OTTAWA NATIONAL WILDLIFE REFUGE COMPLEX

(OTTAWA, CEDAR POINT, WEST SISTER ISLAND NWR's)

Oak Harbor, Ohio

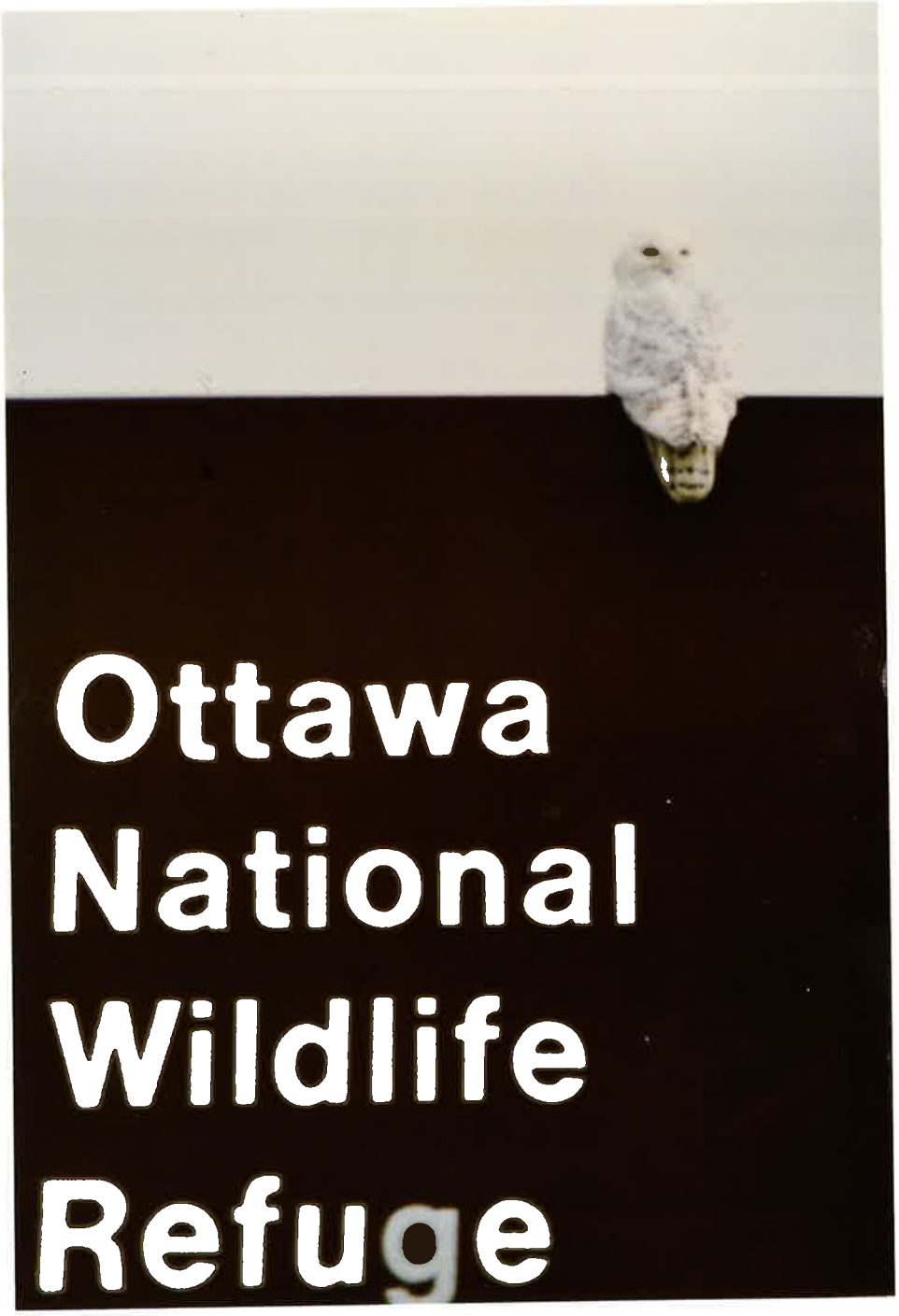
ANNUAL NARRATIVE REPORT

Calendar Year 1991

Refuge Manager — Date: 6-9-92

Refuge Supervisor Review — Date: 6/16/92

Regional Office Approval — Date: 6-19-92



Ottawa National Wildlife Refuge

INTRODUCTION

The Ottawa National Wildlife Refuge Complex is made up of three refuges and five separate units: the Ottawa Refuge has three; Ottawa, Navarre and Darby Divisions, Cedar Point National Wildlife Refuge and West Sister Island National Wildlife Refuge.

The Ottawa Division was established in July, 1961 with land acquired under the authority of the Migratory Bird Conservation Act to preserve a portion of the remaining Lake Erie marshes. West Sister Island was established as a refuge in August, 1938 by Presidential Order. Ceder Point was donated to the Service and accepted by the Interior in December 1964. Darby was acquired in 1966 in exchange for Navarre, with the agreement that most of Navarre would remain under management for wildlife under conditions of a 25- and 50-year lease.

Today, these five separate parcels of land are the Ottawa National Wildlife Refuge Complex.

The cities of Toledo, Detroit, and Ann Arbor are within 2 hours drive of Ottawa NWR. At between 2 to 3 hours driving distance are Cleveland, Akron, Columbus, and Dayton. The refuge is within the bounds of an 8 million person megalopolis. Currently, it is receiving about 100,000 visitors per year who primarily visit the refuge for bird watching and wildlife observation.

The total refuge acreage is 8,316 acres of which 5,350 acres are either open pools, marsh, or moist soil units. Water levels in 3,306 acres can be controlled by pumps; and in 794 acres of moist soil units water levels are controlled by pumping. The remaining acreage of 2,966 is a mixture of grassland, forest and cropland.

Wildlife use of the refuge is high and is approximately as follows; (use days) ducks, 1 to 5 million; Canada geese 1 to 2 million; marsh and water birds, 1 million; shorebirds, gulls and terns, over 1 million. Production is: ducks and geese 500 to 2,000 each; marsh and water birds, 4,000 to 6,000; shorebirds, gulls and terns, up to 500; bald eagles, 2 to 5, and wetland mammals 6,000 to 10,000.

West Sister Island, located 9 miles from Lake Erie's shoreline, is a wilderness area and is the site of the largest colonial nesting bird colony in the Great Lakes chain.

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*NTR - Nothing to report

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L. INFORMATION PACKET (inside back cover)

A. HIGHLIGHTS

A total of 2.7 million dollars is allocated for the expansion of the Ottawa NWR Complex (D.6).

Partners for Cultural Diversity Program is initiated with Gibsonburg High School and The University of Michigan (E.8).

Office rehabilitation is begun almost 30 years after purchase (I.2).

Volunteer participation continued to increase and provide additional management program opportunities during the year (E.4).

B. CLIMATIC CONDITIONS

TABLE 01. Annual Precipitation and Temperatures, CY 1991

Month	Precipitation+ CY-1991	Precipitation+ Average*	Snowfall CY-1991	Snowfall Average*	Temperature Max.	Temperature Min.	Temperature Ave. Max.*	Temperature Ave. Min.*
January	1.15	1.60	0.50	9.33	44	1	50	- 5
February	1.26	1.55	7.00	8.49	55	6	54	- 2
March	1.00	2.46	0.00	5.88	75	24	70	10
April	4.48	2.80	0.00	1.68	85	29	82	22
May	2.84	3.14			94	43	87	34
June	2.27	3.63			92	55	93	45
July	1.78	3.26			89	58	94	50
August	7.52	3.75			94	55	92	47
September	1.28	3.23			93	40	89	38
October	6.93	2.36			84	31	80	26
November	2.52	2.98	1.50	3.66	63	17	68	18
December	1.58	2.88	0.10	7.11	60	12	57	2
TOTALS	34.61	33.68	9.10	29.67				
EXTREMES					94	1	94	- 5

* Averages were calculated by averaging data from 1964 through 1991.
\+ Precipitation includes melted snow.

An official National Weather Service station is located at the refuge headquarters and is monitored daily for precipitation and temperature. An automatic temperature recorder has lessened the need for recording temperatures daily.

Precipitation in 1991 was slightly above average. April, August, and October were the wettest months while January and March were the driest. In August, the refuge received six inches of rain over a two day span. The rain was welcomed due to a dry summer and the inability to move water into the impoundments because of the low water levels in Lake Erie. Snow accumulation was way below normal with little or no snow occurring during the winter months.

Temperatures through the year were relatively mild. The mercury soared into the fifty's in February and by March had reached a high of 75. Then in November and December the mercury reached into the sixty's.

D. PLANNING

Ottawa NWR received 2.7 million dollars for acquisition in FY-92 in response to the final report "Protecting Lake Erie's Western Basin: An Agenda for the 1990'S". This report was commissioned by U.S. Representative Marcy Kaptur, Ohio's Ninth District. In addition to other recommendations, the report recommended that the Ottawa NWR Complex be increased by 5,000 acres to "provide protection, restoration, and management of critically important wetlands along western Lake Erie".

A Preliminary Project Proposal addressing this expansion was prepared and approved this year. An Environmental Assessment for this proposed action is being prepared.

The report "Protecting Lake Erie's Western Basin:An Agenda for the 1990's" also recommended the study of a proposed "Maumee River Recreational Corridor" along the lower 15 miles of the Maumee River. Additionally, three research projects and several facility improvement and development were projects recommended.

2. Management Plan

Water Management Plan was prepared and approved for the management of all impoundments and moist soil units.

3. Public Participation

Involvement with the public was continuous throughout the year. News releases, news articles, and information was provided through the refuge mailing to interested persons. The refuge staff also participated in numerous public information sessions including outdoor shows, conservation clubs, and career day events. A complete listing of activities can be found in section H.

Refuge Manager Blair, Assistant Manager Lenz and ORP Marshall were invited to give a presentation to 20 members of the Maumee Valley Audubon members. The presentation was held in Perrysburg, Ohio on April 4. ORP Marshall gave a general slide presentation and Manager Blair discussed volunteer opportunities available for members. Refuges 2003 - A Plan For the Future, National Wildlife Refuges was discussed by Blair with emphasis to each to participate in planned meetings.

ORP Marshall was invited to give a presentation to 35 members of St. Paul's Lutheran Church Brotherhood dinner on April 8 in Toledo, Ohio.

Manager Blair, Assistant Manager Lenz and Biological Technician Tom Cox traveled to Ohio State University on April 12. Manager Blair gave a presentation to a wildlife class concerning Refuges 2003 and activities and management objectives.

4. Compliance With Environmental and Cultural Resources Mandates

All activities on the refuge requiring Army Corps of Engineers Section 10 and 404 permits and local and state compliance approval were submitted and received. Two Army Corp of Engineer permits were obtained for dike rehabilitation and ditch cleaning and underground fuel storage tank removal is progressing under Ohio EPA guidance.

5. Research and Investigations

Ottawa WMS19 - "Habitat Use and Migrational Movements of Non-game birds in the Lake Erie Marsh Region of NW Ohio." Mark Shieldcastle, Ohio Dept. of Natural Resources Experiment Station.

A long term study of neotropical migrants was continued on both the Navarre and Darby units at Ottawa NWR. Data collection for a Master's study on the energetic condition of the yellow warbler (*Dendrocia petechia*) also continued in 1991. Major migrational "waves" occurred as expected in late April (26-28), mid-May (8-14) and late May (26-27).

In spring, the Navarre study site banded 100 species totaling 6,944 birds on 6,040.5 net hours over 50 survey dates. Including returns from previous years and recaptures a total of 8,232 birds were handled. The top species banded were: magnolia warbler 589, Myrtle warbler 560, white-throated sparrow 535, common yellowthroat 394, and swamp sparrow 328. The Butternut lodge study site was moved to Darby unit in 1991. Seventy-eight different species were banded totalling 867 birds in 778.5 net hours. The top species banded were: Myrtle warbler 105, magnolia warbler 71, and white-throated sparrow and ruby-crowned kinglet at 44 each.

The fall migration was less intensively studied. Navarre banding included 1,551 birds banded of 78 species on 16 survey dates. Large movements were noted on September 21 and October 13. The most common species banded were Swainson's thrush 184, hermit thrush 127, gray catbird 102, and gray-cheeked thrush 101. Darby banding totaled 610 birds of 54 species on 14 survey dates. Dominant species banded were Swainson's thrush 77, Myrtle warbler 44, and white-throated sparrow 35.

One-hundred and nine different species were banded this year for a total of 10,022 birds. Another 159 birds were recaptures from prior years going back as far as 1985.

Ottawa WMS 16 - "Woodcock Population and Habitat Manipulations" Mark Shieldcastle, Ohio Dept. Natural Resources Experiment Station.

Woodcock breeding habitat remains marginal on the Ottawa NWR. Prairie grass fields that have faired poorly due to water inundation have become increasingly important as singing grounds. Higher elevations of marsh units also provide some habitat. Diurnal habitat appears sufficient to hold resident breeders and act as stopover sites for migrants. Twenty-one singing males were recorded in 1991. This represents a 91% increase over last years 11 singing males.

West Sister Island NWR, a lake haven for egrets and herons. (CM)

Timberdoodle use increased on the refuge. (JF)

Ottawa WMS28 - "Movement and Habitat Usage of Black-Crowned Night Herons of West Sister Island Rookery." Mark Shieldcastle, Ohio Dept. Natural Resources Experiment Station.

Research objectives are: (1) to determine feeding and roosting locations along Lake Erie, (2) to determine if there is a colonial interaction with the rookery in Sandusky Bay, (3) to determine migrational movements of both banded and auxiliary marked birds, and (4) to determine rookery population estimates, and habitat parameters.

This study monitors the nesting usage and population status of various colonial nesting birds of West Sister Island NWR. A pilot study began in 1987 to establish an estimate of nesting pairs, colony movements and habitat parameters. Transect system was completed in 1991. This will allow for a more uniform and complete coverage of survey transects. This study will continue on an annual basis to track nesting movements.

TABLE 02. Project Banding to Date - West Sister Island

Species	1986	1987	1988	1989	1990*	1991
Black-Crown Night Heron	195	167	116	90	0	125
Great Blue Heron	1	20	2	4	0	19
Great Egret	23	37	40	33	0	29
Snowy Egret	14	4	8	5	0	8
Cattle Egret	0	4	0	1	0	0
Little Blue Heron	3	1	1	1	0	3
Herring Gull	12	35	11	33	0	34

*No banding done during 1990.

TABLE 03. Project Estimated Breeding Populations on West Sister Island

	Number of Nests					
Species	1986	1987	1988	1989	1990	1991
Black-Crown Night Heron	1300	1320	1285	1000	1240	1240
Great Blue Heron	500	1570	1500	1500	1500	1500
Great Egret	400	680	700	600	1040	1040
Snowy Egret	10	10	10	10	8	10
Cattle Egret	10	10	10	5	0	0
Little Blue Heron	3	3	2	2	1	1
Herring Gull	600	600	700	700	700	700

Ottawa WMS40 - "Physioecology of Fall Migrating American Black Ducks in the Lake Erie Marshes." Joe Robb, Ohio State University, Doctoral Thesis. The objectives of this study are: (1) to determine migration patterns and length of stay of black ducks and mallards in southwestern Lake Erie marshes, (2) to identify habitat use and local movements of staging black ducks and mallards (i.e., use of grain fields vs. natural marshes, (3) to determine temporal survival and mortality factors of black ducks and mallards in staging areas, (4) to evaluate body weight and condition of migrating black ducks and mallards and to denote seasonal and age-sex differences, (5) to relate temporal survival with body condition, habitat use, and foraging patterns, (6) to contract differences of activity budgets of black ducks and mallards, and (7) to make recommendations for management of black ducks and their habitats on Ottawa NWR and other public and private marshes.

Little information is currently available on American black duck use of the southwestern Lake Erie marshes. Black duck numbers in these marshes appear to have fluctuated with observed habitat losses and subsequent wetland reclamation. Body condition and temporal survival of black ducks could be positively or negatively affected by habitat conditions and other factors in Lake Erie wetlands. Comparisons between black ducks and mallards could contrast habitat choices and clarify how potential body condition differences between the two species affect survival and migration patterns.

We will estimate survival, emigration rates, and habitat use of hatching year (HY) female black ducks and mallards through radiotelemetry. We also collect 5-cc blood samples from radioed birds in collaboration with the National Wildlife Health Research Center (NWHRC) to test for lead and disease exposure. Body condition of staging ducks will be assessed through measurements of live-trapped birds and through laboratory analyses of dead whole birds. Time-activity behavioral information was collected in the fall of 1990 and 1991.

We banded and measured 471 black ducks and 607 mallards during the 1991 field season. We collected 30 black ducks and 31 mallards for whole body condition analyses. We placed radio transmitters on 41 black ducks and 38 mallards in mid-October and early November. Lead exposure rates (i.e., 0.2-0.5 ppm) of radioed mallards and black ducks were 3% and 8%, respectively. Eight radioed black ducks and 12 radioed mallards were harvested during the waterfowl season, and 11 black ducks and 1 mallard were killed by predators, mainly mink (*Mustela vison*) and raccoons (*Procyon lotor*). Six black ducks and 7 mallards remained in southwestern Lake Erie into early January. The other radioed birds were censored due to emigration, radio removal, or radio failure. Habitat use/locations of radioed birds were systematically sampled 5 days/week.

Ten major behavior categories were recorded for observations of ducks in 5 major habitat types during 3 diurnal time periods. Environmental variables (i.e., ambient and water temperatures, wind speed, precipitation, and cloud cover were recorded for each session. Mixed flocks were observed to collect nearest neighbor and agonistic behavior data. Particular feeding behaviors within habitat types were also sampled to determine whether behavioral differences contribute to differential habitat use.

Ohio State University research team banding waterfowl. (file)

Ottawa WMS41 - "Feeder Use and Winter Movements of Wintering Passerine Population on Ottawa NWR." Mark Shieldcastle, Ohio Dept. Natural Resources Experiment Station.

Objectives of the study are to document: (1) feeder use, (2) winter home range and (3) return by wintering birds. This study began in 1984.

As in 1990, the winter of 1991 was extremely mild with little snow cover. This resulted in reduced feeder use by ground birds as abundant natural feed remained available. Bird numbers were normal and

widespread in the marsh region. Tree sparrow flocks were common and the house finch continues to increase. Five feeders were sampled at least one time in the 1991 field season. The winter field season starts in December and continues through March. A total of 585 birds including 343 new birds of 16 species were captured in 99.75 net hours. Dominant species banded were the tree sparrow, American goldfinch, house finch, and dark-eyed junco. The most unusual bird captured in 1991 was a Gambel's white-crowned sparrow.

Ottawa WMS42 - "Spring Migrational Movements of Raptors on the Ottawa National Wildlife Refuge and Surrounding Lake Erie Marshes, Ohio." Mark Shieldcastle, Ohio DNR, Crane Creek Wildlife Experiment Station.

Objectives of this study are to monitor long term trends in migrating raptors utilizing the region and to examine for spatial and temporal differences in migration among various age and sex classes of individual species and between species. Energetic conditions of raptors will be analyzed to assess habitat quality.

The field season commenced February 1 and concluded June 1, 1991. Count data were gathered and consisted of observations from fixed points, making visual counts of passing raptors, and identifying by species when possible. Also flight direction, wind direction, wind speed, sky condition, time of observation, and length of observation were collected. Raptor counts were conducted on 42 days between February 21 and May 11. Sixty-two individual trips involving 392.25 hours counted 3,931 raptors within the Ottawa-Magee Marsh wildlife area complex. Raptors with the most observations include turkey vulture (1083), sharp-shinned hawk (710), red-tailed hawk (638), and broad-winged hawk (575).

Two banding stations were located on Ottawa NWR to capture a sample of migrating raptors to determine age and sex compositions. Trap types included bow traps baited with pigeons; modified dhogaza nets used in conjunction with bows; triangle mist nests utilizing pigeons,starlings and house sparrows as lures; and drift mist nets placed across corridors. In 1991, 152 raptors were captured, measured, and banded including two recaptures. The sharp-shinned hawk and Cooper's hawk made up 82% of the captures. Seven owls were captured during night operations.

Two educational programs were conducted in conjunction with this study. Its hoped that in future years more educational programs will be conducted.

6. <u>Other</u>

Lake Erie Study - Identify all lands along and within ten miles of the U.S. Lake Erie shoreline (concentrating on the western basin including the Lake Erie Islands) having the potential to meet one or more of the following criteria:

a. Wildlife habitat including wetlands and areas used by threatened and endangered species.

b. Public recreation areas capable of meeting the public recreational need. This should include hiking, swimming, wildlife observation, hunting, trapping, fishing, marina/boating, and other related uses.

c. Environmental education areas capable of meeting the needs of the general public, primary and secondary schools, and other groups in environmental education related to the Lake Erie shoreline. This should include an assessment of the Stone Laboratory's current role and potential for expanded use as well as possible coordination with other State of Ohio facilities in the region.

d. Unique natural, historical, and scenic features of the shoreline.

Identify research needs required to address the following management concerns on land typical of the Lake Erie shoreline areas addressed in items above.

a. Fish and wildlife habitat management.

b. Flood and erosion control.

c. Restoration of wildlife habitat.

d. Potential human impacts on lands identified in this study.

Identify the need for both new or expanded facilities to include:

a. Federal fish hatchery or federal research station related to Lake Erie's fish, wildlife, wetland resources, and water quality.

b. University-based freshwater research consortium particularly expanding the involvement of the lake front universities such as the University of Toledo.

c. Public environmental education facilities.

d. Federal research role.

Ottawa NWR experienced an active personnel year. Refuge Operations Specialist Stan Cornelius relinquished his supervisory functions and took on coordination duties for the Moist Soil Expert System. Stan will provide direction to all Region 3 field stations for implementing the Moist Soil Expert System.

The Supervisory Refuge Operations Position vacated by Stan Cornelius was filled by Steve Lenz who transferred from Mingo NWR.

Refuge Operations Specialist Sandra Siekaniec transferred to Upper Souris NWR in January. Thomas Roster transferred from Swan Lake NWR in January to assume the duties of that position.

Biological Technician Thomas Siekaniec resigned in January to accompany his spouse to Upper Souris NWR. Thomas Cox was selected in January to fill the vacant position.

Jeff Jaeger, a cooperative education student from Mingo Job Corp, arrived at Ottawa NWR on June 24. Jeff was still in this cooperative position at year's end.

STAFF PHOTOS

Ottawa Refuge Staff: (left to right) Front row: Cox, Marshall
Back row: Jaeger, Cornelius, Roster, Lenz, Day, Miller, Blair (AC)

E. ADMINISTRATION

1. PERSONNEL

Charles W. Blair, - GS-12, PFT ..... Refuge Manager

Steven J. Lenz, GS-11, PFT, EOD 03/24/91 ..... Supervisory Refuge Operations Specialist

Stanley S. Cornelius - GS-11, PFT ..... Refuge Operations Specialist

Thomas P. Roster, - GS-7, PFT, EOD 01/28/91 ..... Refuge Operations Specialist

Charles E. Marshall, - GS-9, PFT ..... Outdoor Recreation Planner

Marjorie L. Miller, - GS-6, PFT ..... Administrative Technician (OA)

David L. Day, - WG-8, PFT ..... Equipment Operator

Robert Reynolds, WG-8, PFT ..... Maintenance Worker

Jeffrey A. Jaeger, WG-5, PFT, EOD 06/24/91 ..... Student Trainee (Maintenance Worker)

Thomas A. Cox, GS-5. TFT, EOD 01/28/91 ..... Biological Technician (Wetlands)

Sandra Siekaniec, GS-9, PFT ..... Transferred to Upper Souris NWR 01/11/91, Refuge Manager

Thomas Siekaniec, GS-5, TFT ..... Termination 01/04/91, Biologial Technician (Wetlands)

Joseph Robb - GS-7, P Int. ..... Refuge Operations Specialist

Robert Reynolds, Maintenance Worker in front of our new Ford L9000 dump truck. (CM)

YCC enrollers take time out from observation platform construction. YCC enrollees, left to right, Rob Rakay, Howard Carr, and Yolanda Hernandez. (CM)

YCC enrollee Josie Hall examines completed vegetation clearing of water control structure. (CM)

TABLE #04. Five-Year Staffing Levels

	Full Time	Part-Time	Temporary	FTE
FY1983	6	1	1	7
FY1984	6	1	4	7
FY1985	6	0	2	7
FY1986	6	0	2	7
FY1987	6	1	2	7
FY1988	7	0	1	7.2
FY1989	7	0	2	7.9
FY1990	7	0	2	7.9
FY1991	9	0	1	10.0

2. Youth Programs

YCC

The Ottawa National Wildlife Refuge 1991 Youth Conservation Corps (YCC) camp began on June 24. This years camp ended on August 23, and was non-residential. Ottawa's camp ending date was extended from the 16th to the 23rd by the refuge manager, however only two of the four enrollees continued work during the extension period. A random drawing was conducted for the selection of four enrollees. Recruitment was coordinated through local high school counselors. Applications were mailed to Oak Harbor, Fremont, Genoa, and Port Clinton High Schools. A news release was prepared and mailed to the local newspapers for additional response interest. Applications returned to the office for selection totalled 23 from applicants. Male applicant interest was higher and totalled 13 with 10 accompanying female applications. Applicants selected for the program were chosen by random drawing. One female selected was a minority of Hispanic origin. All four selected individuals accepted the positions. No crew leader was hired again this year. Camp supervision and field work leadership were directed by refuge staff. The four enrollees worked excellent on field projects and completed much for the work period on the refuge.

Enrollees selected for the 1991 YCC camp included Howard Carr, 15 years of age and Rob Rakay III, 17 of age both males from Port Clinton. Females included Josie Hall, 17 years of age, and Yolanda Hernandez both from Oak Harbor.

Work Accomplishments

Work projects totalled 16 coded activities and a paid holiday for the year. Many of the projects are on-going and were re-submitted for approval. Projects included bird banding, boundary line posting, parking and grounds mowing, maintenance facility cleaning, trail clearing, observation platform constructing, water-pump vegetation clearing, entrance gate, and maintenance shop painting. Some projects required considerable time to complete such as painting of the maintenance shop, and sign posting and clearing vegetation from the many pump stations and water control structures located throughout the three refuge units. These projects comprised approximately two thirds of work hours during the nine week camp period.

An orientation was given to the selected enrollees before the start of camp requiring a parent or guardian to accompany them. The orientation included a complete introduction to the YCC program outlining work requirements for the enrollees. Several environmental education field trips were conducted to expose the

enrollees to other conservation management programs.

Funding

Enrollees paid hours for the nine week camp totalled 1,320.7 hours for four enrollees. Salary cost was $5,612.90. Other cost and materials totalled $862.28. Total cost for the summer camp was 6,475.18. No crew leader salary cost was obligated. Station funds allocated from the regional office for fiscal year 1991 totalled $8,400.00.

Environmental Education

Enrollees visited five sites for field educational tours and discussions. Field environmental education trips were taken to Wildwood Metro Park in Toledo, Toledo Zoo, National Park Service's Perry Monument, and Ohio State University Extension/Ohio Department of Natural Resources Fish Hatchery, Put-In-Bay, Ohio. Refuge staff provided environmental education input as appropriate in the field during work projects.

First aid instruction is nice, but building platforms is more exciting. (CM)

Safety

No serious incidents or lost time occurred during the nine week camp. Minor bruises, scratches, and insect bites were received as usual. Two enrollees developed uncomfortable rashes from poison ivy that disappeared with continuous use of creams available in first aid kits. All four enrollees entered on duty having received swimming certification. One enrollee held a current CPR certification. A three hour first aid refresher was given to the enrollees by volunteer Jeff Stefanelli, a fireman for the Perrysburg Fire Department. Jeff is an instructor for first aid and CPR. Enrollees attended staff safety meetings during the summer as appropriate.

Summary

ORP Marshall coordinated, directed, and supervised the 1991 YCC camp as outlined by the project leader. It is recommended the 1992 summer camp continue to be coordinated and directed by the outdoor recreation planner. Field supervision for the YCC program should be directed by a crew leader in the selection of positions for enrollees. Permanent staff have field supervised enrollees in the past. Staff time is very valuable and the YCC program requires much supervision. A crew leader would provide the required supervision of YCC enrollees and allow staff to give full attention to refuge management priorities.

4. Volunteer Program

Volunteers, refuge staff and family members gather to acknowledge accomplishments through the year. (CM)

The volunteer program continued to be an asset to Ottawa's management program. Basic volunteer projects were interpretive, biological, clerical, and maintenance oriented. Volunteer participation consist of three categories grouped as active, contingent, and inactive. Volunteer hours for calendar year 1991 totalled 2,912 hours donated by 108 individuals. Active volunteer hours totalled 3,998 in calendar year 1990, however decreased in calendar year 1991 by 1,086 hours. This is reflected in several large scout group's participation in 1990 and no large groups in 1991. Active volunteers totalled 29 of which 12 were new participants. See volunteer table for individual donated volunteer hours.

A volunteer meeting was held on March 3 in the headquarters. A total of 15 volunteers attended. ORP Marshall conducted the meeting to give Ottawa's volunteers the opportunity to meet new members and staff. The meeting agenda covered upcoming projects for the season and general pertinent information.

National Volunteer Week was observed April 21-27. A news release was mailed to local media representatives giving recognition to Ottawa's volunteer staff.

Volunteer individual and group efforts were rewarded for contributed hours and recognized by the Ottawa Refuge staff. Wildlife prints were awarded to four individuals for outstanding efforts. They included Mike Crofts from Pemberville, Ohio and Chris Crofts from Northwood, Ohio for coordinating survey efforts of the "Common Tern", a state listed endangered bird. Edwin Pierce from Akron, Ohio was recognized for updating Ottawa's general bird checklist and Alfred Kahl from Toledo, Ohio for weekly clerical assistance. Awards were given to volunteers on October 15 during a volunteer cookout event. Both volunteer and staff families were invited to attend.

Ottawa Volunteers, Tom Bartlett and Mike Crofts were detailed to travel to Saskatchewan for participation in an international field census of piping plovers. Both assisted from June 2-13.

Volunteer award recipients Chris Crofts (left) and Mike Crofts (right). (CM)

Volunteer award recipients, Alfred Kahl, left, Ed Pierce, right and Project Leader Charles Blair, center. (CM)

Volunteer Chris Crofts was given authorization to assist Seney NWR staff to conduct wildlife surveys from May 8-17.

Kristen Wethington, a senior at St. Joseph Central Catholic High School in Fremont contacted the refuge in February requesting permission to conduct a senior project on the refuge. Kristen assisted with the tern project and bald eagle nest monitoring activities.

Steven Stasiak, a student at Ohio State University was interviewed on June 22 and given an orientation for volunteer projects at Ottawa.

Christopher Kaufman, an University of Toledo senior in the recreation department, will be completing a senior field experience at Ottawa. Chris is required to finish 400 hours. Chris's volunteer hours began in September and will be completed in early 1992. Projects included assisting with environmental education workshops, waterfowl banding, receptionist duties, sign boundary posting, educational materials development, and correspondence preparation.

Bruce Schaefer an University of Toledo undergraduate in environmental studies at the University began a field experience on December 30. The volunteer field experience will total 80 hours.

TABLE #05 1991 Volunteer Hours

Volunteer	Hours	Volunteer	Hours	
John Arnold	8	Julie Shieldcastle *	6	
Chris Ashley	30.5	Steven Stasiak *	6	
Jason Bleam *	75	Kim Stahler *	141	
Allen Cornelius	249.5	Bret Stahler *	94	
Chris Crofts	30	Sandra Woosley	9.5	
Ed Daniel	4.5	Chris Kaufman *	240.5	
Barb Faber *	41.5	Brad Kasper *	110	
Jim Fuehrer	255.5	Bruce Schaefer *	8	
Joe Kormorowski	191.5	Molly Maguire	16	
Rex Miller *	139	Sheila Miller *	152	
Kathy Mock	24	Diane Myers *	41.5	
Ed Pierce	545.5	Jim Quinlivan	89.5	
Heather Romer	26	Al Schlecht	6	
Susan Sargeant	7	Toledo Area Scouts (10)	40	
Greg Perth (scout)	6.5	Cub Scout Pac 123 (18)	60	
Mike Crofts	60	Lakefront Clean-up (50)	150	
John Redman	48			
TOTAL	1742		1170	2,912 HOURS

*New Volunteers

5. Funding

TABLE #06 Funding breakdown for the last five year fiscal period

	FY 87	FY 88	FY 89	FY 90	FY 91
Oper.&Maint..	254,800	264,000	343,300(1)	236,000	396,824
Core Maint.				87,372	80,000
ARMM's	62,800	26,200	0	0	0
Flex.Maint			20,000	26,500	308,000
Maint. Mgmt				98,300	0
Fire Mgmt				22,000	400
Threat/Conf.(2)	12,000	9,000			0
Farm Bill			34,000	96,750	117,500
Special Proj.(3)				198,000	0
Drug Intervention					1,010
Migratory Birds					3,000
Totals	329,600	299,200	397,300	764,922	906,734

(1) Includes $25,000 for Permanent Change of Station Costs.
(2) Threats & Conflicts - Includes contaminants and purple loosestrife control.
(3) These are special funds for the study of Lake Erie Wetlands from a special congressional appropriation.

6. Safety

The refuge management operations completed the 1991 year with no accidents or major incidents reported. Safety was given priority in all work assignments. Refuge Manager Blair emphasized the obligation of each employee to observe requirements throughout the year on the job. The safety committee conducted meetings to review safety needs identified for public safety, equipment, vehicles, buildings, and severe weather hazards.

Regional Safety Officer, Gerald Mohl, visited the refuge to conduct the safety portion of the operations inspection on October 15-17. The inspection review increased staff awareness to unapparent safety hazards. Review comments were very good with no major safety infractions found.

Safety Officer Marshall attended the Department of Interior Annual Safety and Occupational Health Seminar held April 14-18 in San Diego, CA. Collateral safety segment tracts reviewed policy standards and introduced the Safety Management Information System. Overall safety awareness was stressed.

Ottawa County Emergency Management officials, Mike Drubrosky and Jim Greer presented a safety program discussing emergency procedures for floods, tornados, chemical spills, and nuclear attacks. A video on tornados was shown entitled "Funnel Facts and Fable".

Refuge staff attended a radiological training refresher course on January 7 instructed by staff from the Ottawa County Emergency Management Agency. The course is designed for emergency services personnel to provide them with a basic knowledge of radiation physics and associated hazards. The student also becomes familiar with the equipment used to detect and measure radiation. Refuge staff attending the training session included Refuge Manager Blair, Assistant Manager Cornelius, Administrative Clerk Miller, and ORP Marshall. Radiation detection equipment issued to the refuge for emergencies is checked periodically throughout the year by emergency management and refuge staff. Staff new comers, Refuge Operations Specialist Steve Lenz and Tom Roster, and Maintenance Worker Jeff Jaeger attended radiological training for the sixteen hour course from December 16-19.

On July 1, a local heavy equipment operator/instructor from Caterpillar Corporation visited Ottawa to help train and certify our operators on the new Cat 200b excavator.

John Allen, Mark Twain NWR and Paul Irrthum, Minnesota Valley NWR conducted equipment certification training at the refuge on August 20th and 21st. Attendees included: Dave Day, Robert Reynolds, Tom Cox, Thomas Roster, Stanley Cornelius, Jeff Jaeger from Ottawa NWR, and Jerry Zoeller and Allen Duszynski from Seney NWR.

Safety films and videos reviewed for the year are as follows:

- Safety Gear: Eye and Face Protection
- Safety Gear: Head Protection
- Safety On The Job: First Aid For Accidents
- Lift and Carry
- Don't Be Blind To Diabetes
- Spinal Injury Management
- Freeway Driving: Making Critical Decisions

Safety Program Overview is as follows:

Number of safety meetings held - 13
Number of kinds of accidents for the year - 0
Innovative safety ideas - 0

7. Technical Assistance

January:

17 Refuge Manager Charles Blair met with Dr. Doug Wilcox (Fisheries), Field Supervisor Kent Kroonemeyer, Biologist Lynn McClain (Ecological Services), and Dr. Barbara Madsen concerning the Lake Erie Shoreline Protection Study.

25 Manager Blair met with Gildo Tori (Ohio DNR) and Jerry Rusk (Joint Venture) concerning the Lake Erie Marshes Joint Venture Project.

February

2 Manager Blair spoke on the Service's wetland restoration program at the Northern Ohio Waterfowl Symposium in Toledo.

12 Manager Blair, Kent Kroonemeyer, Lynn McClain, Doug Wilcox and Barbara Madsen met with Congresswoman Marcy Kaptur to brief her on the progress of the Lake Erie study.

13 The Lake Erie Marshes Implementation Team (LEMIT) of the Lower Great Lakes/St. Lawrence Basin Joint Venture met to discuss the upcoming season. Manager Blair, a co-coordinator of the team, presents the Service's programs for wetland restoration, challenge grants, new Conservation Reserve Program (CRP) sign-ups, the wetland rescue program and other issues at the monthly meetings.

15 Manager Blair attended the Ohio Wildlife Management Association's meeting in Columbus and was asked to brief the association and the Ohio Chapter of the Wildlife Society on the upcoming public meeting concerning Refuges 2003.

20 Senior Realty Officer Bill Swanson visited the refuge to evaluate the 1100-acre Howard Farm parcel adjacent to the west side of the Ottawa Division. Manager Blair, Assistant Manager Stan Cornelius, Bill Swanson, and the realtor viewed the parcel.

27 Manager Blair spoke to over 200 people at the Farm-City Forum held at Bowling Green State University on the value of wetlands and the Service's Wetland Restoration Program. The Forum was held to discuss the conflicts over wetland regulations. The Ohio Farm Bureau, Toledo Realtors Association, state personnel from Ohio EPA and DNR, and private individuals addressed the group.

28 Manager Blair met with Service Law Enforcement Agents Dan LeClair and Ernie Mayer to discuss many subjects of mutual concerns, including a joint radio communications project.

March:

6 Bonnie Shires (Personnel Management) visited the refuge to review the Refuge Manager's position description.

15 Manager Blair, Administrative Technician Marge Miller, and Assistant Manager Tom Roster attended a meeting of all Ohio's U.S. Fish and Wildlife Service offices in Sandusky. Each Office gave a presentation on their station and activities. This was a very informative meeting and will hopefully lead to a better partnership.

21 Manager Blair coordinated a LEMIT meeting to finalize the Lake Erie Plan as part of the North American Waterfowl Management Plan.

22 Manager Blair and Outdoor Recreation Planner Charles Marshall travelled to the University of Michigan to participate in the Cultural Diversity Workshop held at the School of Natural Resources.

April:

15-16 Jim Mattsson, WAM2 biologist conducted the initial phase of the operations inspection regarding the refuge biological overview.

29-May 3 A field operations inspection was conducted by the following team members:

Bill Hutchinson, Assistant WAM2 (RO)
John Ellis, Wildlife Management Biologist (RO)
Alice Clanin, Administrative Officer (Chautauqua NWR)
Hannibal Bolton, Fisheries Assistant (Winona, MN)
Norm Brown, Fire Management Officer (Necedah NWR)
Donna Stanley, Outdoor Recreation Planner (Muscatatuck NWR)

The safety portion was scheduled for a later date. During the inspection, a tour was scheduled to view the some of the wetland restorations in Lenawee County, Michigan.

May:

9 Manager Blair and Assistant Manager Steve Lenz visited the Ohio State University. A wetland restoration slide show was presented by Manager Blair to the student chapter of The Wildlife Society.

11 Manager Blair traveled to Fremont, OH to present a refuge overview and related wetland issues to a biology class at Terra Technical Community College.

14 Matthias Kerschbaum (WAM2) visited the refuge for Manager Blair's performance appraisal and other activities.

30 David Hamilton (Office of Information and Transfer) and Assistant Manager Cornelius reviewed the moist soil management software and related mapping capability computer programs.

June:

19-20 Assistant Manager Lenz traveled to Ashville, OH to assist Bill Swanson, Jeff Donahoe, and Don Hultman (Realty) conduct two public meetings regarding the proposed Pickaway Plains NWR.

July:

23 Manager Blair presented a slide show of Ottawa NWR, wetland restorations, and land acquisitions to the Oak Harbor Rotary Club.

August:

1-31	Assistant Manager Lenz was detailed to Alberta, Canada for the pre-season waterfowl banding program.
8	Manager Blair provided a tour of private land wetland restoration projects in Lenawee County, Michigan to members of the Southern Michigan Association of Conservation Districts.

September:

3	Manager Blair traveled to the Regional Office to review the Lake Erie study with Messrs. Kerschbaum, Hutchinson, and Ellis.
12	A wetland restoration slide show was presented Manager Blair at the Soil and Water Conservation District in Defiance, Ohio.

October:

15-17	Assistant Manager Cornelius traveled to Memphis, Tennessee to discuss the moist soil expert system with University of Missouri-Gaylord staff and Region 4 personnel.
21	Manager Blair attended the Congresswoman Marcy Kaptur news conference for the Lake Erie study and the proposed Howard Farm addition. Congress approved $2.7 million for land acquisition along Lake Erie.

November:

13	Manager Blair and Outdoor Recreation Planner Marshall visited Gibsonburg High School for a "Partners for Cultural Diversity" meeting. Manager Blair provided the students with an overview of the Service's cultural diversity program and ORP Marshall presented a slide program on the U.S. Fish and Wildlife Service.
14	Assistant Manager Tom Roster conducted a career day presentation at Oak Harbor High School for Future Farmers of America.

December:

18	Manager Blair traveled to the Regional Office to discuss the Howard Farm acquisition proposal.

8. Other Items

Manager Blair assisted the Refuges 2003 team set up a public meeting for the preparation of the Environmental Impact Statement that was scheduled for April 25th in Toledo, Ohio.

Regional Office Appraiser, Steven Paulson visited the refuge office on February 25th to review property and building status of each unit. Steven reviewed other private withholdings for possible purchase on the western boundary of the Ottawa Division. Then on October 29th, Jim Dooley arrived and began the appraisal assessment of Howard Farm.

Manager Blair traveled to Circleville, Ohio to attend the public meeting of the proposed Pickaway Plains National Wildlife Refuge.

The new elected Secretary of the Ohio Chapter of The Wildlife Society is Manager Blair.

Manager Blair and Mingo Job Corps cooperative student Jeff Jaeger traveled to the regional Office for Service orientation during July 29-31.

Richard Dyer and Jim Munson, North American Waterfowl Management Plan from Region 5, visited the refuge and toured the Lake Erie Marshes Joint Venture Project area on July 10.

Carl Korschgen and Kristine Mitchell, Northern Prairie Research Center, LaCrosse Field Station, are conducting a research project involving zebra mussels and diving ducks. At the end of the year, the team was having a "hard go" at collecting ducks but the zebra mussels were easy prey.

John Allan (Mark Twain NWR) and Paul Irrthum (Minnesota Valley NWR) conducted heavy equipment certification training at the refuge. Attendees included: Dave Day, Robert Reynolds, Tom Cox, Thomas Roster, Jeff Jaeger, and Stanley Cornelius from Ottawa, and Jerry Zoeller and Allen Duszynski from Seney NWR.

Manager Blair traveled to Springfield, Missouri to attend the WAM JAM project leaders' meeting during September 23-26.

Assistant Manager Lenz and Maintenance Worker Jeff Jaeger traveled to Mingo Job Corps for Jeff's graduation ceremony from the Job Corps on December 12-13.

Tom Olsen and Andrew McDermott (Division of Engineering) conducted inspections on the headquarter's remodeling project through out the year.

Instructors and participants inspect equipment during training at Ottawa NWR. (CM)

Jeff Jaeger, graduates from Mingo Job Corps with all smiles. (SL)

F. HABITAT MANAGEMENT

1. General

Habitat at Ottawa NWR consists of a variety of wetland types (65%), grasslands (20%), cropland (8%), forest and brush land (4%), and dikes and roads (3%). Marshes are managed to provide year-round food, cover, and nesting habitat for waterfowl and other migratory water birds. Moist soil and cropland units provide food for migrating waterfowl. Grasslands support nesting cover for waterfowl and feeding areas for raptors and other resident species.

2. Wetlands

Ottawa Refuge contains approximately 3,500 acres of marsh and 800 acres of moist soil areas which are managed for a wide range of food, cover, and nesting needs.

Moist soil units are managed to provide early successional plant species, such as smartweed, wild millet, etc.. Annual draw downs cause the unit to progress through a series of successional stages from the early smartweed/millet stage through the beggars tick/perennial stage, to the woody growth or cattail stage. The early stages are the most productive and can only be maintained by tillage of the soil or by a period of flooding for 1-2 years.

An undesirable aspect of draw downs is the expansion of purple loosestrife infestation that we are already having difficulty controlling. The low water levels in 1989 for renovation of dikes, water control structures, and pump stations facilitated its spread in several units (especially pheasant farm). Private wetlands and state park lands adjacent to the refuge are heavily infested and provide a constant source of seed for reinfestation even when control actions are effective in removing adult plants. Overall, the refuge is slowly losing the battle. All major divisions of the refuge are at least slightly infested. Control expenditures at the level of the past few years is slowing the spread and stopping rapid takeover.

Another aggressive aquatic plant of concern is phragmites. Phragmites started out in several units as small clumps, but has steadily increased the acreage it dominates. If it continues to expand at this rate, it may become a serious problem in Cedar Point - pool 2 and the show pool. An aggressive control program was initiated in 1989. Many plants were sprayed with Rodeo in conjunction with purple loosestrife spraying.

Ottawa Wetland Units

Pool 1

Water levels were at a shallow marsh stage throughout spring with water levels decreasing slightly during the summer. The unit had an open water area in the middle and moist soil area in the northern section and along the western side. The majority of the rest of the pool was cattail. Submergents and floating aquatics were also present. Fifteen purple loosestrife plants were pulled by hand from the southern portion. The pool attracted large numbers of wildlife including waterfowl whose numbers peaked at about 10,000 birds.

Pool 2A

Water levels did not follow planned levels because the unit was scheduled to be renovated in 1991. Therefore, the levels were kept moderate to high and somewhat constant to help knock back the woody vegetation that has encroached. The pool was not very attractive for wildlife. Use was limited to marsh and water birds and waterfowl. The ducks and geese mainly used the pool as a loafing area during the winter months.

Pool 2B

This unit was at a shallow marsh stage during the year. Water levels were kept somewhat constant, but allowed to decrease slightly during the summer months. Submerged aquatics continued to develop this year as evident by the considerable use by American wigeons and gadwalls. An excellent stand of smartweeds was produced and received a lot of use by migrating waterfowl during November. Cottonwood is still encroaching slowly into the unit.

Pool 2C

Water levels were allowed to evaporate during the summer exposing mud flats by August. The result was a variety of emergents, moist soil plants, and a few submergents. Lotus continues to encroach slowly towards the center, currently it covers approximately 10 percent of this unit. This unit was used extensively by shorebirds while mud flats were exposed and during flooding when water levels were 3-5 inches on the flats. Due to the production of moist soil plants, waterfowl use was steady throughout fall migration.

Pool 3

The unit was in a shallow to low marsh stage through most of the year. Water levels evaporated during the summer exposing mud flats in middle and eastern half. At this level the western third is completely dry and is currently choked with cattail. Fall precipitation brought water levels up over a foot and inundated the cattail. Purple loosestrife continues to be a problem along the north dike. Approximately 200 plants scattered along the north dike were sprayed with a 1% Rodeo solution. The unit had moderate use by waterfowl (as a loafing area), shorebirds, great blue herons and great egrets through the summer months and into fall. Also one mute swan remained in the unit from summer into early winter. The bald eagle pair that nest in pool 4 had started on a new nest in the wooded area on the northwest side of the pool.

Pool 6 (Woodies Roost)

The pool fluctuated along with Lake Erie water levels, precipitation, and evaporation. Due to a relatively dry summer and low lake levels the pool's water levels essentially decreased during the summer and increased in the fall. The unit is overrun with cattail and woody material. Area had limited use by waterfowl, herons, and egrets. The dikes are still riddled with muskrat holes. The unit is scheduled for renovation in the near future.

Pool 9

The unit has no pumping structure and Lake Erie water levels were too low to gravity feed water into the unit, hence by mid-summer the unit was completely dry. The unit is almost a solid stand of cattail with some reed canary grass and phragmites present. A 20-acre area of cattail was disked in the fall and then flooded using a Crisafulli pump in attempt to help open an area up for 1992. The north dike is eroded and contains muskrat/woodchuck holes and is covered with brush. This dike is planned for renovation work in the future. The unit provides essentially no use to waterfowl or other water birds.

Entrance Pool (Headquarter's Pool)

Water was kept at a shallow to moderate marsh stage with levels decreasing during the summer due to evaporation. Cattail surrounds east and south edges. Muskrat houses were very abundant so the unit was divided into two youth trapping units. Waterfowl use was steady throughout the year. Great blue herons, great egrets and black-crowned night herons were abundant during the summer when water levels were low for wading. Up to 200 herons and egrets could be seen in the morning feeding. Five purple loosestrife plants were pulled by hand along the west dike.

Show Pool

Water levels slowly decreased during the summer creating upland type habitat from a remnant island that's situated in the middle. The open water area is devoid of vegetation and cattails and phragmites dominate the shallow water areas. Purple loosestrife has a strong hold and is difficult to stop further expansion. Fifty gallons of 1% Rodeo solution was used to slow down further encroachment. Limited use by ducks, geese, and great blue herons occurred.

Mini Marsh

Water levels were maintained as a deep marsh to control woody vegetation that has sprouted due to drying of the unit in 1990 for dike renovation. This year the unit was lowered in mid-summer to reshape the inside slope of the east and north dike. After reshaping filter fabric and rip-rap were placed on the interior slope. The unit was then again pumped up to a deep marsh area. Waterfowl and wading bird usage occurred during low water levels.

Moist Soil Units

The main moist soil pump is used to manipulate water levels in MSU 3, 4, and 5. Each unit can be managed separately due to screw gates and flap gates. Electrical cost for running this pump during the year was $ 3,520.00. Other moist soil units that can be controlled by pumps are 7A, 7B, 8A, and 8B.

MSU 3

Water levels were allowed to decrease through the summer because this unit was scheduled for renovation work to control woody vegetation. However, limited manpower and higher prioritized projects were worked on. The unit's water level was then slightly increased in fall when MSU 4 and 5 were being filled. Unit was only scarcely used by migrating waterfowl and other migrants. The rehabilitation work is a priority for 1992.

MSU 4

The unit's water level was lowered slightly in spring and then allowed to evaporate through the summer. The result was a tremendous stand of millet, bidens, and smartweeds that covered 60% of the unit. Use by ducks was astounding at almost 250,000 use days when 1990's use days were only 32,000. Overall this unit had the best food production on the refuge this year.

MSU 5

Unit's water level was kept relatively high through Spring and Summer to stress willow and cottonwood that covered over 50% of the area. The unit was drained in July. Cocklebur emerged from the quick dewatering. Small smartweed plants grew, which consisted of a single stock 4-5 inches long containing a small seed head. Woody vegetation was mowed in August and early September. In addition, two areas were lightly disked to assist in controlling the indestructible vegetation. Flooding was done as quickly as possible because a swim-in duck trap is located here and needed to be operational by October 1. During full and early winter, inundated areas were used by ducks, geese, and swans for feeding and loafing.

MSU 6

Water levels fluctuated with precipitation received. Usually the unit will rise and lower in conjunction with the movement of the water levels of Lake Erie because of a breach in the south dike. However, this did not occur because Lake Erie's water levels were low. In the fall, building of a new dike began inside of the old, muskrat hole riddled, and brush infested dike. The dike will be completed in spring of 1992. The unit is choked with cattail, willow, and cottonwood.

MSU 7A

Unit was mostly dry during the growing season thus producing a crop of upland species. Areas that were slightly inundated into the summer produced small stands of moist soil plants. Unit was partially mowed for hunting in the fall. After which, the area was flooded. Use by waterfowl occurred after the hunting season on the refuge closed.

MSU 7B

This unit was managed the same as 7A because water pumped into or out of this unit has to go through 7A. The vegetative response was similar with upland plants growing on the southern third of the unit and moist soil plants scattered throughout the area. An area covering the northern third was lightly disked before flooding took place. Ducks were observed feeding here during fall.

MSU 8A

Unit was dewatered in early summer for rehabilitation work on the west dike. Work on the dike continued through the summer and will be finished in 1992. The unit developed a good stand of millet and smartweeds with some willow and cottonwood intermingled. Areas with young shoots of woody vegetation were mowed just prior to flooding. After the unit was inundated, ducks and geese utilized this unit considerably to take advantage of the seed made available from mowing. Because of this, use days were a lot higher this year (80,000) as compared to 1990's (14,000).

MSU 8B

Unit was kept in a shallow marsh condition until May when water was allowed to slowly decrease through the summer. By August, some of the slightly elevated areas were dry and some mud flats were exposed. The results were a good stand of millet and smartweed production. Early migrating shorebirds utilized the mud flats. Flooding started in September. Geese were the first to move in stripping the seed head of the millet right off the stalks. Waterfowl use days increased substantially over 1990's use days (200,000 in 1991 versus 87,000 in 1990).

Cedar Point - Pool 1

Water levels gradually decreased throughout the year because the pumps could not replace water loss from evaporation. The low water levels in Lake Erie prevented the pumps from running for any length of time. This unit is heavily choked with cattail. Phragmites and purple loosestrife are also troublesome. Twenty acres of purple loosestrife was aerially sprayed with a 5% solution of Rodeo. Unit has not been trapped for the past three years in hopes that muskrat would control the expansion of cattail. However, due to the low water levels this management technique has not been successful. Although, muskrat houses sprung up in late November and early December proving muskrats are abundant. Hopefully in 1992 Lake Erie water levels will be somewhat higher to allow water movement.

Cedar Point - Pool 2

Pool 2 water levels are directly connected to pool 1 through a connecting water control structure. Pool 2's situation is somewhat the same as pool 1's, cattail is the dominate species and only a small open area exist on the south side. Muskrats are also abundant here as evident by the number of houses visible. Muskrats should be able to open up more areas in the cattail if water is maintained high enough during the summer through fall. Waterfowl use was essentially nil this year.

Cedar Point - Pheasant Farm

Water levels were allowed to fluctuate with environmental conditions because rehabilitation of the west and south dikes was suppose to take place. Limited manpower and higher prioritized projects were accomplished instead. The mentioned dikes are eroded on the interior side and have numerous muskrat/woodchuck holes in them. These dikes are schedules for rehab in 1992. Waterfowl use was moderate and occurred mainly in the spring during migration. Five acres of purple loosestrife was aerially sprayed with a 5% Rodeo solution.

Darby - Pool 1

Water levels gradually increased through spring and lowered in summer from evaporation. This produced a diversity of emergents, submergents, and floating aquatic plants. Waterfowl use was steady through the year. American wigeon and gadwalls were seen in large numbers feeding on the floating and submerged vegetation during the fall migration. Bald eagle activity has increased in this pool with the development of a nest.

Darby - Pool 2

Water levels steadily decreased during the year. In fall, the main ditch was lowered to assist neighboring private lands to drain. In doing so, pool 2 drained because the dikes are riddled with muskrat holes. Cattail and submergents are dominate with willow occurring on a remnant dike that still exists within the pool. Purple loosestrife plants are scattered throughout, but no dominant stands have developed yet. Waterfowl and great blue heron use was comparable to prior years at 15,000 and 500 use days, respectively.

Darby - Pool 3

Water levels were kept relatively stable during the year. Levels decreased in the summer from evaporation. Water levels were raised in late summer. Muskrat holes going through the dike was the cause for water levels to drop when pool 4 was lowered. Cattail dominates the middle third. A moderate stand of smartweeds was produced on the northern third. Purple loosestrife plants were scattered throughout the unit but no dominate stands have developed. About 20 plants located along the dikes were sprayed with a 1% Rodeo solution.

Darby - Pool 4

Pool water levels were moderate to high throughout the year. The pool was lowered slightly in fall to assist adjacent landowners in removing water from their property. Open water covers 70% of the pool. In shallow areas stands of moist soil plants, cattail, cottonwood, and willow grew. This unit was used mainly as a loafing area for waterfowl and gulls. Great blue herons and great egrets fed in the shallow areas.

Navarre - Pool 1

Water levels fluctuated greatly during the year, staying in a moderate to deep marsh stage. Cattail, emergents, and submergents dominated the unit. Waterfowl use was average with the bulk occurring in fall for a resting area.

All facilities are maintained by Davis-Besse Nuclear Power Plant staff. All pumping costs were paid by Toledo Edison.

Navarre - Pool 2

Water levels generally followed planned levels except in the fall when levels decreased rather then increased. Cattail is the dominate species within the unit. Areas of higher elevations had moderate stands of smartweeds. Southern portions were a wet meadow habitat.

Again all facilities are maintained by the Davis-Besse staff and all pumping costs are paid by Toledo Edison.

Navarre - Pool 3

Water levels fluctuated greatly and ended up well below objective levels. This unit is choked with cattail, which covers over 70% of the area. Muskrats are using this unit extensively. Waterfowl use of the area was very limited.

3. Forests

There are four major woodlots on Ottawa. The locations of woodlots are: an area surrounding the shop, south of MSU 8B, west of MSU 8B, and west of Butternut Lodge. Dikes along Crane Creek also have large tree species.

Gypsy moth traps were placed in all the major woodlots in June and were removed and checked in August. The number of moths collected this year were 15. This was a decrease from 30 moths captured in 1990.

4. Croplands

Ottawa's cropland program is administered to support the refuge hunting program in providing a quality goose hunt and to support the management of our moist soil program by providing some periodic tillage in these areas, as well as to provide supplemental food resources to waterfowl.

TABLE #07 Crops Planted by Farm Unit - 1991

Crop	Unit 1	Unit 2	Unit 9	Unit 10	Unit 11	Total
Corn	11	18	13		15	57
Sorghum		7	12	7		26
Wheat	7	7	7	8	10	39
Legume		20	26	8		54
Soybeans	15	38	15	19	23	110
Total	339	90	73	42	48	286

A change in the methods of determining the share ratios was initiated this year. Previously, the cooperator received 100% of the soybeans and the refuge receive various amounts, often 100%, of the other crops. The result was that if the other crops, such as corn, was lost or had poor yields, the cooperator was not affected. Thus, the corn crops were often the last put in, received little care, etc., while the soybean crop received top priority. We often had poor crops and often felt that we were simply not getting a fair return.

This year, we changed to a system where we received a 1/3 share of both the corn and the soybean crop, with our share of the soybeans being delivered to an elevator. A portion of these soybeans were then transferred back to the cooperator as reimbursement for work such as planting crops for the refuge which were not part of the cooperative agreement share ratios.

From the table above, all of the soybeans(110 acres) and the corn in units 1 and 2 (29 acres) were under a 2/3-1/3 share ratio. The remainder of the crops were entirely refuge. Refuge personnel prepared and planted the legume, wheat, and sorghum crops, except for unit 2 where the cooperator put in the legume and sorghum crops. He also planted and cultivated the corn in units 9 and 11 after refuge personnel had prepared the ground. A local agricultural supply company applied the herbicides and fertilizers for the refuge crops. The cooperator was then reimbursed for this work by transferring refuge soybeans on a dollar value at the elevator.

This system worked very well and was the first time that we were really able to put a dollar value to the return received by the refuge. A total of $4100.00 worth of soybeans was received by the refuge and approximately $3400.00 of work was done by cooperators. The balance was used to partially pay for herbicides, fertilizers, etc. of refuge corn crops.

While the program seemed to work quite well, weather was not real cooperative and it turned very dry right after the corn and other crops were planted. Almost no rain was received from late May until mid-August. Corn was affected the most and yields were very low. The cooperator planted grain sorghum produced well, however, the refuge planted sorghum was drilled much to heavy and although a heavy stand resulted, little grain formed in the heads. Blackbird use and damage was also very heavy in the sorghum.

5. Grasslands

No special work was done on refuge grasslands this year. The timothy fields in unit 7B that was planted in the fall of 1990 did well and the switchgrass fields did well in the dry weather.
The fescue field in unit 13 was mowed to reduce the invasion of Multiflora Rose.

10. Pest Control

A. Purple Loosestrife

The struggle to contain purple loosestrife was somewhat limiting this year. Manpower constraints prohibited all out assault against the plant to continue like it had in previous years. Plants continue to be scattered throughout the refuge and in large dominate concentrations in portions of Cedar Point and Darby. Purple loosestrife will always be a problem in these two areas because of the infested adjacent lands will continually provide a seed source. The Ohio Department of Natural Resources provided a helicopter and manpower to spray these large mono-cultures. The refuge provided the chemical Rodeo. Many plants that were found in small clumps were pulled by hand and destroyed.

Cedar Point Control Efforts

Loosestrife occurs in a large concentration in the middle of pool 1 with scattered plants along the toe of the dike. Pool 2 contains a scattering of plants but no dominate stands. Pheasant Farm concentrations occur along the western dike. Control efforts consisted of aerial spraying 20 acres in pool 1 and 5 acres in Pheasant Farm with a 5% Rodeo solution.

Darby Control Efforts

Darby unit was also sprayed with assistance of the state's helicopter. In pool 1, 5 acres were sprayed and in pool 4 (eastern side) another 15 acres were treated. Once again aerial treatment was with a 5% Rodeo solution. Another 5 acres were sprayed in pool 4 with the use of a ground sprayer. Fifty gallons of a 1% Rodeo solution was applied.

Ottawa Control Efforts

Various areas on Ottawa were controlled. The major area of importance is in show pool were the pool is highly infested. Loosestrife is located in a dominate stand on the south side of the impoundment and along the eastern dike. Fifty gallons of a 1% Rodeo solution was sprayed in these areas with the use of an air boat. Other impoundments where loosestrife occurs as individual plants intermingled with other vegetation were sprayed with a 1% Rodeo solution. These impoundments include: MSU-8B (40 plants), pool 3 (20 plants), and MSU-5 (10 plants). In pools 2C and Entrance pool, another 4 and 5 plants, respectively, were pulled.

Navarre Control Efforts

All of Navarre control efforts are undertaken by the Environmental Compliance Division at Davis-Besse Nuclear Power Plant. No loosestrife plants were observed. Intensive efforts by Davis-Besse staff, in previous years, has kept purple loosestrife under control.

Volunteer Jim Quilivan assisted in control efforts of purple loosestrife. (TR)

B. Willow

In reclaiming MSU-6, six acres were treated with Roundup and another 12 acres were sprayed with weedone 170.

12. Wilderness Areas

West Sister Island NWR is a wilderness island located 9 miles off the shore of Lake Erie. This island was visited several times by researchers during the summer. For more information about West Sister Island see the separate section of the area at the back of the narrative.

Volunteer Jim Quilivan assisted in control efforts of purple loosestrife. (TR)

B. Willow

In reclaiming MSU-6, six acres were treated with Roundup and another 12 acres were sprayed with weedone 170.

12. Wilderness Areas

West Sister Island NWR is a wilderness island located 9 miles off the shore of Lake Erie. This island was visited several times by researchers during the summer. For more information about West Sister Island see the separate section of the area at the back of the narrative.

14. Private Wetland Restoration (Farm Bill Activities)

During the 1991 field season refuge staff were again involved with Wetland Restoration efforts. Working in a total of 3 states and 8 counties we were able to restore a number of wetlands.

Efforts this year led the refuge staff into 2 new areas: Northeastern and Central Ohio. These 2 areas are target areas for the North American Waterfowl Management Plan, and we hope to focus even more time on these areas next year.

When the dust finally settled and winter rains began to fill most basins, we had restored a total of 53 wetlands for a total of 177.75 acres.

With the increasing number of restorations each year our Management District must also deal with the occasional problems such as rebuilding a dike, searching for additional tile, or correcting adverse water effects on adjoining land owner's property. These are all time consuming events.

During the 1991 field season we revisited 13 such sites to get them functioning again.

TABLE #08. MICHIGAN WETLAND RESTORATIONS - LENAWEE COUNTY

					ACRES		
NAME	CRP	1989 SITES	1990 SITES	1991 SITES	1989	1990	1991
Bayer, Andrew	Y	1			2.0		
Blake, David	N	1			2.5		
Buggerman, Dan	Y		3			4.0	
Comfort, Gorden	Y		1			3.0	
Crane, Martha	Y		1			2.0	
Daub, Gorden	N		1			2.0	
Dunbar, Lem	Y			3			6.0
Emery, Craig	Y			1			1.5
Fisher, Bruce	N	2			13.0		
Greggory, Amos	Y		3			5.0	
Hassenzahl, Joel	N	3			3.0		
Hunt, David	Y			1			2.5
Jones, Kent	N	4			6.0		
Marcoux, Otto	Y		3			6.0	
Pepper, Dan	Y			3			7.0
Poe, Ralph	Y			1			2.0
Ramsdell, Estate	Y		9	1		14.0	0.5
Reeder, Jack	N		1			4.0	
Ruesink, James	N			1			3.5
Ryan, Rial	FmHA		2			7.0	
Sallows, Vera	Y		4			6.0	
Schafer, Melvin	Y	2			6.0		
Schmidt, Richard	Y			1			6.5
Schultz, Marion	Y		7			22.0	
Southwell, Bernard	Y			7			10.5
Steve, Elmer	Y	1			15.0		
Wiebbler, Larry	Y		1			1.25	
Wood, Audrey	Y	1			1.5		
Worker, Ken	Y		4			4.0	
	TOTAL	15	40	19	49.0	80.25	40.0

TABLE #09. INDIANA WETLAND RESTORATIONS - STEUBEN COUNTY

NAME	CRP	1989 SITES	1990 SITES	1991	ACRES 1989	ACRES 1990	ACRES 1991
King, Steve	N	4			11.0		
Lutz, Don	N			1			1.5
Snyder/Griffen	Y	3			15.0		
Stegelman, Rudy	Y	2			6.0		
TOTAL		9	0	1	32.0	0	1.5

TABLE #10. INDIANA WETLAND RESTORATIONS - DEKALB COUNTY

NAME	CRP	1989 SITES	1990 SITES	1991 SITES	ACRES 1989	ACRES 1990	ACRES 1991
Beaman, Jim	Y	10		2	20.8		5.0
Cordray, Gene	Y			1			1.0
Fry	N		2			4.0	
Lumbersome, Larry	N			2			3.5
McCrady, Don	Y	1			1.0		
Murley, Richard	N			1			0.5
Palmer, Bruce	Y	1			2.0		
RCTG Corp.	N		2			4.0	
Stoneking, Richard	Y			2			4.5
Wallace, Max	N			1			3.0
TOTAL		12	4	9	23.8	8.0	17.5

TABLE #11. OHIO RESTORATIONS - HURON COUNTY

NAME	CRP	1989 SITES	1990 SITES	1991 SITES	ACRES 1989	ACRES 1990	ACRES 1991
Jones, Michael	N	1			1.0		
ODNR, Willard Marsh	N	1			2.0		
Parsons, Dan	Y	1			1.5		
Prater, Bayliss	Y	4	1		12.0	2.0	
Sheldon, Dean	Y	3			7.0		
TOTAL		10	1	0.0	23.5	2.0	0.0

TABLE #12. OHIO RESTORATIONS - WILLIAMS COUNTY

NAME	CRP	1989 SITES	1990 SITES	1991 SITES	ACRES 1989	ACRES 1990	ACRES 1991
Bordner, Vincent	Y	2			12.0		
Clements, John	Y	4			12.0		
Lamar, Dick	Y	1			2.0		
Keller, Dan	Y		1			5.0	
Lutz, Jim	Y	3			5.0		
Miler, Ruby	Y	4			5.0		
ODNR, La-Su-Ann	N	9	7		34.0	16.0	
Oyer, Robert	Y	1			3.5		
Sullivan, Don	Y	2			4.0		
TOTAL		26	8	0.0	77.5	21.0	0.0

TABLE #13. OHIO RESTORATIONS - OTTAWA COUNTY

NAME	CRP	1989 SITES	1990 SITES	1991 SITES	ACRES 1989	ACRES 1990	ACRES 1991
McRitchie, Park	N		2			10.0	
TOTAL		0	2	0	0	10.0	0

TABLE #14. OHIO RESTORATIONS - HARDIN COUNTY

NAME	CRP	1989 SITES	1990 SITES	1991 SITES	ACRES 1989	ACRES 1990	ACRES 1991
Christrian, Joe	N			1			1.5
Daugherty, John	N		3	2		4	2.75
Dixon, Perry	Y			1			2.0
Fleece, Charles	Y			2			4.0
Shepard, Gary	Y			1			2.5
Yocum, Trell	Y			3			8.0
TOTAL		0	3	10	0	4	20.75

TABLE #15. OHIO RESTORATIONS - WOOD COUNTY

NAME	CRP	1989 SITES	1990 SITES	1991 SITES	ACRES 1989	ACRES 1990	ACRES 1991	
Pfeiffer, Elroy	Y		1			9		
TOTAL		0	1	0	0		9	0

TABLE #16. OHIO RESTORATIONS - SANDUSKY COUNTY

NAME	CRP	1989 SITES	1990 SITES	1991 SITES	ACRES 1989	ACRES 1990	ACRES 1991
Daubble	N		2			60	
ODNR, Pickerel Creek	N		1			6	
Blue Heron Reserve	N		5			17	
Olszewski, Tom	N		2			4	
TOTAL		0	10	0	0	87	0

TABLE #17. OHIO RESTORATIONS - WYANADOT COUNTY

NAME	CRP	1989 SITES	1990 SITES	1991 SITES	ACRES 1989	ACRES 1990	ACRES 1991
Courtad, Dave	Y			2			5.5
ODNR, Killdeer Plains	N			3			3.0
TOTAL		0	0	5	0	0	8.5

TABLE #18. OHIO RESTORATIONS - TRUMBULL COUNTY

NAME	CRP	1989 SITES	1990 SITES	1991 SITES	ACRES 1989	ACRES 1990	ACRES 1991
ODNR Grand River	N			3			30.0
Schwab, Fred	N			2			20.0
TOTAL		0	0	5	0	0	50.0

TABLE #19. OHIO RESTORATIONS - ASHTABULA COUNTY

NAME	CRP	1989 SITES	1990 SITES	1991 SITES	ACRES 1989	ACRES 1990	ACRES 1991
TRW Rod & Gun Club	N			1			3.5
TOTAL		0	0	1	0	0	3.5

TABLE #20. OHIO RESTORATIONS - GEUAGA COUNTY

NAME	CRP	1989 SITES	1990 SITES	1991 SITES	ACRES 1989	ACRES 1990	ACRES 1991
Mitchel, Chuck	N			1			30.0
Smith, Ken	N			1			1.5
Wadsworth, Tom	N			1			4.5
TOTAL		0	0	3	0	0	36.0

This tiled area would lay wet for 2 days after rains. (TC)

Charles Blair, Steve Lenz and Lawrence Zellar hooking up riser after cutting the tile. (TC)

This tiled area would lay wet for 2 days after rains. (TC)

Charles Blair, Steve Lenz and Lawrence Zellar hooking up riser after cutting the tile. (TC)

Seed mass produced. (TC)

Waterfowl using the site in early February. (TC)

This tiled area is in Lenawee CO. Michigan is receiving some assistance from Terry Papel. Now just add water. (TC)

An instant wetland complete with close to 500 ducks and geese. (TC)

This hen mallard and her brood seem to approve of the repair work done on the dike. (TC)

This hen mallard and her brood seem to approve of the repair work done on the dike. (TC)

G. WILDLIFE

1. Wildlife Diversity

The 8,316 acres of the refuge complex maintains a variety of habitat from croplands and grasslands to several types of wetlands. A wide range of species can be found. The bird list contains 267 normally observed species and an additional 45 that are accidentals. The refuge supports 32 mammals along with 53 amphibians and reptiles. Volunteers conduct bird species counts on all units once each month. Ohio DNR flies refuge units every week for waterfowl census in the fall and winter. Refuge personnel conduct an on-land waterfowl population census biweekly, and weekly during spring and fall migrations.

2. Endangered and Threatened Species

A. Bald Eagles

A volunteer workshop on eagle monitoring was presented by the Ohio DNR at Crane Creek Experimental Station on February 23rd. An excellent presentation was given on eagle behavior and management. Volunteers are used to monitor all eagle nests to determine start of nesting and hatch dates. This information is then used to pin point the best time for banding and installation of telemetry equipment so that habitat use of fledglings can be monitored. Assistant Manager Roster and Outdoor Recreation Planner Marshall attended the presentation.

The 1991 nesting season was an eventful one in northwest Ohio. A total of 19 nests were initiated, but through nest abandonment and lost of young only 6 eaglets made if to flight stage. The refuge complex supports two active nests, one at Ottawa NWR and the other at Cedar Point NWR. Radio tracking of eagles by Ohio DNR experiment Station personnel has shown that eagle numbers peaked at 20 birds in October.

The Ottawa pair moved from their nest located in pool 4 to building on a red-tailed hawk's nest in pool 3. The eagles were able to persuade the pair of red-tails to move on. Building activity took place in February and March. The birds were actively incubating in mid-March with an expected hatch date around the 19-20th of April. Hatching occurred on the 19th and the eaglet disappeared within a week. Cause of loss is unknown. This marked the third consecutive year this pair has lost its young.

The Cedar Point pair started incubating in mid-March and had an expected hatch date around the 18th of April. The pair abandoned the nest on March 31 during a severe cold spell that brought snow. Inspection of the nest resulted in finding broken egg shells. Abandonment may have been due to the weather, however, nothing is being ruled out.

Indications from observations and the telemetry data shows that immatures in the western Lake Erie shoreline congregate at two locations during the fall. One location is near the mouth of the Crane Creek and the other is in Sandusky Bay. Both of these areas are tributaries that are protected and have very little human disturbance.

On February 22, an adult bald eagle was found dead by state wildlife officials in Carrol Township. It is presumed the bird had flown into an electrical power line resulting in electrocution. Band information revealed the eagle was fledged from Ottawa NWR nest site in 1981. Fish and Wildlife Special Agent Dan LeClair investigated the incident and forwarded the bird to the National Wildlife Health Laboratory.

The Health Lab confirmed that death was caused by electrocution and the bird was shipped to the refuge. Then in July, the bird was sent to Mississippi State University - Chemical Laboratory for analysis. Also two eaglets that had perished before fledgling were also sent to the chemical lab. The eaglets were retrieved from the Toussaint Wildlife Area and the Sandusky airport nests. Analysis on organophosphate contamination was negative. The final resting place for the adult eagle was the eagle depository at the forensic lab in Ashland, Oregon.

B. Peregrine Falcons

Nineteen-Ninety One was an active year for peregrine falcons. One falcon was picked up by Ohio DNR in September after it had apparently flown into a building in downtown Toledo, Ohio. The bird was then shipped to the Raptor Rehabilitation Center in Minnesota to be examined. The falcon did not have any injuries, but was found to be an immature barely capable of flight. The Raptor Center shipped the bird to Columbus, Ohio for release through Ohio DNR's hacking program.

Another two falcons were sent to the rehab center during October. One had irreparable wing damage, possible from a line strike and had to be euthanized. The other falcon had a broken scapular and femur. This bird is still undergoing rehabilitation.

3. Waterfowl

A. Ducks

Total duck use for the complex was 3.11 million use days, an increase of 11% from 1990's 2.77 million. Approximately 71% of the use occurred on Ottawa NWR and the remainder at Cedar Point NWR. Duck use days over the past five years are shown below.

TABLE #21. Duck Use Days

Year	1987	1988	1989	1990	1991
Use Days	3.66	5.04	3.00	2.77	3.11

Fall populations peaked at approximately 32,900 birds at Ottawa and 12,900 at Cedar Point. This compares to 1990's peak numbers of 38,600 and 24,000 for Ottawa and Cedar Point, respectively.

A Wood Duck Challenge Grant Project that began in 1990 was continued this year. Another 25 boxes (20 in 1990) were completed by the Northwood High School students in March. Boxes are scheduled to be installed during January, February of 1992.

Challenge grants has allowed for 45 new wood duck boxes constructed. (TR)

B. Geese

Canada goose use days for the complex was 1.39 million use days as compared to last years numbers of 0.80 million use days. The refuge's objectives is 1.5 million use days. Use days were divided between the refuge units as follows: Ottawa 1,128,000, Navarre 52,300, Darby 58,960, and Cedar Point 150,900.

Snow geese and white-fronted geese are infrequent visitors to the refuge but accumulated about 6,500 use days during the year. Snow geese numbers peaked at 50 birds while white-fronts peaked at 10.

C. Swans

Refuge use by tundra swans varies greatly from year to year. In 1991, swan use days totalled 6,300 days and peaked at 250 swans. Use days for the last five years are 19,960 (1990), 2,103 (1989), 2,450 (1988), 7,200 (1987), and 14,000 (1986). Reports from the 1970's show hundreds of swans utilizing refuge units for an extended period. For the last few years, swans have bypassed the refuge completely, or have stayed for only a few days in small numbers, 2-20 birds.

Mute swans have decreased in numbers and no attempt at nesting was tried this year but one swan was seen during the summer. Total use days were 180 for the complex.

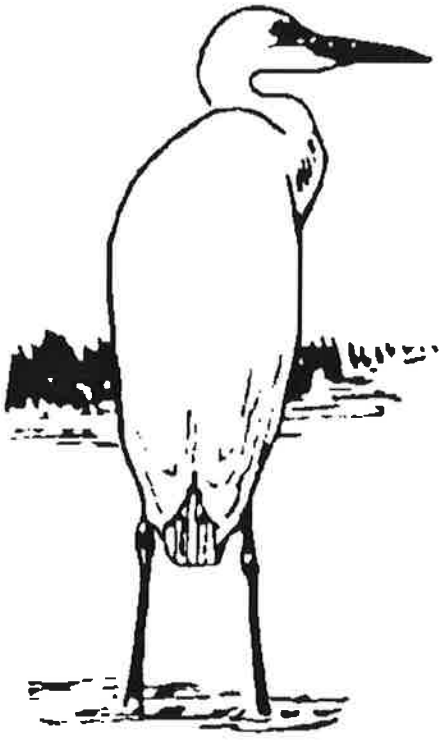
4. Marsh and Water Birds

Great blue herons, great egrets, and black-crowned night herons were abundant on the refuge throughout the spring, summer, and fall seasons. Even a few hearty great blue herons braved the elements and stayed through the winter. Ottawa and Cedar Point Refuges provide much of the feeding areas for the nesting colony on West Sister Island. The colony contains approximately 4,500 nests, and is the largest heron/egret colony on the Great Lakes chain. Studies have shown that these birds will fly 9 miles from the island to the main refuge complex several times a day to feed their young. Very heavy feeding occurs in the marshes, draw down areas, and mud flats created by Lake Erie wind tides. Species found less commonly in the area include snowy and cattle egrets and little blue and green herons. See research project WMS28 (section D-5) for more information on banding at the heron rookery at West Sister Island.

5. Shorebirds, Gulls, Terns, and Allied Species

A. Shorebirds/Gulls

Several shorebird species used mud flats along Crane Creek and in some interior pools throughout spring and fall. Ring-billed and herring gulls are common on the Lake Erie shoreline and nest on West Sister Island. Large numbers of Bonaparte's gulls were observed on the refuge during late fall. A few great black-backed gulls were sighted as well.



B. Common Terns

In 1987 a common tern restoration project was initiated in cooperation with the Ohio Department of Natural Resources (ODNR) and the U.S. Fish and Wildlife Service (Service). The goal is to create a self-sustaining colony of common terns on the refuge. Historically, common terns nested in several colonies around the island region in western Lake Erie and on mud islands dredged up in the Maumee Bay near Toledo. In Maumee Bay alone, there were an estimated 2,500 pairs of nesting terns in the 1960's. By 1987, those numbers were reduced to a few unsuccessful nesting attempts, due partially to the direct competition with ring-billed and herring gulls for nesting sites and food.

A total of three nesting sites have been used, two islands and a peninsula along one of the lake front dikes. The dike nesting area was discontinued in 1990 because of problems controlling ground predators. Management techniques include a mylar tape grid woven on the island to discourage gull use prior to tern arrival, tern decoys for social attractants, and daily observations. Taped tern calls and electric fences were discontinued due to their ineffectiveness. Gull eradication procedure was altered to assess the potential of utilizing a few nesting gulls to ward off non-breeders from the islands. This also reduced human interference during tern nesting.

"Tern Island" site of State endangered common tern restoration project. (TR)

In 1990 one island site was used with 26 nests initiated containing 47 eggs. Also in 1990, the eastern two-thirds of the south island was cleared of brush and sprayed with a 1% Rodeo solution. In addition, the north island was cleared and sprayed to provide an alternate nesting area.

The first terns reported being seen was on April 21, 1991 when the mylar tape was removed. At that time there were three common terns near the island. Also on that date 25 tern decoys were placed on the south island and 15 on the north island.

A limited number of observations were taken this year as compared to previous years. Observations started on the 14th of May and ended on the 4th of June. Ground monitoring was also limited to 3 visits during the breeding season. The visits took place on the 19th of June and the 2nd and 7th of July.

On the first visit 24 nests with 52 eggs were found on the south island. Approximately 60 adult terns were flying around the island during searching efforts. One chick was found and banded, however, another two chicks were discovered dead. On the second trip 14 nests containing 30 eggs were discovered on the south island. One chick was found and banded. Fifty common terns, which included 5 immatures, were observed hovering over the island during the search. The third visit to the islands an additional 20 nests containing 37 eggs were discovered on the south island and 3 nests with a total of 3 eggs were found on the north island. The fate of these nests from the third visit is undetermined because another trip to the island did not take place until late August well after any development time needed for chicks to fledge.

Through August and September common terns were seen loafing in pools 2C, 4, and 5. Common tern numbers ranged around 100 birds, which included 10 - 15 immatures. Its speculated that the immatures were hatched from the islands on Ottawa NWR since other nesting colonies in the area failed to produce any young this year.

In 1990, it was thought that continuously destroying gull eggs and removing gulls with a shotgun was creating a disturbance to the nesting tern. Therefore, during the 1990 season, removal of gulls was not conducted. In addition, it was believed that a few breeding gulls would ward off non-breeders, thus reducing the number of fulls using the island. In 1991, the only control efforts used consisted of a mylar tape grid placed over the nesting area. The grid system kept gulls out of the nesting area prior to tern arrival. No other control efforts were conducted. During ground searches only a few gull nests were found. However, observation reports show large numbers of gulls using the island--perhaps as a loafing area. were using the island -- perhaps as a loafing area.

No ground predator control measures were taken during 1991. Visits to the islands did not reveal any sign of ground predators being there.

TABLE #22. Animals Live Trapped and Removed from Project Area

Species	1987	1988	1989	1990	1991*
Raccoon	17	24	18	46	0
Opossum	10	8	7	2	0
Skunk	0	1	1	0	0
Mink	0	0	1	0	0
Woodchuck	0	0	8	5	0
Fox	0	0	0	2	0

*No trapping in 1991

Keeping the public off the refuge beach area adjacent to Crane Creek State Park has been troublesome because of Crane Creek's public swimming beach. Signs kept the majority of people out, but as always a few people choose to ignore the regulation. Constant wave action and vandalism requires continuous maintenance to the signs. The mouth of Crane Creek can be a problem because of fishermen drifting their boats into the refuge. This year trespass on the refuge did not interfere with the project.

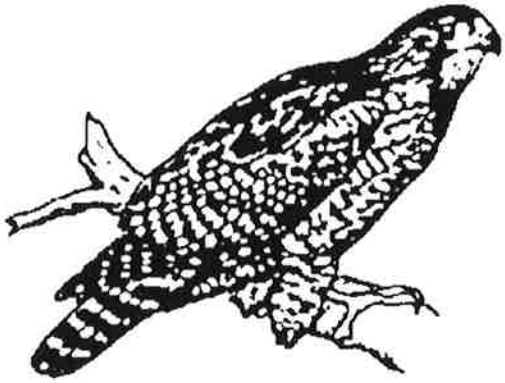
Future years for this project look promising. The number of nests initiated and eggs produced are gratifying, however, determination of what is happening to the eggs or tern chicks is needed. Future years will have to concentrate on this area in order for the project to become a complete success.

Volunteer Jim Quilivan putting the final touches on the tern project -- clean up. (file)

C. Other Tern Species

The refuge is also a migratory stop over for Forester's, caspian, and black terns. In August, approximately 100 terns were seen loafing in pools 2C, 4, and 5. The majority of the terns were common terns but also caspian and Forester's terns were present. One caspian tern was observed in entrance pool during the fall migration.

6. Raptors



Refuge staff assisted Ohio DNR, Wildlife Division staff collect five immature screech owls in May. The owls were taken from area nest boxes and shipped to Patuxant Wildlife Research Center in Laural, Maryland. The owls will become part of Patuxant's captive colony.

An osprey was picked up by Ohio DNR in October was shipped to the Raptor Rehabilitation Center, Minnesota. Diagnosis was a broken radius with swelling at the elbow joint. The bird was still under rehab at years end.

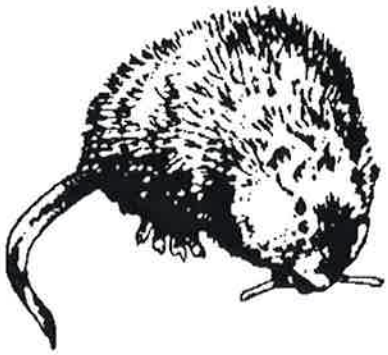
In spring, a migrational study of raptors through the western Lake Erie area was begun. Associated with the study, volunteers under the direction of a state Wildlife Biologist, observe raptor movements over Ottawa and trap and band birds. See WMS42 (section D-5) for more information on this study. Annually, volunteers conduct observations of migrating raptors during the spring. Observations are taken from the visitors parking lot. This year volunteers associated with the above study conducted the surveys. The last six years of observations are as follows:

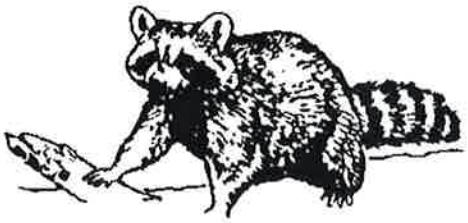
TABLE #23. Six Year Raptor Observations

Species	1986	1987	1988	1989	1990	1991
American Kestrel	34	2	13	25	9	119
Bald Eagle	4	1	0	1	3	7
Broad-winged Hawk	1226	99	25	29	133	575
Cooper's Hawk	37	14	10	25	41	357
Golden Eagle	0	0	0	0	0	4
Merlin	0	0	0	0	0	7
Northern Goshawk	0	0	0	1	0	12
Northern Harrier	36	7	5	16	29	210
Osprey	5	1	16	2	14	20
Peregrine Falcon	0	0	0	0	0	5
Red-shouldered Hawk	137	43	1	65	178	124
Red-tailed Hawk	397	46	38	239	191	638
Rough-legged Hawk	20	10	10	12	16	24
Sharp-shinned Hawk	232	49	183	186	511	710
Turkey Vulture	458	48	33	822	269	1083
Unidentified Accipiter	1	0	0	5	0	11
Unidentified Buteo	19	30	7	22	9	19
Unidentified Eagle	0	0	0	1	0	0
Unidentified Falcon	0	0	0	1	0	2
Unidentified Raptor	0	0	0	1	0	4
Total # Birds Observed	2606	349	332	1453	1430	3934
Observation Time (Hrs)	103.4	24.5	19.4	59.9	59.8	392.3
Raptors/Hour	25.2	14.2	17.1	24.0	24.0	10.0

A snowy owl used the entrance pool as a loafing area during December. (TC)

8. Game Mammals





Visual observations made of mammals indicate an increase in the rabbit population from last year. Muskrat populations remained stable due to a lessening of the drought and re-flooding of a high number of previous draw downs. Deer populations are up in most areas of the refuge.

11. Fisheries Resource

Staff from the ODNR Senecaville Fish Hatchery delivered 1500 channel catfish for stocking in the Cedar Point public fishing area. Fish ranged from 6-14 inches in size. The area is a 15 acre borrow pit open to fishing from June 1 - August 30.

14. Scientific Collections

Gypsy moth traps were placed at selected locations on the refuge with positive results (see Section F-3.)

16. Marking and Banding

A goose banding drive was done in cooperation with the ODNR in June. A total of 1,700 birds were banded from the refuge, Crane Creek State Park, and Winous Point Shooting Club. Of these, 794 were banded on the refuge. Birds received a U.S. Fish and Wildlife Service leg band and black/white neck bands (adults only). The ODNR received help from refuge staff and YCC. The area roundup took 3 days, used 2 helicopters, refuge air boat, a go-devil and up to 30 people a day.

Volunteers, in cooperation with the ODNR biologist captured and banded hawks during the spring migration (see section D-5).

Mark Shieldcastle, ODNR biologist, banded numerous songbirds at Ottawa, Navarre, and Darby (see section D-5).

Joe Robb, Phd. student at Ohio State University, nasal saddled and leg banded mallards and black ducks in conjunction with his thesis work. See section D-5, WSM39 for more information.

Of geese observed in the 1990/91 migration season, only 215 neck collars, of the 600 goose neck band observation quota, were observed by the end of the year. Most of these observations were white/black collars placed on local females by the ODNR. A total of 12,390 geese were observed. Volunteers contributed many hours with moderate success. The mild winter conditions allowed the birds to remain dispersed and in fields off the refuge, making observations extremely difficult to obtain.

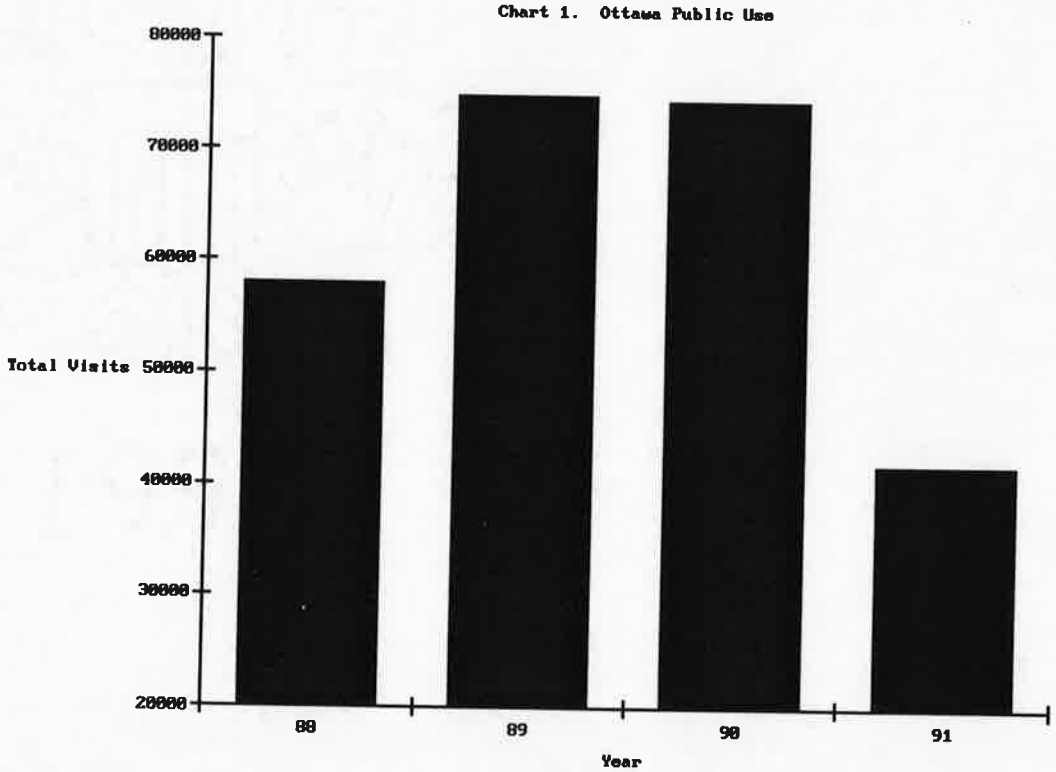
Collars observed in 1991 totalled 124. A total of 2,989 geese were observed. Sixty-three percent of the collars observed were local birds (white/black collars). The next highest observed collars were orange/white at 29%.

H. PUBLIC USE

1. General

Ottawa's visitation totalled 41,942 for calendar year 1991. The total is based on a car count of 14,522 vehicles traveling the entrance road to the refuge and data compiled for consumptive and non-consumptive activities. Visitation reported in 1990 totalled 74,588 based on a car count of 24,094. The 1991 visitation reported decreased by 43%. This is attributed to a new vehicle counter system activated for the beginning of the year. A duplication in reporting visits in the output reporting is also reflected in the total decrease for 1991. Output report categories of wildlife observation and interpretive trails occur simultaneously on Ottawa's visitor trails. The duplication was identified in the station's operations inspection conducted April 29 - May 2. The solution is, that however the visitors are counted, they can be counted in the two categories if the duplication is subtracted from the final total. Visitors should only be counted once from either the wildlife observation or interpretive trails category in the total number visitor's category. The correction will be implemented in calendar year 92.

Public visitation increased considerably in the spring. Peak visitor use days occurs on the weekends. Visitors are restricted to foot access and bicycles on Ottawa's trails. The visitor parking lot is the initial starting point for all wildlife oriented activities. Spring and fall bird migrations attract many visitors to the area. Notable public use programs on the refuge include environmental education for students and teachers, youth programs for scouts, and volunteer interpretive projects.



2. Outdoor Classrooms - Students

Students visiting the refuge and participating in environmental education activities on-site totalled 1,028 visits for 2,463 activity hours in 1991. In 1990, 1,071 students visited for 2,673 activity hours. Environmental Education visits decreased slightly by 4% as activity hours remained the same. The standard operating procedure recommended for educators to visit the refuge is first reserve a visit date and then coordinate activities with the outdoor recreation planner.

Project Leader Blair and ORP Marshall traveled to the University of Michigan, Ann Arbor on March 22nd to participate in a Cultural Diversity Workshop held at the School of Natural Resources. Both attended the meeting in effort to establish a partnership for cultural diversity among the University of Michigan - School of Natural Resources, Secondary Schools, and the Service. Matthias Kerschbaum, Wildlife Associate Manager (WAM 2) coordinated the meeting with input from Blair, Marshall, and other Service personnel which included Charles and Sylvia Pelizza, Shiawassee NWR, Doug Wilcox, National Fisheries Research Center - Great Lakes, and Barbara Milne, Human Resources (OHR). The interest of university administrators and educators may prove a partnership is attainable and can be accomplished. On November 13, Project Leader Blair and ORP Marshall visited Gibsonburg High School, Gibsonburg, Ohio for a "Partners for Cultural Diversity" meeting. Blair provided the students with an overview of the Cultural Diversity program and ORP Marshall presented a slide program on the U.S. Fish and Wildlife Service. The students visited the refuge for a tour on November 26th. A total of 18 participants attended the meeting and 15 took part in the field trip.

Ottawa NWR participated in 2 youth trapper workshops in January in conjunction with the Ohio Trappers Association and the Ohio Division of Wildlife. Both workshops were held on Ottawa.

National Wildlife Week was observed April 21-27. Wildlife week packets were received from the league of Ohio Sportsmen and 300 were mailed to local schools and educators. Wildlife week packets are produced by the National Wildlife Federation. This years theme "Fragile Frontiers - The Ends of The Earth" discussed polar regions. ORP Marshall visited and gave a National Wildlife Week presentation to 180 Lakota Elementary students in Burgoon, Ohio on April 24.

Bowling Green State University, multi-cultural affairs students, participate in classroom EE activities at Ottawa NWR. (CM)

A fishing clinic was held on Sunday June 9th for 13 fifth grade students at the Ottawa Unit. Students were selected from local Ottawa County schools to participate in the National Fishing Week event. Mark Hersman a DNR, Division of Wildlife education officer assisted ORP Marshall in conducting the fishing clinic. A total of fifty people participated for 2-hours including parents and relatives of the participants.

ORP Marshall conducted a 6-hour environmental education field experience program for 40 students from Bowling Green State University on July 13th. The students were from high schools throughout Northwest Ohio selected for participation in an enrichment program for minorities. The program is coordinated through the Office of Multi-CuLtural Affairs at the University.

ORP Marshall attended an advisory committee meeting on September 10th at Bowling Green State University. Marshall will assist other committee members evaluate environmental education curriculum materials developed for preschoolers. The materials are being developed through the Department of Special Education at Bowling Green.

Project Leader Blair and ORP Marshall attended a planning meeting for the annual Ottawa County Fifth Grade Conservation Field Day. The meeting was held on August 28th in Oak Harbor by Joe Morgan, Ottawa County Board of Education and Mike Buhrow, Ottawa soil and Water Conservation District official. The annual county conservation tour was held on September 20th. Fifth grade students from local county schools were given hands on information and talks concerning resource topics. Students and teachers totalled over 500 visiting the refuge for the day.

The Sponsors of the educational event were Ottawa Soil and Water Conservation District, Ottawa Extension Service, Ottawa County Office of Education, Crane Creek Wildlife Experiment Station, and the Ottawa National Wildlife Refuge. This year was the 30th year the event has been sponsored and the 21st year the site of the tour has been held at Ottawa. The student Conservation Field Day originated in 1962 and was held on a private farm in Ottawa County. In 1970 the site the of event was moved to the Ottawa NWR. ORP Marshall and six Guest speakers were available at various stops to discuss natural resource and conservation issues (3 stops Ottawa, 3 at Crane Creek). Guest speakers conducting presentations this year included the following:

Site Stop Ottawa
1. Fred Synder - District Sea Grant Extension Specialist
2. Joel Obrecht - Agriculture Stabilization and Conservation Service
   Matt Duncan - U.S. Soil Conservation Service
3. Charles Marshall - Ottawa Refuge

Site Stop Crane Creek
4. John Morton - Division of Wildlife, Ohio Department of Natural Resources
5. Neal Leimbach - Ottawa County Extension Agent
6. Chris Redern - Ottawa County Litter Control Coordinator

TABLE #24. 1991 Visiting School Groups

School	Town	# Students	Activity	Activity Hours
Vocational Agricultural Center (1-Teacher, 3 act. hrs.)	Toledo, OH	8	Wildlife Mgt.	24
St. Richards Junior High (3-Teachers, 9 act. hrs.)	Swanton, OH	10	Wildlife Photograph	30
Lincoln Elementary (7-Teachers, 21 act. hrs.)	Ypsilanti, OH	55	Wetlands Study	165
Ida High School (2-Teachers, 6 act. hrs.)	Ida, MI	15	Ornithology Study	45
Gibsonburg High School (1-Teacher, 2 act. hrs.)	Gibsonburg, OH	5	Aquatics Study	10
Stamm Elementary (10-Teachers, 20 act. hrs.)	Fremont, OH	70	Natural Resources	140
Glenwood School (1-Teacher, 2 act. hrs.)	Toledo, OH	22	Natural Resources	44
Jerusalem Elementary (3-Teachers, 2 act. hrs.)	Oregon, OH	30	Natural Resources	60
Overland City School (5-Teachers, 10 act hrs.)	Lorain, OH	60	Vertebrates Study	120
Metroparks (1-Instructor, 3 Act. hrs.)	Toledo, OH	10	Botany Study	30
University of Toledo (1-Instructor, 3 act. hrs.)	Toledo, OH	15	Wetlands Mgt.	45
Multi-Cultural Affairs, BGSU (3-Instructors, 18 act. hrs.)	Bowling Green	40	Natural Resources	240
Gateway Junior High (3-Teachers, 9 act. hrs.)	Maumee, OH	100	Wetlands Study	300
Ottawa Co. 5th Graders (20-Teachers, 40 act. hrs.)	Ottawa Co.	500	Conservation Study	1000
St. Johns School, Boy Scouts (2-Leaders, 4 act. hrs.)	Toledo, OH	10	Merit Badges	20
Miami University (1-Instructor, 2 act. hrs.)	Miami, OH	16	wetland Mgt.	32
Gibsonburg High School (1-Teacher, 2 act. hrs.)	Gibsonburg, OH	15	Natural Resources	30
Clyde Junior High (1-Teacher, 2 act. hrs.)	Clyde, OH	8	Wetlands Study	16
Girl Scout Specialty Camp (3-Leaders, 24 act. hrs.)	Ottawa Co.	8	Ecology	64
	Total	989		2351

3. Outdoor Classrooms - Teachers

ORP Marshall made many important educator contacts in the area during the year. Educational information disseminated will hopefully provide opportunities to increase outdoor classroom activities on the refuge. A high percentage of classroom instructors still feel compelled to restrict themselves to the classroom environment. Teachers are encouraged to participate in environmental education workshops at Ottawa for curriculum diversity and increase resource awareness. Four workshop graduates returned to conduct environmental education activities with students.

A total of 125 teachers for 588 activity hours participated in environmental education programs during the year. Total teacher participation slightly decreased from 168 teachers in 1990 for 3%. Activity hours decreased by 36% in 1991 from 918 activity hours in 1990. A total of 63 educators participated in workshops for 422 activity hours. Project Wild, Project Aquatics, and a refuge resource management overview are themes and materials incorporated in workshop agendas. The University of Toledo and Professor Gerry Underfer continued endorsement of Ottawa's teacher workshop program. Bowling Green State University official, Justine Magsig from the Center for Environmental Programs, coordinated a workshop for students at the university. ORP Marshall instructed the course with assistance from University of Toledo intern, Chris Kaufman on October 11th. ORP Marshall coordinated and conducted five workshops on the refuge in 1991. Workshops conducted included the following: (1) Project Wild - May 25, 8-participants, 7-hours, (2) Ottawa Resource Overview - June 8, 7-participants, 7-hours (3) Project Wild - October 26, 9-participants, 7-hours, (4) Project Wild Aquatics - November 2, 10-participants, 7-hours, (5) Ottawa Resource Overview - November 10, 10-participants, 7-hours, and off-site (6) Project Wild - Bowling Green State University, October 11, 19-Participants, 6-hours.

All workshop participants received college or in-service credit for completing workshops. ORP Marshall conducted workshops with assistance from, volunteers, refuge staff, and some assistance from the Department of Natural Resources, Division of Wildlife.

The Ohio Department of Education, Division of In-Service Education was contacted to coordinate teacher workshop credits for continuing education units CEU's. Workshops are conducted for college credit through the University of Toledo. The CEU process will permit the refuge the option of offering both credits to student participants for completing environmental education programs.

ORP Marshall attended the 20th Annual Conference of the North American Association for Environmental Education. The conference was held from September 27 - October 2, in St. Paul, MN.

4. Interpretive Foot Trails

Interpretive foot trail visits totaled 22,243 for 64,377 activity hours for the year. Foot trails, coupled with wildlife observation are activities most visitors participate in. Dike-top roads surrounding moist soil units, open pools, and remanent Black Swamp forest woodlots extend a distance of over seven miles open to public access. Five interpretive panels and bench sites provide management and wildlife information.

The Ohio Audubon Council assisted the refuge in providing Challenge Grant Funds to construct a new observation platform for the public overlooking pools MSU-8B and 2-C. A deck binocular was installed on the platform in the fall.

Ohio Audubon Council members of approximately 20 visited the refuge on September 27 and 29 for birding activities and utilizing the new platform.

6. Interpretive Exhibits/Demonstrations

A three day exhibit was staffed for the Toledo Travel, Boat, and Outdoor Show at the Toledo Sports Arena on February 22-24. Pittman-Robertson exhibit material was borrowed from Minnesota Valley NWR's audio visual department. Volunteers and refuge staff rotated work schedules answering questions for the public and distributing refuge information.

The refuge participated in the Ohio Wildfowlers Festival and Decoy contest held on September 29 at Crane Creek State Park. Refuge Operations Specialist Roster and volunteers Sandra Woosley and Chris Kaufman staffed the exhibit displaying the duck stamp story. In addition, the duck stamp story nomadic system was displayed in the Migratory Bird Museum of the ODNR Experiment Station. A total of 53, 1991-92 duck stamps were sold during the day.

An interpretive exhibit on loan from the Washington office is displayed in the headquarters forum for visitors. (CM)

7. **Other Interpretive Programs**

Outdoor Recreation Planner Marshall presented a general wildlife program to 35 boy scouts at the St. Paul Lutheran Church in Oak Harbor, Ohio on February 5. A film "Wildlife Babies" and wildlife artifact touch items were incorporated in the 1-hour program.

ORP Marshall was invited to give a presentation to 40 scout leaders and boy scouts on March 6 for a Toledo Area Council round table meeting. The presentation was held in the United Way Building in Toledo. Marshall focused on Ottawa's wildlife as a topic theme.

Ottawa County Commissioner's staff and administrative assistant visited the refuge on March 11 for a general slide presentation given by ORP Marshall. A total of 60 members were in attendance.

ORP Marshall conducted a 2-hour tour of the refuge for 10 boy scouts and 2 leaders from St. Johns School in Toledo. Resource information was given to complete badge requirements on October 7.

Lou Campbell, a well known naturalist in the area, his daughter Claire Gavin and granddaughter Wendy visited the refuge on October 21. ORP Marshall gave a tour of refuge units to the three. Photos were taken and information gathered for a future book Mr. Campbell is writing.

Outdoor Recreation Planner Marshall was interviewed by Mrs. Mary Thurber of LaSalle, Michigan. Mrs. Thurber required information on Ottawa's management programs and projects to include in an article for the Great Lakes Coalition News. Mrs. Thurber visited on December 10.

A local group named "TABS" visited the refuge for 1-hour on May 4 and were given an orientation to the area by ORP Marshall.

Refuge Manager Blair and staff hosted a luncheon slide presentation for 25 Metropark staff on May 18. A great tour of the area was given explaining management projects such as moist soil and farmland management, raptor banding and research, bald eagle nesting trends, and interpretive program implementation.

Toledo Metropark staff are host at the refuge for a luncheon and slide presentation given by project leader Blair. (CM)

ORP Marshall, Assistant Manager Roster, volunteers Mike Crofts, Chris Crofts, Dan Lucas and Jeff Lammie conducted an owl hoot on July 30th for boy scout troop 612, including family and friends. A total of 45 participants visited for 3-hours. A presentation was given in preparation for the evening owl search.

ORP Marshall traveled to Bradner, Ohio to give a talk to 100 girl scouts during a summer camp on June 18. Marshall discussed wildlife habitat protection.

Members of the Ottawa County Woman's Farm Bureau visited the refuge on June 29 for a luncheon and program given by ORP Marshall. Twenty-six people attended for 2 hours.

U.S. Department of Agriculture, agriculture stabilization and conservation service are given a tour of the refuge by ORP Marshall. (TR)

ORP Marshall was invited to the Fireland Presbyterian Church in Catawba, Ohio. A presentation focusing on wildlife babies was given on July 17 to 100 summer Bible school students.

Project Leader Blair presented a slide show of Ottawa NWR, wetland restorations, and land acquisitions to the Oak Harbor, Ohio Rotary Club on July 23.

The U.S. Department of Agriculture, Agriculture Stabilization and Conservation Service (ASCS) held their district meeting at Ottawa NWR on August 21. ORP Marshall conducted a tour of the refuge and gave a slide presentation for the 13 attendees. County Executive Director Joel Obrecht and District Director Sid Walker coordinated the group's visit and conducted the business meeting.

Project Leader Blair presented a wetland restoration slide show at the Soil and Water Conservation District in Defiance, Ohio on September 12.

ORP Marshall was invited to give a wetlands presentation to 20 members of the First Unitarian Church in Toledo, Ohio on November 5.

Aullwood Audubon Center's naturalist Christy Krueger and three intern students visited the refuge on November 8. ORP Marshall presented a general slide program and led a short tour with the group.

Refuge Operations Specialist Tom Roster conducted a career day talk at Oak Harbor High School for Future Farmers of America members. Thirty students were in attendance and the Service's Video "U.S. Fish and Wildlife Service: A Challenge and Adventure" was presented.

Gibsonburg High School, cultural diversity students, participate in an area tour of the refuge. (CM)

8. Hunting

Canada, snow and white-fronted geese and ducks are hunted by permit on portions of Ottawa Refuge. Snow and white-fronted geese occur in such small numbers on the refuge that they are rarely taken during the hunt. The hunt is conducted from blinds in and around agricultural fields. Hunting occurs four days a week from half-hour before sunrise to 12 noon. A cooperative agreement provides for the hunt to be administered by the Ohio Department of Natural Resources. Personnel from the Crane Creek Wildlife Experiment Station run the program. Nineteen-Ninety one marked the 16th and 6th year that hunting has occurred on the refuge for geese and ducks, respectively.

The refuge has 28 blinds of which 19 were used in 1991. Blinds 1-6 were closed again because they are near a swim-in duck trap which was used during the hunting season. Another 6 pit blinds were installed in 1991, bringing the total pit blinds to 12. Flip tops were installed on all pit blinds to allow for better hunter concealment. A handicap accessible blind is available and was used on three occasions. Hunting started on October 19 and ended on November 30.

This season 2,699 hunters applied to hunt on the Ottawa Refuge with 232 permits issued (2 hunters per permit). The 519 hunters participating in this year's hunt accumulated 2,335 activity hours. Hunters from 45 Ohio counties and 4 states (Indiana, Michigan, Pennsylvania, and North Carolina) participated in the hunt. The top five counties where Ohio hunters, who participated in the hunt, reside were Cuyahoga (Cleveland Metropolitan Area), Lucas, Lorain, and Ottawa.

In 1991, 519 hunters harvested 120 geese (including one white-fronted goose) for a hunter success of 23% in 25 hunt days. Using culmen measurements to separate sub-species, 67% of the geese harvested were giant Canada's as compared to 54% in 1990. In addition, 71 ducks were harvested. Mallards, black ducks, and wood ducks dominated the harvest. The following tables show goose population in the fall and winter on Ottawa and the hunters harvest and success rates.

TABLE #25. Canada goose populations, Ottawa National Wildlife Refuge, September 1, 1987 to January 15, 1992

Date	1987	1988	1989	1990	1991
09/01	930	1,000	1,050	600	140
09/15	1,110	1,750	1,750	540	1,100
10/01	4,540	4,300	3,020	2,305	2,850
10/15	11,350	4,300	5,075	3,700	5,510
11/01	10,975	8,630	14,840	7,850	6,250
11/15	16,790	9,550	7,950	6,800	7,900
12/01	15,365	5,575	5,000	5,335	4,500
12/15	15,095	5,100	1,720	8,320	5,500
01/01	6,015	2,550	1,600	8,225	9,120
01/15	5,400	8,900	2,800	8,050	3,225

TABLE #26. A Five Year Comparison of the Goose Harvest on Ottawa National Wildlife Refuge

Year	Number of Hunters	Number of Geese	Goose Hunter Success	Number of Ducks	Duck Hunter Success
1987	518	207	.40	38	.07
1988	566	165	.29	12	.02
1989	474	124	.26	70	.15
1990	463	112	.24	37	.08
1991	519	120	.23	71	.14

9. Fishing

Refuge sport fishing is limited to a 15-acre borrow pit at Cedar Point NWR from June 1 to August 30. Visitors are required to possess a valid state fishing license. Random license checks were conducted during the fishing season to monitor regulation guidelines. A total of 700 visitors for 2,450 activity hours participated in fishing the site. Maximum use seems to occur during weekends. A majority of the fishermen checked were senior citizens. Fishing success was the best during the month of June. Sport fish harvested were blue gill, crappie, bass, and channel catfish.

Staff from the ODNR Senecaville Fish Hatchery delivered and stocked 1,500 channel catfish in the Cedar Point refuge public fishing access area in September. Channel catfish ranged from 6-14 inches in size. This was the 3rd consecutive year channel catfish have been stocked in the Cedar Point public fishing access area. Fishing opportunities should increase in the future.

10. Trapping

The Refuge is divided into 13 adult and 3 youth trapping units. Trapping of muskrat, raccoon, mink, fox, opossum, and skunk is permitted following State of Ohio regulations. Trapper selection is made by sealed bid system for adults and a lottery drawing for youths (youth are not charged for trapping).

Five of the adult units were opened for trapping during the 1991-92 season. These units were: 1, 4, 10, 12, and 13. Units 2 and 3 (Cedar Point - Pool 1) were closed again this year because cattail encompasses over 70% of the area. Units 4-8 were not opened due to construction activities. Units 9 and 11 are being trapped by the Ohio State Trapping Association. Three youth trapping units were available this year. Entrance pool provided two youth units and a small portion of unit 11 supported the third.

A Special Use Permit was issued to the Ohio State Trappers Association to conduct trapping courses on the refuge. The Association educates youngsters on trapping techniques and ethics. The five adult units opened this year were awarded to four trappers. Total revenue received was $5,151.38. The following tables show fur harvest and income received over the past seven years.

TABLE #27. Reported Fur Harvest for the Past Seven Seasons

Species	85-86	86-87	87-88	88-89	89-90	90-91	91-92*
Muskrats	4,921	8,776	6,916	226	1,984	2,637	3,644
Raccoon	75	104	144	34	68	122	16
Mink	16	17	42	10	29	34	10
Skunk	5	4	3	1	7	4	0
Opossum	56	34	43	12	20	36	8

*as of 02/09/92

Insects are more important than pesty photographers. (JF)

11. Wildlife Observations

The wildlife observation occurring at the Ottawa Complex occurs basically on the Ottawa division. Limited permitted use occurs at Ottawa and Darby Division and Cedar Point NWR. Public use is restricted on West Sister Island NWR. The Navarre Division activities are limited because of Toledo Edison's nuclear plant (Davis-Besse). Special use permits or letters of authorization is required to visit all units except Ottawa's public trails.

ORP Marshall gave a general slide program on January 19 to 12 members from the Aullwood Naturalist Outreach Program, Dayton, OH. A refuge tour was given after the program.

Scout Troop 122 from Toledo, Ohio visited the refuge on March 16 for a presentation and wildlife observation hike. ORP Marshall discussed refuge management conducted on the area and showed a film entitled "America's Wetlands" to 30 scouts and 10 leaders.

Twenty students and three leaders visited the refuge on March 20 from Hartville Christian School, Canton, Ohio for a 3-hour wildlife observation hike.

Students and leaders from Penfield Community Church, Penfield, Ohio visited the refuge on April 13. ORP Marshall toured the area with 10 students and 3 leaders for 2 hours.

A Cleveland hiking club of 40 people visited the refuge on April 27 for 2 hours and were given an orientation of the refuge by ORP Marshall.

Volunteer Chris Ashley led five members of the Goldwing Touring Association on a tour of the refuge for 2 hours on May 19.

Students from the Calvary Assembly of God School in Toledo, Ohio visited the refuge for a 1-hour wildlife observation hike on July 23. A total of 35 students and leaders conducted a self-guided visit.

A visiting tour bus group of 60 senior citizens from Toledo were given a tour of the refuge by ORP Marshall on November 1. The group thoroughly enjoyed the 2-hour excursion, especially the viewing of waterfowl and refuge pools.

17. Law Enforcement

Four refuge staff possessed law enforcement authority at the end of the year in 1991. Refuge operations Specialists, Tom Roster returned from Glynco, GA. on July 26. Roster completed basic police training and refuge officer basic school. Roster attended law enforcement training from April-July.

Refuge law enforcement officers were required to complete a medical examination to participate in a physical exercise battery (PEB) during the 1991 Refuge Law Enforcement In-Service Training scheduled for March. Officers coordinated medical examinations with their family physician.

Refuge Manager Blair met with Service Law Enforcement agents Dan LeClair and Ernie Mayer on the February 28. Many subjects of mutual concerns were discussed including a joint radio communications project.

Refuge Manager Blair and ORP Marshall travelled to Des Moines, IA for the annual LE refresher training scheduled March 25-29.

On Saturday,February 2, the Ottawa County Sheriff Department contacted Refuge Manager Blair to notify him that two individuals were found trespassing along the Ottawa County Line Road entrance. The entrance is posted with boundary and area closed signs. The two ignored signs and walked into the refuge. Information was taken by refuge Officer Marshall and citations were issued.

Manager Blair and Assistant Manager Lenz met with Ann Arbor, MI special agents, Shiawassee NWR staff, and Lansing (WAO) to discuss wetland easement enforcement and the new law enforcement policy on May 23.

Refuge Officer Marshall contacted four individuals in May who were boating near Ottawa's lake front dike and encountered vessel motor problems. Individuals were forced ashore in a closed area. They were unable to prevent their powerless boat from drifting onto the shoreline rip-rap. Refuge Officer Marshall assisted the group who later returned with help and removed the boat before any further damage occurred.

Two individuals from Oak Harbor were issued NOV's for criminal trespass and unlawful take of deer in the Darby Division of the Ottawa Complex in January 1990. The case was finally closed in May by collateral forfeiture and fulfilled obligations.

Refuge Officer Marshall contacted an individual fishing in the Cedar Point NWR without a valid license. Information was taken to issue a notice of violation. The violation occurred on June 23.

Two boating incidents occurred in June along refuge shoreline boundary. Northeastern winds and high waves on the lake forced two boaters ashore into the rocks in the Cedar Point NWR. Engine malfunction contributed to considerable damage to both boats. Owners not using wise judgment to avoid treacherous conditions on Lake Erie were lucky to have lost boats and not lives.

In July, the Lucas County Fire Department and Police responded to a vehicle fire located on county line road of the refuge. Reports given by the departments indicated the vehicle had been stolen on the 8th and was registered to an owner from Toledo, Ohio. The charred remains were removed and no other information has been provided to the refuge.

On September 17, the Ottawa County Sheriff Department discovered a marijuana patch on the southeastern boundary using a National Guard helicopter. The Department stated that 60 plants to be of high value ($180,000), were destroyed but no arrests were made.

Special Agent Dan LeClair arranged to hone our law enforcement and shooting skills at Camp Perry. Special Agents from Michigan, Illinois, and Ohio along with refuge officers practiced handgun and shotgun shooting and clearing a building on September 25.

On October 9, Special Agent LeClair, Refuge officers presented a bald eagle print and plaque to the Ohio State Highway Patrol for their efforts regarding the bald eagle nest along U.S. highway 2.

Refuge officer Roster assisted the Upper Mississippi National Fish and Wildlife Refuge, Lacrosse, WI crew conduct the canvasback law enforcement task force. No citations were issued.

Refuge officers traveled to Shiawassee NWR to re-qualify with their firearms. Project Leader Lindell (Rice Lake NWR) instructed staff from Shiawassee, Seney, and Ottawa Refuge on October 28.

Violations for opening day waterfowl season on the refuge totalled three. Routine law enforcement hunter checks detected one individual with and unsigned duck stamp unattached and one individual was found hunting without a plug in his shot gun. A third individual was found secretly entering a closed unit with decoys and gun. He confessed to be lost to the refuge officer. His confession occurred after hiding in the brush from the refuge officer.

Officer Lenz assisted Special Agent LeClair and ODNR officers on opening day of the waterfowl season to stake out an off-refuge area that Agent LeClair had previous surveillance for baiting activities. At 9:30 AM, the officers apprehended four individuals for taking waterfowl over bait and lead shot possession. Additionally, one individual admitted to letting the air out of Agent LeClair's government vehicle tires during the prior surveillance activities. Total collateral forfeiture was $3,798.00.

Violations

TABLE #28. Summary of 1991 Citations

Violation	Citations	Disposition
Unsigned Waterfowl Hunting Stamp	1	$50.00 forfeited
Waterfowl Hunting With Unplugged Shotgun	1	$75.00 forfeited
Possession of Firearm On Refuge	1	$150.00 forfeited
Trespass and Animal/Bird Disturbance (Bald Eagle Nest Zone)	2	$50.00 each forfeited
Trespass Hunting	1	$100.00 forfeited
Trespass	5	$25.00 each forfeited
Waterfowl Hunting with toxic shot	1	$100.00 forfeited

20. Take Pride

End of the year Duck Stamp sales totalled $1,537.50. Golden Passport sales for the year totalled $75.00.

Greg Perth a local boy scout helped prepare purple martin bird houses that are to be installed at designated sites. Greg has 6 hours of work required to meet scout badge requirements.

Cub Scout Pack 123 Den 7 from Toledo, Ohio visited the refuge on April 22 to participate in work projects and were given a program and tour of the refuge by ORP Marshall. There were 15 scouts and 3 leaders who participated.

Ten Toledo area scouts visited the refuge on April 24 to assist in a work project. The group was shown the film "America's Wetlands".

A Lake Erie clean-up was coordinated again this year by the Ottawa County Litter Prevention and Recycling Program. Approximately 50 scouts and adults cleared litter and debris from Ottawa's lake front dike in a 2-hour period on June 1.

Boy Scouts from Toledo, Ohio visited the refuge on June 28-30 to camp and conduct a scout project. Nine scouts and three leaders prepared and painted a cabin floor on site used for educational programs. A Saturday evening program was given to the group by ORP Marshall discussing wetlands.

I. EQUIPMENT and FACILITIES

1. New Construction

New Entrance Gate: The refuge office-visitor parking lot entrance area was improved with installation of vehicle barriers, dirt mound, and a new gate. Many positive comments were received from the face lift.

Roofing Projects: The headquarter's roof construction was completed by the Mingo Job Corps. An instructor and five corpsmen removed two sets of old shingles, extended the roof by seven inches, and installed new felt, ice barrier, and shingles during May 12-16. The oil house received the same treatment by refuge staff. New soffit, facia, gutters, and down spouts were then installed on the maintenance shop to complete the roofing project the Mingo Job Corps assisted with in 1990.

Observation Platform: A 16- x 12-foot observation platform was constructed overlooking pool 2C and MSU 8B on the visitor trail. The platform was built by using challenge grant funds from the Ohio Audubon Council. A plaque was mounted on the structure to acknowledge this deed.

Newly constructed observation platform overlooking pool 2-C. (CM)

Ohio Audubon Council contributed to the construction of the new platform. Thanks again, Mr. Gallagher! (CM)

Moist Soil Unit 6: A temporary dike was built along Crane Creek on the south side of MSU 6 to keep the work area dry. At the end of the year, new dike construction has begun and is half way completed. Once the new dike is completed, better water control will be achieved because it will be a barrier between the fluctuating creek and the moist soil unit.

Mini-Marsh Dike Construction: This project began in 1990 and is now complete with the filter fabric and rip-rap placed on the interior dike sides.

Mini Marsh in preparation of dike rehabilitation. (SL)

Headquarter's Remodeling Project: On November 2, D&G Focht Construction began the headquarter's contract for a cost of $85,000.00. The remodeling consists of new windows, a handicapped entrance walkway and bathrooms, cedar siding, carpeting, "folding" wall for conference room, and better lighting. Project scheduled for completion in March 1992.

Shop Parking Lot: The Maintenance Shop Parking Lot was tiled into a sump and "clean" gravel was spread to remove the semi-persistent "lakes". The same treatment is scheduled for the Visitor Parking Lot in 1992.

Contractor carpenters at work giving the office headquarters a face lift. (CM)

Much needed rehab of office headquarters is initiated. (CM)

2. Rehabilitation

County Line Ditch: Cleaning, re-sloping, and rip-rapping of County Line Ditch along the north side of MSU 6 was completed.

Underground Storage Tanks: Midwest Environmental Consultants, Inc. was awarded the contract for site investigation and remedial action regarding the discovered hole on one of the fuel tanks. The contract consisted of soil sampling and monitoring wells as required for the closure report, totaling $18,050.00.

Lindsey-Limestone Ditch/Dike Rehabilitation: The Lindsey-Limestone Ditch on the east side was cleaned of sediment. The dike was re-sloped, filter fabric laid, and No. 1 rip-rap placed to alleviate erosion and provide better access along the ditch into MSU 8a. Remaining work is the finishing of the mud/muck placed on the inside slope once it is dry. Construction will be finished in 1992.

Moist Soil Units 7A and 7B: The contract construction of MSU 7 was completed in summer 1990. This year the inside slopes were re-shaped to prepare for seeding to complete the project. Dry weather persisted, therefore seeding will be accomplished in spring 1992.

Above ground fuel storage tanks were temporarily located near shop. (file)

New farm bill dump truck dwarfs employee's personally owned vehicle. (CM)

New excavator purchased in use immediately after received. (Lindsey-Limestone ditch/dike-BEFORE) (SL)

AFTER (SL)

Crane Creek ditch de-mucking and dike rip-rapping. (TR)

4. Equipment Utilization and Replacement

The" talk of the town" centers around the new equipment Ottawa received and immediately put to use. Few construction contracts were awarded this year because most new construction was done by force account and the Ottawa team. Listed below are new equipment:

Caterpillar EL220B hydraulic excavator	($113,162.00)
John Deere 750 dozer with cab	($78,911.35 / 3,940.00)
Ford L9000 10-yd dump truck with low boy trailer	($61,228.01 / 10,758.48)
John Deere 410D backhoe	($42,281.10)
John Deere 1070 tractor with loader and flail mower	($14,548.50 / 3,195.00 / 1,900.00)
trailer for JD 1070 for farm bill use	($2,495.00)
John Deere 265 lawn mower	($4,157.23)
John Deere 1508; 15-foot batwing type rotary mower	($9,267.35)
Thompson 6-inch pump	($12,939.70)
Utility truck bed for Dodge truck	($2,497.00)

A John Deere 650 dozer with trailer was rented for 3 months (July-Sept) for farm bill work.

5. Communications

The telephone system was up-graded to the AT&T Merlin system. For a total cost of $5,416.00, each work station has a 34-button memory and we can "page" the maintenance shop. Additionally, we can access the Federal Telephone System (FTS) for our long distance needs.

6. Computer System

Another Dell 386SX computer system with 100mb hard drive was purchased primarily to run the Moist Soil Management Advisor software and other database programs. A HP Series III laserjet printer and a digitizing tablet was also purchased for this program. The original IBM-AT computer and wheelprinter was transferred to Muscatatuck NWR.

Software purchases included the Foxpro 2.0 database management system. This is a dbase IV clone with many additional enhancements and a full compiler. The Moist Soil Management Advisor software was also received, installed, and an initial plan formulated.

J. OTHER ITEMS

1. Cooperative Programs

Memorandums of Understanding conducted between the Ohio Department of Natural Resources and the U.S. Department of Interior, U.S. Fish and Wildlife Service active during the year is as follows for the calendar year: 1. Cooperation in the production of Canada geese in the State of Ohio (banding operations), 2. Cooperation in the managed hunt program of waterfowl on the refuge, 3. Common tern management and observation, 4. Research management study of the heron rookery on West Sister Island Refuge.

A cooperative program continues to exist between the Toledo Edison Electric Company and the U.S. Fish and Wildlife Service for management of the Toledo Edison Owned Navarre Marsh unit as part of the Ottawa Refuge Complex. Refuge personnel provide a management plan for water manipulation of the unit, and Toledo Edison personnel are responsible for overseeing the regulation of water levels.

The Ohio Audubon Council donated funds for construction of an observation platform at the Ottawa visitor trail. The refuge match contributions for this project through the challenge grant program. The Audubon Council has also assisted the refuge with other projects through the adopt-a-refuge program in past years.

A cooperative program for cultural diversity between Ottawa Nation Wildlife Refuge and the University of Michigan-Ann Arbor. The same type of agreement also exists with the Gibsonburg High School. Partners for Cultural Diversity is a high emphasis at Ottawa to advise women and minorities of recruitment possibilities, but more importantly to bring an awareness of our natural resources.

3. Items of Interest

Training Attended for the Year:

Blair:
Refuge Law Enforcement Refresher, Des Moines, IA, 3/25-29
Law Enforcement Qualification, Shiawassee NWR, 10/28
Moist Soil Workshop, Puxico,Mo 11/4-8
Women in Natural Resources, Des Moines, IA,12/10-12

Lenz:
Refuge Law Enforcement Refresher, Des Moines, IA, 3/25-29
Law Enforcement Qualification, Shiawassee NWR, 10/28
Oil Spill Response Training Workshop, Saginaw, MI, 11/6-7
Radiological Monitoring Certification, Port Clinton, OH, 12/16-19

Cornelius:
Heavy Equipment Re-certification, 8/20-21
Moist Soil Workshop, Puxico, MO, 11/6-7

Roster:
Federal Law Enforcement Training Center, Glynco,GA,3/25-5/31,7/15-26
Refuge Manager Trainee Program, Ottawa NWR, completed 4/21
Heavy Equipment Certification, Ottawa NWR, 8/20-21

Moist Soil Workshop, Puxico, MO, 11/4-8
Radiological Monitoring Certification, Port Clinton, OH, 12/16-19

Miller:
Common Sense Administrative Workshop, Twin Cities, MN, 11/3-8

Marshall:
Refuge Law Enforcement Refresher, Des Moines, IA, 3/25-29
Safety and Occupational Health Seminar, San Diego, CA, 4/14-18
North America Assoc. for Environmental Ed. workshop, Twin Cities,MN, 9/26-10/2
Law Enforcement Qualification, Shiawassee NWR, 10/28

Cox:
Heavy Equipment Certification, Ottawa NWR, 8/20-21

Day:
Maintenance Workshop, Crab Orchard NWR, 3/18-22
Heavy Equipment Re-certification, Ottawa NWR, 8/20-21

Reynolds:
Maintenance Workshop, Crab Orchard NWR, 3/18-22
Heavy Equipment Re-certification, Ottawa NWR, 8/20-21

Jaeger:
Heavy Equipment Certification, Ottawa NWR. 8/20-21
Cooperative Education Program, Mingo Job Corps, Puxico, MO, completed 12/13
Radiological Monitoring Certification, Port Clinton, OH, 12/16-19

Revenue sharing checks for FY91 were mailed in April to Ottawa and Lucas County Treasurers. Ottawa County received $21,486.00, Lucas received $31,940.00, which amounts to 93.5% of full entitlement.

A farewell dinner was given for Assistant Manager Sandra Siekaniec and Farm Bill Coordinator Tom Siekaniec on January 11. Sandra was selected for an assistant manager position at Upper Souris NWR, North Dakota. Everyone at Ottawa wish the both of them the best of luck!

Refuge staff held the annual Christmas dinner party on December 20th in the evening at the French Quarters, Holiday Inn, Perrysburg, Ohio. Staff and volunteers attending totalled 31.

Siekaniecs are pleased with staff mementos as farewell. (CM)

4. Credits

We would like to thank everyone who helped put together this report:

Blair:	Intro., Index, Sections A, C, E-5, and K
Lenz:	Sections E-7 & 8, I except I-6, and J
Cornelius:	Sections F-4 & 5 and I-6
Roster:	Sections B, D except D-3, F-1 thru F-3, F-9 thru F-12, G, H-8 and H-10 & 11
Marshall:	Sections D-3, E-2 thru E-4, E-6, and H except H-8 and H-10 & 11
Cox:	Sections F-13 & 14
Miller:	Typing and putting it all together

Photo Credits

AC - Allen Cornelius
TC - Thomas Cox
TR - Thomas Roster
SL - Steven Lenz
CM - Charles Marshall
CA - Chris Ashley
JF - Jim Fuehrer
File - On file

CEDAR POINT NATIONAL WILDLIFE REFUGE

Cedar Point NWR is administered as a unit of the Ottawa Complex. The refuge contains approximately 2,500 acres and is entirely marsh except for the dike system. A dike system isolates the marsh from the adjacent Lake Erie and divides the refuge into three pools. All pools are predominantly cattail, bulrush, and other emergent vegetation. The pools are managed to provide stable water levels which are lowered during the summer months only to the extent necessary to encourage aquatic vegetation.

The refuge provides habitat for migrating waterfowl and other marsh and water birds and marsh nesting habitat for a variety of birds. Herons and egrets make extensive use of the area for feeding.

The nesting pair of bald eagles did not succeed in producing young this year (see G-2 for details).

Duck populations peaked during the fall migration and in the spring. Canada geese peaked in the spring and fall (see G-3 for details).

A 15 acre borrow pit near Yondota gate is open for fishing from June 1 through August 31. The pond was stocked with channel catfish during the summer.

Roads were not graded and only mowed once due to manpower constraints and private lands work.

WEST SISTER ISLAND NATIONAL WILDLIFE REFUGE

West Sister Island NWR is an 82 acre island located in the western basin of Lake Erie. It is jointly owned by the U.S. Coast Guard and the U.S. Fish and Wildlife Service. Five acres, including a lighthouse, are owned by the Coast Guard but managed along with the other 77 acres by the Service as a wilderness area. Tall hackberry trees with an under story of abundant poison ivy 12 feet tall dominate most of the island. Great solomons-seal reaches 7-9 feet in height and a great variety of ferns, wildflowers, mushrooms, and other plant life abound.

The island is composed of glacial fill over a limestone shelf. The limestone shelf protrudes along the island showing where large coves have been eroding by hydrological forces. There are no sand beaches but rather two rocky shoals for access to the island. The soil contains a great amount of clay, loam, and humus layers which annually receives a topically applied layer of nitrogen supplied by the thousands of nesting colonial birds.

West Sister Island is noted for having the largest heron/egret rookery in the Great Lakes. Great blue herons and black-crowned night herons comprise 70 percent of the nesters.

Four trips were made to the island by researchers to install reference points, creating a grid, on the island to estimate nest and track movements of colonial nesters. Refuge staff accompanied the researchers on their visits.

Volunteers assisted in banding of colonial nesters on the island. (TR)

Ice covers Lake Erie as viewed from Ottawa's lake shoreline. (CM)

"Few people in northwestern Ohio realize that a remnant of the original wilderness lies almost at their doorstep, in the large marshes near the shore of Lake Erie."

Harold F. Mayfield

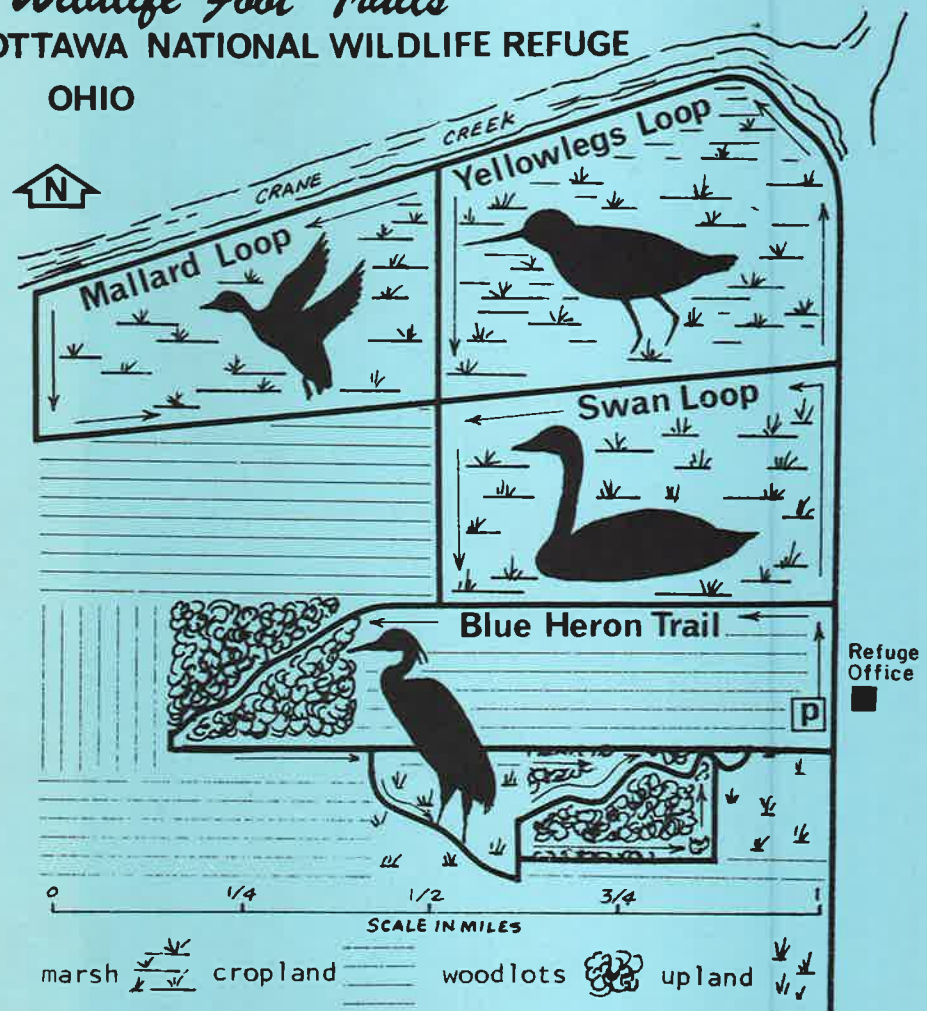
Excerpt taken from The Marshes of Southwestern Lake Erie by Lou Campbell

RF-3353300-11 NOV 75

Wildlife Foot Trails

OTTAWA NATIONAL WILDLIFE REFUGE

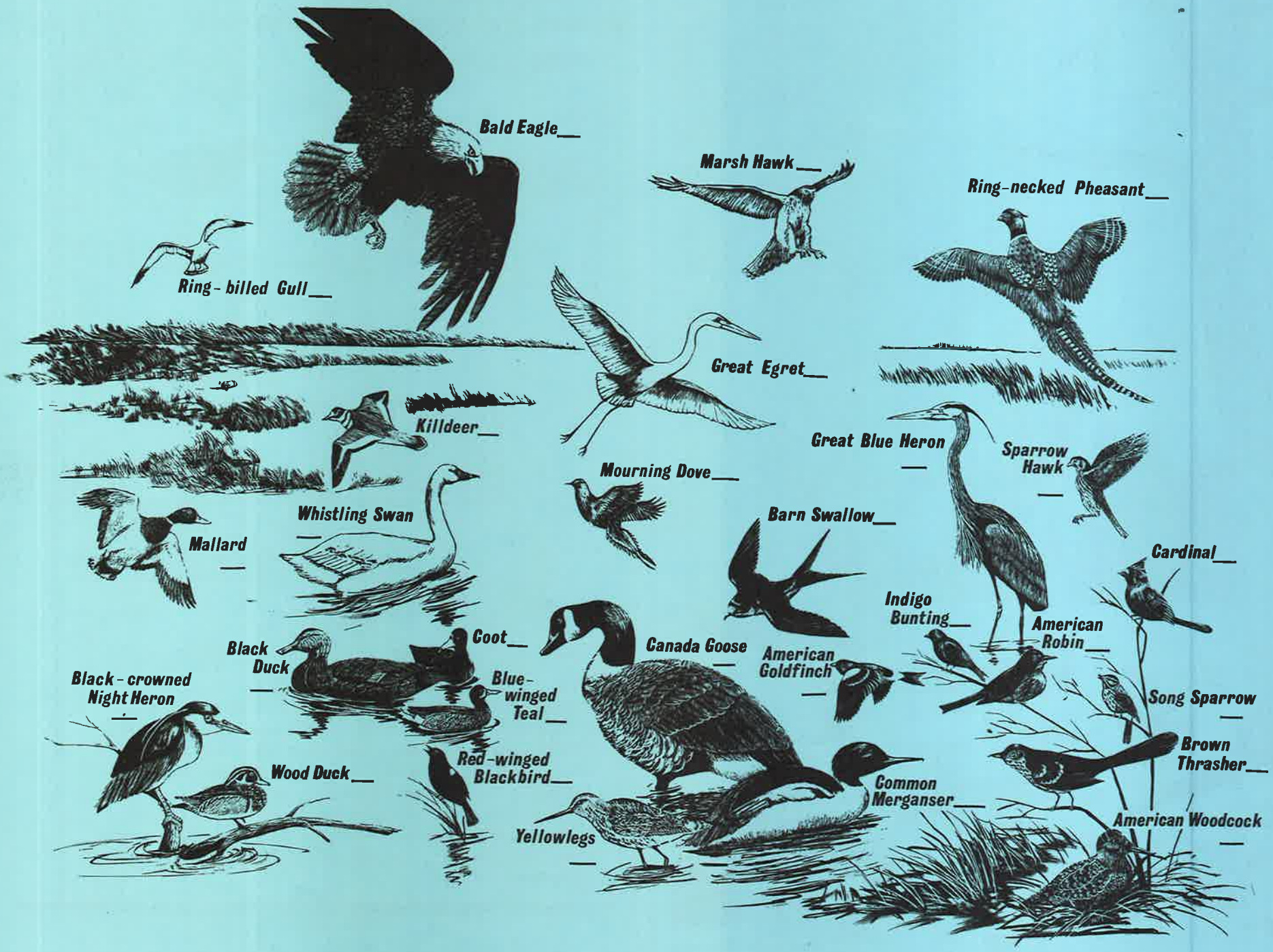
OHIO



These wildlife trails are open from sunrise to sunset throughout the year for you to walk and observe wildlife. Colored signs mark each trail route: Blue Heron Trail is blue, Swan Loop is white, Yellowlegs Loop is yellow and Mallard Loop is green. For your safety, access is limited to these trails only. For additional information contact: Refuge Manager, Ottawa National Wildlife Refuge, 14000 West State Route 2, Oak Harbor, Ohio 43449. Phone (419) 898-0014.

STATE ROUTE 2

← **Toledo, 15 miles - Port Clinton, 18 miles** →


Bald Eagle__
Marsh Hawk__
Ring-necked Pheasant__
Ring-billed Gull__
Great Egret__
Killdeer__
Great Blue Heron
__
Sparrow Hawk
__
Mourning Dove__
Whistling Swan
__
Barn Swallow__
Mallard
__
Cardinal__
Indigo Bunting__
American Robin__
Coot__
Canada Goose
__
American Goldfinch
__
Black Duck
__
Black-crowned Night Heron
__
Blue-winged Teal__
Song Sparrow
__
Brown Thrasher__
Red-winged Blackbird__
Wood Duck__
Common Merganser__
American Woodcock
__
Yellowlegs
__

HUNTING REGULATIONS

Ottawa Controlled Waterfowl Hunt

The Ohio Department of Natural Resources and the U.S. Fish and Wildlife Service have cooperated in the establishment of a controlled goose and duck hunt on the Ottawa National Wildlife Refuge. The hunt will be administered by personnel from the Ohio Department of Natural Resources' Crane Creek Wildlife Experiment Station.

Public hunting of Canada snow (including blue color phase), white-fronted geese and ducks on the Ottawa National Wildlife Refuge is permitted only on the areas designated by signs as open to hunting. Hunting is by permit only.

Handicapped accessible blinds are available and everyone interested is encouraged to apply.

Sport hunting is permitted in accordance with all applicable State and Federal regulations covering the hunting of geese and ducks subject to the following conditions:

SPECIAL CONDITIONS

THE REFUGE IS OPEN TO WATERFOWL HUNTING ONLY. ALL OTHER SPECIES OF WILDLIFE ARE PROTECTED AND MAY *NOT* BE KILLED.

- Hunters may obtain permit applications by contacting the Ohio Department of Natural Resources, Division of Wildlife, Fountain Square, Columbus, Ohio 43224.
- Hunters must report to the waterfowl hunter check station by 5:00 A.M.
- Your special area hunting permit must be presented at the check station along with your current hunting license and Migratory Bird Hunting and Conservation stamp (Duck Stamp).
- Hunting hours—legal shooting time until 12 noon.
- All hunters must be out of blinds by 1 P.M.
- All hunters must report to the check station and submit their waterfowl for examination by 2 P.M.
- Bag limit per hunter—will be determined prior to hunt.
- All shooting must take place at the assigned blind, or within 75 yards of the blind when pursuing a cripple. It is illegal to pursue beyond this 75-yard retrieve zone limitation.
- The use of trained dogs to retrieve downed birds within the 75-yard retrieve zone is permitted.
- No more than two (2) hunters per blind.
- Each hunter may not possess more than ten (10) shells. The shells must be non-toxic (steel)
- Hunters must furnish their own shells.
- Each hunter is responsible for his/her own transportation to and from his/her assigned blind. Once hunters have left their blind, they will not be permitted to return. Boats will not be needed.
- No person shall participate in this area's controlled hunt more than once during the open season.
- Foot travel is restricted to the designated public use areas only.
- Overnight camping and open fires are prohibited.

All injuries or accidents occurring on the refuge must be reported immediately to the Refuge Headquarters, Ottawa National Wildlife Refuge, 14000 W. State Route 2, Oak Harbor, Ohio 43449. Phone 419/898-0014.

QUALITY HUNTING DEPENDS ON YOU **PLEASE RESPECT ALL REGULATIONS**

HUNTING

MAP & REGULATIONS

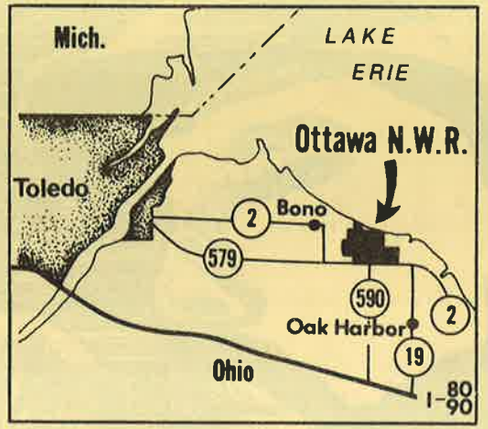
OTTAWA

National Wildlife Refuge/OH

HUNTING MAP

Ottawa Controlled Waterfowl Hunt

REGULATIONS ON BACK SIDE OF MAP



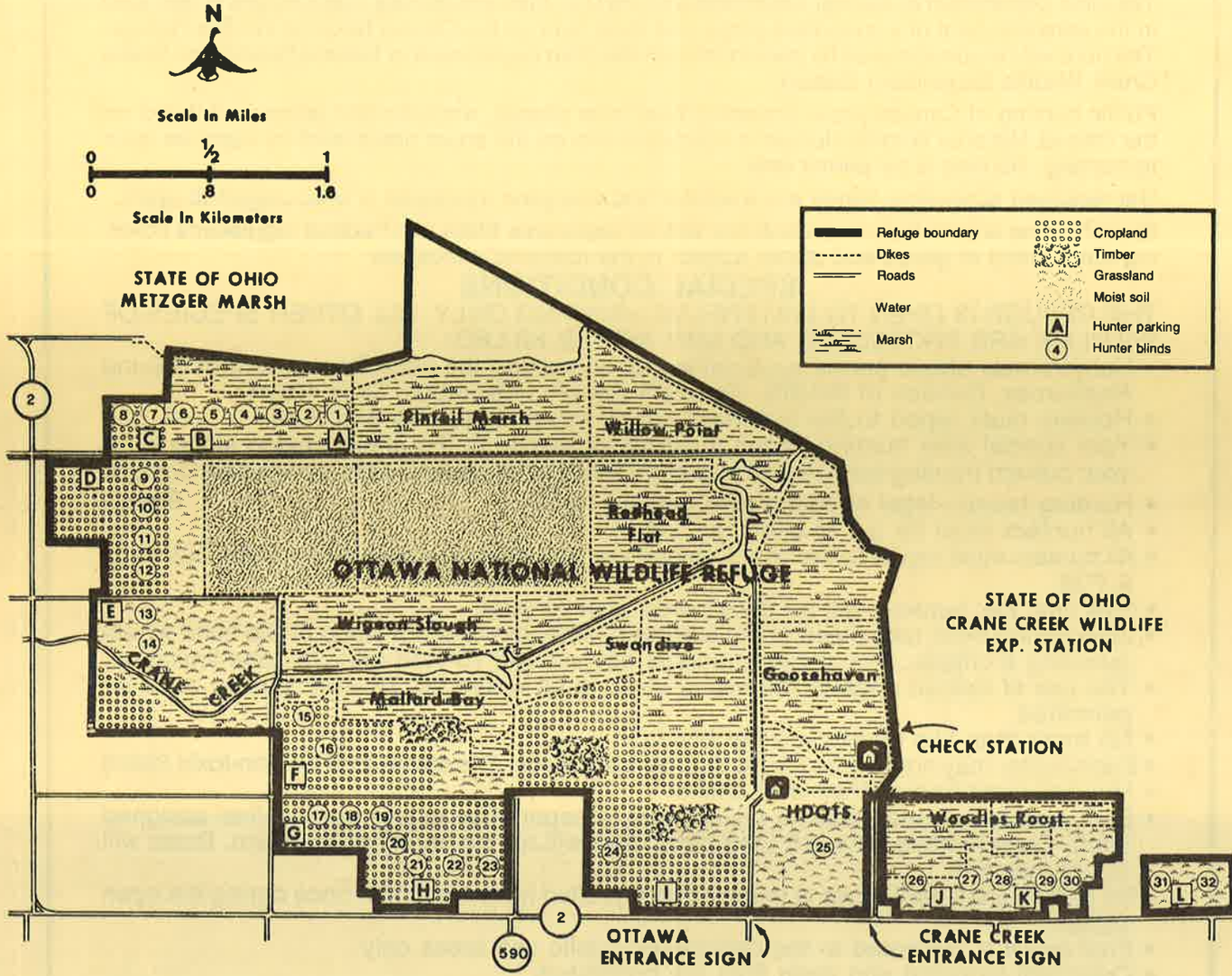
REFUGE SIGNS — KNOW THEIR MEANING

REFUGE BOUNDARY SIGN — ENTRY BY PERMIT ONLY

SANCTUARY AREA — OFF LIMITS TO THE PUBLIC UNLESS OTHERWISE SPECIFIED

HUNTER PARKING AREA

DIRECTION TO HUNTER BLIND



Common Name	S	s	F	W
Red-breasted Nuthatch	u	-	u	x
White-breasted Nuthatch*	u	u	f	f
Brown creeper	f	-	c	f
Carolina Wren*	x	x	x	x
House Wren*	c	c	c	-
Winter Wren	f	-	c	u
Sedge Wren*	x	x	x	-
Marsh Wren*	f	f	f	r
Golden-crowned Kinglet	c	-	c	u
Ruby-crowned Kinglet	c	-	c	x
Blue-gray Gnatcatcher	c	u	x	-
Eastern Bluebird*	u	x	x	-
Veery	f	x	u	-
Gray-cheeked Thrush	f	x	f	-
Swainson's Thrush	c	r	c	-
Hermit Thrush	f	-	f	x
Wood Thrush*	c	c	x	-
American Robin*	c	c	c	f
Gray Catbird*	c	c	c	x
Northern Mockingbird*	r	x	r	u
Brown Thrasher*	c	f	f	x
American Pipit	f	-	u	x
Cedar Waxwing*	f	f	f	r
Northern Shrike	x	-	x	r
Loggerhead Shrike	r	-	x	x
European Starling*	c	c	c	c
White-eyed Vireo*	f	x	x	-
Solitary Vireo	f	x	u	-
Yellow-throated Vireo*	f	-	x	-
Warbling Vireo*	c	c	c	-
Philadelphia Vireo	f	x	f	-
Red-eyed Vireo*	c	c	c	-
Blue-winged Warbler	f	-	x	-
Golden-winged Warbler	u	-	x	-
Tennessee Warbler	c	x	f	-
Orange-crowned Warbler	u	-	x	x
Nashville Warbler	c	-	f	-
Northern Parula	u	-	x	-
Yellow Warbler*	c	c	c	-
Chestnut-sided Warbler	f	x	u	-
Magnolia Warbler	c	x	f	-
Cape May Warbler	c	-	c	-
Black-throated Blue Warbler	c	x	u	-
Yellow-rumped Warbler	c	x	c	x
Black-throated Green Warbler	c	x	f	-
Blackburnian Warbler	f	x	u	-
Yellow-throated Warbler	x	-	-	-
Pine Warbler	x	-	x	-
Kirtland's Warbler	x	-	-	-
Prairie Warbler	x	-	x	-
Palm Warbler	c	-	f	-
Bay-breasted Warbler	c	x	f	-
Blackpoll Warbler	c	r	f	-
Cerulean Warbler	u	-	-	-

Common Name	S	s	F	W
Black-and-white Warbler	c	x	f	-
American Redstart*	c	f	f	-
Prothonotary Warbler*	f	f	u	-
Worm-eating Warbler	x	-	-	-
Ovenbird*	f	x	u	-
Northern Waterthrush	f	x	u	x
Louisiana Waterthrush	x	-	x	-
Kentucky Warbler	x	x	x	-
Connecticut Warbler	u	x	x	-
Mourning Warbler	f	r	x	-
Common Yellowthroat*	c	c	f	r
Hooded Warbler	r	-	x	-
Wilson's Warbler	c	r	f	-
Canada Warbler	c	r	f	-
Yellow-breasted Chat*	u	r	-	-
Summer Tanager	x	-	-	-
Scarlet Tanager*	c	r	u	-
Northern Cardinal*	c	c	c	c
Rose-breasted Grosbeak*	c	u	u	-
Indigo Bunting*	c	c	c	-
Dickcissel*	x	x	f	-
Rufous-sided Towhee*	c	u	u	r
American Tree Sparrow	c	-	c	c
Chipping Sparrow*	f	r	u	-
Field Sparrow*	c	c	c	x
Vesper Sparrow*	f	u	r	-
Savannah Sparrow*	f	f	u	x
Grasshopper Sparrow*	r	u	x	-
Henslow's Sparrow	x	-	x	-
Sharp-tailed Sparrow	x	-	x	-
Fox Sparrow	c	-	c	-
Song Sparrow*	c	c	c	c
Lincoln's Sparrow	f	x	f	-
Swamp Sparrow*	c	u	f	c
White-throated Sparrow	c	-	c	u
White-crowned Sparrow	c	x	f	f
Dark-eyed Junco	c	-	c	f
Lapland Longspur	x	-	x	r
Snow Bunting	u	-	f	f
Bobolink*	f	f	f	-
Red-winged Blackbird*	c	c	c	c
Eastern Meadowlark*	f	f	f	u
Western Meadowlark	r	x	-	-
Yellow-headed Blackbird*	u	x	x	x
Rusty Blackbird	f	x	f	u
Brewer's Blackbird	x	-	x	x
Common Grackle*	c	c	c	u
Brown-headed Cowbird*	f	c	f	u
Orchard Oriole*	f	f	u	-
Northern Oriole*	c	c	f	-
Purple Finch	f	-	r	x
House Finch*	r	x	u	u
Common Redpoll	u	-	x	r
Pine Siskin	u	-	x	r

Common Name	S	s	F	W
American Goldfinch*	c	c	c	c
Evening Grosbeak	r	-	x	x
House Sparrow*	c	c	c	c

Accidentals

Red-throated Loon	Gannet	Wood Stork
American Flamingo	Ross Goose	Ruddy Shelduck
Fulvous Whistling Duck	Trumpeter Swan	Cinnamon Teal
Eurasian Wigeon	Harlequin Duck	Bohemian Waxwing
Barrow's Goldeneye	King Eider	Yellow Rail
Black Rail	Wilson's Plover	Purple Sandpiper
Black-necked Stilt	Pomarine Jaeger	Long-tailed Jaeger
Great Skua	Little Gull	Lesser Black-backed Gull
Black-legged Kittiwake	Least Tern	Groove-billed Ani
Barred Owl	Western Kingbird	Harris' Sparrow
Black-billed Magpie	Boreal Chickadee	Bewick's Wren
Townsend's Solitaire	Muscovy	Townsend's Warbler
Black-headed Grosbeak	Blue Grosbeak	Pine Grosbeak
Hoary Redpoll	Red Crossbill	White-winged Crossbill
Oregon Junco	Lark Sparrow	Bachman's Sparrow
Clay-colored Sparrow	Black-chinned Sparrow	
Smith's Longspur	Common Black-headed Gull	

Notes

Date_____ No. Species_____

Time Afield_____

Observers_____

_____

Weather_____

Remarks_____

_____

_____

_____

_____

For further information contact:
Refuge Manager
Ottawa National Wildlife Refuge
14000 West State Route 2
Oak Harbor, Ohio 43449
(419) 898-0014

RF-31540

Sept 1991

Birds

Ottawa National Wildlife Refuge

Ohio

Birds: a Checklist

The Ottawa National Wildlife Refuge (NWR) complex, located 15 miles east of Toledo, Ohio, contains remnants of a vast marsh that once bordered western Lake Erie. The complex is comprised of three wildlife refuges: Ottawa NWR, Cedar Point NWR and West Sister Island NWR.

The Ottawa complex consists of 8,316 acres of marshes, grasslands and forests that support a variety of wildlife communities. Also, the complex is an important resting and feeding area for waterfowl and other birds traveling the Mississippi and Atlantic flyways.

Dramatic flights of migratory birds may be seen at Ottawa NWR, notably the spring migration of warblers and the autumn passage of waterfowl. Ottawa is home to nesting bald eagles from February, when nesting begins, until the fledging of eaglets in July. Eagles can be observed throughout the year. Eaglets fledged from northern territories migrate through during fall in increased numbers. Federal and State management projects involve constant monitoring and banding of eaglets. Management efforts have helped increase bald eagle numbers in Northwest Ohio and provide excellent opportunities to view the bald eagle in the wild here at Ottawa.

The 274 birds listed are regular visitors to the Ottawa NWR. Another 49 have been seen only a few times on the refuge and are included in the accidental list.

Birds listed are grouped according to their taxonomic identification, first by order (solid line) and then family (dotted line). The family is a classification unit that places birds of similar body structures, feeding habits, and flight together. The order is a more inclusive category consisting of related families. Learning some of these common characteristics can help in identifying new birds.

The English or common names used and the taxonomic order are in accordance with the American Ornithologists' Union "Checklist of North American Birds", 6th Edition, (1983), 3rd Supplement (1989).

This list is designed to inform the visitor to Ottawa NWR of the chances of seeing a specific bird during a visit. The status symbols used do not reflect actual population densities but rather detectability which, in most cases, is similar.

Symbols used are as follows:

Season

S - Spring March - May
s - Summer June - July
F - Fall August - November
W - Winter December - February

Status

c - common: seen on 90% of visits
f - fairly common: seen on a majority (51%) of visits
u - uncommon: seen on 20-50% of visits
r - rare: seen on less that 20% of visits
x - extremely rare: seen on 5 or fewer visits since 1969
- no records
* Has nested on the refuge

Common Name	S	s	F	W
Common Loon	x	x	u	r
Pied-billed Grebe*	c	c	c	r
Horned Grebe	u	x	u	x
Red-necked Grebe	x	-	x	-
Eared Grebe	x	x	x	-
American White Pelican	x	x	x	-
Double-crested Cormorant	c	f	f	x
American Bittern*	u	r	r	x
Least Bittern*	u	r	r	-
Great Blue Heron*	c	c	c	c
Great Egret*	c	c	c	r
Snowy Egret*	f	f	f	-
Little Blue Heron*	u	u	u	-
Tricolored Heron	x	-	x	-
Cattle Egret*	r	r	u	-
Green-backed Heron*	c	c	c	-
Black-crowned Night Heron*	f	c	c	x
Yellow-crowned Night Heron	x	x	x	
Glossy Ibis	x	-	-	-
White-faced Ibis	x	-	-	-
Tundra Swan	f	-	f	f
Mute Swan	x	x	x	x
Greater White-fronted Goose	x	-	x	x
Snow(blue phase) Goose	f	x	f	f
Brant	x	-	x	-
Canada Goose*	c	c	c	c
Wood Duck*	f	f	c	u
Green-winged Teal*	f	u	c	u
American Black Duck*	c	f	c	c
Mallard*	c	c	c	c
Northern Pintail*	f	u	c	f
Blue-winged Teal*	c	c	c	x
Northern Shoveler*	c	u	c	u
Gadwall*	c	u	c	u
American Wigeon*	f	u	f	u
Canvasback	f	x	f	u
Redhead	f	x	f	x
Ring-necked Duck	f	-	f	r
Greater Scaup	x	-	x	x
Lesser Scaup	f	x	f	u
Oldsquaw	r	-	r	r
Black Scoter	x	-	x	x
Surf Scoter	-	-	x	x
White-winged Scoter	x	x	x	x
Common Goldeneye	c	-	f	f
Bufflehead	f	-	f	u
Hooded Merganser*	f	u	c	u
Common Merganser	c	-	u	f
Red-breasted Merganser	c	x	f	u
Ruddy Duck*	c	u	c	u
Turkey Vulture*	f	u	x	-
Osprey	u	x	x	x
Bald Eagle*	c	c	c	c
Northern Harrier	f	r	f	f

Common Name	S	s	F	W
Sharp-shinned Hawk	f	x	u	x
Cooper's Hawk*	f	x	r	u
Red-shouldered Hawk*	u	x	x	x
Broad-winged Hawk	u	x	x	-
Swainson's Hawk	-	x	x	-
Red-tailed Hawk*	c	c	c	c
Rough-legged Hawk	f	-	r	f
Golden Eagle	x	x	x	-
American Kestrel*	f	u	f	f
Merlin	r	x	x	-
Peregrine Falcon	r	x	r	-
Gyrfalcon	x	-	x	x
Ring-necked Pheasant*	f	f	f	f
Northern Bobwhite	x	x	x	-
King Rail*	r	x	x	x
Virginia Rail*	u	r	r	x
Sora*	c	u	u	-
Common Moorhen*	u	u	u	x
American Coot*	c	f	c	u
Sandhill Crane	r	-	x	-
Black-bellied Plover	c	u	f	x
Lesser Golden-Plover	f	x	f	-
Semipalmated Plover	c	u	f	-
Piping Plover	x	-	x	-
Killdeer*	c	c	c	u
American Avocet	-	x	r	-
Greater Yellowlegs	c	u	c	x
Lesser Yellowlegs	c	u	c	-
Solitary Sandpiper	c	u	f	-
Willet	x	x	r	-
Spotted Sandpiper*	c	c	c	-
Upland Sandpiper*	u	r	r	-
Whimbrel	x	x	x	-
Hudsonian Godwit	x	x	u	-
Marbled Godwit	x	x	r	-
Ruddy Turnstone	u	u	u	-
Red Knot	x	x	u	-
Sanderling	r	x	f	x
Semipalmated Sandpiper	f	u	c	-
Western Sandpiper	r	x	u	-
Least Sandpiper	f	f	f	x
White-rumped Sandpiper	u	r	u	-
Baird's Sandpiper	x	-	u	-
Pectoral Sandpiper	f	u	c	-
Dunlin	f	u	c	r
Stilt Sandpiper	x	r	f	-
Buff-breasted Sandpiper	-	-	r	-
Ruff	x	x	x	-
Short-billed Dowitcher	f	u	c	-
Long-billed Dowitcher	x	x	f	-
Common Snipe*	c	x	f	r
American Woodcock*	u	r	u	-
Wilson's Phalarope*	r	r	u	-
Red-necked Phalarope	x	-	r	-

Common Name	S	s	F	W
Red Phalarope	-	-	x	x
Franklin's Gull	x	x	r	-
Bonaparte's Gull	f	x	c	f
Ring-billed Gull*	c	c	c	f
Herring Gull*	c	c	c	f
Iceland Gull	x	x	-	-
Glaucous Gull	x	-	-	x
Great Black-backed Gull	f	u	c	f
Caspian Tern	f	u	c	-
Common Tern*	f	f	c	x
Forster's Tern	f	u	c	-
Black Tern*	u	r	u	-
Rock Dove*	f	f	f	u
Mourning Dove*	c	c	c	c
Black-billed Cuckoo*	u	u	u	-
Yellow-billed Cuckoo*	f	c	c	-
Barn Owl*	x	x	-	-
Eastern Screech-Owl*	u	r	u	u
Great Horned Owl*	c	f	f	c
Snowy Owl	x	-	x	x
Long-eared Owl	u	-	-	x
Short-eared Owl	r	-	-	r
Northern Saw-whet Owl	u	-	x	x
Common Nighthawk*	u	-	u	-
Whip-poor-will	u	-	x	-
Chimney Swift*	f	u	f	-
Ruby-throated Hummingbird*	u	u	f	-
Belted Kingfisher*	f	u	f	r
Red-headed Woodpecker*	f	u	f	u
Red-bellied Woodpecker*	u	x	r	f
Yellow-bellied Sapsucker	f	-	c	x
Downy Woodpecker*	c	f	c	c
Hairy Woodpecker*	u	x	u	u
Northern Flicker*	c	c	c	u
Olive-sided Flycatcher	u	x	u	-
Eastern Wood-Pewee*	c	c	c	-
Yellow-bellied Flycatcher	u	u	u	-
Acadian Flycatcher*	u	r	x	-
Willow Flycatcher*	f	c	u	-
Least Flycatcher	c	u	f	-
Eastern Phoebe*	c	r	f	-
Great Crested Flycatcher*	c	f	u	-
Eastern Kingbird*	c	c	c	-
Horned Lark*	c	f	u	f
Purple Martin*	c	c	c	-
Tree Swallow*	c	c	c	x
Northern Rough-winged Swallow*	f	u	u	-
Bank Swallow*	f	u	f	-
Cliff Swallow*	u	x	u	-
Barn Swallow*	c	c	c	-
Blue Jay*	c	c	c	c
American Crow*	f	r	u	u
Black-capped Chickadee*	u	x	r	r
Tufted Titmouse*	f	u	u	f