

MONTEZUMA NATIONAL WILDLIFE REFUGE  
SENECA FALLS, NEW YORK

ANNUAL NARRATIVE REPORT  
CALENDAR YEAR 1999

U.S. DEPARTMENT OF THE INTERIOR  
FISH AND WILDLIFE SERVICE  
NATIONAL WILDLIFE REFUGE SYSTEM

REVIEW AND APPROVALS

MONTEZUMA NATIONAL WILDLIFE REFUGE

Seneca Falls, New York

ANNUAL NARRATIVE REPORT

Calendar Year 1999

  
Refuge Manager

02/28/02  
Date

  
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3/15/02  
Date

  
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## INTRODUCTION

The Montezuma National Wildlife Refuge lies at the north end of Cayuga lake, in the heart of the Finger Lakes region of New York State. Located five miles east of Seneca Falls in Wayne and Seneca Counties, Montezuma Refuge serves as a major resting area for waterfowl and other water birds on their journeys to and from nesting areas in Northeastern and East-Central Canada.

The Montezuma National Wildlife Refuge was established on September 12, 1938 under Executive Order 7971 as "....a refuge and breeding ground for migratory birds and other wildlife....". At the time, the fledgling refuge encompassed 6,333 acres of marshland and drained wetlands. Today, the refuge has grown to over 7,800 acres, and provides a wide array of habitat types (Table 1).

**TABLE 1. Land Type Inventory, Montezuma National Wildlife Refuge.**

<u>Land Classification</u>	<u>Hectares</u>	<u>Acres</u>	<u>Percent of Total</u>
Wetland Types:			
Riverine	17	42	0.5%
Palustrine	1,457	3,600	45.7%
Bottomland Hardwoods	758	1,874	23.8%
Active Agriculture (Converted mucklands)	422	1,043	13.3%
Upland Types:			
Grassland	333	822	10.5%
Woodland	95	234	3.0%
Brushland	80	197	2.5%
Administrative Lands (Buildings, Parking, Roads)	24	60	0.8%
TOTALS	3,186	7,872	100.0%

In addition to guidance from the refuge's enabling legislation and direction from the Refuge Improvement Act of 1997, today the refuge is guided by the following objectives:

- Maintain and where feasible enhance resting, feeding, and nesting habitat for migratory waterfowl and other migratory birds;
- Provide resting, feeding, and nesting habitats for bald eagles and osprey (a state listed threatened species);
- Provide for the maintenance and enhancement of native wildlife populations and biotic diversity;
- And provide for the public use and enjoyment of the area while instilling a conservation ethic.

Fall peaks of Canada geese approximate 50,000 birds; in spring this number has reached 100,000. Spring migration peaks of snow geese have recently exceeded 100,000 birds. Late fall use by mallards has exceeded 100,000 birds. Use by American black ducks in the fall often reaches 25,000. Approximately 1,200 waterfowl are produced annually.

Bald eagles have been resident on the refuge since 1986, first producing offspring in 1987. Eagles have successfully nested on the refuge for eleven of the last thirteen years, producing thirty young. Four pair of osprey also nest on the refuge, a rare occurrence for the interior of New York. There are established nesting colonies of black-crowned night-herons and great blue herons.

Wildlife education opportunities abound for refuge visitors. Approximately 135,000 persons visit the refuge annually. In addition to a stop at the Visitor Center, refuge visitors may drive the 3.5 mile Wildlife Drive and walk the Esker Brook Nature Trail. Some 10,000 area school students are annual recipients of formal on-site and off-site wildlife education programs by trained teachers, volunteers, or refuge staff.

This Annual Narrative summarizes the major events and activities undertaken on the refuge in 1999.



## INTRODUCTION

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**(Inside Back Cover)**



## A. HIGHLIGHTS

Calendar year 1999 was a banner year for the Refuge in making great strides in wetland restoration, facility maintenance, and monitoring avian populations. A combination of hard work and dedication from the staff and favorable weather conditions resulted in an exceptional level of accomplishment in 1999.

In cooperation with the National Fish and Wildlife Foundation, the State of New York Department of Environmental Conservation, and Ducks Unlimited, Inc., a large earthen dike and water control structures were constructed to restore over 175 acres of previously-drained wetlands. This restoration project was the largest restoration effort attempted by the partners in the Montezuma Wetlands Complex.

Breathing new life into one of the Refuge's oldest impoundments, the 1,400-acre Main Pool was drawn down for the first time in over two decades to consolidate bottom sediments, control non-native fish, and to establish desirable vegetation. The results for migratory waterfowl were astounding, with emergent vegetation reclaiming large areas which only provided open water in the past.

The drawdown, while tremendously successful, was not without accompanying issues. As a result of a severe summer drought in combination with the drawdown, numerous turtles attempted to migrate across the New York State Thruway, resulting in a large number of animals being killed by motor vehicles. The Refuge worked very closely with the Thruway authority in addressing this issue.

The Tschache Pool dike and water control structure received a significant \$130,000.00 facelift and retrofitting this year. Through the combined efforts of Ducks Unlimited engineers and a local contractor, the White Brook water control structure was replaced, and the northern half of the dike was raised between 6" and 8". This work vastly improves our water management capabilities for the future.

Working with the Finger Lakes Community College, the Refuge successfully established a "Monitoring Avian Survivorship and Productivity" (MAPS) station on the Refuge. The data collected from this effort will boost our knowledge of neotropical migrant landbird use in the Complex, and will allow us to monitor changes in their populations over time.

Finally, we said goodbye to Mel Norsen, our Facility Maintenance Mechanic, who served the Refuge well for over two decades. Mel retired in September, and will be missed.

## B. CLIMATIC CONDITIONS

Weather data is obtained from rudimentary weather stations at refuge headquarters and from nearby Locks 1 and 25 of the New York State Barge Canal System. This data is summarized in the table below.

**MONTEZUMA NATIONAL WILDLIFE REFUGE  
1999 Weather Data**

Month	Temperature °F		Rain (inches)	Snow (inches)	Total Precipitation (inches)	48-Year Average Snowfall (inches)	57-Year Average Precipitation (inches)
	Max.	Min.					
January	52	-4	.30	21.0	4.12	16.53	2.20
February	56	2	.39	4.5	.96	15.68	2.30
March	72	-2	2.35	16.25	4.73	10.29	2.95
April	80	26	2.54	---	2.54	2.58	2.39
May	94	32	2.09	---	2.09	0.03	3.23
June	96	42	3.42	---	3.42	---	3.10
July	98	46	2.62	---	2.62	---	3.45
August	96	48	2.52	---	2.52	---	3.28
September	90	42	6.11	---	6.11	---	3.13
October	73	28	3.55	---	3.55	1.54	3.23
November	70	20	2.59	5.0	3.09	5.24	3.45
December	66	3	1.25	5.0	1.45	14.59	2.25
<b>YEARLY TOTALS</b>	<b>98</b>	<b>-4</b>	<b>29.73</b>	<b>51.75</b>	<b>37.20</b>	<b>66.48</b>	<b>34.96</b>

The overall weather pattern during 1999 was generally warmer and slightly wetter than normal. Precipitation for the year totaled 37.2 inches, nearly 2.5 inches above the long-term average. There were, however, wide variations in temperature and precipitation trends throughout the course of the year.

The winter of 1998 - 99 was fairly "open" in character, with less than 42" of snow recorded from January through April. For only the second time since 1952, no snow fell during the month of April. Frequent warm periods resulted in minimal snowpack throughout the late winter and early spring months. The lack of substantial snowpack prevented any serious flooding of refuge impoundments and perimeter dikes during the late winter-early spring period.

The late spring and summer months were warm and dry. Central New York experienced near drought conditions, which varied from mild to severe, depending on the occurrence of localized thunderstorms. Ground conditions proved to be excellent for completion of several refuge construction projects involving heavy equipment and earth moving. The dry conditions did make refuge water management a little difficult as most impoundments fell slightly below objective levels due to high evapo-transpirative water loss.

The summer-long drought aided tremendously in achieving our objectives for the Main Pool drawdown. The hot, dry weather pattern provided ideal conditions for consolidating and oxidizing the exposed bottom sediments of the impoundment. Vegetation response to the drawdown was also aided by the hot dry conditions. The lack of rainfall enabled sediments to dry sufficiently to provide a stable substrate for seedling germination. The entire impoundment bottom turned a lush green as smartweeds, sedges, bidens and seedlings germinated and rapidly grew under ideal conditions.

The fall months brought an end to the dry weather. Heavy rains in September (6.1 inches, nearly double the historical average) and above-average precipitation in both October and November replenished soil moisture reserves and pushed yearly totals above the norm. No snow fell in October, and only 10 inches was recorded during November and December.

### C. LAND ACQUISITION

#### 1. Fee Title

Two fee title acquisitions were completed during 1999. Negotiations are ongoing with several other property owners, and additional acquisitions are anticipated during 2000.

- A.) In late July of 1999 the refuge was notified that the title to Tract 173a had been conveyed to the Service. The former owner, Farm Credit of WNY, ACA, received \$29,700.00 for the 16 hectare (39.6 acre) parcel. Tract 173a contains upland grassland fields on the western boundary of the refuge near the Village of Tyre. The acquisition of this parcel presents the refuge with an opportunity to maintain and enhance existing grassland habitat for many species of grassland nesting birds. The parcel also contains at least one, and possibly two sites suitable for wetland restoration.
- B.) The refuge was also notified in late July that the title to Tract 258,a,R had been conveyed to the Service. The former Sheila P. Smith parcel contains 41.5 hectares (102.5 acres) of red maple/ash wooded wetlands and upland grassland fields. The acquisition of this parcel presents the refuge with an opportunity to protect existing wooded wetlands, provide grassland nesting cover for migratory birds, and manage for several species of native wildlife.

#### 2. Easements

Montezuma National Wildlife Refuge has been designated as the Easement Manager when lands or easement restrictions on lands are conveyed to the Service by the Farm Service Agency (formerly FmHA) for inclusion into the National Wildlife Refuge System. Authority for the conveyance of interest in these properties lies in provisions of the 1985, 1990, and 1995 Farm Bills. Montezuma's jurisdiction covers 21 counties in central and eastern New York. The refuge is responsible for management of over fifty conservation easement tracts and two fee-title transfer properties. The units total over 526 hectares (1,300 acres). The easements range from .4 hectares (1 acre) in size to over 68 hectares (170 acres). The average easement is slightly larger than 11 hectares (28 acres).

Routine site visits and inspections of the easements under Montezuma's jurisdiction were not possible during 1999 due to continuing staff shortages and



a lack of funding to hire a temporary biological technician. Such routine visits would require at least a 40% commitment from the Refuge Biologist. Montezuma (as is the case for many other refuges with FmHA responsibilities) is short-staffed. FmHA easement management has not been a priority, even though we recognize its importance. In order to implement meaningful management practices, or even periodic inspections, we need a biological technician (or private lands biologist) for this program. Active management on any of these properties is impossible without a commitment of funding and manpower.

## D. PLANNING

### 2. Management Plans

The following annual programs were prepared during 1999:

- Annual Hunting Program
- Annual Fishing Program
- Annual Trapping Program
- Annual Water Management Program
- Annual Pesticide/Chemical Use Proposal
- Annual Farming Program
- Annual Prescribed Fire Program

### 4. Compliance with Environmental and Cultural Resource Mandates

During April of 1999 the refuge submitted a joint state and federal Wetlands Permit Application to restore approximately 65 acres of wetland degraded by monotypic stands of cattail, purple loosestrife, and phragmites. Restoration on the Millennium Marsh was to be accomplished through chemical and mechanical control of vegetation and rehabilitation of perimeter dikes to manage water levels to create a greater interspersion of open water and emergent vegetation. The Corps Permit was issued in late May under Nationwide Permit 03 and New York State issued an Article 24 permit waiver for the proposed work. The project proceeded as planned and was completed during the late summer.

Biologist Gingrich prepared and submitted a permit application and project proposal to the New York State Department of Environmental Conservation (NYSDEC) for the refuge's planned aerial application of Rodeo® herbicide to control approximately 65 acres of phragmites on the western edge of the Main Pool of the refuge. The NYSDEC issued the permit and the project proceeded as planned in late August.

### 5. Research and Investigation

Work continued, both on the refuge and within the Montezuma Wetlands Complex, on several Research/Management Studies during 1999.

**Montezuma NR 99 - "Effects of Nest Box Visibility and Density on Wood Duck Productivity." (52550-23)**

**Principle Investigator:** Dr. Paul Sherman

**University Affiliation:** Section of Neurobiology & Behavior  
Cornell University, Ithaca, NY

**Sponsoring Agencies:** Cornell University  
Wildfowlers Association of Central New York

1999 was the seventh year of Dr. Sherman's current Research Management Study, and the ninth year overall that he has worked with the wood duck nest box program on the refuge. Dr. Sherman's initial study (Research/Management Study 52550-21 - *Increasing the Nesting Productivity of Wood Ducks*) demonstrated that when wood duck nest boxes are hidden and spaced widely in the woods near brood habitat, extreme brood parasitism is less frequent than when boxes are clustered over open water. As a result of reduced parasitism, hidden boxes produce more live ducklings per egg laid and per box used than when the boxes are erected in groups over open water. The purpose of the second stage of the study is to examine which of two possible factors, low visibility or low density of nest boxes, is more important in causing the observed reductions in parasitism and increases in productivity.

It is important to separate these factors when developing specific management recommendations. For example, it is a relatively simple matter to reduce the number of boxes in any area, if density alone is the critical factor. If visibility turns out to be the key factor, however, then boxes will have to be removed from open marshes and repositioned on isolated trees in the woods. A brief description of the procedures used in the second phase of this on-going research project follow.

Wood duck nest boxes were erected in four different configurations: Treatment 1) *high visibility - low density*; Treatment 2) *high visibility - high density*; Treatment 3) *low visibility - high density*; and Treatment 4) *low visibility - low density*. Boxes in the first and third treatments were erected in 1993; boxes in the second and fourth treatments have been in place for more than seven years. Each of the four treatments in the experimental design contains at least 30 boxes, and all boxes will be monitored over several breeding seasons (1993-99). Yearly data collection for each box will include: use, clutch size, number of hatched and unhatched eggs, and use by other avian or mammalian species.

For data analysis, the boxes in each treatment will be subdivided into groups of 10. One group from each treatment will be randomly assigned to each of three blocks. Data from the three complete blocks will then be analyzed using a two-way ANOVA. Data from each year will be analyzed separately. At the end of the study period, data from different years will be combined for further analysis if there is no significant heterogeneity among years within blocks.

The wood duck population at Montezuma remained healthy and productive in 1999. The number of eggs laid increased slightly over 1998, as did the total number of hatched young. As in previous years, there were major differences among treatments in the likelihood that eggs would hatch. An egg laid in a low visibility box (treatments 3 & 4) in 1999 was four times as likely to hatch as an egg laid in a high visibility box (treatments 1 & 2) (Figure D-1). Ranking the treatments according to duckling productivity/box, low visibility boxes considered together as a group produced twice as many ducklings as high visibility boxes (Figure D-2).

The 1999 data reveal similar patterns to those observed each year since 1991, particularly regarding the greater importance of nest box *visibility* than density in affecting parasitism and productivity. In all years, in the high and low density, low visibility boxes considered together (treatments 3 & 4), parasitism rates, numbers of eggs laid/box, and unhatched eggs per box were lower, and the proportion of eggs that hatched and duckling production per box were higher than in the high and low density, high visibility boxes considered together (treatments 1 & 2). Moreover, clutch sizes, parasitism rates, egg hatchability, and duckling production are similar among high and low density, low visibility boxes.

The implications are that (1) *wood ducks can be effectively managed by hiding boxes in woodlands*, and (2) *boxes need not be widely scattered so long as they are concealed from one another*. Non-traditional (low visibility) nest box placement is proving to be a useful management option for enhancing productivity of wood ducks by reducing dump nesting, and consequently improving nesting efficiency.



# Montezuma National Wildlife Refuge

## Wood Duck Nest Box Placement Experiment

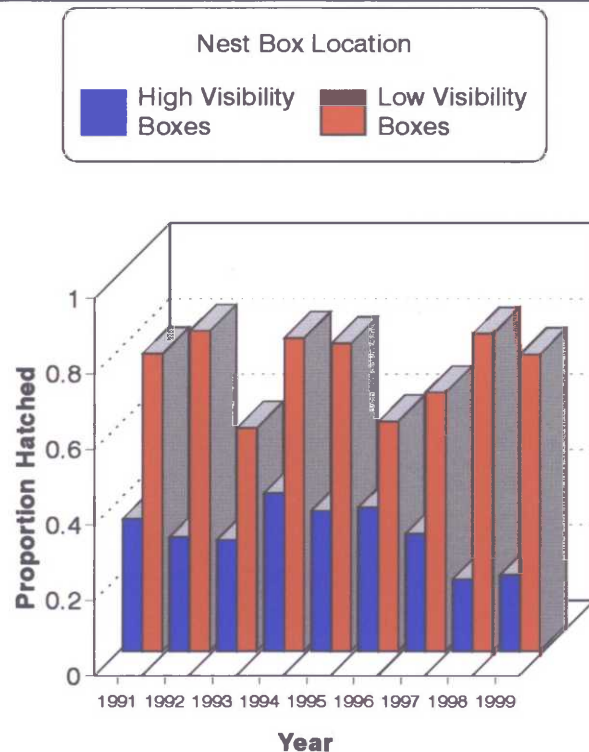


Figure D-1. Proportion of Wood Duck Eggs That Hatched.

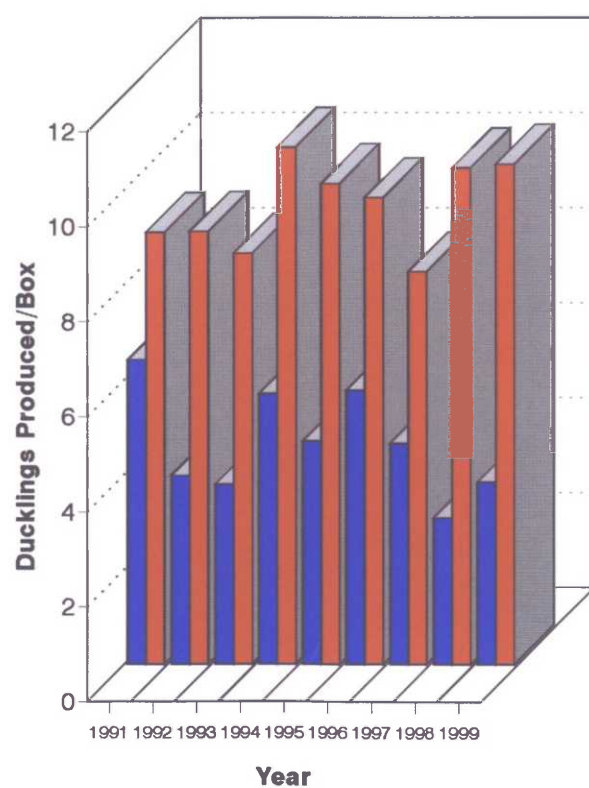


Figure D-2. Number of Ducklings Produced per Box.

**Montezuma NR 99 - "Use of Prescribed Fire for Management of  
Old Fields in the Northeast." (52550-31)**

**Principle Investigator:** Ms. Laura R. Mitchell

**Co-investigator:** Dr. Richard A. Malecki

**University Affiliation:** New York Cooperative Fish & Wildlife Research Unit  
Department of Natural Resources  
Cornell University, Ithaca, NY

**Sponsoring Agencies:** U.S. Fish and Wildlife Service, Region 5  
Interior Fire Coordination Committee - Research  
Working Team

1999 was the second (and final) field season for Laura Mitchell's MS graduate research project. The study was initiated to help close an information gap on seasonal fire effects on invasive shrubs in northeastern prairie-like grasslands. The project was designed to provide practical information on the usefulness of several prescribed burn techniques in reducing the cover of clonal shrubs in old fields of the northeast. Specific project objectives were to:

- 1.) Investigate the effects of prescribed fire on several species of invasive shrubs in prairie-like grasslands in New York.
- 2.) Investigate the effects of prescribed fire during two different seasons: dormant (November through April), and mid-growing (July or August).
- 3.) Investigate the effects of combined mowing and burn treatments, and combined herbicide and burn treatments, versus prescribed burns alone.
- 4.) Investigate burn behavior in prairie-like grasslands to convey information on the type of burns conducted, as well as their ecological effects.
- 5.) Evaluate the cost effectiveness of various treatments.

Four locations, in central and western New York, served as field sites during the course of the research work. These included Iroquois National Wildlife Refuge, the Finger Lakes National Forest, The Nature Conservancy's Rush Oak Openings Preserve, and Montezuma National Wildlife Refuge. The four sites represented different soil types, physiographic regions, and degrees of shrub invasion, and provided information on a broad spectrum of old field conditions.

The following is taken from the Abstract for Laura Mitchell's Master's Thesis.

Wildlife organizations use prescribed burns to manage old fields in the Northeastern U.S. An increasingly popular objective is to restore early successional habitat for declining grassland breeding birds, by increasing cool season grasses and reducing woody plants. Managers also want to control aggressive, late season perennials, such as *Solidago canadensis*, which often dominate old fields during later stages of abandonment. Studies in cool season grasslands in the region have been limited to dormant-season fires. Past work has shown that early spring fires increase frequency of *Solidago* spp., and fail to increase frequency of cool season grasses. Dormant-season burns merely top-kill invading shrubs, which often resprout at higher stem densities during the growing season following fire.

This study examined the effects of several prescribed fire treatments on herbaceous and shrub vegetation in old fields in central and western New York. In addition to a dormant-season burn, I applied combination treatments involving dormant-season mowing and burning, dormant-season mowing and growing-season burning, and growing-season mowing and growing-season burning. I compared vegetation community and structure between treated fields and nearby grasshopper sparrow breeding habitats.

Dormant-season fires failed to kill shrubs, reduce shrub frequency or height, or increase cool-season grass frequency and cover. In contrast, growing-season fires, preceded by growing-season mowing applications, killed some shrubs, reduced shrub frequency and height, and increased cool-season grass frequency and cover. This combination treatment also had lower *Solidago* spp. Frequency and cover than the dormant-season fire treatment. Combination treatments involving dormant-season mowing applications also reduced shrub frequency, but failed to increase frequency and cover of cool-season grasses. All treatments, applied during only a single growing season, failed to reduce shrub stem density. Two years of consecutive growing-season mowing applications, combined with a burn during the second summer, reduced stem density in a resprouting shrub, *Cornus racemosa*.

Phenological timing of treatment was found to be more important than intensity of fires to increasing the importance of grasses, and decreasing the importance

of goldenrod and shrubs. The growing-season mowing and burning treatment resulted in a vegetation community resembling grasshopper sparrow habitat in grass and goldenrod cover, litter depth, and plant community height, one year after treatment. Dormant-season burn treatments resulted in significantly lower grass cover, and higher community height, than grasshopper sparrow habitat.

None of the treatments, applied during only one growing season, reduced shrub cover to levels comparable to grasshopper sparrow habitat. I conclude that it is likely that more than one growing-season mowing/burning treatment, applied during consecutive years, if possible, is needed to restore habitats attractive to grasshopper sparrows in shrubby old fields in New York.

### **Montezuma NR 99 - "Biological Control of Purple Loosestrife." (52550-27)**

**Principle Investigator:** Dr. Bernd Blossey

**University Affiliation:** Biological Control of Non-Indigenous Plant Species Program  
Department of Natural Resources Cornell University  
Ithaca, NY

**Sponsoring Agencies:** U.S. Department of Agriculture Cornell University

1999 was the fourth full field season for this ongoing research project. Objectives of Dr. Blossey's project are to:

- 1.) Identify the potential of three different insect herbivores (*Galerucella californiensis*, *Hylobius transversovittatus*, and *Nanophyes marmoratus*) or combinations of these species to control the wetland weed purple loosestrife (*Lythrum salicaria*).
- 2.) Study the response of native vegetation to insect feeding on purple loosestrife.
- 3.) Study the impact of a leaf feeder (*G. californiensis*) and a root feeder (*H. transversovittatus*) on suppression of purple loosestrife along a moisture gradient.



Purple loosestrife, an exotic wetland perennial introduced into North America in the early 19th century, occurs in dense stands throughout the temperate part of the United States and Canada. Large monotypic stands of purple loosestrife reduce biotic diversity of infested wetlands by replacing native plant communities, thus eliminating food and cover essential to many wetland species, including waterfowl. No effective method is available to control purple loosestrife, except where it occurs on small, localized stands and can be intensely managed. These control measures, however, are costly, require long-term maintenance, and in the case of herbicides, are non-selective and environmentally degrading.

Biological control efforts to control purple loosestrife focus on the release of host-specific phytophagous insects that were introduced from the plant's native range in Europe. Past studies have identified five species attacking the different plant parts; i.e. two leaf-feeding beetles (*G. californiensis* and *G. pusilla*), a root-feeding weevil (*H. transversovittatus*), and two flower- and seed-feeding weevils (*N. marmoratus* and *N. brevis*). The insects selected as biological control agents are the primary force controlling the abundance of purple loosestrife in Europe where the plant is a minor component of wetland communities. Other plant species are not at risk because these insects are extremely host specific and feed exclusively on purple loosestrife. Introduced into the U.S. without their natural parasitoids and diseases, these insects are expected to reduce the abundance of purple loosestrife to about 10 percent of its current level over 90 percent of its range within the next 10 - 20 years.

The current research will identify the "best" agent or agent-combination for release. At the same time, the experiments will study the effects of competition by background vegetation on control success. Results of the current research will immediately affect recommendations concerning release strategies across the entire North American continent.



Adult *Galerucella californiensis* beetles feeding on purple loosestrife plants at a release site near the Refuge's Visitor Center. Plants at this release site are demonstrating classic signs of decline three years after the initial release of the beetles. (99-1; TAG)

**Montezuma NR 99 - "Ecological Function of Wetlands and the Efficacy of Restoration." (52550-28)**

**Principle Investigator:** Dr. James E. McKenna, Jr.

**Sponsoring Agencies:** Tunison Laboratory of Aquatic Science  
National Biological Service, Cortland, NY

1999 was the fourth field season for this long-term study. Objectives of the study are to: 1) quantitatively describe and compare the structure of the biological community and its functions within wetland restoration and control areas; 2) identify statistically significant spatial and temporal differences in the structures of observed species assemblages; 3) identify changes in ecological function as hydrarch succession proceeds; 4) construct an index of ecosystem health for each sampled location and compare values of this index with that of similar indices from other freshwater systems; 5) measure the efficacy of restoration efforts with respect to stated goals; and 6) recommend methods to improve future restorations.

Dr. McKenna's research will quantitatively measure wetlands function and provide a better understanding of the role of wetlands in maintaining good ecosystem health and biodiversity, as well as determining the efficacy of restoration efforts. His findings will also potentially benefit not only the refuge, but the Service's entire private lands restoration program in New York.

**Montezuma NR 99 - "Length of Stay, Survival, Habitat Use,  
and Migration Characteristics of Fall  
Migrant Soras (*Porzana carolina*)."** (52550-30)

**Principle Investigator:** G. Michael Haramis

**Co-investigator:** Gregory D. Kearns

**Sponsoring Agencies:** U.S. Fish and Wildlife Service Webless Migratory  
Game Bird Research Program

U.S. Geological Survey  
Patuxent Wildlife Research Center Laurel, Maryland

Maryland National Capital Park and Planning  
Commission's Patuxent River Park

The freshwater tidal marshes of the Patuxent River, near Jug Bay, Maryland have long been known for their fall concentration of migrant soras. Extensive stands of wildrice, tearthumb, smartweeds, and other seed-bearing annuals attracted thousands of soras during their southerly migration. So abundant were these birds on the Patuxent in the era from the 1890's to the 1950's, that the marshes became renowned for sora rail hunting. Although there is little

quantitative information regarding historical sora population trends or harvest along the Patuxent River, long-time rail hunters agree that sora numbers have declined dramatically in recent years.

The historic importance of the Patuxent wildrice marshes, the apparent decline in numbers of soras, and the paucity of information about the species prompted the Maryland National Capital Park and Planning Commission to sponsor research on the sora beginning in 1987. The primary objective of the study was to investigate movements, habitat use, survival, and length of stay of migrant soras on the Patuxent River Marshes using radio telemetry methods. Secondary objectives included continued data collection on body mass, fat score, recapture frequency, and age/sex plumage characteristics from capture, banding, and examination of soras using call-enhanced walk-in traps.

Improvements in call-enhanced trapping methods are a notable success of the work, especially the use of solid-state microchip message repeaters programmed with sora calls that have resulted in dramatic increases in capture success. Captures in 1993 and 1994 totaled 640 soras, and in 1995, 754 soras were captured and banded at the Park. These 1440+ bandings more than doubled the total historical bandings of soras in North America!

1999 was the third year that this long-running research project included work at Montezuma National Wildlife Refuge. The purpose of the expanded work effort is to band representative samples of soras, monitor weight and age ratios, and provide opportunities to encounter marked individuals at the Maryland study site.

## E. ADMINISTRATION



Front Row (L to R): 6, 4, 5, 14, 8

Back Row (L to R): 2, 1, 3, 7, 10 (99-2; MJN)

## PERSONNEL

1. Thomas M. Jasikoff.....Refuge Manager, GM-13, PFT
2. Charles E. Vandemoer.....Deputy Refuge Manager, GS-12, PFT
3. Tracy A. Gingrich.....Refuge Biologist, GS-11, PFT
4. Marva K. Gingrich.....Outdoor Rec. Planner, GS-11, PFT
5. Judith A. McMahon.....Administrative Assistant, GS-07, PFT
6. Nancy J. Estes.....Clerk/Typist, GS-03, PPT
7. Steven L. Flanders.....Maintenance Mechanic Leader, WL-09, PFT  
(Promoted 01/99)
8. Melvin J. Norsen.....Maintenance Mechanic, WG-09, PFT  
(Retired 09/25/99)
9. Louise K. Dates.....Tractor Operator, WG-06, PFT
10. John A. Crowell.....Maintenance Worker, WG-05, TFT
11. Jessica A. Smith.....Recreation Assistant, GS-04, TFT  
(05/16/99 - 08/28/99)(Not Pictured)
12. Maeve L. Taylor.....Biological Student Trainee, GS-05, TFT  
(Converted to Exc. Appt. 04/25/99)

(Continued on next page)

13. Bruce S. Bigelow.....Park Ranger, GS-05, TFT  
(EOD 09/29/99; terminated 01/01/2000)
14. Sheila Sleggs.....Project Coordinator, MWC

#### 1. Personnel

	<u>Permanent</u>		<u>Temporary</u>	<u>Total</u>
	<u>Full-Time</u>	<u>Part-Time</u>	<u>FTEs</u>	
FY 1999	8	1	3	8.5
FY 1998	8	1	3	8.5
FY 1997	8	1	1	8.5
FY 1996	8	1	1	8.5
FY 1995	8	1	1	8.5
FY 1994	8	1	1	8.5
FY 1993	9	1	1	9.5
FY 1992	8	1	4	8.5

#### 4. Volunteer Program

Volunteers at the Montezuma National Wildlife Refuge continue to be the backbone behind many refuge programs. Many of the facilities and programs that visitors enjoy are available because of this dedicated group of people.

The refuge was fortunate to receive 3,865 hours of service in 1999 from 58 volunteers. A breakdown of volunteer services by categories is provided below.

Monitoring/Studies	807
Habitat Restoration	60
Habitat Management	24
Fish & Wildlife Management	888
Public Use	1,966
Administration	120



Refuge volunteers accomplished and assisted with the following tasks:

- Operated the Visitor Center seven days a week from April 1 to November 30 and greeted 18,000 visitors.
- Led guided bird/wildflower tours.
- Esker Brook Trail maintenance.
- Assisted with special events.
- Presented educational/informational programs to groups.
- Developed interpretive displays.
- Conducted weekly waterfowl surveys.
- Processed news releases.
- Monitored nest sites.
- Lawn maintenance and landscaping.
- Assisted with waterfowl banding.
- Bluebird box management.
- Assisted with grassland habitat management.
- Assisted with private lands restoration projects.
- Webpage maintenance.



Refuge Volunteer Chuck Clark helping with the lawn maintenance. (99-3; MM)

Refuge Volunteer Larue St. Clair contributed 640 hours of service in 1999, bringing his six-year total to 3,308 hours. Larue conducted waterfowl/shorebird surveys, monitored and maintained bluebird nest boxes, mowed lawns and grassland fields, planted warm-season grasses, led guided bird tours, and staffed the Refuge Visitor Center. Larue was one of six finalists for local newspaper The Citizen's (Auburn, New York) Volunteer of the Year Award.



Refuge Volunteer Larue St. Clair receiving an award at The Citizen's Volunteer of the Year Luncheon. (99-4; MKG)

Twenty three volunteers donated 700 hours of service for the operation of the refuge's MAPS station (Monitoring Avian Productivity and Survivorship).

It is obvious that the volunteer program is vital to the successful operation of the refuge. Montezuma is extremely lucky to have such dedicated staff.

Throughout the year, formal volunteer meetings were held. These meetings provided excellent opportunities to exchange information, ideas, and needs among volunteer and staff.



5. Funding

	<u>FY 1995</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
<b>1261 &amp; 1262 - O &amp; M; ARMM; Resource Prob.</b>	<b>\$504,723</b>	<b>\$527,723</b>	<b>\$620,341</b>	<b>\$813,750</b>	<b>\$932,460</b>
<b>4960 - Entrance Fee O &amp; M</b>	<b>0</b>	<b>2,857</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>6860 - Expense For Sales</b>	<b>2,000</b>	<b>2,000</b>	<b>2,000</b>	<b>2,000</b>	<b>2,000</b>
<b>8610 - Quarters Rehab.</b>	<b>4,886</b>	<b>0</b>	<b>1,456</b>	<b>72</b>	<b>0</b>
<b>7201 - Contributed Funds</b>			<b>323</b>	<b>0</b>	<b>0</b>
<b>7208 - Challenge Grant</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>1261 - YCC</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>9120 - Fire</b>	<b>1,800</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>9251 - Fire</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7,000</b>
<b>TOTAL</b>	<b>\$516,266</b>	<b>\$529,731</b>	<b>\$624,120</b>	<b>\$838,822</b>	<b>\$941,460</b>

O & M Funding included:

\$95,291 for a new dump truck.

\$93,154 for a new bulldozer.

\$7,000 to replace computers.

\$3,100 for May's Point Grasslands Project.

\$12,000 for Visitor Center remodeling.

\$1,000 for the Tornatore Property Project.

\$2,000 for windows and heaters for the Fur House.

\$97,000 for Regional Heavy Equipment Repairs and Hauling.

\$7,000 for a new Disc.

In addition to the Refuge's regular budget, the Refuge expended:

- A) \$60,000 from DU and NFWF (contributed funds) to restore the Foster Tract (52550-7201-0463).
- B) \$15,000 Challenge Grant through Ducks Unlimited for wetlands restoration/enhancement. The funding was carried over to FY2000 (52550-1261-C512).
- C) \$4,300 (50130-1261) for environmental audit compliance.
- D) \$800 (50135-3210) for Biologist Tracy Gingrich's salary; re: CIP Farm Credit.
- E) \$277,945 for the Tschache Pool Dike and Water Control Structure Project. The funding was initially included in the Refuge's budget, but the Regional Office redistributed the funding back into their accounts, and the Project was then paid for through R/O accounts.
- F) A \$10,000 Ducks Unlimited Route 89 Marsh Project was made available to the Refuge.
- G) \$10,000 (50135-6351) for a new public radio information station and \$2,000 volunteer funding.
- H) \$1,288 camcorder, \$212 digital camera, and \$4,695 phone system upgrading – due to Y2K compliance (98400-1962-0022).

The Refuge donated \$500 to the regional ecosystem "kitty".

## 8. Other Items

### North American Waterfowl Management Plan Activities

The North American Waterfowl Management Plan (NAWMP), signed by the United States and Canada in 1986, is a blueprint for recovery of declining waterfowl populations and a unique opportunity to protect, enhance, and restore wetland habitats across the continent. The plan presents a number of new opportunities and challenges for the Nation's National Wildlife Refuges. It establishes conservation goals for wetland habitats in specific regions of the continent; sets objectives for restoring waterfowl populations; and provides a framework for accomplishing local, regional, and international goals.

In the United States, six key waterfowl breeding, migration, and wintering habitat regions, called Joint Ventures, were originally established to implement the North American Plan. Joint Ventures provide a vehicle for governments and private organizations to cooperate in planning, funding, and implementation of projects to preserve or enhance waterfowl habitat. Within Region 5, the Atlantic Coast Joint Venture has coalitions of federal, state, and private partners working together to protect wetland habitats and restore waterfowl populations.

Montezuma National Wildlife Refuge lies within the Atlantic Coast Joint Venture and is playing an active role in achieving the objectives of the Joint Venture and the North American Waterfowl Management Plan through proactive wildlife management on the refuge. Montezuma was established in 1938 as a refuge and breeding ground for migratory birds and other wildlife. Waterfowl management centers on manipulation of water levels in the impoundments to favor growth of plant communities and habitat conditions favorable for waterfowl. Providing migratory staging and feeding habitat for American black ducks, mallards, and Canada geese is of particular management concern at Montezuma.

Within the Joint Ventures are smaller Focus Areas where the collective efforts of the public and private sector can have the greatest potential for achieving the goals of the North American Waterfowl Management Plan. One of ten Focus Areas in New York is the Montezuma Focus Area in the central Finger Lakes region. This Focus Area includes a roughly circular area of land 255 square miles in size in Seneca, Wayne, and Cayuga Counties. The Montezuma Focus Area has special significance as a staging and feeding area for migratory waterfowl and resident wetland wildlife and includes the Montezuma National Wildlife Refuge; the Howland's Island, Crusoe Lake, and Cayuga Lake State Wildlife Management Areas; and the lands surrounding these areas. A final plan for the Montezuma Focus Area was completed during 1995. The plan includes a

description of the resource values of the Focus Area, and recommended strategies to protect, restore, and create wildlife habitats contained within its boundaries. Refuge staff actively participated in the writing of the Montezuma Focus Area plan, and continue to be active participants in the ongoing implementation phase of the plan.

The Montezuma Wetlands Complex lies within the larger Montezuma Focus Area. This ongoing project is a major undertaking of both the New York State Department of Environmental Conservation and the U.S. Fish and Wildlife Service to expand existing state and federal lands into a total complex of approximately 35,000 acres.

The Montezuma Wetlands Complex is currently Region 5's largest active Joint Venture project, and was designated as the Region's "flagship" project. The project aims to: protect and enhance wetland habitats for their benefits to waterfowl, endangered and threatened species, and other wildlife; restore drained wetlands whenever feasible; improve access for compatible wildlife-related recreation, education, and research; and foster continued private involvement in the protection and enhancement of the area's wildlife resources.

Ms. Sheila Sleggs began work in January, 1998 as the Project Coordinator for the Montezuma Wetlands Complex. Sheila holds a Ducks Unlimited, Inc. Conservation Staff position cooperatively funded by the U.S. Fish and Wildlife Service and the New York State Department of Environmental Conservation, and receives direct supervision from DU's North Atlantic Biological Supervisor. With assistance and consultation from NYSDEC, USFWS, and others as appropriate, she has overall responsibility for project planning and coordination of activities relative to the Montezuma Wetlands Complex Project, and is involved with implementation of these activities.

## F. HABITAT MANAGEMENT

### 1. General

The lowlands adjacent to Montezuma National Wildlife Refuge were once a contiguous 16,188 hectare (40,000-acre) wetland complex. Following construction of the New York State Barge Canal in 1906, area landowners were able to drain the wetlands for agricultural production since the canal bisected the wetland complex, effectively lowering the water table. Much of the former wetland acreage was drained for agricultural use to exploit the rich muck soils.

Montezuma National Wildlife Refuge was established on September 12, 1938 to protect what remained of the original wetland complex. The enabling legislation (Executive Order 7971) established the area as a refuge and breeding ground for migratory birds and other wildlife in order to effectuate further the purposes of the Migratory Bird Conservation Act of 1909.

The refuge's primary objective is to provide habitat and protection for waterfowl, other migratory birds, and endangered species; and to insure the availability of these resources to the American people for their enjoyment now and in the future. To meet these stated objectives, wetland management programs are directed at improving or maintaining suitable habitats for migratory waterfowl, endangered and threatened species, and a variety of other migratory and resident wildlife species endemic to central New York.

Habitat management activities at Montezuma include: enhancement of existing wetlands and grasslands; restoration of wetlands both on and off-refuge; active management of grassland/brushland areas; and the maintenance of climax and late second-growth wooded wetlands.

### 2. Wetlands

Nearly 75% of the refuge's 3,186 hectares (7,872 acres) is classified as wetland. Management of wetland habitats is the cornerstone of effective habitat management at Montezuma. Water level manipulation is the primary technique used to manage the system of large impoundments found on the refuge. Three major wetland classes are found at Montezuma - Aquatic Bed, Emergent Wetland, and Forested Wetland.

Aquatic Bed refers to wetlands and deep water habitats dominated by plants that grow principally on or below the water surface. Representative species include sago pondweed, white water lily, coontail, bladderwort, duckweed, and several additional species of pondweed.

Emergent Wetland is characterized by erect rooted herbaceous hydrophytes. Dominant emergent vegetation includes cattail, and two exotic plants, purple loosestrife and common reed. Bulrush was once a significant component of the emergent plant community but now occurs only as isolated clumps and in small sparse stands.

Forested Wetland refers to wetlands dominated by woody vegetation greater than six meters in height, and can range from temporarily or seasonally flooded regimes to permanently flooded dead trees. Dominant trees includes ash, swamp white oak, red maple, and eastern cottonwood. The understory is sparse, and includes common winterberry, northern spicebush, and highbush blueberry.

Currently, dikes impound 1,416 hectares (3,500 acres) of freshwater marsh contained within the Main, Tschache, May's Point, North Spring, and South Spring Pools. The following sections provide a brief historical perspective for each of the refuge's five major impoundments, and a summary of significant occurrences during 1999.

### **Main Pool**

Using CCC labor, approximately 5.3 kilometers (3.3 miles) of dikes were constructed to impound the 486 hectare (1,200-acre) Main Pool. The pool was first flooded in 1942, and has been managed as an impoundment since that time. Shortly after the Main Pool was created, much of the open water area supported broken stands of cattail and bulrush. The interspersions of open water and emergent vegetation provided excellent waterfowl pair bonding and brood habitat. In the early 1950's purple loosestrife became established within the impoundment, and over the next three decades displaced much of the native emergent vegetation.

The Main Pool is a large emergent marsh/open water impoundment providing a unique habitat type for the region. Refuge management efforts are directed at maintaining and enhancing this impoundment for carbohydrate production and preserving its role for staging waterfowl.

To prevent further expansion of purple loosestrife stands within the impoundment, the Main Pool had been held at fairly constant high water levels for nearly twenty years. The high water regime precluded the establishment of

moist soil vegetation and contributed to the development of a deep layer of unconsolidated bottom sediments. Over time the pool evolved into a cattail-purple loosestrife-open water marsh/lake. The eutrophic changes in the impoundment significantly degraded the wildlife value and habitat diversity of the marsh.

To reverse the ongoing eutrophication process and restore the resource value of the pool, a growing season drawdown of the Main Pool was implemented during 1999. Objectives of the drawdown were to oxidize and consolidate the deep layer of organic bottom sediments within the impoundment and provide conditions favorable for the germination and growth of moist soil vegetation.

Timing of the drawdown was critical in order to accomplish these objectives without creating conditions suitable for the establishment of dense stands of purple loosestrife and/or a massive botulism outbreak.

As a first step in the rehabilitation process, the Main Pool was completely dewatered to remove carp in early December of 1998. Thousands of carp were removed as the water receded. The impoundment was essentially dry by the first week of January, 1999. The winter drawdown continued through the month of January when the stop-logs were replaced and the pool was slowly refilled during the late winter to provide sufficient water depth for the spring waterfowl migration.

The second stage occurred during the last week of April when the stop-logs were again removed to completely drain the impoundment. The drawdown was maintained throughout the growing season, greatly aided by the summer-long drought which gripped most of upstate New York. The dry weather helped tremendously in consolidating and oxidizing the exposed bottom sediments. Vegetation response to the drawdown was also impressive. The entire pool bottom literally turned a bright green as smartweeds, sedges, bidens, millets, and cattail seedlings quickly germinated. Purple loosestrife seedlings, which tend to germinate later in the growing season when sediment temperatures are slightly higher, were crowded and shaded-out by the fast growing moist soil annuals. By late summer, dense stands of seed producing annuals (some smartweeds were up to six feet in height) dominated the pool substrate.

The Main Pool remained essentially dry until early August when the long process of refilling the impoundment began. The screw gates on the Cayuga Lake Water Connector Channel were opened during the first week of August and water from Cayuga Lake was slowly gravity-fed into the impoundment. The refilling process took eight weeks, ending during the last week of September. As the refilling process proceeded, water within the impoundment slowly spread out

from the borrow ditches and flooded the dense stands of vegetation growing on the pool bottom.

By early October, huge flocks of ducks (literally like clouds of mosquitoes) could be observed circling and dropping into small openings within the stands of umbrella sedge, smartweeds, bidens, and cattail. Thousands of dabbling ducks swarmed into the dense stands of curing annuals made accessible by the slowly rising water. Seeds produced by the plants provided a valuable, carbohydrate-rich food resource for migrating blue and green-winged teal, northern pintails, northern shovelers, American wigeon, gadwalls, mallards, and American black ducks. It was a remarkable experience for refuge visitors and staff alike to witness.



The Main Pool in mid-May -- dewatering of the impoundment is nearly complete. Note the complete lack of vegetation within the impoundment. (99-5; TAG)





The Main Pool in early August following a very successful growing season drawdown. What was once hundreds of acres of barren mudflat is now dominated by dense stands of moist soil annuals producing a bountiful food resource for the upcoming fall migration. (99-6; TAG)



Montezuma Complex Coordinator Sheila Sleggs (Ducks Unlimited) is dwarfed by six-foot tall smartweed plants as she completes a vegetation survey on the Main Pool in early August. (99-7; TAG)



Umbrella sedge dominated the substrate beneath the towering stands of smartweed. We were pleasantly surprised by the paucity of purple loosestrife that germinated during the drawdown. (99-8; TAG)





As September draws to a close, water has started to flood the dense stands of moist soil annuals growing on the Main Pool. The table has been set with a cornucopia of ripening seeds for the thousands of ducks that are soon to arrive from the north.  
(99-9; TAG)

The drawdown, while tremendously successful, was not without accompanying issues. As a result of the severe summer drought in combination with the drawdown and limited access to the area brought about by construction activities, painted and snapping turtles attempted to migrate across the New York State Thruway in June and July, resulting in a large number of animals being killed by motor vehicles.

Over 200 carcasses were collected from the Thruway shoulder by Deputy Refuge Manager Vandemoer and Refuge Biologist Gingrich at one point in the season. The total turtle mortality is unknown, but may have approached 300 individuals. The carcasses were sent to the State Wildlife Pathologist, who indicated there were animals from all age classes and both sexes.

Most turtle movements were located within a one- mile stretch from the western end of Benning marsh. Most local newspapers, the radio, and television stations carried news of this issue, spurred by concerned private citizens.

While the refuge had received reports of turtles being killed on the highway earlier this season, that is historically the case during this time period, which corresponds to the time when nesting females search out the road shoulders. The refuge had not received reports of very large numbers of animals on the Thruway.

At this same time, construction activities on the Thruway to replace the water control structures prevented refuge staff from accessing the area. Subsequently, it was not until news reports indicated that large numbers of turtles were being killed was the refuge aware of this fact.

In response to the large number of turtles attempting to migrate across the thruway, the Refuge immediately established patrols along the Thruway morning, noon, and evening in an attempt to capture and relocate any turtles before they reached the Thruway. A total of 43 animals were captured and relocated as a result of this effort. Refuge staff also mended the dilapidated fence along the Thruway and placed straw bails along the bottom in an attempt to delay turtles from reaching the Thruway long enough to be picked up on subsequent patrols by refuge staff and volunteers.

Other efforts included discing an area along the Thruway in an attempt to attract nesting females to that site, rather than to the Thruway shoulders, and erection of an emergency billboard sign by the Thruway Authority of turtles migrating to alert motorists of the hazards. The Refuge and the New York State Thruway Authority received positive editorials in the media as a result of these efforts.

Future drawdowns of the Main Pool will need to take this issue into account. The Refuge is now working with the State Department of Transportation to look at replacement of the Thruway fence, and with researchers from the State University of New York in assessing turtle populations and crossing structures.

### **Benning Marsh**

This small impoundment, located immediately adjacent to the Wildlife Drive, was created primarily to provide shorebird feeding and resting habitat during migration. Extremely dry conditions through the early summer allowed refuge staff to get an early start on preparing the impoundment for shorebird migration this year. The Benning Marsh substrate was repeatedly disced in mid-June and then shallowly flooded to create mudflat and shallow water habitat for early migrating adult shorebirds beginning the first week of July.

Both shorebird and waterfowl use increased immediately following shallow flooding. Hundreds of mallards, blue and green-winged teal, and gadwalls were observed on the unit by month's end. Shorebird species response was equally

impressive. Species commonly observed included semipalmated plover, greater and lesser yellowlegs, short-billed dowitcher, common snipe, and solitary, spotted, semipalmated, least, and pectoral sandpipers.

### **Tschache Pool**

Historically known as the Storage Pool, Tschache Pool is a 445 hectare (1,100-acre) impoundment created by CCC labor following completion of a 5.2 kilometer (3.25-mile) long dike. The pool was first flooded in 1944, and has been managed as an impoundment since. The pool contained swamp timber and open wetlands when first created. The timber eventually died and the majority of the trees have since fallen.

The dead timber marsh is home to two active bald eagle nesting territories. The dike encompassing the pool was again closed to the public so as not to unduly disturb the nesting bald eagles. Our own presence along the dike is kept to a minimum during critical periods during the nesting season.

The lack of any deep snowpack during the winter months prevented the typical springtime flooding of the Clyde River adjacent to the Tschache Pool perimeter dike. This allowed us to maintain our planned water elevation through the late winter and early spring.

Tschache Pool was brought up to normal full pool elevation in mid-March and maintained at that level through early June. The full pool level was designed to inhibit further expansion of the purple loosestrife and cattail seedlings which germinated during the 1995 summer drawdown. In addition, maintenance of the full-pool elevation provided excellent foraging habitat for the two groups of breeding bald eagles.

By mid-June, the water level in Tschache Pool was slowly lowered to facilitate extensive repair work on the White Brook Water Control Structure and a portion of the impoundment's perimeter dike. The repair project was funded by Ducks Unlimited and completed by a private contractor. The work included the cutting of several additional drainage bays into the existing water control structure and the repair and raising in elevation of the perimeter dike from the White Brook Spillway to the Pumphouse at Black Brook.

Refuge Biologist Tracy Gingrich and several staff members surveyed Montezuma's nesting black tern population during early June. Between 8 and 10 adults were observed on Tschache Pool. Although no nests could be located (due to difficulty in canoeing through the extremely dense stands of emergent vegetation), it is suspected that upwards of ten black tern nests were hidden in the cattails on the impoundment.

Due to the extremely dry conditions throughout the summer months, Tschache Pool remained below our planned water level objective as we prepared for the refuge waterfowl hunt. Despite relatively low water conditions, which slightly hampered hunter access into the heart of the impoundment, waterfowl hunters had an extremely successful season. Late fall precipitation allowed us to finally bring the impoundment back up to normal winter elevation by early December.

### **May's Point Pool**

In 1954 construction of the New York State Thruway across the north end of the Main Pool isolated approximately 65 hectares (160 acres) which came to be known as May's Point Pool. The pool is an open water marsh impoundment. Several water level management strategies have been implemented on this pool during its history.

Current management of May's Point Pool is directed toward maintaining low water levels and exposed mudflats during the late summer and fall months to provide habitat for migrating shorebirds. We have had excellent success in attracting large numbers of shorebirds, and the viewing opportunities have been very popular with upstate New York birding enthusiasts. We view our efforts at providing migratory shorebird foraging habitat as extremely important to the resource, since the Montezuma Marsh Basin was historically the most significant migratory stopover for shorebirds in all of upstate New York.

Hundreds of sandpipers and plovers were observed on the pool immediately after the drawdown began, and thousands of foraging shorebirds were observed on the mudflats throughout the late summer and fall months. Sightings included: three Hudsonian godwits (rare sightings for upstate New York), stilt sandpiper, Baird's sandpiper, American golden plover, black-bellied plover, buff-breasted sandpiper, ruddy turnstone, red phalarope, and Wilson's phalarope. Virtually every species of shorebird that migrates through central New York was represented and recorded during the late summer and fall on May's Point Pool. Over twenty different species of shorebirds were recorded on the unit.

It is of interest to note that the mix of shorebird species migrating through central New York is quite different than what is observed along the Atlantic Coast. Lesser yellowlegs, pectoral sandpipers, and Baird's sandpipers are much more common at Montezuma than at coastal resting areas. This is indicative of the extreme importance of Montezuma as a stopover site for birds that take an interior route on their southward migration.

May's Point Pool was completely drained for a week during late November to remove carp and other rough fish. The impoundment was then reflooded with water from Tschache Pool to bring it back up to the normal winter level.

### **North Spring Pool**

In 1957 a .5 kilometer (.31-mile) long dike was constructed along the west side of State Route 89 to create the 20.2 hectare (50-acre) North Spring Pool. The impoundment flooded swamp timber, which has died due to permanent inundation. The high sulfur and tannic acid levels of the pool have greatly restricted the growth and expansion of emergent vegetation. Purple loosestrife is confined to stumps, fallen decaying logs, hummocks, and along the dike. Several of the stumps and hummocks were used as nesting sites by Canada geese and mallards. An abundance of duckweed during the autumn months provided a good source of food for migrating waterfowl. Throughout much of the fall this pool teemed with American black ducks, mallards, and Canada geese.

### **South Spring Pool**

The South Spring Pool was formed by the construction of a .8 kilometer (.5-mile) long dike in 1958. This 14.2 hectare (35-acre) pool is located directly south of the North Spring Pool, and is supplied by several springs originating on the western boundary of the refuge. Water from this pool can be diverted into Main Pool or to North Spring Pool. As is true with North Spring Pool, purple loosestrife is confined to disturbed or exposed areas, such as dikes and rotting tree stumps. Loosestrife is less prevalent in South Spring Pool than in North Spring Pool.

Historically, both North and South Spring Pools were forested, but changes in hydrology resulting from dike construction and water impoundment caused mortality of the standing timber. Although complete dewatering is possible, both pools currently are maintained in a permanently flooded condition to prevent purple loosestrife germination. The basins are unconsolidated and the mineral content of the water (iron and sulphur) is high. These factors appear to effect invertebrate production and growth of vegetation.

## **3. Forests**

Approximately 853 hectares (2,108 acres) of the refuge are non-commercial woodland, the majority of which is classified as forested wetland. The term generally refers to wetlands dominated by woody vegetation greater than six meters in height, and can range from temporarily or seasonally flooded regimes to permanently flooded dead trees. Red maple, ash, eastern cottonwood, and swamp white oak share dominance in the forest canopy on the majority of the sites establishing a muck-hardwood association common in the region. American elm, a former major component of refuge forests, was essentially lost to disease. Blue beech occurs infrequently as part of the understory.

The understory of these forested wetlands is typically sparse, and includes common winterberry, northern spicebush, and highbush blueberry. These shrubs are largely confined to hummocks. Species common to the transitional zones between hummocks and vernal pools include fern, skunk cabbage, and false nettles.

Upland forested sites on the refuge include Clark's Ridge, Esker Brook, and Fort Hill. These areas are dominated by second growth stands of hickory, black walnut, sugar maple, and white ash. The refuge's forested acreage is large and diverse enough to support forest interior breeding birds and most forest bird species which occur in central New York. Numerous dead snags are dispersed throughout these forested tracts and provide ample cavities for tree swallows, woodpeckers, wood ducks, and a variety of other wildlife. The forest stands are heavily used during spring and fall migration by many species of neotropical migrant songbirds.

#### Unit 17

Unit 17 was originally constructed as a green-timber reservoir in 1965. The tract consists of two 121 hectare (300-acre) impoundments. The impoundments are separated by a mid-dike, and have been simply termed the East and West Pools. The area consists of a large tract of bottomland hardwoods that separates the northern terminus of Cayuga Lake from the extensive open marsh systems which comprise the major waterfowl habitats of the refuge. The forest lies completely within the immediate extension of the Cayuga Lake Basin, and is bordered by cultivated upland to the west (drumlins), the Seneca-Cayuga Canal to the south, and the Seneca Canal to the east.

Management of the unit was initially designed to provide wood duck breeding habitat, and as such was flooded from March through mid-July. Continued long-term flooding during the growing season, however, was severely stressful to the mature trees, and was discontinued in 1977.

A short period of spring flooding, designed to enhance the natural hydrology of the unit while preserving the integrity of the forest community, was accomplished during 1999. The East Pool was flooded to an elevation of 384.1 (6-8 inches in depth) beginning in late March by pumping water from the adjacent canal.

The water level was maintained until drawdown was initiated during early May. Approximately 80% to 90% of the surface area of the East Pool was covered by water at maximum flood level. The spring flooding regimen was instituted to increase the availability of invertebrates for waterfowl. The early spring invertebrate food resource provided a high protein food base for pre-breeding



hens of many waterfowl species, including wood ducks, mallards, American black ducks, and gadwalls.

#### 4. Croplands

Over the last several years, the Service has acquired several hundred acres of actively farmed muck. It is likely that additional acreage will be added in the future. Long-range plans include restoration of some or most of the muck to emergent marsh. This will necessitate development of extensive dike systems or purchase of large tracts in order to prevent flooding of adjacent, privately-owned farmland. With present-day budgets and staff, neither will occur immediately. Experience on the refuge, as well as on a nearby parcel of recently-acquired State muckland, and personal communications with local farmers, indicates that the land cannot lay fallow or it will be dominated in as little as one growing season by purple loosestrife. Once loosestrife is established, it becomes a costly and time-consuming problem to remove. Farming can keep loosestrife from invading, and provide winter food for waterfowl, other migratory birds, and other wildlife. In view of this, farming will be continued on these acquisition tracts until marsh restoration work is completed.

A Cropland Management Plan was written and approved in 1996 to serve as an outline for a Cooperative Farming Program. An annual agreement is entered into whereby the cooperating farmer trades services, including tillage, seeding, and some crops, for the value of the rented land.

During the 1999 crop year, two cooperating farmers (James Beach and Neil Malone) rented a total of 742 acres at \$30.00/acre for a total rental value of \$22,260.00. In exchange for the land rental, the two cooperators performed the following services: 1) purchased seed and assisted in planting 50 acres of warm-season grasses in refuge fields; 2) summer fallowed (plowed and disced) 10 acres of decadent refuge grasslands in preparation for planting to warm-season grasses in 2000; 3) planted 34 acres of refuge land to a wildlife food plot; and, 4) removed small trees and brush encroaching on the Foster Tract perimeter dike.

#### 5. Grasslands

The management of early successional habitats at Montezuma is designed to provide over 330 hectares (800+ acres) of various age fields for habitat diversity, nesting cover for waterfowl and ground nesting birds, and improved wildlife viewing opportunities for the visiting public. To achieve this objective, grassland areas on the refuge have been divided into several Grassland Management Units (GMUs). Active management of these lands provides a mix of grassland

and old field habitats throughout the refuge; the resulting interspersed habitat types substantially increases the availability of ecotones and promotes wildlife diversity at Montezuma.

Present vegetative conditions in refuge grassland fields are representative of early old-field successional stages. Encroachment of woody plants and noxious weeds into the refuge's grassland communities is occurring at an increasing rate. Mowing has had only marginal success in limiting woody plant encroachment. Refuge staff have recently begun to use prescribed burning, in addition to the traditional mowing regimen, to maintain a desirable grass/forb species mix within several grassland fields.

As part of our ongoing grassland rehabilitation efforts, brush hedgerows are being targeted for removal on selected areas of the refuge. Hedgerow removal accomplishes two major habitat management goals: 1) the consolidation of small, fragmented grassland fields into larger contiguous habitat units; and, 2) the removal of visual barriers and/or obstructions between grassland fields and adjacent wetland units. During 1999, a hedgerow composed of willow and cottonwood trees was removed between the grassland field south of the Subheadquarters and the Main Pool.

A second major grassland rehabilitation initiative has focused on the planting of warm-season grass mixtures to establish high quality dense nesting cover near refuge impoundments. During 1999, approximately 50 acres of poor-quality grassland habitat were replanted to a mix of warm-season grass species. The seeding mix, which included big bluestem, little bluestem, switchgrass, sideoats grama, indiagrass, and eastern gamagrass, was planted at a rate of 17 lbs. PLS/acre using a no-till Truax drill. Three grassland units (Subheadquarters North, Lay Road, and the field north of the Main Pool banding site) were planted to the warm-season grass mix during mid-May.



Montezuma's new no-till grass drill (purchased in cooperation with Ducks Unlimited) was quickly put to work planting 50 acres of warm-season grasses during May of 1999. (99-10; TAG)

#### 6. Other Habitats

Within the boundaries of the refuge are 97 hectares (239 acres) classified as river and stream riparian corridors, brushlands, and small isolated grassland areas. These areas are not normally subjected to intensive habitat manipulation, and are allowed to proceed through a natural pattern of successional change over time. These small areas, as they undergo successional change, provide an important component to overall habitat diversity on the refuge.

Several acres of land immediately adjacent to administrative, maintenance, and public use areas are managed in accordance with their respective uses.

#### 9. Fire Management

No wildfires occurred on the refuge during 1999. A cooperative agreement for both wildfire and prescribed fires remained in effect with the Magee Volunteer Fire Department, Inc. during 1999. A Blanket Purchase Order with the

Department provides for reimbursement of costs associated with mobilization for structural fires and/or alarm system responses.

In recent years, Montezuma has used prescribed fire as a habitat management technique to address problems with: 1) extensive monotypic stands of cattail; 2) encroachment of *Phragmites* into refuge impoundments; 3) deterioration of upland fields due to invasion by woody species and undesirable perennials; and 4) maintenance of existing grassland types as nesting cover. 1999 was a very active year for the refuge's fire management program. Six prescribed burns totaling approximately 140 acres were successfully accomplished on the refuge between late March and early August.

- 1.) **Waugh I Field** prescribed burn (April 13). A total of **34 acres** were burned in this upland cool-season grass/forb field. Burn objectives were to remove residual grass, forb, and woody vegetation, and to reduce competition for grass species from encroaching woody vegetation.
- 2.) **Wildlife Drive Outside Corner Fields** prescribed burn (April 5). A total of **51.5 acres** were burned in these upland fields adjacent to the refuge's Wildlife Drive. Burn objectives were to remove residual grass, forb, and woody vegetation in preparation for management activities on these fields during 1999.
- 3.) **Picnic Area** prescribed burn (March 26). A total of **4 acres** were burned in the area surrounding the refuge's public use picnic grounds. Burn objectives were to remove the residual vegetation (black swallow-wort) to expose downed woody material in order to facilitate grounds clean-up and renovation.
- 4.) **Esker Brook South I** prescribed burn (April 6). A total of **3.25 acres** were burned in this upland field on the western boundary of the refuge. This burn was in support of research being conducted by Cornell University graduate student Laura Mitchell. Laura's graduate research is examining the use of prescribed fire as a technique to manage grasslands and old field habitats in the Northeast.
- 5.) **Esker Brook South II** prescribed burn (August 3). A total of **1 acre** was burned in this upland field on the western boundary of the refuge. This summer burn was also in support of research being conducted by Cornell University graduate student Laura Mitchell.
- 6.) **Avery Tract** prescribed burn (March 27 and April 29). A total of **45 acres** were burned in these warm-season grass fields immediately west of the refuge's recently-acquired muck agricultural fields (Florence Foster Tract).

Burn objectives were to remove residual vegetation and cool season grass/forb competition to stimulate establishment of the warm-season grasses planted in 1997 and 1998.



Outdoor Recreation Planner Marva Gingrich (a true "fire bug") ignites a portion of the 51-acre Wildlife Drive prescribed burn. (99-11; TAG)





A small three-acre spring burn was completed at Esker Brook Field in support of Cornell University Graduate Student Laura Mitchell's fire ecology research. (99-12; TAG)

In addition to the successful prescribed burn program carried out on the refuge proper, several staff members were involved in prescribed burn activities off-refuge during 1999. The following is a brief summary of these activities.

- 1.) During the week of April 5, Biological Technician Brett Gore of the St. Lawrence Wetlands and Grassland Management District assisted the Finger Lakes National Forest with a three hundred acre prescribed burn. A total of eight fields ranging in size from five to seventy acres were burned to provide improved habitat for Henslow's sparrows.
- 2.) April 8 and 14 - Refuge Biologist Gingrich traveled to Iroquois NWR to serve as Burn Boss for prescribed burns on nine grassland fields (both warm and cool season grasses) totaling over 90 acres.
- 3.) Co-op Student Maeve Taylor assisted the Finger Lakes National Forest with prescribed burns on two grassland units.
- 4.) April 21 - Biologist Tracy Gingrich and ORP Marva Gingrich assisted Iroquois NWR with prescribed burns on four grassland fields totaling 45 acres.

- 5.) May 26 - Biologist Tracy Gingrich and ORP Marva Gingrich assisted New York State Department of Environmental Conservation fire personnel in administering the wildland fire portion of the New York State Envirothon Test at Morrisville College. Several hundred high school students from throughout New York participated in this annual event.
- 6.) October 7 - Biologist Gingrich assisted the central and western New York Chapter of The Nature Conservancy with a five acre prescribed burn south of Rochester, NY. The burn was conducted to retard brush encroachment and restore Indian grass, little bluestem, and chinquapin oaks to the thin soils and limestone outcrops of the Conservancy's 236-acre Rush Oak Openings Preserve.

#### 10. Pest Control

Purple loosestrife and *Phragmites* are common pest plants on the refuge. Both species can be found growing in dense stands on the periphery of many of the impoundments and along dike and road edges.

On August 31, Rodeo™ (glyphosate) herbicide was aerially sprayed by a private contractor on 65 acres of *Phragmites*, cattail, and purple loosestrife on the western edge of the Main Pool near Route 89. Funding for the project was provided by Ducks Unlimited. Follow-up treatment with management-ignited prescribed fire will occur during the spring of 2000 to remove the dead vegetative material and stimulate germination of seeds of native wetland vegetation.

We are optimistic that the biological control program for purple loosestrife, being implemented on the refuge and within the Montezuma Wetlands Complex by Dr. Bernd Blossey of Cornell University, will reduce our need to chemically treat purple loosestrife in the future. During July of 1999, over 100,000 *Galerucella* beetles were released at several new sites within the Complex. These sites will be monitored by Dr. Blossey over the next several years to document the impact of the beetles on established stands of purple loosestrife at each location.

#### 12. Wilderness and Special Areas

There are two designated Research Natural Areas (RNA) on the refuge. Maple Knoll, a 3.2 hectare (eight-acre) tract located southwest of Tschache Pool, 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 Montezuma.

The second RNA, Swamp Woods, is a tract of approximately 40.5 hectares (100 acres) located southwest of the Main Pool. It is an unusual stand in that 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 wetlands, but has now become rare due to land clearing and draining of muckland for farming. The dominant tree species are red maple, swamp white oak, and ash. Sensitive fern dominates the understory along with royal fern which grows on the higher hummocks. Arrowhead, water plantain, and skunk cabbage grow in the lower areas between the hummocks. Black alder and spicebush are common shrubs. Numerous dead snags are dispersed throughout the natural area and provide ample cavities for tree swallows, woodpeckers, wood ducks, and a variety of other wildlife. The unit is heavily used during spring and fall migration by not only mallards, American black ducks, and wood ducks, but by many species of neotropical migrant songbirds.

A 850 hectare (2,100-acre) portion of the refuge has been designated as a National Natural Landmark under provision of the Historic Sites Act of 1935. 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. Cattail forms the main vegetation in the marsh, often occurring in pure stands, but sometimes mixed with purple loosestrife, bulrushes, sedges, and swamp loosestrife. Other plant species common in the marsh are common reed, smartweed, and burreed. The Swamp Woods RNA borders the southern edge of the Montezuma Marshes National Natural Landmark.



## G. WILDLIFE

### 1. Wildlife Diversity

Montezuma National Wildlife Refuge provides habitats for an abundance of wildlife species. Sixteen species of amphibians, fifteen species of reptiles, forty-three species of mammals, and two hundred forty-two species of birds have either been recorded or can reasonably be expected to be present on the refuge for at least a portion of the year. The wide array of both resident and migratory species found on the refuge is due to the varied habitat types found in the marsh/upland complex. The mix of wooded wetlands, emergent marsh, and mixed successional stages of vegetation on the upland areas all contribute to the species diversity of the wildlife community found at Montezuma.

The unique value of the refuge's habitats was officially recognized when Montezuma National Wildlife Refuge and the adjacent Montezuma Wetlands Complex was dedicated as New York State's first Important Bird Area (IBA).

The refuge plays a significant role in the Atlantic Flyway as a major staging, feeding, and resting area for tens of thousands of migratory waterfowl. Numerous species of shorebirds, wading birds, and neotropical migrants depend heavily on the area also. Common resident mammal species include white-tailed deer, beaver, muskrat, raccoon, mink, and fox.

Of interest each year is the appearance of many rare or uncommon bird species on the refuge. 1999's unusual sightings included:

- A Ross' goose, rarely seen in central New York, was spotted on March 12.
- A sandhill crane was sighted in the field adjacent to the refuge Visitor Center on May 22.
- On May 31, a glossy ibis was observed at Tschache Pool. In late August and early September, two glossy ibises were consistently sighted at either May's Point Pool or Tschache Pool.
- The first week of July found a tricolored heron on Tschache Pool.
- Two trumpeter swans were sighted on May's Point Pool on July 8.
- A red phalarope was observed foraging in the shallow waters of May's Point Pool on September 19.

- A single cattle egret was observed feeding on the refuge's Benning Marsh from October 8 to 12.
- The week of October 18 to 24 brought sightings of two red phalaropes and a western sandpiper foraging on the mudflats of May's Point Pool, and both a Ross' goose and a greater white-fronted goose on May's Point Pool and the nearby harvested muck agricultural fields.
- Peregrine falcons and merlins were sighted harassing shorebirds on both May's Point Pool and Benning Marsh during August and September.

## 2. Endangered And/Or Threatened Species

**Table G-1. New York State Listed Endangered and Threatened Species which may be found on Montezuma Refuge or are reported to be present in the Montezuma Wetlands Complex.**

SPECIES NAME	STATUS	
	FEDERAL	STATE
Bald Eagle ( <i>Haliaeetus leucocephalus</i> )	T	T
Peregrine Falcon ( <i>Falco peregrinus</i> )		E
Black Tern ( <i>Chidonias niger</i> )		E
Short-eared Owl ( <i>Asio flammeus</i> )		E
Pied-billed Grebe ( <i>Podilymbus podiceps</i> )		T
Least Bittern ( <i>Ixobrychus exilis</i> )		T
Northern Harrier ( <i>Circus cyaneus</i> )		T
Upland Sandpiper ( <i>Bartramia longicauda</i> )		T
Common Tern ( <i>Sterna hirundo</i> )		T
Least Tern ( <i>Sterna antillarum</i> )		T
Sedge Wren ( <i>Cistothorus platensis</i> )		T
Henslow's sparrow ( <i>Ammodramus henslowii</i> )		T

**E-Endangered T-Threatened**

### Bald Eagle

The bald eagle is the most frequently observed threatened species at Montezuma. From 1976 to 1980, the refuge was the release site for a hacking program designed to reintroduce the bald eagle to New York. This cooperative program between the New York State Department of Environmental

Conservation and the U.S. Fish and Wildlife Service resulted in the release of a total of 23 young bald eagles to the wild.

An active bald eagle nesting territory has been located on the refuge since 1987. When first discovered, the nest was one of only two successful nests in New York State, and represented the first nesting success on the refuge since 1956. To date, bald eagles nesting on the refuge have successfully fledged a total of thirty young (Figure G-1). Eagle activity is closely monitored, and the area used by the birds, Tschache Pool, is closed to the general public.

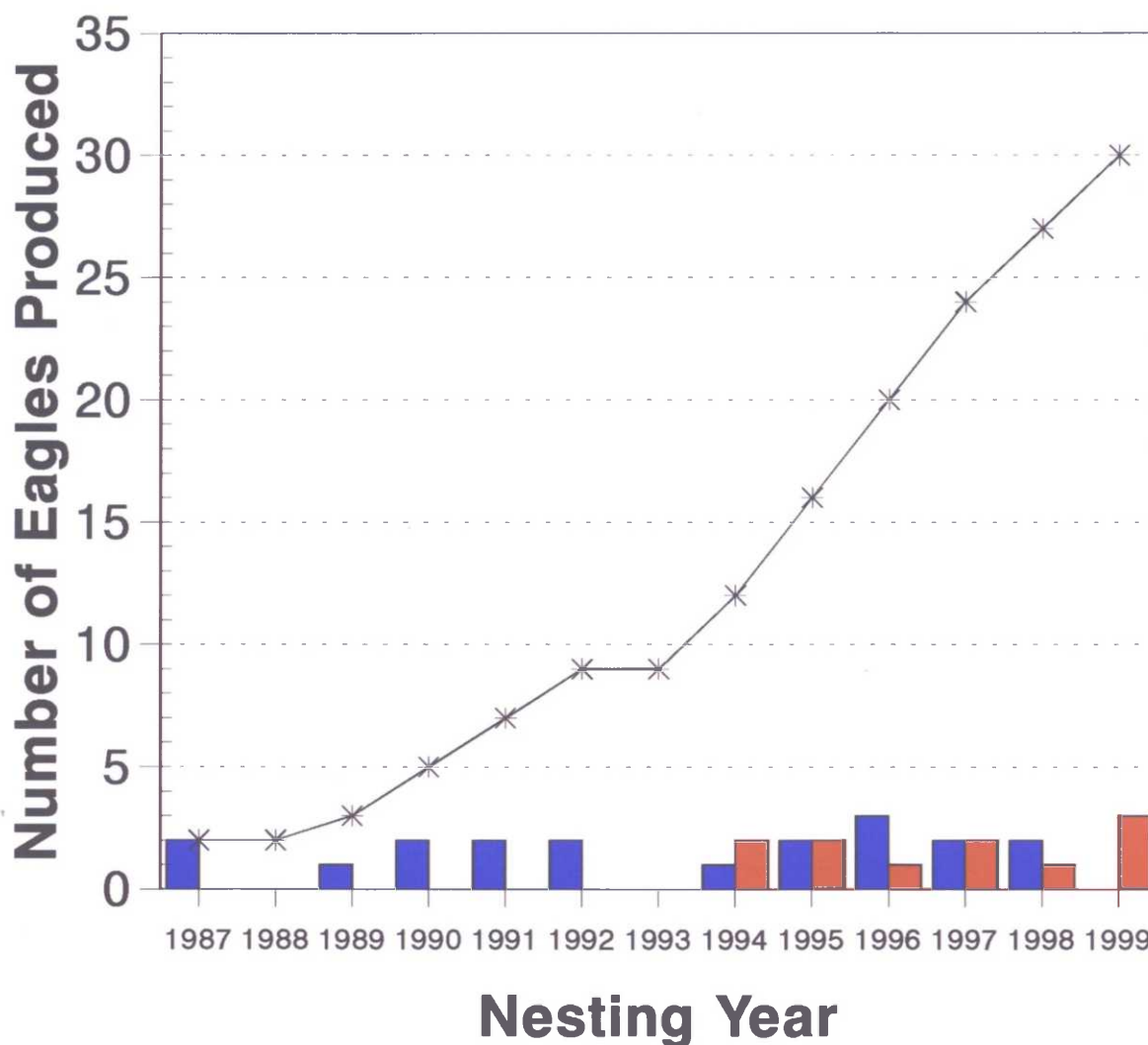
1999 proved to be another successful year for bald eagle breeding at Montezuma. Three young eagles successfully fledged from the refuge's south nest, which is located on a wooded island immediately adjacent to Tschache Pool. The three young eaglets were banded by New York State Department of Environmental Conservation Endangered Species personnel. Unfortunately, the trio of adult birds which occupy the refuge's second nesting territory (the "north nest"), were unsuccessful in their nesting attempt. No reason could be determined for the nesting failure.

#### Peregrine Falcon

Several peregrine falcons were sighted over May's Point Pool, Benning Marsh, and Main Pool by refuge visitors during the months of August and September. The birds were observed harassing shorebirds on the mudflats of the impoundments. Peregrine falcon occurrence at Montezuma is normally quite transitory in nature. Birds sighted in the past several years (as was the case in 1999) have never been observed for more than a few days at a time. The birds are opportunistic foragers that capitalize on the presence of shorebirds on the refuge's exposed mudflat habitat during their migratory passage through central New York.

# Montezuma National Wildlife Refuge

## Bald Eagle Nesting Success 1987 -1999



■ North Nest Production  
■ South Nest Production  
\* Cumulative Production

Total Eagles Produced 1987 - 1999 : 30

Figure G-1. Bald Eagle Nesting Success on Montezuma N.W.R. 1987 - 1999.

### 3. Waterfowl

#### **General**

Since 1938, Montezuma and its associated marshes and other wetland habitats have provided important resting and migration habitat for a diverse waterfowl population. The refuge has assumed a significant role in the Atlantic Flyway as a resting and feeding area for migratory waterfowl.

A large proportion of the mid-Atlantic population of Canada geese utilizes Montezuma and the central Finger Lakes area during spring and fall migrations. Fall peaks of Canada geese routinely exceed 50,000 birds; in spring this number has exceeded 100,000. Approximately 15,000 snow geese use the refuge during spring migration. Tundra swans have often exceeded 400 in number during both spring and fall migrations. Late fall use by mallards has approached 100,000 birds. Use by American black ducks in the fall often exceeds 25,000.

Wood ducks, gadwall, green-winged teal, American wigeon, northern pintail, northern shoveler, and blue-winged teal comprise the bulk of other dabbling duck species using the refuge during migration. Diving duck species that stop at Montezuma during migration include canvasback, redhead, ring-necked duck, and lesser scaup. Smaller numbers of bufflehead, ruddy duck, and common and hooded mergansers also utilize wetland habitats at the refuge during migration.

Overwintering of Canada geese in the Cayuga Lake Basin continued the trend of the last two decades. The numbers of geese staying in upstate New York has skyrocketed since the early 1970's. From overwintering populations of several hundred to a few thousand, current numbers annually exceed 100,000.

#### **Spring and Fall Migration**

The ducks and Canada geese which overwinter on Cayuga Lake often spend portions of milder winter days sitting on the ice or slush covering refuge impoundments. Several thousand Canada geese, mallards, American black ducks and tundra swans are frequently observed resting on the impoundments during these periods of mild winter weather.

A lack of late winter snowfall and milder than normal temperatures combined to "jump-start" spring migration in the area of Montezuma National Wildlife Refuge. Upwards of 75,000 Canada geese and 40,000 snow geese were reported in the Montezuma Wetlands Complex during early March. Large, mixed flocks of Canada and snow geese were observed feeding on waste grain in partially-flooded agricultural fields throughout the Complex. Common duck species found

on refuge pools during spring migration included mallard, wood duck, American black duck, northern shoveler, green-winged teal, ring-necked duck, canvasback, and scaup. The majority of the spring migrant waterfowl left the area during the last week of April.

Waterfowl numbers swelled during late September as fall migration began in earnest with the arrival of over 5,000 Canada geese and several thousand ducks, dominated by mallards, green and blue-winged teal, and American wigeon. Waterfowl numbers gradually increased throughout the remainder of the autumn. The mild and open early winter weather encouraged larger than normal numbers of waterfowl to remain on the refuge throughout early December. Canada goose numbers peaked at well over 70,000 birds during the mild weather of early December. Impressive numbers of Tundra swans (over 600) and diving ducks (over 10,000 canvasbacks, redheads, and ring-necked ducks) were also recorded.

The Main Pool boasted large numbers of puddle ducks during November and December. Thousands of mallards and American black ducks could be observed "dumping" into the impoundment each evening to feed in the dense stands of smartweeds and sedges resulting from the summer-long drawdown of the Main Pool. The most common species were mallard, American black duck, American wigeon, gadwall, canvasback, ring-necked duck, and scaup.

Of particular interest during the late fall-early winter was the number and variety of birds using the agricultural fields north of the refuge. Thousands of waterfowl could be observed feeding on waste corn in the harvested muck fields within the Montezuma Wetlands Complex acquisition boundary. At the peak, tens of thousands of ducks (mostly mallards and American black ducks) and Canada and snow geese were using the partially flooded stubble fields.

### **Brood Counts**

The first Canada goose brood of the season was recorded on May 3; the first mallard brood on May 7; and the first wood duck brood on May 24. Table G-2 provides a summary of waterfowl production at Montezuma during 1999. Information on waterfowl production was collected by recording all broods observed on refuge impoundments during weekly waterfowl surveys beginning with the first brood sighting on May 3.



**Table G-2. 1999 Waterfowl Brood Survey Results**

Species Observed	Actual Number of Broods	Estimated Number of Broods	Actual Number of Young Observed	Estimated Production
Canada Goose	31	39	156	196
Mallard	12	18	89	134
Wood Duck	16	24	125	188
Hooded Merganser	6	9	23	34
* Canada geese: estimated # of broods = actual # of broods X 1.25 * Ducks: estimated # of broods = actual # of broods X 1.5 * Estimated production is equal to (the actual # of young observed ÷ the actual # of broods) x the estimated # of broods.				

### Wood Duck Nest Box Program

The wood duck nest box program at Montezuma has been in place for nearly three decades. Yearly monitoring of box use has aided the refuge in attaining a fairly accurate estimate of wood duck production from boxes. Natural cavities in suitable habitat are abundant; however, we have no information on their use or predation rates, so overall production estimates must be considered conservative.

Biologist Tracy Gingrich, with assistance from Outdoor Recreation Planner Marva Gingrich, completed inspection and maintenance on 61 of the refuge's 121 wood duck nesting boxes during late January and early February. The remaining boxes were inspected by Dr. Paul Sherman (Cornell University). Information collected from all 121 boxes is used in Dr. Sherman's Research Management Study designed to assess the effects of nest box proximity and visibility on brood parasitism (dump nesting), nesting efficiency, and productivity of wood ducks. The experimental design is a two-way ANOVA with three replicated blocks involving 120 nest boxes. There are 30 boxes in each of four treatments at Montezuma: **(1) high visibility - low density**; **(2) high visibility - high density**; **(3) low visibility - high density**; and **(4) low visibility - low density**. Boxes in the second and third treatments were erected in 1993; boxes in the first and fourth treatments have been in place for more than nine years. A complete summary of Dr. Sherman's work is presented in Section D.5.

The wood duck population at Montezuma remained healthy and productive in 1999. The number of eggs laid increased slightly over 1998, as did the total

number of hatched young. Parasitism was lower and productivity higher in nest boxes attached individually to trees near brood habitat ("non-traditional" placement) than in boxes attached to poles over water ("traditional" placement). Isolated boxes had higher clutch sizes and higher productivity than boxes grouped in the open.

Results from 1993-99 indicate that wood ducks can be effectively managed at Montezuma by hiding boxes in woodlands near brood habitat. "Non-traditional" nest box placement is proving to be a useful management option for enhancing population productivity of wood ducks by reducing extreme parasitism ("dump nesting") and consequently improving nesting efficiency.

Results from the 1993 through 1999 nesting seasons are summarized in Table G-3.

<b>Table G-3. WOOD DUCK PRODUCTION SUMMARY: 1993-99.</b>							
	<b>NESTING YEAR</b>						
	1993	1994	1995	1996	1997	1998	1999
Total Boxes Available	120	121	121	121	121	121	121
Number of Hatched Boxes	61	77	64	77	65	60	61
Total Eggs Laid	815	1116	902	1159	872	799	869
Number of Eggs Hatched	611	830	713	856	689	675	741
Number of Dead Ducklings	9	16	7	13	6	7	1
Number of Unhatched Boxes	36	22	34	38	40	38	41
Total Eggs Laid	542	238	330	561	532	600	781
Number of Unoccupied Boxes	23	22	24	13	17	24	21
Percent of Boxes Used	81%	82%	81%	89%	87%	80%	83%
Total Production	602	814	706	843	683	668	740

#### 4. Marsh and Water Birds

Several species of marsh and water birds may be found on refuge pools during the course of the year. The refuge's shallow pools, fringed by emergent vegetation, attract an abundance of great blue herons, green-backed herons, great egrets, black-crowned night-herons, Virginia rails, soras, American and least bitterns, common moorhens, and pied-billed grebes.

Great blue herons again nested on Maple Island in the Main Pool. The nests are located in live trees, and the dense leaf cover obscures the majority of the nests throughout the breeding season, making it impossible to determine how many of these nests were active and fledged young during the breeding season. Black-crowned night herons were common, production of 25-30 birds was estimated from nests located in the emergent vegetation fringing portions of the Main Pool. Other marsh and water birds observed nesting on the refuge in 1999 included Virginia rail, sora, green-backed heron, pied-billed grebe, common moorhen, American coot, and American bittern.

While not nesting on the refuge, double-crested cormorants are conspicuous on Main, Tschache, and May's Point Pools throughout the late summer and fall. The birds are commonly observed foraging on the abundant carp and brown bullhead populations in the pools.

#### 5. Shorebirds, Gulls, Terns, and Allied Species

Gulls are conspicuous at the refuge. Herring, ring-billed, and great black-backed gulls are the most common species. The birds are opportunistic feeders and take advantage of foraging opportunities presented by winter-killed carp and brown bullheads after ice-out in March. The early winter drawdown of the Main Pool provided ample food resources for thousands of gulls as fish (predominantly carp) became stranded as the water drained from the impoundment.

Several staff members surveyed Montezuma's nesting black tern population during early June. Between 8 and 10 adults were observed on Tschache Pool. Although no nests could be located (due to difficulty in canoeing through the extremely dense stands of emergent vegetation), it is suspected that upwards of ten black tern nests were hidden in the cattails on the impoundment. Foraging behavior of adult black terns was also observed on North Spring Pool, Main Pool, and May's Point Pool.

Common and caspian terns were frequently observed during the fall drawdown of May's Point Pool. Both species used the exposed mudflats as a resting area

between foraging flights over the other impoundments on the refuge. Least terns were infrequently observed on May's Point during the same time period.

American woodcock singing ground surveys were conducted on the refuge in early May. The survey routes are slightly modified versions of the national singing ground surveys conducted by the U.S. Fish and Wildlife Service's Office of Migratory Bird Management. During the first week of May, the American Woodcock Singing Ground Survey was conducted on both the Unit 17 route and the North Spring Pool route. Biologist Tracy Gingrich and ORP Marva Gingrich were the surveyors. Seven American woodcock were heard on the Unit 17 route, and three were heard on the North Spring Pool route.

Biologist Gingrich participated in the Service's National Singing Ground Survey. On May 2, a constant zero route southwest of Auburn, New York was surveyed. No birds were recorded on the survey route. On May 10, Gingrich heard seven "peenting birds" on a survey route northeast of Lyons, New York.

Killdeer, spotted sandpiper, American woodcock, and common snipe are the only shorebird species that are common breeders on the refuge, although many other species are commonly observed during migration.

For the past several years, Montezuma has conducted a series of water level drawdowns on the 160-acre May's Point Pool, and more recently, on the 10-acre Benning Marsh Unit. This effort is designed to provide feeding and resting habitat for shorebirds during their annual migrations. We have had excellent success in attracting large numbers of shorebirds, and the viewing opportunities are very popular with upstate New York birding enthusiasts. We view our efforts at providing migratory shorebird foraging habitat as extremely important to the resource since the Montezuma Marsh Basin was historically the most significant migratory stopover for shorebirds in all of upstate New York.

Both May's Point Pool and Benning Marsh were drawn down (Benning Marsh in early July and May's Point in early August) to create mudflats and shallow water habitat for the summer/fall migration. Shorebird response to the drawdowns was immediate and spectacular. Hundreds of sandpipers and plovers were observed on the pools immediately after the drawdowns began, and thousands of foraging shorebirds were observed on the mudflats throughout the late summer and fall months. Rarer species that were sighted included: Hudsonian godwit, western sandpiper, stilt sandpiper, Baird's sandpiper, buff-breasted sandpiper, American golden plover, black-bellied plover, and both red and Wilson's phalarope. Peregrine falcons and merlins were also observed on the pools, obviously attracted by the abundance of shorebirds.

Virtually every species of shorebird that migrates through central New York was represented and recorded during the late summer and fall on May's Point Pool and Benning Marsh. Over twenty species of shorebirds were recorded on the two units. Montezuma has certainly become one of the most critical inland migratory stopover points for shorebirds in the eastern United States.

It is of interest to note that the mix of shorebird species migrating through central New York is quite different than what is observed along the Atlantic Coast. Lesser yellowlegs, pectoral sandpipers, and Baird's sandpipers are much more common at Montezuma than at coastal resting areas. This is indicative of the extreme importance of Montezuma as a stopover site for birds that take an interior route on the southward migration.

## 6. Raptors

Four pair of ospreys, a New York State designated species of special concern, successfully nested on the refuge during 1999. Eleven young were fledged from nests on the Main Pool, Unit 17 (two nests), and Tschache Pool. In June, refuge staff members assisted Mike Allen (New York State Department of Environmental Conservation Endangered Species Biologist) with the banding of the two osprey chicks in the Main Pool nest. In addition to the refuge nests, several other osprey nests could be found in the greater Montezuma area. Once extremely rare in central New York, osprey sightings and successful reproduction have become commonplace in recent years.

Red-tailed hawks and American kestrels were commonly observed throughout the year. Several breeding pairs of each species occur on and in the immediate vicinity of the refuge. American kestrels successfully nested in all three of the nesting boxes erected for their use.

Sharp-shinned and Cooper's hawks are not known to breed on the refuge; however, both species are occasionally seen throughout the year. Eastern screech owls, great-horned owls, and northern harriers are breeders and year-round residents. Turkey vultures are commonly seen from March to November.

The refuge annually hosts several species of wintering birds of prey. Snowy owl, red-tailed hawk, rough-legged hawk, northern harrier, and American kestrel were all observed on the refuge throughout the winter months.

## 7. Other Migratory Birds

General observations, information from refuge visitors, the annual Audubon Christmas Bird Count, and results from the refuge's newly-established MAPS constant-effort mist-netting Station constitute the principal survey methods used for these species.

1999 was the third year that Montezuma served as a host site for the Cornell Lab of Ornithology's Cerulean Warbler Atlas Project (CEWAP). Little is currently known about the breeding biology and habitat requirements of the cerulean warbler, especially in the northeast. The birds are declining throughout most of their range, and are presumed to be very sensitive to habitat degradation and fragmentation. CEWAP aims to create an atlas of cerulean warbler populations in each state. Co-op Student Maeve Taylor conducted the 1999 cerulean warbler survey within the Montezuma National Wildlife Refuge and the Northern Montezuma Wetlands Complex area. Two new breeding sites for cerulean warblers were identified within the Complex this year. All survey data was forwarded to the Cornell Laboratory of Ornithology for compilation and analysis.

### Monitoring Avian Productivity and Survivorship (MAPS) Station

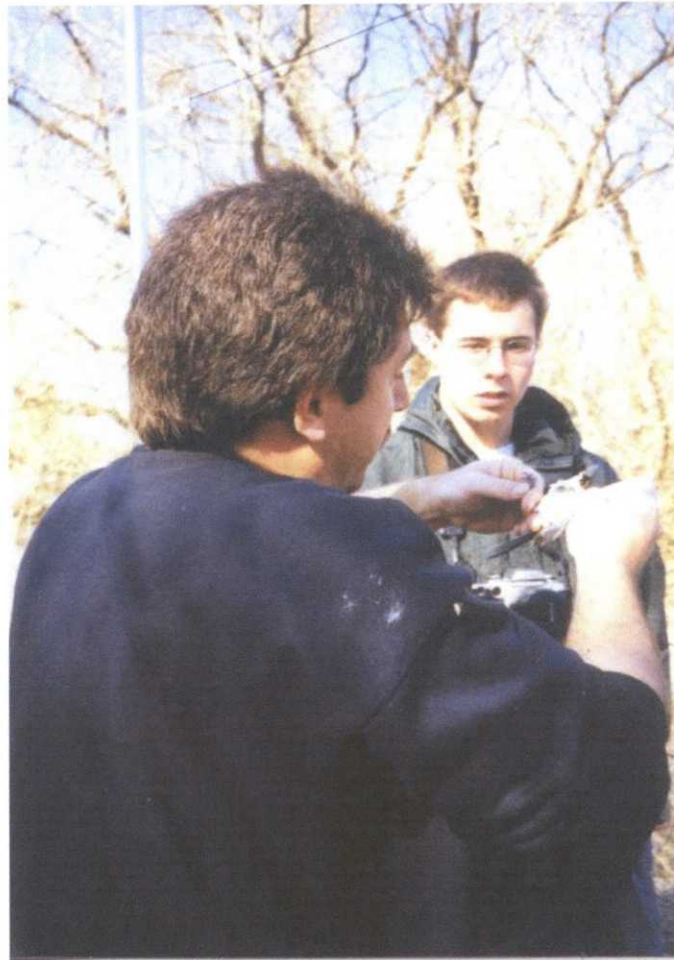
Working in conjunction with the Natural Resources Conservation Department at the Finger Lakes Community College and local birding enthusiasts, refuge staff successfully established and operated a MAPS constant-effort mist-netting station during 1999 at Montezuma. Results of the first year's efforts were very encouraging, with over 350 birds representing 27 different species being captured at the site.

The Institute for Bird Populations (Pt. Reyes Station, CA) initiated the Monitoring Avian Productivity and Survivorship program as a cooperative effort among North American bird banders to establish a continent-wide network of constant-effort mist-netting stations to capture and band landbirds during the breeding season. The major objective of the MAPS program is to contribute to the avian population monitoring system for North American songbird species by providing data necessary to estimate adult population size, post-fledging survivorship, adult productivity, and recruitment into the adult population. The MAPS program uses a standardized protocol to capture birds and record physical data, including species, age, sex, molt, feather wear, body fat content, etc. Ten 12-meter mist nets are set on each of the seven banding dates established within the 100-day "breeding window". Results from 1999's banding season are summarized below.



**Table G-4. Montezuma MAPS Station Results - 1999**

<b>Species Captured</b>	<b>Number Banded</b>	<b>Released Unbanded</b>	<b>Number Recaptured</b>
Downy Woodpecker	3	0	0
Ruby-throated Hummingbird	0	11	0
Willow Flycatcher	4	1	0
Least Flycatcher	2	0	0
Empidonax sp. Flycatcher	0	4	0
Brown-headed Cowbird	4	2	0
Red-winged Blackbird	3	0	0
House Finch	6	0	0
American Goldfinch	13	1	2
Chipping Sparrow	6	0	3
Song Sparrow	42	3	22
Swamp Sparrow	1	0	0
Northern Cardinal	9	0	2
Rose-breasted Grosbeak	2	0	0
Indigo Bunting	1	0	0
Barn Swallow	10	0	0
Cedar Waxwing	4	0	0
Red-eyed Vireo	1	0	0
Yellow Warbler	49	2	12
Cerulean Warbler	1	0	0
Northern Waterthrush	1	0	0
Common Yellowthroat	18	0	11
American Redstart	2	4	0
Gray Catbird	37	1	10
House Wren	13	3	6
Black-capped Chickadee	10	1	1
Wood Thrush	1	0	0
American Robin	16	0	3
<b>27 Total Species</b>	<b>259</b>	<b>33</b>	<b>72</b>



John VanNiel (Finger Lakes Community College Professor and Master Bander at Montezuma's MAPS Station) carefully removes a tufted titmouse from one of the mist nets. (99-13; MKG)



A brightly-colored cedar waxwing. Just one of over 350 songbirds captured during the inaugural year of Montezuma's MAPS Banding Station. (99-14; MLT)

### Christmas Bird Count

The 1999 Montezuma Christmas Bird Count was conducted by members of the Onondaga Audubon Club on January 1, 2000. A total of 66,983 individual birds representing 71 species were recorded (see Table G-5). After two years of high winds and deep snow, this year's conditions were more moderate and the totals certainly reflect that. The 71 species recorded was only one off the high mark set in 1995 and the total of 66,983 individuals observed was also second to only 1995 (the year of 87,000 starlings!). Some of the more impressive or unusual observations during this year's count included: over 10,000 American crows (the highest number by far ever recorded on the count), a record high number of 1793 snow geese, a single Iceland gull, and one short-eared owl.

**Table G-5. Montezuma Christmas Bird Count - January 1, 2000.**

<b>Species Name</b>	<b>Number</b>	<b>Species Name</b>	<b>Number</b>
Great Blue Heron	22	Northern Flicker	20
Snow Goose	1793	Pileated Woodpecker	6
Canada Goose	32228	Northern Shrike	1
Mute Swan	7	Blue Jay	52
Tundra Swan	14	American Crow	10902
Gadwall	5	Horned Lark	336
American Black Duck	1308	Black-capped Chickadee	332
Mallard	12732	Tufted Titmouse	20
Northern Shoveler	1	Red-breasted Nuthatch	1
Northern Pintail	20	White-breasted Nuthatch	46
Green-winged Teal	100	Brown Creeper	7
Greater Scaup	24	Golden-crowned Kinglet	4
Lesser Scaup	1	Eastern Bluebird	42
Scaup Species	300	American Robin	278
Common Goldeneye	5	Northern Mockingbird	1
Hooded Merganser	16	European Starling	2343
Common Merganser	33	Cedar Waxwing	52
Bald Eagle	4	Yellow-rumped Warbler	6
Northern Harrier	18	Common Yellowthroat	4
Sharp-shinned Hawk	4	American Tree Sparrow	139
Cooper's Hawk	2	Song Sparrow	12
Red-tailed Hawk	85	Swamp Sparrow	3
Rough-legged Hawk	14	White-throated Sparrow	1
American Kestrel	11	Dark-eyed Junco	25
Ruffed Grouse	1	Lapland Longspur	1
Ring-billed Gull	895	Snow Bunting	3
Herring Gull	705	Northern Cardinal	80
Iceland Gull	1	Red-winged Blackbird	3
Great Black-backed Gull	105	Common Grackle	40
Rock Dove	569	Brown-headed Cowbird	223
Mourning Dove	264	House Finch	142
Eastern Screech Owl	4	Common Redpoll	104
Great Horned Owl	2	Pine Siskin	1
Short-eared Owl	1	American Goldfinch	175
Red-bellied Woodpecker	27	House Sparrow	194
Downy Woodpecker	51		
Hairy Woodpecker	12		

**71 Species - 66,983 Total Individuals Recorded**

### Eastern Bluebird Nest Box Program

Efforts to assist in the recovery of the eastern bluebird were first rewarded in 1981 when a single pair of birds used one of the refuge's bluebird nesting boxes to produce five young. Since 1981, 140 bluebirds have successfully fledged from nest boxes on the refuge.

Refuge volunteer Larue St. Clair assumed responsibility for monitoring the refuge's fourteen bluebird nesting boxes throughout the 1999 breeding season. Two successful nesting attempts (one pair of adult bluebirds nesting twice) resulted in seven young bluebirds fledging from the boxes. All seven fledglings were banded by Biologist Gingrich. Other species using the remaining boxes included tree swallows (by far the most common nester) and house wrens.

## 8. Game Mammals

### White-tailed Deer

The 1999 firearms hunt was the twelfth refuge gun hunt in the last 30 years. Archery hunting, permitted for most of that period, was only marginally successful in maintaining deer populations within acceptable limits. The firearms hunt was initiated to implement a more aggressive and pro-active program of managing the refuge's deer population.

The objective of the hunt is to protect forested and scrub/shrub habitats from overbrowsing by controlling the size of the refuge's pre-winter deer population. During severe winters the refuge serves as a yarding area for deer from a distance of eight to ten miles. The refuge's 2,000-acre tract of moist hardwood bottomlands and cattail swales provide escape cover not only for refuge deer, but also for deer from adjacent, non-sheltered farmlands. The deer seek out the thermal protection afforded by the bottomland hardwoods and cattail marshes.

The large over-wintering deer populations of the early and mid-1980s had a negative impact upon the overall vigor and diversity of many refuge plant communities. Several areas of the refuge's treed and/or shrubbed acreage were heavily browsed. The refuge's deer hunts were implemented to reduce the deer population, and thus lessen the damage to the vulnerable plant communities. The long, hard winters of the early 1990s and an increase in the number of deer harvested (resulting from implementation of the firearms hunt) appear to have reduced white-tailed deer numbers on and around the refuge. This trend is supported by several years of data collected from deer harvested on the refuge since implementation of the firearms hunt.

A total of 69 white-tailed deer were harvested by hunters during the 1999 refuge season (November 1 through December 18). Archery hunting accounted for 31 deer, with shotgun hunters removing an additional 38. Thirty-six (36) of the deer were examined by refuge personnel at the hunter check station. Information collected on each deer included sex, age, antler beam diameter, total number of antler points, and fawn weight. Table G-6 summarizes the sex and age breakdown of the 36 deer examined at the check station. Table G-7 summarizes the physical condition data gathered on the 18 adult male deer and 9 fawns (both male and female) examined at the Check Station.

**Table G-6. Summary of Check Station Data For the White-tailed Deer Hunt on the Montezuma National Wildlife Refuge, 1999.**

Sex of Deer	Age Class					
	Fawn	1½ Years	2½ Years	3½ Years	4½ Years+	Number Examined
Male	7	14	4	0	0	25
Female	2	4	4	1	0	11
Totals	9	18	8	1	0	36

**Table G-7. Physical Condition Data and Fawn Weights for White-tailed Deer Harvested on the Montezuma National Wildlife Refuge, 1999.**

Age Class	Average Beam Diameter (mm) <sup>1</sup>	Average Number of Antler Points <sup>2</sup>	Average Fawn Weight (lbs)
Fawn (female) (n = 2)	—	—	62.5
Fawn (male) (n = 7)	—	—	66.4
1½ Years (n = 14)	22.64	4.57	—
2½ Years (n = 4)	28.75	8.00	—

<sup>1</sup> The diameter of the antler beam was measured with calipers one inch above the base of the antler burr.

<sup>2</sup> All antler points longer than one inch were counted.



Figures G-2 and G-3 summarize information collected from deer examined at the hunter check station from 1986 through 1999. Although sample sizes are small, both yearling antler beam diameters and fawn weights have increased steadily since 1986. These two measurements of herd health indicate that current hunts appear to be succeeding in reducing deer numbers to levels adequate to insure the overall vigor of the refuge's deer population, and consequently, provide protection of habitats for other wildlife species.

# Montezuma National Wildlife Refuge

## White-tailed Deer Check Station Information

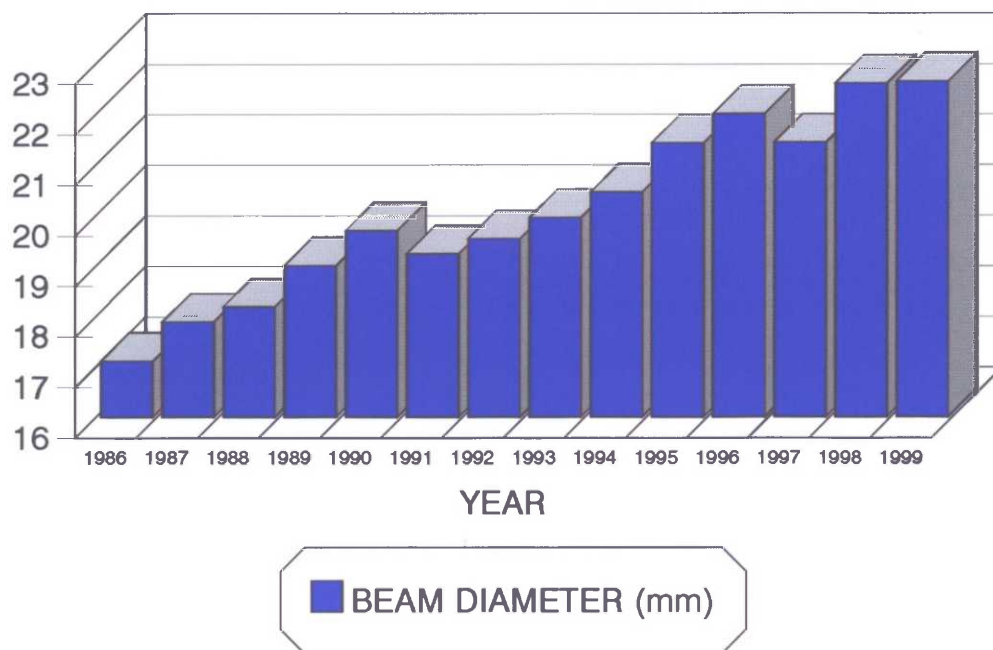


Figure G-2. Mean Yearling Beam Diameters of White-tailed Deer Harvested on Montezuma N.W.R. 1986-99

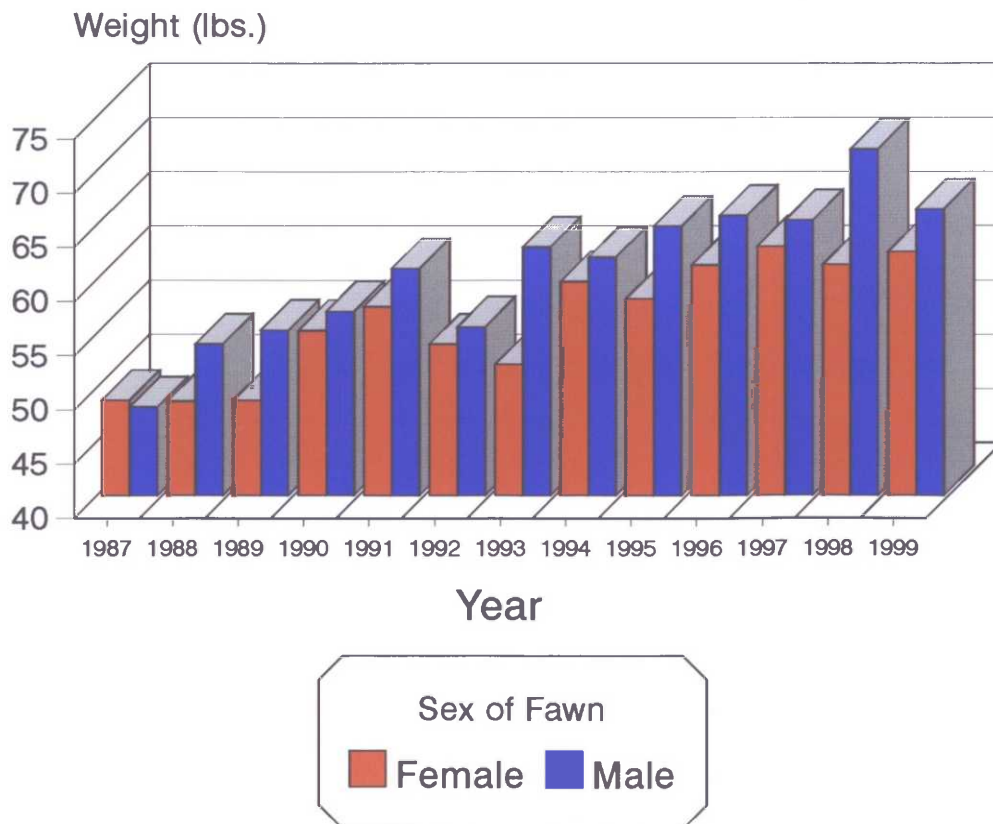


Figure G-3. Average Dressed Fawn Weights of White-tailed Deer Harvested on Montezuma N.W.R. 1987-99

### Raccoon

The raccoon has historically been very abundant in the uplands and throughout the cattail marshes of Montezuma Refuge. We know they prey heavily on waterfowl nests, and have always wished for a much-reduced population. Commercial trapping has been permitted, but the annual take has been very small in recent years, rarely exceeding 50 animals. The low level of trapper harvest in recent years has been insignificant in terms of reducing the raccoon population on the refuge.

### Muskrat

Portions of the emergent cattail marsh, which historically were some of the most productive muskrat habitat on Montezuma, have been significantly degraded in recent years by encroachment of purple loosestrife and phragmites. Muskrat populations have also been reduced by the necessity of using winter drawdowns to remove carp from most refuge impoundments. These factors have combined to reduce the muskrat harvest by refuge trappers from historical highs of over 10,000 animals annually to under 1000. During 1999 the refuge muskrat population appeared higher than in recent years, with numbers of observable muskrat houses significantly higher on Tschache Pool .

### Other Mammals

Beaver were seen throughout the year and appear to be flourishing in many areas of the refuge. Although they occasionally attempt to plug the water control structures in Unit 17 and at the north end of the Cayuga Lake Connector Ditch, they have not yet created significant problems.

No changes were noted in cottontail rabbit, grey squirrel, Virginia opossum, woodchuck, and red fox populations. No noticeable trends were observed which indicated anything but stable populations for each of these species. The number of eastern coyote sightings on and in the immediate area of the refuge continues to increase. The animals were frequently reported in the vicinity of Tschache and May's Point Pools.

### 10. Other Resident Wildlife

The wild turkey population has been increasing in central New York in recent years. Generally good nesting weather during the critical May - July period over the last several years has been instrumental in the increase in wild turkey numbers. Large flocks of over thirty birds were frequently observed throughout the fall and winter months.

Refer to Section F-2 regarding effects of the summer drought and the Main Pool drawdown on turtles.

#### 11. Fisheries Resource

Montezuma offers only limited sport fishing opportunities. In order to minimize disturbance to migratory birds, fishing is confined to non-impoundment waters immediately adjacent to the refuge boundary on the New York State Barge Canal. In the spring of the year there is a small run of brown bullhead and carp, and a popular fishing opportunity exists where the fish congregate on the canal-side outfall of the Seneca Spillway of the Main Pool.

#### 16. Marking and Banding

Due to the summer-long drawdown of the Main Pool, which left our waterfowl banding site literally high and dry, no pre-season waterfowl banding occurred at Montezuma during 1999.

1999 was the first season for banding of songbirds at Montezuma's constant-effort mist-netting or MAPS Station. Over the course of seven banding days during the summer, over 350 individual birds representing 27 species were captured at the MAPS site. A complete report of the banding effort is summarized in Section G-7.

On January 21 and 22, Montezuma staff members assisted New York State Department of Environmental Conservation Region 7 Biologists with a special Canada goose banding project on Cayuga Lake. Over 100 Canada geese and 125 mallards and American black ducks were captured, leg banded, and released over the course of the two days. In addition, five adult female Canada geese were outfitted with satellite transmitters as part of the ongoing Finger Lakes Canada Goose Study.

During late July and early August, refuge staff members and volunteers assisted Michael Haramis (Patuxent Wildlife Research Center) with the banding of rails (both Virginia and sora) on Tschache Pool. The rails were captured and banded as part of Mike's ongoing research work with rails that migrate south from Montezuma to the Patuxent River Marsh in Maryland.

## H. PUBLIC USE

### 1. General

The public use facilities and programs at Montezuma include the 3.5-mile Wildlife Drive, 2-mile Esker Brook Trail, Visitor Center, observation towers and platforms, fishing access sites, hunting programs, trapping program, educational programs and materials, guided tours, and special programs. Figures in Table H-1 and Table H-2 provide visitation profiles for 1995 -1999.

Table H-1  
Monthly Visitation

	1995	1996	1997	1998	1999
January	200	300	400	900	2,000
February	100	330	600	2,400	2,300
March	13,000	4,500	10,000	8,300	7,100
April	19,800	19,000	16,800	14,600	21,000
May	16,600	19,000	15,300	19,700	19,100
June	12,100	12,000	13,400	17,400	16,700
July	11,700	13,000	12,100	15,000	10,000
August	15,300	11,000	20,000	15,000	14,000
September	18,100	11,500	13,200	13,900	16,000
October	18,900	18,500	19,100	19,600	14,700
November	6,000	3,000	5,400	6,700	7,400
December	2,000	3,000	3,000	6,000	3,000
<b>TOTALS</b>	<b>133,800</b>	<b>130,130</b>	<b>129,300</b>	<b>139,500</b>	<b>133,300</b>

Public use continued to play an important role in the management of the refuge. A number of events, both planned and unplanned, affected visitor use of the Wildlife Drive during 1999. The pipes under the road at the Seneca Spillway collapsed on March 2, causing the Drive to be closed for several days. From

May to August, the Main Pool was drained for a summer drawdown, thereby limiting opportunities for wildlife observation along the Wildlife Drive. Once the pool was refilled, the birds flocked to the Main Pool and visitors flocked to the Wildlife Drive.

Table H-2  
Refuge Visitation 1994-1999

	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>
Wildlife Drive	76,900	73,000	73,500	77,900	75,000
Towers/Decks	17,000	18,200	18,700	20,100	13,300
Trails	10,800	11,200	10,400	13,500	17,000
Guided Walks/Tours	750	600	500	700	400
Photography	400	400	200	200	200
<b>Wildlife Observation Subtotals</b>	<b>105,850</b>	<b>103,700</b>	<b>103,300</b>	<b>112,400</b>	<b>105,900</b>
Visitor Center (staffed)	17,000	15,000	17,000	17,400	18,700
Special Programs	900	730	1,000	1,100	1,100
Office - Informational Visits	250	300	300	200	200
Students	3,700	2,900	2,600	3,000	2,900
Teachers	350	350	300	400	400
<b>E.E. (on-site) Subtotals</b>	<b>4,050</b>	<b>3,250</b>	<b>2,900</b>	<b>3,400</b>	<b>3,300</b>
Waterfowl Hunts	200	200	325	400	500
Archery Hunts	550	450	425	400	500
Firearms Hunts	800	700	650	900	700
<b>Hunts Subtotal</b>	<b>1,550</b>	<b>1,350</b>	<b>1,400</b>	<b>1,700</b>	<b>1,700</b>
Trapping	100	100	400	400	100
Fishing	<u>4,100</u>	<u>5,700</u>	<u>3,000</u>	<u>2,900</u>	<u>2,300</u>
<b>YEARLY TOTALS</b>	<b>133,800</b>	<b>130,130</b>	<b>129,300</b>	<b>139,500</b>	<b>133,300</b>

## 2. Outdoor Classrooms - Students

Environmental education was, again, a major component of the refuge's public use program. Topics for school group presentations included: endangered species, migration, purpose and management of Montezuma NWR, careers with the USFWS, wetland values, animal adaptations, and habitat comparisons. A total of 7,800 students and teachers used the refuge's educational services and facilities during 1999. A summary of the refuge's student environmental education effort is provided in table H-3.



Table H-3  
Environmental Education - Students

	Onsite	Offsite	Totals
Elementary School Students	1,200	1,000	2,200
Middle School Students	600	2,000	2,600
High School Students	300	750	1,050
College Students	800	50	850
<b>TOTALS</b>	<b>2,900</b>	<b>3,800</b>	<b>6,700</b>

Colleges and Universities also utilized the resources of the refuge for educational purposes. Colleges and Universities traveling to Montezuma during 1999 included:

Hobart-William Smith College  
 Rochester Institute of Technology  
 SUNY-Morrisville  
 SUNY-Oswego  
 SUNY-Cortland  
 SUNY-Cobleskill  
 SUNY-Binghamton  
 SUNY-Geneseo  
 Ulster Community College  
 Tompkins-Cortland Community College  
 SUNY-College of Environmental Science  
 & Forestry at Syracuse

Paul Smith College  
 Binghamton University  
 Finger Lakes Community College  
 Elmira College  
 Ithaca College  
 St. John Fisher  
 Cayuga Community College  
 University of Rochester  
 Wells College  
 Cornell University

The refuge assisted with the environmental education efforts of other agencies and schools. These off-site programs are summarized in Table H-4.

**Table H-4**  
**Off-site Environmental Education Presentations**

<b>Date and (Time in hours)</b>	<b>Event</b>	<b># of Students</b>	<b>Grade</b>	<b>Location</b>	<b>Topic</b>
3/15/99 (.5)	Class Program	30	7	Ithaca Middle School Ithaca, NY	Exotic Species
4/1/99 (1.5)	Class Program	40	College	SUNY - ESF Syracuse, NY	Interpretation on NWRs
4/13/99 (1)	Class Program	160	2	Skoι Yase Elementary Waterloo, NY	Endanger Species
4/28/99 (4)	Central New York Envirothon	175	9-12	Beaver Lakes Nat. Center. Syracuse, NY	Wildlife Exam
4/29/99 (4)	Central New York Envirothon	175	9-12	Beaver Lakes Nat. Center. Syracuse, NY	Wildlife Exam
5/11/99 (.25)	Reading Week	20	2	Frank Knight Elementary Seneca Falls, NY	Reading
5/13/99 (3)	Mynderse Academy's Adopt- A-Watershed Project	100	10	Mynderse Academy Seneca Falls, NY	Stream bank stabilization project
5/26/99 (4)	NY State Envirothon	250	9-12	SUNY Morrisville Morrisville, NY	Wildfire Exam
5/27/99 (.75)	Class Program	50	8	West Genesee High School Camillus, NY	Careers
6/2/99 (3)	Seneca County Environmental Field Day	900	6	Sampson State Park Romulus, NY	Wetland Habitats & Mammals of Central NY
6/19/99 (2)	Casey Park Environmental Field Day	400	1-5	Casey Park Elementary Auburn, NY	Endangered Species
7-27-99 (.5)	Summer Science Program	55	3	Genesee Elementary Auburn, NY	Endangered Species
9/22/99 (3)	Cayuga County Conservation Day	400	6	Emerson Park Auburn, NY	Wetland Habitat
10/5/99 10/6/99 (6)	Onondaga County Environmental Field Days	720	6	Green Lakes State Park Syracuse, NY	Endangered Species

Date and (Time in hours)	Event	# of Students	Grade	Location	Topic
10/15/99 (1)	Class Program	200	5	Soule Road Elementary Liverpool, NY	Endangered Species
11/3/99 (1.5)	Class Program	40	College	SUNY ESF Syracuse, NY	Public Use on NWRS
11/5/99 (.75)	Class Program	30	8	Camillus Middle School Camillus, NY	Careers
11/8/99 (1)	Environmental Awareness Week	100	1-2	Frank Knight Elementary Seneca Falls, NY	Habitats
11/16/99 (1)	Class Program	50	2	Cayuga Elementary Cayuga, NY	Migration



Students testing their wildlife knowledge at the Central New York Envirothon. (99-15; MKG)

### 3. Outdoor Classroom - Teachers

Approximately 400 educators brought their students to the refuge in 1999. From the refuge, teachers receive lesson plans, site suggestions, and technical assistance that complement the units they are mandated to teach by the New York State Education Department.

ORP Gingrich provided technical assistance to the Frank Knight Elementary School for their Annual Environmental Awareness Week (November 8 - 12). Gingrich prepared information sheets, lesson plans, films, and videos on the wildlife habitats of meadows, forests and wetlands, and display cases of birds.

### 4. Interpretive Foot Trails

Esker Brook Nature Trail is the refuge's only foot trail. Approximately 17,000 people walked the 2-mile trail during 1999. Recreation Aide Jessica Smith and Volunteer Mike Morgan cleared encroaching brush from approximately one mile of the Trail.

Deteriorated interpretive signs and posts were removed. Dennis Mahoney, an area college student, prepared an interpretive trail guide in 1999. The guide has been sent off to the Regional Office for review.

Esker Brook Trail was also used for guided bird and wildflower walks throughout the year.

To reduce potential conflicts, the trail was closed to non-hunting visitors during the refuge's archery and firearms deer hunts (November 1 - December 18).

### 5. Interpretive Tour Routes

The Wildlife Drive continued to be the most popular attraction on the refuge. More than 75,000 people traveled the 3.5-mile route in 1999. The Wildlife Drive provides excellent opportunities for viewing and photographing wildlife from one's vehicle.

The Wildlife Drive brochure corresponds to numbered posts along the Drive, and provides self-guided interpretive information about ecological concepts and management of refuge habitats.

A summer drawdown was conducted in 1999. What once was an open pool of water became a field of greens in 1999. In an effort to educate refuge visitors about the goals of the summer drawdown, interpretive signs were made and installed at the Visitor Center and along the Wildlife Drive, news releases were issued, and a drawdown handout was created.



Homemade sign explaining the summer drawdown. (99-16; MKG)





These visitors wanted an up-close look at the Main Pool drawdown. Apparently distracted, they launched their truck from the Wildlife Drive and covered approximately 25 feet before successfully "sticking" their landing! (99-17; MJN)

Repair projects forced the closure of sections of the Drive during the summer of 1999. Inclement weather and poor road conditions resulted in the closure of the Drive to vehicles in January, and a few days in February.

#### 6. Interpretive Exhibits/Demonstrations

Montezuma Wetlands Complex Project Coordinator Sheila Sleggs, and Paul Hess, Biological Technician with the New York State Department of Environmental Conservation, staffed a Montezuma Wetlands Complex display at the Lake Ontario Bird Festival on May 1-2. The event was held in Mexico, New York and drew 2,000 people.

A staffed display was provided for the Burnett Park Zoo's International Migratory Bird Day Celebration (May 8). More than 200 people from the Syracuse area enjoyed the celebration.

Refuge staff helped celebrate Savannah, New York's "Weekend of the Endangered" on June 5-6, together with the New York State Department of



Environmental Conservation and Ducks Unlimited. From the refuge, Tracy and Marva Gingrich, Maeve Taylor, Jessica Smith, and Mike Morgan assisted with providing guided one-mile tours of Crusoe Creek for approximately 60 people.

Refuge staff and volunteers assisted the New York State Department of Environmental Conservation with the staffing of a display at the Empire Farm Days on August 10, 11, and 12. The exhibit featured information on the Montezuma Wetlands Complex. The Farm Days drew 100,000 people to Seneca Falls.

#### 7. Other Interpretive Programs

In an effort to increase public awareness and interest in wildlife and refuge issues, the refuge used guided bird tours, programs for the general public, and program presentations to groups both on and off the refuge.

The refuge provided 16 guided tours to the public this year. The refuge was fortunate enough to have refuge volunteers, several area bird clubs, and Audubon Chapters to lead these tours again this year. A total of 400 people participated in the tours that focused on birds, wetland ecology, wildflowers, and refuge management.

On Wednesday, March 31, 1999, Paul Hess, Biological Technician with the New York State Department of Environmental Conservation presented a program on Arctic Nesting Geese in the Refuge Visitor Center. Thirty people attended the evening program.

Refuge Volunteer John VanNiel began operating a MAPS (Monitoring Avian Productivity and Survivorship) Station for the refuge. John trained 50 volunteers to secure enough assistance for each day of operation. Volunteers were used to maintain the net sites, set up and take down of nets, removal of netted birds, data recording, data gathering, and inputting of data into the computer program. Further information on the MAPS project can be found in Section G-7.



Refuge Volunteer John VanNiel explains the MAPS program to Volunteers. (99-18; JS)

SCEP Student Maeve Taylor presented a program on the wildlife and culture of Kenya on May 19. Twenty people enjoyed the slide program.

National Wildlife Refuge Week was celebrated from October 10th through the 16th at Montezuma. Highlights of the week included:

On October 10, eight kids participated in the refuge's Youth Waterfowl Hunting Day. See section H-8 for further details.

A guided bird tour was led by Refuge Volunteer Bill Grow on Saturday, October 16. Thirty people participated in the tour on Sunday, and forty people attended the Monday tour.

Educational programs were provided to 370 students and 30 teachers during the week.

The fourth annual National Wildlife Refuge Week Youth Art Contest was another great success, with 180 entries. All participants received

posters, pencils and folders, while the top-placing entries also received books, Montezuma Wetlands Complex tee shirts and hats, or bird feeders.

In recent years, requests for programs from bus tour groups has greatly increased. In 1999, 12 tour bus groups with more than 600 participants received refuge programs.

Six days were set aside in 1999 as Scout Days. The refuge receives a large number of requests for programs for scout groups. Usually these groups have 5 to 10 kids and a few adults. The idea with the scout days was to consolidate the numerous requests into 6 days and schedule several groups for each program. Programs could be scheduled every hour from 9AM to 3PM. In 1999, the refuge presented a total of 12 programs to a total of 30 individual scout groups. A total of 570 scouts and 170 adults participated in the six scout days. This method proved to be very successful, and will continue in 2000.

The refuge provided offsite programs to 8,400 people in 1999. More than 3,900 members of area Lions Clubs, Audubon Chapters, Bird Clubs, Senior Citizen Organizations, Garden Clubs, and Sportsmen's Clubs enjoyed these programs. School visits resulted in participation by 3,800 students and 700 teachers. Further information on offsite school visits is found in Tables H-3 and H-4.

## 8. Hunting

Hunting opportunities provided at the refuge include waterfowl and white-tailed deer (both archery and firearms). Over the years the refuge hunts have changed very little, and all the changes have simplified and reduced the costs of the hunts.

### **Waterfowl Hunting:**

Maintenance Mechanic Steve Flanders offered two Waterfowl Identification Classes (required to hunt waterfowl on the refuge) prior to the season opener. The classes were attended by 50 people.

Refuge personnel worked cooperatively with personnel from the New York State Department of Environmental Conservation to provide a joint Youth Waterfowl Hunt on October 10. The hunt, offered to 16 youths aged 12-15, provided the opportunity to hunt waterfowl before the regular season. A total of 8 young waterfowlers participated and harvested 12 ducks (5 green-winged teal, 2 gadwall, 2 American wigeon, 1 wood duck, 1 blue-winged teal and 1 Northern pintail).

During the refuge season, waterfowlers were permitted to hunt Tschache Pool on Tuesdays, Thursdays, and Saturdays. The 1999 season ran from October 16 through November 20. The 17-day season drew 156 individual hunters, who made 471 hunt visits and harvested 1,462 ducks. The hunt averaged 3.1 birds per hunt visit, the highest in the history of the hunt. Waterfowlers were charged a \$10.00 per reservation hunt fee, and \$2,560.00 were collected during the 1999 waterfowl season.

Further information on the refuge waterfowl hunt is provided in Table H-5, Table H-6, and Table H-7.

**Table H-5**  
**Eleven-Year Comparison of the Refuge Waterfowl Hunt Programs**

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
# of Days	10	10	10	13	10	13	6	14	14	17	17
# of Individual Hunters	152	N/A	146	135	119	127	97	114	151	173	156
# of Hunt Visits	315	293	267	263	208	247	169	236	324	436	471
% of Reservations Used	N/A	N/A	N/A	62%	65%	68%	83%	79%	67%	76%	88%
# of Birds	515	569	406	341	298	250	423	525	640	880	1,462
$\bar{x}$ # of Birds Per Hunt Visit	1.6	1.94	1.52	1.29	1.43	1.01	2.50	2.22	1.98	2.02	3.10
# of Cripples	N/A	N/A	N/A	73	54	68	94	134	162	167	239
Cost of Hunt	\$4,701.00	\$2,683.12	N/A	\$1,935.14	\$1,954.50	\$2,870.39	\$1,946.18	\$2,426.20	\$2,487.77	\$1,869.06	\$1,982.33
Cost Per Hunter	\$ 30.92	N/A	N/A	\$ 14.33	\$ 16.42	\$ 22.60	\$ 20.06	\$ 22.40	\$ 16.48	\$ 10.80	\$ 12.70
Cost Per Hunt Visit	\$ 14.92	\$ 9.15	N/A	\$ 7.36	\$ 9.40	\$ 11.62	\$ 11.52	\$ 10.82	\$ 7.68	\$ 4.27	\$ 4.20
Cost Per Reservation	N/A	N/A	N/A	\$ 11.52	\$ 15.03	\$ 19.39	\$ 19.46	\$ 18.78	\$ 13.30	\$ 7.47	\$ 7.39
\$ Collected	NO FEE	\$1,570.00	\$1,475.00	\$1,495.00	\$1,225.00	\$1,415.00	\$ 965.00	\$1,280.00	\$1,755.00	\$2,375.00	\$2,560.00

N/A = Not Available

Table H-6  
Daily Summary of 1999 Waterfowl Hunt

Date	Reservations Taken	Reservations Used	# of Hunters	Birds Taken	$\bar{X}$ # of Birds Per Hunter	$\bar{X}$ # of Shots Per Hunter	$\bar{X}$ # of Shots Per Bird	# Hit - not Retrieved
10/10/99 YH	10/18 = 56%	8/18 = 44%	8	12	12/8 = 1.50	100/8 = 12.5	100/12 = 8.33	0
10/16/99	18/18 = 100%	18/18 = 100%	34	186	186/34 = 5.47	491/34 = 14.44	491/186 = 2.64	23
10/19/99	18/18 = 100%	17/18 = 94%	31	120	120/31 = 3.87	352/31 = 11.35	352/120 = 2.93	18
10/21/99	18/18 = 100%	17/18 = 94%	29	66	66/29 = 2.28	258/29 = 8.90	258/66 = 3.91	18
10/23/99	18/18 = 100%	18/18 = 100%	34	104	104/34 = 3.06	305/34 = 8.97	305/104 = 2.93	12
10/26/99	18/18 = 100%	16/18 = 89%	29	106	106/29 = 3.66	342/29 = 11.79	342/106 = 3.23	19
10/28/99	18/18 = 100%	18/18 = 100%	31	107	107/31 = 3.45	338/31 = 10.90	338/107 = 3.16	23
10/30/99	18/18 = 100%	18/18 = 100%	29	71	71/29 = 2.45	273/29 = 9.41	273/71 = 3.84	11
11/2/99	14/18 = 78%	15/18 = 83%	29	76	76/29 = 2.62	280/29 = 9.66	280/76 = 3.68	15
11/4/99	18/18 = 100%	16/18 = 89%	29	79	79/29 = 2.72	235/29 = 8.10	235/79 = 2.98	12
11/6/99	18/18 = 100%	16/18 = 89%	29	79	79/29 = 2.72	260/29 = 8.97	260/79 = 3.29	11
11/9/99	18/18 = 100%	16/18 = 89%	27	91	91/27 = 3.37	313/27 = 11.59	313/91 = 3.44	12
11/11/99	18/18 = 100%	16/18 = 89%	31	75	75/31 = 2.42	253/31 = 8.16	253/75 = 3.37	11
11/13/99	18/18 = 100%	17/18 = 94%	26	79	79/26 = 3.04	222/26 = 8.54	222/79 = 2.81	17
11/16/99	15/18 = 83%	12/18 = 67%	21	55	55/21 = 2.62	205/21 = 9.76	205/55 = 3.73	13
11/18/99	18/18 = 100%	13/18 = 72%	22	68	68/22 = 3.09	241/22 = 10.95	241/68 = 3.54	12
11/20/99	18/18 = 100%	17/18 = 94%	32	88	88/32 = 2.75	265/32 = 8.28	265/88 = 3.01	12
<b>TOTAL</b>	<b>291/306 = 95%</b>	<b>268/306 = 88%</b>	<b>471</b>	<b>1,462</b>	<b>1,462/471 = 3.10</b>	<b>4,733/471 = 10.05</b>	<b>4,733/1,462 = 3.24</b>	<b>239</b>

YH = Youth Hunt



Table H-7  
Montezuma NWR Waterfowl Hunt Harvests

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
<b>Mallard</b>	131	198	176	195	155	185	191	149	117	274	264	277	379	706
<b>Green-winged Teal</b>	76	82	65	81	185	80	32	25	41	60	127	223	291	346
<b>American Black Duck</b>	44	55	49	55	47	44	39	39	16	52	17	35	27	119
<b>Northern Pintail</b>	2	8	2	13	11	8	3	6	4	8	9	22	24	57
<b>Mergansers</b>	24 C 9 H	26**	22 C 3 H	18 C 8 H	37 C 0 H	8 C 0 H	17 C 8 H	25 C 14 H	21 C 15 H	0 C 0 H	0 C 2 H	1 C 3 H	8C 3H	8C 3H
<b>Gadwall</b>	7	10	3	7	4	1	11	7	2	2	20	19	76	64
<b>Blue-winged Teal</b>	1	0	2	0	6	2	0	0	1	0	5	6	10	17
<b>Northern Shoveler</b>	1	1	0	9	7	1	0	0	0	2	34	20	16	13
<b>American Wigeon</b>	4	7	0	7	0	1	3	2	4	11	27	7	11	77
<b>Wood Duck</b>	8	10	3	6	4	0	6	1	3	13	12	21	30	19
<b>OTHER</b>	0	0	1	5	3	0	1	3	1	1	7	6	5	5
<b>TOTAL DUCKS</b>	307	397	326	404	459	330	311	271	225	423	524	640	880	1,434
<b>Canada Goose</b>	177	146	98	111	110	76	29	27	25	0*	0*	0*	0*	28
<b>TOTAL HARVEST</b>	484	543	424	515	569	406	340	298	250	423	524	640	880	1,462

\*No Season

\*\* Breakdown not available

C = Common

H = Hooded

### White-tailed Deer Hunting:

The refuge archery season (November 1 - 20 and December 15 - 18) attracted a total of 277 archers who made 530 hunt visits and harvested 31 deer. While there was a slight increase in participation, the number of deer harvested by Archery hunters was surprisingly high. Last year's success rate of 1.6% was nearly tripled in 1999 with a success rate of 5.8% . A twelve year summary of the refuge's archery hunts is provided in table H-8.

The 1999 firearms deer season attracted 333 hunters who made 726 hunt visits. A total of 38 deer were harvested during the refuge's 1999 firearms deer season (November 22 - December 4 and December 11 - 14). A twelve-year firearms hunt summary is provided in H-9.

See section G-8 for more detail on the deer harvest.

Table H - 8

## 12 Year Summary of Archery Deer Hunt

	# of days	# of Hunters	# of Hunt Visits	# of Deer	Success rate (Hunt Visit)	$\bar{x}$ # of Hunters per Day	Cost of the Hunt	Cost per Hunt Visit
1988	37	1,380	2,300	73	3.2%	62	N/A	N/A
1989	39	970	1,618	40	2.5%	46	\$3,453.00	\$ 2.13
1990	19	N/A	1,188	38	3.2%	63	\$5,382.00	\$ 4.53
1991	18	654	1,198	32	2.7%	67	N/A	N/A
1992	16	563	963	24	2.5%	60	\$1,759.00	\$ 1.83
1993	22	480	852	28	3.3%	39	\$2,573.37	\$ 3.02
1994	21	427	815	15	1.8%	39	\$2,476.30	\$ 3.03
1995	15	376	538	16	3.0%	36	\$1,678.37	\$ 3.12
1996	18	305	452	9	1.9%	25	\$1,365.32	\$ 3.02
1997	17	286	436	14	3.2%	26	\$1,658.82	\$ 3.80
1998	16	207	364	6	1.6%	23	\$ 777.39	\$ 2.14
1999	22	277	530	31	5.8%	24	\$1,138.70	\$ 2.15

**Table H - 9**  
**12 Year Summary of Refuge Firearms Deer Hunt**

	# of days	# of Hunters	# of Hunt Visits	# of Deer Harvested	Success rate (Hunt Visit)	× # of Hunters per Day	Cost of the Hunt	Cost per Hunt Visit
1988	6	349	562	61	10.9%	94	N/A	N/A
1989	14	550	916	111	12.1%	65	\$4,524.00	\$ 4.93
1990	11	N/A	352	45	12.8%	32	\$5,194.78	\$ 14.75
1991	12	284	674	91	13.5%	56	N/A	N/A
1992	12	289	753	100	13.3%	63	\$4,760.10	\$ 6.32
1993	15	261	761	93	12.3%	51	\$5,784.58	\$ 7.60
1994	15	233	663	56	8.4%	44	\$4,889.45	\$ 7.37
1995	14	394	807	58	7.2%	58	\$3,807.03	\$ 4.72
1996	15	310	662	47	7.1%	44	\$2,684.24	\$ 4.05
1997	15	275	634	46	7.3%	42	\$2,126.67	\$ 3.35
1998	15	374	875	46	5.3%	58	\$1,000.13	\$ 1.14
1999	15	333	726	38	5.2%	48	\$2,097.13	\$ 2.89

## 9. Fishing

Although no refuge waters are open to fishing, the refuge maintains two fishing access sites: the Seneca River boat launch, and the May's Point fishing site along the Clyde River. An estimated 2,300 fishing visits were made to the refuge's fishing access sites during 1999.

The May's Point fishing access site continues to concern staff. The undercut bank, underwater tree roots, and steep, muddy bank where people fish creates safety concerns. On April 14, 1999 a gentleman fishing at May's Point slipped on the muddy bank and broke his ankle. The cost of repairs makes the project unfeasible. It seems inevitable that the site will have to be closed down in the future.

## 10. Trapping

For the 1998-99 season, three area trappers successfully bid on and were awarded three of the refuge's seven available trapping units. No bids were received on Trapping Units C, D, E, and G.

A total of \$2,689.00 was collected from sealed bids on the three units. Trapping dates for all units were October 31, 1998 through February 14, 1999 (terrestrial sets for raccoon, fox, striped skunk, weasel, and Virginia opossum); November 15, 1998 through February 14, 1999 (muskrat and mink); and December 19, 1998 through January 3, 1999 (beaver). Final results of the three trappers' efforts are summarized below.

### 1998-1999 Trapping Season

Unit	Permittee	Bid	Muskrat	Raccoon	Beaver	Mink
A	M. Wilkinson	\$788.00	456	1	0	1
B	E. Lawson	\$1701.00	1634	0	0	0
C	No Bid					
D	No Bid					
E	No Bid					
F	D. Rotondo	\$200.00	73	12	6	5
G	No Bid					
<b>Totals</b>		<b>\$2689.00</b>	<b>2163</b>	<b>13</b>	<b>6</b>	<b>6</b>

Other species taken: Virginia opossum - 19, red fox - 2, grey fox - 3.

For the 1999-2000 season, two area trappers successfully bid on and were awarded four of the refuge's seven trapping units. A total of \$1,191.00 was collected from sealed bids on the four units. Trapping began on all refuge units on October 23, 1999 and will continue through February 13, 2000.

## 11. Wildlife Observation

Wildlife observation is the primary reason people visit the refuge. Approximately 80% (105,900 people) of the refuge visitors used facilities or participated in

programs provided for wildlife observation. The refuge scheduled and issued news releases for 16 guided bird tours. Eighteen additional news releases were issued to keep the public updated on events at the refuge (International Migratory Bird Day, migration seasons, bald eagle hatchings, broods, shorebird migrations, Duck Stamp sales, etc...).

The 3rd annual Montezuma Muckrace was held on September 11. This birding competition raises money for projects in the Montezuma Wetlands Complex. Nineteen teams competed in this year's contest. Teams hailed from Syracuse, Rochester, Buffalo, Elmira, Ithaca, Auburn, Geneva and Canandaigua. A total of 178 species were tallied, and \$1,900.00 was raised. The winning team, The Cayuga Bird Club Mudhens, found 128 species. Second and third places went to the Cornell Lab of Ornithology Sapsuckers and the Wild Birds Unlimited Tyrants. Three youth teams competed this year, with the Lakeside Chickadees from Rochester winning the youth category. Owasco Valley Audubon Society, with assistance from other area Audubon chapters and bird clubs, organized the event. Funds from the Muckrace will be used to operate the MAPS (Monitoring Avian Productivity and Survivorship) banding station at the refuge.



Muckrace Teams search the mudflats at May's Point Pool.  
(99-19; SS)





One of the Muckrace's youth teams at May's Point Pool.  
(99-20; SS)

#### 18. Cooperating Associations

The establishment of the Friends of the Montezuma Wetlands Complex began in 1999. The refuge was selected as a site for a mentoring visit which took place in August. The Mentoring Team consisted of Frank and Arlene Wolf from the Friends of Blackwater NWR, Glenn Carowan, Refuge Manager of Blackwater NWR, and Ed Grimes from the Friends of Minnesota Valley National Wildlife Refuge. A steering committee that included members of the Montezuma Wetlands Complex Focus Area Team, Refuge Volunteers, Staff from the Refuge, New York State Department of Environmental Conservation, and Ducks Unlimited began the process of legally forming this group. By December, the group was incorporated, had drafted bylaws, was working on its 501c(3) application, and had 126 names of interested members. In 1999, the refuge began constructing a room for a Friends' Sales Outlet in the Visitor Center.

## I. EQUIPMENT AND FACILITIES

### 1. New Construction

In July construction of a dike system on the Foster property, the first of the muckland properties acquired as part of the Refuge, began. The plan to restore the 250-acre plot of old potato farmland back to a marsh habitat required construction of over a mile of earthen dike to tie in two existing intersecting dikes formed out of organic soils, and the placement of water control structures for intake and discharge capabilities. It truly turned out to be a team effort by all on the Refuge Staff; the basic layout and design, site preparation, and the actual earthmoving to complete the dike system proceeded with little or no problems, especially due to the dry summer conditions that were present. The earthmoving for the dike construction encompassed moving 83,000 cubic yards of soil, which included sod removal, core construction, and dike construction 7' high with a 12' wide top and 4/1 side slopes. Utilizing existing soil on-site, a borrow area on the interior of the impoundment provided the material needed to construct the dike.



"Dirt Crew" profiling borrowed fill to contour dike core. (99-21; SLF)

Due to the fact that the land was extensively farmed for many years and the area was tiled to meet the farmers' needs, the tile in the dike footprint had to be removed to insure proper sealing of the unit. To accomplish this goal, a team of operators and equipment needed to be brought in. Equipment including Montezuma's dozers and grader, a JD 750B dozer from Iroquois NWR, two Komatsu D65PX dozers rented from Rupp Rental, and a Caterpillar D7H dozer rented from Syracuse Supply were combined in operation to construct the dike.



Back side of constructed dike with equipment. (99-22; SLF)

Montezuma NWR Staff Steve Flanders, Louise Dates, and John Crowell, along with Jeff Graves from Iroquois NWR, Bob Carpenter from Eastern Shore of Virginia NWR, and Ed Darlington from Harrison Lake NFH, worked for a two-week period to construct the dike. Their work on completing the dike construction on schedule proved their dedication. Their experience and willingness to adapt to the conditions shows what great and talented folks the Service has.





"The Dirt Crew". Left to right: Ed Darlington, John Crowell, Jeff Graves, Louise Dates, Bob Carpenter, Steve Flanders. (99-23; TAG)

To complete the project the dike was left to settle for the winter, after which it will be graded to shape, seeded, and the water control structures will be installed. In addition to the dike construction, as part of in-kind services provided by local farmer Neil Malone, using his V-Ditcher mounted on the rear of a farm tractor, V-Ditches were re-established in the interior of the impoundment to provide channels for water removal in the future. The remaining leg of dike needed to complete the restoration along with the installation of the water control structures of the entire Foster Tract will be accomplished next year if funding allows. A fantastic job was done by all! A great deal of time and effort was done in-house by staff members to make this project a reality, again proving the fact that we have the knowledge and capabilities to accomplish projects such as this.

A 100-acre section of the Main Pool next to Route 89, consisting of a thick mat of cattail that used to be occasionally flooded, was restored to a more viable marsh habitat by the construction of an earthen dike and placement of two water control structures by Refuge staff. An existing spoil pile along the pool edge was reformed, and added material was excavated from the pool to meet elevation goals of a dike 3' high and 12' wide, with 4/1 side slopes. Construction of 900' of new dike at the south end will surround the unit. Two 24" aluminum water control structures and pipe were installed; one on the dike to the Main Pool, and one on

North Spring Pool to act as the intake structure. The dike will be allowed to settle for the winter, after which it will be final-graded and seeded next year to complete the project. A contest to name the new unit was held, and the winning name was Millennium Marsh – not too bad for the change of the century!

A new addition was constructed by Refuge staff onto the Visitor Center to be utilized by the Friends Group as their Gift Shop. Construction to include attaching the room to the existing layout of the Visitor Center proved to be a challenge. The framework and roof, plus the siding, windows, and roofing were accomplished this year. The interior of the room will be finished during the winter months.

## 2. Rehabilitation

The four CMP half-moon risers located at the north end of the Cayuga Connector Canal were repaired this year. The overall height of the structures was reduced to facilitate stoplog changes without having to put boots on and climb down into the Canal to put a board in. In addition to the height reduction, catwalk grating was installed on the top to provide for a safe working platform in all weather conditions when working around the structure. Two 20' sections of 48" CMP were replaced on the west structure controlling water elevations from Unit 17, replacing the existing 48" CMPs which were severely leaking at the joints and were deformed and rusted out. Rip-rap was placed on all existing slopes to prevent erosion around the face of the structures.

An area adjacent to the west of the Entrance Road that seasonally floods, providing excellent waterfowl habitat in the spring, was given a facelift by removing the scrub trees, shrubs, and roots; thereby expanding the area and providing additional public viewing of the area. A tie-in to the project, which was made possible by the Main Pool drawdown this year, allowed us to remove approximately one foot of solid cattail and mat from this area to create a larger open water area.

## 3. Major Maintenance

One day while checking water elevations, Refuge Biologist Tracy Gingrich noticed a hole in the Wildlife Drive over the Seneca Spillway culverts; after examination it was determined that the two 36" CMP culverts installed in 1974 were rusted through, allowing water flowing through the pipes to wash away soil around the culverts, which caused an extensive cave-in around the culverts. Excavation of the site around the culverts showed the extent of the deterioration, which will need to be replaced next year. As a temporary fix, 110 cubic yards of clay was packed in around the culverts to eliminate water flowing outside the culverts; this has held to this point.

The Refuge water supply system proved again to be a thorn in our sides this year. Since we have two 10,000 gallon tanks feeding our water supply, a small leak in the pipe system proved to be costly in the dry summer conditions. A leak under the Office was difficult to locate; a local contractor with detectors was finally able to pinpoint the location and bypass the problem, due to the fact that the Office is constructed on a concrete slab and the leak was somewhere under the building. In addition to installing shutoff valves in the system, the original 10,000 gallon tank was flushed and cleaned out. Trees along the Pole Shed that provided a great deal of debris to the gutters that feed into the tanks were removed, which aided in eliminating some of the water quality problems.

Four trees were removed around the Sub-headquarters Residence, eliminating the possibility of having one of the trees coming down on the house during a windstorm. After removal of the trees the stumps were chipped down to ground level.

#### 4. Equipment Utilization and Replacement

In addition to scheduled preventative maintenance, the following major repairs were made to the refuge fleet of vehicles and equipment:

1992 Dodge Dakota	-	Replace four tires and front bearings
1988 GMC Dump Truck	-	Replace front tires
1989 Dodge W350	-	Replace rack bed with a Rugby hydraulic dump body
JD690C Excavator	-	Replace hydraulic pump and turbocharger
JD7600 Tractor	-	Transmission repair under factory recall, replace left rear tire
1999 Dodge 3500	-	Rustproof, install bed liner, emergency lights, mobile radio, running boards and mudflaps
1999 Ford Explorer	-	Rustproof, install emergency lights and radios/siren for law enforcement activities

The Refuge Staff also provided maintenance and repairs to support the St. Lawrence Wetland and Grassland Management District's equipment fleet, including the Case and John Deere Tractors, a 1979 Chevy Pickup transferred from Iroquois NWR, a Chevy Blazer acquired from McDill AFB, Florida, and the JD 550G Dozer acquired used from 5 Star Equipment Inc, Rochester, New York.



The following is a list of new equipment/vehicles acquired throughout the year:

1999 Dodge 3500 4x4 for fire support  
1999 Ford Explorer for L.E. activities  
Caterpillar D5C Crawler Dozer with Winch  
200-gallon Cascade Slip-on Fire Pumper  
Truax No-Till Seed Drill  
10'-wide Farm Disk

Utilization of Service-owned equipment has proven to be an efficient method of getting the job done. During the year the following equipment that was based out of Montezuma NWR traveled around the Region to get the job done:

JD570A Motor Grader -	to Iroquois NWR for road repair
JD690C Excavator -	to Great Meadows NWR for water control structure repairs
JD310B Backhoe/loader -	to St. Lawrence WMD for facilities restoration

## 6. Computer Systems

In April the Refuge's computers were upgraded, and the Office and Shop were networked. To prepare for this, three computers were re-built, and four new computers were purchased. One older computer was designated as a server. A 16-port hub, a 4-port hub for the Shop, 1000 feet of Category 5 cable, patch cords for all the computers, and Sygate software to run the network were purchased. Dan Greeley from the Regional Office and Mel Norsen of our staff ran all the cabling for the network. An additional three new computers were acquired from the Regional Office in September.

## J. OTHER ITEMS

### 3. Items of Interest:

#### Training/Meetings

- Dates - Maintenance Workshop, NCTC, 04/25/99 - 04/30/99.
- Crowell - Using Government Purchase Cards Training, NCTC, 02/22/99.
- Maintenance Workshop, NCTC, 04/25/99 - 04/30/99.
- Estes - Automated Data Processing Workshop, Hadley, MA 06/13/99 - 06/17/99.
- Flanders - Operations '99 Workshop, NCTC, 04/26/99 - 04/30/99.
- Gingrich, M. - Canada Goose Roundup, Massena, NY, 06/30/00 - 07/01/99.
- Motorboat Operator's Certification Course, Swanton, VT, 07/19/99 - 07/22/99.
- Gingrich, T. - Refuge Biologist Workshop, NCTC, 03/29/99 - 04/01/99.
- S-211 Portable Pumps and S-212 Wildfire Power Saws Fire Training, Newington, NH, 05/17/99 - 05/21/99.
- Shorebird Ecology and Management Course, Portsmouth, NH, 08/17/99 - 08/20/99.
- Canada Goose Roundup, Massena, NY, 06/30/00 - 07/01/99.
- Symposium, Framington, MA, 11/04/99 - 11/06/99.

- Jasikoff - Conference, Detroit, MI, 03/01/99 - 03/03/99.
- Training, NCTC, 03/29/99 - 04/01/99.
- LE Training, NCTC, 04/11/99 - 04/16/99.
- Ecosystem Meeting, Cape May, NJ, 04/26/99 - 04/28/99.
- Developing and Working With Friends' Groups Training, NCTC, 05/04/99 - 05/08/99.
- Ecosystem Meeting, Niagara Falls, NY, 06/21/99 - 06/23/99.
- Ecosystem Meeting, Marquette, MI, 09/27/99 - 09/29/99.
- Project Leaders' Meeting, NCTC, 10/04/99 - 10/07/99.
- Regional Partners For Wildlife Meeting, Alexandria Bay, NY, 10/19/99 - 10/20/99.
- McMahon - Canada Goose Roundup, Massena, NY, 06/30/00 - 07/01/99.
- Administrative Workshop, Hadley, MA, 02/28/99 - 03/05/99.
- Taylor - Nongame Wildlife Survey and Monitoring Techniques, Swanquarter, NC, 03/22/99 - 03/26/99.
- Firefighting S-130 and S-190 Training, Newington, NH, 04/12/99 - 04/16/99.
- Using Government Purchase Cards Training, NCTC and Seneca Falls, NY, 02/02/99.

Vandemoer - Training, NCTC, 03/30/99 - 04/01/99.

1999 Refuge Manager Training Academy, NCTC,  
04/18/99 - 05/07/99.

S-211 Portable Pumps and S-212 Wildfire Power Saws  
Fire Training, Newington, NH, 05/17/99 - 05/21/99.

GIS Meeting, Hadley, MA, 05/25/99 - 05/26/99.

Ecosystem Meeting, Niagara Falls, NY, 06/21/99 -  
06/23/99.

Training, NCTC, 08/15/99 - 08/24/99.

RCRA Waste Management Regulations, Hadley, MA,  
10/26/99 - 10/28/99.

Pre-Retirement Training, Hadley, MA, 11/28/99 -  
11/30/99.

#### Special Assignments/Details/Other Travel

Refuge Manager Tom Jasikoff travelled to the Refuge's satellite station (St. Lawrence Wetland and Grassland Management District) several times during the year for either meetings or to conduct field work.

Maintenance Mechanic Steve Flanders taught Heavy Equipment training at several field stations during the year.

#### Awards

Throughout the year the following employees received either On-The-Spot Awards or Star Awards:

John Crowell, Louise Dates, Nancy Estes, Steve Flanders, Marva Gingrich, Tracy Gingrich, Judy McMahon, Mel Norsen, and Charlie Vandemoer.

#### 4. Credits

Typing and Proofreading - Estes  
Highlights - Jasikoff  
Climatic Conditions - Norsen, T. Gingrich  
Land Acquisition - T. Gingrich  
Planning - Jasikoff, T. Gingrich  
Administration - Jasikoff, McMahon  
Habitat Management - T. Gingrich  
Wildlife - T. Gingrich  
Public Use - M. Gingrich  
Equipment and Facilities - Flanders, Norsen  
Other Items - Jasikoff, McMahon  
Editing - Jasikoff, Estes  
Feedback - Jasikoff

#### Photographs

JS - Recreation Aide Jessica Smith  
JVN - Refuge Volunteer John VanNiel  
MM - Refuge Volunteer Margaret McKinney  
MKG - ORP Marva Gingrich  
MJN - Facilities Manager Mel Norsen  
TAG - Refuge Biologist Tracy Gingrich  
SS - Refuge Volunteer Sue Secaur

## Montezuma National Wildlife Refuge

3395 Route 5 & 20 East

Seneca Falls, NY 13148

Telephone: 315/568 5987

Hearing impaired visitors may call the New York Relay Center at 1 800/662 1220 TDD/1 800 421 1220 voice.

U.S. Fish & Wildlife Service

1 800/344 WILD

<http://www.fws.gov>

Montezuma is one of over 500 refuges in the National Wildlife Refuge System administered by the U.S. Fish and Wildlife Service. The National Wildlife Refuge System is a network of lands and waters managed specifically for the protection of wildlife and wildlife habitat and represents the most comprehensive wildlife management program in the world. Units of the system stretch across the United States from northern Alaska to the Florida Keys and include small islands in the Caribbean and South Pacific. The character of the refuges is as diverse as the nation itself.

The Service also manages National Fish Hatcheries, and provides Federal leadership in habitat protection, fish and wildlife research, technical assistance and the conservation and protection of migratory birds, certain marine mammals and threatened and endangered species.



U.S. Fish & Wildlife Service

# Montezuma

## *National Wildlife Refuge*



FWS photo by Tom Ramsay.



*Montezuma National Wildlife Refuge lies at the north end of Cayuga Lake, in the heart of the Finger Lakes Region of New York State.*

*Located 5 miles (8 kilometers) east of Seneca Falls, in Seneca and Wayne Counties, Montezuma Refuge serves as a major resting area for waterfowl and other waterbirds on their journeys to and from nesting areas in northeastern and east-central Canada.*



## Introduction

*Refuge management benefits wildlife and provides a place for people to visit and enjoy wildlife in its natural habitat.*

*Great blue heron.  
(Photo © Lou Stahlman)*



*Bittern chicks.  
(Photo © Lou Stahlman)*



## Once Extensive Marshes

The Finger Lakes Region was shaped during the last glacial period, some 10,000 years ago. The retreating glacier created a vast system of lakes. In time, the shallower northern and southern ends of the lakes developed into extensive marshes.

The earliest known inhabitants of this region were Algonquin Indians. They were succeeded by the Cayugas of the Iroquois Nation. These early Americans derived part of their livelihood from the wildlife and plants of the area's bountiful marshes.

Prior to the turn of the century, the Montezuma Marsh extended north from Cayuga Lake for 12 miles (19 kilometers) and was up to 8 miles (13 kilometers) wide. The marsh was one of the most productive in North America. As with most wetlands during that era, the importance of the marshes went unrecognized. Construction of the dam at the outlet of Cayuga Lake and changes made to existing rivers during the building of the New York State Barge Canal contributed to the loss of the marsh. By the early 1900s all but a small portion had been drained.

In 1937 the Bureau of Biological Survey, which later became the U.S. Fish and Wildlife Service, purchased 6,432 acres (2,603 hectares) of the former marsh. This land would become the Montezuma National Wildlife Refuge. The Civilian Conservation Corps began work on a series of low dikes which would hold water and restore part of the marsh.

Currently, the refuge consists of more than 7,000 acres (2,833 hectares) as efforts to restore and preserve the marsh continue with the Northern Montezuma Wetlands Project. This project involves the



*Female mallard  
and brood.  
(FWS photo by  
Tom Ramsay)*

Service, New York State Department of Environmental Conservation, conservation organizations, corporations, and private landowners, all working together to restore and enhance wetland habitats and the populations of wetland-dependent wildlife on 36,050 acres (14,590 hectares) of the former Montezuma Marsh. The Northern Montezuma Wetlands Project is part of the North American Waterfowl Management Plan, an international agreement between the United States, Canada, and Mexico that seeks to restore, conserve, and enhance wetland habitats and waterfowl populations throughout North America.





### Legend

- Refuge Boundary
- Refuge Headquarters
- Hiking Trails
- Fishing Area
- ... Wildlife Drive
- Observation Tower
- Observation Area

## Why A Refuge?

Montezuma National Wildlife Refuge was established in 1938 as a refuge and breeding ground for migratory birds and other wildlife. The refuge provides resting, feeding, and nesting habitat for waterfowl and other migratory birds. Montezuma is situated in the middle of one of the most active flight lanes in the Atlantic Flyway.

Careful management of the refuge's 3,500 acres (1,417 hectares) of diked pools ensures that migrating birds will find suitable food in a mix of emergent and submergent plants along with open water and mudflats. Water levels are carefully manipulated throughout the year to provide habitat and food for many bird species.

Wooded areas, grasslands, and wetland habitat are also managed to provide a healthy, self-sustaining population of many wildlife species including mammals, resident birds, reptiles, amphibians, and insects which are normally found in Central New York.



*Purple loosestrife.*  
(© June Henshaw)



In 1976, the refuge cooperated with the New York State Department of Environmental Conservation on a bald eagle release program at Montezuma. Over a period of four years, 23 eagles were released through a "hacking" program. Since the program's inception, bald eagles have returned to Montezuma and have successfully reared young.

The refuge has been a study site for learning about the impacts of the pest plant purple loosestrife on marsh ecosystems and establishing techniques to control its spread. The refuge has worked with Cornell University on these studies.

The refuge also provides compatible wildlife-dependent educational and recreational opportunities for the thousands of visitors who visit each year. Recreational opportunities are carefully planned to complement the management of the refuge.

*Muskrat.*  
(FWS photo by  
Kevin Colten)

## Wildlife Calendar

### *Fall Migration*

Waterfowl – Mid-September to freeze-up; Canada goose numbers peak (50,000) in mid-November; duck numbers peak (150,000) late November. Best viewing times are early morning and late afternoon.

Shorebirds/Wading Birds – Mid-August through mid-October; peak mid-September. Killdeer, yellowlegs, and other shorebirds can be seen on exposed mudflats, while herons and egrets use the shallow water areas throughout the day. Shorebird watching is best at May's Point Pool and Benning Marsh where water levels are managed seasonally for their benefit.

### *Winter*

The self-guided Wildlife Drive is generally closed to traffic (depending upon snow/ice/road conditions). Cross-country skiing and snowshoeing on the Wildlife Drive provide an excellent opportunity to see white-tailed deer, small mammals, and resident birds such as blue jays, woodpeckers, nuthatches, and black-capped chickadees.

### *Spring Migration*

Waterfowl – Late February through April – varies as to weather and thaw – 85,000 Canada geese, 12,000 snow geese (both color phases are present). Many species of ducks are present though not as numerous as in the fall. Best viewing times are in early morning and late afternoon.

Shorebirds – Shorebird migration is less spectacular than in the fall, but birds are common early-May to mid-June.

Warblers – The peak of warbler migration is mid-May. Best viewing is on Esker Brook Trail from dawn until mid-morning.

Wildflowers – From April through June; peak is in May. Violets, trilliums, mayapples, vetches, mustards and others can be seen along Esker Brook Trail.

### *Summer*

Waterfowl Nesting – Canada geese and several duck species nest on the refuge beginning in early-March. Broods first appear in early-May and can be seen throughout the summer.

Heron Rookery – Great blue herons nest in the wooded area adjacent to the Main Pool. Black-crowned night herons may also be seen in Main Pool.

Flowering Plants – Throughout the summer flowering plants may be seen from the Wildlife Drive. Purple loosestrife, iris, mallow, and white water lily peak in late July.

### *Year-round*

White-tailed deer, muskrats, fox, and other resident wildlife can be seen throughout the year. Best viewing times are early morning and late afternoon. You may wish to plan your trip accordingly.

With advance notice, educational programs are available to organized groups throughout the year. The refuge provides area teachers and students with three outdoor classroom sites for environmental education. Teacher workshops are held at various times during the year which enable teachers to effectively utilize the refuge as a resource for scheduled field trips. The refuge provides an extensive assortment of wildlife videos (free of charge) to area educators. Videos are also available for viewing in the Visitor Center.

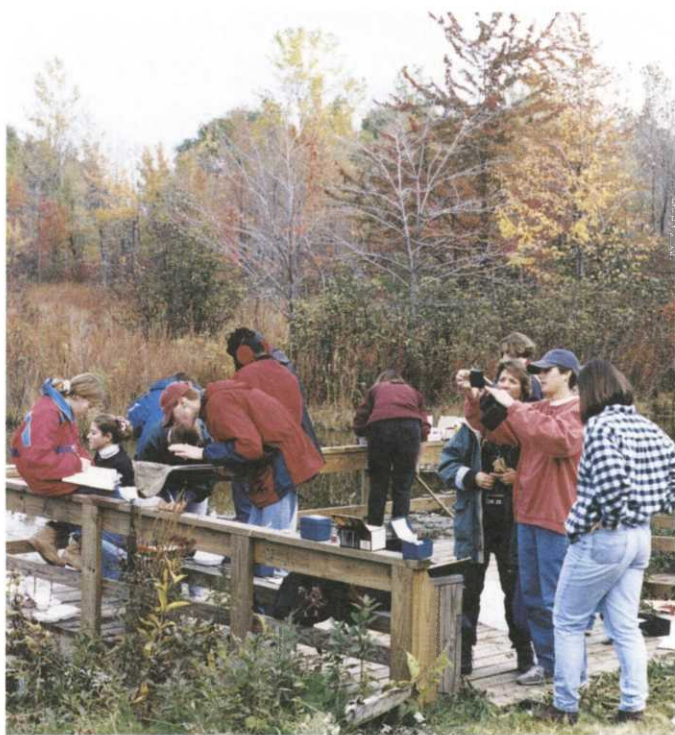


## Enjoying the Refuge

Recreational and educational activities abound at Montezuma throughout the year. The refuge is open daily during daylight hours. Since Montezuma is a National Wildlife Refuge, collecting, disturbing, injuring or damaging plants or animals is prohibited.

The Visitor Center contains exhibits, leaflets and restrooms. Hours of operation vary by season, call the refuge for information on the Center's schedule. The observation deck and tower provide excellent opportunities to see wildlife.

The self-guided Wildlife Drive provides opportunities to observe and photograph wildlife from your car. Please stay in your vehicle since it serves as a "blind" and minimizes disturbance to wildlife. Snow, ice and poor road conditions generally keep the road closed during the winter and early spring months.



*Yellow warbler  
with nestlings.  
(Photo © Lou  
Stahlman)*

There are no bicycling facilities at Montezuma.

Esker Brook Trail, a 2 mile (3.2 kilometer) walking trail, is open from January through October. The Wildlife Drive is open for cross-country skiing and snowshoeing during the winter. All hiking and skiing is limited to established trails.

Although fishing and boating are prohibited in refuge waters, the refuge maintains a boat launch providing access to the state-owned Barge Canal. Three public fishing sites provide bank fishing access to the canal.

Public hunting, for waterfowl and deer, is permitted under special regulations on portions of the refuge during the state seasons. Contact refuge manager for additional information.

*Visitors enjoying  
Montezuma  
National Wildlife  
Refuge. (FWS  
photo by Marva  
Smith)*

# Birds

## *Montezuma National Wildlife Refuge*





## Introduction

*Montezuma National Wildlife Refuge in Seneca and Wayne Counties, New York, was established in 1938 to provide nesting, resting, and feeding areas for waterfowl and other migratory birds. This refuge contains more than 7,000 acres (2,833 hectares) of widely diversified habitat, from extensive marshes to upland hardwoods. In addition to meeting habitat requirements for tens of thousands of spring and fall migrant birds, the refuge annually provides wildlife education and recreation opportunities for 150,000 visitors.*

*Visitor facilities include the 3.5-mile Wildlife Drive, 2-mile walking trail, visitor center, observation towers and decks, and ample opportunities to observe and photograph wildlife.*

*Birding opportunities are best from March through November with peak migrations of waterfowl in mid-April and late October. Warblers are abundant in late May to early June.*



© Julien Beauregard



This brochure lists 320 species of birds that have been identified on Montezuma Refuge since its establishment in 1938. Most birds are migratory, therefore, their seasonal occurrence is coded as follows:

#### Season

s	spring	March – May
S	summer	June – August
F	fall	September – November
W	winter	December – February

- Birds known to nest on or near the refuge
- Italics indicate threatened/endangered species*

#### Relative Abundance

Relative abundance indicates how frequently you might see a bird in its favored habitat.

a	abundant	a species which is very numerous
c	common	likely to be seen or heard in suitable habitat
u	uncommon	present, but not certain to be seen
o	occasional	seen only a few times during a season
r	rare	may be present but not every year



s S F W

#### LOONS – GREBES

—	Red-throated Loon .....	r		r
—	Common Loon .....	u		u
—	• Pied-billed Grebe .....	c	c	c
—	Horned Grebe .....	u		o
—	Red-necked Grebe .....	r		r

#### GANNET – PELICANS – CORMORANTS

—	Double-crested Cormorant .....	c	c	c
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#### BITTERNS – HERONS – IBISES

—	• American Bittern .....	u	u	u
—	• Least Bittern .....	o	o	o
—	• Great Blue Heron .....	c	c	c o
—	Great Egret .....	u	u	u
—	Snowy Egret .....	r	r	r
—	Little Blue Heron .....	r	r	r
—	Cattle Egret .....	r	r	r
—	• Green Heron .....	c	c	c
—	• Black-crowned Night-Heron .....	u	u	u
—	Glossy Ibis .....	r	r	r

#### SWANS – GEESE – DUCKS

—	Tundra Swan .....	u		c	c
—	Mute Swan .....	r		r	
—	Snow Goose .....	c		c	o
—	Brant .....			o	
—	• Canada Goose .....	a	c	a	c
—	• Wood Duck .....	c	c	c	
—	• Green-winged Teal .....	c	o	c	
—	• American Black Duck .....	a	c	a	c
—	• Mallard .....	a	c	a	c
—	• Northern Pintail .....	c	o	c	
—	• Blue-winged Teal .....	c	c	c	
—	• Northern Shoveler .....	c	o	c	
—	• Gadwall .....	c	u	c	
—	Eurasian Wigeon .....	r		r	
—	• American Wigeon .....	c	o	c	
—	• Canvasback .....	c	o	c	
—	Redhead .....	c	o	c	
—	Ring-necked Duck .....	c		c	
—	Greater Scaup .....	c		c	
—	Lesser Scaup .....	c		c	
—	Oldsquaw .....	r		r	
—	Black Scoter .....	r		r	
—	Surf Scoter .....	r		r	
—	White-winged Scoter .....	r		r	
—	Common Goldeneye .....	c		c	
—	Bufflehead .....	c		c	
—	• Hooded Merganser .....	c	u	c	o
—	Common Merganser .....	c		c	u
—	Red-breasted Merganser .....	u		u	o
—	• Ruddy Duck .....	c	o	c	



#### VULTURES – HAWKS – FALCONS

—	Turkey Vulture .....	c	c	c	
—	• Osprey .....	c	c	c	
—	• Bald Eagle .....	c	c	c	c
—	• Northern Harrier .....	c	u	c	u
—	• Sharp-shinned Hawk .....	u	u	u	u
—	Cooper's Hawk .....	u	u	u	u
—	Northern Goshawk .....	r		r	r
—	Red-shouldered Hawk .....	o		o	
—	Broad-winged Hawk .....	o		o	
—	• Red-tailed Hawk .....	c	c	c	c
—	Rough-legged Hawk .....	u		u	u
—	• American Kestrel .....	c	c	c	u
—	Merlin .....	r		r	
—	Peregrine Falcon .....	r		r	

s S F W

**GROUSE - QUAIL - TURKEY**

___ • Ring-necked Pheasant .....	u	u	u	u
___ • Ruffed Grouse .....	u	u	u	u
___ • Wild Turkey .....	u	u	u	u

**RAILS - CRANES**

___ King Rail .....	r	r	r	
___ • Virginia Rail .....	c	c	c	r
___ • Sora .....	u	u	u	
___ • Common Moorhen .....	c	c	c	
___ • American Coot .....	c	c	c	

**PLOVERS - SANDPIPERS**

___ Black-bellied Plover .....	u	u	u	
___ American Golden-Plover .....	u	u	u	
___ Semipalmated Plover .....	c	c	c	
___ • Killdeer .....	c	c	c	
___ Greater Yellowlegs .....	c	c	c	
___ Lesser Yellowlegs .....	c	c	c	
___ Solitary Sandpiper .....	u	u	u	
___ • Spotted Sandpiper .....	c	c	c	
___ Upland Sandpiper .....		r		
___ Whimbrel .....	r	r	r	
___ Hudsonian Godwit .....		r	r	
___ Ruddy Turnstone .....	o	o	o	
___ Red Knot .....	u	u	u	
___ Sanderling .....	u	u	u	
___ Semipalmated Sandpiper .....	c	c	c	
___ Western Sandpiper .....		o	o	
___ Least Sandpiper .....	c	c	c	
___ White-rumped Sandpiper .....	u	u	u	
___ Baird's Sandpiper .....		u	u	
___ Pectoral Sandpiper .....	c	c	c	
___ Dunlin .....	c	c		
___ Stilt Sandpiper .....		u	u	
___ Ruff .....	r	r	r	
___ Short-billed Dowitcher .....	c	u	c	
___ Long-billed Dowitcher .....			u	
___ • Common Snipe .....	u	u	u	
___ • American Woodcock .....	c	c	c	
___ Wilson's Phalarope .....	r	u	u	
___ Red-necked Phalarope .....	r	u	u	

**JAEGERS - GULLS - TERNS - AUKS**

___ Bonaparte's Gull .....	u	u	u	
___ Ring-billed Gull .....	c	c	c	c
___ Herring Gull .....	c	o	c	c
___ Iceland Gull .....	r	o	r	r
___ Lesser Black-backed Gull .....	r	o	r	r
___ Glaucous Gull .....	r	o	r	r

s S F W

___ Great Black-backed Gull .....	r	o	r	r
___ Caspian Tern .....	u	u	u	
___ • Common Tern .....	u	u	u	
___ • Black Tern .....	u	u	u	

**DOVES - CUCKOOS - OWLS - SWIFTS - HUMMINGBIRDS**

___ • Rock Dove .....	u	u	u	u
___ • Mourning Dove .....	c	c	c	c
___ • Black-billed Cuckoo .....	u	u	u	
___ • Yellow-billed Cuckoo .....	r	r	r	
___ Barn Owl .....	r	r	r	r
___ • Eastern Screech-Owl .....	c	c	c	c
___ • Great Horned Owl .....	c	c	c	c
___ Snowy Owl .....	r		r	r
___ • Barred Owl .....	r	r	r	r
___ Long-eared Owl .....	r		r	r
___ Short-eared Owl .....	r	r	r	r
___ Northern Saw-whet Owl .....	r		r	r
___ Common Nighthawk .....	o	r	o	
___ Whip-poor-will .....	r			
___ • Chimney Swift .....	u	u	u	
___ • Ruby-throated Hummingbird .....	c	c	c	
___ • Belted Kingfisher .....	c	c	c	o

**WOODPECKERS - FLYCATCHERS**

___ Red-headed Woodpecker .....	o		o	
___ • Red-bellied Woodpecker .....	c	c	c	c
___ Yellow-bellied Sapsucker .....	c		c	
___ • Downy Woodpecker .....	c	c	c	c
___ • Hairy Woodpecker .....	c	c	c	c
___ • Northern Flicker .....	c	c	c	u
___ • Pileated Woodpecker .....	u	u	u	u
___ Olive-sided Flycatcher .....	r		r	
___ • Eastern Wood-Pewee .....	c	c	c	
___ Yellow-bellied Flycatcher .....	r		r	
___ Alder Flycatcher .....	o	o	o	
___ • Willow Flycatcher .....	c	c	c	
___ • Least Flycatcher .....	c	c	c	
___ • Eastern Phoebe .....	c	c	c	
___ • Great Crested Flycatcher .....	c	c	c	
___ • Eastern Kingbird .....	c	c	c	

**LARKS - SWALLOWS - JAYS - CROWS**

___ • Horned Lark .....	o	o	o	o
___ • Purple Martin .....	u	u	u	
___ • Tree Swallow .....	a	a	a	r
___ Northern Rough-winged Swallow .....	u	u	u	
___ Bank Swallow .....	c	c	c	
___ Cliff Swallow .....	u	u	u	
___ • Barn Swallow .....	c	c	c	



	s	S	F	W
• Blue Jay .....	c	c	c	c
• American Crow .....	c	c	c	c

### TITMICE – NUTHATCHES – WRENS

• Black-capped Chickadee .....	c	c	c	c
• Tufted Titmouse .....	c	c	c	c
Red-breasted Nuthatch .....	o		o	c
• White-breasted Nuthatch .....	c	c	c	c
• Brown Creeper .....	c	u	c	u
• Carolina Wren .....	r	r	r	r
• House Wren .....	c	c	c	
• Winter Wren .....	c	u	c	
• Sedge Wren .....	r	r	r	
• Marsh Wren .....	c	c	c	

### KINGLETS – THRUSHES – THRASHERS

Golden-crowned Kinglet .....	c		c	u
Ruby-crowned Kinglet .....	c		c	
• Blue-gray Gnatcatcher .....	c	c	c	
• Eastern Bluebird .....	u	u	u	r
• Veery .....	c	c	c	
Bicknell's Thrush .....	o		o	
Swainson's Thrush .....	u		u	
Hermit Thrush .....	c		c	
• Wood Thrush .....	c	c	c	
• American Robin .....	c	c	c	u
• Gray Catbird .....	c	c	c	
• Northern Mockingbird .....	r	r	r	r
• Brown Thrasher .....	o	o	o	

### WAXWINGS – SHRIKES – STARLINGS

American Pipit .....	c	u	c	
• Cedar Waxwing .....	c	c	c	u
Northern Shrike .....	o		o	o
Loggerhead Shrike .....	r	r	r	
• European Starling .....	a	a	a	c

### VIREOS – WOOD WARBLERS

Solitary Vireo .....	c	u	c	
• Yellow-throated Vireo .....	c	c	c	
• Warbling Vireo .....	c	c	c	
Philadelphia Vireo .....	r	r	r	
• Red-eyed Vireo .....	c	c	c	
Blue-winged Warbler .....	c	u	c	
Golden-winged Warbler .....	u	u	u	
Tennessee Warbler .....	c	u	c	
Orange-crowned Warbler .....	r		r	
Nashville Warbler .....	c	u	c	
Northern Parula .....	c	u	c	
• Yellow Warbler .....	c	c	c	

	s	S	F	W
Chestnut-sided Warbler .....	c	u	c	
Magnolia Warbler .....	c	u	c	
Cape May Warbler .....	u	u	u	
Black-throated Blue Warbler .....	c	u	c	
Yellow-rumped Warbler .....	c		c	r
Black-throated Green Warbler .....	c	u	c	
Blackburnian Warbler .....	c	u	c	
Pine Warbler .....	o	o	o	
Prairie Warbler .....	r	r	r	
Palm Warbler .....	c	u	c	
Bay-breasted Warbler .....	c	u	c	
Blackpoll Warbler .....	c	u	c	
• Cerulean Warbler .....	c	c	c	
Black-and-white Warbler .....	c	u	c	
• American Redstart .....	c	c	c	
• Prothonotary Warbler .....	r	r	r	
• Ovenbird .....	c	u	c	
• Northern Waterthrush .....	c	c	c	
Louisiana Waterthrush .....	r		r	
Connecticut Warbler .....	r	r	r	
Mourning Warbler .....	u	u	u	
• Common Yellowthroat .....	c	c	c	
Hooded Warbler .....	u	r	u	
Wilson's Warbler .....	u	u	u	
Canada Warbler .....	c	u	c	
Yellow-breasted Chat .....	r	r	r	



### TANAGERS – SPARROWS

• Scarlet Tanager .....	c	c	c	
• Northern Cardinal .....	c	c	c	c
• Rose-breasted Grosbeak .....	c	c	c	
• Indigo Bunting .....	u	u	u	
• Eastern Towhee .....	c	o	c	
American Tree Sparrow .....	c		c	c
• Chipping Sparrow .....	c	c	c	
• Field Sparrow .....	u	u	u	r
• Vesper Sparrow .....	o	o	o	
• Savannah Sparrow .....	u	u	u	
• Grasshopper Sparrow .....	r	r	r	
• Henslow's Sparrow .....	r	r	r	
Fox Sparrow .....	u		u	
• Song Sparrow .....	c	c	c	o
Lincoln's Sparrow .....	o		o	
• Swamp Sparrow .....	c	c	c	o
White-throated Sparrow .....	c		c	u
White-crowned Sparrow .....	u		u	
Dark-eyed Junco .....	c		c	u
Lapland Longspur .....	r		r	r
Snow Bunting .....	u		u	u

**BLACKBIRDS – FINCHES**

• Bobolink .....	u	u	u	
• Red-winged Blackbird .....	a	a	a	o
• Eastern Meadowlark .....	u	u	u	r
• Rusty Blackbird .....	u		u	
• Common Grackle .....	a	a	a	o
• Brown-headed Cowbird .....	c	c	c	o
• Baltimore Oriole .....	c	c	c	
• Pine Grosbeak .....	r		r	r
• Purple Finch .....	u	r	u	o
• House Finch .....	c	c	c	c
• Red Crossbill .....	r		r	r
• White-winged Crossbill .....	r		r	r
• Common Redpoll .....	o		o	o
• Pine Siskin .....	o		o	o
• American Goldfinch .....	c	c	c	u
• Evening Grosbeak .....	o		o	o
• House Sparrow .....	u	u	u	u

**NOTES**

Location \_\_\_\_\_

Date \_\_\_\_\_ Time \_\_\_\_\_

Observers \_\_\_\_\_

Weather \_\_\_\_\_

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**ACCIDENTALS**

The following species have been seen on the refuge one or two times:

Western Grebe  
 Eared Grebe  
 Leach's Storm-Petrel  
 Wilson's Storm-Petrel  
 American White Pelican  
 Northern Gannet  
 Trumpeter Swan  
 Black Swan (E)  
 Pink-footed Goose (E)  
 White-fronted Goose  
 Egyptian Goose (E)  
 Cinnamon Teal  
 Shelduck (E)  
 Fulvous Whistling Duck  
 Barrow's Goldeneye  
 King Eider  
 Red-crested Pochard (E)  
 Masked Duck  
 Gyrfalcon  
 Northern Bobwhite  
 Tricolored Heron  
 Yellow-crowned Night-Heron  
 White Ibis  
 Greater Flamingo  
 Golden Eagle  
 Sandhill Crane  
 Yellow Rail  
 Black Rail  
 Purple Gallinule  
 American Avocet  
 Black-necked Stilt  
 Northern Lapwing  
 Willet  
 Piping Plover  
 Marbled Godwit

(E) = Probably exotic or escaped species



**Montezuma National Wildlife Refuge**

3395 Route 5 & 20 East

Seneca Falls, NY 13148

Telephone: 315/568 5987

Hearing impaired visitors may call the New York Relay Center at 1 800/662 1220 TDD/1 800 421 1220 voice.

**U.S. Fish & Wildlife Service**

1 800/344 WILD

<http://www.fws.gov>

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# *Wildlife Drive*

MONTEZUMA  
National Wildlife Refuge

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Seneca Falls, New York

## WELCOME

The next 3.5 miles of Montezuma's Wildlife Drive will introduce you to the fascinating world of wetlands. Refuge wetlands provide resting, feeding, and nesting habitats for numerous species of waterfowl and other types of waterbirds.

The 1,600-acre wetland you see on your left was restored by the U.S. Fish & Wildlife Service after having been lost in the early 1900's when the vast "Montezuma Swamp" was drained. On your right is the New York State Barge Canal. In 1938, the U.S. Fish and Wildlife Service built dikes around portions of the drained marshes. By the early 1940's, water, the lifeblood of wetlands, was restored. As wetland plant communities slowly returned, a rich diversity of waterfowl, waterbirds, and other wildlife again became abundant on the water and in the air.

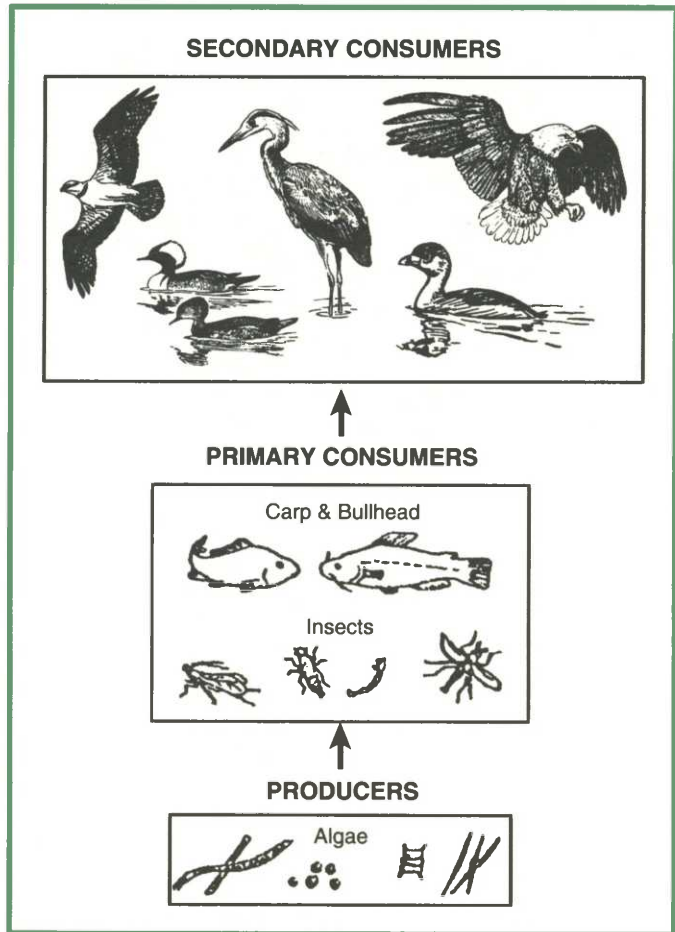
## WATER MANAGEMENT

All of the refuge pools are shallow, averaging approximately 1.5 feet in depth. The actual depth of the water in any pool at any season of the year is carefully planned and managed. This management is done to create conditions which will lead to the best "mix" of submerged aquatic plants, emergent plants, and open water. Ideally, this "mix" would be  $\frac{1}{3}$  emergent plants,  $\frac{1}{3}$  submerged aquatics, and  $\frac{1}{3}$  open water. It is this mix of plant communities which creates habitats – the places animals live – where resting, feeding, nesting, and the rearing of young occur.

## HABITATS

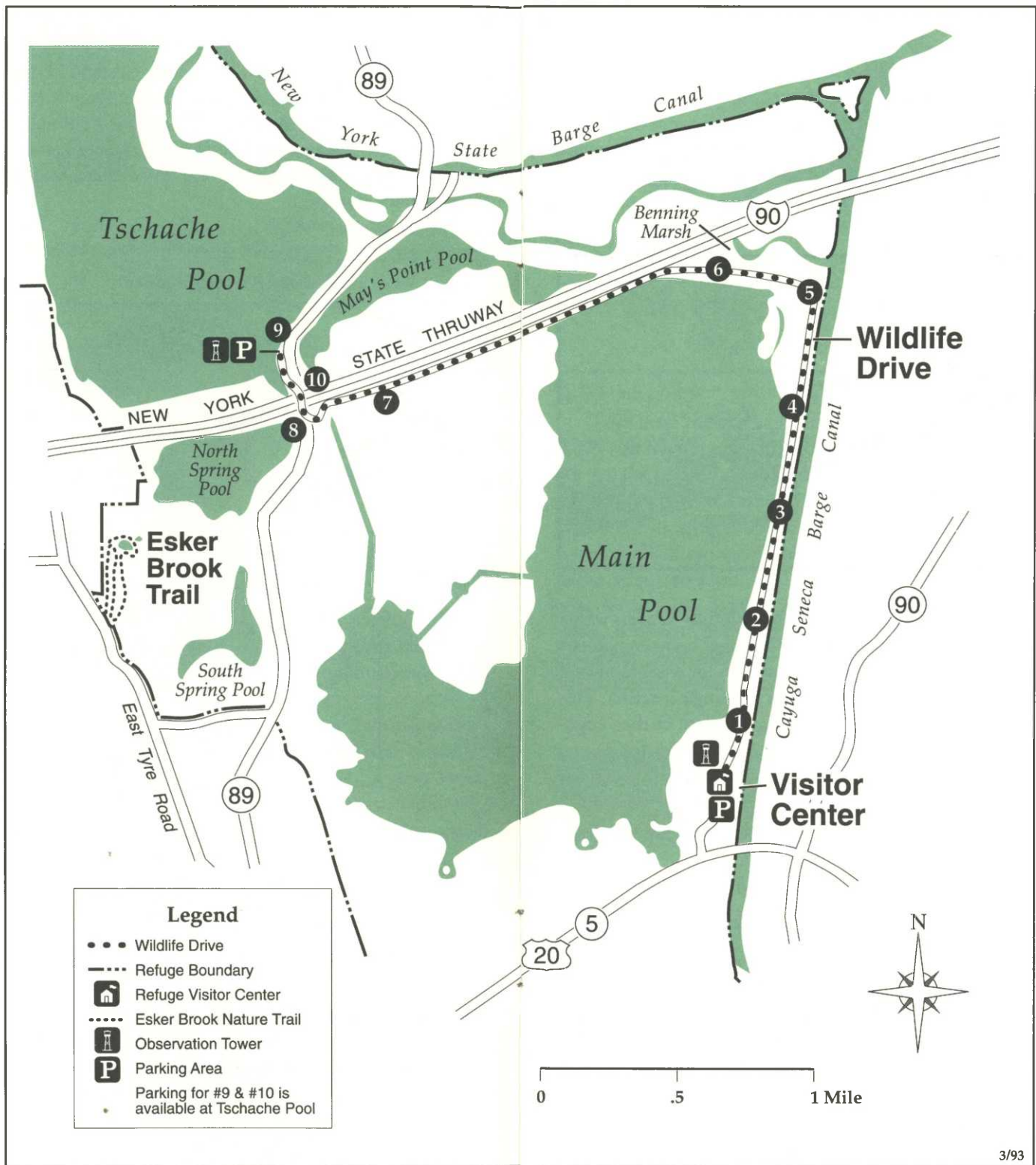
During most of the growing season, the eye is deceived by what appears to be open water. In fact, just under the surface are vast mats of submerged aquatic plants – sago pondweed, water milfoil, waterweeds, coontail, bladderwort, and others. This aquatic plant bed teems with aquatic insects and crustaceans, as well as small fish such as sticklebacks.

Entire food chains and food webs thrive just below the water's surface. Predator-prey relationships among dragonfly nymphs, predaceous water beetles, fairy shrimp, midge larvae, and other animals are as fierce as any among land animals in a tropical jungle. Many species of ducks consume plant materials and seeds. Great blue herons capture the fish, frogs, and larger aquatic insects.



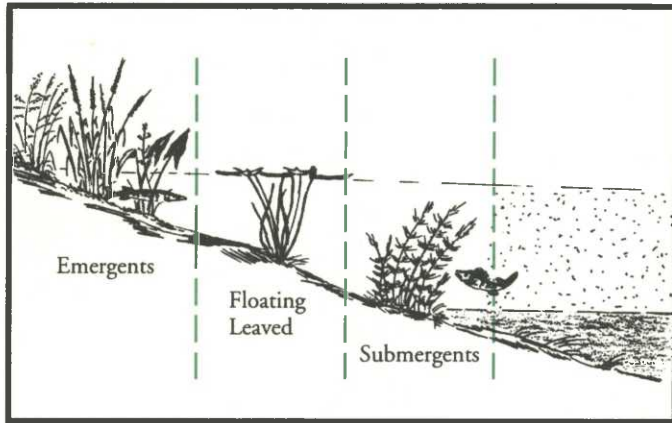
*Typical Food Chains at Montezuma*

At certain seasons, large mats of algae cover portions of the water's surface. At other times, emerald-green mats of duckweed (small individual floating plants with tiny dangling root hairs) cover the quieter zones. All of these provide food for waterbirds and waterfowl, as well as habitat for a diverse host of smaller organisms.





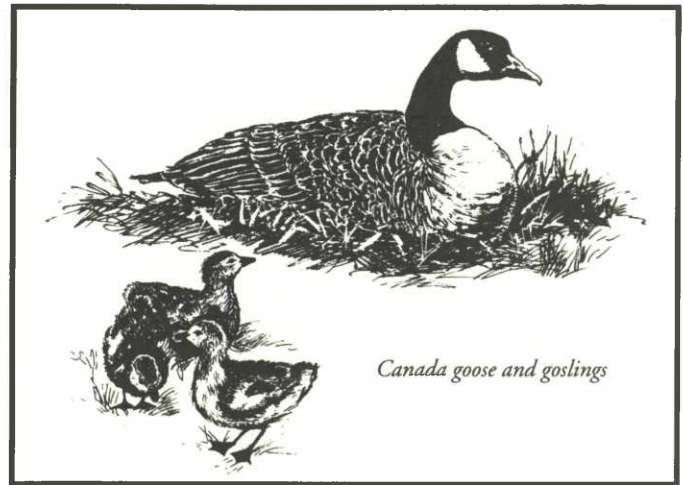
The emergent aquatic plants you see are mostly cattail and purple loosestrife. Purple loosestrife is a "problem" species for us. To learn more about loosestrife control efforts, secure a copy of our purple loosestrife brochure at the Visitor Center. All of the emergent plant communities provide nesting and escape cover from predators for many species of young waterbirds and waterfowl.



As you view the pool, look very carefully at areas where two or more habitats converge. This "edge" between habitats provides a richer, more diverse attraction for wildlife since it merges the benefits of both habitats in a single location. This principle applies whether searching for deer at the "edge" between grassland and woodland, or looking for young ducklings feeding in an open area adjacent to tall, emergent vegetation. Our primary management goal is to manipulate water levels in a manner which produces as much "edge effect" as possible.

## WILDLIFE

**3** The kinds of wildlife using the refuge, and their overall numbers, are determined by the diversity and abundance of habitats that are available. In fact, "wildlife management" is actually "habitat management." We do not "manage" animals; we manipulate plant communities which in turn provide habitats for the animals which use them.



*Canada goose and goslings*

Very large numbers of Canada geese, snow geese, and ducks visit Montezuma during spring and fall. Tundra swans also use the refuge during the same periods. Mallards, American black ducks, blue-winged and green-winged teal, American wigeon, northern shovelers, and wood ducks are frequent dabbling duck species. Common diving ducks are canvasbacks, scaup, redheads, and common and hooded mergansers. Great blue herons, green-backed herons, American coots, common moorhens, bitterns, and other birds are frequently seen along the drive. A complete bird list for Montezuma is available at the Refuge Visitor Center.

## THE NEW YORK STATE BARGE CANAL

**4** Excess water is discharged into the canal through structures similar to this one. However, during seasonal high water periods, the canal sometimes rises so high that it backflows into the pools. Due to wetland destruction, agricultural drainage, and urban development, the nature of the barge canal has changed because it is forced to accept far more water than in earlier times.

Changes in the canal have created unique management problems for the refuge. Carp, exotic fish of Eurasian origin, have become firmly established in the canal. During high

water periods in the canal, literally hundreds of thousands of carp attempt to gain access into shallow refuge pools to complete their breeding cycle. Once inside, their activities stir up so much silt that sunlight cannot penetrate the water, and plant growth is retarded. The carp often uproot those plants which do develop.

For years, drainage of the pools was done to remove carp. Unknowingly, the drawdowns disturbed the niches for native plant species and allowed yet another Eurasian exotic, purple loosestrife, to become established. From a few plants in 1953, purple loosestrife on the refuge expanded to cover 1,250 acres in the late 1970's. Advances in knowledge and changes in management practices during the past decade have led to major reductions in carp and purple loosestrife in the pools.

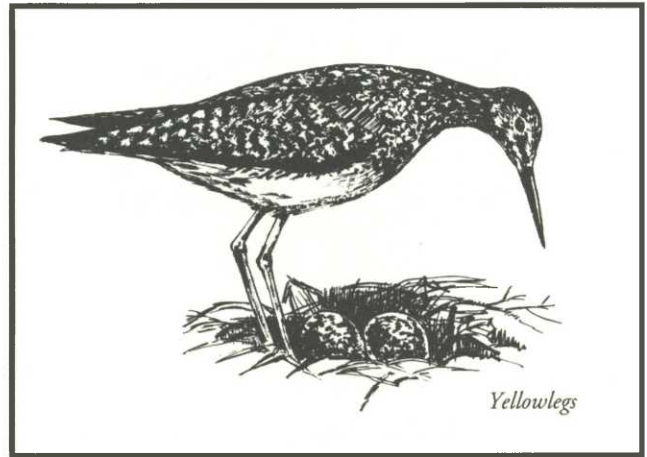
## GRASSLANDS

**5** The refuge manages almost 300 acres of grasslands by periodically mowing them and by controlling undesirable plant species. The grasslands you see are used as nesting habitats by several species of ducks. The grasslands also provide abundant foraging (feeding) areas where hawks, owls, foxes, and other animals search for voles, field mice, rabbits, and other prey species.



## SHOREBIRD MANAGEMENT

**6** Shorebirds are relatively small, and are found wading in very shallow water or walking on exposed mudflats. They probe with their specially-adapted bills in the soft mud for aquatic insects and crustaceans. Numerous species of birds fall into this category. They include yellowlegs, sandpipers, plovers, and many others. The refuge manages water levels in Benning Marsh and May's Point Pool to accommodate the needs of shorebirds. Water levels in both pools are slowly drained in spring and fall so that migrating shorebirds can find the rich mudflats they require for resting and feeding.



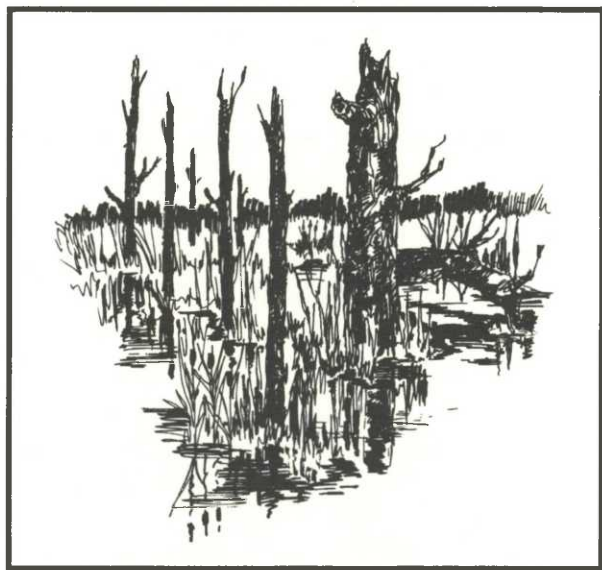
## DRY MARSH

**7** The large cattail area adjacent to the Wildlife Drive and the New York State Thruway has always been shallower than the rest of the refuge pools. As recently as 25 years ago, portions of the area were "farmed" (planted to small grain, annual rye grass, etc.) to attract Canada geese and other waterfowl. The monotypic nature of the plant community (cattail stands) and its shallow nature prevent its use by waterfowl or other waterbirds. Plans call for mechanically opening up areas of the "dry marsh" in future years to create more diverse habitats for wildlife.



## NORTH SPRING POOL

**8** The small pool directly across Route 89 is spring-fed and shallow. Trees were left standing 35 years ago when the area was flooded. Only remnants remain. The water has a very high mineral content due to its spring origins. Waterfowl nesting occurs on some of the hummocks and dikes. In fall, portions of the pool serve as resting and feeding areas for large numbers of wood ducks and American wigeon.



## TSCHACHE POOL

**9** Tschache Pool is 1,300 acres in size, and like the North Spring Pool, contained live timber which was left standing when the pool was flooded. After over 50 years, the few dead trees you see are all that remain of this forested wetland. During spring and fall migration, large numbers of Canada geese and ducks use the pool. Starting in 1976 and continuing through 1980, this pool was host to the North American continent's first bald eagle hacking program. Twenty-three eaglets took their first flight from the 40-foot hacking platform overlooking this pool. It is fitting that there is now an active, productive eagle nest in the Tschache Pool.

## MAY'S POINT POOL

**10** The 200-acre May's Point Pool is the refuge's largest shorebird management unit. In April and May, and again during early August to mid-October, water levels are slowly dropped to create a continuously wet band of exposed mudflats around the pool. In most years, the numbers and types of shorebirds using the area can be among the largest in central New York State. Waterfowl, especially the teals and shovelers, often use the pool during fall months. Most sightings of peregrine falcons on the refuge occur around this pool as this rare, swift falcon stalks its prey from among the large congregations of birds.

We truly hope that what you have seen and learned today has spurred your interest in discovering more about the fascinating relationships in wetlands. Numerous field guides, publications, and films are available about the subject. Talk to staff on national wildlife refuges, with State wildlife departments, and with private conservation groups. The world of wetlands and wildlife is your legacy to our nation's children, and to their children.



## U.S. FISH AND WILDLIFE SERVICE

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For further information, contact:

Refuge Manager  
Montezuma National Wildlife Refuge  
3395 Routes 5 & 20 East  
Seneca Falls, NY 13148  
Telephone: (315) 568-5987



DEPARTMENT OF THE INTERIOR  
U.S. FISH AND WILDLIFE SERVICE

## **1999 ARCHERY HUNT - MONTEZUMA NATIONAL WILDLIFE REFUGE**

**DATES:** November 1 - 20 and December 15 - 18 (no Sunday hunting).

**PERMIT CARDS & PARKING PASSES:** \*Must be picked up daily\*

- \* Daily permit cards available for the entire season at the Route 89 Check Station. Special accommodations are available to persons with a disabled hunting license or a Golden Access Passport.
- \* Complete **PART A** of the permit card at check-in and leave it with Refuge personnel or deposit it in the Part A box.
- \* Carry **PART B** of the permit card while hunting on the Refuge. Complete it at the end of the hunt day and leave it in the Part B box.
- \* Parking passes are to be picked up daily and displayed on vehicle dashboards.

**SUCCESSFUL OPENING DAY HUNTERS:** Must bring their deer to the Route 89 Check Station!

### **\*\*\* ADDITIONAL REGULATIONS \*\*\***

- \* Bows must be **disassembled, locked or cased before legal sunrise and after legal sunset.**
- \* **No advanced scouting.**
- \* **No boats or canoes on Refuge Pools. No hunting open water portions of Refuge Pools.**
- \* **Use or possession of alcoholic beverages is prohibited.**
- \* Tree stands must be removed at the end of each day - **no screw in steps!!!**
- \* Hunters are permitted on the Refuge **1 hour before legal sunrise (2 hours on opening day) and 1 hour after legal sunset.**
- \* Obey **ALL** signs. Do not block gates or roadways!!!

**RESPECT ADJACENT LANDOWNERS' PROPERTY - DO NOT TRESPASS!!!**

Montezuma National Wildlife Refuge  
3395 Route 5/20 East  
Seneca Falls, New York 13148  
(315) 568-5987

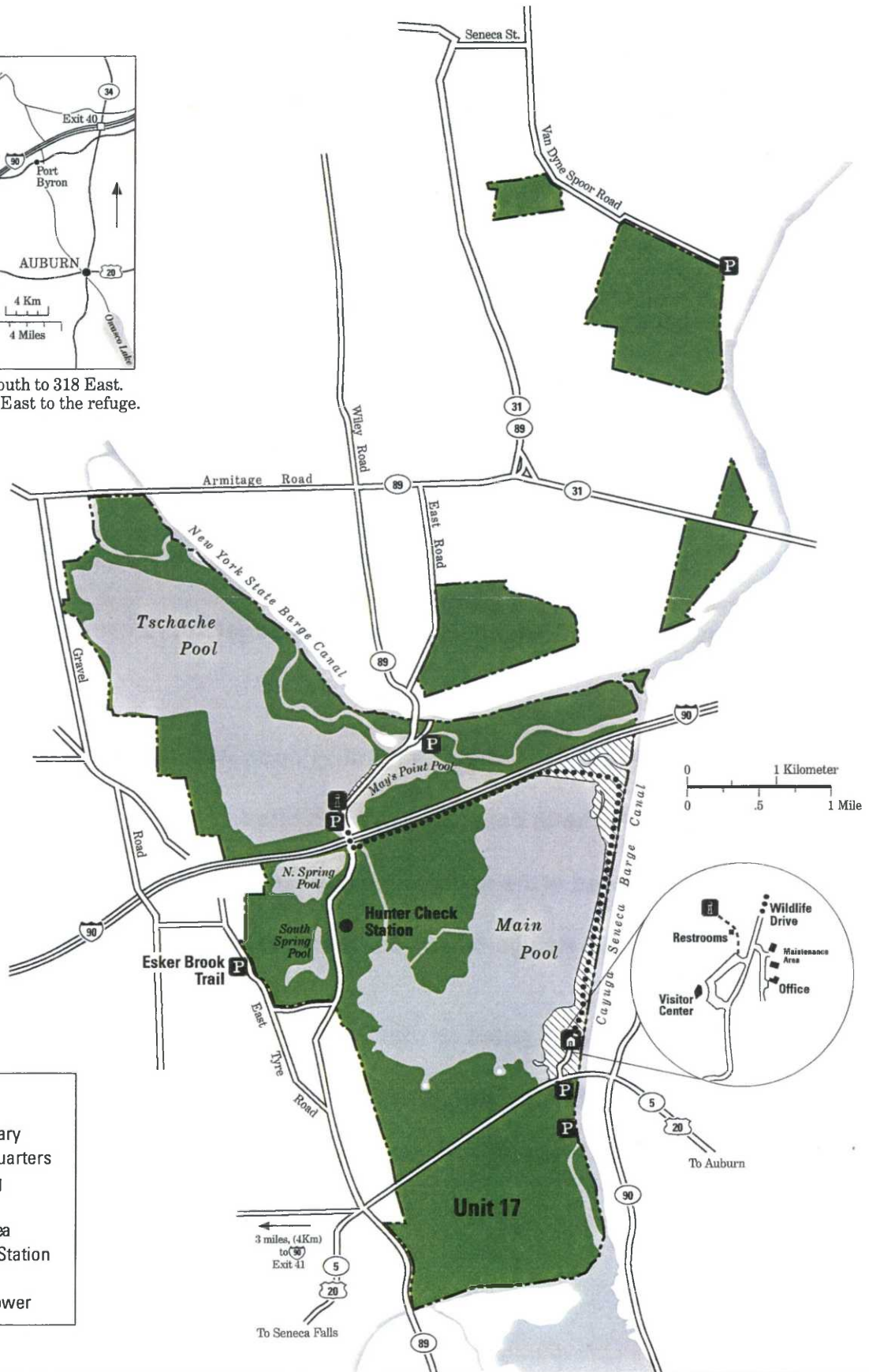


# Deer Hunt Regulations

## Montezuma National Wildlife Refuge



From I-90 take Exit 41 South to 318 East.  
Then take Routes 5 & 20 East to the refuge.



- Refuge Boundary
- Refuge Headquarters
- Hunter Parking
- Wildlife Drive
- No Hunting Area
- Hunter Check Station
- Hunting Area
- Observation Tower

**1999 FIREARMS HUNT REGULATIONS-MONTEZUMA NATIONAL WILDLIFE REFUGE**

**3,230 acres (1,307 hectares) in 8J and 601 acres (246 hectares) in 8F**

**DATES:** November 22 - December 4 and December 11-14 (no Sunday hunting).

**PERMIT CARDS & PARKING PASSES:** \*Must be picked up daily\*

- \* 115 permits available each hunt day on a first-come, first-served basis. Special accommodations are available to hunters with a disabled hunting license or Golden Access Passport.
- \* **Daily Hunt Permits** - available at the Route 89 Check Station from refuge personnel or on a self-service basis from the permit box.
- \* Complete **PART A** of the permit card at check in and leave it with refuge personnel or in the Part A box at the Route 89 Check Station.
- \* Carry **Part B** of the permit card while hunting. Complete it at the end of the day and leave it in the PART B box at the Route 89 Check Station.
- \* Parking Passes are to be picked up at check in and displayed on vehicle dashboards.

**SUCCESSFUL HUNTERS MUST BRING THEIR DEER TO THE ROUTE 89 CHECK STATION ON THE DAYS IT IS STAFFED.**

**\*\*\*ADDITIONAL REGULATIONS\*\*\***

- \* Hunters must wear on **THE HEAD, CHEST AND BACK** at least 400 square inches (2,600 square centimeters) = **a hat & vest, of SOLID BLAZE ORANGE**  
NO CAMO ORANGE or RED!!!
- \* Shotguns and muzzleloaders only - **NO HANDGUNS!**
- \* Guns must be **unloaded before legal sunrise and after legal sunset.**
- \* **No advanced scouting.**
- \* **NO boats or canoes on refuge pools. No hunting open water portions of the refuge pools.**
- \* Use or possession of alcoholic beverages is prohibited.
- \* Trees stands must be removed at the end of each hunt day - **No screw-in tree steps!!!**
- \* Hunters are permitted on the refuge **1 hour before legal sunrise and 1 hour after legal sunset.**
- \* Obey all signs - Do not block gates or roadways!

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Montezuma National Wildlife Refuge  
3395 Route 5/20 East  
Seneca Falls, New York 13148  
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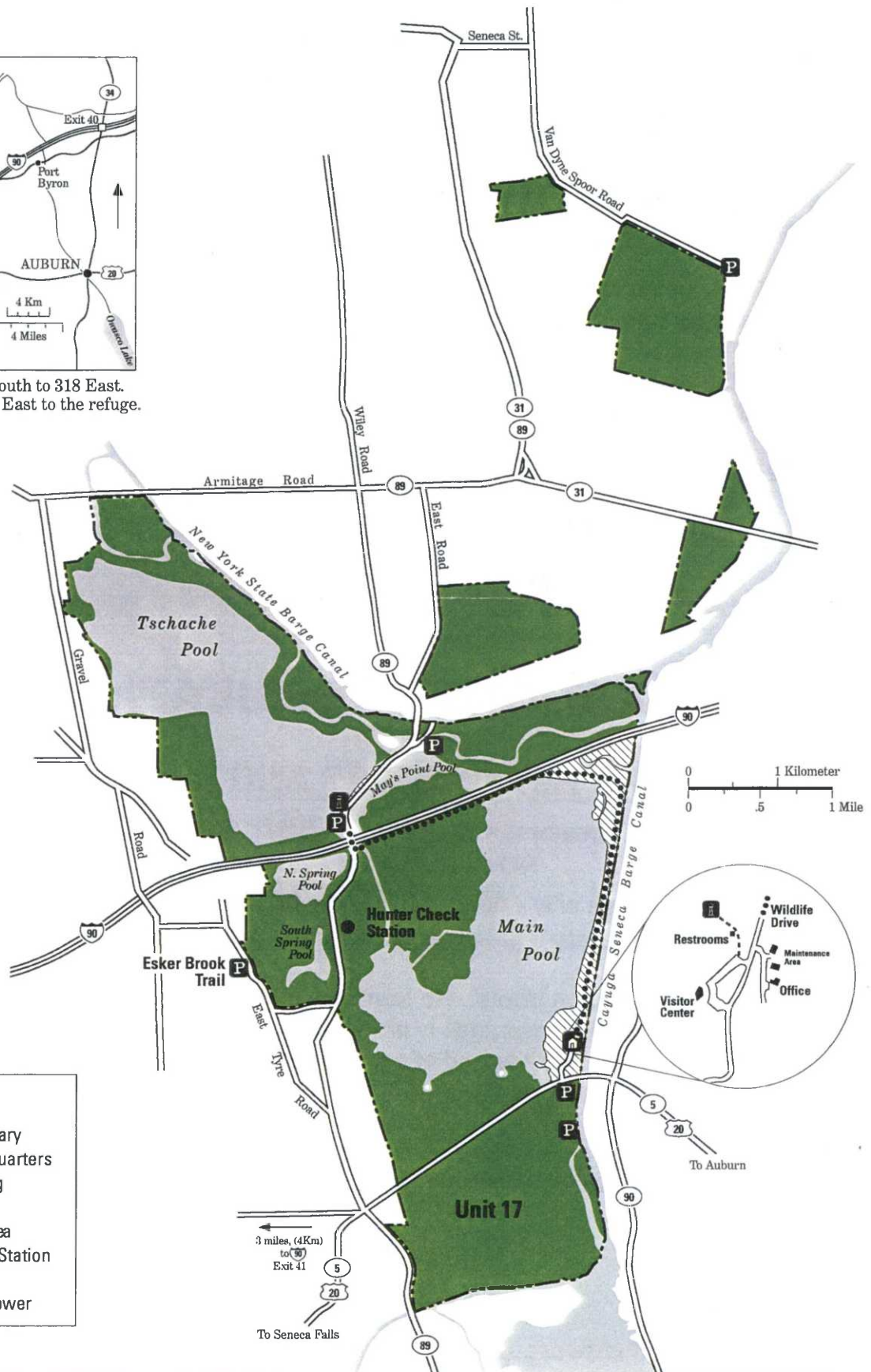


# Deer Hunt Regulations

## Montezuma National Wildlife Refuge



From I-90 take Exit 41 South to 318 East.  
Then take Routes 5 & 20 East to the refuge.



- Refuge Boundary
- Refuge Headquarters
- Hunter Parking
- Wildlife Drive
- No Hunting Area
- Hunter Check Station
- Hunting Area
- Observation Tower

## 1999 WATERFOWL HUNT - MONTEZUMA NATIONAL WILDLIFE REFUGE

**DATES:** Tuesdays, Thursdays and Saturdays from October 16 To November 20 or until conditions force the cancellation of the hunt.

**RESERVATIONS:** Up to 20 reservations per day (Maximum of 2 people per reservation).

\* Telephone reservations taken from **8:00am to 8:30am on Tuesdays, Thursdays and Saturdays for the next hunt day** (call Tuesday to hunt Thursday, call Thursday to hunt Saturday).

**\*\*\*RESERVATIONS FOR OPENING DAY WILL BE TAKEN ON THE DAY BEFORE - 10/15/99.\*\*\***

\* The reservation telephone number is **(315) 568-4136.**

\* All reservations are first-come, first-served. Persons with a reservation may bring 1 companion. Hunters reserve the parking area of their choice while making their hunt reservation.

\* All hunters with reservations (and their companions) **must check in at least 1 hour before legal shooting time or forfeit their reservation.**

\* Reservations unfilled / unclaimed by 1 hour before legal shooting time will be available on a first-come, first-served basis at the Route 89 Check Station. All regulations applicable to reservation hunters also apply to stand-by hunters.

\* Special accommodations are available to persons with a disabled hunting license or a Golden Access Passport.

**FEES:** A \$10.00 per reservation fee is required. If a person has either a Golden Age or Golden Access Passport, the reservation fee is \$5.00.

### ADDITIONAL REGULATIONS

- \* **Boats are required & limited to 1 boat per reservation.** Motors are prohibited. Hunting sites are selected in a free roam system.
- \* **Each hunter is limited to 15 non-toxic shells.**
- \* Hunting ends at **12:00 noon** local time. All hunters **must be checked out by 1:00pm local time.**
- \* **Successful completion of the New York State Waterfowl Identification Course, the Montezuma Non-Resident Waterfowl Identification Course or a suitable non-resident State Waterfowl Identification course is REQUIRED to hunt the Refuge.**
- \* Use or possession of alcoholic beverages while hunting is prohibited.

**VEHICLES BLOCKING GATES OR ROADS WILL RESULT IN A CITATION AND A FINE!**

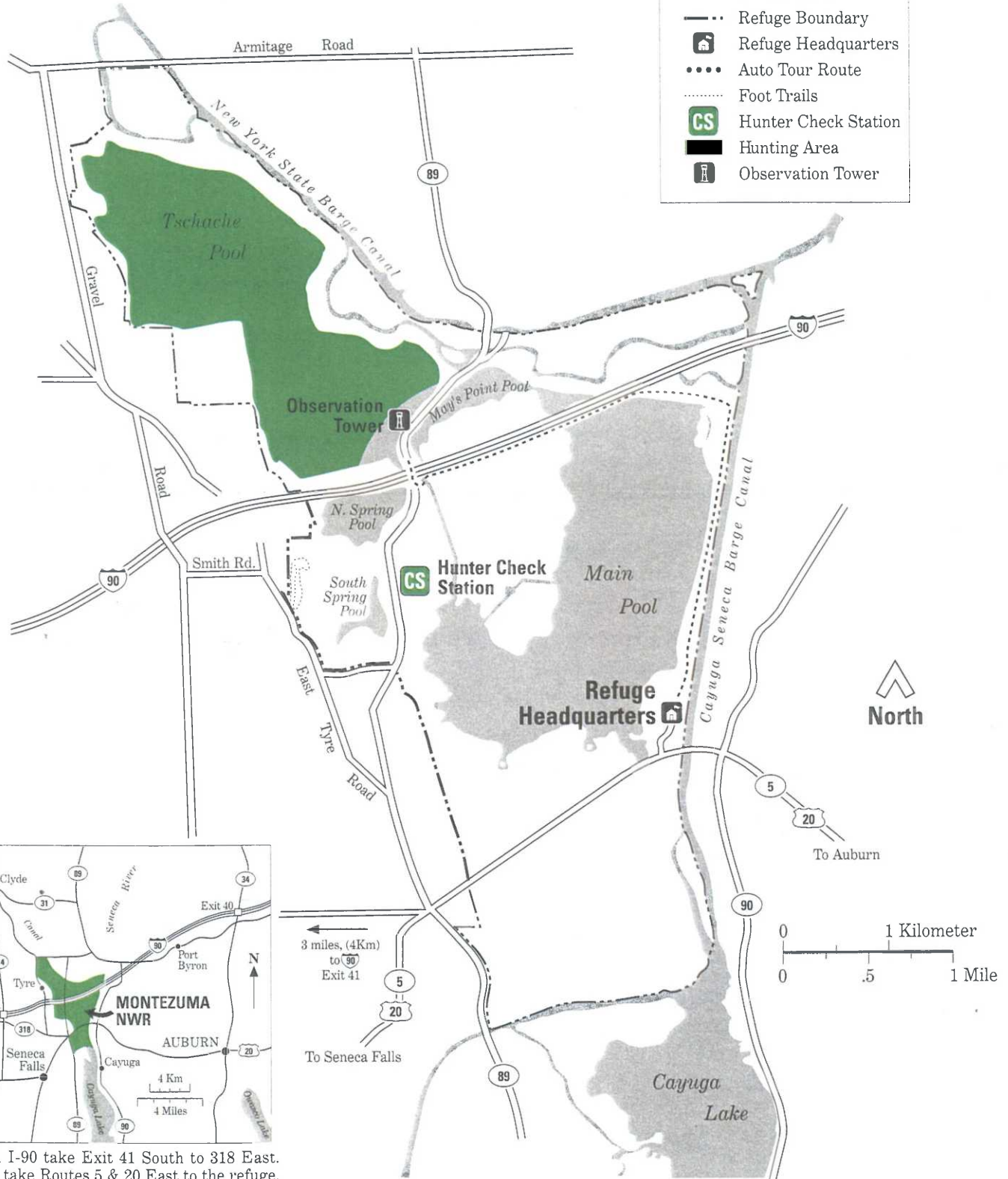
Montezuma National Wildlife Refuge  
3395 Route 5/20 East  
Seneca Falls, New York 13148  
(315) 568-5987

# Waterfowl Hunt Regulations

## Montezuma National Wildlife Refuge

### Legend

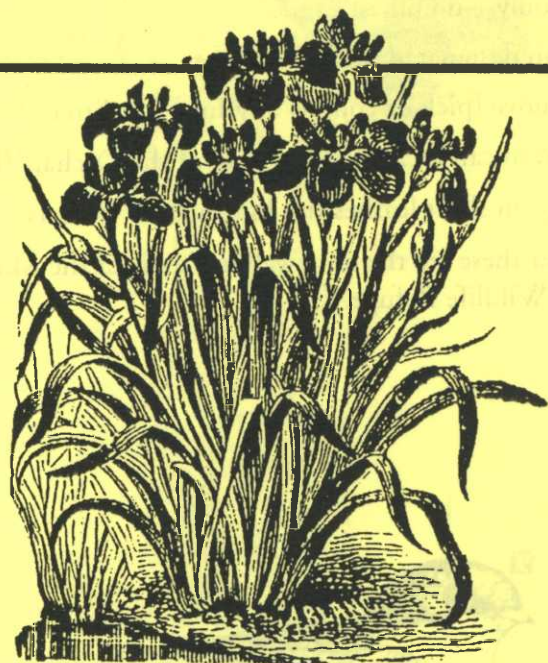
- Refuge Boundary
- Refuge Headquarters
- Auto Tour Route
- Foot Trails
- Hunter Check Station
- Hunting Area
- Observation Tower



From I-90 take Exit 41 South to 318 East. Then take Routes 5 & 20 East to the refuge.



# Esker Brook Trail



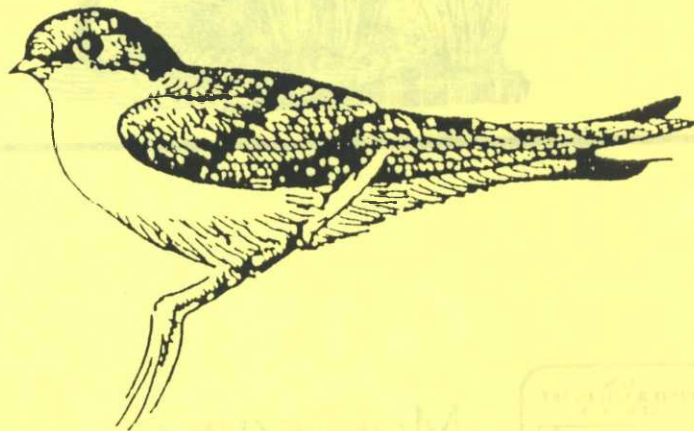
MONTEZUMA  
National Wildlife Refuge  
Seneca Falls, New York

## What's an Esker?

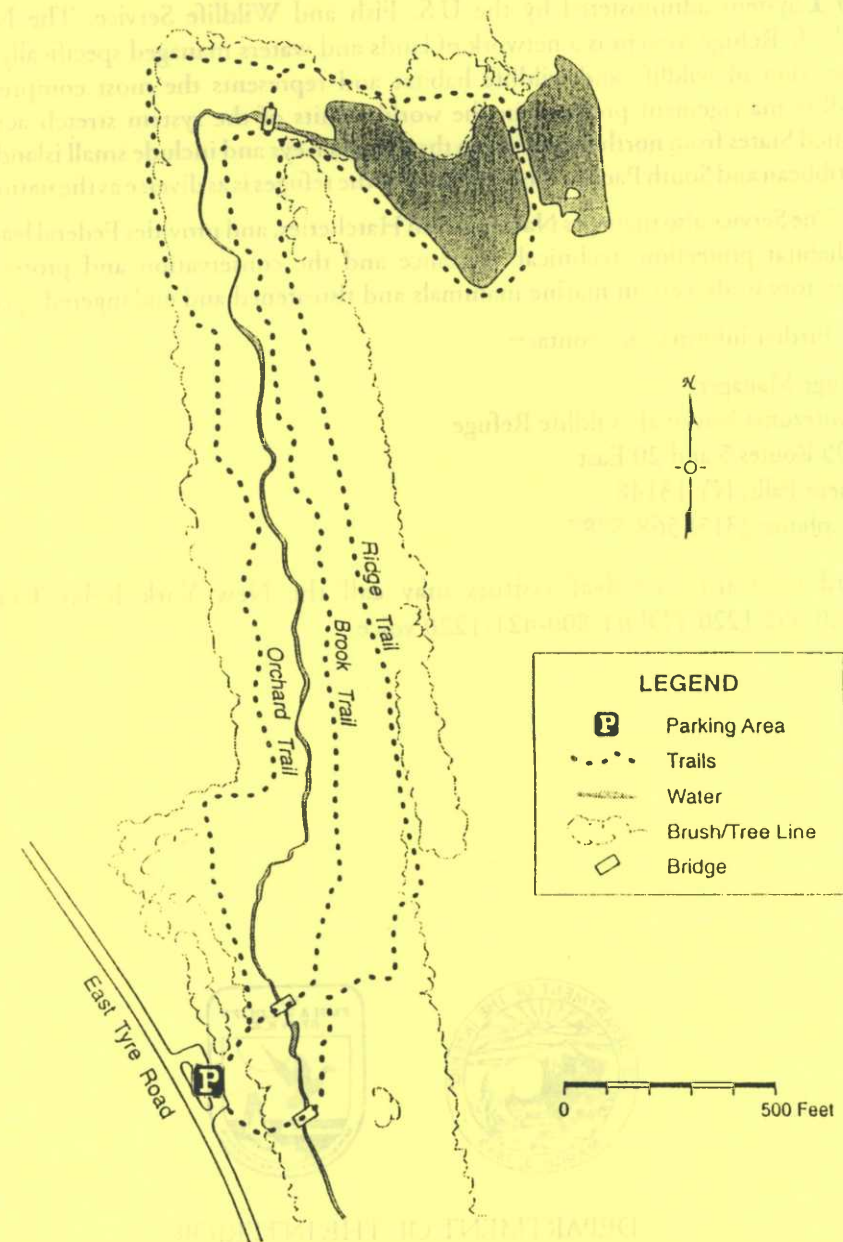
An *esker* is an elongated ridge of sand and gravel created by a stream flowing through a tunnel in a standing or retreating glacier.

## Please...

- Walking only—no bikes!
- Remain on designated trails.
- Don't remove (pick or collect) anything but litter.
- Use the trash can located at the head of the Orchard/Brook Trails.
- Keep dogs on short leashes (no longer than 10 feet).
- Remember these are the only walking trails of the Montezuma National Wildlife Refuge.



## Esker Brook Trail





## U.S. Fish and Wildlife Service

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Hard of hearing or deaf visitors may call the New York Relay Center at 1-800-662-1220 TDD/1-800-421-1220 voice.



DEPARTMENT OF THE INTERIOR  
U.S. FISH AND WILDLIFE SERVICE

March 1995