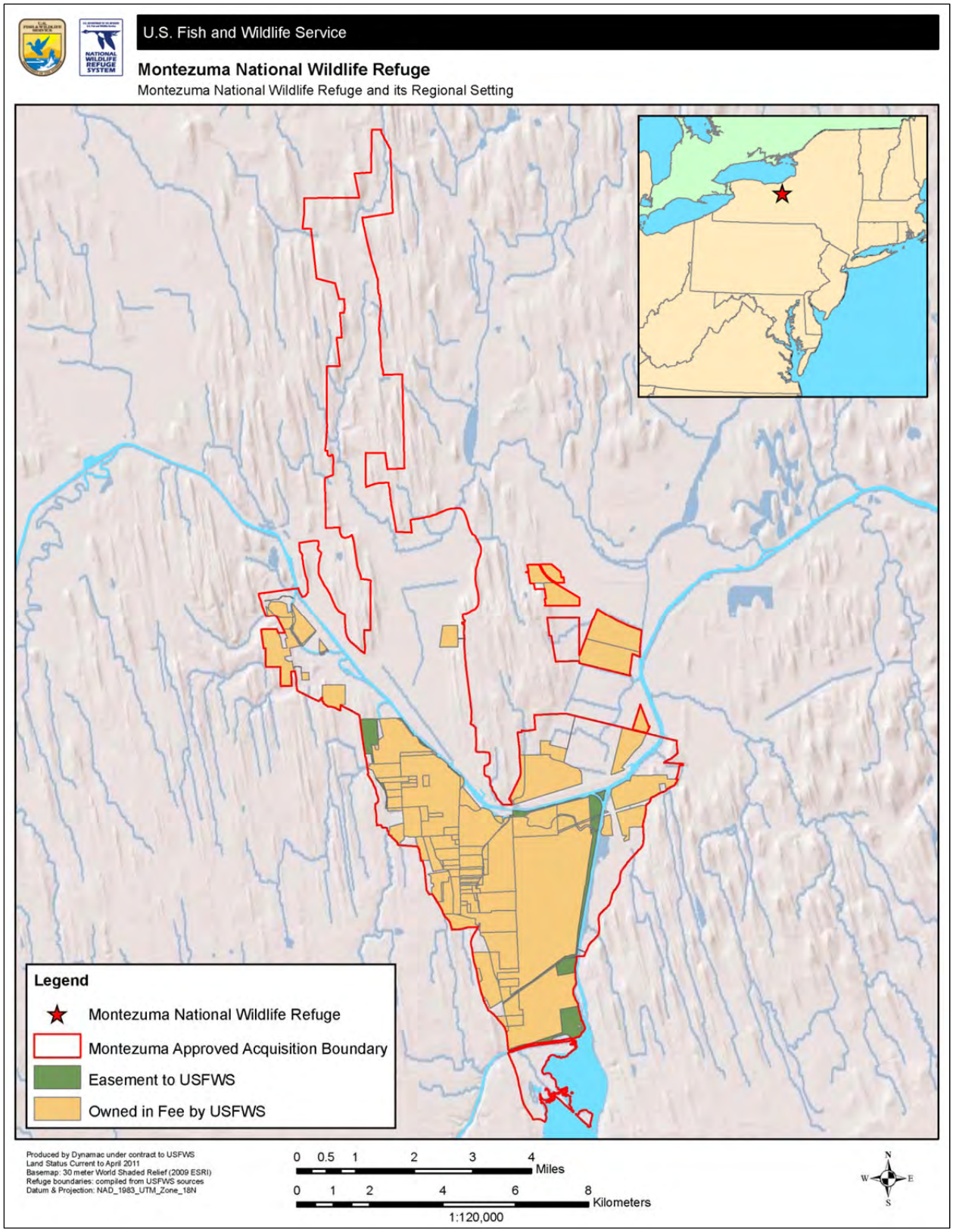
Final Environmental Assessment and Fire Management Plan for Montezuma National Wildlife Refuge and St. Lawrence Wetland and Grassland Management District

TABLE OF CONTENTS

FIGURES

TABLES

APPENDIXES



Map H.1. Vicinity Map of Montezuma National Wildlife Refuge.

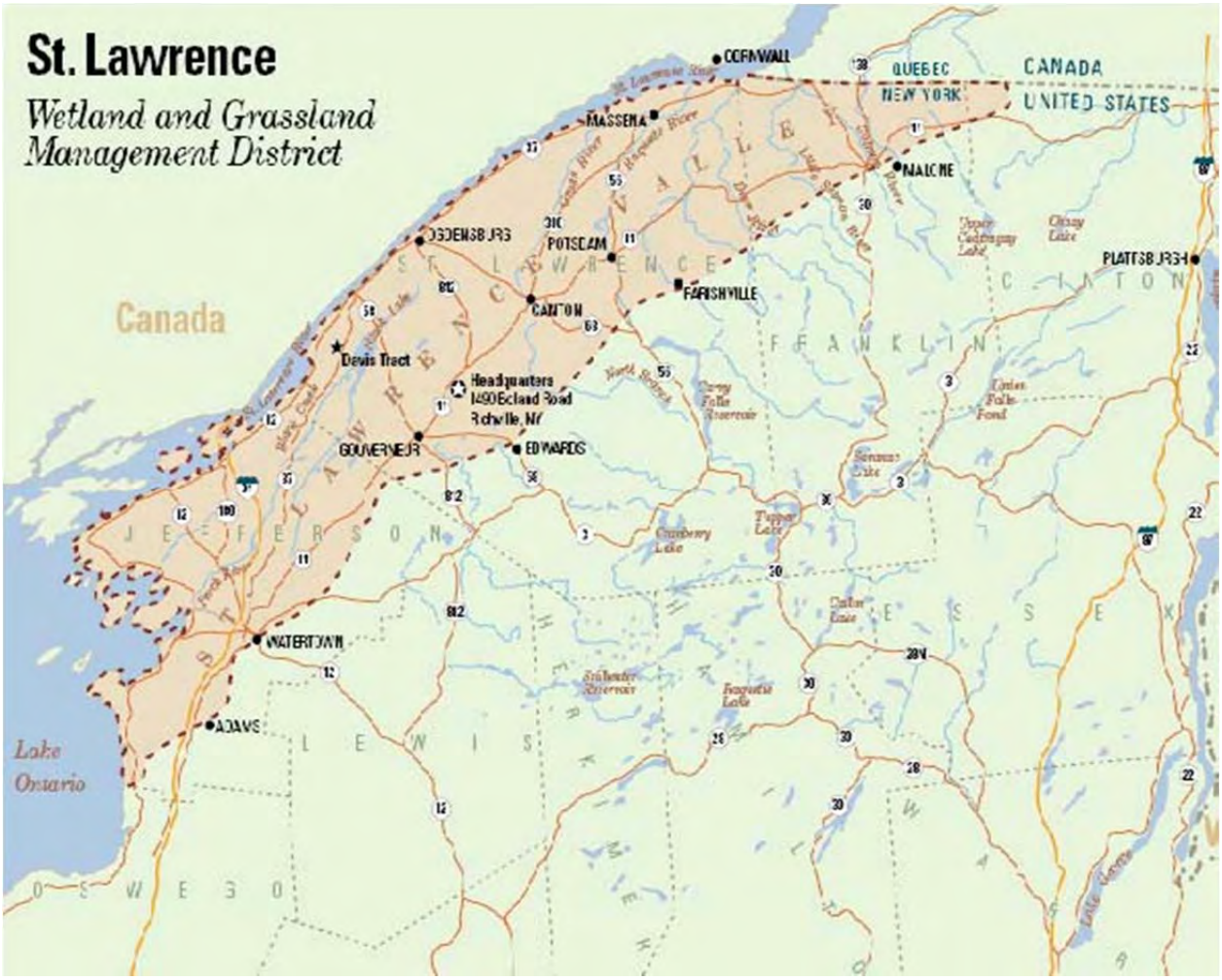


Figure H.1. St. Lawrence Wetland and Grassland Management Unit.

SUMMARY

The U.S. Fish and Wildlife Service (the Service, USFWS) policy requires that any refuge with combustible vegetation must prepare a Fire Management Plan (FMP). The USFWS is therefore proposing to develop an updated FMP for Montezuma National Wildlife Refuge (the refuge, NWR) and St. Lawrence Wetland and Grassland Management District (WMD). The plan would guide and direct the wildland fire program for the refuge and would support the accomplishment of resource management objectives.

Under an existing FMP, refuge management would continue an ongoing program to reduce fuel accumulations around values at risk, use prescribed fire to maintain a variety of vegetative cover types, and reduce invasive plants that threaten native species. All unwanted wildfires would be aggressively and immediately suppressed.

Two alternatives were considered for Montezuma NWR and St. Lawrence WMD FMP:

Alternative A – Wildfire Suppression Only: All wildfires would be fully and aggressively suppressed.

Alternative B – No Action Alternative and Service-preferred Alternative: Continue to suppress wildfires and use prescribed fire and manual/mechanical fuels reduction to meet objectives.

Under each alternative, suppression operations would include a quick response to wildfires to achieve effective control for the protection of human life and property with the least amount of damage to refuge resources.

Three other alternatives were considered but were dismissed from further analysis. A fire management program at Montezuma NWR St. Lawrence WMD that includes wildland fire use as a management option was considered, but the refuge and WMD are too small to allow free-burning fires without a substantial risk to public safety and property. A second alternative considered using only suppression and manual fuels management strategies to meet refuge objectives. Without the ability to use prescribed fire, many fire management, resource protection, and vegetation maintenance/restoration objectives would not be attainable. A third alternative considered but dismissed was no management, meaning that all wildfires would be allowed to burn unimpeded on the refuge. This alternative was dismissed because it is too risky and would not meet resource protection objectives.

This environmental assessment (EA) analyzes the impacts of the alternatives on: vegetation; nonnative, invasive plant species; wildlife; threatened, endangered, and sensitive animal species; soils; water resources; air quality; cultural resources; and public health and safety. Measures to mitigate adverse effects on refuge resources are identified. The cumulative effects of each alternative are also described. Based on the analysis, there would be no direct, indirect, or cumulative major effects to resources resulting from the preferred alternative.

Public Comment

A draft of this document was available for public review and comment for 30 days in conjunction with the release of the refuge's draft Comprehensive Conservation Plan (CCP) and EA. Comments received on the draft of this document are addressed in appendix K of the refuge's final CCP. We made the following changes to the document:

1. We added information and impacts analysis regarding threatened and endangered species to the final fire management plan EA (appendix H) to be consistent with the draft CCP/EA, and we incorporated additional details on air quality impacts and mitigation measures to the final fire management plan EA as well.
2. We corrected the final fire management plan EA to show that alternative B is both the current management (the no action alternative) and the preferred-alternative.

1.0 INTRODUCTION

The U.S. Department of the Interior policy (620 DM 1.4) states that, "every area with burnable vegetation must have an approved Fire Management Plan (FMP)." The Montezuma National Wildlife Refuge (Montezuma NWR, refuge) FMP has been developed in response to this policy statement.

1.1 Purpose and Need

Pursuant to the National Environmental Policy Act (NEPA) of 1969, this Environmental Assessment (EA) is intended to identify and examine the various options (alternatives) for the Montezuma NWR FMP and also includes the St. Lawrence Wetland and Grassland Management District (WMD) under refuge administration. The FMP sets forth the program direction through resource and fire management goals, objectives, and strategies necessary for the suppression of unwanted fire and the use of fire as a viable management tool on the refuge.

This EA considers anticipated natural and human environmental consequences of each identified alternative, including a preferred alternative outlining the proposed future management direction.

This action is necessary to meet and update important fire-related resource management needs and national and agency fire management policy changes from the existing Montezuma NWR FMP, approved in 1997, and proposed fire management strategies for St. Lawrence WMD. Discussions in this document will apply to both management units unless stated otherwise.

First, the 2001 Federal Fire Management Policy update addresses 17 wildland and prescribed fire-related directions. The foremost of these is to provide for human safety. FMPs and operational fire management actions must reflect this commitment. The policy also provides for a full range of management responses to any given wildland fire.

Moreover, this policy represents a significant departure from past fire management practices. All ignitions occurring in wildland areas are now classified as wildfires or prescribed fires. Wildland fires include any nonstructure fire that occurs in the wildland, and includes prescribed fire. Under this policy, wildfires are considered to be unwanted events regardless of whether the origin is natural (e.g., lightning) or human (accident or arson). All wildfires receive a suppression response. Prescribed fires include any fire ignited by management actions to meet stated management objectives in an FMP. Prior to the ignition of prescribed fires, a written and approved prescribed fire plan must exist, and NEPA requirements must be met. This EA constitutes the requisite NEPA documentation and compliance for the FMP.

Secondly, and from a resource management standpoint, fire as a management tool can benefit wildlife in many ways. This may include: maintenance and restoration of native grasslands; recycling of nutrients tied up in old plant growth; control of woody and herbaceous plants, including invasive species; reduction of monocultures; improvements in forage quality; promoting habitat quality for listed species; increased plant growth; and reduced risk of large wildfires.

The habitat goals and objectives in the Montezuma NWR Habitat Management Plan (HMP) (USFWS 2008) provide an important foundation for the refuge's CCP. The goals listed in the Montezuma NWR HMP are, in priority order:

Goal 1
Provide high-quality mudflat and freshwater emergent marsh and open water wetland habitats dominated by native plants for migrating and breeding waterfowl, shorebirds, waterbirds, marshbirds, and bald eagles provided through water level control.

Goal 2
Restore and maintain bottomland hardwood forests (forested wetland), the riparian forests along the Seneca and Clyde Rivers, and upland forests to increase block size and connectivity and reduce fragmentation to support nesting waterfowl and songbirds, breeding amphibians, and uncommon plant communities.

Goal 3
Provide a diverse mix of grasslands and shrublands within the Montezuma Wetlands Complex (MWC) juxtaposed to reduce fragmentation and edge effect and to enhance habitat quality for priority species of conservation concern.

Goals set out for St. Lawrence WMD include:

Goal 1
Protect and maintain, restore and enhance the quality and quantity of wetland and grassland resources of the St. Lawrence Valley to support a diversity of plants, animals, and Trust Resources, particularly breeding and migrating waterfowl and other grassland-nesting migratory species.

Goal 2
Maintain the integrity of the unique ecological communities and rich natural resources of the St. Lawrence Valley by working cooperatively with private landowners, stakeholders, and local communities in an ecologically sound, economically feasible, and socially acceptable way.

Goal 3
Provide opportunities for priority, high-quality, wildlife-dependent public use where appropriate and compatible with wildlife and habitat goals and the purposes for establishment.

As stated above, Montezuma NWR completed a FMP in 1997 to guide all fire program activities on the refuge (USFWS 1997). The 1997 FMP was accompanied by an EA, as required under NEPA and the National Historic Preservation Act. The highest priority of the refuge's existing FMP is the protection of life, property, and natural resources from fire.

Broad fire management objectives articulated in the revised FMP for Montezuma NWR and St. Lawrence WMD are the following:

- Firefighter and public safety is the first priority in every fire management activity.

- The role of wildland fire as an essential ecological process and natural change agent has been incorporated into the planning process. Federal agency land and resource management plans set the objectives for the use and desired future condition of the various public lands.

- FMPs, programs, and activities support land and resource management plans and their implementation.

- Sound risk management is a foundation for all fire management activities. Risks and uncertainties relating to fire management activities must be understood, analyzed, communicated, and managed as they relate to the cost of either doing or not doing an activity.

- FMPs and activities are economically viable, based upon values to be protected, costs, and land and resource management objectives.

- FMPs and activities are based upon the best available science.

- Fire management plans and activities incorporate public health and environmental quality considerations.

- Federal, State, Tribal, local, interagency, and international coordination and cooperation are essential.

- Standardization of policies and procedures among Federal agencies is an ongoing objective.

1.2 Location and Description

1.2.1 Montezuma NWR

Montezuma NWR is located at the north end of Cayuga Lake in the heart of the Finger Lakes region of central New York State. The 9,184-acre refuge lies within New York's 24th U.S. Congressional District in Seneca, Wayne, and Cayuga Counties—35 miles west of Syracuse, 40 miles north of Ithaca, and 45 miles east of Rochester, NY. The refuge headquarters is located on State Route 5 and U.S. Route 20, near the Menard Memorial Bridge over the Cayuga-Seneca Canal. The refuge is bordered on the south by segments of the New York State Canal System. The western boundary is irregular, following segments of New York State Route 89, Gravel Road, and East Tyre Road. U.S. Routes 5 and 20, New York State Route 89, the New York State Thruway (I-90), and segments of the New York State Canal System pass through the interior of the refuge. Since the early 1990s, over 2,500 acres of land have been added to the refuge. Many of these parcels are scattered tracts within the original boundaries of the historic Montezuma marshes.

Although established primarily for migratory waterfowl, Montezuma NWR provides habitats for an abundance of wildlife species. The mix of wooded wetlands, emergent marshes, and mixed successional stages of vegetation on the upland areas all contribute to the species diversity of the wildlife community found at Montezuma NWR. The MWC, of which the refuge is a part, was

recognized for supporting one of the largest migratory concentrations of waterfowl in the Northeast and as a significant stopover site for migrating shorebirds in upstate New York. The MWC was New York's flagship project in the Atlantic Coast Joint Venture after the adoption of the North American Waterfowl Management Plan. The National Audubon Society identified the MWC as an Important Bird Area (IBA). At present, Montezuma NWR has 16 manageable impoundments totaling over 4,700 acres of freshwater wetland habitat. Water levels are managed within and between years in an attempt to mimic natural wetland hydroperiods or to provide the best possible habitat for priority wildlife species. Of note, the MWC supports the second-largest population of cerulean warblers in New York, a species of high conservation concern. Cerulean warblers breed in riparian forested wetlands, a habitat that was drained or cleared in many other areas (USFWS 2006a).

Approximately 1,000 acres of mature bottomland floodplain forest is dominated by red maple, American elm, green ash, and swamp white oak. This unique ecosystem provides breeding habitat for cavity-nesting waterfowl (primarily wood duck), migratory songbirds (such as cerulean warbler), and breeding amphibians. The New York Natural Heritage Program (NYNHP) identified the Montezuma floodplain forest as a significant ecological community.

1.2.2 St. Lawrence WMD

Located in Jefferson County, with a field office in Richville, New York, St. Lawrence WMD (established in 1997) is managed by the Service for conserving freshwater wetland habitat and extensive grassland acreage that support large breeding and migratory populations of waterfowl and grassland birds. More than 300 partnerships on 350 wetland and grassland habitat restoration sites totaling 5,250 acres have been established over the last 15 years. The Service also manages three Farm & Home Administration (FHA) transfer properties totaling 1,000 acres, which it owns in fee-title, and 19 wetland easements totaling 1,125 acres.

The St. Lawrence WMD manages and protects wetlands for high-quality waterfowl migration and brood-rearing habitat for species such as mallards. Grassland management focuses on nesting waterfowl and other bird species, such as Henslow's sparrow, bobolink, eastern meadowlark, and short-eared owl. The North American Waterfowl Management Plan of 1986 designated the Lower Great Lakes-St. Lawrence Basin, including the valley, as one of the first 34 waterfowl habitat areas of major concern in North America (USFWS 2006b).

1.3 Relationship to Other Plans

The 1997 National Wildlife Refuge Improvement Act requires all refuges to complete CCPs by 2012. Once completed and approved, the Montezuma NWR CCP will provide overall management guidance for maintenance, restoration, and use of refuge resources. A HMP for Montezuma NWR, completed in 2008, also supports the CCP and is much more site-specific in detail. The HMP sets a direction for the next 15 years (2008 to 2022) with plan review every 5 years and use of adaptive management to assess and modify management activities as new research and monitoring information become available.

Supporting the CCP and HMP, the Montezuma FMP as stated above represents an update from an earlier FMP. However, many policies with respect to the fire management program have

changed and are addressed in the updated plan. The FMP will receive an annual review with a formal revision in 5 years.

The St. Lawrence WMD EA, Conceptual Management Plan, and Land Protection Plan (July 2006) currently provide management direction for this unit. The FMP will serve to support the mission, goals, and objectives stated in these management documents.

1.4 Laws, Policies, and Authorities

The National Wildlife Refuge System (Refuge System) includes Federal lands managed primarily to provide habitat for a diversity of wildlife species. The purpose(s) for which a particular refuge is established are specified in the authorizing document for that refuge. These purposes guide the establishment, design, and management of the refuge.

Key authorities, statutes, and orders that guide operations and management are summarized in the following section.

Migratory Bird Conservation Act (1929), as amended (16 U.S.C. 715-715s)
The Secretary of Interior is authorized to cooperate with local authorities in wildlife conservation and to conduct investigations, to publish documents related to North American birds, and to maintain and develop refuges.

National Wildlife Refuge System Improvement Act (1997)
This Act calls for managing the Refuge System to conserve biological diversity by applying the latest scientific information and methods to refuge management.

Fish and Wildlife Coordination Act (1934), as amended (16 U.S.C. 661-666)
This Act authorizes the preparation of plans to protect wildlife resources, the completion of wildlife surveys on public lands, and the acceptance by the Federal agencies of funds or lands for related purposes, provided that land donations received the consent of the state in which they are located.

National Wildlife Refuge System Administration Act of 1966 (U.S.C. 668dd-668ee)
This Act provides guidelines and directives for administration and management of all areas in the system, including "wildlife refuges, areas for the protection and conservation of fish and wildlife that are threatened with extinction, wildlife ranges, game ranges, wildlife management areas, or waterfowl production areas."

Fish and Wildlife Conservation Act of 1980 (Public Law 96-366, dated September 29, 1980)
Public Law 96-366 authorized the Service to monitor and assess migratory nongame birds, determine the effects of environmental changes and human activities, identify those likely to become candidates for endangered species listing, identify appropriate actions, and report to Congress one year from enactment. It also requires the Service to report at 5-year intervals on actions taken.

The Federal Noxious Weed Act Public Law 93-629 (7 U.S.C. 2801 et. Seq.; 88Stat. 2148)
This Federal law established a program to control the spread of noxious weeds.

Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands)
These Executive Orders prohibit any significant changes to the natural and beneficial values of the floodplain or wetland and require avoidance of direct and indirect support of floodplain development.

Executive Order 12996 (Management and Public Use of the National Wildlife Refuge System)
This order defines a conservation mission for the Refuge System to "preserve a national network of lands and waters for the conservation and management of fish, wildlife, and plants of the United States for the benefit of present and future generations."

National Environmental Policy Act of 1969, as amended
The National Environmental Policy Act, or NEPA, established a national policy for the environment. Preparation of this EA is a part of the compliance process.

Clean Water Act, as amended
The Clean Water Act provides for the restoration and maintenance of the physical, chemical, and biological integrity of the nation's waters. Section 404 of the act prohibits the discharge of fill material into waters of the U.S., including wetlands.

Clean Air Act (42 United State Code (USO) 7401 et Seq.)
The Act requires states to attain and maintain the national ambient air quality standards adopted to protect health and welfare. This encourages states to implement smoke management programs to mitigate the public health and welfare impacts of wildland and prescribed fires managed for resource benefit

Endangered Species Act (ESA) of 1973, as amended
The ESA provides for the conservation of ecosystems upon which threatened and endangered species of fish, wildlife, and plants depend, through Federal and state actions. A consultation pursuant to Section 7 of the Endangered Species Act was conducted as part of this project to ensure that the proposal would not affect the continued existence of any endangered or threatened species in the project area or result in destruction or adverse modification of their critical habitats.

National Historic Preservation Act
Section 106 of the Act of 1966 requires Federal agencies to consider the effects of their undertakings on properties meeting the criteria for the National Register of Historic Places.

Departmental Manual (Interior), Part 620 Wildland Fire Management, Chapter 1 General Policy and Procedures (April 10, 1998)
This authority defines Department of Interior Fire Management Policies.

The Federal Wildland Fire Management Policy and Program Review (USDA/USDI 1995) and Wildland and Prescribed Fire Management Policy Implementation Procedures Reference Guide (USDA/USDI 1998)

These policies provide specific guidance on fire planning and implementation and require FMPs to recognize the full range of fire management actions to accomplish stated protection and resource management objectives. The policy states:

> *Fire, as a critical natural process, will be integrated into land and resource management plans and activities on a landscape scale, across agency boundaries, and will be based upon best available science. All use of fire for resource management requires a formal prescription. Management actions taken on wildfires will be consistent with approved fire management plans.*

1.5 Issues and Impact Topics Analyzed in Detail

A resource, value, or condition that is protected by Federal, state, or local laws and regulations; executive orders; and USFWS policy can be an impact topic. An impact topic can also be a unique or limited national, regional, or local resource or value. The following impact topics were identified for Montezuma NWR and St. Lawrence WMD:

Vegetation

Wildland fire may affect plant species richness and grassland/wetland plant community diversity. Also, impacts of wildland fire and fire management activities may affect nonnative species.

Soils

Wildland fire may affect soil erosion, soil chemistry, and related processes.

Threatened, Endangered, and Sensitive Plant Species

There are no documented federally listed, threatened or endangered plants currently occurring on the refuge or WMD. The federally listed, endangered Indiana bat (*Myotis sodalis*) has been found on Howland's Island on the NYSDEC Northern Montezuma WMA and likely uses Montezuma NWR for roosting and foraging during summer months. In addition, the St. Lawrence River valley shelters important breeding populations of birds listed as threatened in the State of New York, as does Montezuma NWR. Wildland fire may have an impact on these populations.

Wildlife

Wildland fire may injure, kill, or stress wildlife and change wildlife habitat attributes.

Water and Wetland Resources

Wildland fire potentially may affect water quality, quantity, and/or wetland ecosystems on or near burned areas or from equipment used on wildland fire suppression, possibly affecting siltation and nutrient loading and water levels. Wildland fire can result in damage or loss of wetland vegetation and wildlife.

Air Quality

Emissions from wildland fires may degrade air quality below State and local standards.

Health and Safety

Wildland fire may affect the health of the public or firefighters. Managing fuels in certain areas may protect the health and safety of the public and firefighters; smoke may cause respiratory problems.

1.6 Issues and Impact Topics Considered and Dismissed from Further Consideration

NEPA and the Council on Environmental Quality (CEQ) regulations direct agencies to "avoid useless bulk…and concentrate effort and attention on important issues" (40 CFR 1502.15). Some impact topics that are relevant to other kinds of proposals or projects are not relevant to the FMP alternatives considered in this EA. Potential issues and impact topics that were dismissed from further consideration were:

Cultural Resources

No archaeological, cultural, or historic resources are known to exist on refuge or WMD lands. However, should any be discovered during wildfire incidents or any phase of planning for fire use, a cultural resources specialist would be assigned to establish protection measures.

Wilderness Character

There is no designated wilderness, nor any refuge or WMD lands under study for wilderness designation. Therefore, wilderness character was dismissed from further analysis.

Prime and Unique Farmlands

In August 1980, the CEQ directed Federal agencies to assess the impacts of their actions on farmland soils classified by the Natural Resources Conservation Service (NRCS) as prime or unique. Prime or unique farmland is defined as soil that particularly produces general crops such as common foods, forage, fiber, and oil seed; or unique farmland specialty crops such as fruits, vegetables, and nuts. According to the NRCS, none of the soils on any of Montezuma NWR are classified as prime or unique farmlands. Therefore, the topic of prime and unique farmlands was dismissed from further analysis.

Socioeconomics

NEPA requires an analysis of impacts to the "human environment" which includes economic, social, and demographic elements in the affected area. Implementation of fire management activities, particularly prescribed burning, may require temporary closures of project areas which may, in turn, inconvenience some visitors and public. Such closures, however, are likely to be limited in size and of very short duration. Some fire management activities may bring a short-term need for additional personnel on the refuge, but that would not substantially affect local businesses or the economy. Thus, the alternatives would have a negligible impact on local businesses and the economy. Therefore, the socioeconomic environment will not be addressed as an impact topic.

Environmental Justice

Executive Order 12898, "General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," requires all Federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high adverse health or environmental effects of their programs on minorities and low-income communities. Executive Order 13045 requires Federal actions and policies to identify and address disproportionately adverse risks to the health and safety of children. The alternatives would not disproportionately affect the environment or health of minority or low-income populations or communities as defined in the Environmental Protection Agency's Environmental Justice Guidance (US EPA 1998). Therefore, environmental justice was dismissed from further analysis.

Native American Traditional Values

As there have been no identified or documented traditional values associated with the refuge, the wildland fire program will not affect ethnographic resources linked to Native American traditional values.

Museum Objects

There is currently no museum or significant collection of objects at the refuge.

Noise

Noise is defined as an unwanted sound. Hazard fuels reduction, hazard tree removal, prescribed fires, and fire suppression can all involve the use of noise-generating equipment such as motorized vehicles and equipment. However, it would not substantively interfere with human activities in the area or with wildlife behavior. The infrequent noise associated with fire management activities would not chronically impair the solitude of the refuge to any degree. Therefore, this impact topic was dismissed from further analysis.

Waste Management

None of the fire management alternatives would generate hazardous material or solid wastes that require disposal in hazardous waste or general sanitary landfills. Therefore, this impact topic was dismissed from further analysis.

Transportation

The FMP alternatives would not substantively affect transportation in and around the refuge. There may be temporary closures of nearby roads during fire suppression or prescribed burning activities. However, as evidenced by a low-occurrence fire history, such closures would be very infrequent and would not substantially impinge on local transportation. The impacts of all alternatives on transportation would be negligible. Therefore, this impact topic was dismissed from further analysis.

Utilities

None of the proposed alternatives would cause any effects to existing utility systems on the refuge. Therefore, this impact topic was dismissed from further analysis.

2.0 ALTERNATIVES

Alternatives are an array of proposals that satisfy the purpose and need for the Fire Management Plan outlined in section 1.1. Alternatives should be "reasonable" and meet project objectives. The alternatives that follow were developed from information obtained from the Montezuma NWR Interdisciplinary Team (IDT) scoping process, agency guidance, the Federal Fire Policy, the National Fire Plan, and relevant literature.

Two alternatives were identified by the IDT, one of which meets management objectives. The "no action" alternative is included for analysis in compliance with NEPA. In this case, we define "no action" as no change from current management.

2.1 Description of Alternatives

Alternative A – Wildfire Supression Only
Without an updated refuge FMP, all wildfires would be fully and aggressively suppressed. Rapid assignment of firefighters with hand tools and, in some situations, mechanized equipment would be used to suppress all fires. However, in consideration of firefighter safety, an incident commander would carefully evaluate whether to send fire crews into areas with heavy vegetation, especially under severe fire season conditions.

Wildfire occurrence on Montezuma NWR is very low, with three small fires recorded over the past 9 years (1986, 1991, and 1994). All were human-caused, and the largest was just over 5 acres.

Also under alternative A, prescribed fires would not be an allowable option to treat fuels, conduct maintenance burns, or consume debris, unless separate NEPA compliance for the burn was completed.

Alternative B – Proposed Action/Service-preferred Alternative: Suppress wildfires and use prescribed fire and manual/mechanical fuels reduction to meet objectives.

Under alternative B, suppression operations on all unplanned wildfires would be commensurate with values to be protected, human safety, and suppression costs. For example, where an assessment of an initiating fire indicates a potential to threaten identified values or to cross refuge or WMD boundaries, a prompt and aggressive suppression action would be taken to minimize such threats at minimum cost, similar to alternative A. However, under alternative B, the manager has the discretion (based on criteria in the FMP) to actively suppress wildfires using natural barriers (e.g., open water, breaks in vegetation) and human-made features such as roads, trails, etc., that would serve to minimize disturbance to resource values.

The primary strategy under alternative B is the use of prescribed fire as a management tool. An approved prescribed fire plan (also called a "burn plan") must be written for each prescribed fire project. A burn plan (according to wildland fire policy) outlines the management objectives, prescription, resources to be used, contingencies, and mitigation required for the prescribed fire.

An additional strategy would be nonfire treatments to accomplish fuels management objectives. Mowing, disking, and hand cutting of vegetation would be employed to reduce hazardous fuels from around values at risk.

Refuge vehicles would be deployed where necessary to suppress unwanted wildland fires, but would be restricted to existing refuge or WMD roads for fuels reduction and prescribed burning operations. Tools for prescribed fires would be hand-carried equipment such as hand tools, saws, backpumps, drip torches, and portable pumps for hose-lays from engines stationed along roads or pumping from pools.

Monitoring would consist of notated photos taken before and following treatment and would be used to determine if objectives of the burn have been met.

2.2 Alternatives Considered but Dismissed

Alternative C – Include wildfire as a Management Option
A fire management program at Montezuma NWR and St. Lawrence WMD that allows wildfire as a management option was considered. The refuge is too small to allow free-burning fires to achieve resource objectives without a substantial risk to public safety and property. Further, only personnel with specialized skills and training are qualified to manage such fires; such personnel are not always readily available onsite as required by agency policy. This same reasoning also applies to St. Lawrence WMD.

Alternative D – Use Suppression and Manual Fuels Management Strategies Only
Use only suppression and manual fuels management strategies to meet objectives. Without the ability to use prescribed fire, many fire management, resource protection, and vegetation maintenance and restoration objectives would not be attainable.

Alternative E - No Management
This alternative would allow all wildfires to burn unimpeded without any management action. This alternative was dismissed because it is too risky and would not meet resource protection objectives.

2.3 Mitigating Measures

According to NEPA regulations (40 CFR 1508.20), mitigation actions do one of the following:

- Avoid the effect altogether by not taking a certain action or parts of an action.
- Minimize impacts by limiting the degree or magnitude of the action and its implementation.
- Rectify the impact by repairing, rehabilitating, or restoring the affected environment.
- Reduce or eliminate the impact over time by preservation and maintenance operations during the duration of the action.
- Compensate for the impact by replacing or providing substitute resources or environments.

Minimum Impact Suppression Tactics (MIST) is defined as the application of strategy and tactics that effectively meet suppression objectives with the least environmental, cultural, and social impacts. MIST would be employed during suppression operations.

Public and firefighter safety is the number one priority in fire management. The Federal Fire Policy states "firefighter and public safety is the first priority, and all fire management plans and activities must reflect this commitment." Specifically, the refuge and WMD would:

- Restrict portions of the area(s) by order of the refuge manager when there is any threat to the public or firefighters from a wildfire or fire management activities.
- Smoke warning signs will be posted on roadways and/or traffic control will be instituted during wildland or prescribed fires as needed.
- All fire personnel will receive annual training in all wildland fire safety standards (including the 10 Standard Fire Orders, the 18 Situations That Shout "Watchout," Downhill/Indirect Line Checklist, Four Common Denominators of Fatality Fires, Lookouts-Communications-Escape Routes-Safety Zones (LCES), and Risk Management/Situational Awareness.)
- A safety briefing will be given prior to initiating work on any project.
- All personnel on wildland and prescribed fires will be equipped with proper personal protective equipment (PPE), including a fire shelter.

In areas where species of concern are known to or are suspected to occur, fire management personnel would consult with the wildlife biologist regarding the need for actions to be taken to avoid impacts to the species.

To minimize smoke impacts on visitors and the public, smoke dispersal should avoid sensitive receptors by burning under an unstable air mass (mixing height greater than 1,500 feet).

If indicated, rehabilitation or restoration techniques would be used where appropriate to promote the recovery of burned areas. However, it is the FWS policy to allow burned areas to recover naturally.

2.4 Environmentally Preferred Alternative

The environmentally preferred alternative is determined by applying the criteria suggested in NEPA, which is guided by the CEQ. The CEQ provides direction that, "...the environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in Section 101 of the NEPA," which considers:

- Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.
- Assure for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings.
- Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.
- Achieve a balance between population and resource use that would permit high standards of living and a wide sharing of life's amenities.
- Enhance the quality of renewable resources and approach the maximum attainable recycling of resources.

Under alternative A, firefighters would be exposed to potentially elevated safety risks. This alternative would also contribute to the continued buildup of fuels and the spread of nonnative or

invasive species, thus affecting wildlife habitats on the refuge and WMD. This alternative would generally not provide the same level of protection of resources and humans over the long term as would occur under the preferred alternative B.

Alternative B, the Service-preferred alternative, provides the greatest flexibility in responding to wildfires and provides more opportunities for the effective management of vegetation. It offers the lowest risk to firefighters (i.e., selecting from among the full range of suppression strategies) for wildland fires. Fuels can be effectively managed under alternative B using prescribed fire and manual (non-fire) fuels treatments. Prescribed fire treatments would also contribute to increased long-term stability, productivity, and diversity in grassland, forest, and wetland ecosystems. This alternative would satisfy each of the provisions of NEPA Section 101. Therefore, the environmentally preferred alternative is alternative B. Table H.1 below summarizes and compares the environmental impacts between alternatives.

Table H.1. Summary Comparison of Impacts by Alternative.

TOPIC	**ALTERNATIVE A (WILDFIRE SUPPRESSION ONLY)**	**ALTERNATIVE B (PREFERRED)**
Vegetation	Minor to moderate and localized direct adverse effects to vegetation depending on fire severity, and indirect minor adverse impacts due to loss of vegetation from suppression operations.	Negligible to moderate beneficial impacts as fuels are restored to natural levels locally and a diversity of native vegetation is gradually restored and maintained through prescribed fire and nonfire treatments under an annual workplan and schedule.
Nonnative, Invasive Plant Species	Direct adverse effects on refuge and WMD invasive plants this alternative would be localized, short-term to long-term, and minor to moderate. Indirect effects of suppression of wildfires would be adverse, localized, short term to long term, and moderate.	Direct adverse effects under this alternative would be localized, short term to long term, and minor to moderate. Indirect effects of suppression of wildfires would be adverse, localized, short term to long term, and moderate. Indirect effects resulting from treatments may result in a minor, localized, and long term benefit as nonnative species are displaced by native plants.
Wildlife	Negligible to moderate, adverse, localized, short and long term impacts to wildlife or habitat.	Beneficial, localized, long-term impacts of minor to moderate intensity on refuge wildlife and habitat during the analysis period as overall habitat conditions are improved.
Threatened, Endangered, and Sensitive Animal Species	Impacts would range from negligible to adverse, minor, localized, short term to long term, to potentially beneficial.	Impacts would range from negligible to beneficial, indirect, localized, and moderate over the long term.

Soils	Impacts from this alternative would be negligible with the exception of the most severe wildfire effects.	The direct impacts on the soils resource would be negligible to beneficial, indirect, and of minor intensity.
Water and Wetland Resources	Direct and indirect impacts resulting from wildfires would range from negligible to moderate, depending on fire severity and location.	Long term impacts would be beneficial, indirect, localized, and of minor intensity under a planned program of treatments.
Air Quality	Direct and indirect impacts would be short term and minor on a local scale and nearly negligible on a regional scale.	Minor, direct, localized, but generally short term, adverse impacts to air quality.
Public Health and Safety	The direct and indirect adverse impacts would be localized, short term to long term, and minor.	Impacts would range from negligible to beneficial, minor to moderate, and localized.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section describes the affected environment, methodology, laws, and regulations specific to an impact topic and analyzes probable environmental effects of implementing each of the alternatives. Probable effects are quantified where data exist; otherwise, qualitative descriptions are used.

3.1 Methodology for Assessing Impacts

The potential impacts of each alternative on resources and systems on the refuge and WMD were evaluated based on available information, interviews and correspondence with refuge staff, and relevant scientific literature. Potential impacts to rare species or unique habitats and wetlands or riparian resources within the refuge are assessed in separate sections. Predictions about short and long term impacts were based on past and current studies and relevant science.

For each impact topic evaluated below, the impacts are defined in terms of context, intensity, duration, and timing. Direct, indirect, and cumulative impacts are discussed for each impact topic. Definitions of impact intensity levels vary by impact topic (see the thresholds matrix under each impact topic), but the following definitions were applied for all impact topics.

Beneficial: A positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition.

Adverse: A change that moves the resource away from a desired condition or detracts from its appearance or condition.

Direct: An effect that is caused by an action and occurs in the same time and place.

Indirect: An effect that is caused by an action but that is later in time or farther removed in distance, but it is still reasonably foreseeable.

Context: The geographic extent of the impact; for example, the impact may be localized to a relatively small area (e.g., site-specific) or regional in scope.

Intensity: Refers to the magnitude of the impact. The four impact thresholds are defined for each impact topic. Threshold values for these four intensity categories were developed based on agency standards, similar approved Fire Management Plans or NEPA documents, and discussions with refuge staff.

Duration (short-term, long-term): Refers to length of time that an impact would last; i.e., the length of time before the resource is returned to its predisturbance condition or appearance. Impacts may range from a few hours or the duration of a project (short-term) up to 5 years or greater (long-term).

3.2 Cumulative Effects Analysis

From CEQ regulations (1508.7), a "cumulative effect" (also termed "cumulative impact") is the effect on the environment that results from the incremental effect of the action(s) when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such action.

Cumulative impacts were determined by combining the impacts of the alternative with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify and analyze other ongoing or reasonably foreseeable future projects on Montezuma NWR and St. Lawrence WMD and, if applicable, the surrounding area.

3.3 Impairment Analysis Method

Refuge managers must always seek ways to avoid, or minimize to the greatest degree practicable, adverse impacts on resources and values. However, the laws do give the management discretion to allow impacts to refuge resources and values when necessary and appropriate to fulfill the purposes of a refuge, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given USFWS the management discretion to allow certain impacts within refuges, that discretion is limited by the statutory requirement that the agency must leave resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible refuge manager, would harm the integrity of refuge resources or values. However, an impact to any refuge resource or value may constitute impairment.

3.4 Impact Topics Analyzed

3.4.1 Vegetation

3.4.1.1 Montezuma

The following table shows approximate acreages by ecotype on Montezuma NWR on which the treatment portion of the proposed alternative would be implemented. However, specific areas of

the refuge would be selected based on habitat needs, cyclic maintenance schedules, and other factors described in the refuge's Annual Habitat Work Plan (AHWP, see appendix A).

Uplands
Over 50 percent of the upland habitat on Montezuma NWR is maintained in an early successional state (grassland or scrub/shrub fields) through active management. These areas are currently maintained through a variety of management techniques including mowing, burning, disking, planting, hydro-axing, and chemical treatment.

Grasslands and Crops
Montezuma NWR maintains several fields to support grassland-dependent species. These fields require long-term maintenance, including frequent mowing, herbicide applications, and prescribed burning (see below), to control invasive plants and other nondesirable plants, including woody shrubs.

The more common cool season plant species in grassland fields include timothy (*Phleum pratense*), smooth brome (*Bromis inermis*), birds-foot trefoil (*Lotus corniculatus*), bluegrass (*Poa* spp.), reed canarygrass (*Phalaris arundinacea*), common burdock (*Arctium minus*), thistle (*Cirsium* spp.), field mustard (*Brassica rapa*), and goldenrod (*Solidago* spp.). Warm season grasses include switchgrass (*Panicum virgatum*), big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), sideoats grama (*Bouteloua curtipendula*), and indiangrass (*Sorghastrum nutans*).

In 2006, four cooperative farmers planted corn or soybeans on 663 acres of refuge lands (USFWS 2007). In 2007, the refuge area in the cooperative farming program was reduced to 510 acres. Cooperative farmers provide other in-kind services including:

- Mowing grasslands to prevent brush encroachment.
- Spraying invasive plants.
- Seeding fields.
- Plowing, disking, and cultipacking upland fields prior to planting permanent grass cover.
- Purchasing grass seed for planting in upland fields.
- Maintaining the tops and slopes of dikes.

Also, prescribed fire has been applied under the currently approved FMP (1997) on the upland grasslands for hazard fuel reduction, waterfowl habitat maintenance, retarding thatch buildup, to encourage nutrient cycling, and to setback woody shrub encroachment. Grass fields would be scheduled for spring burning prior to green-up. Cattail units can be burned in the spring, late summer, or fall. Debris burning would be accomplished in the spring, summer, fall, or winter, whenever higher fuel moisture content is present. Table H.2 below lists the primary vegetation habitat types and percent coverage for the refuge.

Scrub/shrub
Montezuma NWR maintains several tracts as scrub/shrub. Shrublands require long-term maintenance to remove trees and minimize invasive plant density. Shrublands have been created on the refuge by allowing succession to proceed past the grassland stage but stopping it prior to

forest establishment. In 2007, shrubs were planted on two tracts to facilitate shrubland establishment.

Forest
Upland forested sites, including Clark's Ridge and Esker Brook, are dominated by hickory, black walnut, sugar maple, oak spp., and white ash, with some basswood, red maple, white pine, and hemlock. The climax community is a beech-maple association. These sites require little to no maintenance but should be monitored for invasive plants.

Table H.2. Selected Habitat Types and Acres, Montezuma NWR.

Habitat Type	Acres[1]	Percent
Emergent Marsh	4,307	46.9
Bottomland Floodplain Forest	1,685	18.3
Riparian Forest Corridor	1,033	11.2
Scrub/Shrub	866	9.4
Upland Forest (all successional stages)	299	3.3
Cropland	183	2.0
Grassland	316	3.5
Ponds, Ditches, Rivers	179	1.9
Infrastructure (dikes, facilities, trails, etc.)	316	3.5
Total	**9,184**	**100.0**

[1]Acreages are current as of October 2012.

3.4.1.2 St. Lawrence

The valley's 150,000 acres of freshwater wetlands consist of nearly every inland wetland type found in the northeastern U.S., including flooded woodland (45 percent), shrub-scrub wetland (33 percent), emergent wetland and wet meadow (17 percent), and other (5 percent) (USFWS Conservation Proposal). This resource provides essential seasonal habitat for numerous species of waterfowl and water-dependent wildlife species.

Jefferson County contains 16 percent of all Alvar habitat found in the Great Lakes Basin. Alvar habitats are grasslands and shrublands that develop on shallow soils with limestone geology and support rare plant communities (NYSDEC 2005) such as Limerick Cedars and Chaumont Barrens (USFWS 2006b). The position of Jefferson County in the internationally recognized Great Lakes Basin and St. Lawrence River Ecosystem and the unspoiled nature of its aquatic and terrestrial habitats and natural resources create an extremely valuable, biologically unique environment (USFWS 2006b). However, little information exists on the historical role of fire within these systems or vegetation as a whole. It is currently believed that historical fires have not greatly influenced vegetative structure, function, or succession on the WMD.

The following threshold and duration criteria are identified for analysis of impacts on vegetation.

Impact Topic	Negligible	Minor	Moderate	Major	Duration of Impact
Vegetation	Vegetation would not be affected or individual plants could be slightly affected; impacts limited to small area. Impact on exotics barely detectable or individual species could be affected.	Changes would be localized and measurable to one or more species, but would be of little consequence to the population. Mitigation of any adverse impacts would be effective. Mitigation to protect native species would be effective.	A large segment of one or more species populations would be affected over a relatively larger area. Mitigation could be extensive, but likely effective.	Considerable impacts on plant populations over large areas. Mitigation to offset adverse impacts would be required and extensive, and success not assured. Impact is severe or of exceptional benefit to native species. Extensive mitigation would be required to offset adverse impacts to native species, but success not assured.	Short term refers to a period of less than 5 years. Long term refers to a period longer than 5 years.

3.4.1.3 Impacts of Alternative A – Wildfire Suppression Only

Impact Analysis: Under the this alternative, neither the refuge nor the Wetland and Grassland Management District would have a long-term strategy for proactively managing fuels buildup and using fire to maintain desired vegetation. Over time and under the right conditions, wildfires in certain vegetation types would be expected to become gradually more severe, with greater impacts on native vegetation and threats to life and property in the area particularly during droughts and high-fire severity periods.

The direct adverse impacts of wildfire under this alternative, particularly given the relatively low occurrence of wildfire and small acreages burned would be localized, short term, and negligible to minor under most circumstances. Minor to moderate impacts may occur under more extreme burning conditions. The indirect impacts of wildfire and suppression operations would be adverse, localized, and minor to moderate, and short term to long term depending on the severity and location of fires.

Cumulative Effects: Any loss of vegetation from high-severity wildland fire, when considered cumulatively with any past fire damage on adjacent lands, would result in minor adverse cumulative impacts. Native seed sources from any damaging wildfires would likely decline temporarily, as would overall habitat quality, particularly during drought conditions.

Mitigation Measures: Suppression operations will have an impact on vegetation. Following the MIST guidelines outlined below can reduce the degree of undesirable impacts associated with wildland fire suppression tactics:

- Fireline construction would be minimized by taking advantage of natural barriers, refuge trails, roads, streams, pools, wetlands, and other existing fuel breaks.
- Consider impacts to open water areas when setting water-handling operations (e.g., porta-tanks, drafting sites, portable pump operations).
- Plan travel routes to avoid identified sensitive areas.
- Select procedures, tools, and equipment that least impact the environment.
- Firelines will be the minimum width necessary to halt the spread of the fire and will be routed to avoid impacts to any resources vulnerable to the effects of fire and fire suppression activities.
- Identify hazards with flagging or use a lookout.
- During fireline construction, cut shrubs or small trees only when necessary. Make all cuts flush with the ground.
- Retardant shall be only used as a last resort.
- Restore area by picking up and removing all flagging, garbage, litter, and equipment. Dispose of trash appropriately.

Conclusion: Alternative A would result in minor to moderate and localized direct adverse effects to vegetation depending on fire severity, and indirect minor adverse impacts due to loss of vegetation from suppression operations during the analysis period. Alternative A would not produce any major adverse impacts or impairment to native vegetation resources or values.

3.4.1.4 Impacts of Alternative B – Service-preferred Alternative

Impact Analysis: Under this alternative, prescribed fire as a management tool would help to maintain historic/native vegetation and reduce fuel accumulations that contribute to larger and more destructive wildland fires. Prescribed burning as a maintenance treatment would act to reduce woody and some exotic plant invasions into grasslands and wetland systems. Prescribed fire would also be used to protect values at risk and other sensitive areas.

Direct and indirect impacts from the limited application of prescribed fire to refuge or WMD lands would be beneficial, localized, and of moderate intensity as habitat management and fuel reduction objectives are met in the long term.

The strategy of manual fuels reduction using hand tools and refuge-owned machinery would have a moderate beneficial impact locally as overgrown areas are thinned, mowed, or disked. Hazard fuels can be kept at natural levels, thus avoiding high-intensity wildland fires. Some surface vegetation would be subject to localized trampling from refuge staff working in the area, but impacts would be negligible.

Cumulative Effects: Any anticipated facility modifications, depending on location and timing, would have adverse impacts in the immediate work area, but the area affected would be sufficiently small that the overall impacts to vegetation communities would be minor.

Mitigation Measures: The following apply to proposed prescribed fire and manual or mechanical fuels management project:

- Reduce fuels available for combustion by removal and use of head-fire ignition with the wind wherever practical.
- Reduce particulate emissions for the fuel consumed by reducing the time period of the smoldering phase; encourage flaming combustion to the extent possible.
- Avoid smoke-sensitive areas, such as highways during heavier traffic periods (i.e., weekends, holidays).
- Use MIST wherever possible.

Conclusion: Overall, alternative B would have negligible to moderate beneficial impacts as fuels are restored to natural levels and a diversity of native vegetation is restored and maintained through prescribed fire and nonfire treatments under an annual work plan.

3.4.2 Nonnative, Invasive Plant Species

A plant species is generally considered native if it existed in North America prior to European settlement. Deliberate or inadvertent introductions thereafter were generally unobtrusive until the age of rapid transport in the last century. When populations of nonnative plants invade and dominate landscapes, healthy natural ecosystems are compromised or eliminated. Displacement of native plants and dependent insects, birds, mammals, amphibians, reptiles, and invertebrates causes cascading effects on not only the ‘footprint’ occupied by the invasive species, but on the adjacent habitats and ecosystems.

Refuge wetlands are dominated by extensive stands of invasive cattail, phragmites, and purple loosestrife. These species mainly occupy disturbed areas. Roads, trails, and disturbed areas function as corridors for invasive species to move onto the refuge. Over time, aggressive populations can greatly expand, altering natural vegetation, displacing rarer native plants, eliminating native forage and cover for wildlife, and changing the scenic character. However, fire is not considered a significant contributor to the spread of invasive species across the refuge.

It should be noted that Montezuma NWR is a key area for research on the management and control of purple loosestrife. The refuge has suffered one of the worst infestations of purple

loosestrife over the past 45 years. In 1951, loosestrife was found only in sparse stands; by 1980, the plant occupied 1,500 acres of the refuge's 3,200 acres of managed wetlands. Various control measures were used, including herbicides and water level manipulations, with little success in controlling the infestation and at high long-term maintenance costs (USFWS 2006a).

For a more complete listing of rare plants occurring on Montezuma NWR, see appendix C.

The following tables (table H.3 and H.4) summarize species of invasive plants that are known to occur within the refuge and off the refuge.

Table H.3. Species of Invasive Plants that are Known to Occur Near the Refuge Boundary.

Species	**Closest Location(s) to refuge**
Norway Maple (*Acer platanoides*)	Onondaga, Ontario, and Oswego Counties
Tree of Heaven (*Ailanthus altissima*)	Cayuga County
Nodding Plumeless Thistle (*Carduus nutans*)	Yates and Tompkins Counties
Chinese Catalpa (*Catalpa ovata*)	Montezuma Wetlands Complex
Giant Hogweed (*Heracleum mantegazzianum*)	Cayuga and Wayne Counties
Common (European) Frogbit (*Hydrocharis morsus-ranae*)	Wayne County
Princesstree (*Paulownia tomentosa*)	Tompkins County
Fig Buttercup (*Ranunculus ficaria*)	Cayuga County
Wine Raspberry (*Rubus phoenicolasius*)	Cayuga and Wayne Counties
Water Chestnut (*Trapa natans*)	Northern Montezuma Wildlife Management Area

Table H.4. Species of Invasive Plants That are Known to Occur Within the Refuge Boundary.

Species	Treatment (Yes/No)	Treatment Method
Velvetleaf (*Abutilon theophrasti*)	No	
Tree of Heaven (*Ailanthus altissima*)	No	
Garlic Mustard (*Alliaria petiolata*)	No	
Burdock (*Arctium* sp.)	No	
Japanese Barberry (*Berberis thunbergii*)	No	
Carline Thistle (*Carlina vulgaris*)	No	
Oriental Bittersweet (*Celastrus orbiculatus*)	Yes	Cut stump treatments with glyphosate herbicide
Knapweed (*Centaurea* sp.)	No	
Canada Thistle (*Cirsium arvense*)	No	
Bull Thistle (*Cirsium vulgare*)	No	
European (Pale) Swallowwort (*Cynanchum rossicum*)	Yes	Triclopyr and glyphosate herbicides, mowing, seeding natives
Teasel (*Dipsacus* sp.)	No	
Autumn Olive (*Elaeagnus umbellate*)	Yes	Cut stump treatments with glyphosate herbicide
Paleyellow Iris (*Iris pseudacorus*)	No	
Tatarian Honeysuckle (*Lonicera tatarica*)	Yes	Cut stump and foliar treatments with glyphosate herbicide, mowing, planting cover crops
Purple Loosestrife (*Lythrum salicaria*)	Yes	Wetland-approved glyphosate herbicide, Beetles
Yellow Sweetclover (*Melilotus officinalis*)	No	
Eurasian Watermilfoil (*Myriophyllum spicatum*)	No	
Reed Canary Grass (*Phalaris arundinacea*)	No	
Common Reed (*Phragmites australis*)	Yes	Wetland-approved glyphosate herbicide, mowing, burning, water level manipulation
Japanese Knotweed (*Polygonum cuspidatum*)	No	
Curly Pondweed (*Potamogeton crispus*)	No	
Common Buckthorn (*Rhamnus cathartica*)	Yes	Cut stump and foliar treatments with glyphosate herbicide, mowing, seeding natives
Black Locust (*Robinia pseudoacacia*)	Yes	Mowing
Multiflora Rose (*Rosa multiflora*)	Yes	Cut stump and foliar treatments with glyphosate herbicide

3.4.2.1 Impacts of Alternative A – Wildfire Suppression Only Alternative

Impact Analysis: Under this alternative, direct effects of high-severity fires that result in temporary bare ground may include spread of nonnative species, resulting in localized, short-term or long-term, minor to moderate adverse impacts. High-intensity fires may, on the other hand, kill seeds of one or more species, depending on time of year, resulting in negligible to even some minor benefits locally.

Low-intensity wildfires may favor either native or nonnative, invasive species depending on time of year and would range between adverse and beneficial. Purple loosestrife may be increased from either high- or low-intensity fire, resulting in potentially moderate adverse effects. Generally, burning the shoots of sprouters stimulates growth (adverse effect) but high-intensity fires may kill seeds of sensitive nonnative species (beneficial effect).

Indirect impacts of suppressing most wildfires may range from expansion of nonnative, invasive species in the burned area to suppressed vigor of nonnative, invasive species. The response is largely dependent on the time and intensity of burning as well as secondary factors such as competition with native species and moisture availability postburn.

Indirect effects include the creation of limited new habitat by suppression-activity disturbances and the clearing of areas by fire. The greater reliance on suppression under this alternative would lead to moderate long-term adverse effects.

Mitigation Measures: Mitigation would include the following:

- Surveying for invasive plant locations.
- Nonnative species control programs (such as pulling plants, application of approved herbicides).
- Maintaining vigilance about seed transport on vehicles.
- Education to help reduce effects of the fire program on the spread of nonnative, invasive species.

Cumulative Effects: Management, visitation, and hunting activities contribute to cumulative impacts through the inadvertent spread of invasive species. Past and future suppression activities in or adjacent to the refuge may cause disturbances that encourage spread of nonnative, invasive plants with minor, long-term adverse effects.

The following criteria are identified for analysis of impacts on invasive vegetation.

Impact Topic	Negligible	Minor	Moderate	Major	Duration of Impact
Nonnative, Invasive Species	Impacts would barely be detectable as to changes in number, distribution, and densities.	Impacts would be sufficient to cause a noticeable but not substantial change in number, distribution, and densities of nonnative, invasive species.	Impacts would be sufficient to cause a noticeable but not substantial change in number, distribution, and densities of nonnative, invasive species.	Impacts would result in substantial and highly noticeable changes in number, distribution, and densities of nonnative, invasive species.	Short term refers to a period of less than 5 years. Long term refers to a period longer than 5 years.

Conclusion: Both high-severity wildfires and associated suppression activities would potentially prepare more areas for colonization by nonnative, invasive species. Thus, the direct adverse effects on invasive plants under this alternative would be localized, short-term to long-term, and minor to moderate. Indirect effects of suppression of wildfires would be adverse, localized, short-term to long-term, and moderate.

3.4.2.2 Impacts of Alternative B – Service-preferred Alternative

Impact Analysis: Under this alternative, direct and indirect effects from potential suppression actions and high-intensity wildfires would be similar to alternative A in the short term. However, as both fire and nonfire treatment objectives are met over time, these localized impacts may be reduced or result in a minor beneficial effect by increasing native plant competition. Similar to alternative A, those invasive species that are established on the refuge may benefit from prescribed or wildfire of any intensity.

Moreover, many plant species identified above are limited to specific locations; fire management actions in these areas would be tailored to reflect the specific characteristics of each species. The continued use of hand and power tools to remove unwanted plants would be another control strategy. However, minor adverse effects may occur from any increased clearing from either fire or by hand, increasing the opportunity for the spread of nonnative plants.

Mitigation Measures: In addition to those measures described in alternative A, the following mitigation would help reduce or minimize the proliferation of invasive species:

- Avoid unnecessary ground disturbance.
- Before any native ecosystems are disturbed (such as with prescribed burning), identify the nonnative species likely to invade the disturbed areas and establish measures to prevent such invasion.

- Consider education programs that teach people how to avoid spreading nonnative plants.
- Continue with nonnative plant management programs on the refuge.

Cumulative Effects: Management activities, hunting, and visitation activities contribute to cumulative impacts through the inadvertent spread of invasive species. Past and future suppression activities in or adjacent to the refuge may cause disturbances that encourage spread of nonnative, invasive plants with minor, long-term adverse effects.

Conclusion: Both high-severity wildfires and suppression activities, as with alternative A, would potentially prepare more areas for colonization by nonnative, invasive species. Thus, the direct adverse effects under alternative B would be localized, short-term to long-term, and minor to moderate. Indirect effects of suppression of wildfires would be adverse, localized, short-term to long-term, and moderate. Indirect effects resulting from treatments may result in a minor, localized, and long-term benefit as nonnative species are displaced by native plants.

3.4.3 Wildlife

Montezuma NWR lies within Bird Conservation Region (BCR) 13, the Lower Great Lakes/St. Lawrence Plain (map 2-2). BCR 13 encompasses the vast, low-lying lake plain region surrounding Lakes Erie and Ontario, the St. Lawrence River Valley, low-lying regions between the Adirondack Mountains and the Laurentian Highlands, and upper regions of the Hudson River Valley. In addition to important lakeshore habitats and associated wetlands, this region was originally covered with a mixture of oak-hickory, northern hardwood, and mixed-coniferous forests. Although once dominated by forests, the landscape is now dominated by agriculture with interspersed wetlands and remnant forest stands. Today, nearly 95 percent of the original habitat types have been lost to agriculture and urban development. The BCR plays a critical role in providing important staging and migrating habitat for birds during the spring and fall migration. In addition, over 17 percent of the global population of bobolinks nests in the St. Lawrence Valley of northern New York (USFWS 2008).

The bird list for Montezuma NWR lists 320 species that have been identified on the refuge since its creation in 1938. Of these, 117 species of birds are known to nest on the refuge. The New York Important Bird Area (IBA) Program recognized the Montezuma Wetlands Complex for harboring a suite of nesting bird species of conservation concern including pied-billed grebe, least bittern, osprey, bald eagle, black tern, sedge wren, and cerulean warbler. Most of the forested wetlands in this region were historically cleared or drained so the bird species that use this habitat are of conservation concern. Montezuma NWR supports this habitat type along with many breeding birds associated with these forests including: sharp-shinned hawk, black-billed cuckoo, eastern wood-pewee, wood thrush, cerulean warbler, rose-breasted grosbeak, and Baltimore oriole. The Montezuma Wetlands Complex is also recognized for its importance to migratory birds (USFWS 2008).

In a 2003 survey, 37 species, 26 genera, 15 families, and 10 orders of fish were recorded on the refuge. Only one species, brown bullhead, was present in all sample sites. The most commonly encountered species were common carp, golden shiner, bluegill, brown bullhead, and yellow

perch. The most abundant fish, common carp, represented 20 percent of the total catch within the refuge (Foust 2003 in USFWS 2008).

A baseline inventory of reptiles and amphibians on the refuge in 1995 and 1996 using various methods including evening audio surveys for frogs and toads, visual encounter surveys, and live-trapping using pitfalls, drift fences, funnel traps, minnow traps, and aquatic hoop traps (USFWS 2008). Frogs and toads recorded during this survey included American toad, gray treefrog, spring peeper, western chorus frog, bullfrog, green frog, wood frog, and northern leopard frog. Salamanders included mudpuppy, blue spotted/Jefferson salamander complex, and northern two-lined salamander. Turtles observed during the survey included snapping turtle, common musk turtle, and midland and eastern painted turtles. Snakes observed included northern water snake, northern brown snake, and eastern garter snake (USFWS 2008).

Waterfowl use the habitat of the valley in most seasons. Ten species, including mallard, American black duck, northern pintail, and wood duck, have been documented using sheetwater wetlands during the spring. Based on 1994 waterfowl breeding surveys throughout the eastern U.S., the valley has one of the highest estimates of mallard breeding population in the Atlantic Flyway (USFWS 2008).

Grasslands not only provide habitat for grassland nesting birds, but also for deer mice and meadow voles. Those mammals are part of the food supply for such raptors as the northern harrier, rough-legged hawk, red-tailed hawk, short-eared owl, and snowy owl.

Fox hunt fields for the mice and voles that inhabit them; they are an important winter food source. Deer also bed down in fields at warmer times of the year. Hedgerows and shrubby edge as well as fields reverting to shrubs provide good habitat for the eastern cottontail, stripped skunk, snowshoe hare, and whitetail deer. Porcupines, common throughout the valley, are often observed chewing the bark off trees. The eastern chipmunk, gray squirrel, and fisher inhabit hardwood forests throughout the area. Raccoon, ermine, and mink may be found close to water or shrubby or wooded habitat. The red squirrel is likely to be found in spruce or pine or mixed hardwood forests (USFWS 2008).

The St. Lawrence WMD supports a wide variety of waterfowl habitat. These include, but are not limited to, mallards, American black duck, wood duck, green-winged teal, northern pintail, ring-necked duck, and Canada goose. Numerous other waterfowl use the open waters during migration. They include: the snow goose, northern pintail, northern shoveler, American coot, bufflehead, common merganser, lesser scaup, canvasback, and common goldeneye (USFWS 2006b). Ducks Unlimited lists the valley as a priority area in its Continental Conservation Plan.

Songbirds include; grasshopper sparrow, Henslow’s sparrow, vesper sparrow, sedge wren, and upland sandpiper. The northern harrier is listed as either a threatened species or as species of special concern in St. Lawrence WMD.

Eagles nest, forage, and overwinter in the region. The St. Lawrence River is the second largest overwintering site for bald eagles in New York State (USFWS 2006b).

The following threshold and duration criteria are identified for wildlife.

Impact Topic	Negligible	Minor	Moderate	Major	Duration of Impact
Wildlife	Impacts barely detectable or individuals could be affected but not populations. Impacts limited to small areas and not measurable.	Changes would be localized and affect one or more species populations. Any adverse impacts can be effectively mitigated.	A large segment of one or more wildlife populations affected over a relatively large area. Mitigation to offset adverse impacts extensive but likely successful.	Impact is severe or of exceptional benefit to wildlife populations Extensive mitigation would be required to offset adverse impacts, and its success not assured.	Short term refers to a period of less than 5 years. Long term refers to a period longer than 5 years.

3.4.3.1 Impacts of Alternative A – Wildfire Suppression Only Alternative

Impact Analysis: Given the relatively low fire occurrence on Montezuma NWR, the direct and indirect impacts of suppression actions on wildlife and habitats would be variable in the short term. Direct impacts would include localized loss of habitat for short periods following fire, particularly in drought years and where fuels accumulations are excessive. Disruption of ground-nesting bird and mammal activity as a result of any fireline construction and general firefighter presence would be adverse, direct, localized, short-term, and of minor intensity. Long-term indirect impacts in high-severity burn areas that recover slowly also would be adverse and minor to moderate in intensity.

Similar impacts would be expected for St. Lawrence WMD.

Cumulative Effects: Any illegal poaching or off-road vehicle use has resulted in negligible impacts when considered cumulatively with the low occurrence of fire traffic. The most prominent activity continuing to occur over the refuge that would add cumulative impacts on species or habitats under this alternative would be machinery use for moving earth and fire risk reduction treatments.

Mitigation Measures: Mitigation of impacts associated with alternative A on native wildlife species and habitats includes, but is not limited to, the following:

- Minimizing ground disturbance wherever possible.
- Planned protection of specified habitats for cavity and ground nesters and other wildlife.

- Where consistent with safe, effective suppression techniques, use natural barriers, such as existing roads and open water.
- Fire retardant, if used, must be on the approved list of retardants.

Conclusion: Impacts of alternative A would result in negligible to moderate, adverse, localized, short- and long-term impacts to wildlife or habitat on Montezuma NWR and St. Lawrence WMD.

3.4.3.2 Impacts of Alternative B – Service-preferred Alternative

Impact Analysis: Under this alternative, use of planned ignitions and nonfire treatment strategies would result in habitat improvements that generally favor wildlife over the long term. The less aggressive approach to suppression of wildfires, where appropriate and safe, would minimize inadvertent damage that might result from aggressive suppression operations under alternative A. This would result in a beneficial, localized, indirect, long-term effect of minor to moderate intensity for wildlife habitats.

Limited prescribed fire, planting, and nonfire fuels treatment operations initially would likely disturb waterfowl and some small mammals in localized areas, but would temporarily benefit predator species. Those species dependent on heavier cover and large trees may experience localized, minor adverse impacts. Noise from human presence also may disturb birds temporarily. However, mitigation would serve to minimize disturbance during breeding and nesting season. Within a post-treatment growing season, sprouting and regrowth of target grasses and forbs would likely invigorate grassland and emergent marshlands.

Proposed prescribed fire and nonfire treatments under alternative B would likely cause short-term adverse effects on wildlife populations. However, as fuels management objectives on refuge lands are met, foreseeable impacts would likely be beneficial and of minor to moderate intensity due to habitat improvement.

Mitigation Measures: Mitigation of impacts for alternative B consists of those listed in alternative A, plus:

- Selection of a time of year for actions that least affect breeding and/or nesting wildlife on the refuge.
- Protection of any values at risk.

Conclusion: Alternative B would produce beneficial, localized, long-term impacts of minor to moderate intensity on Montezuma NWR and St. Lawrence WMD wildlife and habitat during the analysis period as overall habitat conditions are improved.

3.4.4 Threatened, Endangered, and Sensitive Animal Species

Categories of endangered and threatened species are defined in New York State Environmental Conservation Law section 11-0535. Endangered, threatened, and special concern animal species are listed in regulation 6NYCRR 182.5. The following definitions apply:

- **Endangered**: Any native species in imminent danger of extirpation or extinction in New York State. For a list of endangered animal species present in the State of New York, see

the New York State Department of Environmental Conservation (NYSDEC) list at: *http://www.dec.ny.gov/animals/7494.html#Endangered* (accessed June 2011).

- **Threatened**: Any native species likely to become an endangered species within the foreseeable future in New York State. For a list of threatened animal species present in the State of New York, see the NYSDEC list at: *http://www.dec.ny.gov/animals/7494.html#Threatened* (accessed June 2011).
- **Special Concern**: Any native species for which a welfare concern or risk of endangerment has been documented in New York State. For a list of animal species of special concern present in the State of New York, see the NYSDEC list at: *http://www.dec.ny.gov/animals/7494.html#Special_Concern* (accessed June 2011).

The federally and State listed, endangered Indiana bat (*Myotis sodalis*) has been found on nearby Howland's Island within the Montezuma Wetlands Complex, and likely occurs on the refuge. The NYSDEC also lists the following species that occur or may occur on Montezuma NWR:

Cerulean Warbler
The MWC is one of four sites in New York with exceptional numbers of cerulean warblers recorded during the Cerulean Atlas Project. This warbler is among the highest priority landbirds for conservation in the U.S. (USFWS 2006a).

Bald Eagle
Most of the eagle activity on the refuge occurs around Tschache Pool, the site of two of the three active nesting territories. However, adult and immature eagles use the refuge throughout the year. As the Main Pool was draining to encourage vegetative growth in 2007, 59 bald eagles were counted in one morning in early June.

Sandhill Crane
Sandhill cranes were first observed on the MWC during spring migration in 1999. Since then, a few cranes were observed during migration and the first confirmed breeding occurred in 2003; a pair with young was observed again in the 2004 through 2006 breeding seasons. By the 1930s the sandhill crane population was nearly decimated across its range. Today the population has recovered to 650,000 birds and several states including New York, Pennsylvania, Ohio, and Iowa are part of a range expansion (USFWS 2006a).

In addition to the rare bird species, the NYNHP (2006) reported the following species and communities for the refuge: blue-tipped dancer (damselfly) and the holly-leaved naiad.

The following threshold and duration criteria are identified for Threatened, Endangered, and Sensitive Animal Species.

Impact Topic	Negligible	Minor	Moderate	Major	Duration of Impact
Threatened, Endangered, and Sensitive Animal Species	Listed species would not be affected or change so small as to not be of any measurable or perceptible consequence to the individual or its population. Negligible effect would equate with a "no effect" determination per Endangered Species Act Section 7 regulations for species listed as threatened or endangered.	There would be an effect on one or more individuals of a listed species or its habitat, but change would be small. Minor effect would equate with a determination of "may affect but not likely to adversely affect" the species per Endangered Species Act Section 7 regulations for species listed as threatened or endangered.	A noticeable, measurable affect to an individual or population of a listed species. Moderate effect would in most cases equate with a determination of "likely to adversely affect" for the species per the Endangered Species Act Section 7 regulations for species listed as threatened or endangered.	Noticeable, measurable affect with severe consequences or exceptional benefit to the population or habitat of a listed species. Special status species populations may have large changes with population numbers significantly increased or depressed. In extreme adverse cases, species may be at risk of being extirpated locally, key ecosystem processes like nutrient cycling disrupted, or habitat for any species rendered nonfunctional. Major effect would equate with an "adversely affect without a jeopardy opinion" per the Endangered Species Act Section 7 regulations.	Short term refers to a period of 1to 3 years. Long term refers to a period longer than 3 years.

3.4.4.1 Impacts of Alternative A – Wildfire Suppression Only Alternative

Impact Analysis: While Indiana bats have not been documented on the refuge or WMD, they have been found near the refuge and likely forage or roost on refuge lands in the summer. There is no known Indiana bat hibernacula or maternity colony on Montezuma NWR or the St. Lawrence WMD.

Under alternative A, direct impacts to roosting and nesting habitat may range from short term to long term, minor to moderate, and localized to widespread, depending on fire size, intensity, and time of year. Most surface fires occurring on the refuge would likely have little effect on any aerial nest, roost, or perch sites, including those used by Indiana bats and bald eagles. Indirect

impacts would include a possible short-term reduction in prey habitat – a localized, minor, adverse effect – and a long-term increase in prey availability – a localized, minor, beneficial effect. If high-intensity wildfires occur as a result of increased drought, the potential for damage or loss to important roosting or perching habitat components would likely increase.

Cumulative Effects: Considering the locations of any planned activities on the refuge, including support facilities, compared with known sensitive habitat types, the cumulative effects from this alternative would be negligible.

Mitigation Measures: Any potential disturbance to listed species or habitats would be identified through informal consultation with agency Ecological Services under Section 7 of the Endangered Species Act (ESA). However, with the planned use of prescribed fire being very limited on the refuge, formal consultations would likely not be necessary for the foreseeable future. This would also apply to St. Lawrence WMD.

Conclusion: The direct and indirect impacts of alternative A from wildfire and/or suppression operations on most special status plant species across the refuge would range from negligible to minor adverse impacts, localized adverse impacts, short-term to long-term impacts, to potentially beneficial impacts.

3.4.4.2 Impacts of Alternative B – Service-preferred Alternative

Impact Analysis: Prescribed fires are intentionally small (our burn units average 20 acres) and generally active burn stages are completed within 1 to 4 hours. Prescribed fires would be used primarily to maintain grasslands; therefore, prescribed burns are not expected to affect roosting habitat (i.e., forests) for Indiana bat. Because of the small size of prescribed fires, short burn time, and the mitigation measures discussed under Air Quality (section 3.4.7.2) intended to minimize potential negative impacts to air quality, negative impacts on Indiana bats are expected to be negligible to minor and localized. Prescribed fires may also have short-term, negligible to minor adverse impacts on prey habitat and availability on the small area affected by the burn. Assuming the burn area is 20 acres, this would comprise about 0.2 percent of all refuge lands, a very minor component. There could be long-term benefits to Indiana bats by maintaining some open areas to facilitate foraging.

As with alternative A, direct impacts to roosting and nesting habitat may range from short term to long term, minor to moderate, and localized to widespread, depending on wildfire size, intensity, and time of year. Most surface fires occurring on the refuge would likely have little effect on any aerial nest, roost, or perch sites, including those used by Indiana bats and bald eagles. Indirect impacts would include a possible short-term reduction in prey habitat – a localized, minor, adverse effect – and a long-term increase in prey availability – a localized, minor, beneficial effect. If high-intensity wildfires occur as a result of increased drought, the potential for damage or loss to important roosting or perching habitat components would likely increase. Although individual wildfires may become slightly larger, impacts on most special status animal species would approach negligible over the long term because of increased prescribed fire and manual/mechanical fuels treatments (reductions). In extreme drought conditions, periods of high-severity fire potential could increase risk to habitat as described in

alternative A. However, mitigation directed by a proposed fire management plan would help reduce any potential impacts on local habitats from fire or nonfire fuels reduction to negligible.

Cumulative Effects: The locations of any planned changes to visitor/hunting access or support facilities were compared with known sensitive species distribution records and habitat types to assess potential cumulative impacts from a fuels treatment schedule. Any foreseeable planned actions would be outside habitats used by special status species. Therefore, the cumulative effects associated with the preferred alternative on the refuge would be negligible.

Mitigation Measures: In addition to those mitigations described under alternative A, any site-specific measures developed in consultation with Ecological Services will be incorporated into the FMP and subsequent project implementation plans. Mitigation measures described under section 3.4.7.2 would also help minimize potential negative impacts to threatened or endangered species.

Conclusion: Most of the units will be burned to manage for grasslands. There is very little particulate matter associated with this vegetation type and most burns occur during the spring when air masses are changing and dispersion is at its best. For special status species and habitats on the refuge, impacts from the preferred alternative would range from negligible to beneficial, indirect, localized, and moderate over the long term.

3.4.5 Soils

Montezuma NWR: The refuge region is generally underlain by a combination of limestone and limestone/shale bedrock. These calcareous rocks result in the highly productive glacial till found throughout the Montezuma wetlands area. A soil profile of the refuge wetlands would reveal an upper layer of deep Carlisle muck and sedimentary peat over a Chara and shell marl. The subsoil in this area of the old lake basin is compact blue clay. The well-drained sandy loams include pockets of Palmyra gravelly loam, Ontario loam, Poygan silty clay loam, Schoharie silty clay loam, and Wayland silty loam (USFWS 2008).

St. Lawrence WMD: The combination of a generally flat landscape and the presence of dense, clay soils creates suitable conditions for sheet water wetlands throughout the county. Warming sunshine and early spring rains create shallow pools in low field depressions. The small, temporary, shallow pools are the first to thaw in early spring. The heavy soils underneath them are slow to absorb water and extend their life. Their presence is critical for the food they supply waterfowl, shorebirds, and other wildlife.

Large, low, hydric areas also exist throughout the area. Shaped during the last glacial period, those larger wetlands provide nesting and brood-rearing habitat. The uplands surrounding the low areas have enough difference in elevation to sustain upland vegetation: grasses, shrubs, or woods. Those upland areas are often locations with soils containing hydric inclusions. They are not as wet as the hydric soils, but they are wet enough to make intensive agriculture difficult. These lands typically are mowed late in the season because they are too wet to mow much earlier than mid- to late July (USFWS 2006b).

3.4.5.1 Impacts of Alternative A – Wildfire Suppression Only Alternative

Impact Analysis: Under this alternative, physical soil movement or damage would likely result from equipment use on wildfire suppression actions. However, given the low incidence of fires at Montezuma NWR and no fire record at St. Lawrence WMD, this impact would likely be negligible except in the most extreme cases. Any direct impacts of high-severity fire on soil properties would include changes in soil chemistry (e.g., loss of nitrogen), reduction in porosity, and consumption of subsurface organic matter.

Cumulative Effects: Considering the locations of any planned activities on the refuge, including support facilities, and local development involving soil disturbance, the cumulative effects from this alternative would be negligible.

Mitigation Measures: Most mitigation from severe wildfires on the refuge (or St. Lawrence WMD) would take the form of actions to prevent further soil disturbance; this may include seeding, raking over bare soil, and isolating severe burn areas from further human or mechanical entry.

Conclusion: Impacts from alternative A would be negligible with the exception of the most severe wildfire effects.

3.4.5.2 Impacts of Alternative B – Service-preferred Alternative

Impact Analysis: Under the preferred alternative, most maintenance-type prescribed fire treatments and other fuels management on the refuge would result in negligible to beneficial but minor direct effects on the soils resource. Indirect impacts on post-prescribed-fire soils would include a slight increase in soil temperature after vegetation layers are removed in small, localized patches. Soil disturbance from mechanical fuels reduction and exotic plant removal projects would be negligible to beneficial but of minor intensity and indirect. For St. Lawrence WMD, the small prescribed fires planned would result in negligible effects.

Accidental spills from refueling saws or equipment in the field would be minimized by refueling on surfaces where any spills could be contained.

Cumulative Effects: Considering the locations of any planned activities on the refuge, including support facilities, and local development involving soil disturbance, the cumulative effects from the preferred alternative would be negligible.

Mitigation Measures: Mitigation actions would likely be similar to alternative A; project plans involving prescribed fire or mechanical fuels work would outline specific, onsite measures to minimize damage to soils.

Conclusion: The direct impacts of alternative B on the soils resource would be negligible to beneficial, indirect, and of minor intensity.

3.4.6 Water and Wetland Resources

3.4.6.1 Montezuma NWR

Montezuma NWR (9,184 acres), Northern Montezuma Wildlife Management Area (approximately 7,000 acres), and other conservation lands and private ownerships comprise the 50,000-acre Montezuma Wetlands Complex. The entire MWC is located in what was historically called the Montezuma Swamp. This vast area extended northward from Cayuga Lake almost to Lake Ontario. In the late 19th century, most of this swamp was effectively drained for commerce and transportation by the development of the Erie Canal, the NYS Canal System, and the dam at the north end of Cayuga Lake. Draining the area made it possible to clear and farm the rich organic soils that underlaid the marsh. Crop farming of potatoes, onions, and other root crops became a major part of the local economy (Ducks Unlimited 2000).

The refuge receives water from direct precipitation, runoff from the hilly areas bordering the west side of the refuge, three streams originating to the west of the refuge, and several springs within refuge boundaries.

Surface water concerns include water quality, flood flows generated by the operation of the NYS Canal System, and surface water supply for current and future wetland impoundments. Groundwater resources in the MWC are located in the consolidated (bedrock) and unconsolidated glacial deposits. Nearly all the groundwater in this area is derived from precipitation that is absorbed by the mantle of surficial deposits. Unconsolidated sand and gravel deposits produce the best yield of water for wells in the region. Overall, hydrological data for the MWC is lacking, and more detailed information is needed (USFWS 2006a).

The agricultural land uses surrounding the MWC contribute runoff to the wetlands. However, the function and value of some of these reverted wetlands may have lower wetland quality if invasive plants become established or concentrations of agricultural chemicals are left undetected. One study found concentrations of DDT, PCBs, and dieldrin in turtle and fish tissue samples, but not in sediment samples (USFWS 2008).

3.4.6.2 St. Lawrence WMD

Jefferson County is largely contained by the watershed for Lake Ontario and the St. Lawrence River. Most of the county's waters flow into Lake Ontario in a number of smaller streams, such as Sandy Creek, South Sandy Creek, North Branch Sandy Creek, Mill, and Stony and Skinner Creeks, whose headwaters are in the Tug Hill Region of Jefferson County.

Subwatersheds are frequently low gradient flows. They were often altered by ditching and channeling in an attempt to drain water from surrounding lands for farming and now provide the greatest opportunity for wetland restoration in an altered landscape. The management of water levels by the dams, coupled with other factors, degraded the vegetation and function of coastal wetlands and bays. That change adversely affected waterfowl, water bird, shore bird, and fisheries habitat (USFWS 2006b).

Methodology: The following threshold and duration criteria are identified for water and wetland resources.

Impact Topic	Negligible	Minor	Moderate	Major	Duration of Impact
Water and Wetland Resources	Impacts barely perceptible or below detection levels.	Changes to water quality, wetland hydrology, and aquatic organisms detectable but relatively small. No mitigation would be necessary.	Changes to water quality, wetland hydrology, and aquatic organisms readily apparent but localized. Mitigation to offset adverse impacts could be necessary and would likely be successful.	Impacts to water quality, wetland hydrology, and aquatic organisms severe or of exceptional benefit over a wide area. Mitigation to offset adverse impacts would be necessary, but success is not assured.	Short term would refer to recovery in less than 5 years. Long term would refer to recovery, following treatment, requiring longer than 5 years.

3.4.6.1 Impacts of Alternative A – Wildfire Suppression Only Alternative

Impact Analysis: Under this alternative, wildfire suppression operations and direct and indirect effects of fire on the refuge and WMD would range from negligible to moderate, depending on severity. Ash charge into surface water, along with some soil runoff from equipment use, would likely result in direct, short-term and minor impacts to aquatic systems.

Cumulative Effects: There are no known or planned actions at the refuge or WMD that would disturb surface waters or wetlands. Therefore, there would be negligible cumulative impacts associated with alternative A.

Mitigation Measures: Mitigation for low-severity wildfires would be very minimal. For high-severity fires, a rehabilitation plan may be necessary to mitigate any undesirable impacts.

Cumulative Effects: There are no known or planned actions at the refuge or WMD that would disturb surface waters or wetlands. Therefore, there would be negligible cumulative impacts associated with alternative A.

Conclusion: Direct and indirect impacts resulting from wildfires would range from negligible to moderate, depending on fire severity.

3.4.6.2 Impacts of Alternative B – Service-preferred Alternative

Impact Analysis: Under this alternative, as wildfire severity potential is reduced by fuel reduction treatments under an annual treatment schedule, long-term impacts would be beneficial, indirect, localized, and of minor intensity when compared with current conditions. Any change to overall water discharge rates into refuge waterways or pools also is expected to be negligible over the

long term. There could be an increase in runoff during intense storms directly following heavy vegetation removal and/or prescribed fire, but the amount or contents would not likely affect water quality or quantity adversely. The St. Lawrence WMD would experience negligible impacts to water resources from the preferred alternative.

Cumulative Effects: Same as for the alternative A.

Mitigation Measures: Mitigation actions under the preferred alternative would be that project plans involving prescribed fire or mechanical fuels work would outline specific, onsite measures to protect surface waters and wetlands prior to commencing work.

Conclusion: Long-term impacts on refuge or WMD water resources would be beneficial, indirect, localized, and of minor intensity under a planned program of treatments.

3.4.7 Air Quality

Generally, the air quality over Montezuma NWR and St. Lawrence WMD and their surrounding areas is good. Agricultural burning and other types of debris burning occur during the year and may affect the quality of the air to a minor degree and temporary in duration.

As required by Section 118 of the Clean Air Act, as amended (42USC 7418), the Service must submit project-specific prescribed burn plans for each application of prescribed fire to the appropriate state agency located in the area where the burn is scheduled for implementation. These prescribed burn plans include in-depth procedures for applying smoke management techniques to minimize the amount and/or impact of emissions, identifying sensitive resources or populations, and modeling results of predicted air quality impacts.

Based on the level of prescribed burning planned for Montezuma NWR the only pollutant that may be of concern locally is PM 2.5. Long range, and downwind populations would be minimally impacted at best, given distance, and burn prescription designed to loft particulate matter above the mixing height where particles then spread out or dilute (dispersion through dilution).

The following threshold and duration criteria are identified for air quality.

Impact Topic	Negligible	Minor	Moderate	Major	Duration of Impact
Air Quality	Impact on air quality barely detectable and not measurable; if detected, would have slight effects.	Impact on air quality measurable and localized. No mitigation measures would be necessary.	Changes in air quality would be measurable and would have consequences, but impacts local. Mitigation measures necessary and likely effective**.**	Changes in air quality measurable, would have substantial consequences, and noticed regionally. Mitigation measures necessary and success of measures not assured.	Short term would refer to hours or days; i.e., the duration of the fire management incident. Long term would refer to that substantially beyond the duration of the incident or action.

3.4.7.1 Impacts of Alternative A – Wildfire Suppression Only Alternative

Impact Analysis: Under alternative A, wildfires would be aggressively suppressed with the primary goal of keeping them to the smallest acreage possible. Direct adverse impacts to air quality from wildland fire under this alternative would include the release of particulates and smoke into the airshed. Since these fires would most likely be the result of heavier than normal accumulations of dead and downed fuel, fire intensity and duration could provide considerable resistance to control for suppression resources, thus these events would last longer. This condition is somewhat mitigated by the fact that hazardous fuel conditions are located in the refuge but are not continuous. This fact can give suppression resources the opportunity to isolate heavy fuel accumulations and suppress fires in a more expeditious manner and result in an overall reduction in smoke and particulate emissions. Generally, the generation of emissions from wildfire would range from minor to moderate (1 to 5 days). In most cases, especially those in which drought is not a factor, fires would produce a short-term impact. The fire suppression tactics used in this alternative would focus on extinguishing fires as quickly as possible. This would normally minimize smoke production because the total number of acres burned would be kept to a minimum.

The direct and indirect impacts of this alternative on the refuge and WMD would be short-term and minor on a local scale and nearly negligible on a regional scale, except in the most extreme cases.

Cumulative Effects: Cumulative effects, absent a major increase in nonfire related pollutants or large wildfires in the region, would be adverse, direct, localized, and minor. Due to the short term nature of most wildland fires, the cumulative effects on air quality would be localized and minor. This alternative would not change cumulative effects on air quality in the long term. Air quality at the refuge would continue to be impacted from daily vehicle emissions on roads and other management activities that utilize power-driven machinery.

Mitigation Measures: As all wildfires on the refuge would be considered unwanted and emergencies, mitigation would consist of aggressive suppression action to minimize smoke impacts. During aggressive fire suppression activities, the rapid suppression of fires and the extinguishment of residual smoke during the mop-up phase generally assist in reducing smoke impacts. This generally occurs during the smoldering phase of combustion often seen during the waning periods of a wildland fire's life cycle.

Conclusion: Direct and indirect impacts of alternative A would be short-term and minor on a local scale and nearly negligible on a regional scale. Since recent wildland fire occurrence is infrequent and fire size has been small, the direct and indirect adverse impacts of this alternative on air quality would be localized, short-term, and minor. Wildland fire smoke impacts would be minimized in the case of smaller fires that result from the implementation of aggressive suppression tactics. It should be noted that there may be cases where fires, driven by excess hazardous fuel loadings, may exceed the capabilities of suppression resources to effectively and safely suppress, thus allowing fires to burn with increased intensity, duration and increased smoke production. Despite the potential for adverse impacts in the short term, the adoption of this alternative does not constitute impairment.

3.4.7.2 Impacts of Alternative B – Service-preferred Alternative

Activities resulting from implementing the FMP under a proposed annual work schedule would involve some vegetation removal, debris or pile burning, and broadcast prescribed fire. Direct impacts include release of particulates, and indirect impacts would be similar to those of wildland fire. The limited scale of treatments and resulting emissions would cause minor, direct, localized, but generally short-term, adverse impacts to air quality.

Vegetation would also be cut with hand tools in project areas containing fuels that, if burned, would produce moderate levels of emissions for very short periods. The long-term effect would be beneficial, indirect, and of minor intensity.

Since most prescribed burns at the refuge are projected to be small (burn units average 20 acres), a typical burn in the active stages would last approximately 1 to 4 hours. Smoke from prescribed fire can be minimized by altering ignition patterns and burning during times of the day when smoke dispersal is good. In spite of these measures, minor, short-term impacts are likely to occur. Pollutants generated by nonfire fuel reduction projects would add a negligible amount of air pollution above those levels discussed in alternative B since additional acreage would be treated with manual fuel reduction techniques. Pollutants would be generated by the use of gasoline-powered equipment in these operations, but the impacts upon air quality, given the small size of the projects and the infrequency of the activity, would be localized, short-term, and negligible. The indirect, long-term, and downrange adverse impacts would be negligible.

Cumulative Effects: Cumulative effects generally would be similar to alternative A. Air quality at the refuge would continue to be impacted in the short term with minor impacts from such uses as daily vehicle emissions and other similar management or public activities, such as debris burning. In the long term, adverse impacts would be lessened as accumulations of hazardous fuels were reduced through fuel reduction strategies (manual, mechanical, and prescribed fire) both in and outside the refuge through cooperative efforts with neighbors and other agencies.

Mitigation Measures: The extinguishment of residual smoke produced by burning fuels (mop-up) during wildland fire incidents would lead to an overall reduction in smoke production and residual smoke. Coordination with cooperating agencies before prescribed fire operations are implemented could lead to an overall decrease in smoke production. This would be accomplished by the cooperative pretreatment (elimination) of heavy fuel accumulations that would otherwise produce heavy volumes of smoke. In addition, the public could be notified of the potential impacts of smoke and their anticipated duration if warranted. During prescribed fire operations, we may use a variety of techniques to reduce the production and/or impact of smoke emissions:

- Ignitions only implemented when relative humidity is optimized for fuel consumption (less smoke production in a “clean” burn).
- Fuel moistures are conducive to the accomplishment of burn objectives.
- Ignition patterns are utilized that minimize smoke impacts.
- Mixing heights at least 500 meters or more.
- Transport winds greater than 12 mph.
- Wind direction away from smoke sensitive areas.
- Prescribed burn projects compartmentalized into smaller units, resulting in smaller sections burned with less smoke production.

- Burning during periods of atmospheric instability (daylight hours).
- Avoid wind directions that would carry smoke toward smoke-sensitive locations such as highways and towns during heavier traffic periods (i.e., weekends, holidays, etc.).
- Reduce particulate emissions for the fuel consumed by reducing the time period of the smoldering phase.
- Post "Smoke on Road" signs when smoke has the potential to drift over a public roadway.

Conclusion: The preferred alternative would result in minor, direct, localized, but generally short-term, adverse impacts to air quality given mitigation measures. Smoke impacts from prescribed burns are short-term, usually from between 4 to 12 hours, and may be planned for periods of the day when environmental conditions are maximized for smoke dispersion and direction, a major change from most wildland fires.

3.4.8 Public Health and Safety

U.S. Fish and Wildlife Service policy requires that all lands under its control and that possess vegetation capable of sustaining wildland fire prepare and implement a comprehensive fire management plan. The refuge meets these criteria but does not currently have a fire management plan that meets recently published criteria or that is consistent with this CCP being prepared for the refuge. The development of this plan is intended to meet that requirement. The overriding goal of this plan is to provide for the protection of all refuge resources and offer a safe environment for visitors, refuge personnel, and adjacent land owners. Safety is always the first priority!

Wildfires have the potential to impact human health and safety, particularly during high-fire severity periods. Public safety is becoming a management concern, particularly where the Interstate borders Montezuma NWR (e.g., smoke on the highway). Other areas of risk are the refuge's visitor trails, parking areas, and access roads.

The following threshold and duration criteria are identified for park health and safety.

Impact Topic	Negligible	Minor	Moderate	Major	Duration of Impact
Public Health and Safety	An action that could cause a change in level of risk to public and firefighter safety, but the change would be so small that it would not be of any measurable or perceptible effect.	An action that could cause a change in risk level, but the change would be small and localized effect. Mitigation would be a standard procedure and highly effective in	An action that would cause measurable change to levels of risk; however, mitigation to offset adverse effects would generally be	An action that would cause a severe change or exceptional benefit to public and firefighter safety-related values. The change would have	Short term would refer to the duration of a fire management incident. Long term refers to duration extending beyond the specific incident.

	minimizing risk.	moderate complexity and effective.	a substantial effect, and mitigation to offset adverse impacts is not assured.

3.4.8.1 Impacts of Alternative A – Wildfire Suppression Only Alternative

Impact Analysis: One important health impact is the impacts of smoke on refuge visitors and employees, which is addressed as an impact topic under "Air Quality" above.

Montezuma NWR: The increased chance of wildfire escapes along public roadways and the Interstate would create an element of risk to surrounding residents, visitors, refuge staff, and firefighters. Wildfires and the suppression actions all combine to produce confusion and fear, especially during initial phases. Protection of residents and visitors from any short-term, rapidly spreading fires may or may not be as achievable without preventive fuels management interventions to reduce risk. Impacts would be potentially adverse, short-term, direct, localized, and of minor to moderate intensity on public safety and would be partially mitigated by implementing any existing emergency response plans.

St. Lawrence WMD can anticipate some level of visitor increases during fire season in the future, but impacts to public health and/or safety would be negligible.

Cumulative Effects: Cumulative effects of alternative A would be increased duration of exposure to hazards associated with fire and suppression activities on and adjacent to USFWS lands. The cumulative effects on wildland firefighter and public safety are localized and minor.

Mitigation Measures:

- Portions of the refuge or WMD may be restricted by the refuge manager when there is any threat to the public or firefighters from a wildfire or fire management activities.
- Smoke warning signs will be posted on roadways and/or traffic control will be instituted during wildland fires.
- All fire personnel will receive annual training in all wildland fire safety standards.
- A safety briefing will be given prior to initiating work on any project.
- Every Incident Action Plan (IAP) will include a safety message.
- Every project or incident will have at least one person charged with incident safety oversight.
- All personnel will be authorized and obligated to exercise emergency authority to stop and prevent unsafe acts.

Conclusion: The direct and indirect adverse impacts to firefighters and the public under alternative A would be localized, short-term to long-term, and minor.

3.4.8.2 Impacts of Alternative B – Service-preferred Alternative

Impact Analysis: Under this alternative, long-term impacts under alternative B would be reduction in potential for high-intensity wildland fires, as fuels reduction treatments are applied around values at risk. Prescribed fire and fuel removal operations under a proposed work schedule would result in reduced safety threats to visitors, adjacent residents, and staff.

As long-term refuge and WMD protection and resource objectives are accomplished, the impact of the proposed alternative would range from negligible to beneficial, minor to moderate, and localized as the potential for high-intensity wildfires is reduced.

Cumulative Effects: When considered with reasonably foreseeable impacts of the proposed fire management program, cumulative effects would be negligible.

Mitigation Measures: Mitigation measures would be similar to alternative A.

Conclusion: Impacts from the preferred alternative would range from negligible to beneficial, minor to moderate, and localized as the potential for high-intensity wildfires is reduced.

4.0 CONSULTATION AND COORDINATION

4.1 Public Involvement Summary

The environmental analysis pathway follows a general progression starting with internal scoping. Internal scoping at Montezuma NWR was conducted by Wildland Fire Associates, LLC in compliance with NEPA requirements.

Following internal scoping, issues and concerns were distilled into distinct impact topics to facilitate the analysis and allow for a standardized comparison between alternatives based on the most relevant information. The impact topics were identified on the basis of the Federal laws, regulations, and staff inputs.

This EA will be released concurrent with the Montezuma NWR Draft Comprehensive Conservation Plan and Environmental Assessment (draft CCP/EA). Through this process, it will be subject to a 30 public review and comment period.

4.2 Agency Consultation

This EA is included as part of the draft CCP/EA. It will be made available at Montezuma NWR Headquarters and St. Lawrence WMD Field Office, a notice of availability will be published in the *Federal Register* for the draft CCP/EA, and a press release will be sent to local media.

4.3 List of Preparers

Name	Role on Project	Title	Office
Tom Jasikoff	**Administrative Oversight**	**Refuge Manager**	**Montezuma NWR 315-568-5987**
Linda C. Ziemba	**Site and Fire Management Information**	**Wildlife Biologist**	**Montezuma NWR 315-568-5987 ext. 225**
Mike Durfee	**Fire Management Information**	**Zone Fire Management Officer**	**US Fish & Wildlife Service 973.702.7266 ext. 16**
Rick Vollick	**Fire Management Information**	**Regional Fire Planner**	**US Fish & Wildlife Service 973.702.7266 ext. 19**
John Lissoway	**Author, FMP/EA**	**Senior Planner**	**Wildland Fire Assocs. St. Louis, MO 505.670.6437**

4.4 List of Agencies, Governments, Officials, and Organizations Contacted

[Note: The refuge will be developing a CCP and a listing will be prepared as part of the CCP and included here.]

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GLOSSARY AND ACRONYMS

Fire Management Plan (FMP): A strategic plan that defines a program to manage wildland and prescribed fires and documents the fire management program in the approved land-use plan. The plan is supplemented by operational plans such as preparedness plans, preplanned dispatch, prescribed fire plans, and prevention plans.

Habitat Management Plan (HMP): A detailed plan that defines management areas and treatment units, identifies the type or method of treatment, establishes the timing for management actions, and defines how we will measure success of habitat management strategies over the next 15 years.

Manual Fuels Reduction (or Treatment): Manipulation or removal of fuels to reduce the likelihood of ignition and/or lessen potential damage and resistance to control. Methods include, but are not limited to, lopping, piling and burning, thinning, and hand removal.

Montezuma Wetlands Complex (MWC): MWC is part of the 5,100-square-mile Oswego River watershed and includes wetlands and adjacent upland areas north of Cayuga Lake, extending up the Black Brook, Crusoe Creek, Butler Creek, Clyde River, and Seneca River drainages, all of which eventually flow into Lake Ontario. Partners within the MWC seek to restore thousands of acres of wetland habitat and associated uplands within a 50,000-acre drainage basin that was once among the premier wetland areas in the eastern U.S.

Mechanical Fuels Treatment: Manipulation or removal of fuels with machinery to reduce the likelihood of ignition and/or lessen potential damage and resistance to control. Methods include, but are not limited to, chipping, felling, limbing, crushing, lopping, and removing.

Minimum Impact Suppression Techniques (MIST). The application of strategy and tactics that effectively meet suppression objectives with the least environmental, cultural, and social impacts.

Mitigation: Actions taken with the objective of reducing impacts. Mitigating actions include the following:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments.

Prescribed Fire: Any fire ignited by management actions to meet specific objectives. A written, approved prescribed fire plan must exist, and NEPA requirements must be met before ignition.

Prescription: Measurable criteria that define conditions under which a prescribed fire may be ignited. Prescription criteria may include safety, economic, public health, environmental, geographic, administrative, social, or legal considerations.

Values to Be Protected: Include property, structures, physical improvements, natural and cultural resources, community infrastructure, and economic, environmental, and social values.

Wildland Fire: Any nonstructure fire, other than prescribed fire, that occurs in the wildland. This term encompasses fires previously called both wildfires and prescribed natural fires.

Wildfire: An unplanned, unwanted wildland fire including unauthorized human-caused fires, escaped wildland fire use events, escaped prescribed fire projects, and all other wildland fires where the objective is to put the fire out.

Wildland Fire: Any non-structure fire that occurs in the wildland. Includes both wildfire and prescribed fire.

Wildfire Suppression: A response to wildfire that results in curtailment of fire spread and eliminates all identified threats from the particular fire. All wildfire suppression activities provide for firefighter and public safety as the highest consideration but minimize the loss of resource values, economic expenditures, and/or the use of critical firefighting resources.

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APPENDIXES

Appendix A. Annual Habitat Work Plan, Montezuma NWR

ANNUAL HABITAT WORK PLAN

2011

MONTEZUMA NATIONAL WILDLIFE REFUGE
SENECA FALLS, NEW YORK

Waterfowl flushing from the Main Pool during a detectability survey on November 9, 2010 (USFWS).

Introduction

The Montezuma National Wildlife Refuge (NWR) is located at the north end of Cayuga Lake in the heart of the Finger Lakes Region of central New York State. The refuge encompasses more than 9,000 acres and lies within New York's 25th U.S. Congressional District in Seneca, Cayuga, and Wayne Counties—35 miles west of Syracuse, 40 miles north of Ithaca, and 45 miles east of Rochester, NY. The refuge headquarters is located on US Route 20 and NY Route 5 near the Menard Memorial Bridge over the Seneca River. The New York State Barge Canal system, NY State Route 5, US Route 20, NY State Route 89, and the New York State Thruway pass through the interior of the refuge. Since the early 1990s, more than 2,500 acres of lands have been added to the refuge. Many of these parcels are scattered tracts within the original boundaries of the historic Montezuma marshes.

Although established primarily for migratory waterfowl, Montezuma NWR provides habitats for an abundance of wildlife species. The mix of wooded wetlands, emergent marshes, and mixed successional stages of vegetation all contribute to the species diversity of the wildlife community found at Montezuma. The Montezuma Wetlands Complex (MWC), of which the refuge is a part, was recognized for supporting one of the largest migratory concentrations of waterfowl in the Northeast and as a significant stopover site for migrating shorebirds in upstate New York. The MWC was New York's flagship project in the Atlantic Coast Joint Venture after the adoption of the North American Waterfowl Management Plan. The National Audubon Society identified the MWC as New York's first Important Bird Area (IBA).

The refuge is managed for a variety of habitats to fulfill the needs of wildlife of greatest conservation concern. At present, Montezuma NWR has 15 manageable impoundments totaling more than 4,000 acres of freshwater wetland habitat. The remainder of the refuge's acreage consists of forests, grasslands, and early successional habitats ranging from old fields to young forests. Active habitat management is necessary to provide the best possible habitat for native wildlife species. In most impoundments, water levels are manipulated to provide high quality mudflat, emergent marsh, and open water wetland habitats primarily for waterfowl, shorebirds, water birds, marshbirds, and bald eagles (*Haliaeetus leucocephalus*). Water levels are managed within and between years in an attempt to mimic natural wetland hydro-periods or to provide the best possible habitat for priority wildlife species.

2010 Weather Overview

Higher than average precipitation during late summer made it difficult to maintain proposed water levels and made work in the Dry Marsh difficult. Overall, average high and low temperatures were close to average, average rainfall was up 5 inches, and snowfall was up approximately 21 inches (table 1).

Table 1. Weather recorded from the NOAA Online Weather Data in Auburn, NY (*http://www.nws.noaa.gov/*). Approximately 10 miles East of MNWR.

Month	2010 Temperature		29-Yr Temperature		2010 Snowfall Inches	2010 Precipitation Inches	29-Yr Average Snowfall Inches	29-Yr Average Precipitation Inches
	Average High	Average Low	Average High	Average Low				
January	29.7	16.3	30.5	14.1	52.2	2.95	30.2	2.88
February	30.2	18.1	34.0	16.1	43.7	3.54	18.3	2.31
March	48.1	27.9	43.5	24.3	0.3	2.52	16.6	2.97
April	62.4	37.3	55.8	34.9	0.2	2.00	2.9	3.48
May	72.3	47.3	71.7	47.4	0.9	2.45	0.9	2.98
June	76.8	56.3	76.6	54.5	0.0	7.08	0.0	3.90
July	83.8	63.0	80.7	59.9	0.0	3.40	0.0	4.34
August	79.3	60.5	78.7	58.3	0.0	6.23	0.0	3.60
September	71.3	52.5	71.0	50.9	0.0	3.34	0.0	5.42
October	59.1	41.6	59.4	39.7	0.0	6.51	0.8	3.64
November	47.9	31.0	47.7	31.7	1.2	2.94	7.9	3.25
December	30.8	19.4	35.3	19.6	41.3	4.31	20.3	3.68
Avg. Temp./Total Snowfall/ Precip.	**57.6**	**39.3**	**57.1**	**37.6**	**139.8**	**47.27**	**97.9**	**42.45**

Habitat Management Goals, Objectives, and Strategies

Goal 1 Provide high quality mudflat and freshwater emergent marsh and open water wetland habitats dominated by native plants for migrating and breeding waterfowl, shorebirds, waterbirds, marshbirds, and bald eagles provided through water level control.

Objective 1.1 Emergent (Hemi-) Marsh – Migrating Waterfowl
Each year, provide a minimum of 1,000 acres of spring (March through April) and fall (October through November) waterfowl migration and staging habitat consisting of shallow flooded wetlands (less than or equal to12 inches) with a mix of vegetation and open water (hemi-marsh) dominated by native emergent vegetation such as millets (*Echinochloa* spp.), sedges (*Carex* spp. and *Cyperus* spp.), beggarticks (*Bidens* spp.), spikerushes (*Eleocharis* spp.), American water plantain (*Alisma subcordatum*), and smartweeds (*Polygonum* spp.).

Objective 1.2 Shallow Water Mudflats
Provide a minimum of 100 acres of shallow water (less than 3inches) mudflats with sparse (less than 25 percent) vegetation and high invertebrate biomass in at least two patches twice annually during spring and again during late summer and early fall to benefit migrating shorebirds including semipalmated sandpipers (*Calidris pusilla),* greater yellowlegs (*Tringa melanoleuca),* and short-billed dowitcher (*Limnodromus griseus),* among other shorebirds.

Objective 1.3 Open Water
Each year, provide open water on a minimum of 1,000 acres, consisting of at least 2 patches greater than or equal to100 acres from March through November. This will provide feeding habitat for bald eagles, particularly important during their fledging in mid to late summer, and migratory habitat for diving ducks.

Objective 1.4 Emergent Marsh – Breeding Marshbirds
Each year, provide a minimum of 800 acres of habitat for breeding marshbirds (especially black tern *(Chlidonias niger),* pied-billed grebe *(Podilymbus podiceps),* least bittern *(Ixobrychus exilis),* and American bittern *(Botaurus lentiginosus)*) consisting of an average mix of 50 to 70 percent vegetation and 30 to 50 percent open water (hemi-marsh) with an average water depth of 10 to 20 inches and at least 5 muskrat *(Ondatra zibethicus)* lodges per acre. Additionally, this habitat should be provided in a minimum of 3 patches greater than 100 acres each.

Goal 1 Strategies

Proposed and actual water levels for 2010 and proposed water levels for 2011 are listed in appendix A. Table 2 summarizes planned actions for 2011 in the refuge's 13 emergent marsh impoundments to meet the four objectives listed above. A biological calendar was created to further detail management actions on the refuge (available upon request).

Table 2. Summary of planned management in each impoundment for 2011 and the habitat objective each action is intended to meet.

Unit	Acres	Management Action	Habitat Objectives					
			1.1 Emergent Hemi-Marsh – Spring Migrating Waterfowl	1.1 Emergent Hemi-Marsh – Fall Migrating Waterfowl	1.2 Shallow Water Mudflats - Spring Migrating Shorebirds	1.2 Shallow Water Mudflats - Fall Migrating Shorebirds	1.3 Open Water - Bald Eagles & Diving Ducks	1.4 Emergent Marsh - Breeding Marshbirds
Main Pool	**1,663**	Full pool.	**X**	**X**			**X**	**X**
Tschache Pool	**1,270**	Spring slow drawdown. Fall flood up.	**X**	**X**	**X**			
Sandhill Crane Unit	**448**	Full pool.	**X**	**X**			**X**	**X**
Knox Marsellus Marsh	**228**	Late slow drawdown.	**X**	**X**		**X**		**X**
May's Point Pool	**199**	Full pool or late slow drawdown.	**X**	**X**		**?**		**X**
Puddler Marsh	**95**	Late slow drawdown.	**X**	**X**		**X**		**X**
Millennium	**70**	Full pool.	**X**	**X**				**X**
Visitor Center Wetland	**26**	Spring slow drawdown. Summer disk. Shallow flood late summer.	**X**	**X**	**X**	**X**		
Shorebird Flats	**20**	Spring slow drawdown. Summer disk. Shallow flood late summer.			**X**	**X**		
Benning Marsh	**18**	Full pool	**X**	**X**				
Box Elder Bog	**10**	Full pool.	**X**	**X**				
Lesser Yellowlegs	**8**	Full pool.	**X**	**X**				
Display Pool	**2**	Full pool.	**X**	**X**				

Monitoring Strategies for Goal 1 in All Units

Weekly waterbird counts will be conducted in all refuge emergent marsh impoundments from March into November per the Integrated Waterbird Management and Monitoring (IWMM) protocol (2010, *http://iwmmprogram.ning.com*). Vegetation surveys will be conducted once in the spring and twice in the fall in all refuge emergent marsh impoundments per the IWMM protocol. Black tern breeding colony surveys will be conducted in all refuge impoundments with suitable habitat per the protocol used by the NY State Department of Environmental Conservation. Breeding marshbird surveys will be conducted for secretive marshbirds in the seven largest refuge impoundments per the standardized protocol developed by Conway (2009, *http://www.fws.gov/bmt/documents/marshbird_monitoring_protocol.pdf).* Point locations were established by the FWS Division of Migratory Birds as part of a pilot study to develop a national survey that will be applicable to biologists and land managers at the national, regional, and refuge scales.

Management Strategies for Goal 1 in All Units

Muskrat and beaver trapping will be permitted in all refuge impoundments to protect the dikes from muskrat damage, to protect water control structures and stop logs from beaver damage, and to extend the life of the hemi-marsh stage of the wetlands.

Main Pool (1,663 acres)

2010 Management Results: The Main Pool was slowly drained from April to the end of May. Draining the Main Pool allowed restoration to continue in the Dry Marsh. This project involves digging potholes and removing muck soil to provide a greater interspersion of open water and emergent marsh habitats in the northern portion of the Main Pool along the Wildlife Drive. Restoration of the Dry Marsh was hindered by unusually wet conditions during late summer. However, 10 percent of the total 75 acres was completed. Flooding of the Main Pool began in late August.

On April 4, vegetation in the Dry Marsh portion of the Main Pool ignited due to an unknown human cause at the north end of the Wildlife Drive next to the New York State Thruway, I-90. The fire burned for approximately 12 hours and consumed all available fuel in a 694-acre area and then died when it could not cross the open water and ditches surrounding the Main Pool. The fire was early enough in the year to have minimal impacts on nesting wildlife. The burn removed accumulated cattail (*Typha* spp.) biomass and stimulated regeneration.

Volunteers, Larue St. Clair, Jackie Bakker, and Frank Morlock conducted waterbird counts and avian mortality surveillance two times per week from March 10 through December 3 along the Wildlife Drive and at other refuge impoundments. A detectability survey was conducted in the Main Pool on November 9. Breeding marshbird surveys were conducted in the southern portion of the Main Pool, near black lake, in May and June of 2010.

2010 Vegetation and Wildlife Response: The 2010 drawdown resulted in dense cover of cattail, smartweed, beggartick, sedges, and millets in the Main Pool, providing excellent habitat for fall migrating waterfowl.

The results of the weekly waterbird counts are available upon request. As usual, waterfowl use of the Main Pool was phenomenal during both spring and fall migration. Spring migration peaked on March 10, with almost 26,000 individuals of 18 species counted. Although large numbers of waterfowl took advantage of the abundant food in the Main Pool during fall migration, counts were low because the dense vegetation made it difficult to see the birds. Results of the November 9 detectability survey indicated that only 20 percent of the birds present were actually being counted. Table 3 shows the minimum peak numbers of waterfowl species of concern for both spring (March and April) and fall (October and November) migration and includes adjusted numbers for fall migration based on the detectability survey.

Table 3. Peak numbers of waterfowl species of conservation concern detected in the Main Pool in 2010. Only species with peaks greater than 100 are included. Adjusted numbers based on the November 9 detectability survey are included in parentheses.

Species	Spring Migration		Fall Migration	
	Peak Date	Peak Number	Peak Date	Peak Number
Green-winged teal	April 23	268	Oct. 26	34 (170)
Canada goose	March 10	13,500	Nov. 23	3,820 (19,100)
Canvasback	March 19	12,000	Nov. 16	76 (380)
Mallard	March 10	625	Oct. 5	78 (390)
Northern pintail	March 10	2,650	Nov. 2	387 (1,935)
Redhead	March 23	620	Oct. 19	355 (1,775)
Ring-necked duck	March 10	650	Nov. 16	4,000 (20,000)
Scaup	April 2	42	Nov. 23	150 (750)
Tundra swan	March 12	1,100	Nov. 30	600 (3,000)
Total Waterfowl	March 10	**25,853**	Oct. 26	**10,141 (50,705)**

Few shorebirds utilized the Main Pool in the spring due to dry conditions and in the fall due to full pool conditions. No focal marshbirds were detected using the southern portion of the Main Pool.

Bald eagles were a common occurrence on the Main Pool with observations greater than 30 recorded, and one pair nesting successfully on Maple Island.

2011 Management Strategy: Water will be kept in the Main Pool to provide habitat for waterfowl during spring and fall migration and throughout the summer for nesting marshbirds, especially black tern, pied-billed grebe, least bittern, and American bittern, and foraging bald eagles. We will experiment with techniques to continue restoration work in the Dry Marsh with water (i.e. partial drawdown) in the Main Pool.

Tschache Pool (1,270 acres)

2010 Management Results: A spring drawdown was considered but not conducted due to the Main Pool drawdown. Tschache Pool was held at full pool to provide habitat for spring and fall migrating waterfowl, bald eagles, and breeding marshbirds. Muskrat trapping was permitted in the interior of Tschache Pool to prevent muskrats from removing too much emergent vegetation and creating too much open water.

Volunteers with the Montezuma Alliance for the Restoration of Species and Habitat (MARSH!) spent nine workdays removing common frogbit (*Hydrocharis morsus-ranae*) from a 21-acre area in the northwest portion of the impoundment. MARSH! volunteer efforts were focused on the removal of common frogbit from the impoundment with more than ¾ tons removed.

2010 Vegetation and Wildlife Response: Tschache Pool has not been drawn down since 2005. The impoundment has some cattail and sedge cover for waterbirds but is mainly open water and is in need of a drawdown to promote vegetation growth.

Waterfowl numbers were similar to previous years with species of concern present (eg, American black duck *(Anas rubripes)*, green-winged teal *(Anas crecca)*, blue-winged teal *(Anas discors)*, Canada goose *(Branta canadensis)*, mallard *(Anas platyrhynchos)*, northern pintail *(Anas acuta)*, and redhead *(Aythya americana*).

The cover of purple loosestrife (*Lythrum salicaria*) in Tschahce Pool has been greatly reduced by the introduction of biological control beetles (*Galerucella* spp.).

American bittern, common moorhen *(Gallinula choropus)*, pied-billed grebe, and Virginia rail *(Rallus limicola)* were detected during breeding marshbird surveys within the impoundment, and five black tern nests were confirmed during a colony survey.

Bald eagles used Tschache Pool extensively and there were two active nests in the vicinity. The weekly waterbird surveys had counts of at least 30 bald eagles using the impoundment.

2011 Management Strategy: Tschache Pool will be drawn down in the spring for northbound shorebirds and to promote vegetative growth throughout the summer. A fall flood-up will provide habitat for southbound waterfowl, weather permitting.

The interior of the unit will be inspected for common frogbit. If the frogbit is present and accessible, it will be hand pulled by staff and MARSH! volunteers.

Breeding bird surveys will be conducted in the interior of Tschache Pool to determine if obligate grassland breeding birds nest in this impoundment when it is drained.

This impoundment may be surveyed in the summer to determine bottom elevations.

Sandhill Crane Unit (former Foster Malone Tract) (448 acres)

2010 Management Results: The Sandhill Crane Unit was held as high as possible to limit woody plant growth and provide habitat to migrating and nesting waterbirds.

2010 Vegetation and Wildlife Response: In March, thousands of waterfowl including mallard, American black duck, green-winged teal, American wigeon *(Anas americana)*, northern pintail, and Canada goose used the Sandhill Crane Unit.

American bittern, common moorhen, least bittern, pied-billed grebe and sora *(Porzana carolina)* were detected during marshbird callback surveys. A survey also was conducted for black terns with 2 nests found and an additional probable nest. Horned larks *(Eremophila alpestris)* were identified in the unit in April and may have bred in the higher areas.

Winter raptor surveys were conducted in December 2010 through March 2011 with short-eared owl *(Asio flammeus)* (also common in the spring and fall), northern harrier *(Circus cyaneus)*, red-tailed *(Buteo jamaicensis)* and rough-legged hawk *(Buteo lagopus)*, and northern shrike *(Lanius excubitor)* detected utilizing the impoundment.

2011 Management Strategy: Various techniques including high water levels, chemical spot treatments, and cutting with an amphibious excavator are being explored to eliminate woody vegetation from the interior of the Sandhill Crane Unit. A new water control structure will be installed in the ditch on the west side of the unit to divert water into the impoundment. Weather permitting, the Sandhill Crane Unit will be held as high as possible to assist in eliminating woody vegetation and also to provide habitat for migrating waterfowl and breeding marshbirds.

Knox Marsellus Marsh (228 acres)

2010 Management Results: Knox Marsellus Marsh was held at full pool to provide habitat for spring migrating waterfowl, bald eagles, and breeding marshbirds then slowly drained beginning in July to provide habitat for migrating shorebirds.

Beavers (*Castor canadensis*) were active in the southwest corner and repeatedly dammed up the culvert under Towpath road. A trapper was issued a special use permit prior to and through the state trapping season to remove beavers.

2010 Vegetation and Wildlife Response: Knox Marsellus Marsh provided habitat for spring migrating waterfowl and shorebirds, and extremely good habitat for fall migrating shorebirds with thousands counted at a time. Species included greater yellowlegs, lesser yellowlegs *(Tringa flavipes)*, least *(Calidris minutilla)*, semipalmated, stilt *(C. himantopus)*, pectoral *(C. melanotos)*, spotted *(Actitis macularia)*, and solitary *(Tringa solitaria)* sandpiper, short-billed dowitcher,

American golden-plover *(Pluvialis dominica)*, black-bellied plover *(P. squatarola)* and Wilson's *(Phalaropus tricolor)* and red-necked *(P. lobatus)* phalarope. Table 4 shows the minimum peak numbers of shorebirds detected in Knox-Marsellus Marsh in 2010.

Table 4. High counts of shorebirds in Knox-Marsellus and Puddler Marshes reported by birders and volunteers in 2010 (*www.ebird.org*). Only species with a high count greater than 100 are included.

Species	Approximate Peak Date	Peak Number
Killdeer	July 22	130
Least sandpiper	July 22	1,350
Lesser Yellowlegs	July 22	800
Pectoral Sandpiper	September 8	350
Semipalmated Plover	August 13	273
Semipalmated Sandpiper	August 22	400

No marshbird callback surveys were completed due to the lack of suitable habitat.

Wildlife highlights are listed under Puddler Marsh.

2011 Management Strategy: Knox Marsellus Marsh likely will be managed similarly to last year, but management will be flexible depending on the weather and habitat needs.

Puddler Marsh (96 acres)

2010 Management Results: Puddler Marsh was held at full pool to provide habitat for spring migrating waterfowl, bald eagles, and breeding marshbirds. A partial drawdown was conducted throughout the summer and early fall to provide mudflats for migrating shorebirds.

2010 Vegetation and Wildlife Response: Little vegetation provided good mudflats late in the fall migration and shorebirds responded to the habitat. The water level was kept high enough through the summer to limit the growth of Eastern cottonwood trees *(Populus deltoids)* throughout the impoundment. Puddler had a slower response of migrating birds, compared to Knox-Marsellus Marsh.

Some additional highlights for both Knox Marsellus and Puddler Marshes include:

- Dozens of black-crowned night-herons *(Nycticorax nycticorax)* roosting in the cattails through the fall.
- More than 4,500 unique snow geese *(Chen caerulescens)* during fall migration.
- More than 25,000 unique Canada geese during fall migration.
- More than 4,000 unique Northern pintail during fall migration.
- More than 3,500 unique mallards during fall migration.
- Almost 1,500 unique shorebirds during fall migration of 17 species.
- Nine probable and one confirmed black tern nests.
- At least 20 unique sandhill cranes *(Grus canadensis)* through the fall.
- A family of North American river otters *(Lontra canadensis)*.

2011 Management Strategy: If possible, Puddler Marsh will be held lower than last year to promote vegetative growth and possibly to provide additional shorebird habitat. Management will be flexible depending on the weather and habitat needs.

May's Point Pool (199 acres)

2010 Management Results: May's Point Pool was held at full pool to provide habitat for spring migrating waterfowl, bald eagles, and breeding marshbirds and lowered throughout the summer to provide habitat for migrating shorebirds. To facilitate restoration in the Dry Marsh, water was pumped under the New York State Thruway (I-90) into May's Point Pool.

Common frogbit was discovered within the impoundment in late summer. MARSH! volunteers attempted to hand pull the plant but found it to be difficult because the plant was dying (leaves broke off the stems) and because most of the plants were buried under muck soils (out of water, on the shoreline). One MARSH! work day was spent hand pulling common frogbit from the shoreline of the pool. *Galerucella* beetles were released in May's Point Pool to control purple loosestrife.

2010 Vegetation and Wildlife Response: May's Point Pool did not drain enough to provide mudflats for migrating shorebirds but did provide excellent habitat for breeding marshbirds and migrating waterfowl. This pool had a good mixture of open water, submerged and emergent vegetation, and cattail cover for breeding marshbirds, including black tern, pied-billed grebe, and common moorhen, and migrating waterfowl. One black tern nest was identified with another nest probable. Some migrating shorebirds were sighted through fall migration.

May's Point Pool had a waterbird (waterfowl and shorebird) species richness of 37. Highlights included one little blue heron (*Egretta caerulea*) and numerous Great Egrets (*Ardea alba*) frequenting the pool.

May's Point Pool provided the most consistent duck trapping sites for preseason banding with 690 ducks banded. This accounted for more than 58 percent of the total ducks banded in 2010 (1,176 total ducks).

2011 Management Strategy: May's Point Pool likely will be managed similarly to last year, but management will be flexible depending on the weather and habitat needs.

Common frogbit was documented in May Point Pool in 2010 and control will be attempted in 2011 by the MARSH! program.

Millennium Marsh (70 acres)

2010 Management Results: Millennium Marsh was drawn down in the spring to facilitate habitat restoration work in the Dry Marsh and then flooded in the fall from North Spring Pool for southbound waterfowl.

2010 Vegetation and Wildlife Response: Millennium Marsh received consistent use by northbound waterfowl in March and April. Despite excellent vegetative response to the summer draw down, few waterfowl were observed through fall migration. This may not be representative of the entire impoundment because visibility from the Wildlife Drive is poor.

Marshbird callback surveys were conducted at the North end of the impoundment; no focal species were identified.

2011 Management Strategy: Millennium Marsh will be held at full pool for migrating waterfowl and breeding marshbirds.

Visitor Center Wetland (26 acres)

2010 Management Results: The Visitor Center Wetland was drawn down in the spring for northbound shorebirds. Water from the Main Pool was pumped via Crisafulli pump into this unit in April and May to keep it moist through the spring shorebird migration. Common reed (*Phragmites australis*) in the interior of the unit was sprayed with glyphosate in July with an ATV sprayer. The unit was disked in early August and then flooded by pumping water from the Main Pool to create mudflats for southbound shorebirds. The water level was increased in late fall to cover the impoundment for the winter months.

Thanks to the refuge's emphasis on early detection/rapid response for invasive species, flowering rush (*Butomus umbellatus)* was identified near the inlet of the Visitor Center Wetland. All the plants observed were either dug up or chemically treated with Clearcast (active ingredient: imazamox) to control this invasive emergent plant. We will continue to monitor the effectiveness of our treatments and potentially eradicate this new invasive from the refuge. Photo monitoring points were established to monitor the spread of this invasive plant.

2010 Vegetation and Wildlife Response: Migrating shorebirds and waterfowl consistently utilized the Visitor Center Wetland as the impoundment was flooded for spring and fall migration. Over the course of the year, 31 species were present in the wetland. Dunlin, long-billed dowitcher, yellowlegs, pectoral, semipalmated, spotted and stilt sandpiper, black-bellied plover, and Wilson's phalarope foraged on the mudflats while American black duck, green-winged teal, American wigeon, Canada goose, gadwall *(Anas strpera)*, mallard, northern pintail, northern shoveler *(Anas clypeata)*, and wood duck *(Aix sponsa)* foraged in the deeper water (still less than 4 inches). Numbers peaked for shorebirds on August 17 with 111 individuals including 103 yellowlegs. Waterfowl peaked on October 26 with more than 1,647 individuals counted including 1,230 Canada geese, 145 green-wing teal, and 100 mallards.

One pre-season duck banding trap was placed on the dike, and 81 ducks were caught throughout the season.

2011 Management Strategy: The Visitor Center Wetland will be drawn down in the spring for northbound shorebirds. Water from the Main Pool may be pumped via Crisafulli pump into this unit in April and May to keep it moist through the spring shorebird migration. In late June, July, or as soon as the unit is dry enough, vegetation may be disked thoroughly, and later flooded to create mudflat habitat for southbound shorebirds. Whenever the unit becomes too dry for

shorebirds, additional water will be pumped in. Water may be kept high enough to provide some waterfowl habitat during fall migration.

Shorebird Flats (20 acres)

2010 Management Results: Shorebird Flats is a new impoundment that was completed in the fall of 2010 and was managed for fall migrating shorebirds. Water was pumped into the unit via a Crisafulli pump from the Main Pool.

2010 Vegetation and Wildlife Response: Heavy equipment used to complete the impoundment set back all vegetation within the unit providing prime mudflats for southbound shorebirds. Numbers peaked on September 28 with 178 killdeer *(Charadrius vociferous)* and on October 26 with172 dunlin. Other species present include American golden plover, black-bellied plover, buff-breasted sandpiper, greater and lesser yellowlegs, least, pectoral, white-rumped, and semipalmated sandpiper, and Wilson's snipe.

2011 Management Strategy: Management will be similar to the Visitor Center Wetland for migrating shorebirds.

Benning Marsh (18 acres)

2010 Management Results: A slow drawdown was initiated in March and continued until the impoundment was drained in mid-June. It was disked in late July, but was too wet to complete more than one pass with the equipment. Benning was flooded through a structure from the Main Pool although it was difficult to hold water due to muskrat damage on the East dike. The unit was slowly drained to provide fall shorebird habitat. On August 1, the unit was flooded to provide better habitat for waterfowl.

2010 Vegetation and Wildlife Response: The spring drawdown resulted in lush vegetative growth within the impoundment. Despite the inability to properly disk the marsh, shorebirds used the impoundment through the middle of August with the following species observed: killdeer, Wilson's snipe *(Gallinago delicate)*, least, pectoral, and semipalmated sandpipers, dunlin and greater and lesser yellowlegs.

The lush vegetation that resulted from the disking provided good dabbling habitat for fall migrating waterfowl. Species observed include: mallard, American wigeon, northern pintail, green-winged teal, American black duck, northern shoveler, gadwall and Canada goose.

2011 Management Strategy: Benning Marsh will be managed for migrating waterfowl. The vegetation in the unit resulting from last year's drawdown should provide good waterfowl habitat during both spring and fall migration.

Box Elder Bog (10 acres)

2010 Management Results: Box Elder Bog is part of the Riparian Forest Corridor Habitat Management Unit, thus, the intention is to reforest this emergent marsh impoundment. The bog was kept dry for the majority of the year to promote woody vegetation.

2010 Vegetation and Wildlife Response: The majority of this 10-acre impoundment was dominated by reed canary grass (*Phalaris arundinacea*) in 2010 which limited the growth of woody vegetation. No control methods were conducted to control the invasive vegetation. The unit was flooded for fall migration of waterfowl.

2011 Management Strategy: Box Elder Bog will be held at full pool until it can be prepared for seeding and planting native species to promote its reforestation. The surrounding area is dominated by reed canary grass with common buckthorn (*Rhamnus cathartica*) growing adjacent to the Clyde River. Invasives need to be controlled and native species planted in the entire area to increase the likelihood of success. In the meantime, this small impoundment will continue to provide habitat for migrating waterfowl.

Lesser Yellowlegs Unit (Formerly Shorebird Unit, 8 acres)

2010 Management Results: The Lesser Yellowlegs Unit was filled at the end of March to provide habitat for migrating shorebirds and then drained in May in attempts to disk the unit. The unit was, although still wet, disked in July to mix existing vegetation back into the ground to provide food for aquatic invertebrates when flooded. Disking also set back the regrowth of vegetation. Natural precipitation filled the Lesser Yellowlegs Unit to provide habitat for fall migrating waterfowl and cover the unit for the winter months.

Due to wet soil, the vegetation within the unit was not disked thoroughly. In combination with limited water added to the unit due the Main Pool being dry, regrowth was quick and dense.

2010 Vegetation and Wildlife Response: Shorebirds including spotted, solitary and least sandpipers, Wilson's snipe and greater and lesser yellowlegs were observed in the Lesser Yellowlegs Unit throughout the year, and numerous species of waterfowl were commonly found using the impoundment. It was difficult to keep the unit flooded because the Main Pool was drained, and the impoundment is lower in elevation on the northern and southern ends than in the middle. Not being able to add enough water caused vegetative growth which reduced the number of shorebirds utilizing the unit. The vegetation provided habitat for waterfowl that consistently used the unit.

2011 Management Strategy: Water in the Lesser Yellowlegs Unit will be held high (approximately 12 inches) for waterfowl.

Display Pool (2 acres)

2010 Management Results: Water was held in the Display Pool and slowly dropped throughout the summer to provide habitat for migrating shorebirds in the fall.

2010 Vegetation and Wildlife Response: Very little vegetative growth or wildlife use occurred in the Display Pool in 2010.

2011 Management Strategy: Water will be kept in the Display Pool to provide foraging habitat for wading birds in the summer and waterfowl in the fall.

Goal 2 Restore and maintain bottomland hardwood forests (forested wetland), the riparian forests along the Seneca and Clyde Rivers, and upland forests to increase block size and connectivity and reduce fragmentation to support nesting waterfowl and songbirds, breeding amphibians, and uncommon plant communities.

Goal 2 Strategies

The U.S. Forest Service (USFS) conducted a Forest Health Assessment in the Nash, Cerulean, Esker Brook, and Jackson Forests (Dodds and Dubois 2011). Important findings are described separately for each unit.

Jackson Property – East, West, North Central, and South Central Former Agricultural Fields (43 acres)

2010 Management Results: MARSH! volunteers and refuge staff spent five days in October and November planting 950, 3 to 5 foot tall native tree saplings in two former agricultural fields totaling 25 acres. Hackberry (*Celtis occidentalis*), American sycamore (*Plantus occidentalis*), white oak (*Quercus alba*), swamp white oak (*Quercus bicolor*), bur oak (*Quercus macrocarpa*), northern red oak (*Quercus rubra*), and shagbark hickory (*Carya ovate)* were planted. In April and May refuge staff and MARSH volunteers cut garlic mustard (*Alliaria petiolata*) and on July 2, refuge staff sprayed pale swallow-wort (*Cynanchum rossicum*) along the field edges to prevent these invasive plants from invading the fields and thwarting our reforestation efforts. Prior to planting, a cooperative farmer mowed the fields high to stimulate the growth of woody vegetation, reduce the vigor of herbaceous vegetation, and prepare the fields to plant trees.

2010 Vegetation and Wildlife Response: In 2009, MARSH! volunteers and refuge staff planted 450 trees in two former agricultural fields totaling 18 acres. These trees were monitored for mortality in July 2010. At least 76 percent of the trees planted had survived. Unfortunately, a miscommunication with the cooperative farmer who was to mow only the fields that had not yet been planted, led to the already planted fields being mowed and resulted in 21percent of the trees being mowed down (killing the trees).

The USFS conducted a Forest Health Assessment in 47 acres of existing forest at the Jackson Property. The dominant trees are common buckthorn, white ash (*Fraxinus americana*), and

maple (*Acer* spp.), and the main concern is invasive species. Common buckthorn, in particular, is likely to influence tree regeneration and future forest conditions.

2011 Management Strategy: Mortality surveys will continue for trees planted in 2009 and 2010 to determine the success of each planting. A protocol will be developed to monitor reforestation sites not only for the survivorship of planted trees but also to measure natural regeneration.

Objective 2.1 Bottomland Floodplain Forest
Maintain and restore, as necessary, a minimum of 1,000 acres of mature bottomland floodplain forest dominated by red maple *(Acer rubra)*, American elm *(Ulmus americana)*, green ash *(Fraxinus pennsylvanica)*, and swamp white oak *(Quercus bicolor)*, by allowing natural processes and controlling non-native invasive species to provide breeding habitat for cavity nesting waterfowl (primarily wood duck), migratory songbirds (especially cerulean warbler *(Dendroica cerulean*), and breeding amphibians. The New York Natural Heritage Program identified the Montezuma floodplain forest as a significant ecological community.

Objective 2.1 Strategies

Unit 17 East (344 acres)

2010 Management Results: The intention was to maintain the water level in Unit 17 East at 383.0' during 2010 to keep water in the ditch surrounding the unit but drained from the interior of the unit. Conditions kept the water level higher in the unit and made it difficult to drain the interior. A breeding bird survey was conducted in this unit per the standardized protocol developed by Knutson et. al (2008). An emerald ash borer trap was placed in the crown of a trap tree and monitored by the U.S. Forest Service.

2010 Vegetation and Wildlife Response: This unit was over one foot higher than proposed from late summer into fall because the Cayuga Lake Connector Canal was opened to fill the Main Pool and the control structure was rotten. The unit still provided great nesting and foraging habitat for wood ducks and great blue herons *(Ardea herodias)*; a heron rookery was present. The following species of conservation concern were detected during breeding bird surveys: wood thrush (*Hylocichla mustelina*), Baltimore oriole (*Icterus galbula*), Northern flicker (*Colaptes auratus*), rose-breasted grosbeak (*Pheucticus ludovicianus*), scarlet tanager (*Piranga olivacea*), black-throated blue warbler (*Dendroica caerulescens)*, red-headed woodpecker *(Melanerpes erythrocephalus)* and song sparrow (*Melospiza melodia*). The abundance of wood thrush, a focal species for this habitat type, was 1.36. More information about the results of this breeding bird survey can be found in the Breeding Bird Surveys in Forested Wetlands Progress Report (Ziemba and Bakker 2011). The emerald ash borer trap placed in the crown of a trap tree was negative.

2011 Management Strategy: We will attempt to keep the interior of Unit 17 East drawn down again this year to encourage seedling growth. The structure was patched to facilitate filling the Main Pool but to be efficient, the structure should be replaced. Ditches will remain flooded to provide habitat for nesting waterfowl such as wood ducks. Breeding bird surveys will be conducted in this unit, and results will be compared to those for other units as well as results of

previous years' surveys to facilitate adaptive management. The emerald ash borer trap tree will be cut and debarked during the spring 2011. A fish survey may be done in the ditches surrounding this unit.

Unit 17 West (266 acres)

2010 Management Results: The northern outlet structure is rotten so we have limited water level control in this unit. A breeding bird survey was conducted in this unit per the standardized protocol developed by Knutson et. al (2008).

2010 Vegetation and Wildlife Response: This unit provided great nesting and foraging habitat for wood ducks. The following species of conservation concern were detected during breeding bird surveys: wood thrush, Baltimore oriole, Northern flicker, rose-breasted grosbeak, scarlet tanager, red-headed woodpecker, willow flycatcher (*Empidonax traillii)* and song sparrow. The abundance of wood thrush, a focal species for this habitat type, was 0.55.

2011 Management Strategy: Same as Unit 17 East.

Main Pool Forest (457 acres)

2010 Management Results: The Swamp Woods Natural Area was recognized by the NY Natural Heritage Program as a red maple-hardwood swamp that is "significant on a statewide level due to large size, good diversity, good species condition, and good microtopography."

This area is influenced by the water level in the Main Pool and so 2010 was a dry year for this unit since the Main Pool was drawn down. A breeding bird survey was conducted in this unit per the standardized protocol developed by Knutson et. al (2008).

2010 Vegetation and Wildlife Response: The following species of conservation concern were detected during breeding bird surveys: Baltimore oriole, black-billed cuckoo (*Coccyzus erythropthalmus*), Northern flicker, red-headed woodpecker, rose-breasted grosbeak, scarlet tanager, song sparrow, willow flycatcher, and wood thrush. The abundance of wood thrush, a focal species for this habitat type, was 0.45.

2011 Management Strategy: This area is directly influenced by the water regime of the Main Pool, which will be held at full pool throughout the year. Breeding bird surveys will be conducted in this unit and compared to results of previous surveys as well as results in Units 17 East and West to facilitate adaptive management.

Beech-Maple Knoll (69 acres)

2010 Management Results: The Beech-Maple Knoll was designated a Research Natural Area in 1967 because it is a prime example of a mature, northern hardwood beech-maple forest cover type. The beech-maple association provides a unique habitat type not found elsewhere on the refuge. In September, the USFS established a vegetation transect to monitor potential impacts of deer browse.

2010 Vegetation and Wildlife Response: A lack of stems less than 2 inches DBH was found in this unit indicating high negative impacts caused by white-tailed deer.

2011 Management Strategy: The vegetation transect to monitor potential impacts of deer browse will be revisited in the spring and again in the fall to monitor changes to the vegetative community over time.

Esker Brook (229 acres)

2010 Management Results: The USFS conducted a Forest Health Assessment on a 37-acre forest stand in this unit.

2010 Vegetation and Wildlife Response: Black walnut (*Juglans nigra*), white ash, and American elm were the only overstory trees present. Black walnut accounted for 96 percent of the basal area in the stand and 77 percent of the stems. Portions of this stand were thickly covered with invasive honeysuckle species (*Lonicera* spp.) in the understory. With this thick shrub layer of honeysuckle, it may be difficult for forest tree species to effectively regenerate.

2011 Management Strategy: None.

Cerulean Forest (215 acres)

2010 Management Results: The USFS conducted a Forest Health Assessment on a 37-acre forest stand in this unit. The NYNHP considers this forest unit to be a significant occurrence of a silver maple-ash swamp.

2010 Vegetation and Wildlife Response: Dominant trees in this stand include bitternut and shagbark hickory and red maple. This forest stand represents a relatively intact native plant community with a very low invasive species load.

2011 Management Strategy: The USFS may establish vegetation transects to monitor potential impacts of deer browse in the Cerulean Forest.

Other Areas

There are several areas throughout the refuge that also provide forested wetland habitats. These areas are not managed or monitored.

Objective 2.2 Riparian Forest Corridor

Where practical, maintain and restore, as necessary, at least a 150m-wide (Fischer 2000) corridor of riparian forest along the Seneca and Clyde Rivers dominated by native species to maintain connectivity of bottomland hardwood forest and the riverine habitat and to protect the water quality of the river, and provide nesting habitat for wood duck, cerulean warbler, bald eagle, and other species of conservation concern.

Objective 2.2 Strategies

Seneca Trail Area (40 acres)

2010 Management Results: A contractor sprayed the pale swallow-wort growing throughout the entire area with Garlon 4 Ultra (active ingredient: triclopyr) during the growing season. Common buckthorn was treated with Garlon 4 Ultra mixed with bark oil and applied to the basal bark. MARSH volunteers removed all Japanese stiltgrass *(Microstegium vimineum)* from the area.

2010 Vegetation and Wildlife Response: Restoration of the Seneca Trail Area is a long-term project requiring a long-term perspective regarding vegetation and wildlife response. The swallow-wort response to repeated herbicide treatments has been slow in that it returns every year, but the density was much lower this year than in previous years. Herbicide application will continue in an effort to control the plant. Native trees planted in 2008 and 2009 continue to grow in areas where common buckthorn was removed.

2011 Management Strategy: Invasive plant control will continue in 2011. Native trees and shrubs will be planted as time and funding permit.

May's Clyde River Forest Corridor

2010 Management Results and Vegetation and Wildlife Response: No management action occurred within the unit in 2010.

2011 Management Strategy: The Restoration Tree Trust has been contacted in an effort to secure funding to control invasive species and reforest this corridor. The not-for-profit organization's purpose is to foster urban and rural reforestation. When resources become available, this corridor will be reforested. More information about the Restoration Tree Trust and a summary of the Montezuma project can be found at: *http://www.restorationtreetrust.com/.*

Other Areas

There are several areas along both the Seneca and Clyde Rivers on the refuge that meet this objective. These areas currently are not managed.

Objective 2.3 Mature Upland Forest

Provide 300 acres of mature-late successional upland forest (greater than150 years old) dominated by native species, especially sugar maple, oaks, hickories, and white ash to benefit migratory breeding birds including wood thrush, cerulean warbler, and black-billed cuckoo. Focus forest management and restoration on parcels within 500-acre blocks of forest or more, if possible, with an emphasis on those parcels with minimal edge, and maintain forests in close proximity to one another.

Objective 2.3 Strategies

Lawrence Property (65 acres)

2010 Management Results: The southern 25 acres of this field were mowed in October to prepare for planting native shrubs and trees. Planting did not occur due to limited resources. The Conservation Fund and the Restoration Tree Trust were contacted and may fund the planting of the total 65-acre field in 2011.

Vegetation and Wildlife Response: No wildlife or vegetation surveys were conducted.

2011 Management Strategy: Conversion from post agricultural to successional forest will begin on the Lawrence Property in the spring of 2011. Working in the south and north ends of the field, 38 acres will be planted with bareroot seedlings purchased from the New York State Department of Environmental Conservation Tree Nursery in Saratoga, NY. Northern red oak *(Quercus rubra)*, sugar maple *(Acer saccharum)*, red maple, silver maple (*Acer saccharinum*), black cherry *(Prunus seotina)*, buttonbush (*Cephalanthus occidentalis*), and red osier dogwood *(Cornus sericea)* seedlings will be stocked at a rate of 100 per acre. A fall planting also will be conducted. Available resources will determine the extent of this planting.

Nash Forest (211 acres)

2010 Management Results: A 16-acre portion of this unit was enrolled in the cooperative farming program in 2010 to keep the area free of invasive plants until the refuge has the resources to plant native trees and monitor the regenerating area for invasives. The USFS conducted a Forest Health Assessment and also established a transect to monitor impacts of deer browse on vegetation.

2010 Vegetation and Wildlife Response: Of the three vegetation transects established to monitor deer impacts (Nash Forest, Beech-Maple Knoll, and Clark's Ridge), the Nash Forest was least impacted by deer browse. Indeed, this tract was identified during the health assessment as "a unique forest containing large diameter tulip poplar and sugar maple."

2011 Management Strategy: The same 16-acre portion of this unit will be enrolled in the cooperative farming program in 2011 as in 2010. We are working with the Restoration Tree Trust to raise funds to purchase trees to reforest this area. We will continue to monitor the vegetation transect to determine if deer are overbrowsing this unit.

Goal 3 Provide a diverse mix of grasslands and shrublands within the Montezuma Wetlands Complex juxtaposed to reduce fragmentation and edge effect and to enhance habitat quality for priority species of conservation concern.

Objective 3.1 Grasslands

Maintain a minimum of 350 acres of grassland habitat dominated by native species with a mix of cool and warm season grasses, less than 20 percent forbs and less than 3 percent shrub cover to provide habitat diversity, nesting cover for waterfowl and other grassland nesting birds

(especially bobolink *(Dolichonyx oryzivorus)*), habitat for pollinators, and improved wildlife viewing opportunities for the visiting public. Focus grassland management on large (greater than 20 acres) fields, with an emphasis on those fields with minimal edge, less surrounding forest, and more surrounding open habitats (old fields, emergent wetlands), and where possible maintain grasslands in close proximity to one another.

Objective 3.1 Strategies

Wilgoose (including the Winery Field, 173 acres total)

2010 Management Results: The intention was to burn North Wilgoose (30 acres) and the western half (21 acres) of Wilgoose Central in the spring to promote the growth of warm season grasses because these areas are dominated by cool season grasses and a more diverse mix is desirable. The burn was conducted on April 2; however, due to wet conditions in Wilgoose Central, only North Wilgoose was burned. On July 5, a $^{1}/_{3}$-acre area in North Wilgoose adjacent to Route 89 was sprayed with Garlon 4 Ultra to control pale swallow-wort. On July 2, 7 patches of Canada thistle (*Cirsium arvense*) totaling two acres were cut to control this invasive plant. In July, 3,500 *Galerucella* beetles were released in the north to south oriented swale in the northern two-thirds of the field (22 acres) to control purple loosestrife. The southern 44 acres of Wilgoose and 11 acres of the Winery Field were mowed at the end of August to control goldenrod, which has become dominant in those portions of the grassland. Breeding bird and wintering raptor surveys were conducted.

2010 Vegetation and Wildlife Response: This grassland still has a higher component of forbs and woody vegetation than is desirable. Table 5 shows the obligate grassland breeding birds detected in Wilgoose. Other species of conservation concern that were detected using the field are song sparrow and willow flycatcher.

Table 5. Obligate grassland breeding birds detected during surveys in the Wilgoose Grassland.

Species	**Abundance**	**Frequency**
Bobolink	0.67	0.33
Savannah sparrow (*Passerculus sandwichensis*)	3.33	1.00
Vesper sparrow (*Pooecetes gramineus*)	0.83	0.50

Short-eared owls, northern harriers, and red-tailed and rough-legged hawks were detected foraging in the unit through the winter depending on the weather and snow cover. The number of short-eared owls detected peaked in late fall when nine were observed roosting in the southern portion of Wilgoose.

2011Management Strategy: Trees growing in the unit will be cut by Morrisville College students under their professor's supervision using chainsaws. If pale swallow-wort is observed in the unit, it will be sprayed with Garlon 4 Ultra in June. Canada thistle will be mowed twice, first at the early bud stage (i.e., late June) and then in early fall (i.e., September). Wetlands in the unit will be monitored for purple loosestrife, and biological control beetles will be released if necessary. The field will be monitored for goldenrod, and any large patches will be mowed when the plant is in the bud stage (i.e., August).

Mowing may occur to set back succession, removing woody vegetation under 3 inches in diameter. Breeding bird, vegetation, and wintering raptor surveys will be completed to assist with adaptive management.

Waugh I and II (66 acres)

2010 Management Results: Waugh II was scheduled to be burned in the spring to promote warm season grass growth, but there was too little fuel in the unit to carry a fire. Both Waugh tracts were mowed in August to decrease the cover of woody vegetation. Breeding bird and wintering raptor surveys were conducted.

2010 Vegetation and Wildlife Response: Cool season grasses and low shrubs were dominant in Waugh I. Waugh II primarily consisted of forbs with some grasses.

Obligate grassland birds detected in Waugh include two bobolink, one horned lark, and eight savannah sparrows. Other species of conservation concern detected using the field include song sparrow and willow flycatcher.

Northern harriers, red-tailed and rough-legged hawks, and peregrine falcons *(Falco peregrines)* were detected utilizing the grassland during winter raptor surveys.

2011 Management Strategy: Both Waugh Tracts will be burned in spring 2011 to promote the growth of the warm season grasses that were seeded in Waugh II and to decrease the cover of woody vegetation in Waugh I. Breeding bird, vegetation, and wintering raptor surveys will be conducted in both tracts this year.

Sub-headquarters Fields (57 acres)

2010 Management Results: The fields were mowed on August 1 to reduce warm season grass cover. Breeding bird and wintering raptor surveys were conducted.

2010 Vegetation and Wildlife Response: The Sub-headquarters Fields were dominated by a dense stand of warm season grasses with some forbs and woody species in 2010. Breeding bird surveys were conducted at two points. One lone savannah sparrow was the only obligate grassland bird detected.

Winter Raptor Surveys were conducted from December 2010 to March 2011, with observers detecting the following raptor species: red-tailed hawk, rough-legged hawk, and northern harrier.

2011 Management Strategy: Breeding bird, vegetation, and wintering raptor surveys will be conducted. If warranted, the vegetation will be mowed again in late summer to suppress warm season grasses.

Avery Tract (56 acres)

2010 Management Results: The Avery Tract was mowed in August to reduce warm season grass cover. Breeding bird and wintering raptor surveys were conducted.

2010 Vegetation and Wildlife Response: The mowing and removal of above-ground biomass in 2010 increased the structural and plant species diversity in the field, and six savannah sparrows were detected during the breeding season. Other species of conservation concern that were detected using the field are song sparrow and willow flycatcher.

Short-eared owls and red-tailed, rough-legged, and cooper's hawks *(Accipiter cooperii)* were observed foraging over the Avery Tract and adjacent Knox-Marsellus Marsh during winter raptor surveys completed in December 2010 through March 2011.

2011 Management Strategy: Same as Sub-headquarters Fields.

Objective 3.2 Shrublands
Provide 100 acres of shrubland habitat dominated by native species with a mix of shrubs and herbaceous vegetation throughout the refuge to provide breeding habitat for shrubland-dependent birds, especially brown thrasher *(Toxostoma rufum),* field sparrow *(Spizella pusilla),* and blue-winged warbler *(Vermivora pinus)* and to provide food sources for migrating songbirds.

Objective 3.2 Strategies

Esker Brook Thicket (61 acres)

2010 Management Results: No management occurred in the Esker Brook Thicket in 2010. Breeding bird surveys were conducted.

2010 Vegetation and Wildlife Response: The Esker Brook Thicket was previously managed as three separate units; therefore different parts of the field are in different successional stages. The southern-most portion of the field is dominated by a mix of cool season grasses, forbs, and woody species; whereas the northern-most portion of the field consists of a dense stand of shrubs. Field and song sparrow, willow-flycatcher, and wood thrush (all species of concern) were detected during breeding bird surveys within this unit.

2011 Management Strategy: Breeding bird surveys will be conducted.

Clark's Ridge Old Field (23 acres)

2010 Management Results: No management occurred in Clark's Ridge Old Field in 2010. Breeding bird surveys were conducted.

2010 Vegetation and Wildlife Response: The field includes a diverse mix of herbaceous cover and has a large stand of thick woody shrubs and trees.

Baltimore oriole, song sparrow, willow flycatcher, wood thrush and cerulean warbler were detected within the shrubland during breeding bird surveys.

2011 Management Strategy: Breeding bird surveys will be conducted.

Waugh III (14 acres)

2010 Management Results: No management occurred in Waugh III in 2010. Breeding bird surveys were conducted.

2010 Vegetation and Wildlife Response: This field includes a diverse mix of herbaceous and woody cover. Species of conservation concern detected during breeding bird surveys in this unit include: song sparrow, willow flycatcher, and Baltimore oriole. Cerulean warblers were using trees adjacent to the unit.

2011 Management Strategy: Breeding bird surveys will be conducted.

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Appendix A. Proposed and actual water levels for 2010 and proposed levels for 2011, Montezuma NWR. DD = Drawndown, HP = Half Pool, FP = Full Pool.

Approximate Date	Benning Marsh			Knox Marsellus			Lesser Yellowlegs Unit		
	2010 Proposed	2010 Actual	2011 Proposed	2010 Proposed	2010 Actual	2011 Proposed	2010 Proposed	2010 Actual	2011 Proposed
1-Jan	381.0	381.0	381.5	376.8-379.3	377.6	376.8-377.3	382.2	380.6	382.2
15-Jan	381.0	381.3	381.5	376.8-379.3		376.8-377.3	382.2	380.8	382.2
1-Feb	381.0	381.2	381.5	376.8-379.3	378.0	376.8-377.3	382.2	380.8	382.2
15-Feb	381.0	381.2	381.5	376.8-379.3		376.8-377.3	382.2	NO DATA	382.2
1-Mar	381.2	381.2	381.5	376.8-379.3	377.6	376.8-377.3	382.2	380.6	382.2
15-Mar	381.2	381.1	381.0	376.8-379.3	377.9	377.3-378.3	382.2	380.6	382.2
1-Apr	381.4	381.1	381.0	376.8-379.3	377.8	377.6-378.3	381.7	381.7	382.2
15-Apr	381.4	381.0	381.0	376.8-379.3	377.6	377.6-378.3	381.7	381.7	382.2
1-May	381.4	380.4	381.0	376.8-379.3	377.4	377.6	381.3	381.5	382.2
15-May	380.5	380.7	381.0	376.8-379.3	377.4	377.3	380.9	380.4	382.2
1-Jun	380.2	380.4	381.0	376.8-379.3	377.1	377.1	379.4	DRAINED	382.2
15-Jun	380.2	380.2 DRAINED	381.0	376.8-379.3	377.1	377.1	379.4	380.0	382.2
1-Jul	380.4		381.0	376.6	377.1	377.0	381.3	379.9	382.2
15-Jul	380.4		381.0	376.6	376.7	376.7	381.1	DRAINED	382.2
1-Aug	380.6	381.2	381.0	376.4	376.4	376.5	381.0	381.3	382.2
15-Aug	380.6	381.2	381.0	376.4	376.5	376.4	380.9	381.5	382.2
1-Sep	380.8	381.4	381.0	376.2	376.3	376.3	380.9	381.3	382.2
15-Sep	380.8	381.3	381.0	376.2	376.2	376.2	380.9	381.4	382.2
1-Oct	381.0	381.5	381.0	376.0	376.5	376.0	381.3	381.6	382.2
15-Oct	381.0	381.5	381.0	376.0	375.9	375.9	381.3	381.6	382.2
1-Nov	381.2	381.5	381.0	375.8	376.1	376.8-377.3	382.2	381.5	382.2
15-Nov	381.2	381.3	381.0	375.8	376.5	376.8-377.3	382.2	381.5	382.2
1-Dec	381.0	381.7	381.5	376.8	376.8	376.8-377.3	382.2	381.4	382.2
15-Dec	381.0	382.6	381.5	376.8	377.1	376.8-377.3	382.2	382.1	382.2

Approximate Date	Main Pool			May's Point Pool			Millennium Marsh		
	2010 Proposed	2010 Actual	2011 Proposed	2010 Proposed	2010 Actual	2011 Proposed	2010 Proposed	2010 Actual	2011 Proposed
1-Jan	379.0	379.4	381.2	383.5-383.8	384.0	382.5	384.0	384.3	383.5
15-Jan	379.0	379.4	381.2	383.5-383.8	384.1	382.5	384.0	384.4	383.5
1-Feb	379.0	378.9	381.2	383.5-383.8	383.6	382.5	384.0	384.6	383.5
15-Feb	379.0	NO DATA	381.2	383.5-383.8	383.6	382.5	384.0	NO DATA	383.5
1-Mar	381.0	379.0	381.2	383.5-383.8	383.4	382.5	384.0	384.2	383.5
15-Mar	381.0	381.1	381.2	383.5-383.8	383.5	382.5	384.0	383.5	383.5
1-Apr	381.0	381.4	381.2	382.5-383.5	383.5	382.5	383.0	383.8	383.5
15-Apr	381.0	381.0	381.2	382.5-383.5	383.3	382.5	383.0	382.3	383.5
1-May	377.0-381.2	377.0	381.2	382.5-383.5	383.0	382.5	381.6	381.6	383.5
15-May	377.0	377.5	381.2	382.5-383.5	382.9	382.5	381.6	381.8	383.5
1-Jun	377.0	376.9	381.2	382.5-383.5	382.6	382.5	381.6	381.8	383.5
15-Jun	377.0	376.8	381.2	382.5-383.5	382.4	382.5	381.6	DRAINED	383.5
1-Jul	377.0	377.0	381.2	382.5-383.5	382.3	382.5	381.6	381.9	383.5
15-Jul	377.0	NO DATA	381.2	382.5-383.5	382.0	382.5	381.6	DRAINED	383.5
1-Aug	377.0	NO DATA	381.2	382.5	381.9	382.5	381.6	DRAINED	383.5
15-Aug	377.0	DRAINED	381.2	382.5	381.9	382.0	381.6	DRAINED	383.5
1-Sep	377.0-381.0	380.0	381.2	381.5-382.5	381.6	381.5	381.6-384.2	DRAINED	383.5
15-Sep	377.0-381.0	380.2	381.2	381.5-382.5	381.6	381.0	384.0	DRAINED	383.5
1-Oct	381.0	380.6	381.2	381.5-382.5	381.8	381.0	384.0	DRAINED	383.5
15-Oct	381.0	381.2	381.2	381.5-382.5	383.0	381.0	384.0	383.8	383.5
1-Nov	381.0	381.3	381.2	381.5-382.5	383.0	382.5	384.0	384.0	383.5
15-Nov	381.0	381.2	381.2	381.5-382.5	383.0	382.5	384.0	384.1	383.5
1-Dec	379.0	381.4	381.2	382.5-383.5	382.6	382.5	384.0	384.1	383.5
15-Dec	379.0	381.7	381.2	382.5-383.5	382.7	382.5	384.0	384.0	383.5

Approximate Date	Puddler Marsh			Sandhill Crane Unit			Shorebird Flats*		
	2010 Proposed	2010 Actual	2011 Proposed	2010 Proposed	2010 Actual	2011 Proposed	2010 Proposed	2010 Actual	2011 Proposed
1-Jan	376.7-378.9	377.1	376.7-377.6	Drained	378.7	380.0			384.0
15-Jan	376.7-378.9	NO DATA	376.7-377.6	Drained	NO DATA	380.0			384.0
1-Feb	376.7-378.9	NO DATA	376.7-377.6	Drained	379.0	380.0			384.0
15-Feb	376.7-378.9	NO DATA	376.7-377.6	Drained	NO DATA	380.0			384.0
1-Mar	376.7-378.9	377.2	376.7-377.6	Filling	378.4	≥380.0			384.0
15-Mar	376.7-378.9	377.4	376.7	Full Pool	379.1	≥380.0			384.0
1-Apr	376.7-378.9	377.4	376.7	Full Pool	379.1	≥380.0			384.0
15-Apr	376.7-378.9	377.2	376.7	Full Pool	379.3	≥380.0			384.0
1-May	376.7-378.9	377.0	376.7	Full Pool	379.3	≥380.0			384.0
15-May	376.7-378.9	376.9	376.7	Full Pool	379.3	≥380.0			Shorebird Habitat
1-Jun	376.7-378.9	376.7	376.5	Full Pool	379.0	≥380.0			
15-Jun	376.7-378.9	376.7	376.5	Full Pool	379.0	≥380.0			DRAINED
1-Jul	376.4	376.7	376.5	Full Pool	378.9	≥380.0			Shorebird Habitat (Disk, Pump, Whatever's needed)
15-Jul	376.4	376.5	376.5	Full Pool	378.7	≥380.0			
1-Aug	376.2	376.3	376.3	Full Pool	378.7	≥380.0			
15-Aug	376.2	376.0	376.0	Full Pool	378.4	≥380.0			
1-Sep	376.0	375.9	375.8	Full Pool	378.3	≥380.0			
15-Sep	376.0	375.8	375.7	Full Pool	378.1	≥380.0			
1-Oct	375.8	376.1	375.7	Full Pool	378.1	≥380.0			
15-Oct	375.8	375.8	375.7	Full Pool	379.1	≥380.0			384.0
1-Nov	375.6	375.9	376.7-377.6	Full Pool	379.0	≥380.0			384.0
15-Nov	375.6	375.9	376.7-377.6	Full Pool	376.2	≥380.0			384.0
1-Dec	376.7	376.3	376.7-377.6	Full Pool	378.9	≥380.0			384.0
15-Dec	376.7	376.6	376.7-377.6	Full Pool	379.3	≥380.0			384.0

*Created in 2010.

Approximate Date	Tschache Pool			Unit 17 East			VC Wetland		
	2010 Proposed	2010 Actual	2011 Proposed	2010 Proposed	2010 Actual	2011 Proposed	2010 Proposed	2010 Actual	2011 Proposed
1-Jan	384.4	385.2	384.4	383.0	383.7	383.0	384.0	383.9	384.0
15-Jan	384.4	385.0	384.4	383.0	NO DATA	383.0	384.0	383.9	384.0
1-Feb	384.4	384.5	384.4	383.0	384.0	383.0	384.0	383.9	384.0
15-Feb	384.4	384.5	384.4	383.0	NO DATA	383.0	384.0	383.9	384.0
1-Mar	384.0	384.6	384.4	383.0	NO DATA	383.0	384.0	384.0	384.0
15-Mar	384.0	384.1	384.4	383.0	383.8	383.0	384.0	384.1	384.0
1-Apr	384.0	384.0	384.0	383.0	NO DATA	383.0	383.5-383.7	NO DATA	384.0
15-Apr	384.0	383.8	383.0	383.0	383.6	383.0	383.5-383.7	383.7	384.0
1-May	384.0	383.9	382.5	383.0	383.1	383.0	383.5-383.7	383.9	384.0
15-May	384.0	384.0	381.5	383.0	383.6	383.0	383.5-383.7	383.8	Shorebird Habitat
1-Jun	384.4	383.8	<381.5 DRAINED	383.0	383.7	383.0	381.5	DRAINED	
15-Jun	384.4	384.3		383.0	383.1	383.0	< 383.3	DRAINED	< 383.3
1-Jul	384.4	384.3		383.0	383.1	383.0	< 383.3	DRAINED	
15-Jul	384.4	384.2		383.0	383.1	383.0	< 383.3	DRAINED	
1-Aug	384.4	384.3	Fill to 384.4 - 384.8	383.0	383.6	383.0	< 383.3	NO DATA	
15-Aug	384.4	384.4		383.0	384.4	383.0	< 383.3	384.4	Shorebird Habitat
1-Sep	384.4	384.3		383.0	384.5	383.0	381.5	383.8	
15-Sep	384.4	384.3		383.0	384.4	383.0	383.5-383.7	383.5	
1-Oct	384.4	385.0		383.0	384.7	383.0	383.5-383.7	384.0	
15-Oct	384.4	384.9		383.0	384.4	383.0	383.5-383.7	383.6	
1-Nov	384.4	384.8		383.0	383.6	383.0	383.5-383.7	383.6	384.0
15-Nov	384.4	384.6		383.0	383.5	383.0	383.5-383.7	383.7	384.0
1-Dec	384.0	384.2		383.0	383.8	383.0	384.0	383.8	384.0
15-Dec	384.0	384.7		383.0	383.7	383.0	384.0	383.9	384.0

Appendix B. Map of Burn Units, Montezuma NWR

Appendix C. Rare Animals, Plants, and Significant Ecological Communities, Montezuma NWR

New York Natural Heritage Report on Rare Animals, Rare Plants, and Significant Ecological Communities

of MONTEZUMA NATIONAL WILDLIFE REFUGE

Prepared February, 2006 from the Biodiversity Databases of the New York Natural Heritage Program, NYS DEC, 625 Broadway, Albany, NY, 12233-4757.

COMMON NAME	SCIENTIFIC NAME	NY STATE LISTING	NY STATE RANK*
Montezuma National Wildlife Refuge			
Documented on the Refuge since 1985			
Birds			
Pied-billed Grebe	*Podilymbus podiceps*	Threatened	S3
Bald Eagle	*Haliaeetus leucocephalus*	Threatened**	S2S3
Black Tern	*Chlidonias niger*	Endangered	S2
Short-eared Owl	*Asio flammeus*	Endangered	S2
Dragonflies and Damselflies			
Blue-tipped Dancer	*Argia tibialis*		S1
Plants			
Holly-leaved Naiad	*Najas marina*	Endangered	S1
Ecological Communities			
Floodplain Forest			S2S3
Other Species and Community Types Documented near the Refuge since 1985			
Birds			
Sedge Wren	*Cistothorus platensis*	Threatened	S3
Great Blue Heron	*Ardea herodias*		S5
Moths			
Imperial Moth	*Eacles imperialis imperialis*		SU
Plants			
Kentucky Coffee Tree	*Gymnocladus dioica*	Endangered	S1
Big Shellbark Hickory	*Carya laciniosa*	Threatened	S2
Seaside Bulrush	*Bolboschoenus maritimus* ssp. *paludosus*	Endangered	S2
Salt-meadow Grass	*Leptochloa fusca* ssp. *fasciculanis*	Endangered	S1
Ecological Communities			
Inland Salt Pond			S1
Inland Salt Marsh			S1
Shrub Swamp			S5

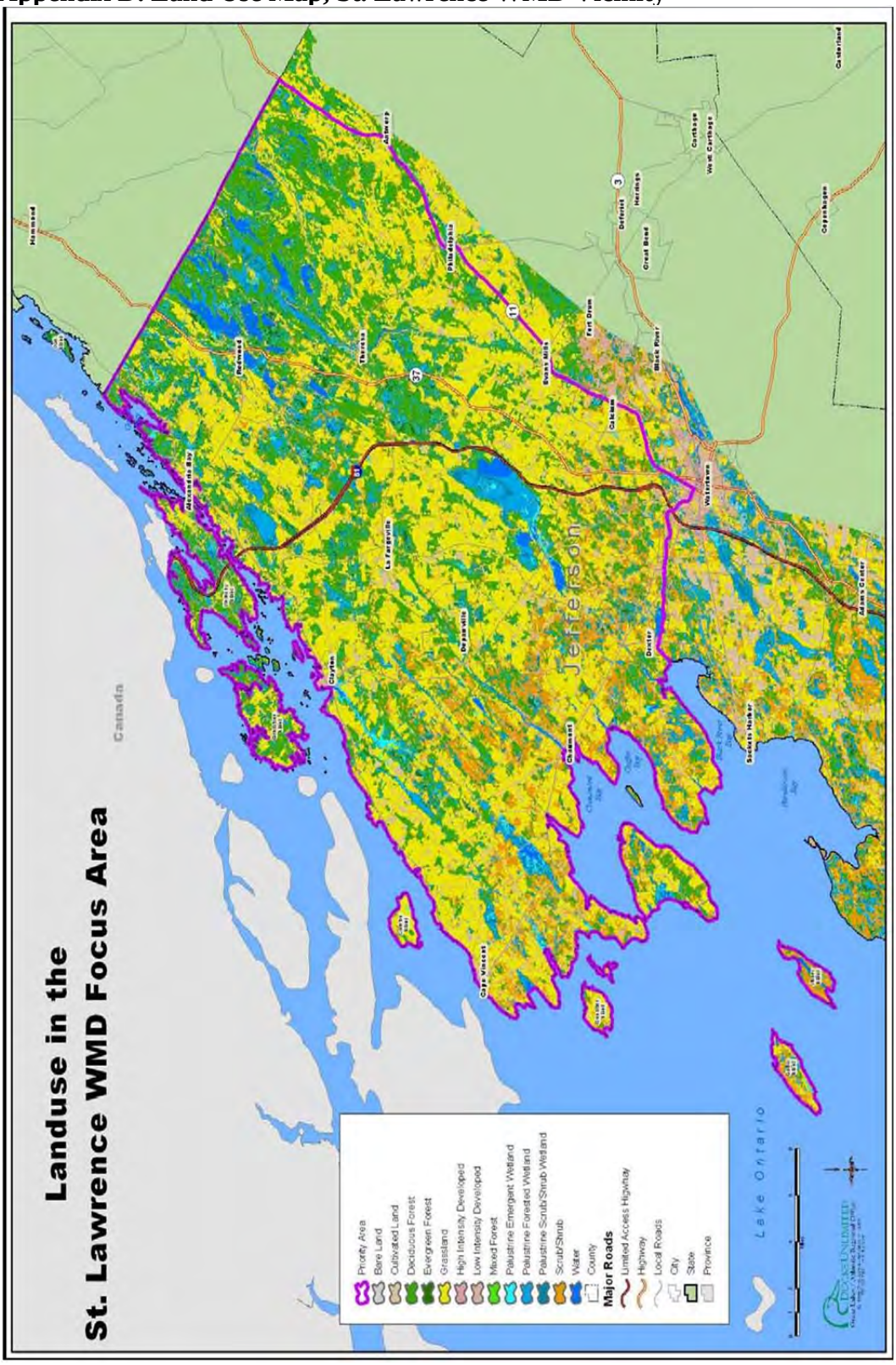
	COMMON NAME	SCIENTIFIC NAME	NY STATE LISTING	NY STATE RANK*
	Documented on or near the Refuge (precise locations unknown) before 1940.			
Plants				
	Golden Dock	*Rumex maritimus*	Endangered	S1
	Log Fern	*Dryopteris celsa*	Endangered	S1
Communities				
	Inland Salt Marsh			S1
	Documented near the Refuge before 1970; current status unknown.			
Birds				
	Northern Harrier	*Circus cyaneus*	Threatened	S3
Plants				
	Button-bush Dodder	*Cuscuta cephalanthi*	Endangered	S1
	Seaside Crowfoot	*Ranunculus cymbalaria*	Endangered	S1
	Marsh Valerian	*Valeriana uliginosa*	Endangered	S1S2
	Pink Wintergreen	*Pyrola asarifolia ssp. asarifolia*	Threatened	S2
	Sartwell's Sedge	*Carex sartwellii var. sartwellii*	Threatened	S1S2
	Documented near the Refuge at one time, but now extirpated from those locations.			
Plants				
	Seaside Crowfoot	*Ranunculus cymbalaria*	Endangered	S1
	Marsh Arrow-grass	*Triglochin palustre*	Threatened	S2
	Marsh Valerian	*Valeriana uliginosa*	Endangered	S1S2

* Rarity in NYS as ranked by NY Natural Heritage Program on a 1 to 5 scale.
S1 = Critically imperiled; S2 = Imperiled; S3 = Rare or uncommon;
S4 = Abundant and apparently secure; S5 = Demonstrably abundant and secure;
SH = Historical records only; no recent information available;
SU = Not yet ranked.

** Also Federally Listed.

Natural community occurrences in this report are all ranked as being of excellent quality, and therefore are considered significant from a statewide perspective. By meeting specific, documented significance criteria, the NY Natural Heritage Program considers this occurrence to have high ecological and conservation value.

Appendix D. Land Use Map, St. Lawrence WMD Vicinity



Appendix I

Doug Racine

Bald eagles on the refuge

Montezuma National Wildlife Refuge Wild and Scenic River Designation Review

Introduction

The Wild and Scenic Rivers Act (Act), (Public Law 90-543 as amended: 16 U.S.C. 1271-1287) established a method for providing federal protection for certain free-flowing rivers, preserving them and their immediate environments for the use and enjoyment of present and future generations. The function of this wild and scenic river review is to inventory and study the rivers, river segments and their immediate environments within the Montezuma National Wildlife Refuge (NWR, refuge) acquisition boundary to determine if they merit inclusion in the National Wild and Scenic River System.

Section 5(d) (1) of the Act states in part: *In all planning for the use and development of water and related land resources, consideration shall be given by all federal agencies involved to potential national wild, scenic and recreational river areas, and all river basin and project plan reports submitted to the Congress shall consider and discuss any such potential. The Secretary of the Interior and the Secretary of Agriculture shall make specific studies and investigations to determine which additional wild, scenic and recreational river areas within the United States shall be evaluated in planning reports by all federal agencies as potential alternative uses of the water and related land resources involved.*

Wild and scenic river considerations are a required element of comprehensive conservation plans and conducted in accordance with the refuge planning process outlined in 602 FW 1 and 3, including public involvement and National Environmental Policy Act compliance.

Wild and Scenic River Review for Montezuma NWR

The purpose of this wild and scenic river review is to inventory and study the rivers, river segments, and their immediate environments within the refuge planning area to determine if they merit inclusion in the National Wild and Scenic Rivers System.

As part of the Section 5(d) (1) review process, we are required to include all river segments that are within the planning area and listed in the Nationwide Rivers Inventory (NRI). The NRI is maintained by the National Park Service and lists more than 3,400 free-flowing river segments in the U.S. that are believed to possess one or more “outstandingly remarkable” natural or cultural values judged to be of more than local or regional significance.

Service Summary and Conclusion of Wild and Scenic River Review

There are no rivers or river segments within Montezuma NWR’s current boundary. The Seneca and Clyde Rivers flow adjacent to the refuge, and their immediate environs are within the current boundary. We reviewed the NRI and found no record of the segments located adjacent to the refuge within its listing. As a result, the portions of these rivers adjacent to the refuge and their environs are not considered by the NRI to have outstanding remarkable values or potential for special designation. Based on this information, we have determined that there are no rivers, river segments, or portions of their immediate environments that are eligible for listing under the Wild and Scenic Rivers Act within the current refuge boundary. This determination will be reevaluated in 15 years, during the next comprehensive conservation plan development process.

Appendix J

USFWS

Montezuma National Wildlife Refuge visitor contact station

Example Administrative and Visitor Service Facilities

Introduction

Under the Montezuma National Wildlife Refuge (NWR) Comprehensive Conservation Plan, the U.S. Fish and Wildlife Service (Service) is proposing colocating staff and facilities from the Service's Cortland Ecological Services Office and Montezuma NWR. At this time, the location and exact nature of the necessary facilities have not been determined and funding has not been identified. Site selection will be based on the following criteria (if applicable):

- Sufficient buildable area.
- Sufficient wetland buffers.
- Access or ability to create access to suitable water and sewer.
- Proximity to a major road.
- Visibility of Service buildings from road.
- Site impacts of buildings and parking areas.
- View and access to trails, wildlife observation areas, and other visitor resources.

The Service has developed standardized designs for administration and visitor facilities. Because the specific site has yet to be identified, specific site plans for facilities at Montezuma NWR have not been developed. Based on current and potential staff needs, we anticipate that the following standardized facility plans could be approriate (figures J.1 through J.4). It is possible that separate visitor and administrative facilities will be chosen (figures J.1 and J.4), or that one combined administration and visitor service facility will be chosen (figures J.2 and J.3). These standard designs would likely be modified based on specific building site characteristics and staff needs.

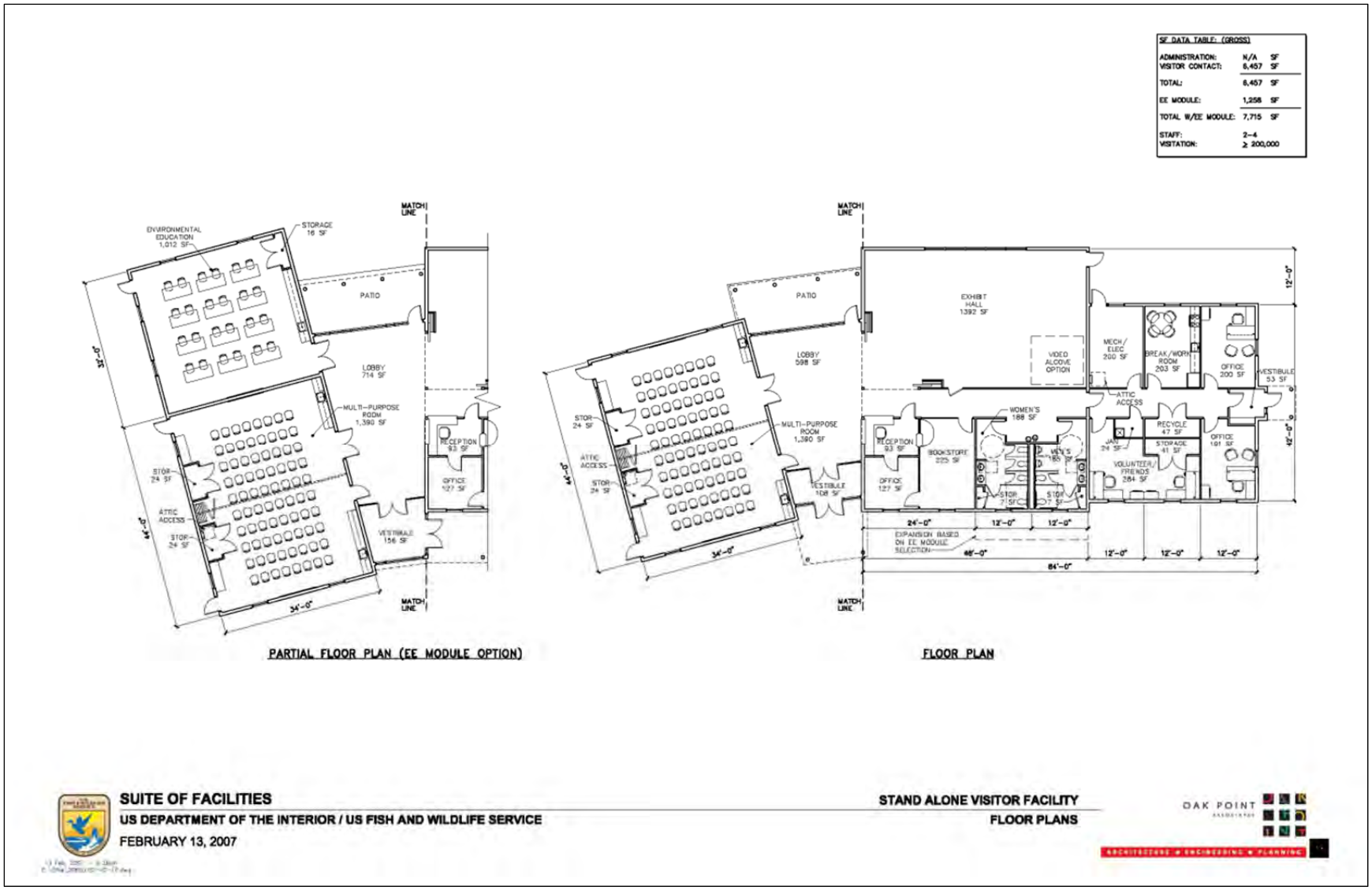


Figure J.1. Standard Design for Separate Visitor Facility with Optional Environmental Education Module. This design could be modified as needed.

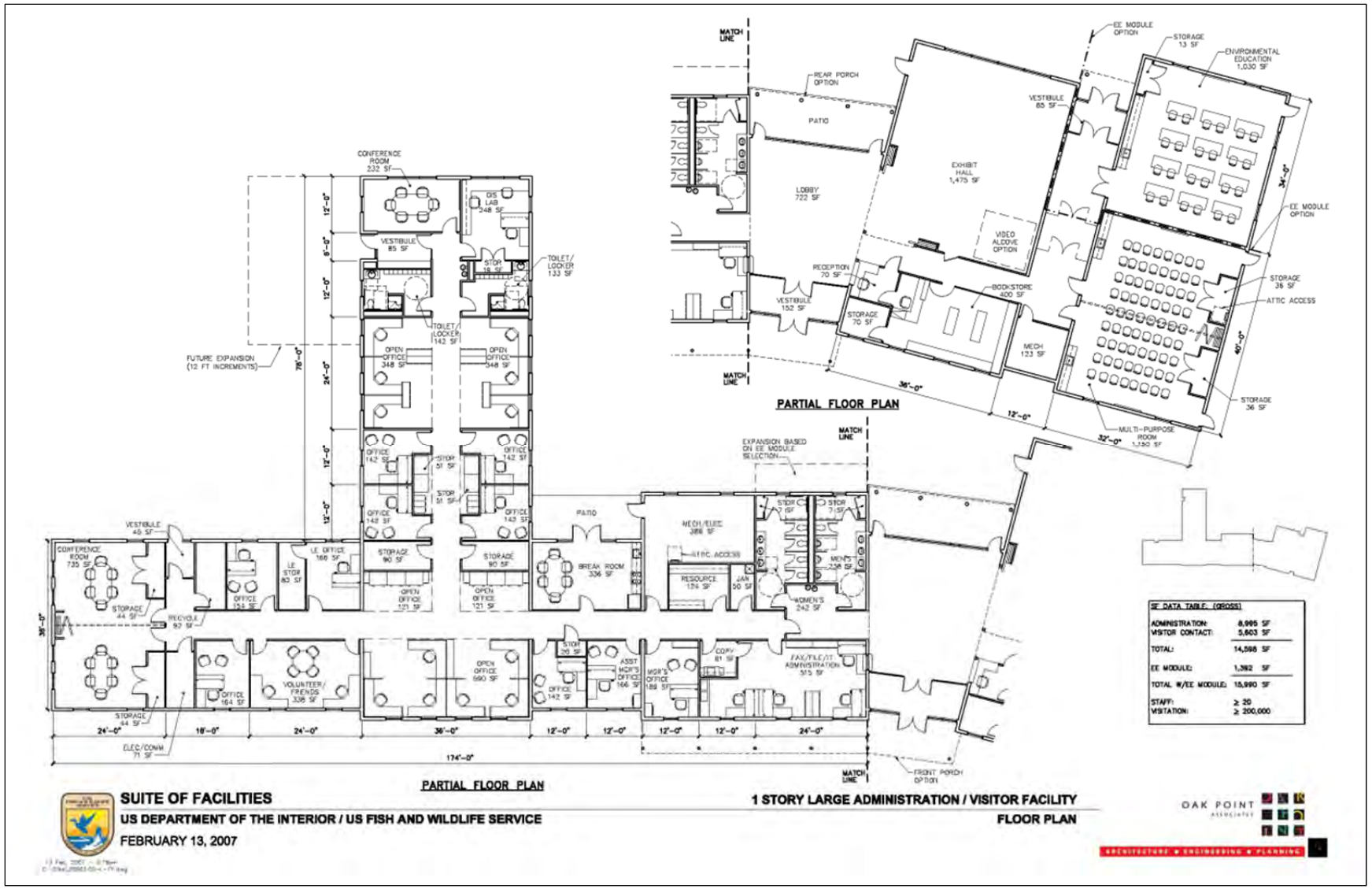
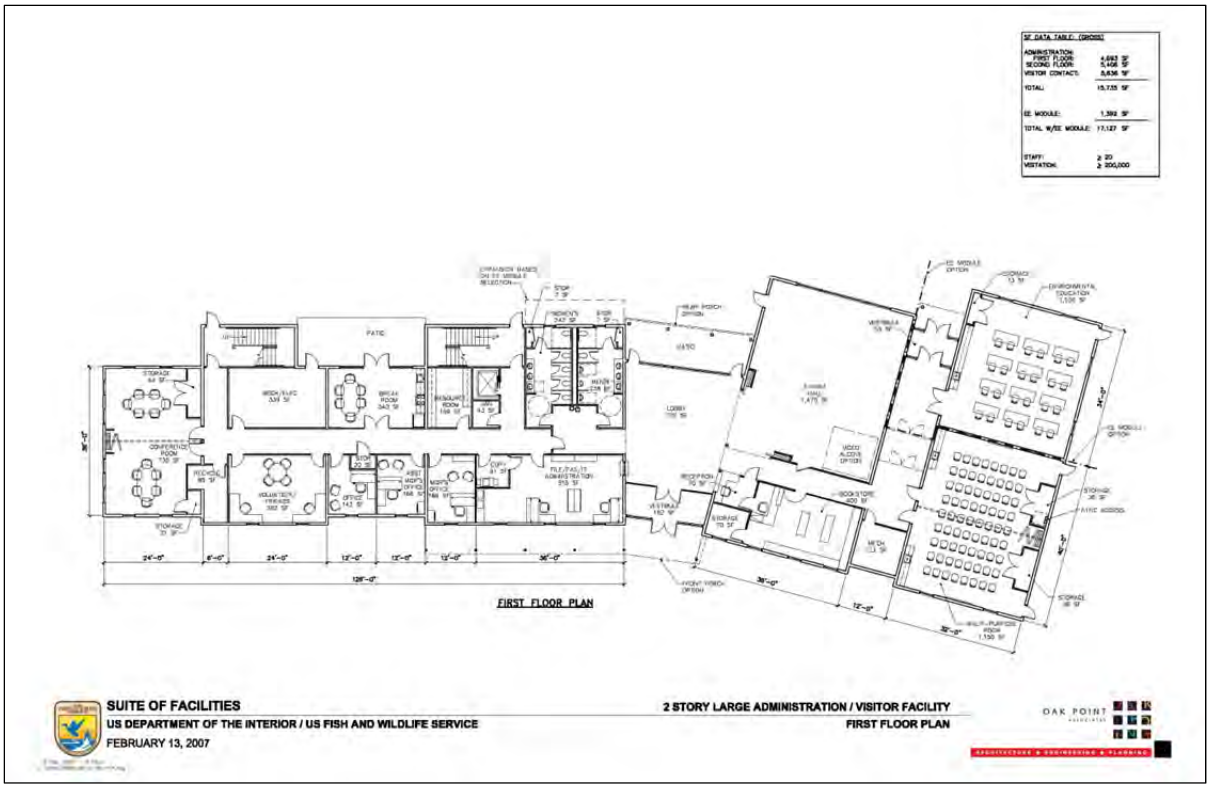


Figure J.2. Standard Design for Large, One-story, Combined Administration and Visitor Facility with Optional Environmental Education Module. Only the administration component could be constructed if separate facilities are chosen.



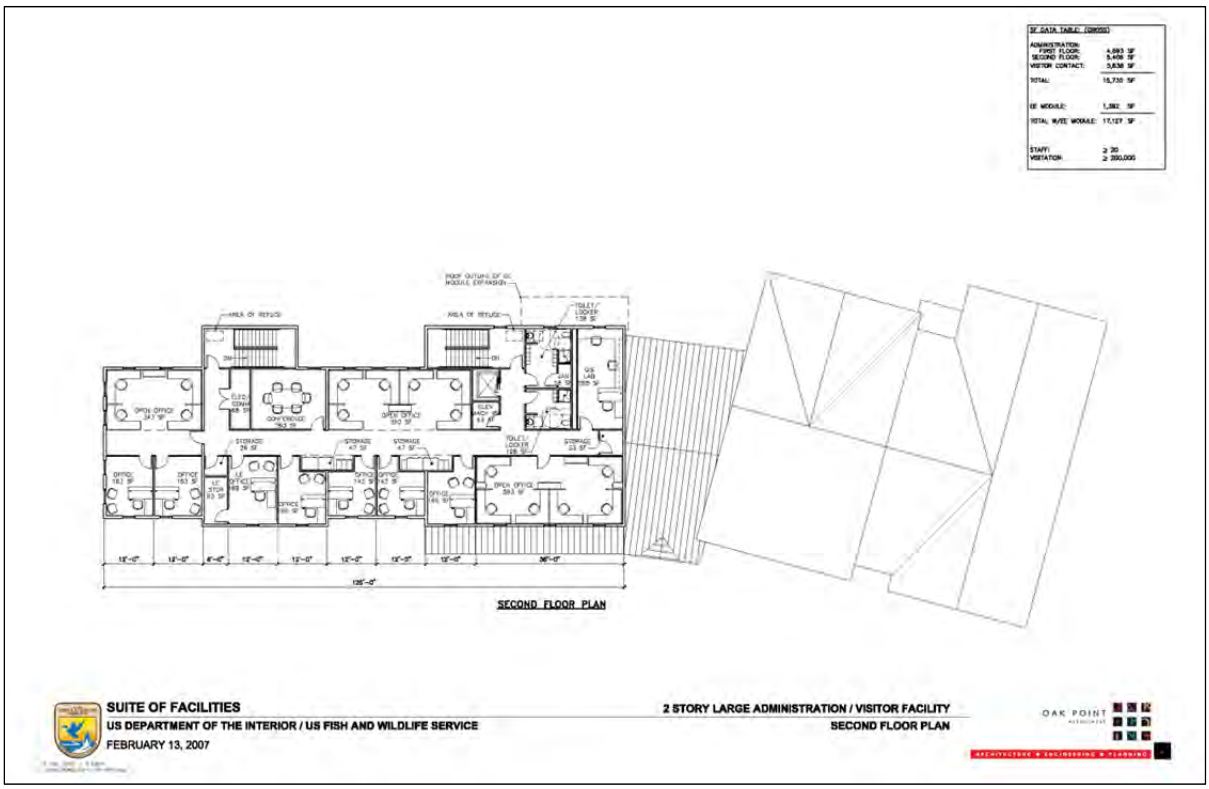


Figure J.3. Standard Design for Large, Two-story, Combined Administration and Visitor Facility with Optional Environmental Education Module. Only the administration component could be constructed if separate facilities are chosen.

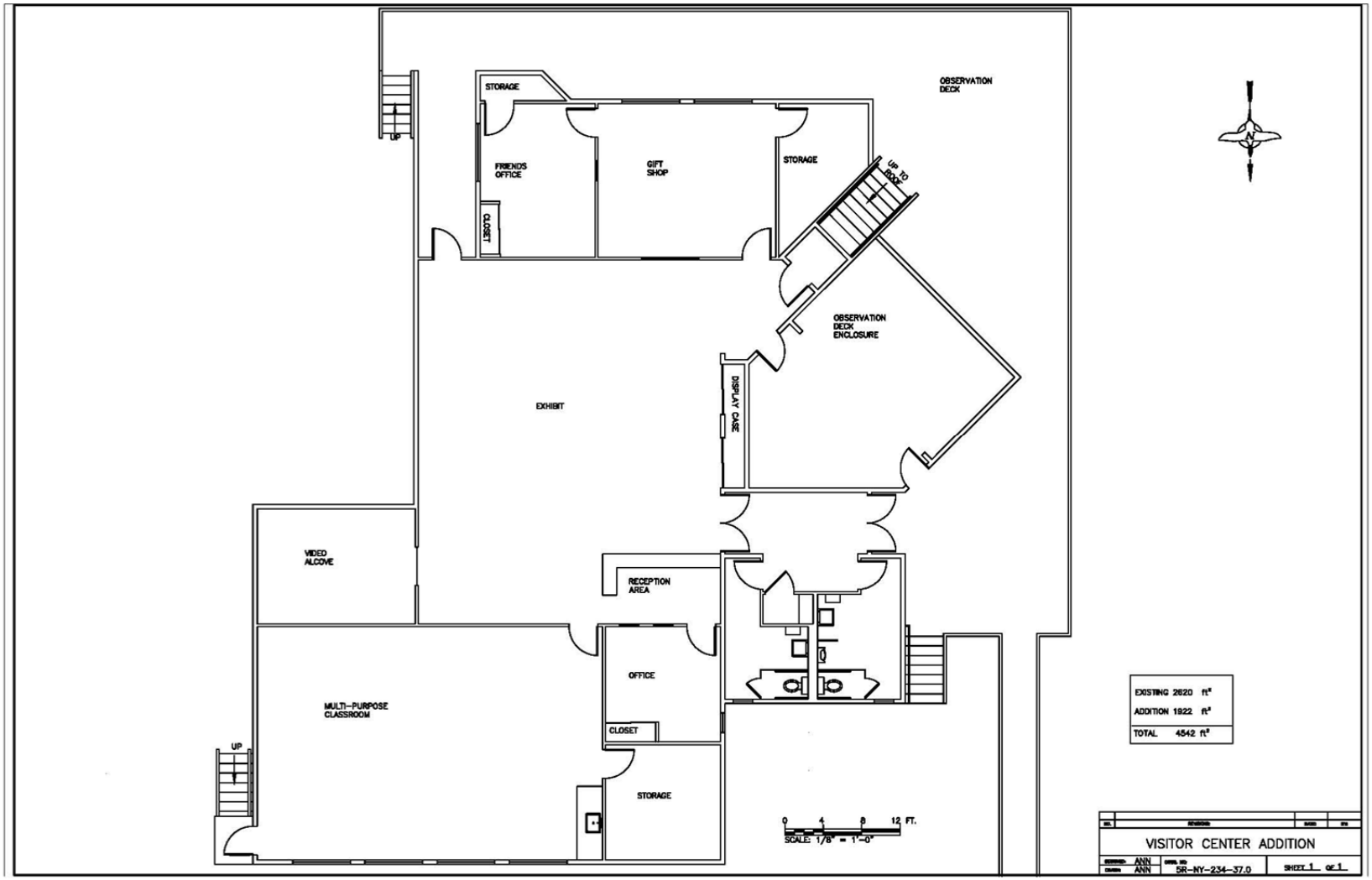


Figure J.4. Conceptual Design for Remodeling Current, Separate Visitor Contact Station and Approximately Doubling the Square Footage of this Facility.

Appendix K

Hollinsworth/USFWS

Swamp sparrow

Summary of Public Comments and Service Responses on the Draft Comprehensive Conservation Plan and Environmental Assessment for Montezume National Wildlife Refuge

Appendix K.

Summary of Public Comments and Service Responses on the Draft Comprehensive Conservation Plan and Environmental Assessment for Montezuma National Wildlife Refuge

February 2013

Introduction

In May 2012, the U.S. Fish and Wildlife Service (Service, we, our) completed the Montezuma National Wildlife Refuge (Montezuma NWR, the refuge) draft Comprehensive Conservation Plan (CCP) and Environmental Assessment (EA). That document outlines three alternatives for managing the refuge over the next 15 years and identifies alternative B as the "Service-preferred alternative." We released the draft CCP and EA for public review and comment from May 22 to June 21, 2012.

We evaluated all the letters, email, and phone calls we received during that comment period, along with comments recorded during our two public meetings. This document summarizes the substantive comments we received and provides our responses to them. Based on our analysis in the draft CCP and EA and our evaluation of comments, we made minor modifications to alternative B and recommended it to the Northeast Regional Director for implementation. It is that modified alternative B which is detailed in this final CCP. Our modifications include additions, corrections, or clarifications of our preferred management actions. We have also determined that none of those modifications warrants publishing a revised or amended draft CCP and EA before publishing the CCP.

The changes we made to the final CCP include the following:

1. We increased the amount of shrubland we intend to maintain to 396 acres (similar to alternative A), which is about 100 acres more than originally proposed under alternative B of the draft CCP and EA.
2. We included additional information in chapter 4, under "Protecting Land and Proposed Land Expansion," that we will evaluate newly acquired lands for their potential for habitat restoration (i.e., emergent marsh, forest, shrubland, or grassland).
3. We have added estimates of hazard abatement surveys to table 4.1, and have revised the cost estimates for demolition.
4. We added a section titled "Alternatives Considered but not Fully Developed" to the final hunt program EA (appendix E, which includes a discussion of closing the refuge to hunting.
5. We modified the Land Protection Plan (appendix F) to incorporate climate change information from the CCP and estimated numbers of migratory birds and breeding marshbirds that could use emergent marsh habitats, once lands have been acquired and restored. We also revised the land protection plan and final CCP to clarify which parcels

we own, which have been previously added to the refuge's approved acquisition boundary but not purchased, and which would be included in the refuge expansion.

6. We corrected the final fire management plan EA to show that alternative B is both the current management (the no action alternative) and the preferred-alternative.

As we create the refuge step-down plans, we will take into consideration all comments that relate to those plans.

The Northeast Regional Director will either select alternative B for implementation, or one of the other two alternatives analyzed in the draft CCP and EA, or a combination of actions from among the three alternatives. She will also determine whether a Finding of No Significant Impact is justified prior to finalizing her decision. She will make her decision after:

- Reviewing all the comments received on the draft CCP and EA, and our responses to those comments.
- Affirming that the CCP actions support the purpose and need for the CCP, the purposes for which the refuge was established, help fulfill the mission of the National Wildlife Refuge System (Refuge System), comply with all legal and policy mandates, and work best toward achieving the refuge's vision and goals.

Concurrent with release of the approved CCP, we will publish a notice of the availability in the *Federal Register*. That notice completes the planning phase of the CCP process, and we can begin its implementation phase.

Summary of Comments Received

During the comment period, we received 36 sets of responses, both written and oral. We gathered oral comments at the following two public meetings attended by about six people: June 4, 2012, 2:00 to 4:00 p.m. and 6:00 to 8:00 p.m. at the Montezuma National Wildlife Refuge, 3395 US Route 20 East, Seneca Falls, NY 13148.

We received written comments, including email and post, from 34 organizations and individuals. We received letters from the New York State Department of Environmental Conservation (NYSDEC), the New York State Ornithological Association, New York Audubon, and the Onondaga Audubon Society. We received a letter from the Mayor of Aurora, NY, and comments from members of the public.

In the discussions below, we address every substantive comment received during the comment period. Comments were organized by subject. Directly beneath each subject heading, you will see a list of unique letter numbers that correspond to the person, agency, public meeting, or organization that submitted the comment. In some cases, one person may have submitted a comment more than once (public meeting, email, written letter, or telephone). The cross-referenced list appears as attachment 1 to this appendix.

In our responses, we may refer the reader to other places in this document or the draft CCP and EA where we address the same comment. In some instances, we refer to specific text in the draft CCP and EA and indicate how the CCP was changed in response to comments. There are several

options for obtaining the full versions of the draft CCP and EA or the final CCP. They are available online at: *http://www.fws.gov/northeast/planning/Montezuma/ccphome.html.*

For a CD-ROM or a print copy, please contact the refuge at:

Andrea VanBeusichem
Montezuma NWR
3395 US Route 20 East
Seneca Falls, NY 13148
Phone: (315) 568-5987
Email: *Andrea_VanBeusichem@fws.gov*

Service Responses to Comments by Subject

Biological Resources

Habitat Management
(Letter ID#: 4, 6, 8, 10, 11, 27, 28, 30, 31)

Comment: One commenter expressed appreciation for the refuge's work to improve and restore habitat for wildlife, especially endangered species, and that the refuge is essential for these species' well-being.

Response: Thank you for your support.

Comment: One commenter stated that the CCP does not satisfactorily address the effects of refuge management in the larger Montezuma Wetlands Complex (MWC) and that the effects of combined changes in this larger area are not considered in the CCP. They stated that we cannot meet the goals of managing for specified population changes unless we coordinate with other managers in the surrounding areas.

Response: We agree that coordinating with other land managers within the MWC is paramount in achieving conservation goals in this area. Under all of the alternatives in the draft CCP and EA and in the final CCP we emphasize continued coordination with NYSDEC and other partners. We have and will continue to work closely with NYSDEC and other land managers in the area to coordinate habitat management and species needs across the MWC. As part of the National Wildlife Refuge System, we must also consider our role in habitat and species conservation on a landscape scale that extends beyond the MWC. As we develop CCPs, we coordinate with partners and other Service programs to evaluate habitat management and public use at multiple scales, including potential changes to the landscape. No one can predict future habitats with certainty. We use the best available science, our professional judgment, and information from our partners to develop our habitat management strategies.

Comment: We received several comments about grassland and shrubland habitats on the refuge, including comments from New York State Ornithological Society (NYSOA), Onondaga Audubon Society, and Audubon New York as well as others. One person considered reducing

grassland and shrubland to be ill-advised since these comprise much smaller portions of the refuge than forest habitat. NYSOA commented that the increase in forest is unlikely to significantly improve the populations for species such as the cerulean warbler, wood thrush, wood duck, and Indiana bats while the reduction of shrubland and grassland will negatively impact a large group of bird species of concern. The NYSOA would rather have shrubland and grassland habitats be increased by limiting forest succession and managing marshlands to provide these habitats. One commenter also noted that grassland bird species are declining faster in New York than forest species, so increasing forest habitat and decreasing grassland habitat on the refuge was ill-advised. Audubon New York commented that they support the consolidation of grassland units because these grassland units have not supported many priority grassland species. However, they feel that there could be additional opportunities to provide grassland habitat in addition to the 287 acres proposed in the CCP. They would prefer that the goals for grassland and shrubland habitat types remain at least at their current levels rather than being reduced. Onondaga Audubon Society is not in favor of decreasing shrubland habitat by 110 acres and also believes that providing 287 acres of grassland is a step in the wrong direction for bird species that require fields that are not mowed too soon.

Response: We recognize that grassland birds have been declining faster than any other habitat-species suite in the northeastern U.S. We currently manage four parcels for grassland obligate breeding birds. Managing grasslands successfully is labor intensive, requiring frequent mowing, burning, or both. We have chosen to maintain three high quality grassland areas on the refuge. We based this decision on a variety of factors, in particular they are relatively large (greater than 54 acres), and some are surrounded by or adjacent to other open habitats (e.g., emergent marsh or cropland). As noted by Audubon New York, grassland areas we are planning to convert to other habitats have not support priority grassland species. Results of breeding bird surveys indicate that the only consistent grassland breeding birds in these units are bobolink and savannah sparrow. One unit currently managed as grasslands will convert to shrubland under alternative B of the draft CCP and EA: the Subheadquarters Field. This field is linear with a lot of edge and not as productive for grassland breeding birds (from 2008 to 2010 only one bobolink and two savannah sparrows were detected during breeding bird surveys). However, higher numbers of both willow flycatcher and song sparrow (both early successional species of conservation concern) were detected on this unit.

We are hopeful that with approval of the final CCP, we will have the capacity to improve habitat conditions in the remaining three grassland units (e.g., by haying in late summer and by increased monitoring, management, and restoration in early successional habitats if additional staff are approved and funded). As new lands are acquired, we will evaluate the potential to restore or maintain new grassland units, specifically on large parcels with little edge surrounded by or adjacent to other open habitats. While always our intent, we clarified this in chapter 4 of the final CCP, under “Land Protection and Proposed Expansion.”

As a result of a number of insightful comments during the draft CCP and EA comment period and input from the Service’s Division of Migratory Birds regarding shrublands, forest gaps, and the species that depend on them, we have decided to increase the amount of refuge land managed for shrublands by decreasing proposed mature forest habitat. In alternative B of the draft CCP, we proposed increasing refuge acreage of forested habitats from 3,017 to 3,757 and decreasing

acreage of shrubland habitats from 866 to 291. We have revised the final plan so forested habitats will total 3,646 acres, and shrublands will total about 396 acres. This has been accomplished by changing the target habitat type on five management units.

We also want to point out that the habitat acres reported in the draft CCP and EA and final CCP reflect overall tract size and do not take into account some of the diversity within the tracts or the lag time in conversion from early successional habitat to mature forest. For example, some of the areas included in "current shrublands" and "alternative B forests" are former agricultural fields (surrounded by forests) where tree and shrub seedlings have recently been planted. These "fields" will remain in an early successional stage through the 15-year lifetime of the plan even though forest habitat is the long-term goal. Similar to grasslands, as new lands are acquired, we will evaluate the potential to restore or maintain new shrubland units, specifically in areas with existing edge habitat. While always our intent, we clarified this in chapter 4 of the final CCP, under "Land Protection and Proposed Expansion."

Patches of early successional habitat already exist and will continue to be present within existing forests. These canopy gaps have not been mapped or included in the target acreage for shrublands. For example, in the 266-acre Unit 17 West, there is a 33-acre open patch resulting from beaver activity. In addition, powerlines run through four of our forested tracts, creating linear patches of early successional habitats within these forested units. Indeed, the following species of conservation concern that use early successional habitats were detected during breeding bird surveys in two forested units on the refuge (Unit 17 and the Main Pool Forest Unit) from 2007 to 2011: American woodcock, Baltimore oriole, northern flicker, song sparrow, and willow flycatcher.

Finally, and sadly, we are poised to lose great chunks of our forest canopy over the course of the next 15 years as a result of the emerald ash borer. The U.S. Forest Service identified white ash as a dominant tree in four of the 10 forest stands surveyed on the refuge for a Forest Health Assessment in 2010. Not included were Unit 17 East and West and the Main Pool Forest where green ash co-dominates with red and silver maple. The legacy of the emerald ash borer will be to create significant gaps in the forest canopy leading to considerable patches of early successional habitat within forested habitats not only on the refuge but statewide. In New York State, there are approximately 900 million ash trees, and 10 percent of the trees in New York's hardwood forests are ash. As these trees die, forest gaps and early successional habitats will increase throughout the State. These should benefit not only species that require early successional habitats but also the postbreeding success of forest interior species. The management challenge will be to promote native vegetation in these areas so they do not become over-run by nonnative, invasive species. For example the dominant understory plant in some parts of the refuge is common buckthorn, a nonnative, invasive species. Our hope is that increased partnerships and additional staffing (if authorized and funded) proposed under alternative B of the draft CCP and EA and in the final CCP will help us successfully control invasive species to continue to provide high quality habitat.

We have added additional clarification about early successional habitats that exist on the refuge but are not actively maintained by the refuge to the rationale for objective 3.2 in the final CCP.

Comment: There should be more specific mention of the management and protection of cavity nesting birds in the CCP. Change in habitats may result in more nesting and roosting sites for these species if snags are kept in place. More details about plans for cavity nesting species should be added to the plan.

Response: We recognize the importance of cavity nesting species. As stated previously, as part of the National Wildlife Refuge System, we must also consider our role in habitat and species conservation on a landscape scale that extends beyond the refuge and the MWC. As we develop CCPs, we coordinate with partners and other Service programs to evaluate habitat management and public use at multiple scales. We use the best available science, our professional judgment, and information from our partners to develop our habitat management strategies. A comprehensive list of resources of concern for the refuge, compiled from a multitude of guiding documents and other information sources, is in table A.1 in appendix A of both the draft CCP and EA and final CCP. This list includes 87 bird species, 50 of which breed on or near the refuge. This is a large number of species with a broad array of habitat needs. CCPs are intended to help focus and prioritize management strategies. From the list of 87 species, we chose focal species to guide our management based on criteria listed in the draft handbook for identifying refuge resources of concern and management priorities (USFWS 2009; see appendix A for criteria and focal species).

Of the 50 bird species of conservation concern that breed on or near the refuge, only five are cavity nesting: hooded merganser, wood duck, long-eared owl, northern flicker, and prothonotary warbler. Based on the criteria described in appendix A, none of these were identified as focal species for the refuge. However, all of these species will benefit from proposed refuge management actions. Tree cavities currently exist on the refuge, and we expect them to become more prevalent as refuge forests mature. We are increasing the acreage of forested habitats on the refuge, in some places by planting trees, and expect these forests to eventually provide additional cavities as existing trees with cavities continue to decay and fall. If the conservation concern for cavity nesting species increases, we will consider reevaluating focal species and revising the CCP.

Comment: One commenter noted that the nest boxes for eastern bluebirds, tree swallows, etc. have been productive; however, it would be useful to expand these artificial nests to include more species, such as the black capped chickadee, northern flicker, screech owl, etc. This will be very beneficial to nesting and roosting birds and could potentially be used for additional environmental education and interpretation opportunities.

Response: In general, the Service is increasing our focus on providing natural nesting habitat for wildlife rather than artificial nesting boxes. Expanding nest boxes on the refuge would require refuge staff time and funds, diverting these resources from other, higher priority activities such as environmental education programs and habitat restoration efforts. As discussed under goal 2, strategies that apply to all objectives, because of the potential benefits to the federally listed Indiana bat, we will work with partners to determine the need for bat houses on the refuge and install where appropriate if deemed worthwhile. If conservation concern for other species of conservation concern increases, we will reconsider expanding the refuge's nest box program.

Comment: Audubon New York does not see the need to increase waterfowl habitat by 500 acres and would rather the refuge focus resources on other priority species. If the refuge proceeds with increasing waterfowl habitat, they would not want that to compromise shorebirds and marshbirds by reducing their habitat.

Response: Managing habitat for waterfowl is compatible with managing habitat for marshbirds and shorebirds. Most large wetland impoundments on the refuge, for example Tschache Pool and the Main Pool, are managed on a rotation between flooding and drawing down. This provides habitat for migratory birds that have different water level requirements, including waterfowl, marshbirds, and shorebirds. The increase in waterfowl habitat under alternative B of the draft CCP and EA and included in the final CCP does not come at the expense of shorebird or marshbird habitat. We are working with biologists throughout the Atlantic Flyway through the Integrated Waterbird Management and Monitoring Program (*http://iwmmprogram.ning.com/*) to fine tune our wetland management to balance the needs of all waterbird species. Increasing waterfowl habitat as proposed will also benefit breeding marshbirds. For example, in 2011, the Main Pool provided ample habitat for both migrating waterfowl and for breeding marshbirds including Virginia rail, American bittern, sora, pied-billed grebe, common gallinule, and black tern. Similarly, in 2011, Knox-Marsellus and Puddler Marshes provided extensive habitat for both shorebirds and waterfowl.

Comment: One person expressed the need for increased management of shorebird habitat, as much of their habitat has been eliminated due to a loss of wetlands. The CCP does not specifically address shorebird habitat and shorebird habitat has become overgrown quickly and there seems to be insufficient resources to maintain these habitats for their intended purposes. Because birders frequently visit the refuge from Syracuse, Rochester, and Ithaca to see these species, the refuge should allot more resources for shorebird habitat management.

Response: We agree that providing habitat for shorebirds is important and it will continue to be a high priority for the refuge. As specified in chapter 3, objective 1.3 in alternative B of the draft CCP and EA and chapter 4, objective 1.3 of the final CCP, we will continue to manage a minimum of 100 acres of mudflats to benefit migrating shorebirds throughout both the northbound and southbound shorebird migrations (i.e., April to November). We also intend to increase the suitability and availability of this habitat, potentially allowing a greater number of shorebirds to use the refuge. Most large wetland impoundments on the refuge, for example Tschache Pool and the Main Pool, are managed on a rotation between flooding and drawing down. This provides habitat for migratory birds that have different water level requirements, including shorebirds during the drawdown years. Certain wetlands are designated specifically for shorebird habitat most years (e.g., Benning Marsh, Lesser Yellowlegs Unit, and Visitor Center Wetlands). Unfortunately, weather patterns sometimes prevent or delay us from maintaining shorebird habitat. In the absence of tidal waters, providing shorebird habitat is also labor intensive and sometimes lack of staff and funding prevent us from meeting our objective of providing 100 acres of shorebird habitat throughout the entire migration. Proposed increases in staff, if authorized and funded, will help us provide more shorebird habitat.

Comment: One commenter believes that cooperative farming is not a compatible use and that agribusinesses disrupt wildlife, and should therefore not be allowed on the refuge.

Response: Prior to initiating the CCP, we completed a compatibility determination (see appendix B of the final CCP) for cooperative farming where we found this use to be compatible. As we state in the CCP and in the compatibility determination, cooperative farming is used as an important interim management method to keep newly acquired fields from being colonized by nonnative, invasive species while we are preparing for native habitat restoration. Refuge lands are phased out of the cooperative farming program as soon as habitat restoration is feasible. Currently, only 180 acres are included in the refuge's cooperative farming program, or about 2 percent of the refuge's current acreage.

Species of Concern
(Letter ID#: 8, 9)

Comment: One commenter suggested that the blue-winged teal be included as a species of special concern listed on page 2-25 of the draft CCP and EA, mainly because its population in New York has steadily declined.

Response: The list of species of conservation concern on page 2-25 of the draft CCP and EA is not meant to be an exhaustive list for the MWC or the refuge. As discussed on this page, there are more than 117 species of birds known to nest on the refuge. Only a few of them are highlighted in this paragraph. The blue-winged teal is included as a species of concern in appendix A of both the draft CCP and EA and the final CCP. It is classified as a species of medium priority in the Bird Conservation Region 13 and the North American Waterfowl Management Plan.

Comment: One commenter stated that the repeated reference throughout the CCP to the cerulean warbler is an over-emphasis and that other species, including the vesper sparrow, blue-winged warbler, brown thrasher, long-eared owl, wintering short-eared owl, black tern, and least bittern should receive equal consideration in the plan.

Response: We recognize the importance of managing the refuge to benefit a variety of species. As stated previously, a comprehensive list of resources of concern for the refuge, compiled from a multitude of guiding documents and other information sources, is in table A.1 in appendix A of both the draft CCP and EA and final CCP. This list includes 87 bird species, 50 of which breed on or near the refuge. This is a large number of species with a broad array of habitat needs. Effectively managing refuge habitats for this number of species would be ineffective and logistically unfeasible. Service CCPs are intended to help focus and prioritize management strategies, and we developed focal species for each habitat to help guide management efforts based on criteria listed in the draft handbook for identifying refuge resources of concern and management priorities (USFWS 2009; see appendix A for criteria and focal species). Please note that, while we have identified specific focal species for habitat management, a variety of species of conservation concern (including reptiles, mammals, amphibians etc.) are expected to benefit from our efforts to maintain and restore habitats on the refuge. These are listed in appendix A, table A.2 of both the draft CCP and EA and final CCP.

We have provided additional information about the selection of specific focal species below:

- The cerulean warbler was chosen as a focal species because it is the only regularly breeding bird on the refuge that is listed as highest priority in the Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region (BCR 13) (ACJV 2007). As stated in the draft CCP and EA, the MWC is listed as one of the areas with the largest concentrations of cerulean warblers in the Atlas of Cerulean Warbler Populations (Rosenburg et al. 2000), indicating that we have an important role to play in the conservation of this species.

- Blue-winged warbler and short-eared owl are the focal species for shrubland and grassland habitats, respectively. We discuss these species in the rationale sections of objectives 3.1 (blue-winged warbler) and 3.2 (short-eared owl).

- As described in appendix A, American and least bittern, pied-billed grebe, and black tern are all good candidates to use as focal species for marshbird breeding habitat. All of these species are listed in at least four of eight conservation plans/lists, and all are listed in the New York State Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) and the BCR 13 plan (ACJV 2007). However, least bittern and black tern were not selected as focal species for Montezuma NWR because they occur in low abundances in BCR 13 relative to other BCRs. The pied-billed grebe was selected because it is more easily detected and currently more abundant than the American bittern on the refuge so may be more useful as an indicator species for the entire group as all four species use similar habitats. Also, the pied-billed grebe is believed to be more vulnerable to climate change than the American bittern so monitoring this species may be more useful for monitoring climate change impacts on the refuge.

- Vesper sparrow is a special concern species in NY State and listed as a species of greatest conservation concern in the New York State Comprehensive Wildlife Conservation Strategy (NYSDEC 2005), but it is not listed in any other major bird conservation plan for this area (e.g., the U.S. Fish and Wildlife Service Division of Migratory Birds, Birds of Conservation Concern for Region 5; the Bird Conservation Plan for the Lower Great Lakes/St. Lawrence Plain Bird Conservation Region (BCR 13) (ACJV 2007); or Partners In Flight Landbird Conservation Plan: Physiographic Area 15: Lower Great Lakes Plain (Dettmers and Rosenberg 2003). Vesper sparrow is listed in appendix A as a species of concern for grasslands, and we hope the vesper sparrow will benefit from improved grassland habitat management as described in alternative B of the draft CCP and EA and included in the final CCP.

- Brown thrasher is listed under only two of seven conservation plans consulted. It is listed in appendix A as a species of concern, and we hope the brown thrasher will benefit from improved early successional habitat management under alternative B.

- The long-eared owl is rare on the refuge and listed in only one of seven conservation plans consulted. However, it is still listed in appendix A as a species of concern. Since the long-eared owl breeds in open forests, it may benefit from the forest gaps that will be created in forest interiors as a result of the emerald ash borer.

Comment: Onondaga Audubon would like the CCP to include the creation of properly maintained early successional habitat and scrub/shrub wetlands to attract breeding golden-winged warblers, whose population is in decline. The refuge has the resources to provide such habitat, in addition to habitat management consultants in the area that could provide additional support and guidance as a partner.

Response: We are aware that golden-winged warblers are in decline and this species has been identified as a species of concern for the refuge (see appendix A in both the draft CCP and EA and final CCP). While this species has been identified as a species of concern in five of the conservation plans used to help determine focal species, we have not focused refuge management efforts on this species mainly because focal species must be supported by current or restorable refuge habitats and must respond well to management. Despite the availability of suitable habitat for golden-winged warblers in the area, between 1993 and 2012 only four individuals were reported on Ebird for the entire MWC (*http://ebird.org/ebird/map/*). The refuge will continue to provide early successional habitat and shrublands, which would benefit this species if present. We will continue to conduct monitoring efforts on the refuge to document species occurrences. If we detect this species on the refuge or if a potential source population is found near the refuge, we will consider reevaluating focal species and revising the CCP.

Flooding
(Letter ID#: 25, 26, 29)

Comment: One person commented that the refuge should be used as part of the floodplain to help reduce overall flooding and release water in a controlled manner. There is currently not a good plan for potential flooding and how to control it.

Response: We recognize the importance of floodplains in reducing impacts of flooding, as well as benefits to native species. Unfortunately, as discussed in chapter 2 of the draft CCP and EA and chapter 3 of the final CCP, the hydrology within and surrounding the refuge is so highly altered that we must use artificial means to mimic natural hydrologic patterns, for example spring flooding in wetlands to provide habitat for native species. One of the benefits of alternative C in the draft CCP and EA was reconnecting portions of the refuge to the current floodplain. However, we did not select this alternative for the final CCP because it did not support the refuge's purpose of providing habitat for migratory birds or the goals of the CCP, as well as alternative B. We will work with local towns, the NYS Canal Corp, and other partners to help minimize impacts of flooding as needed, and will ensure that refuge management does not contribute to impacts from flooding.

Comment: The Flood Hazard Mitigation Coordinator for the Cayuga County Planning Department and the Mayor of Aurora requested the Service do a complete evaluation of the potential flood impacts of acquiring and managing mucklands off New York State Route 31 in

the towns of Tyre and Savannah. Managing these mucklands to reduce flooding frequency could have adverse impacts on flooding. This potential flood impact triggers Executive Order 11988, however there appears to be no money allocated for flood modeling. They requested that the Service calculate floodplain storage losses, potential floodway rise, and the number of homes and properties that would be potentially impacted by flooding. They have also requested more information on the $150,000 to be used for impoundments and water control structures, and how they would impact flooding.

Response: Flooding can have significant impacts on communities. Our role in the community is very important to us. We consider impacts of refuge activities on local communities, including potential increased risk of flooding. Of the 1,431 acres proposed in the Land Protection Plan (appendix F), about 725 acres are classified as cultivated crops (a.k.a. mucklands). It is our understanding that these acres are currently diked, drained, and farmed, effectively removing them from the floodplain already. We do not anticipate that habitat restoration of these lands after acquisition would result in removing additional lands from the floodplain. In fact, it is possible that Service acquisition and subsequent habitat restoration and refuge management actions on these lands could result in increasing floodplain capacity. During flood events we may open water control structures to allow floodwaters to enter refuge lands, which might not occur if left in private ownership. We estimated it would cost about $150,000 (in 2012 dollars) to modify or upgrade existing dikes and water control structures in conjunction with habitat restoration efforts for these lands. This estimate is based on costs from similar-sized projects that have already been conducted on the refuge. Additional details on design, location, and potential impacts on flooding will not be available unless these lands are acquired and we develop a restoration plan. We will work with interested local communities and towns as we develop our restoration plans to minimize or eliminate potential negative effects of refuge activities. We have clarified that we will continue to comply with all applicable Executive Orders, Federal regulations, and laws, including NEPA and Executive Order 11988 in “Socioeconomic and Cultural Impacts” of appendix F and chapter 4 of the final CCP, under “Protecting Land and Proposed Land Expansion.”

Comment: The Cayuga County Planning Department expressed concern that if construction of the Wildlife Drive extension is designed on a berm and water is managed to keep it from overtopping during flooding, the extension will keep portions of the floodplains dry which will impact flood levels along the Clyde and Seneca Rivers. This potential flood impact triggers Executive Order 11988, however there appears to be no money allocated for flood modeling.

Response: At this time, we do not have sufficient information to analyze potential impacts of expanding the Wildlife Drive. Prior to implementing any expansion, we would need to complete an additional NEPA document to present alternatives and analyze potential impacts of each alternative, including potential impacts to flooding. We do not know what the cost of that analysis would be, as it depends on specifics in the alternatives which haven’t been developed. We anticipate that, during flooding events, some or all of the Wildlife Drive would be closed temporarily to protect public safety and to allow and floodplain lands to function as such. As stated previously, we will work with interested local communities as we develop alternatives and we will comply with all applicable Executive Orders, Federal regulations, and laws, including Executive Order 11988, prior to initiating any on the ground activities.

Refuge Administration
(Letter ID#: 25)

Comment: The Cayuga County Planning Department commented that all structures being demolished in the Proposed Expansion Area must have a pre-demolition asbestos survey and that the demolition proposal does not allocate enough money for hazard abatement (see table 3.1 in the draft CCP and EA).

Response: As stated previously, we comply with all applicable Executive Orders, Federal regulations, and laws when conducting refuge management activities, including construction and demolition projects. We have revised this table (chapter 4, table 4.1) in the final CCP to include potential costs of conducting hazardous materials surveys and have included some additional estimates of funds needed for removal of hazardous materials. It is important to note that, as with the other estimated costs in this table, these are general estimates only (in 2012 dollars) and actual costs are expected to vary.

Fire Management Plan EA
(Letter ID#: 4, 25)

Comment: The Cayuga County Planning Department stated that the Fire Management Plan did not adequately address the effects of prescribed burning on the local and regional airshed, specifically the potential impacts on sensitive individuals and the impacts of prescribed burns on air quality. This person noted there was a fire on or near the refuge in 2010 or 2011 that rained ash on downtown Auburn. Another commenter requested we prohibit prescribed burning because it releases mercury and fine particulate matter into the air, which can cause human health problems and diseases.

Response: The above event cited was not a prescribed burn. This was a wildfire on the refuge that burned cattails in the pool bordering the NY State Thruway. The exact cause of the fire is not known. It started on Easter morning, April 4, 2010, and consumed about 700 acres. It was contained by that afternoon. Several additional days were spent putting out larger fuels on upland portions of the refuge to prevent further unwanted impacts. The reference to ash fallout is unique when cattails burn. The burning cattail “fluff” is lofted and unfortunately can travel downwind before falling out. We do our best to notify for such occurrences, even an uncontrolled event like a wildfire, because we too are concerned for public health as well as the health of those fighting the fire.

We understand that fires (both prescribed burns and wildfires) affect air quality and consequently may affect area residents. Because of these potential impacts to the airshed, we limit the size of our burn units for prescribed fires.

Smoke management guidelines from the EPA (Clean Air Act standards) and NYSDEC air quality regulations for prescribed burning are used to develop parameters for burning and are an agency requirement. Below are some techniques that we use to mitigate and reduce smoke from prescribed fires:

- Reducing acres burned (keeping our burn units small).
- Isolating large diameter woody debris that tends to smolder for long periods.
- Reduce consumption of larger fuels by burning with a higher moisture content (avoidance).
- Schedule burning before spring green-up (and high live fuel moisture content that causes a lot of smoldering as moisture is being driven off).
- Increase combustion efficiency by using a backing fire ignition technique.
- Rapid mop-up (put out smoking materials) after the flaming front as passed.
- Burn during times of good air dispersion and away from smoke sensitive areas (residences, roads, schools, hospitals, etc.).
- Time of day–we burn after morning air has warmed and stable air no longer is present, and complete our ignition prior to the return of more stable air as cooler evening conditions set in.
- We burn when we have some surface wind (indicator of unstable conditions) and only if we have adequate mixing height aloft.
- Advance notification–public awareness is very important and our burn plan will address this need, usually through news releases, radio, or where residences are close by, door-to-door notification.

Our burn plans specify no burning when poor atmospheric conditions are forecasted, and we use smoke dispersion and air quality information generated by the National Weather Service. We are required to obtain a "Spot Weather Forecast" prior to implementing any prescribed burn.

Impacts on a regional level would be minimized from burns at Montezuma NWR and St Lawrence Wetland and Grassland Management District (WMD) by having small units that can be treated (burned) in a short period of time. The fire management plan EA has been clarified to reflect mitigation measures as well as the potential impacts (see appendix H of the final CCP).

During a wildfire situation (exempt from air quality standards) tactics and strategies are deployed to suppress the fire while maintaining firefighter and public safety. Our past experience with wildfires on the refuge and WMD suggests they are usually short duration wildfires, small in size, and lasting less than 24 hours. Within the fire management plan EA, we have clarified that we will put out wildfires when safe to do so at their smallest size.

Pre-planned fire management actions do affect emission production from wildfires because they intentionally reduce occurrence, extent, or severity. Fire prevention, aggressive suppression, and fuel treatments (e.g. prescribed fires) all reduce emissions from wildland fires.

The release of mercury into the air associated with fires has primarily been an issue in the Western U.S. We did not discuss potential effects of mercury associated with the refuge's fire management plan EA (appendix H) because only trace amounts of mercury have been detected in refuge soils and wildlife (Stoll 1988), so we would expect that prescribed burns would release only negligible amounts of this metal into the air.

Comment: The Fire Management Plan and Environmental Assessment really did not address the larger regional airshed. We are upstream of the mid-Atlantic and northeast coastal airshed, and

under certain circumstances what happens here can impact air quality along the coast. Under certain circumstances, prescribed burns could introduce pollutants to the atmosphere that can be transported long distances, contributing to haze or smog on the coast. The plan should recognize that this is a factor in timing of prescribed burns.

Response: The proposed course of action to include prescribed fire would most likely have minimal downrange, long distance impacts to both air quality and haze. Our prescribed burn units average less than 20 acres and generally active burning is completed within 1 to 4 hours. Most of the units will be burned to manage for grasslands. There is very little particulate matter associated with this vegetation type and most burns occur during the spring when air masses are changing and dispersion is at its best. For many of the reasons above, the likelihood of a spring burn associated with an adverse coastal impact day would be very rare, but this point is noted, and we will look well beyond the burn location.

Prescribed burns are controllable situations. Wildfire, on the other hand, is not and could impact air quality along the coast if the fire is large or burns for several days, or if it gets into a marsh and we were under drought (summer/fall) conditions. As the fire management plan EA states, we limit the acreage of wildfire through an aggressive initial attack when safe to do so, for this very reason. While it can happen, it would be a very rare occurrence to have a wildfire on the refuge burning for extended periods of time and thus cumulatively influencing conditions well downrange.

Public Use and Access

General Public Use
(Letter ID #: 6, 8, 33, 35)

Comment: One person commented that the hiking trails are very enjoyable and that she looks forward to the refuge implementing additional trails.

Response: We appreciate your feedback on the refuge trails and support for additional trails proposed under alternative B.

Comment: One person commented about access to the refuge, specifically the access to Puddler Marsh and Knox-Marsellus Marsh from Towpath Road. He suggested either acquiring Towpath Road or coming to an agreement with the NYS Canal Corp to conduct better maintenance of that access point. Additionally in regards to Towpath Road, it was suggested that the foliage be better managed to allow better viewing of Knox Marsellus from the road. The refuge could create open areas for viewing along the road which would be conducive to field trips and handling a large number of cars and people who want to do wildlife observation form the road.

Response: Thank you for your comment. We will take it under consideration as we develop our visitor services step-down plan. We do cooperate with NYS Barge Canal and have permission to grade the road and create openings in the Towpath Road vegetation for viewing. We do so as staff time allows. Knox-Marsellus and Puddler Marshes have become increasingly popular with birders and other visitors. Both areas offer excellent habitat for wildlife. A more in-depth look at

access to these areas is needed to address balancing our "wildlife first" mission and public access. The visitor services step-down plan will give refuge staff and visitors the opportunity to look more closely at this issue. As stated in alternative B, objective 4.1, we hope to develop products and programs to better orient visitors to the Knox-Marsellus Marsh. More specific details on how to reach that end will be developed in the visitor services plan.

Comment: The Onondaga Audubon Society requested that we seriously consider the opinions of non-hunting visitors, and expressed their interest in learning how many of the refuge visitors would be categorized as "birders."

Response: We seriously consider the comments and opinions of all interested parties when developing CCPs and step-down plans. The Refuge Improvement Act identifies six priority public uses that are to receive enhanced consideration in refuge planning: hunting, fishing, wildlife observation and photography, and environmental education and interpretation. Our mandate is to provide high-quality opportunities for those priority uses when they are compatible with refuge purposes, goals, and other management priorities. The Refuge Improvement Act does not establish a hierarchy among the six priority uses, but requires us to facilitate them when they are compatible and appropriate. Currently, we do not keep records of the number of refuge visitors categorized as "birders." To collect this information, we would have to survey refuge visitors. The Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*) outlines extensive rules and guidelines every Federal agency must follow when collecting information from the public. U.S. Geological Survey recently completed a national survey of public use at several national wildlife refuges, including Montezuma NWR (Sexton et al. 2012). According to this survey, 82 percent of visitors surveyed at Montezuma NWR reported they were bird watching.

Comment: One person believes that we should not be spending money on new staff and buildings, given the current economic situation.

Response: The purpose of the CCP is to develop a management direction that best achieves the refuge purpose; attains the vision and goals developed for the refuge; contributes to the Refuge System mission; addresses key problems, issues, and relevant mandates; and is consistent with sound principles of fish and wildlife management. In 2008, the Service approved a national staffing model which identifies the number of staff needed at each refuge or refuge complex throughout the country. The goal of this model was to quantify staffing and law enforcement resource needs and to help guide allocation of resources. The new staff proposed in the Service's preferred alternative in the draft CCP and EA reflects the recommended staff from this modeling effort. Nationally, the Service spends a significant portion of our budget paying for leased facilities. While moving offices and staff would initially cost additional funds, collocating Service offices on refuge lands is expected to save money by reducing rent and lease expenses over the long term. Collocation is also expected to improve cross-programmatic coordination and efficiency. We recognize that additional funding is unlikely in the current economic situation. Over the life of the plan, we are hopeful that the economic situation will improve.

Wildlife Observation
(Letter ID #: 8)

Comment: Bird watchers need better access, and even limited seasonal access, to the larger impoundments, including Puddler Marsh and May's Point Pond, to view the shorebirds. This would be important as long as there was no negative impact to the birds.

Response: Wildlife observation is one of six public uses available at Montezuma National Wildlife Refuge. As an area of emphasis for the refuge, staff time and other resources will be prioritized toward maintaining and creating wildlife observation areas, including shorebird viewing areas. Objective 4.1 lists strategies for doing so. These strategies will be further developed in the refuge's visitor services step-down plan and we will take this recommendation into consideration as we develop our visitor services step-down plan.

Hunting and Hunt Program EA
(Letter ID#: 3, 4, 5, 9, 10, 11, 12, 14, 15, 17, 20, 21, 22, 24, 28, 31, 32, 33, 34, 35, 36)

Comment: Several individuals expressed their opposition to expanding, and even allowing, hunting on the refuge. Two commenters stated that hunting is something they considered to be in conflict with the concept of a refuge, which should be a safe place for wildlife. One commenter stated that they believe hunting benefits only a small portion of visitors to the refuge, at the expense of the majority, and is not conducive to a family friendly environment. Several people also stated that the number of young hunters and big game hunters has declined in New York. The Onondaga Audubon Society and the NYSOA expressed concern about the negative impacts on other refuge users from the expanded hunt program. In particular, they are concerned about closing the Wildlife Drive to other users beginning December 1 to allow hunting; allowing Sunday hunting for all deer seasons; allowing a fall turkey hunt; and the uncertainty surrounding the impacts that increased Canada and snow goose hunting will have on non-hunting refuge visitors. They are also concerned about the how the expansion of waterfowl hunting will affect other bird species and how strictly the refuge will regulate this activity.

Response: We understand there are differing opinions about the role of hunting on national wildlife refuges. Hunting is an historic use of refuge lands, and has been allowed on the refuge since 1957. There are many laws, policies, establishment documents, and other mandates that we used to guide public use programs on the refuge. The Refuge Improvement Act identifies hunting as one of six priority public uses that are to receive enhanced consideration in refuge planning. The others are fishing, wildlife observation and photography, and environmental education and interpretation. Our mandate is to provide high-quality opportunities for those priority uses when they are compatible with refuge purposes, goals, and other management priorities. The Refuge Improvement Act does not establish a hierarchy among the six priority uses, but requires us to facilitate them when they are compatible and appropriate. Executive Order No. 13443 (August 16, 2007), "Facilitation of Hunting Heritage and Wildlife Conservation," reinforces the importance of hunting for recreational and management purposes on national wildlife refuges. That order recognizes the declining trends in hunting, and directs the Department of the Interior and other Federal land management agencies to "facilitate the expansion and enhancement of hunting opportunities and the management of game species and

their habitat." It also states that Federal agencies are to "manage wildlife and wildlife habitats on public lands in a manner that expands and enhances hunting opportunities, including through the use of hunting in wildlife management planning." One of the objectives specified in the 1991 Northern Montezuma Wetlands Project Final Environmental Impact Statement which authorized the refuge expansion is to improve "accessibility to this wetland complex for compatible wildlife-related public recreation, education, and research" (USFWS and NYSDEC 1991).

Hunters also contribute to wildlife conservation by purchasing Duck Stamps, a requirement for hunting waterfowl in the U.S. According the Service's Duck Stamp Web site (*http://www.fws.gov/duckstamps/*), funds from duck stamps have purchased or leased almost 8 million acres of wetland habitat across the country through July 2010. These funds have purchased about 87 percent of refuge lands at Montezuma NWR.

As discussed in the refuge's hunting environmental assessment (see appendix E of the final CCP), we have proposed expanding deer and waterfowl hunting for management reasons as well. We expect expanding the refuge's deer hunt program will be a cost-effective way to help control the deer population and improve habitat quality. Vegetation monitoring in refuge forests has revealed that deer are suppressing plant growth and succession leading to a decrease in overall plant diversity (Rawinski 2010 personal communication). Not only is the herbaceous layer less diverse but also as mature trees die and fall, there are few or no native tree saplings to replace them because the seedlings are being browsed so heavily by deer. A number of studies have documented that habitat changes caused by overbrowsing by deer can have negative impacts on nesting songbirds. If we do not decrease the size of the deer herd on the refuge, negative impacts to forest birds would likely occur due to continued degradation of the vegetation's physical structure and diversity as a result of overbrowsing by deer.

The additional Canada goose hunt days and areas would contribute to the Service's goal of reducing the resident population of Canada geese in the Atlantic Flyway from more than one million to 620,000 and the Service and NYSDEC goal of reducing the number of resident population Canada geese in the State from 257,000 (*http://www.dec.ny.gov/animals/67311.html*) to at or below 85,000 birds (USFWS 2005). Resident geese, as their name implies, spend most of their lives in one area, although some travel hundreds of miles to wintering areas. In recent years, flocks resident geese have become year-round inhabitants of parks, waterways, residential areas, and golf courses in New York State, and too often, they are causing significant problems. Problems include over-grazed lawns, accumulations of droppings and feathers on play areas and walkways, nutrient loading to ponds, public health concerns at beaches and drinking water supplies, aggressive behavior by nesting birds, and safety hazards near roads and airports (NYSDEC and USDA 2007). In addition, studies have shown that when resident Canada goose populations are high, they can have profound negative impacts on wetland vegetation (Haramis and Kearns 2007, Laskowski et al. 2002).

The additional snow goose hunt days and areas would contribute to the Service goal to reduce the population of lesser snow geese by 50 percent from the level observed in the late 1990s (USFWS 2007). Some populations of snow geese have become so numerous that they are damaging their Arctic and sub-Arctic nesting habitats (Abraham and Jefferies 1997, Jano et al. 1998). These studies show that parts of the fragile tundra habitats where these geese traditionally nest are being seriously degraded or destroyed, primarily by overgrazing. Snow geese in the mid-

continent region are showing signs of overpopulation in lower-than normal body size in both goslings (Cooch et al. 1991a, b) and adults (Reed and Plante 1997). Populations of other bird species that breed in the Arctic and sub-Arctic are declining; researchers believe these declines are caused, at least in part, by habitat degradation caused by snow goose populations (Rockwell et al. 1997 as cited in USFWS 2007).

To balance the priority public uses and ensure sensitive species are protected, we have stipulated that opening additional areas to waterfowl hunting would occur only when the refuge manager determines there is sufficient quality habitat available that can be accessed by hunters on foot or by boat without disturbing sensitive species or conflicting with other priority public uses. In addition, we have delayed opening portions of the refuge to deer hunting to reduce conflicts with visitors participating in wildlife observation, photography, environmental education, and interpretation. We will continue to monitor for potential conflicts among priority public uses and potential disturbance to wildlife and habitats and will adjust locations, dates, or times of day for authorized public use on the refuge if warranted.

The Service's previous NEPA documents on expanded snow goose hunting (USFWS 2007) and resident Canada goose (USFWS 2005) incorporated this information and we included it by reference in the refuge's hunt program EA. However, we have included the additional details on impacts of resident Canada geese and snow geese presented above in the refuge's final hunt program EA (see appendix E, page E-42 of the final CCP) to more clearly explain to readers our reasoning behind expanding waterfowl hunting in our preferred alternative. To more clearly explain why we did not decide to eliminate or reduce hunting on the refuge, we have added a section titled "Alternatives Considered but not Fully Developed" to the final hunt program EA (see appendix E, page E-7).

Comment: Several people commented that they were in favor of expanding hunting opportunities on the refuge. One commenter stated that they believed opening more of the refuge to hunting under alternative B would be very positive. The increased hunting opportunities will be very beneficial to waterfowl hunters who are greatly invested in this activity. One commenter believes the refuge should be managed for the expansion of waterfowl and other hunting opportunities since access is limited due to the management of wildlife habitat. One commenter believes alternative B helps ensure that hunting is appropriately managed on the refuge and an activity that will endure.

Response: We thank the commenters for their support.

Comment: One commenter asked if animal protection groups had been invited to participate in the CCP process and whether the refuge's partners included such groups.

Response: Service planning policy is designed to ensure broad public, agency, and Tribe involvement (602 FW 1, 3, and 4) when developing CCPs. The refuge maintains a contact list which includes agencies, organizations, and individuals that have expressed interest in refuge activities and who have given contact information. This was used as a basis for our initial contact list for mailings. This contact list was updated throughout the CCP process. In addition to sending out newsletters to the contact list, we announced our intention of preparing a

comprehensive conservation plan in the *Federal Register* (75 FR 25286) and held two public scoping meetings. We issued press releases announcing the official beginning of the planning process and the release of the draft CCP and EA, and we posted notices on the refuge's planning website (*http://www.fws.gov/northeast/planning/Montezuma/ccphome.html*). As required by law and policy, we also coordinated with State and Federal agencies and Tribes. We did not categorize agencies or organizations on our contact list by issue or focus and definitions of "animal protection groups" can vary; therefore, we do not know if any of the organization on the contact list would meet the commenter's definition of an animal protection group.

Comment: One commenter was concerned about taxpayers being required to fund hunting activities on a wildlife refuge.

Response: As stated above, hunting is one of the priority public uses identified in the Refuge System Improvement Act. The refuge's operational budget does come from Federal taxes paid by citizens and corporations of the U.S. The cost of administering the refuge's hunt program is a minor component of the refuge's operation funds (less than 1 percent). It helps us meet refuge and Service management objectives (e.g., controlling the deer population on the refuge and reducing snow goose and resident Canada goose populations) and Refuge System mandates (e.g., facilitates a priority public use).

Comment: A commenter suggested we choose alternative A in regards to expanding hunting on the refuge and not pursuing trail expansion, as it is more difficult to hunt when the animals are disturbed by humans. This person stated that the refuge should allow good habitat for breeding birds and that hunters can help reduce the goose populations on the refuge. This person believes there is no need for additional trails or attracting more visitors to the refuge.

Response: Thank you for your comment. We are happy that many visitors are satisfied with the current hunting opportunities offered at the refuge. We believe expanding hunting on the refuge as proposed in alternative B of the draft CCP and EA and in the final CCP would benefit refuge resources (i.e., control the deer population) and regional and national goals (reduce Canada and snow goose populations). Our planned restoration efforts, as well as expanding the deer hunt, are expected to improve habitat quality for wildlife. We have proposed a few new trails on the refuge. These trails have been located in areas that used to have a trail (i.e., Oxbow Trail) or in areas that provide opportunities for visitors to engage in priority public uses with minimal disturbance to wildlife. We recognize that there is a balance between providing high quality habitat for wildlife, high quality visitor experiences, and increasing the number of visitors to the refuge. We believe the increase in visitation projected under alternative B of the draft CCP and EA, if managed as proposed, would not cause undue disturbance to wildlife or decrease the quality of most visitor experiences. We will monitor public use activities and infrastructure (e.g., trails) on the refuge for conflicts and will modify them if warranted.

Comment: The issue of wounded or injured waterfowl as a result of hunting was not mentioned, as the CCP did not adequately explore specific adverse impacts on waterfowl from hunting. This person specifically referenced the Impacts from Public Uses section in chapter 4 (page 4-36) of the draft CCP and EA as lacking scientific research to show the detrimental effects on wounded waterfowl from hunting.

Response: The main body of the draft CCP and EA is not intended to address all of the impacts of hunting, rather these are more thoroughly addressed in the included hunt program EA (appendix E). The Service has established national guidelines and regulations for hunting migratory birds through a previous final supplemental environmental impact statement (USFWS 1988). Our analysis of the effects of the refuge's hunt program for migratory birds tiers off this document. This final supplemental environmental impact statement includes estimates of migratory birds "downed but not retrieved" (see pages 40, 56, 62, and 64). As discussed in the hunt program EA and supplemental environmental impact statement, we monitor breeding populations and harvest levels for migratory waterfowl. Estimates of breeding populations incorporate effects of any downed birds, as they would be removed from the breeding population. We use the results of these monitoring efforts to determine bag limits and season lengths for migratory waterfowl that maintain healthy populations of these species. While this information was presented in the hunt program EA, we inadvertently excluded the citation for the above referenced final supplemental environmental impact statement. We have updated the hunt program EA with this reference (see appendix E, page E-37).

Comment: Several commenters expressed concern over potential conflicts between hunting and other priority public uses. One commenter stated that due to the illegal activities associated with hunting, e.g. trespassing, he and many of his friends will not go into the fields during hunting season. Another commented that although there is a need to decrease the Canada goose and deer populations, allowing hunting on Sundays is not an appropriate method because it decreases the time birders and other visitors can safely use the refuge. Another commenter stated that the increase in hunting to reduce Canada and snow geese is fine, however the critical aspect is the degree to which this increased hunting reduces non-consumptive uses of wildlife, which would be dependent upon how the hunting is implemented. This commenter believes that hunting would eventually conflict with wildlife observation.

Response: Our goal is to provide a quality public use program, which includes placing a high priority on public safety. We make every effort to manage the refuge's hunt program to protect visitors and neighbors, and to minimize potential conflicts between hunters and other refuge visitors. We have posted refuge boundaries to help minimize trespassing, and partner with NYSDEC conservation officers to enforce refuge and State regulations. In addition, as stipulated in the refuge's hunt program EA (appendix E), the refuge manager will only open additional areas after determining there is sufficient quality habitat available that can be accessed by hunters on foot or by boat without disturbing sensitive species or conflicting with other priority public uses. We will monitor to ensure compatibility and evaluate compliance. Potential conflicts between user groups will also be evaluated. If impacts of conflicts are noted, we will follow Service policies and procedures to mitigate impacts and conflicts as needed.

Comment: One commenter stated that hunting will not significantly reduce the snow and Canada goose populations because the species are too widespread to be affected by increased hunting on the refuge. To reduce the populations, such changes in hunting would need to occur at every hunting venue in New York, not just at the refuge. Another commenter suggested the refuge implement a plan that targets hunting geese at Cayuga and Seneca Lakes since they tend to stay

there during the winter. It would be more effective and less costly to have a hunting program that targeted the lakes during the winter.

Response: We agree that expanding snow goose and early (resident) Canada goose hunting on the refuge is not sufficient, by itself, to control these populations. Expanding hunting opportunities for these species on the refuge is intended as one component of the Service's national efforts to reduce these populations. For additional information, see our response to the first question in this section and see appendix E, the refuge's hunt program EA.

We are aware that geese congregate in Seneca and Cayuga Lakes in the winter. The refuge does not have jurisdiction over Seneca and Cayuga Lakes; therefore, we cannot initiate a hunt program in those areas.

Comment: One commenter supports opening the refuge to Sunday hunting, to give those who work during the week an extra day to hunt. This person also wanted the refuge to allow the use of rifles, stating both would be consistent with hunting throughout Cayuga County and much of New York.

Response: We thank the commenter for the support. Under alternative B of the draft CCP and EA and in the final CCP, we propose opening the refuge to Sunday hunting for all deer hunt seasons. We are also proposing to allow the use of riffles in order to be consistent with State hunting regulations. This is outlined in the hunt program EA (appendix H) and we expect to make this change the fall of 2013 or 2014.

Comment: One commenter suggested the refuge bulldoze and clear more open trails, especially in thicker areas, to give hunters a clearer shot and easier access when hunting.

Response: As stated previously, hunting is one of six priority public uses identified for national wildlife refuges. While some visitors have requested additional trails and open areas, others have requested no new trails be created. We must balance providing opportunities for public use with restoring habitat and managing for wildlife. Alternative B of the draft CCP and EA does include creating some additional trails. These are intended to support all of the six priority public uses.

Comment: One person stated that special privileges should not be given to waterfowl hunters who arrive late during check in and are allowed to move to the front of the line.

Response: We did not intend to establish special privileges for any group of hunters. The refuge hunt program allows waterfowl hunters to move to check in first for administrative reasons. Waterfowl hunters must make reservations and pay a fee. Allowing waterfowl hunters to check in first makes it easier to separate waterfowl and deer hunters and avoid confusion at check in. Waterfowl hunting begins one hour earlier than deer hunting. We are not aware that allowing waterfowl hunters to check in first has affected the ability of any deer hunters to be in position at the start of the day for deer hunting. Lastly, allowing waterfowl hunters to check in first should only affect deer hunters 2 days a year, once during the opening day of archery season and once during the opening day of shotgun seasons; otherwise, deer hunters may check in on a self-serve basis.

Comment: One person was opposed to using hunting as a method to regulate the deer population. Rather, this person commented that deer are able to regulate their populations themselves through fetal absorption.

Response: A considerable amount of research has been conducted, as discussed in the draft CCP and EA and the hunt program EA, documenting the detrimental effects high densities of deer can have on native habitats. We believe that the deer population on the refuge should be actively controlled to maintain high quality habitat on the refuge, avoiding negative effects on refuge resources. Deer hunting is a cost effective method for controlling the refuge's deer population and allows us to facilitate a priority public use for the Refuge System. Please see the hunt program EA (appendix E) for a more detailed discussion of the impacts of deer over population on refuge habitats. Our search of the scientific literature did not readily reveal any peer-reviewed literature discussing regulation of deer populations through fetal absorption.

Comment: One commenter suggested we replace the term "weapon," when referring to hunting, with "implement." Weapon can have a negative connotation, implying aggressiveness or violence, and is even considered taboo in hunter education. Instead, a term such as implement should be used because it is more appropriate for describing a tool that is used for hunting.

Response: We understand your concerns regarding the use of the word weapon as it relates to hunting. The Service uses the term weapon consistently in our documents related to hunting. Therefore, we will continue to use the term weapon as a tool used for hunting.

Comment: The Onondaga Audubon Society are concerned about how hunting will be monitored, and if negative impacts are found on other bird species, will the refuge scale back waterfowl hunting?

Response: We recognize the importance of the Refuge System's wildlife first mandate. As discussed in the hunt program EA (appendix E) and the compatibility determinations (appendix B), the number of hunters for each season would be controlled through special use permits. This allows refuge staff to protect refuge resources and ensure a quality hunt by limiting the number of daily permits issued. The maximum number of daily hunt permits that can be issued is based on a variety of factors, including areas open to hunting. This ensures that the number of hunters is kept at levels that have only negligible impacts on refuge resources. We would continue to monitor the refuge for potential impacts and would take steps to limit access or close areas as needed to protect wildlife and habitat, including other bird species.

Alternatives

Alternative A
(Letter ID#: 18, 19)

Comment: Three commenters supported the adoption of alternative A, or continuing the current management of the refuge. One commenter supported alternative A over both alternatives B and

C, largely because they believed alternative B will decrease the quality of many visitors' experiences on the refuge and not serve the rare wildlife species

Response: Thank you for your comments. We strive to provide high quality public use opportunities for all refuge visitors. Addition details were not provided, so we are not sure exactly which aspects of alternatives B and C are of concern. We believe alternative B of the draft CCP and EA, with minor modifications as presented in the final CCP, best satisfies the refuge purpose's and goals, the Service mission, and the Refuge System mission, as well as complying with Service policies and mandates.

Alternative B
(Letter ID#: 7, 8, 13, 16, 23, 27, 30, 35, 36)

Comment: Several commenters stated their support for alternative B, including NYSDEC, because of perceived benefits to wildlife and public use. One commenter believes it is the most beneficial for wildlife conservation and public use, and that the current management is insufficient to support the refuge's goals. One commenter hopes that the CCP will remember and embody the reason Montezuma NWR was founded, to provide a resting and staging area for migratory birds. Several commenters stated their support for alternative B because of the proposed increase in public access and recreational opportunities, and ensuring that hunting is appropriately managed on the refuge and an activity that will endure. One commenter also stated that it is also important to promote nature and the outdoors to youth.

Response: Thank you, we appreciate your support.

Comment: In support of alternative B, one commenter suggested working with as many stakeholders as possible, including The Nature Conservancy, Audubon Society, and Ducks Unlimited. Under the new partnerships proposed under alternative B, the Onondaga Audubon Society would like to be considered as a new partnership for the refuge and be included in refuge outreach activities.

Response: We agree that working with partners is critical to successful wildlife and habitat protection and restoration. We currently work with partners, including Audubon New York, Ducks Unlimited, and The Nature Conservancy, to conduct biological monitoring, research, habitat management, and restoration, and environmental education and interpretation on the refuge and within the MWC. Such partnerships will continue into the future under alternative B. We are always seeking new partnerships and ways to strengthen relations with our current partners. We appreciate Onondaga Audubon Society's offer to partner with us on outreach activities and look forward to working together.

Comment: Two people supported alternative B because it will allow for more hunting that would help reduce the waterfowl and snow goose populations. It is important to reduce the species' populations to target levels and will allow hunters to hunt desirable game without being a threat to the species.

Response: Thank you, we appreciate your support.

Comment: Audubon New York supports alternative B because of the proposed increase in marshbird habitat, forest restoration goals, maintaining some shrubland acreage, and increasing the staff capacity of the refuge. They support the Service's funding to surrounding towns in the form of shared revenues, the Service's strategies to minimize impacts from nearby oil and gas extraction, and the Proposed Land Expansion Area.

Response: Thank you, we appreciate your support.

Comment: The Onondaga Audubon Society asked if the four new pulloffs along the Wildlife Drive will allow visitors to get out of their vehicles and observe the wildlife. They recommended the construction of simple, open wildlife viewing blinds in these pulloff sites.

Response: Thank you for your suggestion regarding construction of wildlife viewing blinds. At this time, we intend to continue to require visitors to stay in their vehicles along the Wildlife Drive during the waterfowl migrations (spring and fall) to minimize disturbance of these species. Once the pulloffs are constructed, visitors may be allowed to leave their vehicles during summer months, when pedestrian travel is allowed on the Wildlife Drive. We will take this comment into consideration as we develop our visitor services step-down plan.

Comment: The New York State Ornithological Association and NYSDEC support the proposal to increase the refuge's approved acquisition boundary and increase land acquisition within the MWC. They also support continued coordination with other agencies and partners within the MWC.

Response: Thank you for your support of land acquisition for the refuge and support for our partnerships with outside agencies.

Alternative C
(Letter ID#: 27, 30, 35)

Comment: Several commenters did not support alternative C because of its proposed reduction of emergent marsh and wetlands and subsequent reduction in marshbird and waterfowl habitat, as well as associated public use opportunities. Two commenters were also concerned about the significant decrease of shrubland and grassland habitat associated with this alternative.

Response: We appreciate your comments. We agree that alternative C does not best meet the refuge's purposes, vision, or the goals of the CCP. Therefore, we did not select it for the final CCP.

Planning Process and Policy

CCP Process
(Letter ID#: 4, 10, 28, 35)

Comment: One commenter stated that the bibliography is antiquated and that some of the sources are too outdated and should not be used in this CCP.

Response: The Service is directed by the Department of the Interior Information Quality Guidelines as published in the *Federal Register* (67 FR 8452) to use the best available science and supporting studies conducted in accordance with sound and objective scientific practices, including peer-reviewed studies where available. We try to balance the information and data we use for our CCPs by referencing the most recent studies along with older studies that have laid the groundwork for their fields. Most of the older sources we cite are highly reputable and cited by many of the more recent sources we have used. We believe that we have used the best available science and our best professional judgment to develop the CCP.

Comment: Three commenters requested the comment period be extended. Some stated that the comment period for the CCP was not long enough to thoroughly read the CCP, provide comments, and disseminate the CCP to colleagues. Others did not find out about the draft CCP and EA until part way through the comment period.

Response: We recognize that the draft CCP and EA is a long document. Service planning policy establishes 30 days as the standard review period for draft comprehensive conservation plans and environmental assessments. We believe this is sufficient time for most reviewers. We strive to notify interested parties and the public as soon as the draft CCP and EA is available for public review and comment, to ensure interested individuals and organizations have the maximum time for reviewing the document. We send a newsletter announcing the availability of the draft CCP and EA to our contacts list, we send a press release to local, regional, and national media contacts, we post the document to the refuge's planning Web site, and we publish a notice of availability in the *Federal Register*. Unfortunately, these efforts do not always reach all of the interested parties in a timely manner. In addition, the Refuge Improvement Act requires that all CCPs be completed by October 4, 2012. The Service is making every effort to meet this deadline where feasible. While we encourage public comment on our draft CCP and EA, extending the comment period would have delayed the completion of the final CCP, possibly beyond this October 2012 deadline.

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Attachment 1. Letter Identification (ID) Numbers and Respondents

Letter ID Number	Name or Public Meeting Date and Time
1	June 4, 2012 2:00-4:00 pm meeting
2	June 4, 2012 6:00-8:00 pm meeting
3	Adam Perry, NYSDEC-Region 7
4	Jean Public
5	Robert Halstead
6	Wendy Sparks
7	James Stebbins
8	Dominic Sherony
9, 28	John Confer, Biology Department, Ithaca College
10	Andrew Mason, Conservation Commission, New York State Ornithological Association
11	John H. Rogers
12	Michelle Otto
13	Roger Moore
14	Karen Storne
15	James McQuiggan, Financial Adviser , Pinnacle Investments, LLC
16	Tom Cunningham, Wildlife Biologist, Loomacres Wildlife Management Inc.
17	Bina Robinson
18	Dennis Merlino
19	Elaine Montambeau
20	Janice Wilson
21	Kim Brenner
22	Dino Aimino
23	Jacqueline Siudy
24	Lc Goeckel
25	Bruce Natale, Environmental Engineer and Flood Hazard Mitigation Official, Cayuga County
26	John Potter
27	Matthew Frackelton Scientist, ARCADIS
29	Bonnie Apgar Bennett, Mayor of Aurora, NY
30	Jillian Liner, Director of Bird Conservation, Audubon New York
31	Candace E. Cornell
32	Asher Hockett
33	Wade and Melissa Rowley
34	Gary Norsen
35	Maryanne Adams, Conservation Chair, Onondaga Audubon Society
36	Patricia Riexinger, Director, Division of Fish, Wildlife and Marine Resources, New York State Department of Environmental Conservation

Appendix L

David Brezinksi/USFWS

Baltimore Oriole

Finding of No Significant Impact

Finding of No Significant Impact

Montezuma National Wildlife Refuge
Comprehensive Conservation Plan

In May 2012, the U.S. Fish and Wildlife Service (Service) published the Montezuma National Wildlife Refuge (NWR) draft comprehensive conservation plan (CCP) and environmental assessment (EA). Montezuma NWR was established in 1938 to provide nesting, feeding, and resting habitat for waterfowl and other migratory birds. Situated in Seneca, Wayne, and Cayuga Counties, the refuge currently encompasses 9,809 acres, which includes two parcels acquired in December 2012. Refuge habitats include emergent marshes and shallow water mudflats, open water, bottomland floodplain forest, old fields and shrublands, croplands, grassland, and successional forest. The refuge is part of the Montezuma Wetlands Complex, an area identified by the Service, the New York State Department of Environmental Conservation (NYSDEC), and other partners for its role in the conservation of migratory birds, particularly waterfowl. The Montezuma NWR draft CCP and EA outlines three alternatives for managing the refuge over the next 15 years. It carefully considers their direct, indirect, and cumulative impacts on the environment and their potential contribution to the mission of the National Wildlife Refuge System (Refuge System). The draft CCP and EA restates the refuge's purposes, creates a vision for the next 15 years, and proposes six goals to be achieved through plan implementation. Alternative B is identified as the Service-preferred alternative. Chapter 3 in the draft CCP and EA details the respective goals, objectives, and strategies for each of the three alternatives. Chapter 4 of the draft CCP and EA describes the consequences of implementing those actions under each alternative.

The draft plan's 10 appendixes provide additional information supporting the assessment and specific proposals in alternative B. Two of these appendixes are stand-alone EAs intended to help satisfy National Environmental Policy Act (NEPA) requirements for the refuge's hunt program (appendix E) and fire management plan (appendix H). Alternative B of the draft CCP and EA reflects alternative B (the Service-preferred alternative) presented in both of these EAs. A brief overview of each alternative in the CCP follows:

Alternative A (Current Management): The Council on Environmental Quality regulations on implementing NEPA require a no-action alternative, which we define here as "continuing current management." This alternative describes our existing management priorities and activities, and serves as a baseline for comparing and contrasting alternatives B and C. It would maintain our present levels of approved refuge staffing and the biological and visitor programs now in place. We would continue to focus on managing impoundments to provide emergent marsh and open water habitats for migrating and nesting wading birds, marshbirds, waterfowl, shorebirds, and other wildlife. We would also continue to actively control invasive species, manage grassland and shrubland habitats, and improve riparian and other forested habitats. We would continue to provide opportunities for all six priority public uses: hunting, fishing, wildlife observation, photography, environmental education, and interpretation. Our partnerships with Federal, State, and local agencies and organizations would continue to emphasize the role of the refuge in the community.

Alternative B (Service-preferred Alternative): This alternative combines the actions we believe would most effectively achieve refuge purposes, vision, and goals, and respond to public issues. Under alternative B, emergent marsh management would remain the focus on the refuge. We would focus efforts on improving existing emergent wetland habitat and restoring additional acres, and re-establishing wetland and riparian forests, where feasible. More upland forest would be promoted through succession or planting native species. Additionally, we would continue to manage for some shrublands, and grassland management would focus on creating larger patches with less edge, resulting in fewer grassland acres overall. Public use opportunities would increase with the addition of trails, viewing areas, and photography blinds. We would develop a formal, curriculum-based environmental education program. Environmental interpretation would be enhanced through updated interpretive displays and associated services. The refuge would be opened to new hunting opportunities, and we would provide more sites that meet Americans with Disabilities Act standards. Fishing opportunities would be increased by providing additional access to canal waters for anglers.

Alternative C (Less Active Habitat Management): Under alternative C, most emergent marsh habitat on the refuge would be allowed to convert to bottomland floodplain forest. Only the Main Pool, Tschache Pool, and Visitor Center Wetland impoundments would be maintained. Newly acquired lands would not be converted to impoundments. Natural succession would play a larger role in shaping vegetative communities on the refuge compared to alternatives A and B. We would allow most upland habitats to revert to forests. Compared to alternative A, opportunities for visitors to participate in priority public uses would increase under this alternative, but not to the extent proposed under alternative B. We would develop a few additional sites to support wildlife observation and photography. Interpretive messages would be changed, reflecting the different focus of refuge management. Hunting opportunities would increase, similar to alternative B; however, waterfowl hunting would remain the same as alternative A and fishing opportunities would be the same as alternative B.

We distributed the draft CCP and EA for a 30-day period of public review and comment from May 22 to June 21, 2012. We received 34 letters, calls, or emails representing individuals, organizations, and State agencies and had approximately 6 people attend two public meetings held on June 4, 2012 at the refuge. Appendix K in the final CCP includes a summary of the substantive comments and our responses to them.

After reviewing the proposed management actions, and considering all substantive public comments and our responses to them, we have determined that the analyses in the respective EAs are sufficient to support our findings. We are selecting alternative B, as presented in the draft CCP and EA with the following changes recommended by the planning team, to implement as the final CCP. Based on public comments, we made the following changes to the final CCP (including appendixes):

1. We increased the amount of shrubland we intend to maintain to 396 acres (similar to alternative A), which is about 100 acres more than originally proposed under alternative B of the draft CCP and EA.
2. We included additional information in chapter 4, under "Protecting Land and Proposed Land Expansion", that we will evaluate newly acquired lands for their potential for habitat restoration (i.e., emergent marsh, forest, shrubland, or grassland).
3. We have added estimates of hazard abatement surveys to table 4.1, and have revised the cost estimates for demolition.
4. We added a section titled "Alternatives Considered but not Fully Developed" to the final hunt program EA (appendix E, which includes a discussion of closing the refuge to hunting.
5. We modified the Land Protection Plan (appendix F) to incorporate climate change information from the CCP and estimated numbers of migratory birds and breeding marshbirds that could use emergent marsh habitats, once lands have been acquired and restored. We also revised the land protection plan and final CCP to clarify which parcels we own, which have been previously added to the refuge's approved acquisition boundary but not purchased, and which would be included in the refuge expansion.
6. We corrected the final fire management plan EA to show that alternative B is both the current management (the no action alternative) and the preferred-alternative.

We also are selecting alternative B, the Service-preferred alternative, of the refuge's final hunt program EA (see appendix E of the final CCP) and alternative B of the refuge's final fire management plan EA (see appendix H of the final CCP). As stated previously, alternative B of the draft CCP and EA reflects alternative B (the Service-preferred alternative) presented in both of these EAs.

We conclude that alternative B, with the above changes, in comparison to the other two alternatives will: (1) best fulfill the mission of the Refuge System; (2) best achieve the refuge's purpose, vision, and goals; (3) best maintain and, where appropriate, restore the refuge's ecological integrity; (4) best address the major issues identified during the planning process; and (5) be most consistent with the principles of sound fish and wildlife management. Specifically, in comparison to the other two alternatives, alternative B provides the biggest increase in health and quality of refuge habitats through enhanced habitat management. It also provides the most reasonable and effective improvements to existing public use programs that are in demand, with minimal impacts to wildlife and habitats. The plans to increase staffing and improve and expand infrastructure are reasonable, feasible, and will result in the most efficient management of the refuge and best serve the American public. This Finding of No Significant Impact (FONSI) includes all three EAs (draft CCP and EA, final hunt program EA, and final fire management plan EA) by reference.

We have reviewed the predicted beneficial and adverse impacts with alternative B that are presented in chapter 4 of the draft CCP and EA and compared them to the other alternatives. We specifically reviewed the context and intensity of those predicted impacts over the short and long term, and considered the cumulative effects. Additionally, we have reviewed alternative B in both the final fire management plan and final hunt program EAs to assess the impacts both will

have. The review of each of the NEPA factors to assess whether there will be significant effect on the environment is summarized here (40 C.F.R. 1508.27).

(1) Beneficial and adverse effects–we expect the final CCP (alternative B) management actions to benefit both the wildlife and habitats at Montezuma NWR. Important examples include measures to restore emergent marsh for migrating waterfowl and breeding marshbird habitat, maintain some high-quality grassland and shrubland habitats, and decrease forest habitat fragmentation by allowing some shrubland and grassland areas to revert to forest to benefit focal species on the refuge. Benefits will not result from any major change in management strategy; rather, they will be incremental to the effects of the current management. Therefore, we do not anticipate these incremental benefits to result in a significant impact on the human environment nor do we expect a significant adverse impact on the human environment.

(2) Public health and safety–we expect the good safety record of the refuge to continue based on the protective actions provided in the stipulations of the compatibility determination for each of the authorized public uses on the refuge. The fire management plan EA will implement prescribed burns, each of which will first require a prescribed fire plan that will ensure public safety. Hunting under alternative B of the final hunt program EA will continue to follow Federal and State regulations. There should be no significant impact on public health and safety from the implementation of the CCP.

(3) Unique characteristics of the area–the primary, unique characteristic of Montezuma NWR is its location within the Montezuma Wetlands Complex, which is an important area for the conservation of migratory birds, particularly waterfowl, in the State of New York. The expansion and restoration of marsh and forest habitat for bird species will support the larger wetland restoration efforts occurring in the Montezuma Wetlands Complex. The final fire management plan EA will help maintain important grassland habitats and does not propose activities that will significantly impact the Montezuma Wetlands Complex. As in (1), the benefits will be incremental to the effects of the ongoing management measures originally instituted to protect these resources. Thus, we do not expect these incremental benefits to result in a significant impact on the human environment.

(4) Highly controversial effects–the management actions in the final CCP such as wetland and forest habitat restoration, expanding white-tailed deer and waterfowl hunting, and other wildlife-dependent recreational uses are time-tested measures. Their effects on the refuge are widely known from past management and monitoring. There is no scientific controversy over what these effects will be. Thus, there is little risk of any unexpectedly significant effects on the environment.

(5) Highly uncertain effects or unknown risks–the management actions in the final CCP are evolutionary. They are mostly refinements of the existing management measures that we have used for many years. We will implement a comprehensive monitoring program to reassess the effectiveness of each planned improvement. With the data available on the current management results and the system in place to adjust for any unplanned effect, we do not find a high degree of uncertainty or unknown risk that the CCP, hunt program EA, or fire management plan EA will cause any significant impact on the environment.

(6) Precedent for future actions with significant effects–the purpose of the CCP is to establish the precedent for managing the refuge for up to 15 years. The effects of that management are designed as gradual improvements over the existing conditions, not global changes. This also includes management activities proposed in the fire management plan EA and the hunt program EA, many of which will be implemented over several years. For example, strategies such as expanding environmental education and converting shrubland to upland forest will be completed over many years. Therefore, we do not expect this precedent to cause any significant impact on the environment.

(7) Cumulatively significant impacts–the CCP provides the programmatic, long-term management plan for the refuge. We plan to coordinate with surrounding land managers to promote common goals such as managing wildlife, habitat, and public use to minimize potential conflicts. Our management jurisdiction is limited, however, to refuge lands, and we do not foresee any of the coordinated activities rising to the level of a significant effect on the environment. Within the term of the CCP, we intend to pursue smaller projects such as building additional trails and observation towers, creating one or more discovery areas, and constructing small vehicle pulloff areas. Cumulative impacts of these projects have been analyzed in the draft CCP and EA. Cumulative impacts of other, larger future projects, such as constructing a new stand-alone visitor contact station and administrative office, could not be analyzed the draft CCP and EA because we do not have sufficient detailed project information to complete the analysis. We will examine the cumulative effects of these projects before they are approved. We will conduct whatever level of additional NEPA review is warranted.

(8) Effects on scientific, cultural, or historical resources–evaluation of archaeological resources presented in the draft CCP and EA showed no significant impacts on these resources from the planned management activities. Service archaeologists in the Northeast Regional Office keep an inventory of known sites and structures, and ensure that we consider them in planning new ground-disturbing or structure-altering changes to the refuge. Throughout the implementation of the CCP and the Fire and Hunt EAs, we will continue to consult with the New York State Historic Preservation Office (SHPO) on any ground disturbing activities (e.g., constructing a new administrative office) and other projects that might affect cultural resources.

(9) Effects on Endangered Species Act (ESA)-listed species and habitats–as detailed in the CCP, we have contacted the Service's New York Ecological Services office under Section 7 of the ESA. The federally and State-listed, endangered Indiana bat has been found near the refuge and likely occurs on the refuge. Our management actions are designed to preserve and improve the existing habitat for this species and there is no ESA-designated, critical habitat on the refuge. The CCP also protects the delisted bald eagle. We will consult with appropriate Ecological Services staff on the Indiana bat or other species if warranted. Therefore, we do not anticipate any significant effects on ESA resources.

(10) Threat of violating any environmental law–our habitat management actions are designed to benefit the environment. They will comply with all applicable protections such as the Clean Water Act and the Clean Air Act. Pursuant to the National Wildlife Refuge System Administration Act (16 U.S.C. 668dd(e)(3), 668dd(m)), we have coordinated closely with

NYSDEC in developing the habitat management plans and the fish and wildlife regulations for the refuge. Our hunting and fishing program require all participants to comply with Federal and State regulations. We do not anticipate a threat that the CCP, the hunt program, or fire management plan will violate any environmental law or cause any significant impact on the environment.

Based on this review, we find that implementing alternative B, as modified, will not have a significant impact on the quality of the human environment, in accordance with Section 102(2)(c) of NEPA. This finding applies to alternative B of the final hunt program EA and final fire management plan EA as well. Therefore, we have concluded that an Environmental Impact Statement is not required, and this FONSI is appropriate and warranted.

21 FEB 2013

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Date

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