

SHIAWASSEE NATIONAL WILDLIFE REFUGE  
Saginaw, Michigan

ANNUAL NARRATIVE REPORT  
Calendar Year 1987

U. S. Department of the Interior  
Fish and Wildlife Service  
NATIONAL WILDLIFE REFUGE SYSTEM

REVIEW AND APPROVALS

SHIAWASSEE NATIONAL WILDLIFE REFUGE

Saginaw, Michigan

ANNUAL NARRATIVE REPORT

Calendar Year 1987

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Regional Office Approval	Date		
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## INTRODUCTION

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## INTRODUCTION

Shiawassee National Wildlife Refuge was established in 1953 based on recommendations of the Migratory Bird Conservation Commission to restore and enhance a historically important wetland area for the benefit of migrating waterfowl. Its formation resulted from the culmination of numerous land use proposals and attempts over many years by various private and conservation groups and governmental agencies. As a result of local and regional conservationst's initiatives toward reclamation (from marginal agriculture to natural habitats), the State of Michigan established the Shiawassee River State Game Area adjacent to the Federal refuge project. Together these two areas encompass and practice complementary management on approximately 20,000 acres of some of the most productive waterfowl habitat in the state. The refuge is 8,984 acres in size and is located in central Michigan about twenty-five miles south of Saginaw Bay.

The refuge is part of an area historically known as the "Shiawassee Flats", an extensive floodplain once rich in shallow water, marsh, and riparian vegetation with associated wildlife resources. Following a period of extensive timber harvest and coal mining in the area, agricultural development through ditching and draining began in the early 1900's. In its thirty-five-year history, the refuge has restored much of the natural floral and associated faunal communities by restoration and maintenance of shallow marshes, moist soil units, grasslands, and bottomland forests. Five rivers converge at various points on the refuge that make the area prone to flooding, especially in the spring. This overflow bottomland/marsh habitat attracts concentrations of migrating waterfowl for which the area has become well known. With restoration of these native habitats and protection from human disruption, peak populations of 35,000 geese, 40,000 ducks, and 2,500 swan, high concentrations of wading and waterbirds, migrant and nesting bald eagles, and certain native species are now common.

Wyandotte NWR, administered as a satellite of Shiawassee, was established by an Act of Congress in 1961 to "be maintained.....for migratory birds and other wildlife". It consists of two islands, Grassy and Mammajuda, and adjacent shallow water area approximately to the six-foot contour depth totaling 304 acres in the Detroit River just off shore from the cities of Wyandotte and Ecorse. From 1948 to 1961 the islands were controlled by the U. S. Coast Guard.

The Michigan Islands NWR, administered as a satellite of Shiawassee, was established by Executive Order in 1943 as a refuge and breeding ground for migratory birds and other wildlife. These three islands, Shoe and Pismire in Lake Michigan and Scarecrow in Lake Huron, are 2, 3, and 7 acres respectively in size, and are similar in character. A fourth island, Thunder Bay, was added to the refuge in 1965 by a U. S. Coast Guard/Fish and Wildlife Service agreement under a revocable permit (five-year renewal periods). The Service has secondary jurisdiction on 121 acres of the total 168 acres on Thunder Bay Island. Gull Island (230 acres) became the fifth island in the system in 1969 when it was ceded to the Service by the U. S. Coast Guard. The three original islands in the Michigan Islands NWR were designated as Wilderness Areas in 1970 under Public Law 91-504, Stat. 1104.

### A. HIGHLIGHTS

Calendar Year 1987 emphasis centered on recovering from the 1986 fall 100-year flood. Interior water levels receded or were pumped to fairly normal and workable conditions by early January. Initial force account work concentrated on patching levees to prepare for normal spring flows. Damage assessment initiatives materialized into a congressional supplement for \$800,000 of rehabilitation. Engineering and CGS planning preliminaries proceeded to allow work to be scheduled for 1988.

In addition to flood recovery work a fairly normal operational year was experienced. Wildlife population levels were average--fall waterfowl peaks were back down (from flood concentration peaks) to 23,000 geese and 32,000 ducks; deer were down somewhat but the population appears to be rebuilding; shorebirds benefitted from exposed mudflats during dry summer and fall conditions; and one bald eagle pair fledged two young. Staff personnel status was in good condition with filling of the secondary assistant vacancy in March; however, early December saw the transfer of the Primary Assistant Refuge Manager and the Refuge Manager with the Refuge Manager Trainee position to be vacated in January 1988. Operational and maintenance funding was minimally adequate with emergency flood damage repair being supplemented by station ARMM's funds. Public use seemed below normal. Several law enforcement problems kept officers busy during the final months of 1987.

--Scheduled ARMM's projects for 1987 included:

Miscellaneous moist soil development.....	\$ 9,000
Habitat maintenance.....	6,200
Road/parking lot rehabilitation.....	<u>10,000</u>
	\$ 25,200

Approximately 60% of total ARMM's funding was rescheduled for emergency flood-damage repairs. Left-over funds were used for miscellaneous equipment purchases.

- Waterfowl hunting season returned to normal with 1,263 geese harvested on refuge-managed hunts and 258 geese and 1,041 ducks taken in Department of Natural Resource managed hunts on refuge properties. The deer harvest was virtually non-existent due to a major curtailment of hunter opportunity resulting from a local deer club/DNR agreement to "let the herd build up"!
- Habitat management activities were on schedule per station management plans. After the 1986 rejuvenation, Moist Soil Units 1 and 2 were in a highly productive state.

## B. CLIMATIC CONDITIONS

Following the extreme flooding of 1986, the refuge experienced a year of precipitation levels 28% lower than normal excluding June and September. Trails were less than favorable for cross-country skiing with minimal snowfall in February and March. Temperatures were above normal, especially during February through July. The mild winter allowed farm fields to dry permitting our agricultural program to get spring planting done on time.

### 1987 Climatic Data for Vicinity of Shiawassee NWR

<u>Month</u>	<u>Average Temperature (F<sup>o</sup>)</u>	<u>Precipitation (inches)</u>	<u>Snowfall (inches)</u>
January	24.8	1.17	14.9
February	29.5	0.81	0.7
March	36.8	1.34	2.0
April	50.4	1.99	Trace
May	62.7	0.92	-
June	71.2	5.69	-
July	75.7	1.24	-
August	70.0	3.99	-
September	63.5	5.13	-
October	45.6	2.07	-
November	41.8	2.37	Trace
December	32.3	2.73	7.7

In past years the refuge has used weather data from the Bishop Airport located forty miles from the refuge. This year we obtained the information from two sources in the Saginaw area located a few miles north of the refuge. The Michigan Department of Agriculture Research Station has been sending monthly weather data to the refuge office; the Saginaw Water Treatment Plant has agreed to provide copies of monthly weather data that is sent to the National Weather Service. Data from both sources was averaged in preparing the above chart. Because of the distance between the new and old sources of information, a comparison of 1987 to prior years is not provided.

## D. PLANNING

### 2. Management Plan.

Part III, Management Program Summary and Subject Chapters, is nearing completion. Current status is as follows:

Approved:	Animal Control	Fishing	Marsh and Water
	Contingency/Oil-Gas	Forest	Safety
	Crowd Control	Fur	Search and Rescue
	Disease Contingency	Hunting	Wilderness
	Fire	Law Enforcement	

Pending RO Approval: Wildlife Inventory

Scheduled for update: Sign Plan

### 3. Public Participation

For the fifth consecutive year a public information/participation meeting was conducted at Green Point Nature Center, a facility operated by the City of Saginaw. This meeting location is adjacent to the northern boundary of the refuge just across the Tittabawassee River and provided necessary facilities. Thirty-four people attended the meeting with one group and one individual presenting public statements. Participation in the question-answer-comment session was good.

Presentations by the staff reviewed objectives/policies, wildlife populations, public use, and operational activities and projects. No major changes were made in refuge activities or projects from last year. The main objective of the meeting was to present a flood damage report and list repairs already completed and those yet to be completed.



Public  
Information  
Meeting  
(4/87; SAS)



Similar to last year, some of those that attended expressed concern over continuing cooperative farming versus moist soil management. Others were supportive of the moist soil units. Much of the public interest centered around waterfowl and deer hunting. Waterfowl hunters would like to see more goose blinds as well as an extended season and more duck hunting opportunities. For the third year in a row the Shiawassee Flats Hunter and Citizens Association wanted major restrictions on deer harvest within the State/Federal refuge complex. On the whole, local environmental and conservation groups were very supportive of ongoing and proposed wildlife management and public use programs.

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

A Corps of Engineers/Department of Natural Resources Section 404 permit renewal was requested in September for the new exterior dike around Moist Soil Units 3 and 4. The original permit for this project was granted in 1984; however, high river levels have delayed construction.

Preliminary review of proposed flood damage restoration work indicates that regulatory requirements relating to wetlands/floodplains and Section 7 have been previously covered by an environmental assessment or categorical exclusion prepared for the station. A possible exception is the Spaulding Drain dike rehab/construction along the east side of the green-tree reservoirs.

#### 5. Research and Investigations

Shiawassee NR87 - A Survey of Xenobiotics on the Shiawassee National Wildlife Refuge by Gregory B. Herbert, Ohio State University, Ohio Cooperative Wildlife Research Unit; No. 14-16-0009-1539.

Field investigations were initiated in 1985 and completed in 1986. Problems with sample analyses delayed the study completion until September 1987. In a November 19, 1987 meeting, Mr. Herbert indicated that while various contaminants (e.g., PCB's dioxin, heavy metals) were found in sediment and tissue (primarily raccoon) samples, levels were not considered significant. Macroinvertebrate diversity indices indicated low-level pollution in refuge river systems. Mr. Herbert was granted another extension and the final report is expected during 1988.



E. ADMINISTRATIVE1. Personnel

3, 7, 5, 6



4, 2, 1

1. Joe W. Hardy, Refuge Manager, GS-12.....Permanent Full-time  
Transferred to Mississippi Sandhill Crane NWR effective 12/07/87.
2. Stan A. Skutek, Primary Assistant Refuge Manager, GS-9  
.....Permanent Full-time  
Transferred to Wildlife Assistance, Madison, WI effective 12/07/87.
3. Richard A. Weide, Secondary Assistant Refuge Manager, GS-9  
Transferred from Okefenokee NWR 3/1/87.....Permanent Full-time
4. Diane L. Johnson, Refuge Manager Trainee, GS-5.....Permanent Full-time  
Reassigned from Biological Technician (Wildlife) effective 11/15/87.
5. Shirley L. Wolfe, Administrative Technician, GS-5...Permanent Full-time
6. Lawrence J. Blazo, Maintenance Mechanic, WG-9.....Permanent Full-time
7. Marion L. Nowosatko, Maintenance Worker, WG-7.....Permanent Full-time

Personnel Levels Over the Past Five Years

<u>Calendar Year</u>	<u>Permanent</u>		<u>Temporary</u>
	<u>Full-time</u>	<u>Part-time</u>	
1987	7	0	0
1986	6	0	2
1985	7	0	0
1984	6	1	2
1983	4	3	3

2. Youth Programs

In 1987, seasonal workers were selected from Michigan Youth Corps (MYC) and Summer Youth Employment Training Program (SYETP) rather than the YCC program. The MYC program was attractive because older more versatile workers, 18 to 21 years of age, were available at no cost to the Fish and Wildlife Service. Under these programs the refuge served only as a worksite. Linda Gay, returning to Shiawassee for her fifth summer, was selected to direct summer activities. Her familiarity with the refuge and leadership abilities made Linda an excellent supervisor. Overall guidance came from Assistant Manager Weide. In general, the summer went smoothly and significant progress was made on all assigned projects.

Group Leader

Linda M. Gay (MYC)

Enrollees

Michael L. Curry (MYC)  
Scott A. Sanderson (SYETP)  
Michael P. Bergdolt (MYC)

Herron M. Washington (MYC)  
(not shown)

(8/87; RAW)



MYC Enrollee  
Badriyyah F. Wazeerud-Din

(9/87; JWH)



Summer projects included:

- Trail maintenance: patching holes, resurfacing, clearing weeds/brush/limbs, and replacing signs and trail markers.
- Cleaning up trash and debris: especially remnants of the 1986 flood along dikes.
- Removing old fence lines: primarily on north side of refuge.
- Painting: gates, miscellaneous.
- General organization/cleaning of vehicles and buildings.



Finished trail. (8/87; RAW)

### 3. Other Manpower Programs

Shiawassee first participated in the U. S. Department of Labor's Green Thumb program in January when local resident Art Gillis was signed on as a Refuge Assistant. Based on the premise that older, low income persons have the right to remain actively employed, this program serves to develop part-time employment opportunities such as community service. Art worked on several refuge projects from January through May involving minor maintenance, painting, and cleaning refuge machinery and buildings.

In August, Green Thumb employee Alexander Lichtenwald signed on and is currently employed as a Refuge Assistant. Alex works twenty-four hours per week and is assigned to assist our maintenance staff with a variety of refuge jobs including cleaning, painting, fabrication, light maintenance, lawn mowing and trimming. The work accomplishments of these employees are greatly appreciated.



"Green Thumbers" Arthur H. Gillis and Alexander Lichtenwald  
(2/87; SAS - 11/87; SAS)

#### 4. Volunteer Program

Volunteer efforts significantly enhanced refuge programs in 1987. About 710 hours were contributed by five regular and several one-time volunteers. Local Audubon activists Bob Grefe and Bruce Winchell assisted with the spring songbird monitoring study (required by 1986 Environmental Assessment for Mosquito Control on Shiawassee National Wildlife Refuge). Several volunteers were also recruited to search the wilds of central Michigan in June for an errant tundra swan with an attached transmitter monitored by Patuxent. While the search was unsuccessful, all seemed to enjoy the opportunity to participate in an important Service project. Volunteers were also quick to respond when an extra hand was needed during the fall-winter hunts.

A new volunteer, David Peters of Saginaw, was particularly helpful in 1987. His bird identification skills, conscientious work habits, and willingness to assist with any task made him an important asset. Even as weather turned miserably cold during late fall and early winter, David never failed to show for a bird survey or to read Canada goose neckband codes.

Volunteer David Peters  
receives a Volunteer Certificate from Refuge Manager  
Hardy. (11/87; RAW)





A volunteer intern from Superior State College was scheduled for wildlife-related projects during the summer of 1987. As summer approached the scheduled intern declined the Shiawassee opportunity in favor of a paid position. An alternate could not be found in time.

## 5. Funding

### Funding Levels 1983-87

<u>Fiscal Year</u>	<u>Dollars</u>
1987.....	\$ 273,500
1986.....	292,600
1985.....	359,200
1984.....	272,000
1983.....	293,000

NOTE: An appropriation construction project costing \$250,000 for Moist Soil Units 3 and 4 has not been included in any of the above total station amounts.

## 6. Safety

In April, Manager Hardy sustained a slight "no-work-loss" back strain. The summer of 1987 had its share of poison ivy and bee sting incidents involving seasonal workers. An after-the-fact safety meeting covered poisonous plants and insects. A more timely discussion of these problems is planned for 1988. On a more serious note, a Michigan Youth Corps worker fractured her wrist in a fall. Office duties allowed this individual to finish her appointment without loss of work time.

## 7. Technical Assistance

Technical assistance has been provided to requesting and cooperating agencies, groups, and individuals on an on-call basis. Planning assistance was given to the Flint River Dike Committee, a local group attempting to develop a plan for flood control in agricultural areas immediately adjacent the refuge. Several meetings were attended to provide Service input to the DNR during formulation of regulations affecting the Saginaw County Goose Management Area and the Shiawassee Experimental Deer Area. The refuge lies within geographical boundaries of each of these areas. The Refuge Manager served as a member of the Saginaw County Mosquito Abatement Commission's Technical Advisory Committee. Environmental education and career guidance were provided to local nature centers and schools in both on- and off-station settings.

Although deer populations were down from the previous three years, this, plus normal goose activity in the immediate vicinity of the refuge, generated requests from farmers for animal damage control assistance. Our response has consisted of coordinating damage control requests with DNR and FWS, and USDA ADC specialists. The transfer of all off-refuge ADC work to USDA has gone smoothly. A USDA ADC representative is stationed within fifty miles of the refuge which is closer than the former FWS ADC

specialist. Considering the relatively low level of assistance requests and normal involvement of DNR in ADC, we anticipate no major problems.

During mid-May, Shiawassee NWR received a telephone request for assistance from Patuxent Wildlife Research Center in locating a "downed" tundra swan in the northern part of the lower peninsula of Michigan. The swan was one of three wearing a satellite transmitter applied on wintering grounds of Chesapeake Bay, Maryland. A combination air/ground search located the bird in Missaukee County. When the ground crew approached to within thirty yards, the weakened swan managed to flush and escape into heavy forest cover. A subsequent intensive ground search and several low-level overflights yielded no sign of the bird. Satellite signals ceased two days after initial ground contact with the swan.

#### 8. Other

Staff training included:

--Computer Literacy Course; 18 hours.....Hardy, Skutek, Wolfe  
 --Annual Refuge Law Enforcement Refresher.....Hardy, Skutek, Weide  
 --Office letter/memo-writing seminar.....Hardy  
 --Regional Wetlands Management Workshop.....Weide

### F. HABITAT MANAGEMENT

#### 1. General

Water levels are a factor for concern affecting all aspects of management on the Shiawassee National Wildlife Refuge. Record high water levels from the floods of 1986 have left their mark on refuge habitats and, to some extent, on the refuge staff. The relatively dry conditions of 1987 were seen as a welcome change. The 1986 predictions for rising Great Lakes water levels for 1987 did not materialize. Instead, water levels receded causing river levels in the refuge to reach near record lows.

Water conditions on the refuge are influenced to a large degree by water levels in Lake Huron. High lake levels and northeast winds cause the Saginaw, Shiawassee, and Tittabawassee Rivers to back up into refuge habitats, hampering efforts to manage refuge pool/marsh water levels. This was a common occurrence in 1986. In contrast, 1987 saw low lake levels and predominant winds out of the west and southwest, blowing waters out of the refuge river systems. The result was low water in refuge habitats throughout most of the year.

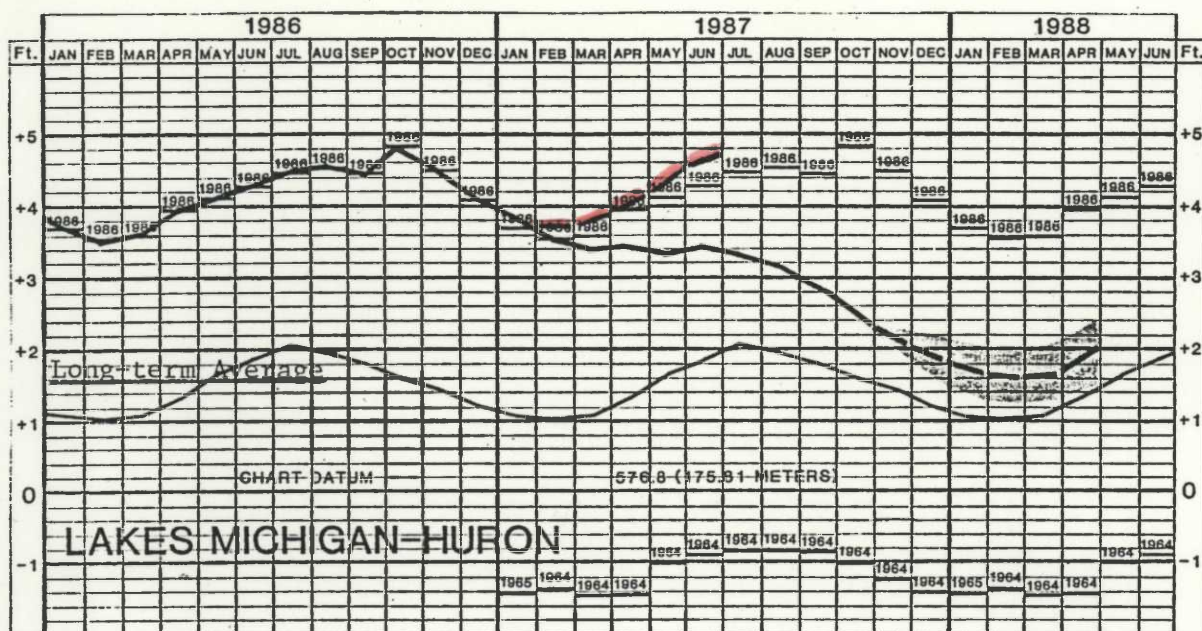
The following two charts show (1) water levels of Lakes Michigan and Huron in 1986-88 and (2) a breakdown of habitat types found on the refuge.



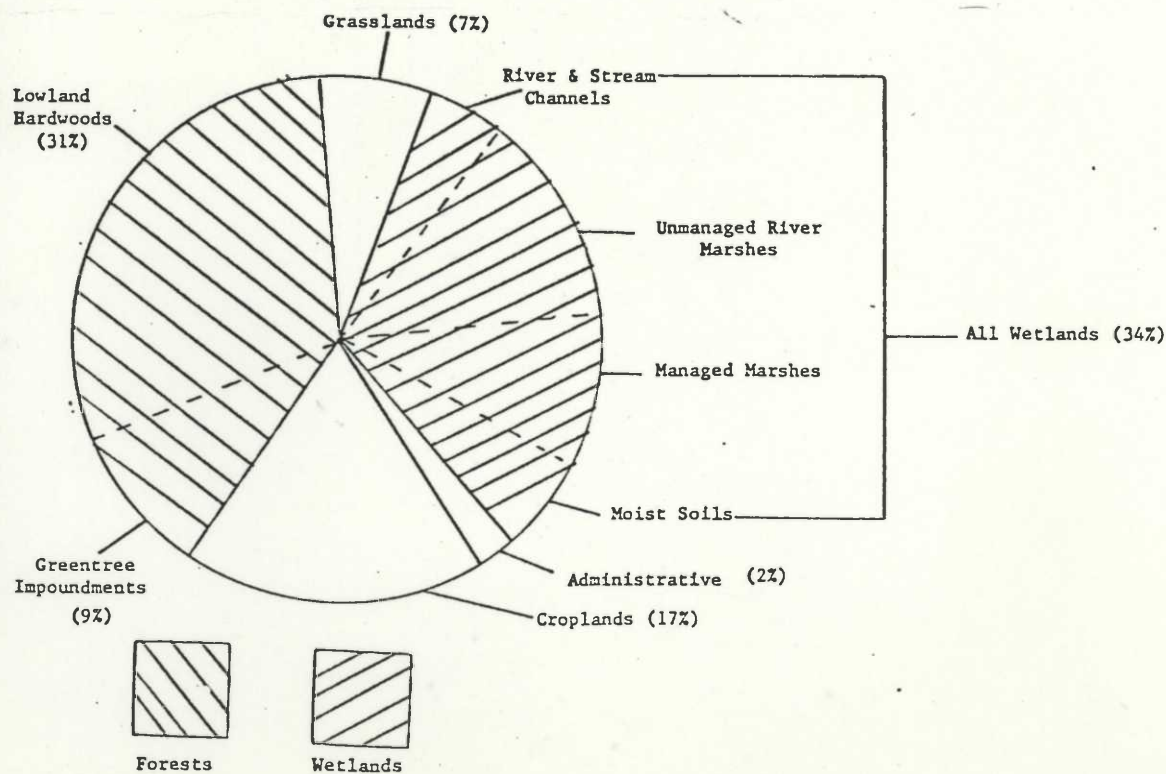
# Lakes Michigan and Huron Water Levels: 1986-88

1986 Predictions for 1987

Actual 1987 levels



## General Habitat Types Shiawassee National Wildlife Refuge



## 2. Wetlands

### a. Pool 1A

Pool 1A is the largest managed marsh on the refuge at 315 acres. Water levels were significantly lower this year as compared to the last two years. Water levels this year averaged 582.6 (March-November) as compared to 584.5 (January-December) in 1986. Because of the low summer water levels, nutsedge was common on mudflats around islands. Mudflats and shallow water areas provided shorebird and waterfowl habitat.

### b. Pool 1B

Pool 1B (190 acres) is located adjacent to and just south of Pool 1A. Water levels in Pool 1B were similar to Pool 1A. Mudflats were more common in Pool 1B and moist soil plants (smartweed and nutsedge) quickly colonized many areas. Shorebirds were attracted to extensive mudflats that appeared in the fall as dry weather continued. Growth of dense stands of willow on several islands has been a persistent problem in this pool. The aerial application of Rodeo in 1986 reduced willow invasion significantly. Visual observations indicate an estimated 90% dieoff. To maintain control over willows in this area, future spot-herbicide treatment, burning, and dozing (when conditions permit) should be done. Flood damage to water control structures currently limits effective water management. Flood damage money is available for 1988 repairs that should restore more effective water management capabilities to this pool.

### c. Pool 2

Pool 2 (115 acres) is a cattail marsh (approximately 80% cattail, 20% open water) that has had virtually no water control during the past several years due to deteriorated dikes and abnormally high water levels. Future plans to repair and maintain a low level dike should restore water level control providing the river stays at average levels. This pool will remain closed to trapping during the 1987-88 trapping season to allow muskrat populations to open up dense cattail stands. Muskrat populations and their effects on the pool's vegetation will be monitored over the next several years. Pool 2 water levels averaged 583.3 (March-November) compared to last year's 585.1 (January-October).

### d. Pool 4

Pool 4 (214 acres) like Pool 2 is a flooded cattail marsh. However, the cattail to open water ratio is much lower at approximately 50%-60%. Management in the pool is currently non-existent as the only access to the pool was blocked when the flood-damaged Miller Drain bridge was removed in 1986. It is unlikely that any major management activities will be scheduled for Pool 4 in the near future.

### e. Moist Soil Units 1 and 2

For the first time in approximately five years, these two units were, as a result of the 1986 renovation, in a highly productive, early-succession state. The 1986 Annual Narrative covered the renovation program.

The following summarization covers the 1987 management efforts on Moist Soil Units 1 and 2:

(1) Moist Soil Unit 1

A late spring drawdown was accomplished to stimulate early season moist soil species, especially smartweeds. A rapid drawdown was used and on June 10th the drawdown was complete. At this point no vegetation was present on the unit.

June 10-21 - Low precipitation period; water levels maintained at ditch tops. Apparently this water level was not adequate to maintain a moist subsoil condition throughout the unit. Cocklebur was becoming established throughout. There was also concern that little, if any, desirable vegetation was present at this point. Smartweeds were totally absent.

June 24-26 - Gravity flooding and pumping; approximately two to four inches of water was put on the unit to stunt cocklebur. Sedge growth was becoming apparent at this point.

July 9-14 - Planting Japanese millet; approximately 850 pounds of Japanese millet was hand sown over 70 acres. Seeding was accomplished on saturated soils.

July 31 - Extremely dry weather prevailing; conditions at this point showed soils to be drying at a rapid rate. Even with water kept at ditch-top levels soils over the majority of the unit appeared to be too dry. High daily temperatures resulting in rapid evaporation were depleting soil moisture. The Japanese millet got a good start but slowed down as soil moisture dropped. Cocklebur was also re-establishing in several areas.

August 3-7 - Flooding (pumping); three to four inches of water was put on unit to stunt cocklebur and to stimulate Japanese millet and other moist soil plants. At this time, wild millet was also becoming apparent throughout the unit.



Moist Soils;  
Summer Moist  
Soil  
(8/87; RAW)



September 1 - Inspection; approximately two- to five-inch water depth throughout unit. Japanese millet starting to head out and wild millet becoming established in high density.



Moist Soils: Millet  
(9/87; RAW)

September 3-8 - Maintaining water levels throughout August was successful in stunting cocklebur and in stimulating moist soil species. Both Japanese and wild millets occurred in dense stands throughout, along with yellow nutsedge and scattered smartweed. At this point the unit was considered to be in excellent condition.

September 15 - Flooding (pumps) added approximately six inches water. Extensive waterfowl use: approximately 10,000-15,000 ducks and up to 1,500 geese using this unit.

## (2) Moist Soil Unit 2

This unit was scheduled for an early summer drawdown in an attempt to stimulate millet growth. Although millet came in late it did not reach the density present in Moist Soil Unit 1 (early drawdown).

June 25 - Commenced with a slow drawdown; water levels were allowed to decline naturally through evaporation. As a result, a wider diversity of moist soil species developed. Dense growths of plantain, spike rush were common and millet, beggartick, smartweed, and bulrush started to appear throughout July.



Moist Soils; Beggarticks (9/87; RAW)

August 1 - This unit stayed dry through August. Upland species (e.g., cocklebur) occurring.

Mid-September - Flooded unit with four to six inches water to increase availability of moist soil plants to waterfowl.

Managing by rapid drawdown (MSU 1) and slow drawdown (MSU 2) resulted in a good variety of vegetation - both moist soil and upland species. From the standpoint of abundant seed production (millet and smartweed), a rapid drawdown early in the summer seems to be a preferred management technique. The slow drawdown in MSU 2 resulted in lower seed production but a wider variety of plant species. The positive attributes resulting from the slow, late-season drawdown were seen as abundant cover for late fall waterfowl use and, it is predicted, for cover and invertebrate substrate possibly favoring the 1988 spring migrants.



Moist Soils:  
Fall Moist Soil  
(10/87; RAW)



f. Moist Soil Units 3 and 4

Due to low river levels during 1987, water levels in these management units were considerably lower than last year. The entire southern two thirds were dry by late May resulting in excellent stands of smartweed.



Moist Soils: Smartweed (6/87; RAW)

The northern portions of the units, which are cattail marshes, were pumped dry during late June to late July to facilitate construction of a cross-dike. As water levels north of the newly-constructed cross-dike were reestablished (autumn precipitation) waterfowl use increased. The northeast section of this unit, a flooded marsh and dead timber area, received high use by mallards and black ducks as several thousand birds made daily use of the area. This same flooded area received tremendous waterfowl use during 1986. After completion of the exterior dike and pumping station, moist soil and marsh management capabilities in these management units will be greatly increased.

3. Forests

a. Pool 3/5 Complex (greentree reservoir)

These two impoundments (820 acres total) are lowland hardwoods dominated by soft maples (red and silver) and green ash. Areas of higher elevation support red oak, hickory/walnut, basswood and cottonwood. Water level control is by gravity feed and the pools function as greentree impoundments whenever flooding conditions allow. Water levels during 1987 did not permit flooding of these units as water levels were



maintained within the channels of the two bayous (Ferguson and Crystal) that traverse these units. March through November water levels averaged 582.6 this year as compared to 584.6 in 1986. The low water levels this year resulted in very low waterfowl use as compared to last year or other years when these units were flooded during the fall-winter-spring seasons.

#### b. Other Forest Habitat

The refuge contains approximately 4,300 acres of bottomland forest dominated by second growth, even-aged timber seldom exceeding twelve inches dbh. Selective and clear cutting as outlined in the Forest Management Plan began in 1986 and continued this year. Two 5-acre clearcuts and two 10-acre selective cuts in Compartment 3 were scheduled during 1986 and 1987. One 5-acre clearcut has been completed and one 10-acre selective cut is nearing completion. The remainder of the planned cutting in these units should be complete by the summer of 1988. Response to the cutting by deer was dramatic with felled tree tops providing a readily available food source. Numerous brush piles created by the wood cutters should provide some added habitat for a variety of wildlife, especially songbirds.

#### 4. Croplands

Approximately 1,500 acres were included in the farming program in 1987. Crops included 390 acres of corn, 855 acres of beans, 73 acres of winter wheat, and 175 acres of barley. In addition, 57 acres of clover/pasture mix were interseeded in barley and 323 acres of winter wheat were planted on harvested bean fields. Approximately 30 acres were removed from the farm program for a waterfowl viewing area adjacent to the Curtis Road parking lot. A screwgate control structure was inserted into the drain tile system to facilitate flooding of the viewing area.

Refuge crop shares are set up as follows: on goose hunting units (674 acres), the refuge share is 25%; on non-geese hunting units (826 acres in Farm Unit 1), the shares are based in a land-rental system. The latter system usually results in an approximate 30% refuge share. Cooperative Farming Agreements are renewed every year on the goose hunting units and every three years in Farm Unit 1 (Trinklein Tract).

#### 9. Fire Management

No wildfires occurred on the refuge in 1987. All refuge prescribed burning was completed between March 25th and April 20th. Approximately ten acres of dikes and 85 acres of grassland (north of the Shiawassee River) were burned.

#### 10. Pest Control

Shooting and gas cartridges were used to control woodchucks in 1987. This effort should be stepped up next year as personnel and ADC supplies permit.

Herbicides were used by cooperative farmers in the farming program and by refuge staff for the control of purple loosestrife. Approximately 0.7 gallon of Round-up was used to treat a five-acre patch of purple loosestrife in Moist Soil Unit 2.



Biological Technician  
Johnson preparing to spray  
loosestrife. (8/87; RAW)

In addition, willow control on refuge dikes was contracted to Chem-trol Company. They used ten gallons of Round-up to treat approximately six miles of refuge dikes. Dikes treated included the main dike around the Trinklein Farm Unit, the dike on the south side of Pool 1B, and the Spaulding Drain dike from Pool 1B south approximately one-half mile.

## 12. Wilderness and Special Use Areas

See Section M, Wilderness and Special Use Areas Administered by Shiawassee.

# G. WILDLIFE

## 1. Wildlife Diversity

Waterfowl maintenance is a major objective at Shiawassee National Wildlife Refuge. Managed marshes, moist soil units, greentree reservoirs, and farm units provide habitat for thousands of ducks, geese, and swans during spring and fall migrations. A variety of other wildlife such as shorebirds, wading species, raptors, furbearers, deer, and small mammals also benefit from waterfowl habitat management.

Refuge forests and grasslands also provide habitat for a variety of wildlife. Songbirds are probably the most noticeable species occupying these habitats. Forest management practices, initiated in 1986, should increase woodland passerine use. Deer and small mammals will be favored. Prescribed burns of grassland units in 1987 may enhance diversity.

The 1986 100-year flood displaced many species. Favorable conditions in 1987 saw a return of most wildlife to vacant habitats however (if only the dikes were as resilient).



## 2. Endangered and/or Threatened Species

Bald eagles, threatened on the Federal list, nested on Shiawassee in 1987. The mated pair successfully raised two young and the family group was a common sight throughout the year. Because of beaver activity nearby, the nest tree was fenced as a precaution.



Bald eagle nest.  
(12/87; RAW)



Fencing around eagle nest  
tree. (12/87; RAW)

Bald eagles are also common during migrations and it is not unusual to see winter concentrations of 10-15 individuals.

20

A federally-listed endangered species sighted in 1987 was the peregrine falcon. While observations were sporadic, Assistant Manager Skutek was fortunate enough to see a peregrine hit a mallard over the refuge. No other federally endangered or threatened species were observed/reported this year.

Several species on the Michigan threatened/endangered list may be found on Shiawassee: Threatened (t).

Red-shouldered hawk (t)  
Merlin (t)  
Osprey (t)

Common tern (t)  
Common loon (t)  
Caspian tern (t)

### 3. Waterfowl

Because many parts of the refuge cannot be consistently monitored, or are otherwise inaccessible, a way to expand waterfowl survey data to include these areas is important. Starting in July a procedure was used to survey visible parts of major refuge units and then extrapolate (using simple proportions) to include unseen areas in the total waterfowl estimates.

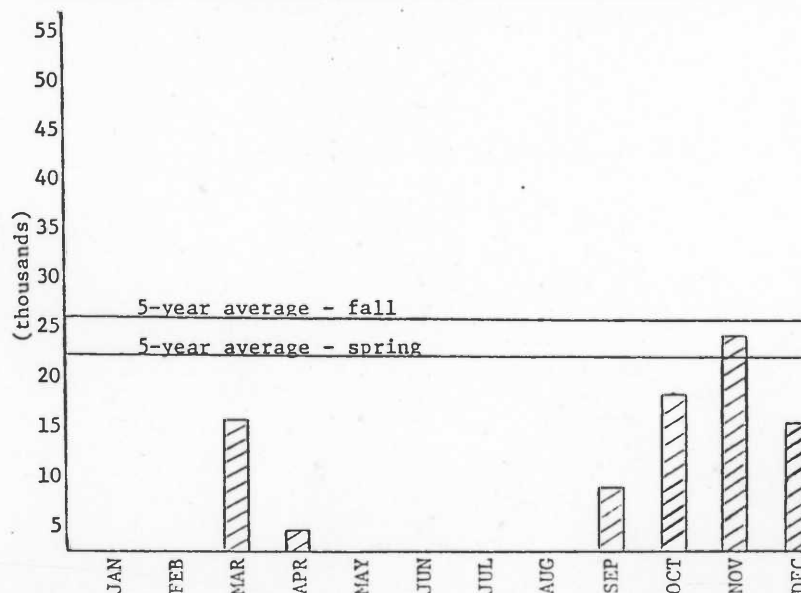
#### a. Swans

The spring tundra swan peak of 330 on March 12th was comparable to last year (500 on April 1). As in other years, several thousand swans could be found in the vicinity of the refuge at some point in the spring migration. Fall swan numbers were also about normal with a peak of 158 on November 19th.

#### b. Geese

About 3,000 geese were still using the refuge during January and February due to mild weather. Goose numbers increased by mid-March and peaked at 16,000 on March 24th. By the second week of April the population had dropped to 3,700. The 1987 spring peak was 27% lower than the five-year average (1982-86).

1987 monthly Canada goose peaks compared to 5-year averages.





The first geese with orange neck collars (TVP birds) started arriving in early September. Goose numbers increased gradually to 6,000 by late September and reached 18,000 by late October. In early November, Canada and snow geese reached peaks of 23,800 and 335, respectively. The 1987 fall Canada goose peak was about 8% below the five-year average (1981-85 ; 1986 fall data deleted due to flood effects). During the fall geese fed on waste grains in Farm Unit 1 and loafed on the Shiawassee River and Pools 1A and 1B. Many geese had left the area by December and the average population for that month was about 10,000.

c. Ducks

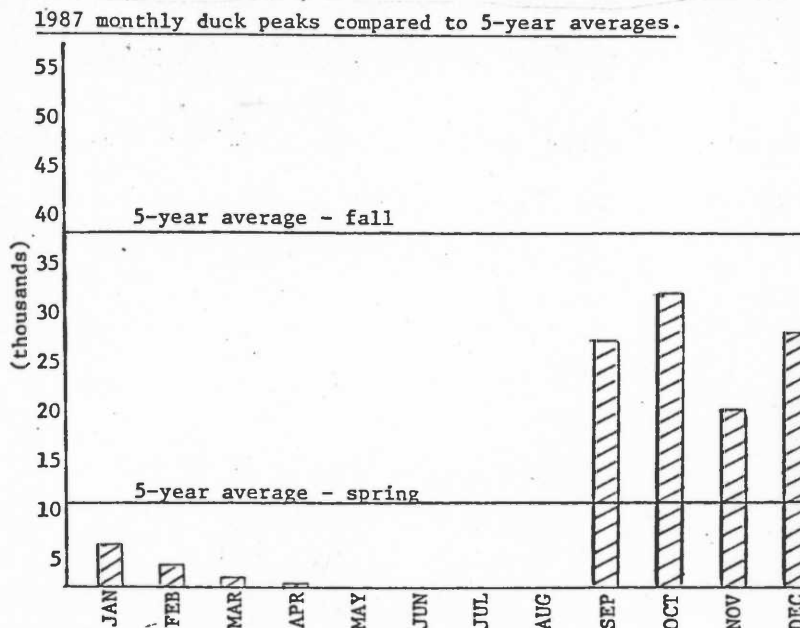
An estimated 2,000 mallards and 300 black ducks were present in January and February. Common merganser numbers were high in January at 4,000 but dropped off to 450 by February. Winter waterfowl populations were higher this year than in the past, probably due to mild weather. The spring peak of 1,700 was about 83% below the five-year average (1982-86). Reasons for the decline are unclear but speculation is that high water may have inundated traditional feeding areas and discouraged use of Shiawassee.



Loafing on Pool 1A. (10/87; RAW)

Blue-winged teal started arriving in August reaching 425 by the middle of the month. By late September duck numbers had risen to 19,000 and the majority of these could be found in Moist Soil Unit 1. Black ducks peaked at 1,870 on September 24th. Green-winged teal numbers were significant with a peak over 5,000 in mid-October. Occasional shovelers, gadwalls, and pintails could also be seen. By late October ducks were more dispersed taking advantage of waste grains in addition to moist soil foods. The peak was reached on October 21st at 32,000 ducks of

which 78% were mallards. This was 14% below the five-year average (1981-85; 1986 data deleted due to flood effects).



In November, many of the dabblers were replaced with diving species. Scattered ringneck ducks, common goldeneyes, buffleheads, ruddy ducks, redheads, scaup, and hooded mergansers passed through the refuge. Common mergansers were particularly abundant on the Shiawassee River numbering 15,000-20,000. Apparently gizzard shad came up area rivers in late fall and become an important food source. Open water became scarce as temperatures dipped below zero in late December and only a few thousand ducks remained.

#### d. Waterfowl Production

Shiawassee was established primarily for waterfowl maintenance and even in a good year production is generally low. The resident flock of giant Canadas (about 400) produced an estimated 150 young in 1987. This is comparable to prior years.

Nest searching was discouraging in 1987. A high school ecology class from St. Charles was recruited and about 65 acres were searched on May 22nd. After several hours of "beating the brush", students were finally rewarded with one predated duck nest. An active nest discovered on June 15th was found predated on the 19th. Use of nest structures on Shiawassee was also disappointing. There was no evidence of nesting in the 14 usable baskets surveyed in 1987. However, the year was not a total loss as pair counts and brood surveys indicated about 185 mallards and 50 wood ducks were produced. This represents a decline of 30% from the 1986 level.

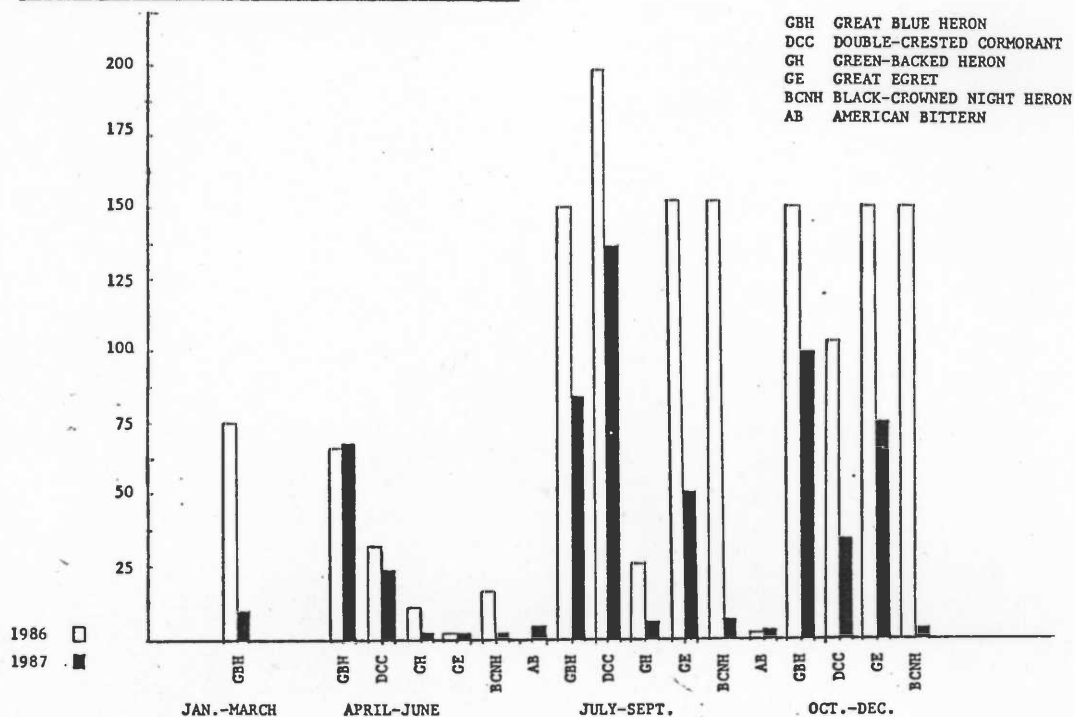
#### 4. Marsh and Waterbirds

For the second year the moist soil units were drawn down in early summer reducing the amount of habitat available for marsh and waterbirds. However,



by the end of July the units were reflooded and avian use improved. Great-blue heron numbers peaked in July instead of September as they did in 1986. Great egrets were first sighted in July while in 1986 they were not observed until mid-August. The fall flood of 1986 provided extra habitat and the fall peak numbers for that year were very high compared to the more normal peak numbers of 1987. Great egret and black-crowned night heron numbers being the most significant change.

1986-87 Quarterly wading/marsh bird population peaks.



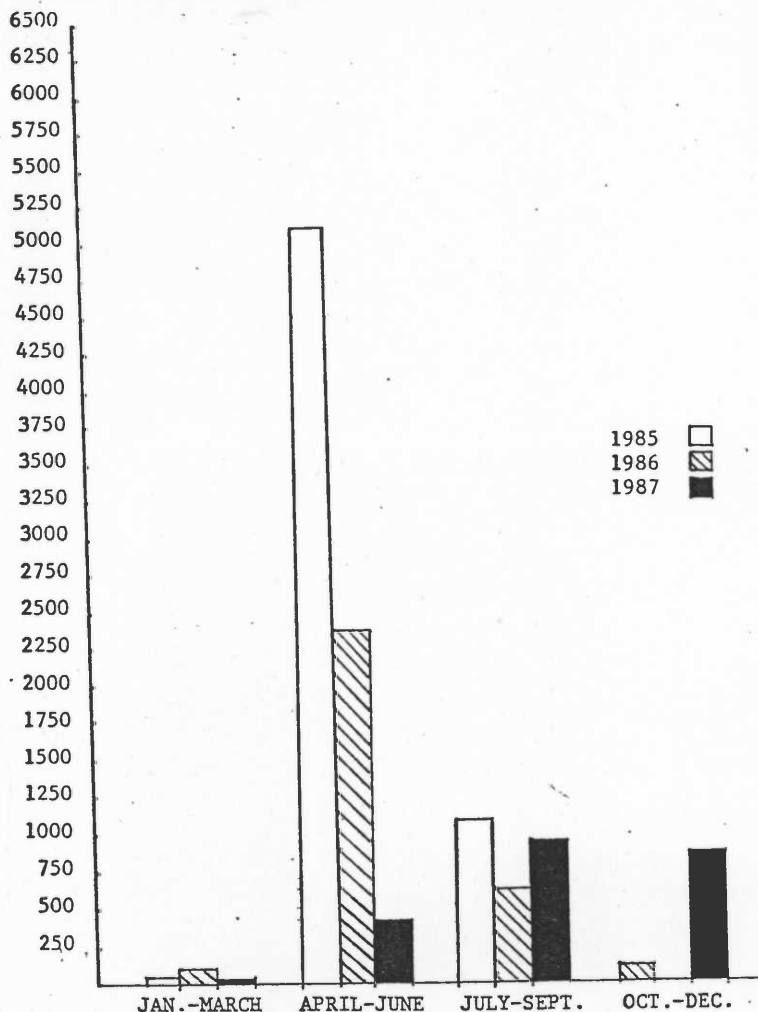
## 5. Shorebirds, Gulls, Terns, and Allied Species

The shorebird numbers during the 1987 spring migration were very low, especially when compared to last year. For the first time in several years large numbers of pectoral sandpipers and dunlins were absent. All areas that normally would attract large concentrations were still under water from the flood of 1986. In June, Moist Soil Units 3 and 4 finally had exposed mudflats but dewatering for planned construction coupled with dry weather caused these areas to completely dry out. Moist Soil Units 1 and 2 had intermittent use between the drawdowns and reflooding (see Habitat Management, Section F.2.e). Thus, spring shorebird use was down again for the second year.

Fall shorebirds were able to utilize the pools this year due to low water levels. Pools 1A, 1B, and 2 were kept low during summer, followed by even lower levels in the fall, exposing large areas of mudflat in Pools 1B and 2. Sandpipers, dowitchers, and yellowlegs used the pools extensively during late summer with large numbers of dunlins observed as late as November. Moist Soil Units 3 and 4 were kept dry for construction while Moist Soil Units 1 and 2 were flooded for waterfowl use.

Overall, gull numbers were down this year compared to last. However, in February herring gulls peaked at 2,500. This early and high concentrated use may have been due to the mild winter.

1985-87 Quarterly shorebird population peaks.



#### 6. Raptors

The most common raptors on the refuge are red-tailed hawks and bald eagles. Turkey vultures are seasonally common. A frequent sight this summer was the the two new eaglets from a successful nest on the refuge. Other species sighted in 1987 included Cooper's Hawk (occasional), sharp-shinned hawk (October), dark phase red-tailed hawk (November, December), rough-legged hawk (March), peregrine falcon (May, September), osprey (July), great-horned owl (occasional), and snowy owl (October, November).

#### 8. Game Mammals

White-tailed deer are the only game mammals of significance on Shiawassee. Out of concern for deteriorated habitat (browse lines) two exclosures were erected in 1987 to monitor long-term habitat changes. Each exclosure covers 1,600 square feet. The first is located in a clear-cut that was formerly bottomland hardwoods. A second begins in an old-field habitat, bisects forest edge, and ends in mature bottomland hardwood forest.



(8/87; JWH)

Deer exclosures.

(8/87; RAW)



Deer population dynamics remain a mystery on Shiawassee NWR. A late winter 1987 aerial survey of the State/Federal refuge complex and adjacent areas resulted in 43 deer counted. While displacement of the herd was obvious during the 1986 100-year flood, no evidence of significant mortality was found. By the spring of 1987 the refuge herd had started to regroup and "windshield" surveys suggested that 100-200 deer were present. Favorable habitat conditions and normal recruitment (twin fawns common) added to the population during the summer. Spotlight counts in July indicated that a population approaching 300 animals was not unreasonable.

During negotiations with the Michigan Department of Natural Resources to establish harvest objectives for the fall deer season, the Shiawassee Flats Hunter and Citizens Association intervened. Citing mismanagement by State



and Federal authorities, the Association demanded closure of the 1987 deer season on the State/Federal complex. After intense debate, and more than a little political pressure, the State conceded to a so-called "compromise" (for several years now the Service has allowed the State to assume a lead role in deer population management as it relates to the Federal refuge). The resulting "non-harvest" is described under Hunting, Section H.8(b).

Since most of Shiawassee was a deer sanctuary in 1987, and because of the preponderance of females, significant population growth can be expected in 1988. To avoid serious conflicts with primary refuge objectives, reasonable deer harvest strategies must be considered in the future. Hopefully, the biological soundness of refuge programs will take precedence over the narrow priorities of special interest groups.

#### 16. Marking and Banding

Black duck banding operations began August 14th with five newly built floating traps placed on Pool 1A. Two of last year's traps were later found washed onto islands (caused by 1986 flood). The first one was repaired and in position by August 16th; the second was operating by August 26th, making a total of seven traps.



Floating trap under construction. (7/87; RAW)

Raccoons immediately became a problem, ripping apart doors to get at the corn and/or ducks. Live-traps were maintained throughout the duck trapping period and were effective in removing problem animals. Trapping success was low the first two weeks but improved by August 30th. However, in early September a nearby barley field was mowed to provide food for waterfowl, causing trapping success to decrease. The remaining season was consistent but still slow. Canada geese used traps for loafing, often washing out the bait. Unlike last year, very few mallards and only one blue-winged

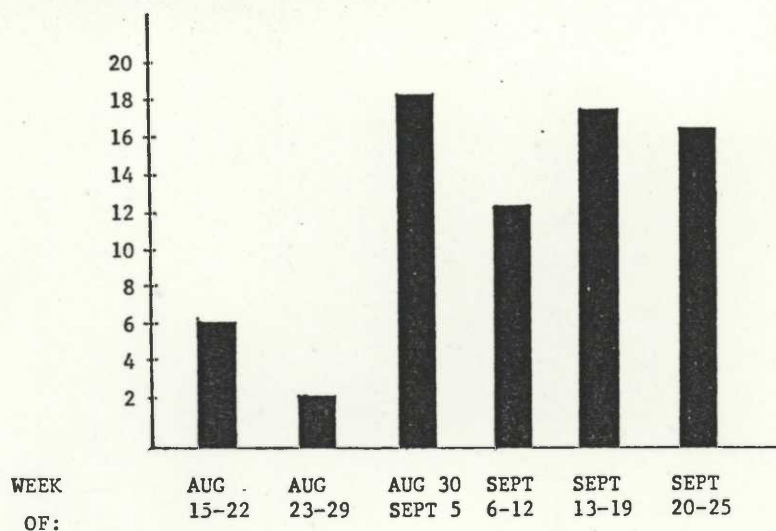
teal were captured. Due to a shortage of staff (personnel were asked to assist the State with the Upper Peninsula goose hunt) trapping ended September 25th with 71 black ducks banded.



Biological Technician Johnson at work. (8/87; RAW)

While this was 42 more than last year, the 1987 total still fell short of the station quota of 200.

1987 Weekly black duck banding totals.





## H. PUBLIC USE

### 1. General

Total refuge visitation in 1987 was down about 35% from the 1984-86 average. While the reasons are not clear, hot, dry spring/summer weather probably discouraged visitation. Pleasant weather and the goose hunt coupled with fall fishing increased public use during October.

#### Monthly Refuge Visitation

<u>Month</u>	<u>1984-86 Average</u>	<u>1987</u>	<u>% Change</u>
January	1,670	3,804	+ 128
February	3,092	2,080	- 33
March	4,480	1,747	- 61
April	5,430	817	- 85
May	5,523	2,418	- 56
June	3,098	1,060	- 66
July	1,821	1,600*	- 18
August	2,684	1,965	- 27
September	4,018	2,159	- 46
October	5,064	6,530	+ 29
November	3,105	1,938	- 38
December	2,758	1,478	- 46
	42,743	27,596	- 35

\*Estimated; actual data missing from file.

#### Total Refuge Visitation (rounded to nearest thousand)

1979 - 32,000	1984 - 66,000
1980 - 41,000	1985 - 29,000
1981 - 53,000	1986 - 33,000
1982 - 59,000	1987 - 28,000
1983 - 71,000	

Traffic counters were installed in entrances to the two main parking areas (Curtis and Stroebe Road lots). Since hikers must use these parking lots to access trails, counters will help monitor trail use. Volunteers have already been determining the number of trail user vehicles versus other vehicles that enter parking areas each day.

### 2. Outdoor Classrooms - Students

The following refuge tours involved structured environmental/wildlife education (conducted by non-Service personnel):

<u>Date</u>	<u>School</u>	<u>Number</u>
5/ 6/87	New Lothrop Elementary Class	30
9/23/87	New Lothrop Elementary Class	29
10/28/87	St. Lorenz High School, Frankenmuth	74
10/29/87	St. Lorenz High School, Frankenmuth	87

#### 7. Other Interpretive Programs

Non-structured wildlife education was provided to:

<u>Date</u>	<u>School</u>	<u>Number</u>
3/27/87	Flint High School class	100
5/ 7/87	Central Michigan University	10
5/22/87	St. Charles High School	16
9/14/87	Chesaning Elementary class	25
9/25/87	Central Michigan University	5
10/ 3/87	Michigan State University	30
10/14/87	Central Michigan University	4



Wildlife Class from Michigan  
State University, (10/87; JWH)

Shiawassee is fortunate to have staff from nearby Green Point and Chippewa Nature Centers ready and willing to conduct refuge tours. Volunteers from the local Audubon Society Chapter are also happy to assist as needed. The following tours/surveys were conducted by non-Service personnel:

<u>Date</u>	<u>Group</u>	<u>Number</u>
3/21/87	Audubon Society	20
4/11/87	Audubon Society	17
5/30/87	Green Point Nature Center	7
9/26/87	Green Point Nature Center	30
10/12/87	Good Shepherd Church	22
10/17/87	Chippewa Nature Center	15
10/24/87	Audubon Society	5
11/28/87	Audubon Society	22

Off-refuge programs were again held to a minimum in 1987. One of the more significant events was a Wetland Ecology/Management Program for teachers, held at Delta College on November 5th. Assistant Manager Weide and Biological Technician Johnson were guest speakers in front of about 70 area educators.

## 8. Hunting

### a. Managed Waterfowl Hunt

Shiawassee is part of the Saginaw County Goose Management Area that includes the State refuge to the west and adjacent private lands. Boundaries formed by State Roads M-13, M-46, M-52, and Fergus Road (see Appendix 2) encompass about 50,000 acres. An annual goose harvest is allocated to the area based on the trend of the Tennessee Valley Canada goose population. The 1987 managed area harvest quota was 4,500, a reduction from the 1983-86 level of 5,000. This year was the first year that the entire Saginaw Bay Area, including Saginaw County, was designated a steel shot zone.

Goose hunting applications and permits were handled from the Lansing Department of Natural Resources office. Hunters had to pay a \$3.00 fee per applicant to the State to cover processing of applications. All information related to seasons, dates, hunting areas, and other regulations on the refuge was incorporated into the State's waterfowl hunting guide. The State provided a computer printout of hunters issued permits for the refuge goose hunt.

Once again the refuge set aside two days for a youth-priority goose hunt. A change from previous years allowed only the youths to hunt and not the supervising adults. Many of the refuge staff received positive feedback about the new idea but on the weekend of the youth hunt only 11 youth hunters participated. This poor showing may have been due to the duck opener being on the same weekend as our youth hunt. Additional news releases may have been helpful.

The 1987 refuge goose hunt ended with a total harvest of 1,263, 1,764 hunter visits, and an average success rate of 0.72 birds/hunter. This contrasts with the 1985 harvest of 900, 1,719 visits, and 0.52 success (flood prevented meaningful hunt in 1986). Success generally remained high throughout the three-week refuge season. Refuge personnel stressed a quality hunt and most hunters responded favorably. Together with the harvest from the State Game Area and adjacent private land, the Goose Management Area quota was exceeded by about 100 birds.



Shiawassee NWR Managed Goose Hunt Data

1978-87

<u>Year</u>	<u>Management Area Quota</u>	<u>Quota Reached</u>	<u>No. Hunting Days</u>	<u>Hunter Visits</u>	<u>Refuge Harvest</u>
1978	2,500	No	28	1,576	415
1979	2,500	Oct, 31	16	1,532	909
1980	3,000	No	28	1,991	692
1981	3,000	No	27	1,410	319
*1982	3,000	Oct, 17	16	1,444	1,409
*1983	5,000	No	31	2,120	1,587
1984	5,000	No	21	1,603	959
*1985	5,000	No	23	1,719	901
1986	5,000	No	14	349	184
*1987	4,500	Yes	23	1,764	1,263

\*Daily bag limit - 2; all other years, daily bag limit - 1.

The Shiawassee River State Game Area administers duck and goose hunting on part of the refuge (Pool 4) under a Cooperative Agreement. The agreement was revised this year to include additional Federal land in Sections 13 and 24 adjacent to and north of Pool 4 for a total of 444 acres. This is the only part of the refuge where ducks may be hunted. Because of its location on the western fringe of the refuge and its proximity to the State Game Area, the Pool 4 area can be more efficiently managed by the State from their St. Charles Field Office. The 996 hunter visits to this area harvested 1,041 ducks and 258 geese; very similar to the results in 1985.

As in 1986, the Service cooperated with the State in collecting data to distinguish giant Canada geese from the Interior subspecies. Information collected from a sample of 200 geese included age, sex, and skull, culmen, wing, and tarsus measurements. Based on analysis of this data, 18% of the harvest in 1987 consisted of giant Canadas.



Collecting  
Morphological Data.  
(10/87; RAW)



One of Several  
Richardson Geese  
Taken.

(10/87; RAW)

b. White-tailed Deer Hunt

Refuge staff met with State Biologists and representatives of the Shiawassee Flats Hunter and Citizens Association, a local sportsman's club, several times before finalizing plans for the 1987 hunting season. As a result of pressure from private interests, deer hunting was cut back considerably from 1986. All hunts (archery, shotgun, and muzzleloader) on the Federal refuge were restricted to land north of the Shiawassee River, approximately 1,200 acres. Last year the permit quota ranged from 75 to 150 for five eight-day hunting periods. In 1987, only 30 permits were issued for each three-day hunt period, a 34% reduction in total hunters. As in 1986, bucks only could be taken.

The State and Federal hunts were again combined under one permit system. A \$3.00 fee was charged per applicant by the State to cover administrative costs. Applications were designed to allow up to four hunters and three different hunt-period choices to be listed on one card. After a random drawing, a successful applicant would receive only one permit for one of the hunt periods. The refuge provided application cards and the State provided hunting permits and computer processing. Permits were valid for open areas on both the Shiawassee River State Game Area and the Federal refuge,

<u>Archery Season Dates</u>	<u>Period Choice</u>	<u>Archery Season Dates</u>	<u>Period Choice</u>
Oct. 1 - Oct. 3	A1	Nov. 9 - Nov. 11	A14
Oct. 4 - Oct. 6	A2	Nov. 12 - Nov. 14	A15
Oct. 7 - Oct. 9	A3	Dec. 1 - Dec. 3	A16
Oct. 10 - Oct. 12	A4	Dec. 4 - Dec. 6	A17
Oct. 13 - Oct. 15	A5	Dec. 7 - Dec. 9	A18
Oct. 16 - Oct. 18	A6	Dec. 10 - Dec. 12	A19
Oct. 19 - Oct. 21	A7	Dec. 13 - Dec. 15	A20
Oct. 22 - Oct. 24	A8	Dec. 16 - Dec. 18	A21
Oct. 25 - Oct. 27	A9	Dec. 19 - Dec. 21	A22
Oct. 28 - Oct. 30	A10	Dec. 22 - Dec. 24	A23
Oct. 31 - Nov. 2	A11	Dec. 25 - Dec. 27	A24
Nov. 3 - Nov. 5	A12	Dec. 28 - Dec. 30	A25
Nov. 6 - Nov. 8	A13	Dec. 31 - Jan. 1	A26
<u>Firearm Season Dates</u>	<u>Period Choice</u>	<u>Muzzleloading Season Dates</u>	<u>Period Choice</u>
Nov. 15 - Nov. 17	F1	Dec. 11 - Dec. 13	M1
Nov. 18 - Nov. 20	F2	Dec. 14 - Dec. 16	M2
Nov. 21 - Nov. 23	F3	Dec. 17 - Dec. 20	M3
Nov. 24 - Nov. 26	F4		
Nov. 27 - Nov. 30	F5		



Deer reported during the 1987 refuge hunts:

<u>Hunts</u>	<u>Visits</u>	<u>Deer Harvested</u>
Shotgun	103	3
Muzzleloader	87	0
Archery	459	0

Only three deer were reported taken during refuge deer hunts in 1987. Actual deer harvest is difficult to document because of the tradition of not requiring hunters to report their kill in Michigan. With the low number of permits issued, open areas restricted to north of the Shiawassee River, and the bucks-only restriction, it is not surprising that only a few deer were harvested.

#### 9. Fishing

Improved water quality and the developing walleye fishery in area rivers has renewed interest in fishing among local sportsmen. Stocking efforts by the State of Michigan have paid off as fishermen jockey for position on the Tittabawassee and Saginaw Rivers in spring and fall. A two-mile stretch of the Tittabawassee River forms the northeast boundary of the refuge. Up to 30 boats could be seen on or immediately adjacent to the refuge during peak use. Fishing for other species can probably be considered marginal. A limit of carp can always be assured however,



Walleye Fishing Tournament on the Saginaw and  
Tittabawassee Rivers, (5/87; SAS)



## 10. Trapping

Refuge furbearer trapping returned to normal in 1987 after the 100-year flood adversely affected the program in 1986.

### 1987-88 Refuge Trapping-related Data

	<u>Ditches</u>	<u>MSU 3/4</u>	<u>Pool 4</u>	<u>Rivers</u>	<u>Totals</u>
Muskrat	375	37	708	146	1,266
Raccoon	9	0	1	40	50
Beaver	2	2	7	0	23*
Opossum	0	0	0	43	43
Fox	0	0	0	1	1
Mink	1	0	0	1	2
Hours	312	9	260	180	791**
High Bid	\$ 415	\$ 220	\$ 511	\$ 385	\$ 1,531

\* Includes 12 beavers taken during 1987 spring season.

\*\*Includes 30 hours from 1987 spring season.

The muskrat harvest was down 46% from the five-year average (1980-85). Low water in 1987 probably had a negative effect on muskrat populations, particularly in Moist Soil Units 3 and 4.



Muskrat Trapping  
Through the Ice.  
(12/87; RAW)

Pool 4, however, was highly productive; another indicator of this unit's potential.

State regulations regarding trapping seasons and target species were in effect on Shiawassee,

## 17. Law Enforcement

Vandalism to station property included damage to a trail bridge rail and a couple of gates bent by cowboy four-wheelers.



Vandalism to New Bridge Across  
Bullhead Creek. (6/87; JWH)

Two permit goose hunters were cited for hunting with shotguns capable of holding more than three shells. Their guns were plugged for 3" magnums but 2-3/4" shells were being used. Violations during the deer season included several cases of hunting in a closed area. Also, a refuge permit trapper reported unauthorized conibear sets along the Cass River in early December. The violator was promptly identified and a violation notice issued.



Illegal Conibear Set.  
(12/87; RAW)



## I. EQUIPMENT AND FACILITIES

### 1. New Construction

A 1984 ARMM's project held over due to high water levels was completed on the north end of Moist Soil Units 3 and 4. The 1,870-foot cross-dike with stoplog water control structure allows the 100-acre marsh to be managed at variable water depths separate from the moist soil units. Pool filling will be by gravity or portable pump from the river; dewatering will be via gravity through the newly installed stoplog structure.



Cross-dike Under Construction.

(8/87; JWH)

Completed Cross-dike Showing Stoplog Structure.

(12/87; RAW)



A habitat improvement project on Moist Soil Units 3 and 4 received construction funding in FY'84 for \$250,000 but has been held up due to high water. During this delay period it was determined that the funding level was insufficient for the entire exterior dike and pumping station; therefore, congressional reprogramming action was necessary. This was accomplished and a bid



was let for a scaled-down low-level dike that will accomplish most of the intended management objectives. The bidder has been selected and construction is scheduled to be completed in FY'88.

## 2. Rehabilitation

This year, due to drier weather and steadily lowering lake/river levels, was more favorable for construction and rehab work than the previous five summers. Rehabilitation activities centered on the 1986 flood damage to equipment, roads, levees, and water control structures. Initial force account work amounting to approximately \$20,000 (excluding labor) addressed high priority items required to keep normal O&M on schedule; i.e., patchwork of dikes, water gates, roads, equipment, etc.



Patched Dike, (7/87; RAW)

## 3. Major Maintenance

A special congressional appropriations of \$800,000 was received for permanent flood damage rehab work. On-site inspection and surveying by regional engineers was completed in the fall. Planning and selection of contractors should be completed in time for completion of most related projects in calendar year 1988. Following is a list of planned projects:

- IPW-59: Miscellaneous culvert rehab - various water control structure up-grading.
- IPW-60: Miscellaneous force account projects - equipment repair and replacement.
- IPW-61: Pool 2 north dike rehab - replace eroded section.
- IPW-62: Misteguay dike rehab - level and raise low sections of dike.
- IPW-63: Spaulding Drain restoration - build and reslope dike on west side of drain.

- IPW-64: Road gravel - resurface some 15 miles of road and parking lots.
- IPW-65: Hiking trail rehab - grade and resurface some 6 miles of hiking trail.
- IPW-66: Miscellaneous ditch cleanout - clean and reslope 10 to 15 miles of drainage ditches.

Above flood damage restoration will be primarily by job contract and, to a lesser extent, equipment-operator contract. Only limited work is scheduled for force account since oversight of contractors will require a major effort.

#### 4. Equipment Utilization and Replacement

An overdue video monitor-playback machine was purchased for VCR tapes. This capability will greatly enhance our station training and staff information possibilities.

A Minolta automatic SLR camera was acquired to replace the broken Pentax camera at this station.

#### 6. Computer System

The refuge staff is gradually getting acquainted with the personal computer received last year. A waterfowl program using the math functions of Word Perfect was written and has proven helpful. This year the refuge received several new pieces of equipment such as a color monitor and proprinter as well as numerous software packages. Hopefully the winter months of 1988 will provide a good opportunity for some additional staff training.

### J. OTHER ITEMS

#### 1. Cooperative Programs

The level of cooperative efforts with Michigan Department of Natural Resources in the deer and waterfowl hunting programs increased. Details of these programs are covered in Section H, Public Use. There was a continuation of the contaminant study which began in 1985 under contract by Ohio State University Cooperative Wildlife Research Unit (Section D.5).

Based on a request from the Saginaw County Mosquito Abatement Commission to increase their B.t.i. treatment to include an additional 400 acres of the refuge, an Environmental Assessment was prepared by the Regional Office. The selected alternative was to expand control and monitor the impact on non-target species. While the Commission sampled invertebrate populations, refuge personnel and volunteers surveyed avian density along transects in treated and untreated areas. This was the first of a three-year monitoring effort.



Picking up another load of  
B.t.i. for treatment of  
refuge forested wetlands  
adjacent to Saginaw.

(4/87; RAW)

### 3. Items of Interest

Canada Surveys: Primary Assistant Manager Skutek was assigned to the annual aerial waterfowl surveys in Canada this year. He teamed up with Flyway Biologist Art Brazda and spent the better part of the summer (May 1st - June 8th and July 1-25th) flying survey transects in northern Manitoba and Saskatchewan. The surveys, which were flown in the boreal forest region of the two provinces, included both breeding pair and production counts. Skutek considers this assignment "one of the high points of his career" and looks forward to working the surveys during 1988 and 1989.



Stan with Survey Plane.  
(5/87; AB)



Refuge Manager Joe W. Hardy was awarded a "Certificate for Outstanding Performance".

Refuge Manager Hardy and Administrative Technician Wolfe each received a "Certificate of Recognition" for 20 years of service.

#### 4. Credits

Introduction; Sections D.2, 4; E.1, 5, 7, 8; and I.1, 2, 3, and 4 - Hardy  
 Sections D.5; E.2, 4, 6; G.1, 2, 3, 8; H.1, 2, 7, 9, 10; J.4; M.1, 2, 3  
 - Weide

Sections A; H.17; J.1 ..... Hardy and Weide

Sections E.3; F.1, 2, 3, 4, 9, 10; J.3 .....Skutek

Sections D.3; G.4, 5, 6, 16; I.6 ..... Johnson

Sections B; H.8 ..... Weide and Johnson

Overall guidance, organization and final editing.....Weide

Typing, organization, photo layout, and final editing.....Wolfe

General "there-when-you-need-them" assistance.....Blazo and Nowosatko

K. FEEDBACK

With orders in hand to report to a reassignment in another region, this is an opportunity to restate my respect for those I have been privileged to serve with over the past six years. Station staff and regional support/supervisory personnel alike, it has been a rewarding personal/professional experience to work with you all. The net gains to our wildlife resource base and the public understanding thereof have hopefully been advanced. Kindest regards,

.....Joe W. Hardy

## M. WILDERNESS AND SPECIAL AREAS ADMINISTERED BY SHIAWASSEE

### 1. Michigan Islands NWR

The Michigan Islands NWR was established by Executive Order 9334 in 1943 as a refuge and breeding ground for migratory birds and other wildlife. These three islands; Shoe and Pismire in Lake Michigan and Scarecrow in Lake Huron are 2, 3, and 7 acres in size, respectively, and are similar in character. As noted during an on-ground inspection in June, increased lake levels continue to inundate land surfaces, especially on Shoe Island in Lake Michigan. In 1965 a fourth island, Thunder Bay, was added to the refuge by the U. S. Coast Guard under a revocable permit (5-year renewal periods). Renewal of the permit was accomplished in 1985. The Service has secondary jurisdiction on 121 acres of the total 168 acres at Thunder Bay Island. Gull Island (230 acres) became the fifth island in the system in 1969 when it was ceded to the Service by the U. S. Coast Guard. The three original islands in the Michigan Islands NWR were designated as Wilderness Areas in 1970 under Public Law 91-504, Stat. 1104. The larger islands are used heavily by migrating and nesting birds. Most notable wildlife use is as nesting areas for species such as gulls and terns, herons, cormorants, and some waterfowl. The islands, which are located from 150 to 200 miles from Shiawassee NWR, are visited annually by a fly-over inspection and/or on the ground to note posting needs, evidence of trespass, and bird use of the area. With assistance from the U. S. Coast Guard, the Lake Huron Islands (Thunder Bay and Scarecrow) were visited on June 10th.



Transportation  
Provided by U. S.  
Coast Guard.  
(6/87; RET)

Following is general biological information collected on that visit.



a. Thunder Bay Island

Ring-billed was the dominant gull species (2,000+ adults in vicinity) with fewer than 500 herring gulls sighted. A major ring-billed gull nesting/nursery area was located at the south end of the island near the lighthouse.



Ring-billed Gull Nesting/Nursery Site. (6/87; RAW)

Dense vegetation and intense protective behavior by the adults complicated the survey. An estimated 2,000-3,000 nests is probably a minimum number. Most eggs had hatched and chicks were present in large numbers.



Ring-billed  
Gull Nest.  
(6/87; RAW)



About 40 herring gull nests were found on the north side of the island.

About 200-300 terns were also present on the island. An estimated 90% of these were common (although Foresters may also have been present) and the rest appeared to be Caspian. Nest density was high, up to 10/100 sq. ft., but the total area involved was probably less than 0.5 acre. Waterfowl included 165 Canada geese (non-breeders), about 25 mallards (including one brood), and fewer than 50 total individuals of the following species: common merganser, blue-winged teal, black duck, pintail, and gadwall. Other species represented were great blue and black-crowned night heron, spotted sandpiper, and turkey vulture.

Old growth habitat, primarily white cedar with yew understory, was prevalent on Thunder Bay Island. The absence of deer was obvious. These unique conditions prompted a suggestion to investigate whether primary jurisdiction of this island could be obtained by the service.



Unique Old-growth Habitat  
on Thunder Bay Island.  
(6/87; RAW)

b. Scarecrow Island

Double-crested cormorants, about 300 adults, were dominant on this small island. Over 200 nests, most containing eggs and a few with young, were counted in the scattered trees. Several hundred adult herring gulls were also present. Scattered gull nests were found on suitable habitat. Black-crowned and great blue herons, white-winged scoters, and small sandpipers were also observed.



Scarecrow  
Island.  
(6/87; RAW)

Double-crested  
Cormorant Nests on  
Scarecrow Island.  
(6/87; RAW)



The Lake Michigan Islands (Gull, Pismire, and Shoe) were inspected on June 22nd. Logistical support was received from the Seney NWR staff.

a. Gull Island

Only herring gulls were observed and nest density appeared to be about half that on Thunder Bay Island (for ring-billed gulls). An estimated 800 cormorants were in the area and all nests were on the ground. Waterfowl included 150 Canada geese, 300 goldeneyes, 100 common and red-breasted mergansers, and 50 mallards. Miscellaneous species included spotted sandpiper and Caspian tern.

b. Pismire Island

Observations indicated about 20 active cormorant ground nests. Young



cormorants were also present. Herring gulls (nesting) and red-breasted mergansers were common.

c. Shoe Island

The navigation structure that was present in 1986 was missing, probably the result of ice damage.

2. Wyandotte NWR

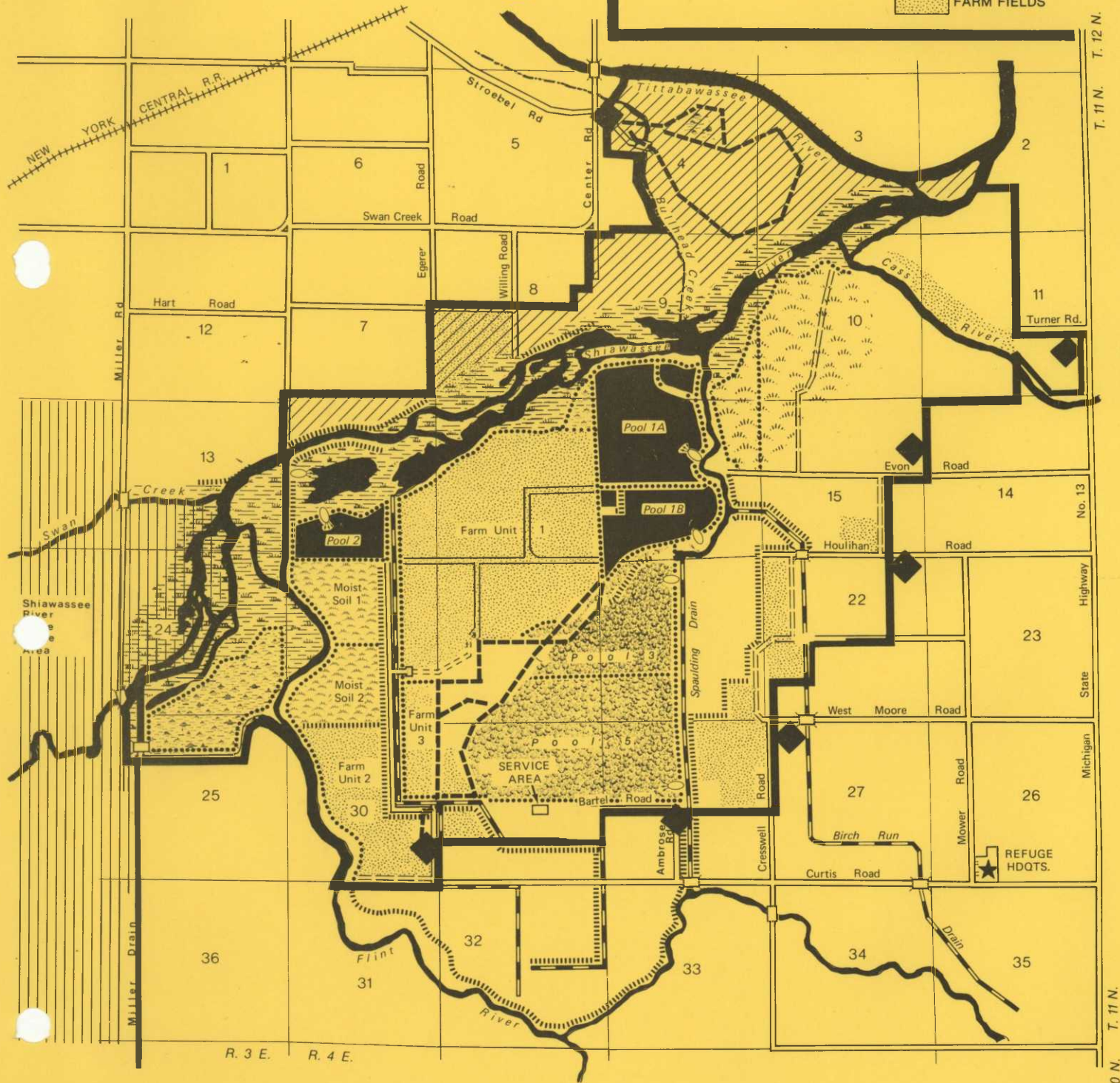
Wyandotte NWR was established by Congress in 1961....."to be maintained as a refuge and breeding place for migratory birds and other wildlife". However, the wording "breeding place" in the authorizing document has little application since production potential is very limited. The refuge is located in the Detroit River just off shore from the cities of Wyandotte and Ecorse and consists of two small islands, Grassy and Mamajuda, and their surrounding water areas approximately to the six-foot contour depth. Total size is approximately 304 acres. Grassy Island consists of approximately 90 acres of upland woodlands and dredge material containment pools.

Mamajuda Island has long had less than one acre above the waterline. Within the last ten years high water levels and erosion have resulted in only an occasional boulder or concrete slab and a metal navigational aid structure above water. The area historically was a major waterfowl concentration area particularly for redheads and canvasbacks; however, urbanization, industrialization, and associated pollutants have destroyed much of the value of this area. Prior to 1982, floating buoys were placed around the islands and were posted in an attempt to eliminate hunting of the area. Boundary posting around the upland portion of Grassy Island is inspected and maintained on an annual basis. Reposting of Grassy Island was accomplished in 1986. Law enforcement, however, is difficult from Shiawassee, some 100+ miles away. DNR Conservation Officers provide occasional routine patrol of the area.

# SHIAWASSEE NATIONAL WILDLIFE REFUGE

## SAGINAW COUNTY, MICHIGAN

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



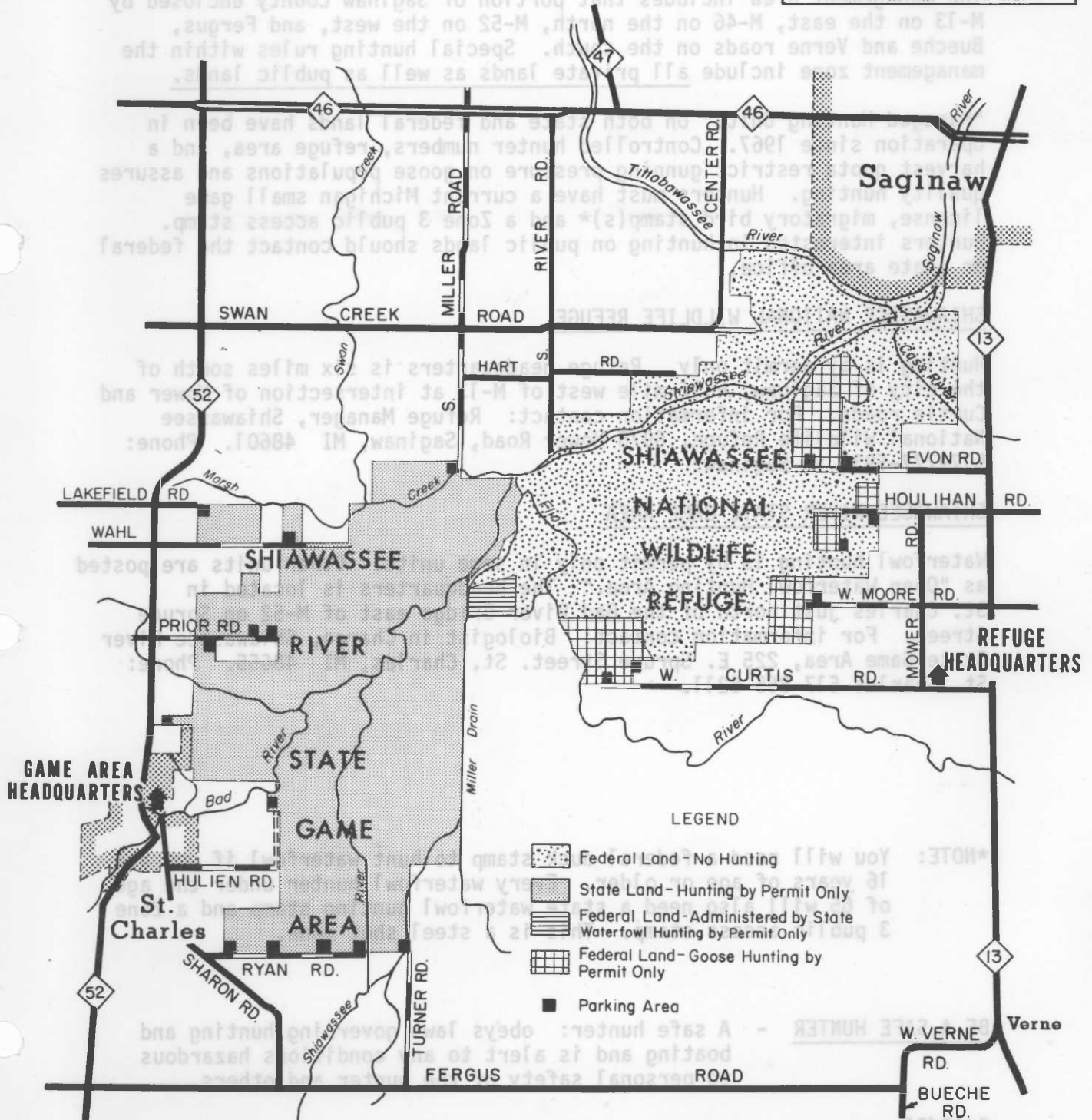
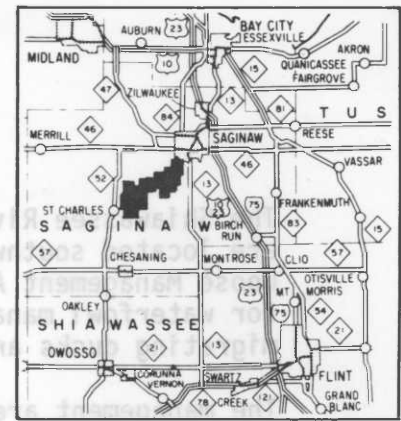
SHIAWASSEE NATIONAL WILDLIFE REFUGE  
6975 MOWER ROAD R R #1  
SAGINAW, MICHIGAN 48601  
PHONE: (517) 777-5930

SCALE IN KILOMETERS  
0 0.4 0.8 1.6 2.4 3.2  
0 1/4 1/2 1 1 1/2 2  
SCALE IN MILES



MICHIGAN  
DEPARTMENT OF NATURAL RESOURCES

# SAGINAW COUNTY GOOSE MANAGEMENT AREA







A map of Saginaw County, Michigan, showing the boundaries of the Goose Management Area. The map includes major roads like M-13, M-46, M-52, and Fergus, and water bodies like the Shiawassee River. The management area is shaded and labeled.

## SAGINAW COUNTY GOOSE MANAGEMENT AREA

The Shiawassee River State Game Area and the Shiawassee National Refuge are located southwest of Saginaw and form the core of the Saginaw County Goose Management Area. State and federally owned lands are dedicated for waterfowl management to provide a major resting and feeding area for migrating ducks and geese.

The management area includes that portion of Saginaw County enclosed by M-13 on the east, M-46 on the north, M-52 on the west, and Fergus, Bueche and Verne roads on the south. Special hunting rules within the management zone include all private lands as well as public lands.

"Managed Hunting Units" on both state and federal lands have been in operation since 1967. Controlled hunter numbers, refuge area, and a harvest quota restrict gunning pressure on goose populations and assures quality hunting. Hunters must have a current Michigan small game license, migratory bird stamp(s)\* and a Zone 3 public access stamp. Hunters interested in hunting on public lands should contact the federal or state area office.

### SHIAWASSEE NATIONAL WILDLIFE REFUGE

Hunting is by permit only. Refuge headquarters is six miles south of the city of Saginaw, half mile west of M-13 at intersection of Mower and Curtis roads. For information contact: Refuge Manager, Shiawassee National Wildlife Refuge, 6975 Mower Road, Saginaw, MI 48601. Phone: 517-777-5930 in Saginaw.

### SHIAWASSEE RIVER STATE GAME AREA

Waterfowl hunting is by permit only in some units. Other units are posted as "Open Waterfowl Hunting Area." The headquarters is located in St. Charles just north of the Bad River Bridge east of M-52 on Spruce Street. For information contact: Biologist in Charge, Shiawassee River State Game Area, 225 E. Spruce Street. St. Charles, MI 48655. Phone: St. Charles 517-865-6211.

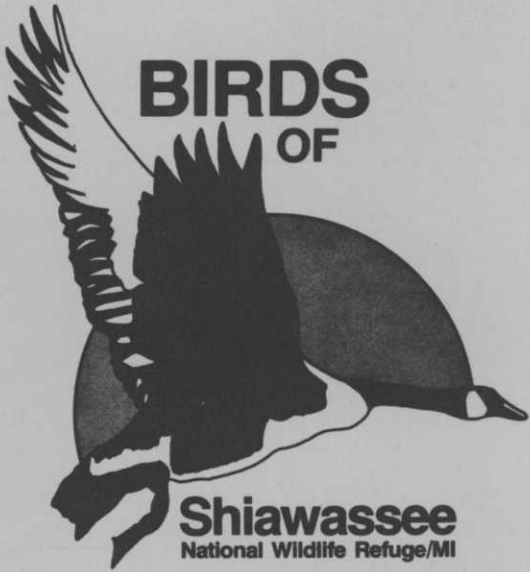
\*NOTE: You will need a federal duck stamp to hunt waterfowl if you are 16 years of age or older. Every waterfowl hunter under the age of 65 will also need a state waterfowl hunting stamp and a Zone 3 public access stamp. This is a steel shot zone.

BE A SAFE HUNTER - A safe hunter: obeys laws governing hunting and boating and is alert to any conditions hazardous to personal safety of the hunter and others.

9/17/84

Hunter Monies Made This Area Possible

# BIRDS OF



**Shiawassee**  
National Wildlife Refuge/MI



## BIRDS

Shiawassee National Wildlife Refuge is located just 6 miles south of Saginaw, Michigan. With the help of a field guide for bird identification and binoculars, a bird watcher will find that Shiawassee is a wildlife oasis in the backyard of a highly industrialized community.

Six rivers traverse the refuge to form the Saginaw River, Michigan's largest tributary. The Saginaw Valley is extremely flat, and frequent flooding of refuge lands occurs during periods of high water levels. The refuge's watershed is spread over 20 counties containing 3½ million acres.

Shiawassee Refuge protects 9,000 acres of shallow marshes, agricultural lands, bottomland hardwoods and grasses. This variety of habitat types attracts 192 species of birds which you may see at some time during the year. Another 14 species are considered accidental to this area and are listed separately.

Bird populations vary according to the season. Spring and fall are excellent times to observe large concentrations of ducks, geese and swans. Season and relative abundance are coded as follows:

PR - permanent resident (present year around)

SR - summer resident (present in spring, summer and fall)

WR - winter resident (present in fall, winter and spring)

MI - migrant (present in spring and fall during migration)

WV - winter visitor (present in winter irregularly)

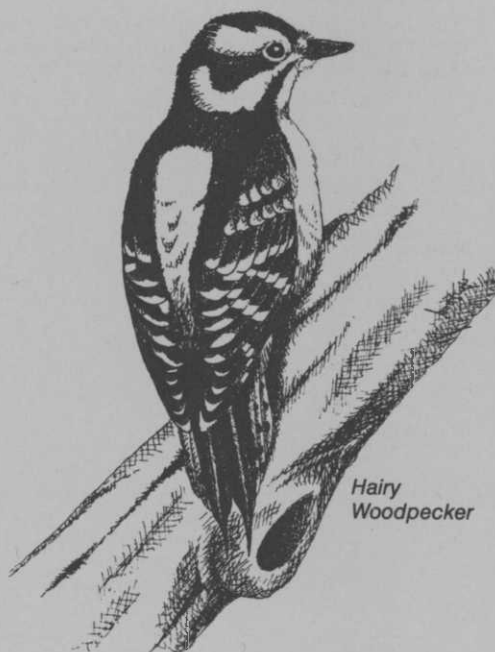
a - abundant (should see in large numbers)

c - common (should see but not in large numbers)

u - uncommon (present but not always seen)

Solid lines = orders

Dotted lines = families



Hairy  
Woodpecker

This bird list is in accordance with the amended American Ornithologists' Union Check List of North American Birds.

Common Loon	MI-u
Horned Grebe	MI-u
Pied-billed Grebe	SR-c
Double-crested Cormorant	MI-u
Great Blue Heron	SR-a
Green Heron	SR-c
Great Egret	SR-u
Black-crowned Night Heron	SR-c
Least Bittern	SR-u
American Bittern	SR-c
Whistling Swan	MI-c
Canada Goose	SR-a
Snow Goose	MI-c
Mallard	SR-a
Black Duck	SR-c
Gadwall	MI-u
Pintail	SR-c
American Green-winged Teal	MI-c
Blue-winged Teal	SR-c
American Wigeon	MI-c
Northern Shoveler	MI-u
Wood Duck	SR-c



Redhead	MI-u
Ring-necked Duck	MI-u
Canvasback	MI-u
Greater Scaup	MI-u
Lesser Scaup	MI-u
Common Goldeneye	MI-u
Bufflehead	MI-u
Ruddy Duck	MI-u
Hooded Merganser	MI-u
Common Merganser	MI-c
Red-breasted Merganser	MI-u
Turkey Vulture	SR-c
Sharp-shinned Hawk	SR-u
Cooper's Hawk	SR-u
Red-tailed Hawk	PR-c
Red-shouldered Hawk	SR-u
Broad-winged Hawk	SR-u
Rough-legged Hawk	WV-c
Golden Eagle	MI-u
Bald Eagle	SR-u
Marsh Hawk	SR-c
Osprey	MI-u
American Kestrel	SR-c
Ruffed Grouse	PR-u
Bobwhite	PR-u
Ring-necked Pheasant	PR-c



Rough-legged  
Hawk

Sandhill Crane	MI-u
King Rail	SR-u
Virginia Rail	SR-u
Sora	SR-u
Common Gallinule	SR-u
American Coot	SR-u
Semipalmated Plover	MI-u
Killdeer	SR-c
American Golden Plover	MI-u
Black-bellied Plover	MI-u
Ruddy Turnstone	MI-u
American Woodcock	MI-u
Common Snipe	MI-u
Spotted Sandpiper	SR-c
Solitary Sandpiper	MI-c
Greater Yellowlegs	MI-c
Lesser Yellowlegs	MI-c
Pectoral Sandpiper	MI-c
Baird's Sandpiper	MI-u
Least Sandpiper	MI-u
Dunlin	MI-u
Short-billed Dowitcher	MI-u
Long-billed Dowitcher	MI-u
Stilt Sandpiper	MI-u
Semipalmated Sandpiper	MI-c
Wilson's Phalarope	MI-u
Herring Gull	PR-c
Ring-billed Gull	PR-c
Common Tern	SR-c
Caspian Tern	SR-u
Black Tern	SR-c
Mourning Dove	SR-a
Yellow-billed Cuckoo	SR-u
Black-billed Cuckoo	SR-u
Barn Owl	PR-u
Screech Owl	PR-u
Great Horned Owl	PR-u
Snowy Owl	WV-u
Barred Owl	PR-u
Long-eared Owl	PR-u
Short-eared Owl	MI-u
Saw-whet Owl	PR-u
Common Nighthawk	SR-c
Chimney Swift	SR-u
Ruby-throated Hummingbird	SR-u
Belted Kingfisher	SR-c
Common Flicker	PR-c
Red-headed Woodpecker	SR-u
Yellow-bellied Sapsucker	PR-u
Hairy Woodpecker	PR-c
Downy Woodpecker	PR-c

Eastern Kingbird	SR-c
Great Crested Flycatcher	SR-c
Eastern Phoebe	SR-u
Willow Flycatcher	SR-u
Least Flycatcher	SR-u
Eastern Wood Pewee	SR-u
Olive-sided Flycatcher	SR-u
Horned Lark	PR-c
Tree Swallow	SR-a
Bank Swallow	SR-c
Rough-winged Swallow	SR-c
Barn Swallow	SR-a
Purple Martin	SR-u
Blue Jay	PR-c
Common Crow	PR-c
Black-capped Chickadee	PR-a
Tufted Titmouse	PR-u
White-breasted Nuthatch	PR-c
Red-breasted Nuthatch	WV-u
Brown Creeper	WV-c
House Wren	SR-u
Long-billed Marsh Wren	SR-u
Gray Catbird	SR-c
Brown Thrasher	SR-c
American Robin	SR-c
Wood Thrush	SR-u
Hermit Thrush	MI-u
Swainson's Thrush	MI-u
Gray-cheeked Thrush	MI-u
Veery	SR-u
Eastern Bluebird	SR-u
Golden-crowned Kinglet	MI-u
Ruby-crowned Kinglet	MI-u
Cedar Waxwing	MI-c
Northern Shrike	WV-u
Loggerhead Shrike	SR-u
Starling	PR-a
Red-eyed Vireo	SR-c
Warbling Vireo	SR-c
Black-and-White Warbler	MI-c
Tennessee Warbler	MI-c
Yellow Warbler	SR-c
Magnolia Warbler	SR-u
Cape May Warbler	MI-u
Black-throated Blue Warbler	MI-u
Yellow-rumped Warbler	MI-c
Black-throated Green Warbler	MI-u
Blackburnian Warbler	MI-u
Chestnut-sided Warbler	MI-c
Bay-breasted Warbler	MI-u
Palm Warbler	MI-u
Ovenbird	SR-c
Northern Waterthrush	MI-c
Louisiana Waterthrush	SR-u

Connecticut Warbler	MI-u
Mourning Warbler	MI-u
Common Yellowthroat	SR-c
Wilson's Warbler	MI-c
Canada Warbler	MI-u
American Redstart	SR-c
House Sparrow	PR-a
Bobolink	SR-c
Eastern Meadowlark	SR-c
Red-winged Blackbird	SR-a
Northern Oriole	SR-u
Rusty Blackbird	MI-u
Brewer's Blackbird	MI-u
Common Grackle	SR-c
Brown-headed Cowbird	SR-c
Scarlet Tanager	MI-c
Cardinal	PR-c
Rose-breasted Grosbeak	MI-c
Indigo Bunting	SR-c
Purple Finch	WV-u
Pine Grosbeak	WV-u
Common Redpoll	WV-u
Pine Siskin	MI-u
American Goldfinch	SR-c
Rufous-sided Towhee	SR-c
Savannah Sparrow	SR-u
Vesper Sparrow	SR-u
Dark-eyed Junco	MI-c
Tree Sparrow	WR-c
Chipping Sparrow	WV-u
Field Sparrow	MI-u
White-crowned Sparrow	MI-u
White-throated Sparrow	MI-u
Fox Sparrow	MI-c
Lincoln's Sparrow	MI-u
Swamp Sparrow	MI-u
Song Sparrow	SR-c
Lapland Longspur	WR-c
Snow Bunting	WV-c

These 14 species are of accidental or rare occurrence and have been recorded only one or two times:

White Pelican  
 Little Blue Heron  
 Cattle Egret  
 Snowy Egret  
 Mute Swan  
 Barnacle Goose  
 White-fronted Goose  
 Oldsquaw  
 White-winged Scoter  
 Black Scoter  
 Peregrine Falcon  
 Merlin  
 Buff-breasted Sandpiper

## Information

Additional information may be obtained by writing Refuge Manager, Shiawassee National Wildlife Refuge, 6975 Mower Road, Saginaw, MI. 48601.

Phone: (517) 777-5930

## Notes

Date \_\_\_\_\_ No. Species \_\_\_\_\_

Time Afield \_\_\_\_\_

Observers \_\_\_\_\_

Weather \_\_\_\_\_

Remarks \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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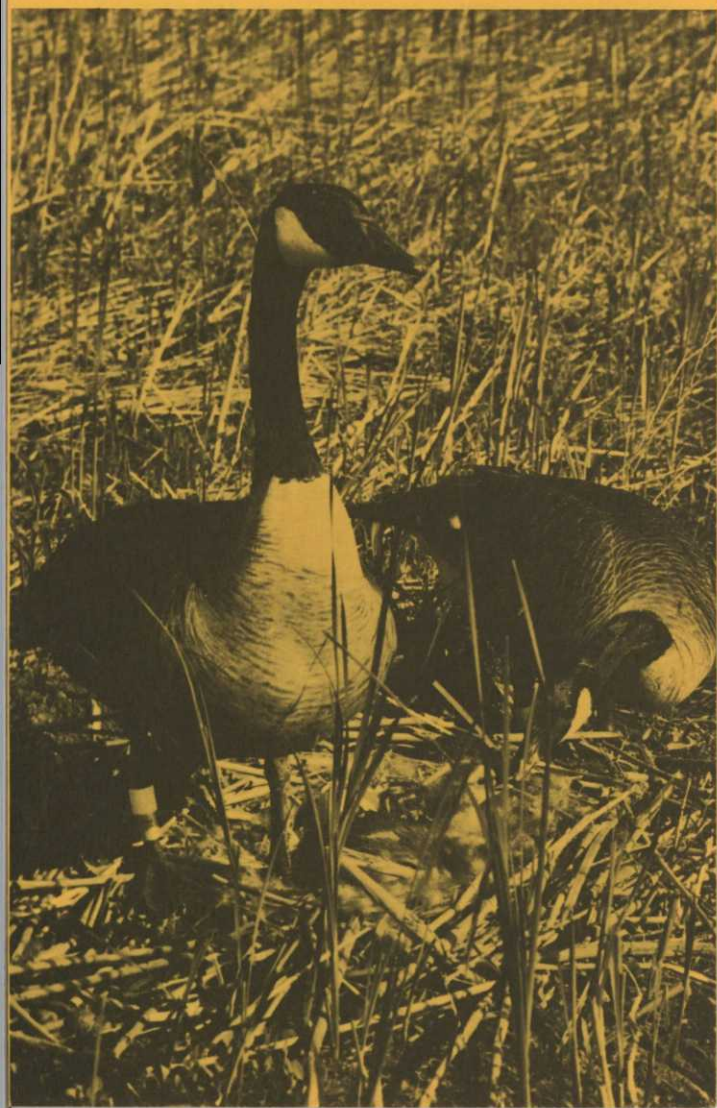
**DEPARTMENT OF THE INTERIOR  
U.S. FISH AND WILDLIFE SERVICE**

RF-31520-2 • MAY 1979





**Shiawassee**  
**National Wildlife Refuge**  
SAGINAW, MICHIGAN





## Welcome to Shiawassee National Wildlife Refuge.

Surrounded by both agricultural lands and industrial development, the refuge is an oasis for thousands of migratory birds and other resident wildlife species. This leaflet will introduce you to the operation and management of Shiawassee.



## Management of the Refuge.

As land development has increasingly reduced the natural breeding and stopover areas for migratory waterfowl, the need for protected oases has risen sharply. To serve the needs of Canada geese and other migratory waterfowl, this refuge was established in 1953. Effective management of the area includes a series of controlled pools, wetlands and croplands. During the peak migration seasons of March-April and September-November, over 25,000 Canada geese and 50,000 ducks make Shiawassee their temporary home. Other birds such as whistling swans and shorebirds flock to the refuge as well. Since 1953, the changes in the landscape have made this refuge a choice area for wildlife to feed, breed, and rest during migration.



## The Migration Puzzle.

The chevron flights to geese, ducks and swans take them to and from their ancestral breeding grounds during migration. The migration "road map" is taught to young birds by the older ones—they learn to recognize and follow landmarks along the route, and to locate known refuges. Shiawassee is one of the stopover oases for waterfowl traveling the Mississippi Flyway.



The specifics of how the birds are able to navigate a route which may cover thousands of miles is still one of the puzzles of migration.

While the major management efforts at Shiawassee are directed toward migratory waterfowl, other members of the refuge community also benefit from the improved food and habitat conditions. Whitetail deer, red fox, raccoons and muskrats are a few of the permanent residents who may sometimes reveal themselves to visitors. Occa-



sionally, the area's more secretive animals, such as beavers, may come into view briefly, and then just as quickly disappear from sight. These are but a few examples of the wildlife species you may observe during a tour of the refuge.

Setting the dinner table for thousands of migratory birds and resident wildlife is no easy task. A cooperative sharecropping effort between local farmers and the refuge helps to provide adequate food sources. Crops raised include corn, wheat, barley, buckwheat and soybeans. The refuge's share (about one-third of the total harvest) is left standing in the fields for the wildlife migrants and residents. With the coming of spring and melting snow, many acres of refuge land are deliberately flooded. These temporary pools and reservoirs create ideal feeding conditions for thousands of spring waterfowl migrants. After the birds leave on their way north, water is removed from the flooded areas by a pump system. The land is then ready for new agricultural and natural crops to accommodate waterfowl during the return migration in the fall.

## The Refuge Oasis.

If you were to get a bird's eye view of Shiawassee, you would see that the refuge is truly an oasis of wetland and woodland, surrounded on all sides by industrial development and commercial cropland. The refuge boundaries protect a traditional resting place for thousands of migratory waterfowl. By managing the oasis for visiting waterfowl and by allowing controlled public access, the refuge serves to meet the needs of both the wildlife community and the neighboring human community.



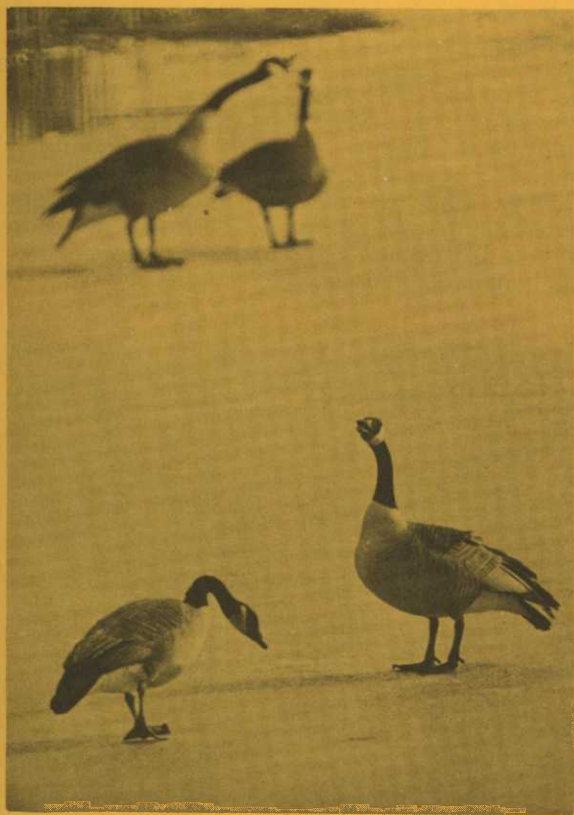


## Refuge Heritage.

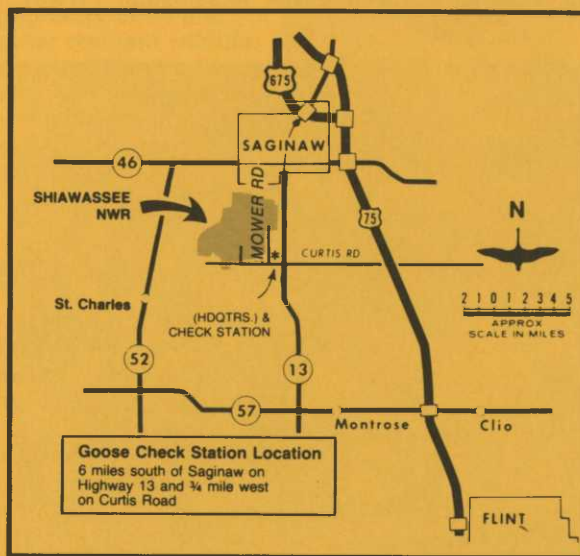
The heritage of the Shiawassee National Wildlife Refuge is one rich in natural and human resources. Historically, the Shiawassee River Flats (including the refuge) and nearby Saginaw Bay have been important waterfowl concentration points. These sites have long provided plentiful feeding, nesting, and resting habitats for geese, ducks and whistling swans.

Closely tied to the refuge's waterfowl heritage is the water resource story. Five area rivers converge to form the Saginaw River, eventually flowing into Saginaw Bay on Lake Huron. (Actually, about one-sixth of Michigan's Lower Peninsula is drained by refuge waterways!) The refuge water system is even affected by wind tides from Saginaw Bay, which alter water levels up to two or three feet.

As far back as 7000 B.C., human communities were attracted to the abundant food resource, trading and transit avenues provided by the Shiawassee River system. Remains of an early 20th Century lumbering industry and coal mining operations may still be seen in the refuge today.



## Refuge Location.



### For further information you may contact:

Refuge Manager  
Shiawassee National Wildlife Refuge  
6975 Mower Road, RR #1  
Saginaw, Michigan 48601  
Phone (517) 777-5930





K. FEEDBACK

With orders in hand to report to a reassignment in another region, this is an opportunity to restate my respect for those I have been privileged to serve with over the past six years. Station staff and regional support/supervisory personnel alike, it has been a rewarding personal/professional experience to work with you all. The net gains to our wildlife resource base and the public understanding thereof have hopefully been advanced. Kindest regards,

.....Joe W. Hardy