MONTEZUMA NATIONAL WILDLIFE REFUGE

SENECA FALLS, NEW YORK

ANNUAL NARRATIVE REPORT

CALENDAR YEAR 1992

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 1992

Refuge Manager — 04/15/93 Date

Refuge Supervisor Review — 5-17-93 Date

Regional Office Approval — 5-28-93 Date

INTRODUCTION

Montezuma National Wildlife Refuge is located at the north end of Cayuga Lake in the Finger Lakes Region of New York State. The refuge contains 6,432 acres and is situated in Seneca County. The refuge is 35 miles west of Syracuse, 40 miles north of Ithaca, and 45 miles east of Rochester. Land was initially acquired under Executive Order 7971, dated September 12, 1938. The purpose of the acquisition was: "...as a refuge and breeding ground for migratory birds and other wildlife...". For other lands acquired under the Migratory Bird Conservation Act (16 U.S.C. 715-715r), as amended, the purpose of acquisition was: "...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds".

Proposed objectives for the refuge are as follows:

1. Maintain and, when possible, enhance resting, feeding, and nesting habitat for migratory waterfowl and other migratory waterbirds.

2. Provide resting, feeding, and nesting habitats for bald eagles and ospreys (a state-designated threatened species).

3. Within constraints imposed by the two objectives above, efforts shall be made to provide adequate habitat diversification to permit the presence of self-sustaining communities and populations of other life forms that are typical of central New York State.

4. Provide opportunities for public wildlife education and enjoyment when these opportunities are compatible with the above objectives and the reasons for the area's establishment.

LAND TYPE INVENTORY

LAND CLASSIFICATION	ACRES	% OF TOTAL
Wetland Types:		
Riverine	42	.7
Palustrine	3,600	56.0
Bottomland Hardwoods	1,800	28.0
Upland Types:		
Grassland	560	8.7
Woodland	200	3.1
Brush	170	2.6
Administrative Lands (Bldgs., Parking, Roads, etc.)	60	.9
TOTAL REFUGE ACRES	6,432	100.0

Fall peaks of Canada geese approximate 50,000 birds; in spring this number has exceeded 100,000. Approximately 15,000 snow geese use the refuge in spring. Late fall use by mallards has annually approached or exceeded 100,000 birds. Use by American black ducks in the fall often reaches 25,000. Approximately 1,200 ducks and geese are produced annually.

Use of the refuge by other water-related avian species is significant. Bald eagles have been common at Montezuma since the hacking program was discontinued in 1980. They have been resident on the refuge since 1986, and first mated in 1987. Eagles have successfully nested on the refuge for five of the last six years, producing nine young. Two pair of osprey nested on the refuge during 1992, a rare occurrence for the interior of New York. There are also nesting colonies of black-crowned night-herons and great blue herons.

Wildlife education opportunities abound for refuge visitors. Approximately 150,000 persons visit the refuge annually. In addition to a stop at the Visitor Center, visitors may drive the 3.5 mile Wildlife Drive and walk the Esker Brook Nature Trail. Some 3,400 area school students are annual recipients of formal on-site and off-site wildlife education programs by trained teachers, volunteers, or refuge staff. Many teachers are involved each year in refuge-affiliated workshops.

INTRODUCTION

PAGE

TABLE OF CONTENTS i

A. HIGHLIGHTS 1

B. CLIMATIC CONDITIONS 2

C. LAND ACQUISITION

1. Fee Title . . . . . Nothing to Report
2. Easements 4
3. Other . . . . . Nothing to Report

D. PLANNING

1. Master Plan . . . . . Nothing to Report
2. Management Plans. 6
3. Public Participation. 6
4. Compliance with Environmental and Cultural Resource Mandates. 7
5. Research and Investigation. 9
6. Other . . . . . Nothing to Report

E. ADMINISTRATION

1. Personnel 14
2. Youth Programs. 15
3. Other Manpower Programs . . . . . Nothing to Report
4. Volunteer Program 17
5. Funding 19
6. Safety. 19
7. Technical Assistance. 20
8. Other Items 25

F. HABITAT MANAGEMENT

1. General 36
2. Wetlands. 36
3. Forests 43
4. Croplands . . . . . Nothing to Report
5. Grasslands. 47
6. Other Habitats. 48
7. Grazing . . . . . Nothing to Report

F. HABITAT MANAGEMENT (Continued)

8. Haying. . . . . Nothing to Report
9. Fire Management 48
10. Pest Control. 49
11. Water Rights. . . . . Nothing to Report
12. Wilderness and Special Areas. 51
13. WPA Easement Monitoring . . . . . Nothing to Report

G. WILDLIFE

1. Wildlife Diversity. 53
2. Endangered and/or Threatened Species. 54
3. Waterfowl 60
4. Marsh and Water Birds 67
5. Shorebirds, Gulls, Terns, and Allied Species. . . . 68
6. Raptors 71
7. Other Migratory Birds 71
8. Game Mammals. 72
9. Marine Mammals. . . . . Nothing to Report
10. Other Resident Wildlife 78
11. Fisheries Resource. 79
12. Wildlife Propagation and Stocking 79
13. Surplus Animal Disposal . . . . . Nothing to Report
14. Scientific Collections. 80
15. Animal Control. 80
16. Marking and Banding 81
17. Disease Prevention and Control. 84

H. PUBLIC USE

1. General 85
2. Outdoor Classrooms - Students 86
3. Outdoor Classrooms - Teachers 90
4. Interpretive Foot Trails. 90
5. Interpretive Tour Route 91
6. Interpretive Exhibits/Demonstrations. 91
7. Other Interpretive Programs 92
8. Hunting 96
9. Fishing 100
10. Trapping. 101
11. Wildlife Observation. 101
12. Other Wildlife Oriented Recreation . . . . . Nothing to Report
13. Camping . . . . . Nothing to Report
14. Picnicking. . . . . Nothing to Report
15. Off-Road Vehicling. . . . . Nothing to Report

H. PUBLIC USE (Continued)

16. Other Non-Wildlife Oriented Recreation . . . . . Nothing to Report
17. Law Enforcement 101
18. Cooperating Associations. . . . . Nothing to Report
19. Concessions . . . . . Nothing to Report

I. EQUIPMENT AND FACILITIES

1. New Construction. 102
2. Rehabilitation. 104
3. Major Maintenance 107
4. Equipment Utilization and Replacement. 110
5. Communications System 111
6. Computer Systems. 111
7. Energy Conservation 111
8. Other . . . . . Nothing to Report

J. OTHER ITEMS

1. Cooperative Programs. . . . . Nothing to Report
2. Other Economic Uses 112
3. Items of Interest 112
4. Credits 117

K. FEEDBACK - Nothing to Report

L. INFORMATIONAL PACKET

(Inside Back Cover)

A. HIGHLIGHTS

Despite a series of construction-related problems throughout most of the year, water from Cayuga Lake finally flowed from Cayuga Lake to Main Pool along the 1.2-mile Connector. After eight and a half years, the ditch is ready for use.

A station record of 1,181 ducks were banded at two land sites adjacent to the Main Pool during ten trap-nights of pre-season effort.

Record numbers of over 15,000 diving ducks and 3,500 American widgeon were observed for several weeks feeding on extensive beds of sago pondweed which covered much of the open water area within Main Pool.

Montezuma's first complete Biological Program Evaluation was conducted from July 13-15.

Refuge involvement in the Service's Partners For Wildlife Program was again focused upon the area within the immediate vicinity of the refuge. Four projects totalling over 200 acres were completed within the Northern Montezuma Expansion Proposal Boundary.

Montezuma staff were involved in the 1992 pilot Wetlands Reserve Program (WRP). The refuge was responsible for a geographic area covering 32 counties within New York State.

A second osprey nest was discovered in May. This second nest successfully fledged one young bird, bringing the total number of osprey produced at the refuge in 1992 to four.

The refuge's eagle "trio" again fledged two eaglets from the Tschache Pool nest. A second pair of eagles demonstrated strong nesting tendencies in the southern half of the pool.

The transfer of the New York State Barge Canal from the New York State Department of Transportation to the New York State Thruway Authority finally occurred in 1992.

Our YCC enrollees removed 5,000 feet of silt curtain along the lake connector ditch, installed several benches along Esker Brook Nature Trail, surveyed several miles of refuge boundaries, and completed a 3-day Spike Camp at the Tunison Laboratory of Fish Nutrition in Cortland, New York.

B. CLIMATIC CONDITIONS

Weather data are obtained from a weather station at the refuge headquarters, and also from nearby Locks 1 and 25 of the New York State Barge Canal System.

Weather for 1992 was cooler and wetter than in the past several years. Precipitation for the year totalled 46.79 inches: 55.5 inches of snow and 40.93 inches of rain. Overall precipitation was 12.25 inches higher than the 50-year average. In fact, June and October were the only months when precipitation was below the 50-year average for this area.

A recurring theme to remember the year 1992 - "Water, water everywhere, and what the hell are we supposed to do with it?"!! This shows the White Brook Structure on Tschache Pool being overwhelmed by flood waters from the adjacent Clyde River. Water is actually flowing into Tschache Pool through the Refuge's largest discharge structure.

Not surprisingly, high water conditions throughout the year made water level management virtually impossible. Inflow into refuge pools far exceeded our ability to discharge, and water levels in all impoundments far exceeded objective

levels. In July water from the New York State Barge Canal, adjacent to the refuge, overtopped the White Brook Spillway on Tschache Pool and the May's Point Pool Structure, allowing thousands of carp to enter both Tschache and May's Point Pools. The flooding negated all the work and success of last winter's drawdowns to reduce the number of fish in refuge pools. Drawdowns of the pools later in the year successfully reduced fish numbers.

Wet conditions also thwarted phragmites control efforts. All fields with normally tractor-accessible stands of phragmites had either standing water (several inches deep in some cases) or saturated soils.

Monthly precipitation and temperatures for the year are summarized in the table below:

1992 PRECIPITATION

Month	Snowfall (Inches)	Rain (Inches)	Total Prec. (Inches)	Temp (°F) Max	Min	41-Year Average Snowfall	50-Year Average Prec.
January	9.50	1.04	2.13	52	2	16.43	2.05
February	10.00	1.23	2.21	56	-2	16.16	2.31
March	19.50	2.32	4.67	60	0	9.25	2.82
April	.50	2.61	2.66	78	20	2.65	2.23
May		3.54	3.54	90	34	.01	3.36
June		.97	.97	90	40		3.05
July		10.98	10.98	86	50		3.56
August		4.83	4.83	86	49		3.27
September		5.47	5.47	86	34		3.03
October		2.46	2.46	74	26	1.80	3.25
November	2.50	3.56	3.74	62	20	4.72	3.38
December	13.50	1.92	3.13	48	8	15.33	2.23
TOTALS	55.50	40.93	46.79	90	-2	66.35	34.54

C. LAND ACQUISITION

2. Easements

The Refuge Manager at Montezuma National Wildlife Refuge has been designated as the Easement Manager when interest in lands is conveyed to the Service for inclusion into the National Wildlife Refuge System by the Farmers' Home Administration (FmHA). Authority for the conveyance of interest in these properties lies in provisions of the 1985 and 1990 Farm Bills. Montezuma's responsibility includes approximately 75% of all lands in New York State. The Cortland, New York Fish and Wildlife Enhancement (FWE) field office is responsible for recommending the conservation easement and assisting the Easement Manager in establishing administration over the easement property. The working relationship between Montezuma and the Cortland field office can only be described as excellent. Cooperation and coordination between the two offices has often made implementation of this program remarkably smooth and trouble free. We have nothing but praise for our professional brethren from FWE.

In New York, the Service has requested that conservation easements be placed on 98 FmHA inventory properties totalling over 3,900 acres. The easements range in size from one acre to over 330 acres, and are located in 29 counties across the state. The average easement is slightly larger than 31 acres in size.

The Service has asked the FmHA for formal fee title transfer on seven of the 98 properties identified for conservation easements. The names of the seven properties, acreage requested for fee title transfer, and property locations are as follows:

1.	R. Spengler	180 Acres	Cattaraugus County
2.	S. Pollock	160 Acres	Franklin County
3.	S. MacDougal	180 Acres	Steuben County
4.	T. Davis	152 Acres	St. Lawrence County
5.	F. Harris	335 Acres	St. Lawrence County
6.	P. Sutton	30 Acres	Wayne County
7.	W. Warren	37 Acres	Chenango County

During 1992, Biologist Gingrich completed site visits, landowner contacts, and Certificates of Inspection and Possession (CIP's) for nine FmHA Inventory Properties scattered across New York State. The nine properties, acreage of easement, location, and date of inspection were as follows:

Property Name	Easement Acreage	Location	Inspection Date
Harris	360.55	St. Lawrence County	January 2, 1992
Bogue	13.10	Yates County	March 6, 1992
Galens	28.43	Ontario & Wayne Counties	March 6, 1992
Valcore	28.00	Wayne County	March 6, 1992
Durham	28.00	Wayne County	March 10, 1992
Bond	15.18	Yates County	April 8, 1992
Fellion	75.83	St. Lawrence County	April 16, 1992
LaRock	72.11	St. Lawrence County	April 16, 1992
Moore	13.00	Washington County	May 13, 1992

D. PLANNING

2. Management Plans

The Sign Plan was completed November 5, 1992, and sent forward for Regional Office review and approval.

The following annual programs were prepared and approved during 1992:

1. Annual Water Management Program
2. Annual Pesticide/Chemical Proposal
3. Annual Trapping Program
4. Annual Hunting Program

3. Public Participation

On February 10, Hocutt addressed 135 persons in Ithaca, New York at the Monday Night Seminar Series at the Laboratory of Ornithology at Cornell University. The subject was the Northern Montezuma Wetlands Expansion Program and it's future. The involvement of the New York State Farm Bureau and the Cross Lake - Seneca River Association was discussed at some length.

On March 26, Hocutt was guest banquet speaker at the annual dinner of the Seneca County Federation of Sportsmen's Clubs. It was attended by 190 people. Hocutt's address covered Montezuma's marsh restoration program, Partners For Wildlife, NOMOWET, and other topics. Several NYSDEC officials were in attendance, along with outdoor writers and local officials.

On May 20, Hocutt spoke in Rochester, New York to 35 members of the Rochester Committee for Scientific Information (RCSI). RCSI is a "think tank" group of scientists from the University of Rochester, the Rochester Institute of Technology, and area high-tech industries who are committed to sharing information with media and the public and solving environmental problems.

Christenson spoke to 19 members of the Waterloo Lions Club on June 4. The discussion focused on the expansion but also included the alternate water supply, waterfowl population trends, bald eagles, and other minor topics.

On June 10 Hocutt addressed 40 members of the Genesee Ornithological Society (Rochester, New York) about proposed changes in the refuge's water level management regimen, as well as other shifts in management strategies.

On June 22, Biologist Gingrich presented a one-hour program on the refuge and current management programs to the Cato Rotary Club. Approximately 20 people attended the talk and participated in a question and answer session afterward.

On August 31, Hocutt hosted 20 members of the Cayuga County Federation of Sportsmen's Clubs at the refuge Visitor Center. A tour of the Cayuga Lake Connector was provided before the meeting. Hocutt also gave a briefing about the expansion proposal and the refuge's upcoming fall hunting seasons.

On September 8, Hocutt spoke to 40 members of the Skaneateles Garden Club about refuge management policies, and plans for improving the infrastructure (dikes, subimpounding, the Cayuga Lake Connector, etc.) which supports these policies.

On Sunday, September 20, Hocutt attended and spoke at the annual fall meeting/picnic of the Vanderbilt Marsh Gun Club. The group of 25 business/professional people own a 3,200-acre marsh just north of the refuge in Wayne County. Hocutt presented several areas of mutual concern to the refuge, the club, and the NOMOWET expansion program. We also reached tentative agreements in which we will provide technical assistance to them in terms of carp control, loosestrife management, and other topics.

On the evening of October 20, Hocutt hosted the Seneca County Federation of Sportsmen's Clubs. Management policies and subimpoundments were explained, and a major pitch for their support of NOMOWET was made.

4. Compliance With Environmental and Cultural Resource Mandates

During March of 1992 the refuge submitted a joint state and federal Wetlands Permit Application for repair work on 1,200 linear feet of the badly deteriorated Tschache Pool Dike. Application materials were prepared and submitted to the New York State Department of Environmental Conservation (Region 8) and the U.S. Army Corps of Engineers (Buffalo District). A brief project description follows.

The proposal involved the placement of approximately 800 cubic yards of upland borrow fill to rebuild the inboard embankment (pool side) of the dike to its original profile (4:1 slope). The dike top was not be raised in height above the current elevation. Approximately 185 cubic yards of medium stone riprap was placed for embankment protection. The original 4:1 slope was reestablished on the section of 50-year old dike.

The New York State Article 24 Freshwater Wetlands Permit was granted in May and the Corps Permit was issued in April under Nationwide Permit 33 CFR 330, Appendix A, Section B, No. 3. Construction on the project started in late September and was completed by mid-October.

During April of 1992 the refuge submitted an application to the New York State Department of Environmental Conservation for a Freshwater Wetlands Permit (Article 24) extension for use of a "Cookie Cutter" Dredge to rehabilitate approximately 52,800 feet of existing channels within the Main and May's Point Pools. The existing state permit expired in May of 1991 prior to completion of the project. The State granted a permit extension through October of 1993. Some work was accomplished on the project during 1992, and we hope to have the machine back in 1993 to finish the work.

During the early spring of 1991 a considerable amount of staff effort was devoted to writing an Environmental Assessment addressing a long-term proposal for rehabilitation of wetland impoundments on the refuge. The purpose of the rehabilitation proposal is to increase refuge management capabilities on existing wetland areas, create new wetlands, and increase water management flexibility on all refuge impoundments.

The Environmental Assessment proposed the rehabilitation of several existing water control structures, construction of additional water control structures, and the construction of several miles of interior (subimpoundment) dikes on Main and Tschache Pools.

During 1992 much progress was made on the first-stage implementation of this large-scale proposal. Regional Office engineering staff completed initial cost estimates for construction, and field surveying was completed for the Main Pool subimpoundment dike layout. A large amount of work is yet to be done, but the important first steps have been taken.

Once implemented, the Environmental Assessment and the new construction it details will provide a roadmap to guide refuge management actions for the foreseeable future. An urgent need currently exists to prevent further losses of wetlands and wildlife habitats in the vicinity of the refuge. Historically, the Montezuma Marshes were much more extensive than now exists. Uses and alterations of the landscape have dramatically reduced the quantity and quality of wetlands and wildlife habitats within the geographic area surrounding the refuge. These alterations have substantially reduced the functions and benefits these wetlands once provided. Many of the wetland conversion and

alteration activities continue today. To accomplish Service objectives, the additional management capability resulting from full implementation of the subimpoundment proposal is needed to offset further wetland losses in the historical Montezuma Marsh basin.

In both 1988 and 1989, the refuge prepared Section 7 Evaluations for winter drawdowns of refuge pools. Peter Nye, Endangered Species Program Coordinator for the New York State Department of Environmental Conservation, requested the evaluations to assess the impact of the drawdowns on the three adult bald eagles that have established a nesting territory encompassing the Tschache Pool area of the refuge. The drawdowns were initiated to reduce extremely high carp populations in refuge pools. We concluded, and Mr. Nye agreed, that the drawdowns in both 1988 and 1989 had little, if any, impact upon the eagles. It was determined that some fish would remain available in the pools after the drawdowns to supply food for foraging bald eagles. Fish would also be available in the river and canal system bordering refuge pools, and in the nearby Finger Lakes.

Based upon our experiences in 1988 and 1989, a less formal consultation process was followed in 1992 in planning for a winter drawdown of Tschache Pool. Refuge staff, together with Mr. Nye, agreed that the proposed drawdowns would have little adverse impact on the bald eagles. Past experience has shown that abundant food sources will remain for the eagles during and after the drawdowns. In the unlikely event that a food shortage developed, contingency plans were prepared to establish several eagle "feeding stations" within the birds' nesting territory. Road-killed deer carcasses or carp trapped from other refuge pools would be provided at such "feeding stations" as an emergency food source for the birds.

5. Research and Investigations

Work continued on one Research/Management Study during 1992. In addition, one Research/Management Study began during the year.

Montezuma NR90 - "Increasing The Nesting Productivity of Wood Ducks" (52550-21).

In 1990, Dr. Paul W. Sherman (Section of Neurobiology and Behavior, Cornell University) initiated a systematic investigation of the effects of nest box proximity and visibility on brood parasitism (dump nesting), nesting efficiency, and productivity of wood ducks. The goal is to more rigorously test a hypothesis (developed during previous

studies and supported by preliminary data) that nest boxes hidden in the woods near brood habitat are less often parasitized and produce more ducklings per egg laid in them than highly-visible boxes located over open water (singly or in groups). Based on the results, specific management recommendations will be made regarding the future placement of nest boxes at Montezuma and elsewhere. The objective of Sherman's research is to find a more cost-effective way to use the thousands of wood duck nest boxes that are presently scattered all over the United States to enhance the birds' nesting productivity.

Wood duck nest boxes were erected in three configurations: visible-isolated, visible-clumped, and well-hidden. The boxes will be monitored over three breeding seasons (1991-1993), and the following data will be recorded for each configuration: percentage of box use, clutch sizes, numbers of dump nests, nesting efficiency, and hatching success. At present there are about 100 boxes in use at Montezuma, the majority of which fall into the visible isolated or visible clumped categories. Approximately 30 boxes were moved so that they fit into the well-hidden category.

At the end of the three-year study period, enough information should be available to accept or reject the hypothesis that nest box proximity and visibility increase dump nesting in Montezuma wood ducks and decrease their per capita productivity. Information gathered during the three-year study should place the Refuge Manager in a position to make prudent and justifiable recommendations for managing healthy, growing wood duck populations.

Dr. Sherman's findings after one year of the this planned three-year study are quite dramatic. His findings are more fully discussed in Section G.3.

Montezuma NR92 - "Spatial Variability of Methane Emissions for a Typha latifolia Marsh (52550-22).

Dr. Michael A. Hardisky (Biology Department, University of Scranton) initiated this study to develop an empirical model relating macrophytic biomass above and below ground to measured methane emission rates. These methane emission rates will then be extrapolated to the entire refuge using Landsat Thematic Mapper imagery. Dr. Hardisky's collaborators on the project were Dr. Paul Wolf (Lebanon Valley College), Dr. Michael Gross (Marshall University), and Dr. Vic Klemas (University of Delaware). Scientists from NASA also participated in this NASA-funded project. Montezuma was chosen as a study site because it contains

extensive Typha marshes which can be easily studied using satellite imagery.

The study was not related to any refuge management problem. However, considering the current national interest in monitoring the health of wetland systems, the project is a demonstration of a technique which holds great promise for large-scale wetlands monitoring. A similar study is currently being conducted at the Prime Hook National Wildlife Refuge.

A brief description of the procedures used during the study follow.

Three sites were chosen within the refuge which represent a range in Typha biomass density and afforded easy access. At each site, two aluminum collars (one meter square) were placed over the vegetation and pushed into the marsh substrate. At monthly intervals beginning in May, teflon flux boxes were positioned over the vegetation and sealed to the collar. The dynamic flux chambers measured two cubic meters and were used for one day at each site. Methane samples were collected from the chambers and returned to the laboratory for analysis.

Concurrent with monthly flux measurements, the researchers also harvested a one-half square meter area of aboveground vegetation and removed six 21.5 cm diameter (50 cm deep) soil cores for analysis of root distribution at each site. An equilibrium pore water sampler was also deployed at each sample site. This sampler contains 66 water wells positioned at 1 cm intervals and covered with a teflon membrane. Water sampler data allowed the researchers to determine the dissolved methane profile within the marsh substrate. Field data collection procedures also included a variety of nondestructive remote sensing techniques to measure canopy spectral reflectance and the proportion of incident photosynthetically active radiation absorbed by the canopy.

The field data is used to assign methane flux rates and biomass values to appropriate spectral signatures found on the Thematic Mapper imagery. This allows development of an empirical relationship between the spectral and the methane/ biomass characteristics of the Typha canopy.

Results from the 1992 field work are not yet available. Dr. Hardisky hopes to gain additional funding to continue his work at the refuge during 1993.

E. ADMINISTRATION

Front Row (L to R): 8, 11, 12, 5, 10
Back Row (L to R): 6, 1, 7, 5 (92-2; MJN)

PERSONNEL

1. Grady E. Hocutt.....Refuge Manager, GM-13, PFT
2. Barrett L. Christenson.....Refuge Manager, GS-11, PFT
   (Transferred to Union Slough NWR, Iowa, effective 10/17/92)
3. J. Frederick Caslick..Outdoor Rec. Planner, GS-11, PFT
   (Transferred to Federal Aid, R5 Regional Office, effective 10/01/92)
4. Tracy A. Gingrich.....Refuge Biologist, GS-11, PFT
5. Judith A. McMahon.....Fiscal Assistant, GS-06, PFT
6. Nancy J. Estes.....Clerk/Typist, GS-03, PPT
7. Steven L. Flanders....Maintenance Mechanic, WG-10, PFT
8. Melvin J. Norsen.....Maintenance Mechanic, WG-09, PFT
9. Renee Robichaud.....Coop. Student, GS-07, PFT
   (EOD 5/31/92; LWOP effective 09/15/92)
10. Louise K. Dates.....Tractor Operator, WG-05, TFT
    (EOD 06/15/92)
11. Marva K. Smith.....Recreation Assistant, GS-04, TFT
    (Transferred to Great Meadows NWR 09/26/92)

Continued on next page.

12. Ian J. Drew.....Biological Technician (Wetlands Restoration Specialist), GS-05, TFT (EOD 05/03/92; Employed by FWE, Cortland, New York, and stationed at Montezuma indefinitely)
13. Robert G. Murray.....Biological Technician (Wetlands Restoration Specialist), GS-05, TFT (EOD 05/03/92; Employed by FWE, Cortland, New York, and stationed at Montezuma; terminated 09/19/92)

Cooperative Education Student Renee Robichaud. (92-3; TAG)

1. Personnel

Ian Drew and Robert Murray were hired by FWE, Cortland to work with the Partners For Wildlife Program and the Wetlands Restoration Program. Both employees were assigned to Montezuma Refuge to work with the Partners For Wildlife program in central and northern New York State.

Barry Christenson transferred to Iowa to accept the Refuge Manager position at Union Slough NWR. Congratulations to Barry on his promotion.

Fred Caslick was on a detail in the Regional Public Affairs Office for the period 06/14/92 - 09/30/92. Effective 10/01/92, Fred transferred to Federal Aid in the Regional Office.

Marva Smith transferred to Great Meadows Refuge in Massachusetts. Congratulations, Marva.

A summary of staff allocations for the last seven years is displayed below:

	Permanent		Temporary	
Total	Full-Time	Part-Time		FTEs
FY 1992	8	1	4	8.5
FY 1991	8	1	2	10.5
FY 1990	8	1	2	10.5
FY 1989	8	1	2	10.4
FY 1988	9	1	2	9.5
FY 1987	9	1	2	10.1
FY 1986	9	1	2	11.4

Although we were allocated eight full-time employees, we were very short-handed starting mid-June. Our Coop. Student was here for only three months, the Outdoor Recreation Planner took a detail to the Regional Office effective mid-June and then transferred there, and the Primary Assistant transferred in mid-October. Ian Drew, who was terminated from his temporary appointment with the Cortland FWE, was hired as a temporary Biological Technician (GS-5) at the refuge until he is again picked up by FWE in spring, 1993. By mid-October we had a skeleton crew "holding the fort".

2. Youth Programs

Montezuma's eight-week 1992 Youth Conservation Corps (YCC) camp began on June 29 and ended August 21, 1992. The enrollees were selected from five school districts (Waterloo, Seneca Falls, Port Byron, Clyde-Savannah, and Union Springs). The program consisted of three girls and four boys. Mary Jo Antonacci, a Biology and Earth Science teacher, was selected for a second year to serve as Group Leader.

In the past we have hired six enrollees; however, this year it was necessary to include an additional member to provide assistance in transporting enrollees to the various work sites using refuge vehicles. We had anticipated renting a 7-passenger mini-van as we have done for the past several years. The Solicitor's Office, however, dictates amending the contractor's "rental agreement" to correspond with the Tort Claim regulations. American International was the only vendor who, in the past, would allow us to amend their "rental agreement". However, in 1992, the newly-hired manager at American International decided not to allow us to amend their agreement. We contacted several other vendors; none would allow us to amend their "rental agreements". We were, therefore, forced to use two refuge vehicles.

Front (L-R) Keith Brophy, Bryan Van Riper. Back (L-R) George Guy, Jason Wittwer, Group Leader Mary Jo Antonacci, Jessica Bonnie, Janel McMahon, Renee Smith. (93-4; KH)

On June 30 all enrollees and the Group Leader completed an 8-hour First Aid Training Course.

Many valuable projects were completed by this very cooperative and enthusiastic group. Projects included: Removing five thousand feet of silt curtain from the "ditch" site; painting the Fur House, several picnic tables, and walls and floors in the Subheadquarters' Check Station; building and installing several benches along Esker Brook Nature Trail; maintaining bridges and upgrading trails at Esker Brook; boundary inspection along several miles of refuge boundaries; landscaping around the Headquarters Building and the Visitor Center; installing informational/ directional signs throughout the refuge; clearing vegetation around buildings, parking bumpers, and water control structures; upgrading kiosks and observation towers; and removing litter throughout the refuge on a weekly basis. In addition, the group participated in a two-day Spike Camp at the Tunison National Fish Nutrition Laboratory in Cortland, New York. Projects completed there included litter pickup and scraping posts and rail fences.

The enrollees worked cooperatively with each other, exhibiting enthusiasm and pride as they completed each project. During each of the various work projects, many environmental education concepts were discussed. These concepts included: Marsh vs. terrestrial ecology; plant succession; recycling of nutrients in an ecosystem; migration and migratory patterns; public impact on the environment; the purpose and function of wildlife refuges such as Montezuma; the biology and ecology of numerous wetland and terrestrial wildlife species; species evolution including natural selection of plant and animal traits; water quality (both surface and ground water); erosional forces and preventative measures to limit deterioration of the substrate; the effects of hazardous chemicals on the environment; and identification of aquatic and terrestrial organisms (plants, algae, fungi, and animals).

Field trips were planned to enhance the enrollees' understanding of major biological, ecological, and geological concepts. Field trips included Beaver Lake Nature Center, Cayuga Nature Center, Tunison Laboratory of Fish Nutrition, the Syracuse Zoo, and the Laboratory of Ornithology at Cornell University.

Included in the educational experiences were several sessions spent with refuge personnel discussing topics such as: wetland ecology and restoration, the reintroduction of the American Bald Eagle to New York State, and refuge management techniques in dealing with problems pertaining to purple loosestrife and the increasing carp population.

In addition, YCC members toured sections of the refuge with Refuge Manager Grady Hocutt and Assistant Refuge Manager Barry Christenson, where they were shown sampling techniques and allowed to observe, handle, and identify various forms of aquatic vegetation and invertebrates.

Two special programs were presented to the enrollees by Refuge Biologist Tracy Gingrich and the Seneca County Health Department to increase awareness regarding the potential threat of Lyme Disease and rabies in our area.

In conclusion, the enrollees benefitted from their work experiences at the refuge. They learned how to work together and function as a group, cooperate and share ideas with one another, follow specific directions, and take pride in their accomplishments and themselves. The enrollees were presented with many unique and positive experiences, and were given the opportunity to interact with and learn from a variety of people. The 1992 YCC enrollees finished the program with a sense of pride, dedication, and a much more positive attitude toward the environment. It was a very good year.

4. Volunteer Program

Four new volunteers were recruited during 1992. The 27 volunteers provided over 2,500 hours of service to the refuge. Volunteers continue to be vital to the success of the refuge's public use program. Additionally, volunteers assisted with several biological programs. Refuge volunteers accomplished or assisted with the following tasks: Visitor Center operations, guided tours, group presentations, office assistance, New York State Fair exhibit assistance, wood duck nest box replacements and survey, waterfowl banding, bald eagle and osprey nest observations, several maintenance projects, and photography of refuge programs and projects.

Quarterly volunteer meetings provided excellent opportunities to exchange information and ideas among volunteers and staff. Volunteers receiving special achievement pins in 1992 were:

Grace Schaffer - 1,000 hours
Ed Klein - 500 hours
Yvonne Klein - 500 hours
Mary Dreiling - 250 hours
Kevin Holcomb - 250 hours
Adam Kozlowski - 250 hours

Two very dedicated volunteers left us for college in August. Kevin Holcomb attends the State University of New York College of Environmental Science and Forestry at Syracuse, New York. Volunteer Adam Kozlowski attends Cornell University in Ithaca, New York. Both Adam and Kevin provided many hours of service, ranging from Visitor Center assistance to wood duck nest box replacements. Adam and Kevin each received a certificate of appreciation and a carved waterfowl decoy. We certainly miss them, and wish them the best.

Refuge Volunteer Kevin Holcomb receiving a Certificate of Appreciation and a carved wood duck decoy from Recreation Aide Smith. (93-5; BC)

Volunteer funding allowed us to purchase new volunteer shirts. The volunteer emblem was silk-screened on beige golf shirts. The shirts proved to be a big hit, as they are more aesthetically appealing than the standard volunteer tee shirt with the large, target-sized emblem. Nine volunteers were honored on September 15 at a dinner at the Deerhead Inn.

5. Funding

	FY 1988	FY 1989	FY 1990	FY 1991	FY 1992
1261 & 1262 - O & M; ARMM; Resource Prob.; Fire	$433,445	$403,933	$412,302	$612,146	$486,406
4960 - Entrance Fee O & M	0	4,308	0	0	0
6860 - Expense For Sales	2,000	2,000	2,000	2,000	2,000
8610 - Quarters Rehab.	3,429	3,556	5,200	5,741	5,700
1261 - YCC	0	14,280	14,280	16,665	16,732
9120 - Fire	0	0	3,500	2,500	500
1230 - Wetlands Restoration	0	0	0	20,240	2,785
TOTAL	438,874	428,077	437,282	659,292	514,123

The Regional Office paid Outdoor Recreation Planner Fred Caslick's salary while he was on a special detail there. The salary savings of $15,000.00 were used to purchase gravel for the Unit 17 ditch project and for reimbursable travel expenses incurred by other refuge personnel.

The refuge was allocated $40,000.00 to complete a stabilization/repair erosion project. We spent $22,000.00. The balance was used to purchase a Chevrolet Suburban vehicle.

A new 4x4 pickup truck was ordered at the end of the fiscal year for $11,000.00. Unfortunately, processing was not completed in the Regional Office and the money was lost. The "aging" of our vehicle fleet was further accelerated.

6. Safety

Three no-lost-time accidents occurred in 1992.

During an inspection of an old WWII portable bridge on June 6, 1992, Refuge Manager Hocutt fell through girders with his left leg and struck his chest on an adjacent girder. Hocutt suffered a fractured rib and a large hematoma over the left knee.

While removing vegetation around a water control structure, YCC Enrollee Janel McMahon was bitten on the ear by an unknown insect. She received medical attention and

prescription medication to treat her red, swollen, and sore ear.

In late July, Biological Technician Ian Drew developed a rash similar to a Lyme Disease reaction. The rash appeared nine days after working in Suffolk County, Long Island. Drew was inspecting sites for possible inclusion in the Wetland Reserves Program. He received medical attention from Geneva General Hospital and Laboratory.

Refuge staff and volunteers attended a New York State-Certified Defensive Driver Course on January 14th.

Staff safety meetings were held throughout the year. In addition to Regional and Service-wide safety alerts, topics included snowblower/snow removal safety, CPR Certification, Standard First Aid Certification, lawn mower safety, Rabies and Lyme Disease information, and Check Station safety.

Quarterly public use facilities inspections were conducted to identify and correct problems that possessed potential safety problems for refuge visitors. New signs were installed on observation towers and the Visitors Center deck cautioning visitors to avoid use during electrical storms and warning them about slippery conditions that develop during wet and freezing weather.

7. Technical Assistance

Hocutt spent the first 15 days of January researching, talking to "experts", and completing the writing of the "Waterfowl Management - Waterfowl Hunting Issue" section of Refuges 2003. This work included both the "Environmental Consequences" (Chapter 4) portion and the "Affected Environment" (Chapter 2) portion. This latter work followed our efforts on behalf of the national follow-up Refuges 2003 questionnaire that went out in early December. This "total immersion" process raised hell with Christmas week, New Year's Day, weekends, and evenings right up until January 15th. The more one researched, read, and talked to experts, the more one realized just how flimsy are some of the suppositions underlying many of our decisions about waterfowl management and waterfowl hunting on refuges. Hocutt was asked again in March to critique an "edited" version of his 2003 section. He again advised that the conclusions were not consistent with his findings nor the national survey. Hocutt asked that his name be taken from the document. In April, Hocutt was asked to write portions of the R5 comments upon the Draft.

Throughout the month, several staff members assisted New York State Department of Environmental Conservation Region 7

Biologists with the ongoing winter Canada goose banding project on Cayuga Lake (see Section G-16).

Formal seminars were presented during the year to the following college classes:

1/22 University of Maine (at Orono); "Ethics and Professional Responsibilities in Resource Management" (Hocutt/40 majors).

2/7 Cornell University (at Ithaca); "Marsh Management and Purple Loosestrife" (Hocutt/25 Agronomy Department faculty and graduate students).

4/7 The State University of New York at Syracuse College of Environmental Science and Forestry (SUNY-ESF) (on refuge); "Federal Wetlands Management and the National Wildlife Refuge System" (Hocutt/35 juniors and seniors).

4/24 Cornell University (on refuge); "Noxious Weed Management" (Hocutt/16 Agronomy Department faculty and graduate students).

9/27 SUNY-ESF (on refuge); "Banding, Aging, Trapping, and Handling Techniques for Waterfowl" (Hocutt and Gingrich/50 members of SUNY-ESF Student Chapter of the Wildlife Society).

10/3 SUNY-ESF (on refuge); "Wetland Management" (Smith/40 Birds and Mammals class students).

10/15 SUNY-Binghamton (on refuge); "Canada Goose Overwintering" (Hocutt/15 Animal Behavior class students).

12/2 SUNY-ESF (at Syracuse); "Ethics in Resource Management" (Hocutt/95 junior, senior, and graduate students).

Throughout the year, Hocutt spent considerable time revising drafts, correspondences, economic studies, etc., pertaining to controversial aspects of the proposed St. Lawrence Valley NWR.

Hocutt met on March 31 with Jorge Negron, District Ranger of the Finger Lakes National Forest, along with Assistant Rangers Joel Fisk and Mark Welch. At issue was a proposal by Ithaca and Cornell University activists to force the U.S. Forest Service to adopt a "rewilding" plan for the forest. The proposal suggested such things as closing roads, stopping all timber stand removal, limiting access, reintroducing the eastern timber wolf, etc. We learned that the group had also sought to incorporate the refuge and the NOMOWET area into the concept. At Negron's request, Hocutt agreed to serve as a panelist on April 4th at a conclave

("Finger Lakes National Forest - Wild!") to be held at the Cayuga Lake Nature Center in Ithaca.

On April 4th each of the participants stated their positions during the morning session. The formal panel began at 12:30 p.m. and lasted until 6:30 p.m. In addition to Negron and Hocutt, panelists included: Dave Foreman, founder of Earth First and now editor of "Wild Earth" magazine; biodiversity "expert" and author Dr. Stewart Noss; the Chief Forester for the New York State Department of Environmental Conservation Department; the New York State Director of the Sierra Club, and others. Hocutt's observations about the potential negative effects of such efforts upon an already suspicious community, upon the forest itself, and especially upon the USFWS/NYSDEC expansion proposal were not well received by the activists and some panelists. A couple of exchanges between Noss, Foreman, and Hocutt were heated. This was a classic example of "biodiversity" carried to ridiculous and harmful extremes. Hopefully, our involvement helped derail this ill-conceived concept.

The refuge hosted the regionwide B.E.S.T. Contaminants Workshop during the week of March 9th. Approximately 35 persons attended. Several of our staff provided major logistical support.

Christenson was detailed to the Regional Office from March 16-20 to sit in for RF-N.

Caslick was detailed to the Regional Office during the weeks of March 23rd and March 30th to assist PAO with a position description for the Environmental Educator's position.

The refuge hosted the regionwide Wetlands Restoration Workshop during the week of March 23rd. Approximately 40 RF, FWE, and NYSDEC biologists participated. Several refuge staff participated, and also provided demonstrations and major logistical support to the effort. The very successful workshop covered subjects ranging from hydro-engineering, soil analysis, watershed evaluation, surveying, and construction techniques.

ORP Caslick attended the Region 5 FWE meeting on March 16-17 in Ellenville, New York. Caslick spoke on "Watchable Wildlife".

On March 24, Biologist Gingrich did an interview with Laura Hand of Syracuse television station WSTM-TV (NBC). The subject was Canada geese, migration, behavior, etc.

During April, Hocutt provided formal documents regarding waterfowl management and waterfowl hunting on refuges for

the Regional Director's comments about the Draft Refuges 2003 EIS.

Flanders travelled to Blackwater NWR on his way back from LE training in April and taught a one-day heavy equipment course on hydraulic excavator safety for five Blackwater employees.

Hocutt met on May 14th with Paul Lattimore, a business and civic leader in Auburn, New York, to discuss a number of matters of mutual concern -- the Governor's Flood Advisory Council (Lattimore and Hocutt are appointees), the NOMOWET proposal, and possible Challenge Grants.

At the request of the Regional Office, ORP Caslick assisted with two station/site dedications during May. He travelled to Dover, Delaware for a planning meeting over the 4th and 5th, with staff from Bombay Hook NWR and the Delaware Bay Estuary Program. He returned to Delaware to help with logistics for the ceremony dedicating the marsh as a RAMSAR international site. Later in the month, as part of a regional ORP team, Caslick assisted with planning for the dedication of Ohio River Islands NWR. He travelled to Parkersburg May 26-29 to help finalize logistics and assist with the dedication.

Flanders travelled to Erie Refuge June 10-11 to teach heavy equipment training for three persons.

At the request of NYSDEC wildlife personnel, Manager Hocutt and Co-op Student Robichaud participated in the annual Wilson Hill WMA Goose Roundup. The large contingent of biologists and volunteers captured and banded over a thousand birds at the St. Lawrence Valley location.

ARM Christenson was appointed to the Seneca County Water Quality Committee headed by Bill Cool, Seneca County Soil and Water Conservation District. This Committee is charged with developing and implementing a county-wide strategy for improving water quality. Addressing non-point pollution through improved land management is a key element of this strategy.

On July 9, Hocutt did taped interviews with Holly Bally to provide background materials about wetlands values for two syndicated radio spots -- "Bird Talk" and "Enviro minute". Both programs are tied to Cornell's Laboratory of Ornithology, and air in over 50 cities.

Hocutt reviewed draft reports from Cornell University for possible economic impacts of the proposed St. Lawrence Valley NWR. He attended meetings on August 3rd and 4th in

the Regional Office on the same subject. Several telecons were held with planners from Cornell.

During the period August 25 - 27, the refuge hosted the Northern Zone Project Leaders' Conference. The entire refuge staff played key roles in assuring the success of the conference and in assisting participants and speakers.

On September 9, an inspection of Montezuma's hunting fee program was carried out by the Department of the Interior's Office of Inspector General. Auditor Marion Watson and her staff spent an afternoon with refuge staffers McMahon, Gingrich, and Hocutt. Once again, we were discouraged at the apparent gap between what the central office perceives that we do and the real world of what a small staff can physically and logistically accomplish in handling fee programs. Hocutt took the auditors on an airboat and vehicular tour of the refuge after the audit was completed.

On October 15, Hocutt served as the "entire" Environmental section at a Career Day for grades 9-12 at Mynderse Academy (Seneca Falls High School) for students from Mynderse, South Seneca, and Waterloo High Schools. Despite staffing shortages, this long-standing commitment was honored because Dick Compo, President of the Seneca County Chamber of Commerce (and a staunch refuge friend in recent years) specifically requested our involvement.

On October 15, Hocutt provided a management tour for David Kline, Central/Western New York State Director of The Nature Conservancy, and 15 of their major contributors. The visit included a lengthy presentation about NOMOWET, and the fact that we obviously needed their money and appreciated it deeply -- but we also needed their political support!!

On the evening of October 29, we hosted a joint meeting of the Seneca County and Yates County Sportsmen's Clubs at the Visitor Center. The 40 people listened to Dr. William Porter, Professor of Wildlife Management, SUNY College of Environmental Science and Forestry at Syracuse, present the results of his 15 years of research with deer in New York State. This was another "pay-back" for the small mammal hunt issue.

On November 10, Hocutt met with Peggy Murray and Jim Petreszyn of the Oswego County Planning Board to discuss purple loosestrife management. In addition to sharing our successes (and failures), we provided them with an extensive literature cache.

On November 25, at the request of the Greater Rochester/Finger Lakes Film Advisory Board, Hocutt met with Executive Field Director Smoky Forrester and Field Director

Dan Jones of Pathway Productions. The half-day visit was to explore use of refuge locations for an upcoming documentary. The 8-hour miniseries, "500 Nations", is being produced by actor Kevin Costner, and will be aired on CBS-TV in early spring, 1995. The subject will deal with native cultures from Alaska to Costa Rica. Refuge locations, if used, will typify habitats of northeastern (Iroquois Confederacy) Indians before the white man. Filming will overlap several seasons, and could occur here in spring and summer of 1993.

8. Other Items

Northern Montezuma Wetlands Project ("NOMOWET") Joint Venture:

1992 was a slightly more tranquil year in the NOMOWET proposal than in 1991 when the FEIS was released and numerous brushfires (and a couple of major blazes) erupted between the New York State Farm Bureau and the Service. Still, 1992 was a year of great activity in NOMOWET. Much of the work had to do with continued coordination with state colleagues with New York State Department of Environmental Conservation. The refuge continued in 1992 to provide space in the Fur House for a NYSDEC Field Office for NOMOWET.

On February 11, Hocutt met with John Proud (Regional Wildlife Administrator) and Ward Dukelow (Senior Wildlife Biologist), NYSDEC R-8, Cortland, New York, to discuss the opposition of the Cross Lake - Seneca River Association to all private lands initiatives by the Service or State in the Oswego River Drainage. Several strategies were considered and plans were formulated to meet with the NOMOWET team to discuss a more pro-active stance in the issue.

On February 20 a meeting was held in the Visitor Center with NYSDEC colleagues to explore directions and decisions for NOMOWET. The State was represented by Director Ken Wich and several key regional biological and realty staff, including Dave Woodruff (R-8), Larry Myers (R-8), Bruce Robinson (R-8), Wes Stiles (R-7), and others. The Service was represented by Bob Miller, Don Frickie, Dick Dyer, Hocutt, and Christenson. On the preceding evening (the 19th), Service participants met in the refuge conference room to outline and establish Service priorities for NOMOWET. The Service and State presented the current status of their respective efforts, and discussed possible future directions. A number of areas for interagency cooperation were explored (educational extension, private lands initiative, etc.). The proposal to acquire portions of the Roger Waugh farm and potential consequences for both agencies were discussed. The meeting was productive and did much to assuage concerns of Director Wich and other state

staffers that Service commitment to NOMOWET was less than the State had expected. We believe the meeting established important cooperative bridges for Service interests in St. Lawrence County and other state/federal areas of shared interest.

On March 19, Hocutt and Gingrich hosted staff from the Trust For Public Lands Mid-Atlantic Regional Office to discuss acquisition and NOMOWET. Chrisanne Fuhrman and Heather Lehman spent most of the day at the refuge in discussions and on a tour of the proposed acquisition lands. They wish to return as soon as we complete the "re-do" of LAPS and the Project Priority Plan. Due to training and special details, we haven't the foggiest notion when all of this will occur.

On March 26, Hocutt and Gingrich met at the refuge with Andy Zepp of The Nature Conservancy to discuss NOMOWET and the role of TNC in acquisition. Again, we had to defer further substantive discussions until LAPS is redone and PPP is done.

On June 18, Hocutt met with Ms. Heather Lehman of the Trust For Public Lands to discuss possible acquisition strategies for the Northern Montezuma Complex. An airboat tour of the refuge and a vehicular tour of the expansion area was also conducted.

1992 also involved the potential purchase of land (the first since 1940!) under the auspices of NOMOWET. Several nearby landowners approached the refuge to express their interest in selling property to the Service during 1992. Information on two properties was forwarded to Realty with our comments stressing their value and importance to the refuge under the Northern Montezuma Wetlands Expansion Project. The two projects are:

1. George Dinsmore - The approximately 80-acre tract comprises the northern half of "Eagle Island" at the northwest corner of the existing refuge boundary. The parcel is predominantly seasonally-flooded hardwood forest surrounded by the New York State Barge Canal and the Clyde River.

2. Ward Russell - Two parcels totalling approximately 86 acres. Both tracts are predominantly emergent cattail marsh with small areas of seasonally-flooded woodland. Both marshes were managed by Mr. Russell for cooperage flag for many years, and they still appear to be in very good condition. Both parcels are located near the present refuge boundary northeast of Tschache Pool.

In 1991, information on the Roger Waugh tract, which adjoins the western boundary of Tschache Pool, was forwarded to Realty. The property is actively managed for pasture, corn, alfalfa, and winter wheat. The property's juxtaposition to Tschache Pool makes it a highly desirable location for goose hunting, and our concern has always been that it would be purchased by a hunting group for that reason.

On May 1, 1992, the Service's offer of $1,218.00 per acre for 53.08 acres of land was accepted by Roger Waugh. The purchase offer included a provision that it could be accepted and executed by the Service at any time within twelve months. We expect the completion of the transaction will occur during early 1993, and the Refuge will have made it's first acquisition at Montezuma since the early 1940's.

New York State Barge Canal

1992 was a very active year for a number of interactions between the refuge, the New York State Barge Canal (our boundary on three sides), and our mutual antagonist downstream -- the 1,200 member Cross Lake - Seneca River Association.

Hocutt continued his role as a member of the Governor's Central New York State - Finger Lakes Regional Flooding Advisory Committee. This included attendance at a number of meetings in Syracuse as well as review of several drafts of the revised scope of study for the 1.2-million dollar study of alleged flooding along the Seneca River between the refuge and Syracuse. Finally, at the March 18, 1992 meeting, several members were able to form a block which voted to approve the proposed study. William Jaynes, President of the Cross Lake - Seneca River Association, continued his efforts to the bitter end to prevent a vote undesirable to his group's agenda. Hopefully, the return of this controversy to the technical experts (U.S. Army Corps of Engineers) will "buy" a period of respite from our more intensive involvement.

Meanwhile, the long-awaited transfer of the 535-mile long New York State Barge Canal System from the New York State Department of Transportation to the New York State Thruway Authority finally occurred. Governor Cuomo's proposed "Canal 2000" program to turn the entire canal into a statewide development was passed by the legislature in late 1991. Since the refuge "lives or dies" with the canal system, this change has profound consequences for our water management programs.

On February 14, Hocutt met for half a day with Katherine Wolf and Rick Manning, consultants and landscape architects

with the firm of Trowbridge Associates of Ithaca, New York. The firm is a contractor to New York State for first-phase implementation of conversion of the NYS Barge Canal to a 535-mile long state recreational waterway (Proposition 3 on last November's statewide ballot). It was important that we got a first interview with these people before the Cross Lake - Seneca River Association. A great potential threat to wildlife habitats along the canal (and refuge water programs and NOMOWET) is that the order of priority in the proposition was (1) economic, (2) recreation, and (3) conservation (whatever that is!). Hocutt provided slides to Ms. Wolf for her presentations throughout central NYS.

During the first half of the year, Hocutt held several informal and formal meetings with officers of adjacent county sportsmen's federations, the New York State Sportsmen's Council, the New York State Federation of Bird Clubs, local birders, and others to urge them to ensure that wetlands values and wildlife have equal billing with commercial and recreational development of the canal.

On July 20, Hocutt provided an airboat and vehicular tour of the refuge for New York State Assemblyman Michael Bragman, his wife Susan, and their three children. Mr. Bragman is Chairman of the Transportation Committee and also of the Fish and Wildlife Sub-Committee of the New York State Assembly. A very productive discussion ensued in which Hocutt expressed his concerns that without planning, fish, wildlife, and wetland values could be harmed under "Canal-2000", the massive push by the State to expand commercial and recreational exploitation of the New York State Barge Canal System. Mr. Bragman agreed with our proposal to set up a committee (including FWS) of resource managers and scientists to address the fish, wildlife, and wetlands aspects of the proposal.

On October 29, with the assistance of Robert Banister (Chairman of the Governor's Conservation Fund Advisory Council), we hosted NYS Senator John Sheffer, II (R., Erie County/Buffalo) and his Executive Assistant Luke Rich. Senator Sheffer was the principal sponsor of legislation which transferred administration of the New York State Barge Canal System from the New York State Department Of Transportation to the New York State Thruway Authority. Mr. Rich headed the team which wrote the legislation. Present at the meeting, at our invitation, were David Odell, NOMOWET Project Manager for NYSDEC, and Dr. Guy Baldassarre, who heads the wetlands program for the College of Environmental Science and Forestry of the State University of New York at Syracuse.

The purpose of the meeting was to follow-up efforts begun earlier with New York State Assemblyman Michael Bragman (D.,

Syracuse) to ensure that wetlands/wildlife values would achieve true equality with commercial and recreational interests as fundamental changes occur in the operation of the 535-mile canal. Specifically, we wished to ensure the integrity of existing permits this refuge has with Canals, and also to ensure water use and availability for the NOMOWET expansion area. Refuge Manager Hocutt presented slides and a detailed historical narrative about the refuge, it's relationship to the canal and it's operation, and the genesis and status of the Cross Lake controversy and our involvement on the Governor's Central New York - Finger Lakes Regional Flooding Advisory Committee.

The three-hour session involved in-depth questioning of Refuge Manager Hocutt about the many facets of refuge involvement in these complex issues. Senator Sheffer responded to our question to him of how he felt we should work within this infrastructure by offering that he would like Hocutt to give exactly the same presentation to Chairman Robert Tufo and Executive Director Susan Kupferman. He offered to arrange the meeting. The group then toured the refuge, where many thousands of ducks and geese were present on the Main Pool.

The eventual shape of the development of the "Canal 2000" venture will have profound impacts upon wetlands and wildlife values along the canal. More importantly for us, our entire water management regimen is affected by and essentially determined by the operation of the canal. Consequently, it is crucial that refuge staff closely monitor (and also influence when possible) the direction that the "Canal 2000" program takes with regard to wetlands and wildlife.

Partners for Wildlife Program

1992 brought a continuation of Region 5's very successful wetlands restoration program in New York State. Renamed as the Partners For Wildlife Program for 1992, the program was carried out on lands that had been ditched or tiled. Former wetlands were restored through the placement of ditch plugs, removal of drainage tiles, raising of culverts, and/or construction of small low-head dikes. Water control structures, stand-pipes, and rip-rapped spillways were installed where site conditions required their use to restore natural hydrology.

In the immediate vicinity of Montezuma NWR, the Partners For Wildlife (PFW) Program saw its third consecutive successful year in central New York. Four restorations were accomplished, restoring hydrology to nearly 260 acres of privately owned land. Ian Drew and Robert Murray were

temporarily stationed here from the New York Field Office (NYFO) in Cortland, New York to administer the Wetlands Reserve Program (WRP). Since the PFW program was very similar to the WRP, it was also Drew and Murray's responsibility to administer the PFW under the supervision of Refuge Biologist Gingrich. Drew and Murray responded to information requests, performed site investigations, surveyed qualifying sites, and then designed restorations for the sites. Construction of the restorations started in August, when the Partners For Wildlife contractor for this area, Van Cleef Construction, moved their equipment to central New York.

Due to unusually heavy rains, a restored muck farm, now owned by New York State, became flooded to design specifications by late October (Photograph 92-6). The site was restored by removing a 40" corrugated metal culvert with a flap gate from the dike and replacing it with a 36" aluminum culvert with a flap gate that held water in instead of releasing it. The water control device was furnished by the State of New York. The flap gate was designed to allow flood water to enter the site, and hold it there. Flood water did enter the site, but most of the hydrology was restored by surface runoff. As you can see from Photograph 92-7, the hydrology is restored and wildlife has already taken advantage of the new wetland (note muskrat house in left foreground). Waterfowl use was high on the area this fall, and should be again this spring. Two islands were created, and it is hoped that these will harbor breeding waterfowl or shorebirds this spring.

The 245-acre parcel owned by the State of New York. Wetlands were restored by reversing a pipe and flapgate to let water in and keep it there instead of releasing it. (92-6; ID)

A closer view of the 245-acre parcel owned by New York State. The hydrology has been restored, and wildlife have already taken advantage of the restored wetland (muskrat house in center of photo). (92-7; ID)

At a restoration in Savannah, New York, owned by Mr. and Mrs. Stanley Hadden, the site had filled by early November. Runoff from heavy rains was the main source of water, but construction also uncovered a strong natural spring. Tile lines were removed and a dike was constructed to restore the hydrology at this particular site. The construction resulted in a quickly developing 4-acre wetland that will be dominated by over 80% emergent vegetation (see Photographs 92-8 and 92-9 for before and after views).

The Haddens have reported waterfowl and shorebird use, and seem to be getting as much enjoyment out of their wetland as our staff did during the design and restoration phase of the project.

Hadden Restoration Site before construction - a poorly drained pasture no longer in production. (93-8; ID)

Hadden Restoration Site eight weeks after construction of a low-head dike. The site is completely full, and water is flowing over the spillway. (93-9; ID)

Montezuma hosted the Region 5 Wetlands Restoration Techniques Workshop during the week of March 23rd. Approximately 40 Refuges, Fish and Wildlife Enhancement, and New York State Department of Environmental Conservation employees participated. The very successful workshop featured "hands-on" training covering subjects ranging from hydro-engineering, soil analysis, watershed evaluation, surveying, and construction techniques.

All Montezuma staff members who participated in the Partners For Wildlife Program found the experience to be very rewarding. The positive public relations fostered by the program were quite evident when talking to landowners. Even farmers who did not have suitable sites were supportive and pleased with suggestions for wildlife enhancement on their properties. Landowners were oftentimes enthusiastic and pleased just to be able to talk to a wildlife professional. Landowners were just as enthusiastic about receiving a bluebird or wood duck nesting box as they were about having a wetland restored on their property.

Overall, the Partners For Wildlife Program can be viewed as win, win, win for all involved - landowner, Service representative, and most important of all, the wildlife resource we all work to protect.

Wetland Reserve Program

Nine states were eligible for the pilot Wetlands Reserve Program (WRP) this year: California, Iowa, Louisiana, Minnesota, Missouri, Mississippi, New York, North Carolina, and Wisconsin. Since our refuge is in New York, we were involved in supporting the program.

The WRP is a voluntary program set up to restore and protect wetlands on private property. Authorized by the Food, Agriculture, Conservation, and Trade Act of 1990 (1990 Farm Bill), the WRP provides the opportunity to receive payment for retiring marginal cropland. Through this program, the Department of Agriculture plans to restore and protect one million acres in the years 1991-1995. Up to 50,000 acres was allocated for enrollment into WRP in 1992. This land could be farmed wetlands, wetlands farmed under natural conditions, or drained wetlands. Riparian and buffer zones could be included to join and protect enrolled parcels. The WRP requires perpetual conservation easements from participating landowners and will provide cost-share payments for accepted wetland restorations. Similar to the Conservation Reserve Program (CRP), WRP pays farmers for those easements.

In addition to their "Partner" efforts, Ian Drew and Robert Murray administered USFWS interests in the Wetlands Reserve Program. They were responsible for consulting with Soil Conservation Service (SCS) representatives in initiating the WRP, making on-site evaluations, and writing plans to restore and protect wetlands for 32 counties of New York State.

Drew attended the Conservation Application Training Workshop offered by the SCS in Cortland, New York in May. Training included surveying and design, along with watershed delineation and runoff calculations. In June, Drew and Murray attended the Wetland Restoration and Enhancement Training in Alexandria Bay, New York, sponsored by the SCS and USFWS. Drew, Murray and Gingrich attended a WRP training session with the SCS in Cicero, New York, to complete an on-site evaluation and write a restoration plan for the WRP. This training was an attempt by the SCS to standardize the restoration plans for the state of New York.

Drew and Murray compiled a list of 129 potential WRP participants and contacted them by phone and by mail, attempting to establish an increased awareness of the program. They visited all of the 24 landowners who signed up for the WRP in their area. Thirteen of these 24 were deemed eligible for the WRP, totaling 185.7 acres. Drew and Murray also provided technical biological advice to the

landowners and the SCS, and assisted the SCS in designing and writing the restoration plans for each parcel of land.

Seneca Meadows Landfill:

Refuge involvement in the Seneca Meadows Landfill (SMI) issue continued at a lower level of intensity (thankfully!) in 1992. The year was spent awaiting the decision of the NYSDEC Commissioner regarding SMI's proposal to add another "lift" (127 feet higher) to the original site.

Hocutt met during the year with engineers and legal staff from NYSDEC's Region 8 Solid and Hazardous Waste Division to review possible permit conditions and the monitoring of sediment and water in Black Brook when (and if) the 127-foot height increase was granted. Meetings were also held with Dr. Robert Seem, Chairman of Concerned Citizens For The Preservation of Black Brook, to discuss mutual strategies in the event the NYSDEC Commissioner did grant the 127-foot increase and a new permit.

Hocutt had discussions on July 6 with John Battaglia (Executive Vice President) and Carl Casecia (Business Manager) of Seneca Meadows Landfill regarding their pending proposal to NYSDEC for construction of a methane recovery plant at the landfill. They finally believe that a commercial market is possible, and that customers exist.

On November 18, Hocutt attended an informational session in Waterloo, New York, where State and County officials discussed proposed remedial measures at the inactive Phase II Superfund Site at the Seneca Meadows Landfill. Representatives of the New York State Department of Environmental Conservation, the New York State Health Department, and the Seneca County Health Department were present. It appears that substantial amounts of Hocutt's time will be involved in early 1993 in coordinating refuge interests (in Black Brook) with the remedial design parameters.

F. HABITAT MANAGEMENT

1. General

Montezuma National Wildlife Refuge was established on September 12, 1938 by Executive Order 7971 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 (45 Stat. 1222).

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. As an integral component of the National Wildlife Refuge System, the refuge strives to attain the following proposed habitat objectives.

1. Maintain and, when possible, enhance resting, feeding, and nesting habitats for migratory waterfowl and other migratory waterbirds.

2. Provide resting, feeding, and nesting habitats for bald eagles and ospreys (a state-designated threatened species).

3. Within constraints imposed by the two objectives above, efforts shall be made to provide adequate habitat diversification to permit the presence of self-sustaining populations of other life forms that are typical of central New York State.

To meet these stated objectives, moderate water levels were maintained during migration. Water levels are allowed to decline slightly throughout the waterfowl nesting season. Over 9.5 miles of dikes were mowed during late summer in an effort to maintain succession at a stage suitable for nesting. The dikes represent a substantial portion of the refuge's nesting cover.

2. Wetlands

Wetland management is the essence of habitat management at Montezuma, since approximately 75% of the refuge's 6,432 acres is classified as wetland. The three major wetland classes at Montezuma are Aquatic Bed, Emergent Wetland, and Forested Wetland.

Aquatic Bed presently totals 1,800 acres, and refers to wetlands and deep water habitats dominated by plants that grow principally on or below the water surface, such as

sago pondweed, white water lily, coontail, bladderwort, duckweed, and several additional species of pondweed.

Emergent Wetland, characterized by erect rooted herbaceous hydrophytes, presently totals 1,350 acres and typically occurs in calmer, more shallow water. 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 is the largest wetland habitat type at Montezuma, comprising 1,850 acres. 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. Dominant vegetation includes ash, swamp white oak, red maple, and eastern cottonwood. The understory is sparse, and includes common winterberry, northern spicebush, and highbush blueberry.

The refuge continues to be hindered by problems brought on by our lack of flexibility to change water levels and the lack of a reliable water source. Water management facilities at Montezuma were constructed over 50 years ago. The original design had a myriad of "built-in" problems that have since worsened and now severely limit the management of water. These factors are compounded by sedimentation, eutrophication, and the presence of exotic plant and fish species. All of these problems have combined to significantly alter the structure of existing marsh plant communities and reduce their productivity and carrying capacity for marsh dwelling wildlife. Management of habitat diversity is severely hindered by these limiting factors. They also have frustrated most efforts to use more innovative management techniques.

Recently, the refuge has undertaken a major construction project to secure a reliable source of water for the Main Pool. Construction was begun in 1990 on a channel through Unit 17 that will provide water, via gravity transport, from Cayuga Lake to the Main Pool. The gravity flow channel was finally completed during 1992 and will provide a much-needed independent supply of water for the Main Pool, and a welcome light at the end of a long tunnel is evident for enhancing water availability and transport.

At present, dikes impound some 3,500 acres of freshwater marsh contained within the Main, Tschache, May's Point, North Spring, and South Spring Pools. The following sections provide historical perspective for the five major refuge impoundments.

Main Pool

Using CCC labor, approximately 3.3 miles of dikes were constructed with little or no imported fill to impound the 1,200-acre Main Pool. The pool was flooded in 1942, and has been managed as an impoundment since that time. Several water level management strategies have been implemented on the pool throughout it's history.

Main Pool has been the traditional purple loosestrife stronghold on the refuge. Again this year, water levels were held high enough to retard loosestrife germination, but not so deep as to unduly stress established cattail. Main Pool will be the primary recipient of benefits derived from the water transport channel from Cayuga Lake.

Main Pool was partially drawn down during the winter of 1991-92 to remove carp, consolidate bottom sediments, and retard water lily expansion. Rising floodwaters from the adjacent Cayuga-Seneca Canal during winter and early spring came close to overtopping the Seneca Spillway. Fortunately carp ingress was light, and no damage occurred to the Main Pool dike.

The regional "cookie-cutter" dredge was delivered to the refuge on May 16 to begin work on reestablishment of drainage channels within Main Pool. Two regional equipment pool operators were detailed to the refuge to operate the dredge. We discovered early on that the "cookie-cutter" was terrific for cutting through old established purple loosestrife stands which were too high to cut with the Hockney Weed Cutter.

Unfortunately, severe mechanical problems limited the amount of work we could accomplish with the dredge. It was determined that the machine had a cracked engine block. Repairs required most of the summer to complete and the machine was shipped off to Missisquoi NWR when the repair work was finally completed. We are hopeful that the "cookie-cutter" will return to Montezuma in 1993 for additional habitat work.

A new system to monitor vegetational changes in the Main Pool was implemented during June of 1992. Cooperative Education Student Renee Robichaud designed what will become a three to five-year study to monitor changes in vegetation community composition as the water levels within the Main Pool are manipulated during summer drawdowns. Circular vegetation plots and photopoints were established to monitor vegetation changes.

Main Pool photopoint. Circular vegetation plots and photopoints were established in the Main Pool during 1992 as part of a 3-5 year study to monitor changes in vegetative community composition as the water levels within the pool are manipulated during summer drawdowns. Poor growth of purple loosestrife plants is a result of stress flooding over the last several years. (92-10; RR)

1992 brought one of the wettest summers on record. The nearly continual rain events resulted in "full pool" water levels in the Main Pool. The submerged aquatic plant community responded incredibly. Extensive stands of sago pondweed covered much of the open water within the impoundment. The sago provided a tremendous food resource for waterfowl during fall migration. Record numbers of diving ducks and American widgeon were observed feeding on the lush growth of submerged aquatic vegetation.

Water management facilities at Montezuma were constructed over 50 years ago. The original design had a myriad of "built-in" problems that have since worsened and now severely limit the management of water. Some pools are too large, water control structures are undersized or missing in several key areas, and portions of the dikes are too low or are badly eroded. These factors are compounded by

sedimentation, eutrophication, and the presence of exotic plant and fish species. All of these problems have combined to significantly alter the structure of existing marsh plant communities and reduce their productivity and carrying capacity for marsh-dwelling wildlife. Habitat degradation attributable to all of these factors has diminished production of, and daily use by, waterfowl and diverse other wading and marsh birds by approximately 50% during the past 25 years.

The first important step in restoring Montezuma's pools was the establishment of a viable Main Pool alternate water supply by construction of the Cayuga Lake Connector. That project, supported by Ducks Unlimited and the North American Wetlands Council, will provide the initial water management capability so long lacking. Subimpounding of Main and Tschache Pools is the logical next step to increase overall refuge management capability.

Construction of subimpoundment dikes to create smaller pools will enable the refuge to vary water management treatments between pools. For example, high water can be retained in one pool to stress purple loosestrife while maintaining shallower water depths in another pool to encourage establishment of desirable emergents such as bulrush and three square. A third unit can be drawn down to oxidize accumulated organic materials in the substrate and to establish annuals (i.e., water smartweed and millet) prior to late season flooding to provide a food source for migrating waterfowl. This project will allow the refuge the necessary flexibility and management opportunities to restore the native vegetation component found in the marshes 50 years ago.

Significant changes in fish and wildlife populations are expected following completion of subimpoundment dikes. Habitats for a multitude of species will be enhanced or created through such projects. Species groups including waterfowl, shorebirds, marsh waders, amphibians, reptiles, wetland-related mammals, and several endangered and threatened species would be the primary benefactors. Ground nesting birds, primarily waterfowl, can greatly benefit from dense nesting cover established on dikes - especially if combined with effective predator control and/or exclosures.

The acreage of native wetland vegetation will be expected to increase in all refuge impoundments following project completion. Improved water control capabilities in conjunction with smaller impoundment sizes are the keys to management of the marsh and water resources at Montezuma. The current deteriorated water management infrastructure has constrained water management efforts designed to control pest plant species.

Encroachment and expansion of purple loosestrife and phragmites will decline as water control capabilities are upgraded. Control of purple loosestrife and phragmites is difficult, but can be achieved through a variety of techniques including cutting, discing, herbicide applications, and flooding.

Dabbling duck use is expected to increase as a result of the improved interspersion of open water, emergent vegetation, and submergent vegetation. Diving duck numbers are expected to positively respond to increased acreages of submergent vegetation (i.e., sago pondweed) within the newly-constructed subimpoundments.

The refuge will be able to respond quickly and effectively to an epizootic disease outbreak among waterfowl on the refuge. Smaller pool sizes will allow for rapid flooding or draining of impoundments. Speed of moving water becomes especially valuable when disease is involved. Smaller pool sizes also facilitate other disease management techniques, such as hazing or recovery of sick and dead birds.

September 1992 was a very productive month for planning efforts for this proposed subimpoundment project on Main and Tschache Pools. On September 2 and 3, Curt Orvis (RO/EN) and Roger Tornstrom (RO/RW), along with contract surveyor Bruce Wurz, visited the refuge. The group toured the proposed project area and developed a workable strategy for subimpounding.

On September 23 and 24, Orvis, Tornstrom, and Wurz again visited the refuge to perform the necessary field work to "ground truth" previous planning efforts. Soundings were taken of the depth of water and bottom materials across the open water area along the proposed dike layouts. During the first two weeks of November, four surveyors from contractor C.T. Male Associates completed the formal dike surveying for the Main Pool portion of the subimpoundment proposal.

While much was accomplished on the subimpoundment proposal during 1992, a great deal of work lies ahead. Necessary permits, engineering drawings, and a tremendous amount of money must be found in the near future to bring the project to completion. Reports on our progress will surely become a part of future narratives.

Tschache Pool

Traditionally known as the Storage Pool, Tschache Pool is a 1,100-acre impoundment created by CCC labor following completion of a 3.25-mile long dike. The pool was first flooded in 1944, and has been managed as an impoundment ever

since. The pool contained swamp timber and open wetlands when first created. The timber eventually died following flooding, and the majority of the trees have since fallen.

The dead timber marsh has hosted over 100 great blue heron nests as well as an active bald eagle nesting territory, one of only 18 in all of New York State. 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.

For the last few years we have drawn down Tschache Pool during the winter in an effort to reduce carp numbers. Unfortunately, each spring the neighboring New York State Barge Canal has risen and flooded the White Brook Spillway, allowing hundreds of thousands of carp back into the pool. These overwhelmingly high carp numbers play an important role in limiting expansion of aquatic and emergent vegetation in the pool, in addition to hampering water quality and clarity. Until funding is provided to raise the crest elevation of the White Brook Spillway to prevent inflow from the canal, we will be caught in a never-ending (and losing) battle with carp during periods of spring flooding.

A total drawdown of Tschache Pool was initiated during the month of December. Wet, mild weather during portions of the month and the resultant high canal levels caused some problems with our attempts to completely drain the pool. By month's end the pool was basically dry, and the vast majority of carp were either flushed from the pool, dead, or dying. The drawdown's success in reducing carp numbers was considered an unqualified success.

May's Point Pool

In 1954 construction of the New York State Thruway across the north end of the Main Pool diked off 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 it's history. Current management of May's Point Pool is directed toward maintaining low water levels and exposed mudflats during the spring and fall to provide habitat for migrating shorebirds.

May's Point Pool was completely drained during late May to remove carp after heavy rains and high Canal and Clyde River levels allowed the fish to gain access to the pool.

After the drawdown, May's Point Pool was refilled to a new higher level in our continuing efforts to combat purple loosestrife expansion within the pool. This was possible with the addition of new channels capable of holding more stoplogs, which in turn allowed us to hold higher levels of water in the pool. The higher water level (about one foot higher than was possible before) stress-floods the newer loosestrife growth that has emerged during the past two years.

North Spring Pool

In 1957 a .31-mile long dike was constructed along the west side of State Route 89 to create the 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, gadwalls, and Canada geese.

South Spring Pool

The South Spring Pool was formed by the construction of a .5-mile long dike in 1958. This 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.

3. Forests

Approximately 1,850 acres of the refuge are non-commercial woodland, the majority of which is classified as forested wetland. Red maple, ash, and swamp white oak share dominance in the 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. Species typical of alluvial soils, such as American sycamore and silver maple,

are noticeably absent on the poorly drained muck soils that underlie the majority of the refuge's forested wetlands.

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. No direct forest management occurred on the refuge in 1992.

Unit 17

Unit 17 was originally constructed as a green-timber reservoir in 1965. 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 stressing the mature trees and was discontinued in 1977. Since that time the water transport facilities (channels, control structures, and diesel-operated pump) have fallen into disrepair through lack of use.

This 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 Montezuma National Wildlife 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. The tract was utilized to construct two 300-acre experimental impoundments in 1965. The impoundments are separated by a mid-dike, and have been simply termed the East and West Pools.

The water source for the green-timber impoundment is direct run-off, snow melt, and alternatively, the Seneca-Cayuga Canal. A 6,000 gallon per minute screw-lift diesel pump was initially provided to flood and maintain the pools until drawdown. Separate water control structures were included in the construction of each pool and thus, each pool could be regulated at different levels and be drained or flooded independently.

With the exception of the East Pool, the soil of this bottomland site is dominantly deep organic muck derived from woody materials, cattails, sedges, and rushes. The muck is slightly acid to neutral and ranges in depth from 40 inches to as much as 17 feet. The black muck surface layer grades perceptibly to a fibrous peaty material containing many decomposed wood fragments. This is underlain by mineral soil material (sand, silt, clay, or a mixture of these) or calcareous marl. The East Pool quickly grades from this deep muck along the mid-dike to a Wallkill soil which

dominates the pool. This soil consists of alluvial mineral materials deposited over muck by former seasonal flooding along the Seneca River floodplain.

The area presents an almost completely forested situation except for the approximately four miles of dikes and associated canals constructed to impound the habitat. Other open areas include two parallel pipeline rights-of-way, each approximately 25 meters wide, which span the basin near the north end of the mid-dike. Natural breaks in the canopy include two stands of cattail located in the East Pool. One comprises a small marsh located in a low area along the northeast edge of the pool. The second is a dense stand of cattails interspersed within the timber in the southeast corner of the pool. The West Pool is continuous green timber with the exception of an old cutoff meander of the original Seneca River, located in the southwest corner.

Red maple, ash, and swamp white oak share dominance in the canopy on the site in establishing a common muck-hardwood association for this region. American elm, a former major component, was essentially lost to disease. Blue beech occurs infrequently as part of the understory.

The striking feature of the forest floor in this mature swamp hardwood is the presence of the tree island, or hummock. These formations play an integral role in the ecology of the muck forest community, and are created through the accumulation of uprooted materials by windthrown trees. The subsequent repetition of this event through successive tree generations, as well as the build-up of organic materials through stump decay, leaf litter accumulation, etc., provide stability and growth to the hummock.

The deep muck soil within the bottomland forest of Unit 17 is structurally weak, and it is so poorly drained that standing water can be found in all but the driest summer months. Hummocks rise as much as 30 inches above the forest floor and many are larger than six feet across. These hummocks provide drier sites which favor the growth of tree seedlings as well as firmer sites which are able to support larger trees.

Flat topography and impervious layers of clay and marl in the subsoil allow vernal pools to persist on the forest floor until early June, and even later in wet years. Ultimately, however, surface water disappears as periodic rainfalls are unable to supply the demands of evaporation and the large transpirational losses through the forest canopy.

Charged by snow-melt and ensuing spring rains, these pools soon become teeming with many forms of invertebrate life which have shaped their life cycles about the transient nature of this aquatic system. Crustaceans dominate the fauna, including representative species in the orders Anostraca, Cladocera, Podocopa, Copepoda, Isopoda, and Amphipoda. Many representatives of the Class Insecta are also present, including six important orders: Odonata, Hemiptera, Trichoptera, Megaloptera, Coleoptera, and Diptera. Mollusks are represented by three important families of gastropods and one family of pelecypods.

The interwoven system of vernal pools and hummocks results in the distribution of a relatively simple but well-ordered flora along a sharp moisture gradient. Aquatic species occupying vernal pools include duckweed, bladderwort, arrow arum, and swamp loosestrife. Species common to the moist transitional zone between pool and hummock include sensitive fern, royal fern, cinnamon fern, false nettle, spotted touch-me-not, skunk cabbage, and beggar's ticks. Hummocks are commonly occupied by false lily-of-the-valley, spinulose shield fern, and the two woody vines: poison ivy and virginia creeper. The two dominant shrubs throughout the forest are deciduous holly and high-bush blueberry. Spicebush and arrow-wood are present but to a much lesser extent.

In support of recent research demonstrating the critical importance of high-protein food sources to pre-nesting female dabbling ducks, the refuge has proposed that Unit 17 be flooded in mid-March. The early spring flooding would provide several hundred acres of foraging habitat for pre-nesting female dabbling ducks (mallards, wood ducks, American black ducks, northern pintails, and gadwalls) which will subsequently nest at Montezuma or elsewhere within the Atlantic Flyway. The flooded bottomlands would insure the availability of high-protein invertebrate food sources at a critical period during migration. The birds will then enter the metabolically stressful nesting period in better condition. Water will be drained from the unit by the first of May to allow an adequate growing period for the mature hardwoods, insuring continued maintenance of the valuable bottomland hardwoods habitat used by a diversity of migrating birds and resident wildlife.

The refuge has been funded in FY-93 to complete infrastructure work to support habitat needs for prenesting female ducks.

1. Rehabilitation of the pump building, replacement of defective water control structures, and complete overhaul of the diesel power plant and associated screw-lift pump - $40,000.00.

2. Removal of dense vegetation from within the water transport channels and repair/reshaping of dikes - $2,000.00..

All anticipated construction will be completed using refuge equipment and personnel. Completion of this work will allow the refuge to proceed with implementation of the Unit 17 management proposal and meet two important objectives:

1. Annual early spring (mid-March to May 1st) flooding of Unit 17 bottomland hardwoods to provide critical pre-nesting feeding habitat for dabbling duck species such as American black ducks and mallards.

2. Dewatering of the area by May 1st to insure perpetuation of the valuable lowland hardwoods habitat used by a diversity of neotropical migrants and resident wildlife.

5. Grasslands

The establishment and management of fields of undisturbed grassland cover at Montezuma was initiated to provide approximately 500 acres of various age fields for habitat diversity, increased 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). This was possible only after all on-refuge grazing was terminated in the early 1980's. The Grassland Management Program at Montezuma insures a variety of grassland and old field habitats. The interspersion of habitat types substantially increases the availability of ecotones and promotes wildlife diversity.

Present vegetative conditions in the grassland fields are representative of early old-field successional stages. Encroachment of woody plants and noxious weeds is minimal at the present time. Vegetation within all fields is dominated by species of tall grasses and perennial forbs remaining from tame pasture and hay field plantings during the past several decades. The resulting cover consists of tall, dense, rank live vegetation with loosely packed litter composed of dead vegetation from previous growing seasons. This ground litter serves to conceal nesting hens, and provides a deterrent to predatory mammalian and avian activity.

During 1992, mowing practices were instituted in GMU's I, III, and IVB in accordance with the current rotational schedule. Clipping heights were maintained at 15 cm (six

inches) using rotary and sickle bar mowing attachments. Mowing was delayed until August to prevent nest destruction of late-nesting and renesting waterfowl and ground-nesting bird species.

Nest searches have suggested limited use of refuge grassland units to date. This was confirmed again this year when a nest search of GMU 2 (sub-headquarters field) revealed no waterfowl nesting activity. Future plans to increase nesting use and success include strip mowing, dense nesting cover plantings, and removal of brush and trees from along pool/field interfaces. Monies have thus far been unavailable to undertake these fairly intensive treatments.

Maintenance Mechanic Steve Flanders spent approximately seven days during early March operating the Hydro-Axe clearing brush and small trees from two areas on the refuge. Encroaching brush was removed from the southwest dike in Unit 17 and approximately five acres of box elder was cleared from a potential moist-soil unit adjacent to May's Point Pool.

6. Other Habitats

In addition to the habitat types previously discussed, the refuge has approximately 100 acres classified as rivers, streams, brush, and small isolated grassland areas. These areas are not normally subjected to any periodic habitat manipulation and are allowed to follow a natural pattern of successional change over time. Several acres of land adjacent to administrative, maintenance, and public use areas are managed in accordance with their respective uses.

9. Fire Management

No prescribed fires were initiated during 1992. The potential for using fire as a management tool at Montezuma is hindered by the presence of organic peat soils and the fact that two major highways traverse the refuge. This set of circumstances makes smoke management a serious problem. Future prescribed burning activities will require strict prescriptions for allowable wind speed and direction.

Maintenance Mechanic Flanders and Biologist Gingrich successfully passed the required "step test" and were issued red cards. Neither employee was sent on assignment to participate in western forest fire-fighting activities. Gingrich also attended and successfully completed "Intermediate Fire Behavior" (S-390) held in Minneapolis, Minnesota in late January.

A cooperative agreement for both wildfire and prescribed fires remains in effect with the Magee Volunteer Fire Department, Inc. A blanket Purchase Order with the Department provides for reimbursement of costs associated with structural fires and alarm system responses.

No wildfires occurred on the refuge during 1992.

10. Pest Control

Refuge spraying operations this year were limited to the ground application of the herbicide Triox (Prometon). The soil sterilant is applied once per year to control vegetation in areas where mowing or hand trimming are difficult or hazardous; i.e., around sign posts, asphalt surface edges, and building foundations. The approximate area covered was less than 1,000 square feet. The Triox was applied at the rate of two pints of product per nine pints of water to cover 75 square feet.

Phragmites is present in small, isolated stands throughout the refuge and has been for several years. What is currently not known is the rate of expansion of the plant. Subjective evaluation suggests that it has begun to expand and displace adjacent vegetation in several areas on the refuge. Most disturbing has been the encroachment of phragmites into areas that previously supported solid stands of cattail. Eradication of phragmites from these areas (if possible) will prove to be costly and very labor-intensive.

Control of phragmites on terrestrial sites is accomplished with a combination of mechanical and chemical control methods. Stands of phragmites are initially mowed in July to stress the actively growing plants. In early to mid-August, Round-up (glyphosate) is applied to the new phragmites growth by means of a boom-wick applicator mounted on the front of a farm tractor. A 33% solution (one gallon of product/two gallons of water) is applied through the boom-wick applicator.

During July of 1992, refuge staff completed pretreatment mowing on over 20 acres of phragmites. Unfortunately, the summer's extremely wet weather and resultant wet, soggy ground conditions thwarted our control efforts. All fields with normally tractor-accessible stands of phragmites had either standing water (several inches deep in many cases) or saturated soils. The wet ground conditions forced the delay of our chemical treatment program until the optimal application window had passed. Instead of applying the Round-up under less than the preferred conditions, a decision was made to postpone chemical treatment until 1993. This decision was based upon the fact that Round-up is too

expensive to indiscriminately use when conditions for its effectiveness are less than ideal.

1993 will also see a continuation of our expanded efforts to survey and document the extent and location of existing phragmites stands on the refuge. Considerable staff time will be expended to accurately document and map these locations as a preliminary step in planning future control efforts involving methods other than the boom-wick applicator. Future control efforts may include aerial application of Round-up in areas inaccessible to tractor-mounted equipment. Any plans for future aerial application of herbicides are contingent upon the funding of IPW's to cover the high costs associated with this application method.

White water lily has, in recent years, invaded a large portion of the Main Pool. Once established, the plant forms a very dense mat that shades out more desirable submerged aquatic plant species (predominantly sago pondweed). Control of water lily on the Main Pool has traditionally involved underwater cutting with the Hockney Weed Cutter, a very labor intensive method. This created openings which attracted waterfowl, but the results were often short-lived. No cutting has occurred since 1989 as effective lily control has been an unexpected result of our winter drawdowns designed for carp control. Winter drawdowns have resulted in a sharp reduction in lily and a corresponding increase in submerged aquatic vegetation.

Winter drawdowns have proven to be an effective and inexpensive cultural method of white water lily control. However, a long-term management scheme of winter drawdowns is not desirable for several reasons, foremost of which is the near total eradication of the Main Pool's muskrat population. Long-term lily control on the Main Pool will be reevaluated following completion of the Cayuga Lake water connector and initiation of summer drawdowns in 1993.

Pesticide use at Montezuma either supports the public use or the marsh and water management programs. The refuge makes every attempt to limit the use of pesticides to minimum but effective levels. The pest management program is designed to utilize the best combination of control techniques to effectively limit current and potential pest damage. The ultimate goal of the program is to enhance overall refuge habitat diversity. The safety of refuge visitors and station personnel is viewed as the number one priority during any pesticide application procedure. All station personnel involved in pesticide application activities have current New York State certification. All applicators are also required to wear appropriate personal safety equipment

(respirators, gloves, eye protection, and disposable coveralls).

12. Wilderness and Special Areas

There are two designated Research Natural Areas (RNA) on the refuge. Maple Knoll, an 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 Refuge.

The second RNA, Swamp Woods, is a tract of approximately 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 hummocks. In the sandy soil between the hummocks grow arrowhead, water plantain, and skunk cabbage. Black alder and spicebush are common shrubs. A variety of swamp species grow in the forest, including joe-pye-weed, lizardstail, and jewelweed.

This mature stand is probably virgin, as it shows no evidence of disturbance. Several of the swamp white oaks are over 40" d.b.h., with heights of 75 to 85 feet. Most of the trees are over 30" d.b.h., with an average height of 60 feet. Age of the stand is estimated at from 150 to 200 years old. 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 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. This area, along with other portions of the refuge, serves as a resting and feeding area for migrating waterfowl and provides nesting for many species of ducks, herons, and other waterbirds.

Broad-leaved cattail forms the main vegetation in the marsh. These often occur in pure stands, but sometimes are mixed with purple loosestrife, bulrushes, sedges, and swamp loosestrife. Other plant species common in the marsh are common reed, smartweed, and burreed. The cattails and other plants appear as islands of emergent vegetation in a shallow lake. The Swamp Woods RNA borders the southern edge of the Montezuma Marshes National Natural Landmark.

G. WILDLIFE

1. Wildlife Diversity

The Montezuma National Wildlife Refuge provides habitats for a wide variety of wildlife, including sixteen species of amphibians, fifteen species of reptiles, forty-three species of mammals, two hundred forty-two species of birds, and over fifty species of fish. Each of these species has either been documented or can reasonably be expected to be present on the refuge, at least for a portion of the year.

The value of the wetland and associated upland habitat within the Montezuma Refuge has been recognized at both the state and national levels. The refuge has assumed a significant role in the Atlantic Flyway as a major staging, feeding, and resting area for tens of thousands of migratory waterfowl. A significant proportion of the mid-Atlantic population of Canada geese utilize the refuge during both spring and fall migration. In addition, a growing number of these birds are now overwintering in the Cayuga Lake Basin. Numerous species of shorebirds such as the sandpipers, plovers, and terns depend heavily on this area as well, as do many neotropical migrants. Resident species most noticeable in the area include white-tailed deer, beaver, muskrat, raccoon, mink, and fox.

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 here.

Of particular note in 1992 was the appearance of several rare or uncommon species on the refuge. These included eastern white pelican, glossy ibis, red-necked grebe, eared grebe, horned grebe, black-bellied plover, cattle egret, and Eurasian widgeon.

A gyrfalcon was reported in the area near the refuge on several days during the latter half of March. The bird was first observed on the Main Pool by Recreation Aide Marva Smith on March 29. The presence of this arctic falcon caused quite a stir in the local birding community. Dozens of area birding enthusiasts converged on the refuge and the north end of Cayuga Lake to catch a glimpse of the bird. The bird was observed on most days for a period of two weeks before it left the area.

Montezuma's first complete Biological Program Evaluation was conducted July 13-15. Central Zone Biologist Pelizza headed

this effort, with valuable input from George Gavutis, refuge staff, and invited guests. Mike Haramis (FWS-Patuxent Research Center), Dave Woodruff (NYSDEC-Region 8), and Dr. Guy Baldassarre (SUNY-CESF Wildlife Professor) provided excellent comments with a much-needed "outside" perspective.

2. Endangered And/Or Threatened Species

The following is a list of endangered, threatened, and/or state-listed species of special concern which may be found on the refuge or are reported to be present in the immediate area:

Species	Status	
	Federal	State
Bald Eagle (*Haliaeetus leucocephalus*)	E	E
Peregrine Falcon (*Falco peregrinus*)	E	E
Osprey (*Pandion haliaetus*)		T
Northern Harrier (*Circus cyaneus*)		T
Common Tern (*Sterna hirundo*)		T
Spotted Salamander (*Ambystoma maculatum*)		SC
Jefferson Salamander (*Ambystoma jeffersonium*)		SC
Wood Turtle (*Clemmys insculpta*)		SC
Small-footed Myotis (*Myotis leibii*)		SC
Upland Sandpiper (*Bartramia longicauda*)		SC
Black Tern (*Chlidonias niger*)		SC
Common Barn Owl (*Tyto alba*)		SC
Short-eared Owl (*Asio flammeus*)		SC
Common Nighthawk (*Chordeiles minor*)		SC
Eastern Bluebird (*Sialia sialis*)		SC
Vesper Sparrow (*Pooecetes gramineus*)		SC
Henslow's Sparrow (*Ammodramus henslowii*)		SC
Grasshopper Sparrow (*Ammodramus savannarum*)		SC

E - Endangered T - Threatened SC - New York State Species of Special Concern

a) Bald Eagle

In the mid-1970's New York State launched one of the most comprehensive bald eagle restoration programs in the nation, designed to return breeding bald eagles to all portions of the state still suitable for their existence.

In 1976, a program designed to re-establish nesting bald eagles in New York was undertaken at the Montezuma National Wildlife Refuge by the New York State Department of Environmental Conservation in cooperation with the U.S. Fish and Wildlife Service. The program involved the use of "hacking" to release young bald eagles to the wild. Montezuma was chosen as the site for the release program because of its central location, large amounts of open water and suitable habitat, abundance of fish and mammal prey species, and limited disturbances. In addition, Montezuma was formerly an active bald eagle nesting site as recently as 1959, with young last successfully produced in 1956.

From 1976 to 1980 a total of 23 bald eagles were released at the refuge through the hacking program. The birds were obtained from wild nests in Michigan, Minnesota, and Wisconsin, and from the captive breeding stock at the U.S. Fish and Wildlife Service Research Laboratory in Patuxent, Maryland. The project demonstrated that young bald eagles can be reared in man-made situations and still learn to hunt, feed, and survive on their own. The program attained its first success in the spring of 1980 when the first two eagles released in the program (1976) successfully nested in northern New York. In 1981, the hacking project was expanded and relocated to the Oak Orchard Wildlife Management Area in western New York.

In 1987, three adult bald eagles (a white-tagged male eagle released in 1978 at Montezuma, an unmarked female bird, and a yellow-tagged male bird released in 1982 at the Oak Orchard hacking site) successfully raised two young at an isolated nest site on the northern portion of the refuge. The two young bald eagles were the first to be produced at Montezuma in over 30 years. In late December of 1987, refuge staff worked with the New York State Electric and Gas Corporation (NYSEG) and the New York State Department of Environmental Conservation to stabilize the nest which was precariously perched in a dead elm tree. A 75-foot wooden pole was installed six feet from the nest tree and the nest was then transferred and secured to a platform bolted to the pole.

Despite 1987's success, and our efforts to insure the long-term stability of the nest site, 1988 proved to be year of disappointment when the birds failed in their nesting attempt. During 1989, the three adult bald eagles were once

again successful in their nesting attempt on the refuge. A single eaglet was fledged from the pole nesting site.

During the 1990 breeding season, the three birds constructed a second nest within their nesting territory. The new nest was located in a dead snag on Tschache Pool. Two eaglets were successfully fledged from the nest in the early summer.

The same nest was used in 1991, and two young were again fledged successfully.

Throughout 1992, Michael Allen (New York State Department of Environmental Conservation Region 8 Biologist) closely monitored the birds' nesting activities. Egg-laying and incubation apparently began on March 20. Hatching occurred on or around April 26 with two young eaglets barely visible over the edge of the nest on the last day of April.

On June 16, New York State Department of Environmental Conservation personnel and several refuge staff and volunteers visited the nest to band the young birds. Michael Allen climbed up to the nest to attach the bands. Both young birds (one male and one female) were found to be in good physical condition. The birds represent the eighth and ninth eagles to hatch on the refuge since 1987. The young birds fledged in mid-July, and from then until early November adult and immature eagles were seen consistently on Tschache Pool.

This year's eaglets just prior to banding by State Biologists Mike Allen and Peter Nye. (92-11; MA)

Sightings of additional bald eagles were recorded periodically throughout the year on Tschache, North Spring, and Main Pools. Aggressive behavior and intra-specific conflict was frequently observed between the three nesting birds and a fourth adult eagle on Tschache Pool. The fourth adult bird (possibly a female) was observed adding sticks to two old great blue heron nests. The bird has yet to attract a mate (either one of our two males or a fifth "new" bird). It could prove interesting in the future if the fourth eagle does attract a mate. We can only wait and see what develops.

The young bald eagles raised at Montezuma in 1992 were but two of twenty-four birds fledged throughout New York State this year. The twenty-four birds were raised on thirteen of the eighteen active nesting territories identified statewide. The reestablishment of nesting bald eagles throughout the state within the last decade is an accomplishment for which the New York State Department of Environmental Conservation can be extremely proud.

b). Osprey

Since 1988, osprey (a New York State-listed threatened species) had successfully nested on an artificial platform in the Main Pool. The nest site is located immediately to the southwest of the refuge Visitor Center. The proximity of the nest site had provided excellent viewing opportunities for visitors throughout the spring and summer months in past years.

During 1991, the osprey pair were unsuccessful in their nesting attempt at the Main Pool platform site. The reason for the failure in still unknown, but may have been the result of raccoon depredation. To prevent a similar occurrence during 1992, and in future years, a conical galvanized sheet metal predator guard was fabricated and installed on the nesting platform.

The 1992 nesting season proved to be an unqualified success for osprey on the refuge. On July 6, refuge staff assisted New York State Department of Environmental Conservation personnel with banding three young birds which hatched from the Main Pool platform site. The birds (two males and one female) were approximately seven weeks old at the time, and in excellent physical condition.

State Biologist Mike Allen and Recreation Aide Marva Smith banding young osprey. (92-12; AK)

The three young osprey at the Main Pool nest site proved to be very popular with the visiting public. The proximity of the nest to the Visitor Center observation deck provided excellent viewing opportunities throughout the spring and summer. Many dedicated local birders made repeated visits to the refuge to monitor the progress of the nesting adults and their young.

On May 23, Recreation Aide Marva Smith discovered a second osprey pair nesting on the refuge. The nest was located atop a communications cable transmission tower in the extreme southeast corner of Unit 17. This pair was successful in fledging one young osprey from their nesting attempt.

The future looks quite bright for the osprey at Montezuma following this year's successes. Plans are currently being finalized for installation of a second nesting platform on the refuge. The new platform will be erected at North Spring Pool in an area that has been frequented by ospreys during migration in the past. Hopefully, we can encourage a third pair of birds to nest on the refuge in the near future.

This communication cable transmission tower was the nest site for a second pair of osprey in 1992. (92-13; MKS)

c). Northern Harrier

This New York State threatened species was frequently observed throughout the year foraging over refuge grasslands and marshes. While no active nests were found, northern harriers were thought to have bred on or in the immediate refuge vicinity during 1992.

d). Peregrine Falcon

A single peregrine falcon, an infrequent migrant, was sighted during the third week of October on Tschache and May's Point Pools by members of a local birding club. Peregrine occurrence on the refuge is normally quite transitory in nature. Birds observed in the past several years have never been known to stay for more than a week at a time.

3. Waterfowl

Montezuma National Wildlife Refuge was established on September 12, 1938 by Executive Order 7971 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. Since 1938, Montezuma and it's 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 significant proportion of the mid-Atlantic population of Canada geese now utilizes Montezuma and the central Finger Lakes area during spring and fall migrations. Fall peaks of Canada geese approximate 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 150 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 widgeon, 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 hooded merganser also utilize wetland habitats at the refuge during migration.

Canada goose, mallard, and wood duck have been the most abundant nesting waterfowl at Montezuma in recent years. Historically, annual waterfowl production at Montezuma was much higher. Several species of waterfowl that formerly nested quite successfully at the refuge now do so only sporadically or not at all.

The marsh and water management system of the refuge has ecologically and structurally aged. The eutrophication of the pools has resulted in the classic waterfowl production cycle: rapid increase in production, dramatic decline, and a long period of dynamic stability at a significantly lower level. The production peak was maintained through the 1960's by water level manipulation which stimulated production, but by the 1970's the eutrophication process, coupled with the loss of water level control, the invasion of exotic plant and animal species, and the decline in water quality significantly affected productivity in the 1970's and 1980's. Current habitat conditions in refuge impoundments have deteriorated to the point that annual

waterfowl production has reached historical lows over the last several years. Of course, regional declines in populations have also played a role.

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 can annually approach 100,000 or more. 1992 was no different in this regard.

The New York State Department of Environmental Conservation conducted the 44th annual New York State Midwinter Aerial Waterfowl Survey from January 6 through 19. A total of 238,498 waterfowl were counted this year, which is two percent higher than last year and ten percent higher than the previous ten-year average (1982-1991).

1992's survey conditions were a carbon copy of the year before, with mild weather resulting in most large bodies of water being devoid of ice. The open water created difficult survey conditions because the waterfowl tended to be spread over a larger area, with many birds being in places that are not on the traditional survey routes. Generally, of the waterfowl species that have major wintering populations in New York State, puddle ducks and geese were up from the ten-year average and diving ducks, except for redheads, were below the average.

The Finger Lakes Region portion of the Midwinter Survey was flown on January 19. Surveyors counted 52,000 Canada geese, 19,500 mallards, and 5,600 American black ducks overwintering in the central New York/Finger Lakes Region. The total of 52,000 Canada geese observed were only a portion of the estimated 100,000 birds overwintering in the Finger Lakes area. It is believed that many of the geese were in fields feeding at the time of the survey, and therefore, were not counted.

These "lake" birds which overwinter on Cayuga Lake often spend portions of mild winter days sitting on the ice or slush covering refuge pools. Several days of mild weather during the last two weeks of February encouraged an average of approximately 6,000 Canada geese to sit in the slush atop the ice or in actual open water on both Main and Tschache Pools. During the same period, several hundred mallards and American black ducks were sighted on refuge pools. The birds come up to the refuge from Cayuga Lake with every major freeze/thaw cycle.

March ushered in the beginning of one of the strangest spring migrations in recent memory. Mild weather during the

first half of the month found approximately 9,000 snow geese and 20,000 Canada geese on refuge pools. Snow and cold weather during the latter half of March refroze refuge impoundments and drastically reduced bird use. New York State Department of Environmental Conservation biologists estimated that upwards of 250,000 Canada geese were in the Cayuga Lake Basin during this period of renewed ice and snow. Few, if any, of the birds were found on the frozen refuge pools. Surrounding agricultural fields, mucklands, and open water on the Barge Canal System were literally covered wingtip to wingtip with staging Canada geese waiting to push northward. It was truly a spectacular sight for anyone travelling through the area near Montezuma.

Spring migration goose and duck numbers on the refuge never really recovered from the diminishment after the unprecedented "re-freezing" for three weeks in late March and early April. The majority of the birds appeared to bypass the refuge on the way north. Most numerous duck species on the refuge during the unusual spring push were mallard, wood duck, green-winged teal, northern shoveler, ring-necked duck, and canvasback.

Fall migration began in late September with the arrival of 2,000 Canada geese and several thousand ducks, dominated by green-winged teal, mallards, and American widgeon. Waterfowl numbers gradually increased throughout the remainder of the autumn. The fall Canada goose peak occurred during early November, with over 20,000 birds counted on the refuge. Fall duck numbers for most species also peaked in November. Over 30,000 ducks were counted on the refuge during this period. The most common species were mallard, American black duck, American widgeon, gadwall, canvasback, redhead, ring-necked duck, and scaup.

Of particular note throughout the fall was the presence of over 12,000 diving ducks on the Main Pool. Large rafts of canvasbacks, ring-necked ducks, redheads, and scaup were easily observed from the Main Pool tower and Wildlife Drive. The large rafts of divers were an impressive sight for visitors and refuge staff alike. The birds were commonly observed feeding on the extensive sago pondweed beds which dominated the submerged aquatic vegetation within the Main Pool. Large numbers of American widgeon were also observed feeding on the extensive sago pondweed beds throughout fall migration.

Thousands of American widgeon could be found on the Main Pool during fall migration. Extensive beds of sago pondweed were the main attraction. (92-14; J & KH)

The late fall period (early December) brought large flocks of mallards and American black ducks to the refuge. Seemingly endless flights of groups of 50 to 200 birds were observed leaving from and returning to the Main Pool. The birds were often sighted feeding on the muck fields north and east of the refuge. Their feeding patterns and dispersal around the refuge made them impossible to census.

The first Canada goose brood of the spring was sighted on May 6. The first wood duck brood was spotted on May 26, and the first mallard brood on May 21.

Waterfowl production at Montezuma was calculated by both our traditional method (broods observed during weekly waterfowl surveys) and the Bennett method.

The Bennett survey was conducted on June 17, 1992 during the first peak of waterfowl hatching on the refuge. The total area surveyed included Main Pool, Tschache Pool, North and South Spring Pools, and Unit 17. Results of the survey are as follows:

Bennett's Technique

	Different Broods	Total Broods	Estimated Number Of Broods	Actual Number of Young Seen	Estimated Production
Mallard	4	4	20	29	145
Wood Duck	21	21	59	173	486
Northern Pintail	1	1	7	11	77

*Bennett's Technique was conducted on 6/17/92; this was during the first peak of hatching.
*Estimated production = [the actual # of young ÷ different broods] x the estimated # of broods.

The "traditional" survey method which consists of recording all waterfowl broods in the impoundments during the weekly waterfowl surveys were consistently recorded, with the first brood sighting (Canada goose) occurring on May 6. Again this year (as in past years), the traditional survey included more species than the Bennett survey. The traditional survey method is extrapolated to provide an estimate for the entire refuge. This extrapolation has always produced larger production figures than the Bennett's technique. Results of the traditional survey method are provided below. Our records suggest the traditional survey is more accurate than Bennett in the refuge's very large pools.

1992 Waterfowl Brood Survey (Traditional Method)

	Actual Number Of Broods	Estimated Number Of Broods	Actual Number of Young Seen	Estimated Production
Canada Goose	35	44	171	215
Mallard	15	23	131	201
Blue-winged Teal	1	2	11	22
Wood Duck	37	56	359	543
Hooded Merganser	2	3	20	30
Northern Pintail	1	2	11	22

*For Canada Geese, the estimated # of broods = # of broods x 1.25.
*For Ducks, the estimated # of broods = # of broods x 1.5.
*Estimated production is equal to [the actual # of young seen ÷ the actual # of broods] x the estimated # of broods.

Total duck production for 1992 was very similar to the preceding year. The northern pintail brood sighted on June 17 was quite unusual.

A hen wood duck and her brood were caught "sunning" themselves on a beautiful June morning on the Main Pool. (92-15; AS)

The wood duck nest box program at Montezuma has been very successful over the last decade. Yearly monitoring of box use has aided us in attaining a fairly accurate estimate of wood duck production from boxes on the refuge. Natural cavities in suitable habitat appear to be abundant; however, we have no information on their use, locations, or predation rates, so overall production estimates must be considered conservative.

The wood duck box program at Montezuma represents a traditional nest box program with fairly densely-placed boxes (both single and double boxes) in highly-visible areas. While Montezuma has not yet experienced the classic "rise and crash" syndrome of other wood duck box programs around the country, the potential exists. Such a "rise and crash" traditionally results in a severe reduction in hatchability of eggs due to increased rates of dump nesting and increased incidences of intraspecific strife between nesting hens.

In 1990, Dr. Paul Sherman (Section of Neurobiology and Behavior, Cornell University) initiated a systematic investigation of the effects of nest box proximity and visibility on brood parasitism (dump nesting), nesting efficiency, and productivity of wood ducks. The goal was to more rigorously test a hypothesis (developed during previous studies and supported by preliminary data) that nest boxes hidden in the woods near brood habitat are less often parasitized and produce more ducklings per egg laid in them than highly-visible boxes located over open water (singly or in groups). Based on the results, specific management recommendations could be made regarding the future placement of nest boxes at Montezuma and elsewhere.

The objective of Dr. Sherman's research is to find a more cost-effective way to use the thousands of wood duck nest boxes that are presently scattered all over the United States to enhance the birds' nesting productivity.

Wood duck nest boxes were erected in three configurations: visible-isolated, visible-clumped, and well-hidden. The boxes are being monitored over three breeding seasons (1991 - 1993), and the following data is recorded for each configuration: percentage of box use, clutch sizes, number of dump nests, nesting efficiency, and hatching success.

At the beginning of the study there were slightly more than 100 boxes in use at Montezuma, the majority of which fell into the visible-isolated or visible-clumped categories. Approximately 30 boxes were moved so that they fit into the well-hidden category.

Wood duck nesting boxes from the previous nesting season are inspected, cleaned, and maintained in late January and early February. Results from the 1992 nesting season are not yet available. 1991 nesting season data is presented below.

Wood duck box use remained essentially the same as last year with 77% of the 111 boxes used in 1991. Production increased slightly to 603 ducklings, but the hatching rate for all eggs laid dropped to only 42%.

The first-year results from Dr. Sherman's box relocation study were quite dramatic. Seventy-eight percent of eggs (173 of 223) laid in the well-hidden boxes hatched, whereas only 35% of the eggs (444 of 1,281) laid in the visible boxes hatched. Clutch sizes in the well-hidden boxes remained low and well within the range of greatest hatchability, whereas in the visible boxes clutch sizes were much higher. Hatchability dropped as clutch sizes increased above 15 eggs.

Clearly, a greater proportion of the population's reproductive potential is utilized when wood ducks are encouraged to nest in more "natural" circumstances as opposed to highly visible wood duck box condominiums. The preliminary findings from this ongoing research project indicate that the operative goal of any box program should be the number of eggs successfully hatched per box. This hatchability "yardstick" is a much better measuring stick than counting the number of boxes used or the total number of eggs laid.

Two general messages are becoming clear from Dr. Sherman's work. First, programs for conserving and managing species should be developed in light of, rather than in spite of, their evolved behavior. This is because social restructuring due to habitat manipulation can have a major impact on reproduction and thus the well-being of natural populations. Second, his work illustrates the value of partnerships between academic researchers and refuge biologists. In this case, "basic" research in animal behavior has led to a new insight into an "applied" problem. If we want wood ducks to behave normally and to maintain their populations near the environmental carrying capacity, we must both preserve the birds' natural habitat and judiciously position artificial nesting structures in that habitat.

4. Marsh and Water Birds

Several species of marsh and water birds may be found on the refuge pools over 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 rail, American and least bitterns, common moorhens, and pied-billed grebes.

Rarer migrants observed on the refuge included a horned grebe in late April on the Main Pool, two red-necked grebes and an eared grebe on the Main Pool during the first week of May, a glossy ibis on Main Pool and Benning Marsh during late April, and a cattle egret at the Main Pool banding site during mid-October.

Black-crowned night herons nested in the purple loosestrife and cattail stands fringing sections of the Main Pool. Production was estimated at 25 birds. Other marsh and water birds observed nesting on the refuge in 1992 included green-backed heron, Virginia rail, common moorhen, and pied-billed grebe. While not nesting on the refuge, double-crested cormorants capitalized on the abundant carp and bullhead populations in refuge pools. Upwards of 500 birds could be

observed on Main, Tschache and May's Point Pools throughout the late summer and fall.

Starting in 1982, great blue herons have nested atop dead snags in the east-central portion of Tschache pool. Prior to 1982, when two pair of birds first nested in the snags, this species had not successfully reproduced at Montezuma since the mid-1940's.

While the number of great blue herons nesting in the Tschache Pool rookery has steadily increased each year, the number of suitable nesting sites (dead snags over water) has gradually declined. The snags are the remnants of a hardwood forest that was flooded in the 1940's. Over the intervening years, the snags have rotted and fallen. In late 1990, several passing weather fronts with accompanying high winds accelerated the rate of snag loss. It was anticipated that the heron rookery would relocate at some point to a location with a greater abundance of suitable nesting sites. 1991 proved to be the year that the birds abandoned the Tschache Pool rookery. In mid-April it was discovered that herons were nesting on the southern wooded edge of the Main Pool.

Great blue herons again occupied the Main Pool rookery during 1992. All of the nests are located in live trees and the dense leaf cover obscures the majority of the nests throughout the breeding season. A late fall (post leaf drop) count revealed 45 to 50 nests. How many of these were active during the breeding season is impossible to determine.

5. Shorebirds, Gulls, Terns, and Allied Species

Killdeer, spotted sandpiper, and American woodcock are the only shorebird species that are common breeders on Montezuma, although many other species are commonly observed during migration. For the past several years, Montezuma has instituted a program of both spring (April - May) and fall (mid-August -late October) drawdowns of water levels on the 160-acre May's Point Pool. 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.

During our drawdowns, shorebird diversity was quite impressive. Killdeer, lesser yellowlegs, greater yellowlegs, spotted sandpiper, snipe, semipalmated sandpiper, least sandpiper, and semipalmated plover were most numerous. The more unusual sightings included a

male ruff in full breeding plumage, black-bellied plover, ruddy turnstones, redknot, white-rumped sandpiper, lesser golden plover, northern phalarope, Hudsonian godwit, pectoral sandpiper, stilt sandpiper, and Baird's sandpiper. Virtually every species of shorebird that passes through central New York during migration was represented and recorded during the spring and/or fall on May's Point Pool.

Just one of many. The shallow waters and exposed mudflats of the Benning Marsh were extensively used by a large variety of migrating shorebirds this year. (92-16; J & KH)

American woodcock singing ground surveys were again conducted at Montezuma this year. The survey routes are slightly modified versions of the national singing ground surveys conducted by the U.S. Fish and Wildlife Service Office of Migratory Bird Management.

On May 4 and May 6, 1992, the American Woodcock Singing Ground Survey was conducted on the North Spring Pool route. Primary Assistant Manager Christenson and his wife Elise were the surveyors. Six American woodcock were heard on the North Spring Pool route. The Unit 17 route was not run this year due to impassable road conditions resulting from construction activity associated with the Cayuga Lake water connector project. Biologist Gingrich also participated by

running a constant zero route near the refuge as part of the Service's National Singing Ground Survey.

Herring and ring-billed gulls were a common sight after ice-out in mid-March. Both species appear to take advantage of foraging opportunities presented by winter-killed carp and small bullheads. The gulls were again opportunistic feeders in November and early December when Tschache Pool was drained. Hundreds of herring, ring-billed, and greater black-backed gulls made quick work of any carp left stranded by the receding water during the drawdown. The only unusual gulls recorded at Montezuma were Bonapart's gulls. These were seen in both the spring and fall of this year.

The first documented observation of black terns at Montezuma occurred in 1942. However, it is probable that terns occurred on the marshes for many years prior to the establishment of the refuge in 1937. Terns were observed nesting on the refuge nearly every year from 1942 to 1986. Historical records document a gradual decline in black tern populations from several hundred in the early 1950's. From 1987 to 1991 there were no known black tern nests on the refuge. Throughout 1992, no nests were observed, and a maximum of only four individuals were seen. These birds tended to congregate in the northwest corner of Main Pool.

The decline of the black tern nesting population at Montezuma may simply be a reflection of declining populations throughout New York State. New York State is currently reviewing the status of the black tern for consideration as a threatened or endangered species. The cause of the declining population is unclear; however, it may have to do with the loss of suitable habitat. Tern nesting habitat at Montezuma has been altered by the aggressive colonization of the refuge by purple loosestrife. This caused not only a decline in the overall diversity and abundance of native wetland vegetation, but created edge habitat on the water that was unbroken by pockets or thinning areas.

Black terns require nesting habitat set back in the vegetation a short way with a matrix of 50% vegetation and 50% open water. Our work with the Hockney underwater weed cutter has provided that matrix, but still we have seen no terns nesting in these areas. The reasons may be simple. Terns nest on floating cattail root stalks and dead emergent vegetation accumulated on floating boards or logs. They also use abandoned muskrat lodges and feeding platforms. These nesting platforms are absent in the areas where loosestrife control has been effective. Another factor may be sheerly in the number of birds present during the pre-nesting time period. Several colonial waterbird biologists

feel that there is a minimum number of birds needed to start a colony before any birds will breed.

We have submitted a Challenge Grant proposal in cooperation with our local audubon bird club to try to alleviate these problems. We are proposing placing 50 32" x 32" nesting platforms with the start of a nest built in the center. We also have proposed placing black tern decoys at 15 of the nest sites to encourage their use. The black terns that are sighted at Montezuma are seen in the areas where we propose to use these platforms, and we hope that this will spur nesting activity after a five year dry spell.

During the fall drawdown of May's Point Pool, common and caspian terns used the area extensively. Both species seemed to use the mudflats as a resting area, and would fly off to feed on both Tschache and Main Pools.

6. Raptors

Other than the preceding comments (Section G.2) concerning bald eagle and osprey use of the refuge, raptor populations underwent no noticeable changes in 1992. Red-tailed hawks and American kestrels were commonly observed throughout the year. Several breeding pairs of each species occur on the refuge.

Sharp-shinned and Cooper's hawks are not known to breed on the refuge. However, both species are occasionally seen during fall and winter. Eastern screech owls and great-horned owls are breeders and year-round residents. Northern harriers are suspected breeders, but have not as yet been confirmed. Turkey vultures are commonly seen from March to November.

The refuge hosts several species of wintering birds of prey. Rough-legged hawks and snowy owls are typically seen each year, with this year being no exception.

Some infrequently sighted raptors stopped here this year and caused quite a stir in the local birding community. An immature peregrine falcon and a gray morph gyrfalcon were sighted this year. The gyrfalcon stayed around the area for several days, and dozens of birders converged on the refuge hoping to see this rare arctic falcon. Most went home happy since the bird was very visible.

7. Other Migratory Birds

Unit 17, located at the northern end of Cayuga Lake, is an excellent place to observe spring and fall migrations. The

wooded bottomland hardwoods attract thousands of warblers during migration. Some of the more notable species include prothonotary warbler, cerulean warbler, and Tennessee warbler.

On January 1, 1993, the Montezuma Christmas Bird Count was conducted. A total of 63 species and 21,780 individuals were recorded. Unusual sightings included: Pied-billed grebe, Iceland gull, snowy owl, belted kingfisher, eastern bluebird and a yellow-rumped warbler.

Preliminary discussions were held with the Owasco Valley Audubon Club regarding the implementation of some type of nongame bird surveys on Montezuma beginning in 1993 or 1994. Conducted as a volunteer effort, the goal of these surveys will be to monitor longterm trends in breeding populations of nongame birds.

Montezuma's efforts to assist in the recovery of the eastern bluebird were first rewarded in 1981 when a single pair of birds used one of our nesting boxes to fledge five young. Since 1981, 68 bluebirds have fledged from nest boxes on the refuge.

In 1992, two nest boxes were occupied by eastern bluebirds. A total of nine eggs were laid during the two nesting attempts. Unfortunately, only two young were fledged from the boxes. One box contained an active bluebird nest from which five young hatched during mid-May; however, the nestlings died during the last week of May. Several consecutive nights of unseasonably cold weather probably resulted in the young birds' deaths. The second nesting attempt included four nestlings, of which two survived to fledge from the box. Species using the remaining boxes included tree swallows (by far the most common nester) house wrens, and black-capped chickadees.

Refuge volunteer Kevin Colton monitored the refuge's twenty-six bluebird nesting boxes throughout the breeding season. Kevin's work with our bluebird boxes began several years ago and has led to his active involvement with the North American Bluebird Society.

8. Game Mammals

For the fifth consecutive year the refuge conducted a shotgun hunt for white-tailed deer. In conjunction with the traditional archery season, the shotgun hunt was initiated to implement a more aggressive and proactive program of managing the refuge's deer population.

The objective of the hunt is to protect forested and scrub/shrub habitats by controlling the size of the refuge's pre-winter deer population. Our efforts at population control have been hampered by New York State Department of Environmental Conservation (NYSDEC) harvest goals in the Deer Management Units surrounding the refuge. A second factor that has limited our efforts at deer population control is one shared by many wildlife managers in the northeastern states. It has become obvious in recent years that there are just too few hunters to adequately control a growing deer population. This development has thrown the proverbial "monkey wrench" in our best laid plans.

During 1992, NYSDEC took a giant step forward in an attempt to alleviate the current situation of too few hunters. Antlerless deer permits for Deer Management Unit (DMU) 86, of which the refuge is a part, were increased this year. The greater number of permits appeared to increase hunter participation and enthusiasm. Many hunters were able to obtain multiple DMU permits. This effectively raised the hunters' seasonal bag limit from one deer to three or possibly four deer. As wildlife managers, scrambling to control a growing deer herd, we viewed the measures taken by NYSDEC as very positive.

Throughout the year, deer leave the refuge on a daily basis to feed on surrounding agricultural lands. 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 those deer from adjacent, non-sheltered farmlands. The deer seek out the thermal protection afforded by the bottomland hardwoods and cattail marshes.

The recent series of mild winters have resulted in too many deer for winter carrying capacities. The large over-wintering deer population has had a negative impact upon the overall vigor and diversity of the refuge's plant communities. Several areas of the refuge's treed and/or shrubbed acreage have been heavily browsed in recent years. The refuge's deer hunts have been designed and implemented to reduce the deer population and thus lessen the damage to the vulnerable plant communities.

A total of 124 white-tailed deer were harvested by hunters during the 1992 refuge season (November 2 through December 12). Archery hunting accounted for 24 deer, with shotgun hunters removing an additional 100. One hundred nine (109) of the 124 deer harvested were examined by refuge personnel at the voluntary hunter Check Station. Information collected on each deer included sex, age, antler beam diameter, total number of antler points, and fawn weight.

Table 1 summarizes the sex and age breakdown of the 109 deer examined at the Check Station.

Table 1. Summary Of Check Station Data For the White-Tailed Deer Hunt On The Montezuma National Wildlife Refuge, 1992.

	AGE CLASSES					
Sex	Fawn	1 1/2 Years	2 1/2 Years	3 1/2 Years	4 1/2+ Years	Number Examined
Male	19	15	8	1	0	43
Female	13	23	19	7	4	66
TOTALS	32	38	27	8	4	109

Table 2 summarizes the physical condition data gathered on the 24 adult male deer and 32 fawns (both male and female) examined at the Check Station. For adult male deer, all antler points longer than one inch were counted, and the diameter of the antler beam was measured with calipers one inch above the base of the antler burr.

Table 2. Summary of Physical Condition Data and Fawn Weights For Deer Taken on the Montezuma National Wildlife Refuge, 1992.

Age Class	Average Beam Diameter (mm)[1]	Average Number Of Antler Points[2]	Average Fawn Weight (lbs)
Fawn (female) (n = 13)	-	-	54.0
Fawn (male) (n = 19)	-	-	55.6
1 1/2 Years (n = 15)	19.53	4.20	-
2 1/2 Years (n = 8)	23.75	5.88	-
3 1/2 Years (n = 1)	34.00	8.00	-

[1] The diameter of the antler beam was measured with calipers one inch above the base of the antler burr.

[2] All antler points longer than one inch were counted.

Table 3 and Figures 1 and 2 provide seven-year summary information on deer examined at the hunter check station from 1986 through 1992. Although sample sizes are small, both yearling beam diameters and fawn weights have increased 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.

Table 3. Seven-Year Summary of Check Station Data for the White-Tailed Deer Hunt On The Montezuma National Wildlife Refuge.

		Age Classes						
Hunt Year	Sex	Fawn	1 1/2 Years	2 1/2 Years	3 1/2 Years	4 1/2+ Years	Number Examined	TOTALS
1986	Male	8(40.0)[1]	9(45.0)	3(15.0)	0(0.0)	0(0.0)	20	35
	Female	6(40.0)	4(26.7)	3(20.0)	1(6.7)	1(6.7)	15	
1987	Male	6(31.6)	8(42.1)	4(21.0)	1(5.3)	0(0.0)	19	49
	Female	5(16.7)	4(13.3)	12(40.0)	4(13.3)	5(16.7)	30	
1988	Male	15(31.9)	22(46.8)	8(17.0)	2(4.3)	0(0.0)	47	89
	Female	7(16.7)	10(23.8)	13(31.0)	6(14.3)	6(14.3)	42	
1989	Male	18(34.0)	24(45.3)	8(15.1)	0(0.0)	3(5.7)	53	111
	Female	14(24.1)	18(31.0)	12(20.7)	8(13.8)	6(10.3)	58	
1990	Male	14(40.0)	16(45.7)	2(5.7)	3(8.6)	0(0.0)	35	66
	Female	4(12.9)	12(38.7)	5(16.1)	6(19.4)	4(12.9)	31	
1991	Male	24(38.1)	30(47.6)	9(14.3)	0(0.0)	0(0.0)	63	110
	Female	11(23.4)	17(36.2)	11(23.4)	4(8.5)	4(8.5)	47	
1992	Male	19(44.2)	15(34.9)	8(18.6)	1(2.3)	0(0.0)	43	109
	Female	13(19.7)	23(34.8)	19(28.8)	7(10.6)	4(6.1)	66	

[1] Percentage in each age class (by sex) of total deer harvest.

Average Beam Diameter
Yearling Bucks

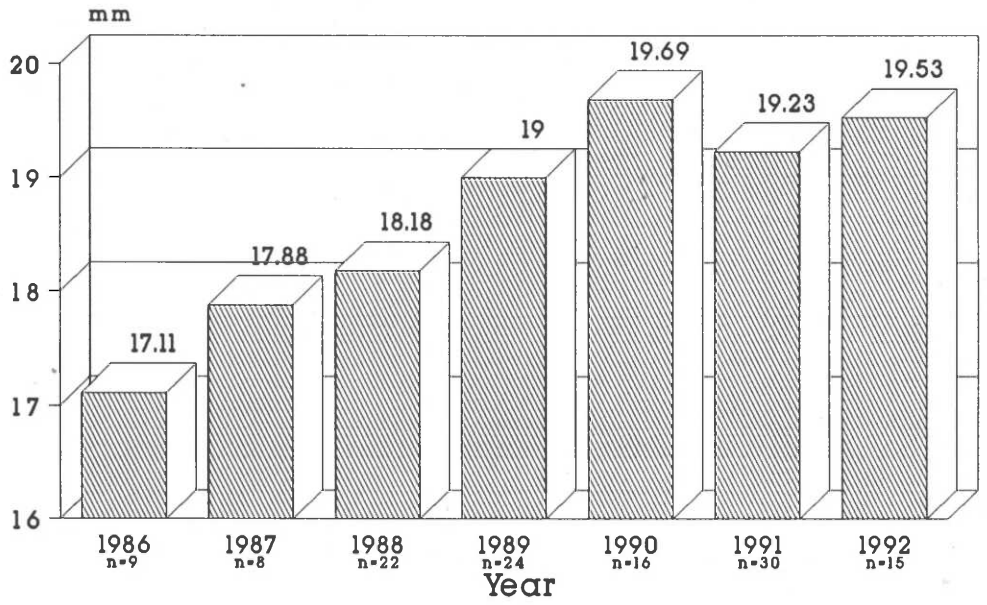


Figure 1. Seven-Year Summary of Mean Yearling Antler Beam Measurements For Deer Taken On The Montezuma National Wildlife Refuge.

Average Fawn Weight
(Field Dressed)

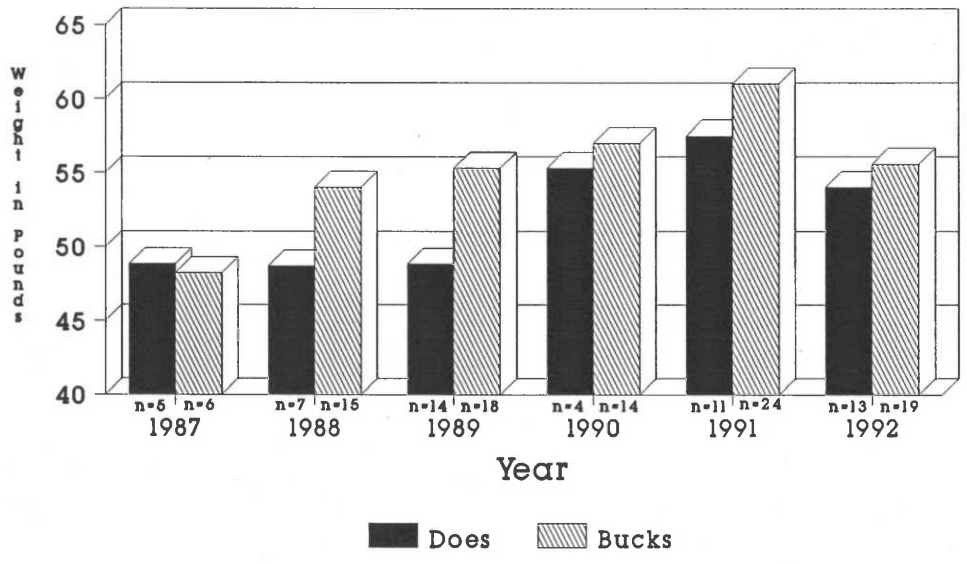


Figure 2. Six-Year Summary of Dressed Fawn Weights For Deer Taken On The Montezuma National Wildlife Refuge.

No furbearer trapping had occurred on Montezuma since the 1989-90 season. Due to ongoing conflicts with winter pool drawdowns, a greatly reduced soft fur market, and a lack of trapper interest in the program, a decision was made to discontinue the Annual Trapping Program at Montezuma during both the 1990-91 and 1991-92 seasons. It was decided that the closure would continue until such time as a significant change in these conditions warranted a reevaluation of the action.

A slowly strengthening fur market, an absence of planned winter drawdowns on refuge pools, and increased local interest in reopening the refuge to trapping resulted in our reevaluation of the closure for the 1992-93 season.

For the 1992-93 season, two area trappers successfully bid on and were awarded a total of three of the refuge's six trapping units. A total of $376.00 was collected as a result of sealed bids on the three units. No bids were received for the other three units. Trapping dates were October 24, 1992 through February 14, 1993. Results will be reported in the 1993 Annual Narrative Report.

10. Other Resident Wildlife

Mild winters, coupled with the availability of good habitat (in the form of managed grassland field/cattail marsh associations) have led to a substantial recovery in the local ring-necked pheasant population. Cattail and marsh grasses on the refuge provide excellent cover for pheasants. In addition, food was readily available in adjacent farm fields and it appears that survival of the refuge pheasant population during 1992 was good. Crowing cock pheasants commonly are heard throughout the spring and several broods were observed on and in the immediate vicinity of the refuge during the summer.

Montezuma provides only marginal habitat for ruffed grouse. No drumming males were heard by refuge staff and only a few individuals were flushed during the year.

The wild turkey population has been increasing in upstate New York in recent years. Although limited upland acreage and a lack of mast producing trees may be limiting factors within the boundary of the refuge proper, the turkey population near and on the refuge appears to be increasing. Small flocks of up to a half-dozen birds are seen occasionally throughout the late winter and spring months. Hens may very well be beginning to nest on or immediately adjacent to the refuge.

11. Fisheries Resource

In order to minimize disturbance to migratory birds, fishing is confined to non-impoundment waters adjacent to the refuge.

Although fishing does not occur in refuge waters, the refuge controls two access sites (May's Point and Armitage Road), and operates under a cooperative agreement with the New York State Department of Environmental Conservation to maintain a third site used for boating access to the Cayuga-Seneca Barge Canal. There are approximately 2,400 feet of fishing bank access at the three sites. Popular fish species sought include: northern pike, perch, sunfish, crappie, bullhead, and carp. During the spring of the year there is a small run of bullhead and some fishing opportunity exists where bullheads congregate on the canal side outfall of the Seneca Spillway.

12. Wildlife Propagation And Stocking

A total of 66 canvasbacks were released on the refuge during 1992 by Patuxent Wildlife Research Center (WRC) personnel. These birds were raised on enclosed outdoor ponds at Patuxent WRC as part of various research projects. Patuxent WRC Biologist Mike Haramis obtained the proper federal and New York State permits on each of the four occasions when birds were released. All birds were certified as healthy and disease free.

The refuge appears to have adequate habitat for breeding canvasbacks; in fact, canvasback breeding has occurred at Montezuma in the past. The most recent record was a brood of nine young produced in 1981. The following table provides a summary of release dates and locations for the 66 birds released on the refuge in 1992.

SUMMARY OF CANVASBACK RELEASES ON MNWR - 1992

Date of Release	Location of Release	Number Released		
		Male	Female	TOTALS
04/14/92	Tschache Pool	19	22	41
08/20/92	Main Pool	5	5	10
09/18/92	Main Pool	11	0	11
10/28/92	Main Pool	1	3	4
GRAND TOTALS		36	30	66

14. Scientific Collections

On September 29 and 30, a U.S. Geological Survey (USGS) drilling rig and crew took sediment core samples down to a depth of seventy feet at two locations on the refuge (the east dike in Unit 17 and the headquarters picnic area). This work was the culmination of investigations over the past year to determine the glacial history and on-going glacial rebound of the Montezuma Marshes and surrounding area. Bill Kappel (Senior Hydrologist, USGS) and Dr. Dick Young (Chairman of the Geology Department, State University of New York at Geneseo) conducted the scientific elements of the study. In essence, the team is tracing the geological history of the area during the past 12,000 years. A number of interesting sediment relationships were revealed in the layers of peat, varved clays, and other materials from the soil borings. The researchers' interest in the sediments underlying the refuge were first piqued when we started excavating the Unit 17 connector to Cayuga Lake. At that time, layers of peat, ancient cedar trees, and other unusual sediments were revealed during ditch construction. Dr. Young intends to work with refuge public use staff to develop a Visitor Center display depicting the geology of the historic Montezuma Marshes.

15. Animal Control

Each year, several woodchuck burrows on the refuge are treated with rodent control cartridges (gas cartridges). Control efforts are annually limited to selected areas along dikes where woodchuck activity, if left unchecked, would result in structural damage to the integrity of the dikes. Control efforts were also undertaken in the vicinity of the

Esker Brook Nature Trail where woodchuck burrowing activity constitutes a safety hazard for refuge visitors.

Raccoons have historically been a problem during waterfowl banding operations at Montezuma. They frequently find baited areas and discourage ducks from the banding site, rendering it useless for waterfowl trapping. If raccoons do not discover the site during pre-baiting, but find it after the traps are set and ducks are captured, there is the possibility that the raccoons will kill and/or maim captured ducks.

During 1992, six raccoons and one Virginia opossum were captured in traps at the banding sites during the banding period and removed to other areas of the refuge. Seven raccoons were also removed from banding sites in 1991. The success of this removal program is reflected, in part, in the success of our banding program. Last year the refuge banded 1,028 birds. This year, a record 1,181 ducks were banded. Not one bird was lost to depredation during these banding efforts.

The refuge still has occasional stray dog problems. In most instances, the local dog warden has been successful in capturing and returning the animals to their owners.

16. Marking and Banding

The preseason waterfowl banding effort at Montezuma during 1992 was the most successful on record. The refuge banding quota of 200 mallards (50 each age and sex) was exceeded, as was the refuge quota of 50 American black ducks. Montezuma does not receive a quota for wood ducks, but all wood ducks, northern pintails, American widgeon, and additional mallards captured are banded at the request of the New York State Department of Environmental Conservation to assist them in reaching their statewide goals.

All birds were captured in three-compartment (Montezuma style) walk-in traps. Whole kernel corn is used to entice birds into the traps. A station record of 1,181 ducks were banded at two land sites adjacent to the Main Pool during ten trap-nights of effort.

Biological Technician Bob Murray and Tractor Operator Louise Dates banding ducks. (92-17; MKS)

Refuge Volunteer Grace Schaffer does it all for us. During duck banding, she's our information recorder. (92-18; PL)

Approximately 50 members from the Student Chapter of the Wildlife Society at the State University of New York College of Environmental Science and Forestry participated in the refuge's banding program. Additionally, 15 students from the Onondaga Nation's Indian School, six YCC enrollees, 15 local boy scouts, and several refuge volunteers also participated in refuge banding efforts. Their help was much appreciated.

Banding totals for each species are summarized below:

1992 Preseason Banding Summary

	HYM	AHYM	HYF	AHYF	TOTAL
Mallard	196	131	269	179	775
Wood Duck	142	106	50	39	337
American Black Duck	9	8	30	15	62
Northern Pintail	1	2	0	3	6
American Widgeon	0	1	0	0	1
GRAND TOTAL					1,181

Total Immature/Adult

Mallard	327/448	= 0.73
Wood Duck	248/89	= 2.79
American Black Duck	17/45	= 0.38
Northern Pintail	3/3	= 1.00

From mid-January to mid-February, several refuge staff members and volunteers assisted New York State Department of Environmental Conservation Region 7 Biologists with the on-going winter Canada goose banding project on Cayuga Lake. A total of 418 Canada geese and approximately 600 American black ducks and mallards were captured, leg banded, neck collared (geese only), and released during the effort. The cooperative banding effort provided an excellent opportunity for refuge personnel to work with and learn from their state counterparts.

The new soft-plastic, conical neck collars were used during the winter banding efforts as part of the Atlantic Flyway Canada Goose Study. These new style collars have more flexibility than the cylindrical hard plastic collars used in previous studies. The flexibility diminishes chipping and breaking, and prevents accumulation of ice on the

collar, eliminating a potential mortality factor. The collars fit better on the goose and are easier for the observer to read. These improvements will make future data collection throughout the flyway much more efficient and ultimately generate more accurate information for analysis by the study's researchers.

17. Disease Prevention and Control (Reviewed 1/23/93)

Since the 1960's, rabies in New York State had been limited largely to several northern counties near the Canadian border. These counties have been affected by a persistent red fox rabies outbreak in Ontario, Canada. Bat rabies has been reported since the late 1950's throughout New York State. Occasionally, cases of rabies in domestic cats, grey foxes, and livestock have been reported in areas otherwise free of rabies. These cases were the result of exposure to bat rabies.

The mid-Atlantic raccoon rabies epizootic, previously affecting the District of Columbia, Virginia, West Virginia, Maryland, Delaware, Pennsylvania, and New Jersey, initially spread into New York State during 1990. It first appeared in the southern tier counties of Steuben, Allegheny, Cattaraugus, and Chemung. Over 650 confirmed cases of rabies were reported in raccoons in these southern tier counties in 1991. During 1992 this intense outbreak continued to move northward and infect large numbers of raccoons (nearly 1,400 cases of raccoon rabies were reported in New York during 1992), and has spilled over to other wildlife species and unvaccinated domestic animals. By year's end, dozens of confirmed cases of raccoon rabies were reported in both Seneca and Cayuga Counties (Montezuma NWR lies entirely within Seneca County and is adjacent to the Seneca-Cayuga County border). Fortunately, no confirmed cases have been reported on the refuge as yet. We do expect that the virus will be present in the refuge's raccoon population in 1993.

Because of this threat, several informational pamphlets describing rabies in wildlife have been made available to refuge visitors. In addition, Michael Allen, Senior Wildlife Technician with the new York State Department of Environmental Conservation, presented a rabies program on March 21 at the refuge Visitor Center. Fifty people turned out to learn the history of the disease and preventative measures to reduce exposure to the virus. Attendees were also informed of the protocol to follow if they or their pets have an encounter with an animal that might be rabid.

H. PUBLIC USE

1. General

The Public Use Program at Montezuma provides wildlife-oriented educational and recreational opportunities compatible with refuge management objectives. Public use facilities and programs include the 3.5 mile self-guided Wildlife Drive, the 1.5 mile Esker Brook Nature Trail, fishing and hunting programs, educational programs, a Visitor Center, observation towers, guided tours and walks, and special Visitor Center programs. Figures 1 and 2 provide visitation profiles for 1991-1992.

Weather conditions throughout much of 1992 were not favorable for most outdoor activities. Winter weather conditions forced the closure of the Wildlife Drive and observation towers from January through March, and again in mid-December. Following the unusually long winter, Central New Yorkers were ready for the hazy, hot, and humid weather typical of the summer months. Instead, very wet, cool weather plagued the area from June through September. As a result, total refuge visitation was down in 1992. Most significant decreases involved fishing (14,100 fewer visits) and environmental education (2,500 fewer visits).

FIGURE 1 - MONTHLY VISITATION

Month	1991	1992
JANUARY	3,000	3,700
FEBRUARY	4,200	2,900
MARCH	8,000	4,900
APRIL	22,400	29,900
MAY	18,500	16,900
JUNE	14,300	11,400
JULY	18,500	17,300
AUGUST	17,800	15,200
SEPTEMBER	15,300	15,600
OCTOBER	19,000	18,300
NOVEMBER	11,400	9,000
DECEMBER	2,900	2,800
TOTALS:	155,300	138,900

FIGURE 2 - VISITATION BREAKDOWN

	1991	1992
Wildlife Observations		
Tour Route	71,800	76,100
Towers	9,900	6,200
Trails	10,700	7,400
Guided Walks	280	400
Photography	500	400
SUBTOTALS	**92,180**	**90,500**
Visitor Center (staffed)	16,200	17,000
Special Programs	900	600
Informational Visits - Office	500	400
Environmental Education		
Students	4,500	2,100
Teachers	400	300
SUBTOTALS	**4,900**	**2,400**
Hunts		
Waterfowl	300	300
Archery	1,200	1,000
Firearms	700	800
Small mammal	70	--
SUBTOTALS	**2,270**	**2,100**
Trapping	0	0
Fishing	37,400	25,800
		100
YEARLY TOTALS	**155,350**	**138,900**

2. Outdoor Classrooms - Students

The Visitor Center is the primary focus of refuge environmental education activities. Student visitation decreased in 1992. The decrease can be attributed to several factors, including the weather, the absence of the ORP during most of the year, and the lack of any public

staff during the peak months of school group visitation (October - November). In past years, October has been the busiest month for environmental education, with well over 1,000 students visiting the refuge.

Concepts such as adaptations, habitats, the role and importance of wetlands, migration, and endangered species were discussed with the 2,100 students that visited the refuge. The majority of the groups also received guided tours around the refuge. Student visitation in 1992 by grade level was:

Elementary	900
Middle School.	500
High School.	200
College.	500
Total:	2,100

Scout groups continue to visit the Refuge for environmental education. Approximately 240 scouts visited in 1992. Volunteer Ed Klein continued to conduct scout programs in the Visitor Center. He did a great job, and we will continue to utilize his services.

A local boy scout troop set up two nesting tripods on the Main Pool. Although the tripods were not used in 1992, the scouts were rewarded for their interest and efforts with an invitation to assist with the fall duck banding. The fifteen scouts thoroughly enjoyed the opportunity to learn about and handle mallards, American black ducks, and wood ducks.

The duck banding season also provided educational opportunities for 50 members of the Student Chapter of the Wildlife Society at the State University of New York College of Environmental Science and Forestry in Syracuse, and for fifteen students from the Onondaga Nation Indian School.

The refuge hosted a Conservation Day for scouts on May 2nd. Over 140 scouts and 30 leaders participated in the program. Station topics included: rabies, waterfowl identification, wetland values, insects, bird adaptations, trees, migration, bluebirds, water cycle, and wildlife laws.

Primary Assistant Manager Barry Christenson discussed various wildlife laws during the refuge's Scout Conservation Day. (92-19; EK)

Scouts learned about the water cycle from Outdoor Recreation Planner Fred Caslick. (92-20; EK)

Refuge staff also helped support the educational programs of other agencies. Joint efforts included:

Manchester High School Career Day - Recreation Aide Smith spent a day discussing U.S. Fish and Wildlife Service career opportunities with 60 students in grades 9-12. Students participating in the program had career interests in the environment, wildlife, and biology.

Central New York Envirothon (Sponsored by several local Soil and Water Conservation Districts.) - Over 125 high school students participated in the regional competition for the New York State Envirothon Championship. ORP Caslick and Tim Noga from the Cayuga County Sportsmen's Federation prepared a written and field test on wildlife for the competition.

Frank Knight Elementary School's Reading Week - Assistant Refuge Manager Christenson and Recreation Aide Smith participated in the annual program that has local professionals visit classrooms and read short stories.

Seneca County Conservation Day - Organized by the Cornell University Cooperative Extension 4-H Program of Seneca County. Over 350 students and 14 teachers learned about the importance of wetlands at the refuge's station.

Cayuga County Conservation Days - Organized by the Cayuga County Soil and Water Conservation District. Over 500 students and 20 teachers learned about wetland habitats from refuge staff. Following the Conservation Days, the students are encouraged to enter an essay contest about the most important things they learned from the program. This year's winning essay was written about the refuge's wetlands program.

Mynderse Academy Career Day - On October 15, Hocutt served as the "entire" Environmental Section at a Career Day for grades 9-12 at the Mynderse Academy for students from Seneca Falls, South Seneca, and Waterloo High Schools.

Refuge staff also travelled to several schools in 1992. Off-site environmental education visits were as follows:

Recreation Aide Smith spent the morning at the Cayuga Elementary School on January 27th. Endangered species was discussed with ninety 1st grade students.

On March 25, Smith travelled to Weedsport Elementary School. Endangered species was again the topic. Two hundred 4th and 5th grade students participated.

Recreation Aide Smith spent April 15 and 16 at the Clyde Elementary School. Predators was the topic for eighty 3rd graders, while eighty 5th graders learned about Montezuma and other National Wildlife Refuges.

ORP Caslick spent April 24 at Trumansburg Elementary School. Some 300 students learned about endangered species.

3. Outdoor Classroom - Teachers

Approximately 300 teachers brought their classes to the refuge in 1992. Most of the teachers were unfamiliar with the refuge and relied on refuge staff rather than the refuge itself to provide the students with a quality education experience. The lack of environmental education workshops for teachers in the past several years has resulted in this tour-guide type of education. Our goal is to return to using teacher workshops in order to create teacher-directed environmental education programs at Montezuma. Through workshops, teachers will explore ways in which they can work with their students in an outdoor classroom setting. Teachers will also learn about the facilities and equipment the refuge has available for environmental education; i.e., microscopes, nets, boardwalks, etc.

In recent years, many schools have eliminated or reduced field trips due to the lack of funding. This trend is most likely to continue, and will result in fewer school group visits to the refuge. Teacher workshops then become our link to the students. If we expect students to be educated about the outdoor world around them, we need to first educate the educators. Through environmental education workshops, teachers will be provided the tools needed to conduct hands-on environmental studies, even without field trips. There is nothing wrong with using a schoolyard or a site within walking distance of the school. The goal is, after all, to expose students to environmental concepts and issues.

Recreation Aide Smith continues to work on an environmental education guide for the refuge. The guide consists of three sections: general information, classroom lessons, and field lessons. The first two sections introduce and reinforce the concepts that will be learned in the field lessons.

4. Interpretive Foot Trails

Esker Brook Nature Trail is the refuge's 1.5 mile walking trail. Approximately 8,000 people hiked the trail in 1992. Again this year, YCC made improvements to the trail by

spreading woodchips and installing benches. Two interpretive panels were ordered in August for the trailhead kiosk. To reduce potential conflicts, Esker Brook Nature Trail was closed to the non-hunting public during the refuge's archery and firearms hunting seasons (November and the first week in December).

5. Interpretive Tour Route

The Wildlife Drive continues to be the most popular attraction on the refuge. Approximately 76,000 people (54% of the total visitation) travelled the 3.5 mile Wildlife Drive during 1992. The Drive provides excellent opportunities for viewing and photographing wildlife from one's vehicle, especially the thousands of ducks and geese present during the spring and fall migration seasons.

Inclement weather and poor road conditions resulted in the closure of the Wildlife Drive to vehicles from January through March. While closed to vehicles, snowshoers, cross-country skiers, and hikers used the Drive when weather and road conditions permitted.

A Wildlife Drive Brochure was written and submitted in August. The brochure addresses ecological concepts and management of the refuge's habitats.

6. Interpretive Exhibits/Demonstrations

Refuge staff worked with the Fish and Wildlife Enhancement Office in Cortland, New York, on a Fish and Wildlife Service Exhibit for the New York State Fair. Refuge and Enhancement Office staff designed and built the exhibit, which was displayed at the State Fair in Syracuse from August 27 through September 7. This year's exhibit featured photographic displays on the Clean Water Act and endangered species, a wetland model, a computer storybook, and a wood duck nest box display.

Montezuma continues to exhibit and schedule the use of the regionally-owned North American Waterfowl Management Plan (NAWMP) Exhibits. This year's off-refuge schedule of use was as follows:

Display	Site/Date
NAWMP (Large Exhibit)	Great Northeastern Sportsmen's Show, Syracuse, New York, January 24 - 26, 1992.
NAWMP (Large Exhibit)	National Fishing Research and Development Laboratory, Wellsboro, Pennsylvania, National Fishing Week, May 30 - June 30, 1992
NAWMP (Tabletop Exhibit)	Frank Knight Elementary School's Environmental Awareness Week, Seneca Falls, New York, November 2 - 6, 1992.

Refuge staff developed an exhibit for the Earth Day Celebration (April 17-20) at the Burnett Park Zoo in Syracuse, New York. The exhibit featured a photographic display titled "Wetlands, Wildlife, and You". A wood duck nest box display was also part of the exhibit. Refuge volunteer Kevin Colton staffed the exhibit on Saturday, April 18th. The estimated daily visitation was between 2,000 and 3,000 people.

The refuge hosted it's first wildlife art show in 1992. The works of several central New York State wood carvers were displayed in the Refuge Visitor Center during the month of April. Milton Cansdale, Kevin Colton, Robert Buss, Maureen Poole, and Blair Clements provided carved birds for the display.

Five new interpretive signs were ordered in August. The new signs will be placed in the kiosks at Tschache Pool and Esker Brook Nature Trail. A kiosk for the Main Pool has been considered for 1993 using Challenge Grant funds.

7. Other Interpretive Programs

In an effort to increase the general public's awareness and interest in the environment, the refuge provided a variety of special programs in 1992. These included:

Volunteer Kevin Holcomb and Recreation Aide Smith led a guided tour on January 4th. Despite rainy weather, 40 people attended the hour and a half wetland tour. Following the tour, the refuge Visitor Center ran a two hour movie marathon which was attended by 25 people.

Recreation Aide Smith presented a bird feeding program in the refuge Visitor Center on January 11th. Thirty-five people attended the program.

Refuge volunteer Kevin Colton presented a bluebird program on January 19th. There was a morning program with 20 participants and an afternoon program with 35 participants. Each program was two hours long.

Wesley Stiles, a Senior Wildlife Biologist with the New York State Department of Environmental Conservation presented a program on the winter banding of Canada geese. Despite inclement weather, 46 people turned out for the February 9th program.

A cavity nesters program was presented to 20 people on February 16th. Refuge volunteer Kevin Colton was the guest speaker.

Michael Allen, a Senior Wildlife Technician with the New york Station Department of Environmental Conservation presented a rabies program on March 21st. Fifty people turned out to learn the history of the disease and preventive measures to reduce exposure. The attendants also learned how to deal with an encounter with a potentially rabid animal.

Refuge volunteers Barb Olds, Kevin Holcomb, Steve Kahl, and Recreation Aide Smith led five guided tours in April. Eighty people (average of 16) attended these 3-hour tours.

Joe Ogradnack, the senior Photographic Specialist with the New York State Agricultural Experiment Station in Geneva, New York, presented a photography workshop on April 11th. Twenty-five people attended the program.

Outdoor Recreation Planner Fred Caslick presented programs and tours to a Garden Club and a Senior Citizens group in May.

Recreation Aide Smith led a Memorial Day Guided Tour for 40 people. Three hours were spent identifying and discussing birds, plants, and refuge management techniques.

On June 6th, a local 4-H group participated in a Refuge Fishing Site Beautification Day. The 26 "litter getters" did an excellent job gathering 12 bags of trash. Following the cleanup, everyone enjoyed an interpretive tour around the Wildlife Drive.

After gathering trash, the 4-H'ers spent time observing the eagles at Tschache Pool. Sometimes it takes Recreation Aide Smith a long time to find the birds. (92-21; KH)

Volunteer Charlie Rouse led a guided bird walk for 35 people around Esker Brook Nature Trail on June 7th. Volunteer Barb Olds led a nature walk around Esker Brook on June 14th.

Recreation Aide Smith led a guided tour on Father's Day. Twenty-five people attended the tour which identified the flora and fauna of the refuge.

Recreation Aide Smith presented a slide program about the refuge at St. Mary's Church in Auburn, New York. Thirty five people attended the June 12th program.

A July 4th guided tour attracted 35 people. Recreation Aide Smith and volunteer Holcomb identified birds and plants and discussed various refuge management techniques.

Refuge volunteer Charlie Rouse presented a shorebird workshop on August 26. Tips and techniques for shorebird identification were given to the 17 participants.

Volunteers Polly and Herb Keating led a 3-hour guided bird tour on August 29. Twenty-five people attended the tour which focused on shorebirds.

A Labor Day guided tour drew 75 people to the refuge. Recreation Aide Smith identified birds and plants, discussed refuge management, and explained the refuge's waterfowl banding techniques.

On September 20th, a guided bird tour was led for 20 people. The 3-hour tour focused on the migratory birds moving into the area.

Recreation Aide Smith led two guided bird tours in October. A total of 45 people participated.

On October 15, Hocutt provided a management tour for David Kline, Central/Western New York State Director of The Nature Conservancy, and 15 of their major contributors. The visit included a lengthy presentation about NOMOWET, and the fact that we obviously needed their money and appreciated it deeply -- but we also needed their political support!!

On the evening of October 20, Hocutt hosted the Seneca County Federation of Sportsmen's Clubs. Management policies and subimpoundments were explained, and a major pitch for their support of NOMOWET was made.

On October 24, Hocutt provided a talk at the Visitor Center and a tour of the refuge for newly-elected American Legion National Commander George Munson and his entourage of dignitaries, state/local Legion officials, and three New York State Police cars.

On the evening of October 29, the refuge hosted a joint meeting of the Seneca County and Yates County Sportsmen's Clubs at the Visitor Center. The 40 people listened to Dr. William Porter, Professor of Wildlife Management, SUNY College of Environmental Science and Forestry at

Syracuse, present the results of his 15 years of research with deer in New York State.

On November 25, at the request of the Greater Rochester/Finger Lakes Film Advisory Board, Hocutt met with Executive Field Director Smoky Forrester and Field Director Dan Jones of Pathway Productions. The half-day visit was to explore use of refuge locations for an upcoming documentary. The 8-hour miniseries, "500 Nations", is being produced by actor Kevin Costner, and will be aired on CBS-TV in early spring, 1995. The

subject will deal with native cultures from Alaska to Costa Rica. Refuge locations, if used, will typify habitats of northeastern (Iroquois Confederacy) Indians before the white man. Filming will overlap several seasons, and could occur here in winter, spring, and summer of 1993.

8. Hunting

Waterfowl:

Maintenance Mechanic Steve Flanders conducted two waterfowl identification classes (required of all waterfowlers hunting the refuge) prior to the season opener. Over 75 people attended the classes.

Waterfowl hunting was permitted on Tschache Pool Tuesdays, Thursdays and Saturdays from October 8 - 15 and again from November 3 - 21. The thirteen day season drew 135 hunters who made 236 hunt visits. Waterfowlers were charged a $10.00 per reservation hunt fee. A total of $1,495.00 was collected. Three hundred and forty birds were harvested. A five-year summary of Montezuma's waterfowl seasons is provided in the table below:

TABLE 1.

COMPARISON OF HUNTER VISITS AND AVERAGE HARVEST BY YEAR

	1988	1989	1990	1991	1992
# Of Hunt Days	10	10	10	10	13
# Of Hunt Visits	294	315	293	269	263
# of Birds Taken	424	515	569	406	340
Avg. Birds Per Visit	1.5	1.6	1.9	1.5	1.3

Despite three additional days of hunting, fewer hunters turned out and the overall bird take was again down in 1992. The breakdown of the birds harvested is as follows:

TABLE 2.

MONTEZUMA NWR WATERFOWL HUNT HARVESTS

Species	1988	1989	1990	1991	1992
Mallard	176	195	155	185	191
Canada Goose	98	111	110	76	29
Green-winged Teal	65	81	185	80	32
American Black Duck	49	55	47	44	39
Pintail	2	13	11	8	3
Common Merganser	22	18	37	8	17
Gadwall	3	7	4	1	11
Blue-winged Teal	2	-	6	2	-
Shoveler	-	9	7	1	-
American Widgeon	-	7	-	1	3
Wood Duck	3	6	4	-	6
Hooded Merganser	3	8	-	-	8
Brant	-	1	-	-	-
Snow Goose	-	3	-	-	-
Bufflehead	-	1	-	-	-
Other	2	1	3	-	1
TOTAL HARVEST	424	515	569	406	340

Table #3 provides a seasonal comparison of the four waterfowl species most often harvested. The majority of harvested birds has consistently been mallards, Canada geese, green-winged teal, and American black ducks.

TABLE 3.

WATERFOWL SPECIES MOST OFTEN HARVESTED - SEASONAL COMPARISON

Year By # & %	Mallard	Canada Goose	Green-winged Teal	American Black Duck	TOTAL
1988	176 (41%)	98 (23%)	65 (15%)	49 (11%)	388 (90%)
1989	195 (37%)	111 (21%)	81 (15%)	55 (10%)	442 (83%)
1990	155 (27%)	110 (19%)	185 (32%)	47 (8%)	497 (86%)
1991	185 (45%)	76 (18%)	80 (19%)	44 (10%)	385 (92%)
1992	191 (56%)	29 (8%)	32 (9%)	39 (11%)	291 (84%)
Change From 91/92 Season	+6 (3%)	-47 (-61%)	-48 (-60%)	-5 (-11%)	

The combination of poor hunting weather and the unusually wet year contributed to the decrease in the total number of birds harvested. Birds did not need to concentrate on traditional staging areas such as the refuge because of the abundance of seasonally flooded wetlands throughout the region. The state season regulations limited Canada goose hunting with a late season opener and reduced daily bag limits. Goose hunting during the refuge's season was permitted on nine of the thirteen days, and for six of these days the daily bag limit was one bird.

White-tailed Deer:

Deer hunting is a major public use event at the refuge and in upstate New York. The refuge offers both archery and firearms hunts.

The 1992 archery season was November 2 - 14 and again from December 9 - 12. Permits for the opening day were issued on a first-come, first-served basis. For the remainder of the season, daily permits were available on a self-service

basis. A total of 963 hunt visits were made by 563 archers who harvested 24 deer. Archery hunters were not required to pay a hunt fee.

The firearms season ran from November 16 - 25 and from December 5 - 8. Daily hunt permits were available on a first-come, first-served basis. Firearms hunters were charged a $10.00 per season hunt fee. A total of $2,785.00 was collected from firearms hunters. Two hundred eighty-nine hunters made 753 hunt visits and harvested 100 deer.

Information in the following Table is included to demonstrate the positive impact (on shotgun hunter participation and total deer take) of the change from the collection of a $10.00 per day user fee in 1990 to a more reasonable $10.00 per season user fee in both 1991 and 1992. Shotgun hunter participation increased by over 53% from 1990 to 1992. While hunter success rates were similar for the three years, total deer take increased by over 33% (1990 = 83, 1992 = 124), due to the increase in shotgun hunter participation.

The change to a season-long pass appears to have reversed 1990's hunter dissatisfaction (and subsequent lower participation rate) with the daily user fee. The change to what the hunters perceive as a more reasonable user fee should allow the refuge to maintain recent gains in herd physical health indicators.

Seven-Year Summary Of Selected White-Tailed Deer Hunt Information On Montezuma National Wildlife Refuge (1986-1992).

	Year						
	1986	1987	1988	1989	1990	1991	1992
# Archery Hunt Days	27	45	37	35	19	18	16
# Shotgun Hunt Days	--	--	6	14	11	12	12
Total # Hunt Days	27	45	43	49	30	30	28
# Archery Hunt Visits	1648	2953	2300	1618	1188	1198	963
# Shotgun Hunt Visits	--	--	562	916	352	674	753
Total # Hunt Visits	1648	2953	2862	2534	1540	1872	1716
# Deer Harvested-Archery	63	89	73	40	38	32	24
# Deer Harvested-Shotgun	--	--	61	111	45	91	100
Total # Deer Harvested	63	89	134	151	83	123	124
Success Rate-Archery	3.8%	3.0%	3.2%	2.5%	3.2%	2.7%	2.5%
Success Rate-Shotgun	--	--	10.9%	12.1%	12.8%	13.5%	13.3%
Total Success Rate	3.8%	3.0%	4.7%	6.0%	5.4%	6.6%	7.2%
$\bar{x}$ # Hunters/Day-Archery	61	66	62	46	63	67	60
$\bar{x}$ # Hunters/Day-Shotgun	--	--	94	65	32	56	63
$\bar{x}$ # Hunters/Day-All Hunts	61	66	67	52	51	62	61

9. Fishing

Although no refuge waters are open to fishing, the refuge maintains two fishing areas along the Clyde River. In conjunction with the New York State Department of Environmental Conservation, the refuge maintains a third fishing area with a boat ramp into the Seneca River. This facility is located on state land adjacent to the refuge.

An estimated 25,800 fishing visits were made to refuge fishing areas in 1992.

10. Trapping

Please see Section G-8 for a discussion of trapping. Our muskrat trapping program is intended to be a habitat management technique.

11. Wildlife Observation

Wildlife observation is the primary reason people visit the refuge. Approximately 65% (90,500 people) of the refuge visitors used facilities or participated in programs provided for wildlife observation. The refuge scheduled and issued news releases for fifteen guided tours in 1992. The tours were very popular, especially on holidays, with 420 people (an average of 28 per tour) participating. For further details on wildlife observation opportunities, see Sections H-1, 4, 5, and 7.

17. Law Enforcement

Law enforcement efforts emphasized preventive techniques such as clear, concise signing, good hunting maps, and, as always, much "showing the flag" (routine drive throughs) by staff and volunteers on weekends. Most cases involved illegal entry, improperly tagged deer, excess shells (waterfowl hunting), and similar violations.

I. EQUIPMENT AND FACILITIES

1. New Construction

The Ditch

Hopefully, 1992 brought to a conclusion the construction phase of the Cayuga Lake Water Connector Project (The Ditch). Construction of the 7,000-foot long water transport channel designed to allow gravity flow of water from Cayuga Lake to the Main Pool has been ongoing since early 1990. Although the majority of the construction work was completed by Villager Construction during 1991, a host of problems prevented final acceptance of the work until late in 1992.

Severe erosion resulting from improperly installed pipes and water control structures on the Cayuga Lake Connector Project - a recurring nightmare throughout 1992. (92-22; TAG)

Highlights (lowlights??) of 1992's developments are summarized below:

May - Pete Elliott (R.O. - Engineering) and refuge staff met with representatives of Villager Construction and Syracuse Pipe (supplier of pipes and water control structures for the project) to discuss joint failures and resulting washouts at the north dike structures. The question about whether the

problem was due to design or construction was unresolved after the meeting.

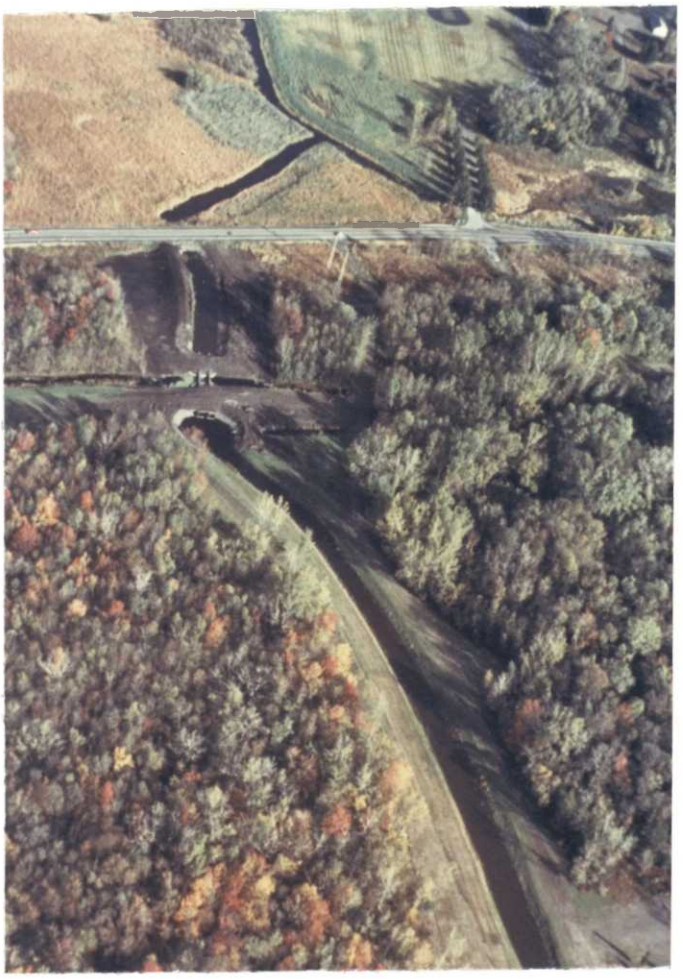
June - Villager Construction was instructed by CGS to expose all problem pipe joints, reinstall wider bands over all pipe joints, and replace damaged anti-seep collars.

July - Villager Construction returned to work early in the month with the goal of repairing the leaking pipe joints and completing final grading and seeding. Work was stopped on July 10th when Inspector Jacobs (R.O. - Engineering) declared the pipes unacceptable due to wide variations in diameter and unacceptable bituminous coatings. All involved parties (Villager, the pipe supplier, and the Service) are convinced that someone else is at fault.

September - New pipes for the leaking north structure were installed by Villager Construction. Unfortunately, after installation, water was still leaking freely around the headwalls of both pipes. A proposed "fix", agreed to by the Service and Villager Construction, involved placing a clay "blanket" (plus geotextile fabric and riprap) around the inlet and outlet to each pipe. The 180-foot long gravel bed which was originally installed was also sealed with imported clay.

October - Repairs were finally completed (we hope) on the leaking north structure. The three-foot deep gravel bed below the inverts of the pipes was excavated, a two-foot clay "blanket" was compacted into place, and riprap was reinstalled.

On October 13th, the gates were opened and water flowed into the Main Pool from Cayuga Lake. After eight and a half long years of planning and hard work, The Ditch was officially on-line. We can only hope it stays that way!



The finished (we can only hope and pray) Ditch! The troublesome pipes and water control structures are located in this - the northern reach of the water connector project. (92-23; DO)

2. Rehabilitation

Refuge Residence

The long-term efforts to upgrade the refuge residence were finally completed in 1992.

- The second floor bedroom was remodeled to include a new bathroom, complete with a shower, water closet toilet, and walk-in closet.

- The existing walls and ceiling of the second floor bedroom were exposed to the wood studs and ceiling rafters. Insulation was installed and the walls and ceiling were clad with gypsum board, then painted.

- A new circuit breaker box was installed in the basement to accommodate the new bathroom's electrical needs, as the existing box was full:

- New seamless gutters were installed to move water away from the basement walls.

Subheadquarters Barn

We became one side closer to completely vinyl siding the small subheadquarters barn this year. Using end-of-year funds in 1991, we were able to cover two sides of the barn. This year, we were able to do one more side.

Visitor Contact Station

Several visitor center projects and improvements were completed in 1992:

- Deteriorated deck boards were replaced.
- The entire deck was treated with wood preservative.
- New redwood framing was installed around the outdoor interpretive panels on the deck.
- New asphalt was laid on the walkway to the Visitor Center steps.
- New steps to the deck were built.
- A new pole light was installed on the east side of the Visitor Center.
- Emergency lights were replaced.
- The interior information counter was moved to the back wall of the Center in order to provide larger classroom space.
- The telephone line was relocated to the new counter location.
- Three ceiling fans were installed in order to improve air circulation.

Office

The refuge office only required minor repairs in 1992.

- The cracked valleys in the office roof were replaced.
- An asphalt ramp to the front door was constructed to make the office accessible to the mobility-impaired.

- A doorbell has been purchased, and will be installed in 1993.

Maintenance Mechanic Mel Norsen repairing the office roof. (92-24; TAG)

Old Shop

Used as the YCC Headquarters, a storage area, and a wash bay, the Old Shop had two damaged windows replaced in 1992.

May's Point Pool Channel

A 750' channel from the New York State Thruway to the connecting spillway was excavated to improve water transfer. The project involved site preparation, excavation, and spoil leveling and seeding. Approximately 1,500 cubic feet of material was excavated from the channel.

Dikes and Parking Areas

The Entrance Road, Visitor Center and Tschache Pool parking areas, and the East Dike of Unit 17 were resurfaced with a new layer of crusher run stone. The base of each area was graded and rolled before the new fill was applied. After being spread, graded, and rolled, the final depth of the new fill was 4".

Benning Marsh Dike

Constructed in 1991, the low head dike of Benning Marsh was cultivated, seeded, and mulched this year. The goal was to produce a more desirable composition of plant species that would provide nesting habitat for waterfowl.

Refuge Signs

The refuge began the process of converting the in-house routed signs with new signs that meet Fish and Wildlife Service standards. Montezuma received and used $2,000.00 for signs in 1992. Station funds provided an additional $2,885.00 to purchase eleven guide signs and nine interpretive signs. The new guide signs were installed in July. Interpretive signs for the Tschache Pool and Esker Brook Nature Trail kiosks were ordered from the Sign Shop and Wilderness Graphics. New interpretive signs will be installed in the spring of 1993.

New signs being installed by Maintenance Mechanic Steve Flanders and Tractor Operator Louise Dates. (92-25; TAG)

3. Major Maintenance

In late August, a 1,200-foot section of the Tschache Pool Dike was repaired. The project required the placement of

1,157 tons of imported fill to rebuild the inboard embankment (pool side) of the dike to it's original profile (4:1 slope). Five hundred feet of geotextile fabric was installed over the imported fill, and 416 tons of medium stone rip-rap was placed on top of the fabric for embankment protection. The roadway over the section of repaired dike was topped with a 4-inch layer of run-of-crusher stone. Wet ground conditions prevented completion of finish dressing and seeding of the project area. This work will be completed during the spring of 1993.

Initial stage of Tschache Pool Dike Repair Project. That's Maintenance Mechanic Steve Flanders operating Montezuma's 690C Hydraulic Excavator. (92-26; TAG)

Tschache Pool Dike after Steve has worked his magic. (92-27; TAG)

The regional "cookie-cutter" dredge was delivered to the refuge on May 16 to begin work on reestablishment of drainage channels within Main Pool. We discovered early on that the "cookie-cutter" was terrific for cutting through old established purple loosestrife stands. Unfortunately, severe mechanical problems limited the amount of work we could accomplish with the dredge. It was discovered during operation that antifreeze was present in the air venting through the engine block blow line. A Detroit Diesel service technician determined that the problem was a cracked engine block. Refuge maintenance personnel removed the engine and transported it to Syracuse for repairs (replacement of the engine block). The repairs required most of the summer to complete. Once repaired, the engine was reinstalled and the "cookie-cutter" was shipped off to Missisquoi NWR.

What ended up as a $7,000.00 repair to the "cookie cutter" engine could have been avoided if $7.00 of antifreeze had been used during winter preparation of the machine. Unfortunately, someone, somewhere, forgot. Hopefully it won't happen again.

In conjunction with scheduled vehicle maintenance, washing and waxing, and safety inspections, the following list of major repairs was accomplished by refuge staff:

JD 310B Backhoe - Rebuilt backhoe boom cylinder.

JD 570A Motor Grader - Replaced fuel injectors, adjusted timing, and tuned the engine.

JD 550A Bulldozer - Rebuilt blade control linkage, replaced winch cable, and constructed mounting plate for laser level.

JD 690C Excavator - Rebuilt right boom cylinder.

Ford 531 Tractor - Replaced oil pan and hydraulic jackshaft.

Gator Pump - Constructed and installed safety screens.

Black Brook Pump - Adjusted rack and timing and tuned the engine.

1982 Dodge Ram - Replaced starter and relay, muffler, and tailpipe.

1984 K-Car - Rebuilt starter and replaced radiator fan.

1985 Jeep - Replaced front axle u-joint, muffler, and tailpipe.

1987 Dakota - Installed bed cap and replaced battery.

1989 Jeep - Replaced front track bar, muffler, and tailpipe.

1991 Dodge 4x4 - Installed front winch.

1992 Dakota - Installed bedliner, bed screen, and mobile radio.

4. Equipment Utilization And Replacement

The Hydro-Axe from Iroquois NWR was used in March to remove box elders from the southwest dike of Unit 17. The Hydro-Axe was also used to remove box elders from the field at May's Point.

A 1992 Dodge Dakota extended cab 4x2 pickup truck replaced our 1980 LUV in June.

As mentioned in Sections I-2 and I-3, the Cookie-Cutter was used on a limited basis to cut through old stands of purple loosestrife on the Main Pool.

To facilitate phragmites mowing, we traded tractors with Iroquois NWR in July. The use of their John Deere 4055 4x4

tractor allowed us to mow areas we could not have reached with our John Deere 4040 4x2 tractor.

The refuge purchased a used Ford 10' tillage disc to use for marsh and grassland management. The disc was used in 1992 to cultivate the Benning Marsh dike.

Stewart B. McKinney NWR borrowed the John Deere 690 Excavator in December. Maintenance personnel from both refuges worked together to insure that the proper service procedures were completed on this expensive piece of equipment.

5. Communication Systems

Only routine, minor maintenance was completed on our radio system this year. Six portable units received new batteries, and minor adjustments were made to the station's base unit.

6. Computers

A Mustek flatbed color scanner was purchased at the end of the fiscal year for $1,795.00.

7. Energy Conservation

A new programmable thermostat was installed in the maintenance shop to improve setback capabilities. The new thermostat allows weeknight and all weekend setbacks to occur automatically.

Three ceiling fans were installed at the Visitor Center. The fans helped to more efficiently heat the building, and also proved to be a useful alternative to air conditioning.

J. OTHER ITEMS

2. Other Economic Uses

One permit was issued for commercial carp fishing. The fish are actually removed from the adjacent canal (state waters) as they attempt to swim through our water control structures to the pools to spawn. We consider it appropriate to charge a small fee for using our control structures as fish traps. Fishing conditions were average this year, and the Service received $684.00 ($.03 per pound for 22,800 pounds of carp).

Two beekeeping permittees paid a total of $60.00 for placing bee hives on the refuge.

3. Items of Interest

On April 9, the Chief of Fisheries and the Deputy Chief of Fisheries for the Ministry of Agriculture of the People's Republic of China visited the refuge. The trip was arranged by Dick St. Pierre (Susquehanna River Coordinator) as part of the northeastern tour he was conducting for the Chinese officials. Tracy Gingrich took the group on a management tour and ended with excellent viewing of all four of the refuge's bald eagles. Hocutt gave each of the officials a USFWS cap and the Chinese presented the refuge with two very detailed and attractive posters (in English and Chinese) which had color prints of mammals and fish under their jurisdiction.

On June 17, Deputy ARD Lee Wright visited the refuge. In addition to an airboat tour of the refuge, there were opportunities to visit with staff and to discuss refuge problems and proposed solutions.

On July 13, Hocutt provided an airboat and vehicular tour of the refuge for Assistant Director Dave Olsen and his wife, Annie Laurie.

On August 14, Hocutt provided a tour of the refuge for Bobby Schillinger, Executive Assistant to Congressman Frank Horton. Discussed at great length was the transitional period from Congressman Horton (who is retiring after 30 years) to Congressman Bill Paxton. It is likely that major hurdles will arise in the future with regard to expansion, the New York State Farm Bureau, tax bases, and many other subjects.

On September 8, Dr. Leigh Frederickson (University of Missouri) visited the refuge for an evaluation of wetlands management programs. The tour was of great benefit to

Refuge Biologist Gingrich, Zone Biologist Pelizza, and to Hocutt.

On October 24,. Hocutt provided a talk at the Visitor Center and a tour of the refuge for newly-elected American Legion National Commander George Munson and his entourage of dignitaries, state/local Legion officials, and three New York State Police cars. All those limousines going out the muddy dike in a driving rainstorm must have been one hell of a sight! Commander Munson is a very gracious man, and he asked many relevant questions as we led the "parade" up the dike in the lead trooper car. We presented the Commander with a USFWS baseball cap.

The 1986 conviction of Thomas Bianco for two counts of second degree murder in the death of Auburn teenager Julie Monson was overturned by a New York State Superior Court Judge, and a new trial was ordered. Bianco was accused of raping and murdering Ms. Monson in September, 1981. Her body was discovered on the refuge on April 7, 1983 by a student-volunteer who was taking soil samples. The reversal was based upon allegations that critical information was withheld from the defense. This alleged withholding violates New York State's "Grimaldi Rule" regarding the provision of all information to the defense in murder cases. The action was again overturned in October by a New York State Supreme Court Justice. Mr. Bianco was arrested at his place of business and remanded directly back to prison to continue his two 25-life sentences. At year's end, the controversy still raged with one Syracuse paper seemingly lobbying for a new trial.

Training in 1992 included:

Christenson	"Progressive First Aid Training", Seneca Falls, NY, 4/28/92 (4 hours).
	"Community CPR Refresher", Montezuma NWR, 3/24/92 (4 hours).
	"Law Enforcement Refresher", Cape Charles, VA, 4/6/92 - 4/11/92 (44 hours).
	"Basic Helicopter And Fixed Wing Aircraft Safety", Norfolk, VA, 6/8/92 (8 hours).

Christenson - "Aviation Management Training For Supervisors", Norfolk, VA, 6/9/92 (8 hours).

Dates - "Defensive Driver Training", Geneva, New York, 07/01/92 - 07/02/92 (6 hours).

Drew - "Survey Training", Cortland, New York, 05/04/92 - 05/07/92 (32 hours).

"Wetlands Restoration And Enhancement Training", Alexandria Bay, New York, 06/01/92 - 06/05/92 (36 hours).

"Defensive Driver Training", Geneva, New York, 08/05/92 - 08/06/92 (6 hours).

Estes - "Defensive Driver Training", Seneca Falls, New York, 01/14/92 (6 hours).

"Progressive First Aid Training", Seneca Falls, New York, 04/28/92 (4 hours)

"Introduction To Windows", Canandaigua, New York, 05/09/92 (7 hours).

"Pagemaker Training", Canandaigua, New York, 06/19/92 and 06/26/92 (14 hours).

Flanders - "Defensive Driver Training", Seneca Falls, New York, 01/14/92 (6 hours).

"Community CPR Refresher", Montezuma NWR, Seneca Falls, NY, 3/24/92 (4 hours).

Flanders - "Law Enforcement Refresher", Cape Charles, Virginia, 04/06/92 - 04/11/92 (44 hours).

"Progressive First Aid Training", Seneca Falls, New York, 04/28/92 (4 hours).

Gingrich - "Defensive Driver Training", Seneca Falls, New York, 01/14/92 (6 hours).

"Fire Behavior (S-390)", Bloomington, Minnesota, 01/28/92 - 01/30/92 (16 hours).

"Wildlife Biologist Workshop", Cape Charles, Virginia, 02/25/92 - 02/27/92 (24 hours).

"Wetlands Reserve Program", New Orleans, Louisiana, 04/27/92 - 04/29/92 (20 hours).

"Basic Helicopter And Fixed Wing Aircraft Safety", Norfolk, Virginia, 06/08/92 (8 hours).

"Aviation Management Training For Supervisors", Norfolk, Virginia, 06/09/92 (8 hours).

Hocutt - "Defensive Driver Training", Cortland, New York, 01/14/92, (6 hours).

Refuges-North Project Leaders' Meeting, Orono, Maine, 01/22/92 - 01/23/92 (16 hours).

Hocutt -	"Compatibility Of Uses On Service Lands" Training, San Antonio, Texas, 04/28/92 - 04/29/92 (16 hours).
	Region 5 Project Leaders' Meeting, Seneca Falls, New York, 08/25/92 - 08/27/92 (24 hours).
McMahon -	"Defensive Driver Training", Seneca Falls, New York, 01/14/92 (6 hours).
Murray -	"Wetlands Restoration And Enhancement Training", Alexandria Bay, New York, 06/01/92 - 06/05/92 (36 hours).
	"Defensive Driver Training", Geneva, New York, 08/05/92 - 08/06/92 (6 hours).
Norsen -	"Defensive Driver Training", Seneca Falls, New York, 01/14/92 (6 hours).
Smith -	"Defensive Driver Training", Seneca Falls, New York, 03/03/92 (6 hours).
	"Community CPR Refresher", Montezuma NWR, Seneca Falls, NY, 3/24/92 (4 hours).
	"Progressive First Aid Training", Seneca Falls, New York, 04/28/92 (4 hours).

Special Assignments/Details:

Refuge Manager Hocutt participated as a study team member for the proposed St. Lawrence National Wildlife Refuge. This involved planning, review of economic studies, and similar activities.

Refuge Manager Hocutt continued work on the waterfowl section of Refuges 2003 during the January - April period.

Biological Technicians Ian Drew and Robert Murray travelled extensively inspecting and visiting potential wetlands restoration sites in New York: Long Island, Cooperstown, Morrisville, Albany, Catskill, and Middletown.

ORP Fred Caslick participated in several special details during the calendar year: he helped with the RAMSAR ceremony in Dover, Delaware on May 14, 1992, was a panel member for the FWE Regional Biologist Workshop on March 16, 1992 in Ellenville, New York, assisted staff in the Regional Public Affairs Office from March 23 to April 3, 1992, and served a 4-month detail to the Regional Public Affairs Office from June 13 to September 30, 1992.

Maintenance Mechanic Steve Flanders and Assistant Refuge Manager Barry Christenson participated in a special Law Enforcement detail January 16-18, 1992 in Kingston, New York.

Maintenance Mechanic Steve Flanders was an instructor for Heavy Equipment Training June 10-11, 1992 at Guys Mills, Pennsylvania. He also participated as a team member to discuss the agenda for a maintenance workshop on October 6, 1992.

Refuge Biologist Tracy Gingrich travelled to Saratoga Springs, New York May 12-13, 1992 to evaluate wetlands restoration sites.

Awards

Steve Flanders, Tracy Gingrich, Grady Hocutt, Judy McMahon, and Marva Smith all received Special Achievement Awards in 1992 for their work performance.

4. Credits

Typing and Proofreading - Estes
Climatic Conditions - Smith, Norsen
Planning - Hocutt, Gingrich
Administration - Hocutt, McMahon, Smith
Habitat Management - Gingrich
Wildlife - Gingrich
Public Use - Smith
Equipment and Facilities - Flanders, Norsen, Gingrich, Smith
Other Items - Hocutt, McMahon, Gingrich
Editing - Hocutt, Estes

Continued on next page.

Photographs 92-4 and 92-21 were taken by Refuge Volunteer Kevin Holcomb.

Photograph 92-10 was taken by Cooperative Education Student Renee Robichaud.

Photograph 92-11 was taken by New York State Department of Environmental Conservation Biologist Mike Allen.

Photograph 92-12 was taken by Refuge Volunteer Adam Koslowski.

Photographs 92-14 and 92-16 were taken by professional photographers John and Karen Hollingsworth.

Photograph 92-15 was taken by professional photographer Art Smith.

Photograph 92-18 was taken by Refuge Volunteer Paul Lattimore.

Photographs 92-19 and 92-20 were taken by Refuge Volunteer Ed Klein.

Photograph 92-23 was taken by New York State Department of Environmental Conservation Biologist Dave Odell.

FEEDBACK

Nothing to report.

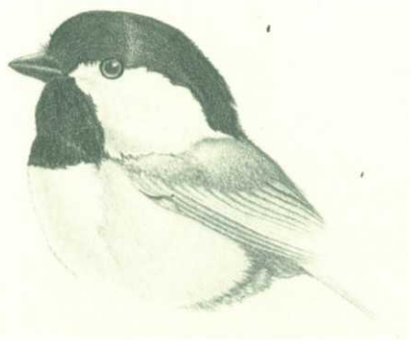
Montezuma

National
Wildlife
Refuge

New York

Welcome to Montezuma

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 east of Seneca Falls, in Seneca County, 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. Refuge management benefits wildlife and provides a place for people to visit and enjoy wildlife in its natural habitat.



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 twelve miles and was up to eight miles 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 1900's all but a few hundred acres had been drained.

In 1937 the Bureau of Biological Survey, which later became the U.S. Fish and Wildlife Service, purchased 6,432 acres 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. Efforts to restore and preserve the marsh continue today. The Service, working cooperatively with New York State, several conservation organizations, corporations, and private landowners, is seeking to protect even more of the original Montezuma Marsh. The project which joins all of these organizations together is the North American Waterfowl Management Plan. The Plan is an international agreement between the United States and Canada to conserve, restore, and enhance wetlands and waterfowl habitat.

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 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.

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-oriented educational and recreational opportunities for thousands of visitors each year. Recreational opportunities are carefully planned to complement the management of the Refuge.

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. Sandpipers 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, where water levels are managed seasonally for their benefit.

Winter

The self-guided Auto Tour Route is generally closed to traffic (depending upon snow/ice/road conditions). Cross-country skiing and snowshoeing on the Tour Route and Esker Brook Trail 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 flooded timber area of Tschache Pool. Black-crowned night-herons may also be seen in Main Pool.

Flowering Plants - Throughout the summer flowering plants may be seen from the Auto Tour Route. Purple loosestrife, iris, mallow, and white water lily peak in late July.

Year-Round

White-tailed deer, rabbits, foxes, 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 for scheduled field trips.

The Refuge provides an extensive assortment of 16mm wildlife films and videos (free of charge) to area educators. Films 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, staffed on weekends from 9:00 am to 5:00 pm (summer), 9:30 am to 4:00 pm (winter), most Tuesdays and holidays, contains exhibits, leaflets and restrooms. The Observation Deck and Tower provide excellent opportunities to see wildlife.

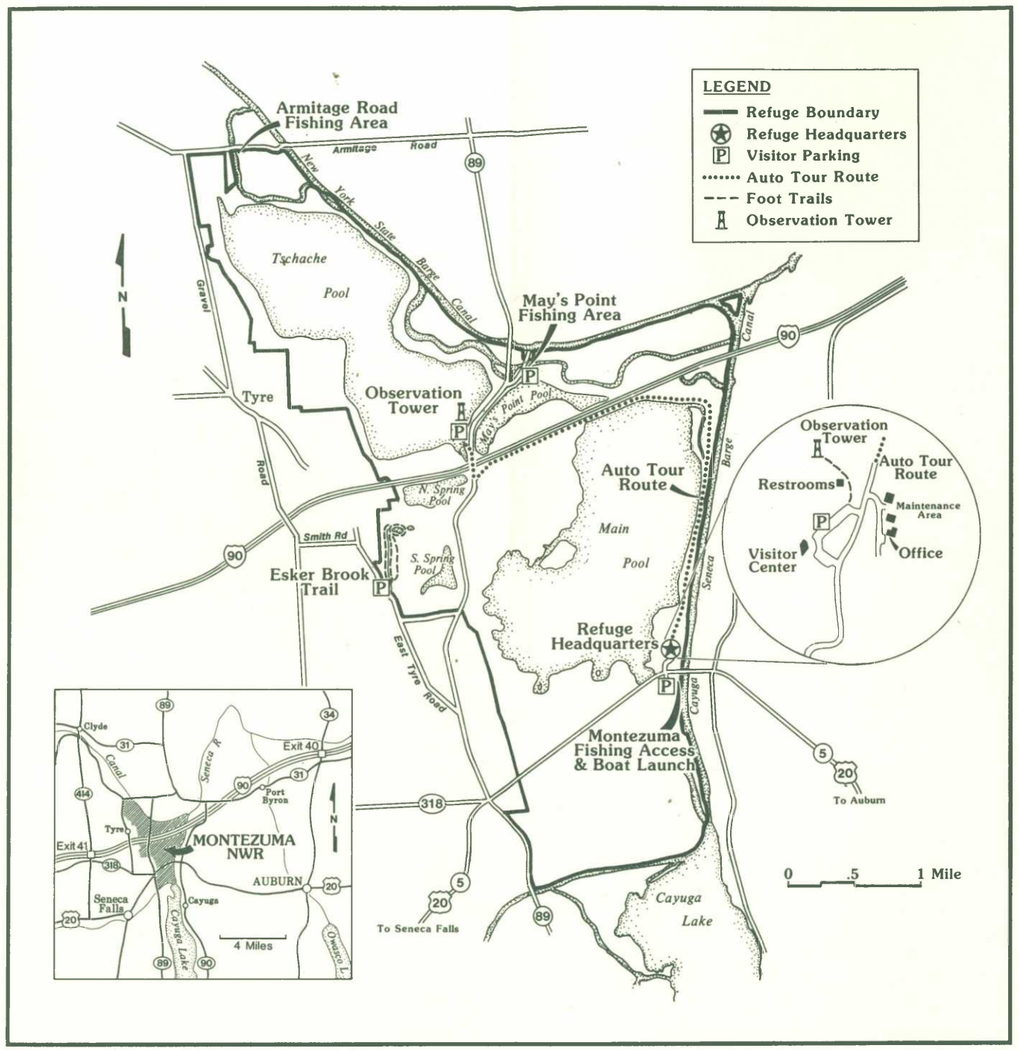
The self-guided Auto Tour Route provides opportunities to observe and photograph wildlife from your car. Please stay in your vehicle since it serves as a "blind" and minimizes disturbance to wildlife. Snow, ice and poor road conditions generally keep the road closed during the winter and early spring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

Esker Brook Trail, a two-mile walking trail, is open year-round. The Trail and Auto Tour Route are open for cross-country skiing and snowshoeing during the winter. All hiking, skiing, etc. 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, primarily for waterfowl and deer, is permitted under special regulations on portions of the Refuge during the State seasons. Contact Refuge Manager for additional information.

Montezuma National Wildlife Refuge



Mission: As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally-owned public lands and natural and cultural resources. This includes fostering wise use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historic places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also promotes the goals of the Take Pride in America campaign by encouraging stewardship and citizen responsibility for the public lands and promoting citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. Administration.

TAKE PRIDE IN AMERICA

For further information, contact:

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

☆U.S. GOVERNMENT PRINTING OFFICE: 1990-0-701-715

Illustrations by Julien D. Beauregard

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

RL-51530-1 July 1990

Birds of Montezuma

National Wildlife Refuge

New York

Montezuma National Wildlife Refuge in Seneca County, New York, was established in 1937 to provide nesting, resting, and feeding areas for ducks, geese, and many other water birds and songbirds. This refuge contains 6,432 acres 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 to a quarter of a million visitors.

Public uses include a 3.5 mile self-guiding auto tour around the Main Pool, a Visitor Contact Station, a 2-mile hiking trail and ample opportunities to photograph wildlife.

Birding opportunities are best from March through November with peak migrations of waterfowl in mid-April and early October. Warblers are abundant in late May to early June. Summer nesters and broods provide excellent viewing - there is always something to see on a birding tour.

This folder lists 315 species of birds that have been identified on Montezuma Refuge since its establishment in 1937. Please report any sightings of birds that are not included in this list to the Refuge Manager.

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 - CORMORANT				
___Red-throated Loon	r			
___Common Loon	o		o	
___Pied-billed Grebe †	c	c	c	
___Horned Grebe	o		o	
___Red-necked Grebe	r		r	
___Double-crested Cormorant	o	c	c	
BITTERNS - HERONS - IBIS				
___American Bittern †	o	c	c	
___Least Bittern †	o	o	o	
___Great Blue Heron †	c	c	c	o
___Great Egret	o	c	o	
___Snowy Egret		r		
___Little Blue Heron		r	r	
___Cattle Egret	r			
___Green-backed Heron †	o	c	o	
___Black-crowned Night-Heron †	o	c	c	
___Glossy Ibis	r	r		
SWANS - GEESE - DUCKS				
___Tundra Swan	o		r	o
___Mute Swan	o		o	
___Snow Goose	c		o	
___Brant			o	
___Canada Goose †	a	c	c	c
___Wood Duck †	c	c	c	
___Green-winged Teal †	c	o	c	
___American Black Duck †	a	c	a	o
___Mallard †	a	c	a	o
___Northern Pintail †	c	o	c	
___Blue-winged Teal †	c	c	c	
___Northern Shoveler †	c	o	c	
___Gadwall †	c	c	c	
___Eurasian Wigeon	r		r	
___American Wigeon †	c	o	c	
___Canvasback †	c	o	c	
___Redhead †	c	o	c	
___Ring-necked Duck	c	o	c	
___Greater Scaup	c		c	
___Lesser Scaup	o	o	o	
___Oldsquaw	o		o	
___Black Scoter	r		r	
___Surf Scoter	r		r	
___White-winged Scoter	r		r	
___Common Goldeneye	c		c	
___Bufflehead	c		c	
___Hooded Merganser †	c	o	a	o
___Common Merganser	a	o	a	c
___Red-breasted Merganser	o	r	o	
___Ruddy Duck †	o		o	
VULTURES - HAWKS - FALCONS				
___Turkey Vulture	c	c	c	c
___Osprey †	c	c	c	
___*Bald Eagle †*	o	o	o	o
___Northern Harrier †	o	o	o	o
___Sharp-shinned Hawk †	o	o	o	o
___Cooper's Hawk	o	o	o	o
___Northern Goshawk	o	o	o	
___Red-shouldered Hawk	o		o	
___Broad-winged Hawk	o		o	
___Red-tailed Hawk †	c	c	c	c
___Rough-legged Hawk			o	c
___Golden Eagle		o	o	
___American Kestrel †	c	c	c	o
___Merlin	r		r	
___*Peregrine Falcon*	r		r	
PHEASANT - GROUSE				
___Ring-necked Pheasant †	u	u	u	u
___Ruffed Grouse †	u	u	u	u
RAILS - CRANES				
___King Rail	r	r	r	
___Virginia Rail †	c	c	c	r
___Sora †	c	c	c	
___Common Moorhen †	c	c	c	
___American Coot †	c	c	c	
PLOVERS - SANDPIPERS				
___Black-bellied Plover	o	o	o	
___Lesser Golden-Plover	r	o	o	
___Semipalmated Plover	o	c	c	
___Killdeer †	c	c	c	
___Greater Yellowlegs	c	c	c	
___Lesser Yellowlegs	c	c	c	
___Solitary Sandpiper	r	o	o	
___Spotted Sandpiper †	c	c	c	
___Upland Sandpiper		r		
___Whimbrel	r		r	
___Hudsonian Godwit		r	o	
___Ruddy Turnstone	o	o	o	
___Red Knot	r	r	r	
___Sanderling	r	r	r	
___Semipalmated Sandpiper	c	c	c	
___Western Sandpiper		r	r	
___Least Sandpiper	c	o	c	
___White-rumped Sandpiper	o	o	o	
___Baird's Sandpiper			r	o

	s	S	F	W
___Pectoral Sandpiper	c	c	c	
___Dunlin	c		c	
___Stilt Sandpiper	o	c	c	
___Ruff		r	r	
___Short-billed Dowitcher	c	o	c	
___Long-billed Dowitcher			c	
___Common Snipe †	o	o	o	
___American Woodcock †	o	o	o	
___Wilson's Phalarope	r	r		
___Red-necked Phalarope	r	o	o	
GULLS - TERNS				
___Bonaparte's Gull	o	o	o	
___Ring-billed Gull	c	c	c	o
___Herring Gull	c	o	c	c
___Great Black-backed Gull	o	o	o	u
___Caspian Tern	o		o	
___Common Tern †	o	o	o	
___Black Tern †	o	o	o	
DOVES - OWLS - HUMMINGBIRDS				
___Rock Dove †	o	o	o	o
___Mourning Dove †	c	c	c	o
___Black-billed Cuckoo †	o	o		
___Yellow-billed Cuckoo †	o	o		
___Barn Owl	r	r	r	r
___Easter'n Screech-Owl †	c	c	c	
___Great Horned Owl †	c	c	c	c
___Snowy Owl				r
___Barred Owl †	r	r	r	r
___Short-eared Owl	o	r	o	o
___Northern Saw-whet Owl	r		r	r
___Common Nighthawk		r		
___Whip-poor-will	r			
___Chimney Swift †	o	o		
___Ruby-throated Hummingbird †		o		
___Belted Kingfisher †	c	c	c	o
WOODPECKERS - FLYCATCHERS				
___Red-bellied Woodpecker †	o	o	o	o
___Yellow-bellied Sapsucker	o		o	
___Downy Woodpecker †	c	c	c	c
___Hairy Woodpecker †	o	o	o	o
___Northern Flicker †	c	c	c	o
___Pileated Woodpecker †	o	o	o	o
___Red-headed Woodpecker	o	o	o	
___Olive-sided Flycatcher	r		r	
___Eastern Wood-Pewee †		c		
___Alder Flycatcher	o	o		
___Willow Flycatcher	o	c		

	s	S	F	W
___Least Flycatcher †		c		
___Eastern Phoebe †	c	c	c	
___Great Crested Flycatcher †	o	c		
___Eastern Kingbird †	c	c	o	
LARKS - SWALLOWS - JAYS - CROWS				
___Horned Lark †	o	o	o	o
___Purple Martin †	c	c		
___Tree Swallow †	c	c	c	r
___Northern Rough-winged Swallow	o	o		
___Bank Swallow †	c	c		
___Cliff Swallow †	r	r		
___Barn Swallow †	c	c	c	
___Blue Jay †	c	c	c	c
___American Crow †	c	c	c	o
TITMICE - NUTHATCHES - WRENS				
___Black-capped Chickadee †	c	c	c	c
___Tufted Titmouse	o	o	o	
___Red-breasted Nuthatch †	o		o	r
___White-breasted Nuthatch †	c	c	c	c
___Brown Creeper †	o	o	o	o
___Carolina Wren	r	r	r	
___House Wren †	c	c		
___Winter Wren †	c	c	c	
___Sedge Wren †	r	r		
___Marsh Wren †	c	c	c	
KINGLETS - THRUSHES - THRASHERS				
___Golden-crowned Kinglet	c		c	
___Ruby-crowned Kinglet	c		c	
___Blue-gray Gnatcatcher	o		o	
___Eastern Bluebird †	u	u	u	r
___Veery †	c	c	o	
___Gray-cheeked Thrush	o		o	
___Swainson's Thrush	o		o	
___Hermit Thrush	c		c	
___Wood Thrush †	c	c	o	
___American Robin †	c	c	c	o
___Gray Catbird †	c	c	c	
___Northern Mockingbird	r	r		
___Brown Thrasher †	o	o	o	
WAXWINGS - SHRIKES - STARLINGS				
___Water Pipit	c		c	
___Cedar Waxwing †	o	o	o	o
___Northern Shrike				o
___Loggerhead Shrike	r	r		
___European Starling †	a	a	a	o
VIREOS - WOOD WARBLERS				
___Solitary Vireo	o		o	

	s	S	F	W
___Yellow-throated Vireo †	o	o		
___Warbling Vireo †	c	c	c	
___Philadelphia Vireo	r		r	
___Red-eyed Vireo †	c	c	c	
___Blue-winged Warbler	r			
___Golden-winged Warbler	o	o		
___Tennessee Warbler	o		o	
___Orange-crowned Warbler	r			
___Nashville Warbler	c		c	
___Northern Parula	o		o	
___Yellow Warbler †	c	c	c	
___Chestnut-sided Warbler	o		o	
___Magnolia Warbler	c		c	
___Cape May Warbler	c		c	
___Black-throated Blue Warbler	c		c	
___Yellow-rumped Warbler	c		c	
___Black-throated Green Warbler	c		c	
___Blackburnian Warbler	c		c	
___Pine Warbler	o		o	
___Prairie Warbler	o		o	
___Palm Warbler	o		o	
___Bay-breasted Warbler	o		o	
___Blackpoll Warbler	c		c	
___Cerulean Warbler †	c	o	c	
___Black-and-white Warbler	c	o	c	
___American Redstart †	c	c	c	
___Prothonotary Warbler †	o	o		
___Ovenbird †	c	c	c	
___Northern Waterthrush	o	o	o	
___Louisiana Waterthrush	o	o	o	
___Connecticut Warbler	r		r	
___Mourning Warbler	o	o	o	
___Common Yellowthroat †	c	c	c	
___Hooded Warbler	r		r	
___Wilson's Warbler	o		o	
___Canada Warbler	c		o	
___Yellow-breasted Chat	r	r		
TANAGERS - SPARROWS				
___Scarlet Tanager †	c	o	o	
___Northern Cardinal †	c	c	c	c
___Rose-breasted Grosbeak †	c	c	c	
___Indigo Bunting †	c	c		
___Rufous-sided Towhee †	c	o	c	
___American Tree Sparrow			c	c
___Chipping Sparrow †	c	c	c	
___Field Sparrow †	c	c	c	o
___Vesper Sparrow †	o	o	o	

	s	S	F	W
___Savannah Sparrow †	o	o	o	
___Grasshopper Sparrow †	o	o	o	
___Henslow's Sparrow †	o	o	o	
___Fox Sparrow	c		c	
___Song Sparrow †	c	c	c	o
___Lincoln's Sparrow	o		o	
___Swamp Sparrow †	c	c	c	
___White-throated Sparrow	c		c	
___White-crowned Sparrow	c		c	
___Dark-eyed Junco	o	o	o	
___Lapland Longspur				o
___Snow Bunting				o
BLACKBIRDS - FINCHES				
___Bobolink †	o	o	c	
___Red-winged Blackbird †	a	a	a	o
___Eastern Meadowlark †	c	c	c	o
___Rusty Blackbird	o		o	
___Common Grackle †	a	a	a	o
___Brown-headed Cowbird †	c	c	a	o
___Northern Oriole †	c	c	c	
___Purple Finch †	c	o	c	o
___House Finch †	o	o	o	o
___Common Redpoll				r
___Pine Siskin				r
___American Goldfinch †	c	c	c	o
___Evening Grosbeak	r		r	r
___House Sparrow †	c	c	c	c

NOTES

Date _____ Time _____

Observers _____

Weather _____

Tides _____

_____

_____

_____

_____

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
Black Swan
Pink-footed Goose
White-fronted Goose
Bar-Headed Goose
Egyptian Goose
Cinnamon Teal
Shelduck
Fulvous Whistling Duck
Barrow's Goldeneye
King Eider
Red-crested Pochard
Masked Duck
Gyrfalcon
Turkey
Northern Bobwhite
Tricolored Heron
Yellow-crowned Night-Heron
White Ibis
Greater Flamingo
Sandhill Crane
Yellow Rail
Black Rail
Purple Gallinule
American Avocet
Black-necked Stilt
Northern Lapwing
Piping Plover
Marbled Godwit
Buff-breasted Sandpiper
Red Phalarope
Parasitic Jaeger
Glaucous Gull
Iceland Gull
Little Gull
Least Tern
Arctic Tern
Roseate Tern
Forster's Tern
Gull-billed Tern
Razorbill
Thick-billed Murre
Dovekie
Black Guillemot
White-winged Dove
Long-eared Owl
Scissor-tailed Flycatcher
Western Kingbird
Say's Phoebe
Yellow-bellied Flycatcher
Acadian Flycatcher
Gray Jay
Common Raven
Boreal Chickadee
Sprague's Pipit
Bohemian Waxwing
Yellow-headed Blackbird
Brewer's Blackbird
Boat-tailed Grackle
Blue Grosbeak
Pine Grosbeak
European Goldfinch
White-winged Crossbill
Dickcissel
Sharp-tailed Sparrow
Lark Sparrow
Clay-colored Sparrow

U.S. Fish and Wildlife Service

Montezuma is one of more than 445 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.

For further information contact:

Refuge Manager
Montezuma National Wildlife Refuge
3395 Rts. 5 & 20 East
Seneca Falls, New York 13148
Telephone: (315) 568-5987

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

RL-52550-2 January 1991