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SENEY NATIONAL WILDLIFE REFUGE
HARBOR ISLAND NATIONAL WILDLIFE REFUGE
HURON ISLANDS NATIONAL WILDLIFE REFUGE

ANNUAL NARRATIVE REPORT
Calendar Year 1989

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

SENEY NATIONAL WILDLIFE REFUGE

SENEY, MICHIGAN

ANNUAL NARRATIVE REPORT

Calendar Year 1989

<u>Michael Tansy</u>	<u>3/14/90</u>	<u>Ed Crozier</u>	<u>7/5/90</u>
Refuge Manager	Date	Refuge Supervisor Review	Date
<u>John R. Eadie</u>		<u>4/23/90</u>	
Regional Office Approval		Date	

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INTRODUCTION

Seney National Wildlife Refuge is situated in the east central portion of Michigan's Upper Peninsula equidistant from Lake Superior and Lake Michigan. Located in northeastern Schoolcraft County, the refuge is removed from major population centers. The three nearest major communities are all over 80 miles away.

The 95,455 acre refuge was established in 1935 in what is locally known as the Great Manistique Swamp. Habitats range from marshes and open water areas to hardwoods, spruce and pine forests. There are 21 major, managed impoundments with 7,000 surface acres. The 25,150 acre Seney Wilderness Area, characterized by string bog topography, is located in the northwest corner of the refuge.

Also administered from the Seney National Wildlife Refuge are the Huron Islands National Wildlife Refuge and Wilderness Area, eight small islands located off the south shore of Lake Superior, and the Harbor Island National Wildlife Refuge in Lake Huron. Total acreage is 842 for these two satellite stations.

A. HIGHLIGHTS

- Several personnel changes took place during the year including the manager, two assistant managers, a forester and outdoor recreation planner. E.1 page 13

-A common loon study was initiated. D.5 page 5

-Gentle release techniques work with sandhill cranes continued D.5 page 8.

-No wildfires in 1989. F.9 page 32

-Bald eagle research involving satellite tracking marked birds. D.5 page 10

-A refuge cooperating association, the Seney Natural History Association, expended \$17,250 on needed refuge projects with funds from bookstore sales. H.18 page 58

B. CLIMATIC CONDITIONS

Weather records that include precipitation and temperature for 1989 are from the National Oceanic and Atmospheric Administration (NOAA) cooperative weather station located at the Sney National Wildlife Refuge. The refuge has maintained an official station since January 21, 1939. Refuge personnel record rainfall, snowfall, snow depth, and temperature daily including weekends and holidays. The Administrative Technician transmits this weather data to the NOAA computers via telephone on NOAA's ROSA encoder.

During 1989, the refuge received 25.21 inches of precipitation, 6.84 inches below normal. Temperatures ranged from a high in July of 94 degrees F (2 degrees F above average) to a low of -20 degrees F in February (2 degrees below average). Five months saw below zero temperatures, and 10 months were below freezing.

The 1989 snowfall of 89.9 inches was below the average 113 inches of snowfall for the area. From January through May, the snowfall was well below the normal 69.7 inches for that period with only 38.1 inches being recorded. However, October through December had a heavy snowfall level of 51.7 inches compared to the normal amount of 43.75 inches.

See Section F (Habitat Management) and Section G (Wildlife).

TABLE 1. Weather data, 1989

	Total	Precipitation		Max. Temp.	Min. Temp.
		Normal	Snowfall		
January	1.06	2.05	20.3	45	-17
February	.61	1.60	12.3	38	-20
March	1.45	2.11	3.2	57	-17
April	0.68	2.21	2.3	67	09
May	3.72	2.87		79	26
June	3.17	3.43		84	24
July	2.73	2.87		94	42
August	3.51	3.18		92	41
September	1.97	3.42	.1	81	25
October	2.00	2.88	4.8	71	21
November	2.73	2.98	20.2	46	04
December	1.58	2.45	26.7	33	-13
ANNUAL TOTALS	<u>25.21</u>	<u>32.05</u>	<u>89.9</u>	<u>94</u> (Extremes)	<u>-20</u>

Average precipitation is calculated using monthly readings from 1940 to 1989

C. LAND ACQUISITION

3. Other

An exchange of property between the Fish and Wildlife Service and Michigan Department of Natural Resources that was proposed in 1986, neared completion this year. The exchange involves the Service trading 1,800 acres of irregular boundary west of the Creighton Truck Trail and two parcels of land in Germfask for 1,280 acres of State land adjacent to the wilderness area's southern boundary, and State land that lies between the present refuge boundary and the Manistique River on the southeastern corner of the refuge. A contaminant survey planned for the spring, 1990, must be completed before finalization of the exchange.

D. PLANNING5. Research and InvestigationsSTUDY OF MULTIPLE-LAKE USAGE AND SEXUAL DIFFERENCES IN
THE NESTING ECOLOGY OF THE COMMON LOON, David Evers

Projects's objective and background: This was the first year of research designed to gather information on multiple-lake usage and sexual differences in the nesting ecology of the Common Loon. A color-marked population has now been established to answer these questions. As a continuation of color-marking activities by Seney National Wildlife Refuge (3 immature banded in 1987, and 1 adult and 5 immature banded in 1988) colored leg bands and wing tags were applied in 1989 to 4 adults and 1 immature to allow individual identification. In 1989, 6 family units were known, each with 1 offspring.

Methods: Low-risk capture techniques for adult common loons on their nesting territories are not well known. The following described method was developed during this year's research. It addresses the highly sought question of "how to catch a loon" with a time-efficient mechanism and minimal apparent stress to family units.

Upon location of a family unit at dusk, 1-2 flat bottom sport boats with 4-4.5 hp engines were launched. Complete darkness was awaited prior to any further movement in the boats. Night spot-lighting (400,000-750,000 candlepower) then was used to locate family units and to allow a close approach. Strong hand-held spotlights served to mesmerize the adults. During approach, the engine was set on trolling speed. Within 100-150 feet, several wall calls were broadcasted toward the family unit. The adult's response was to swim directly toward the boat. When the adult was within 10 feet of the boat a salmon net (2 foot hoop) with an 8-foot extended handle was then placed in front of the loon. This elicited a dive response with the loon directly diving into the net. The loon was then lifted from the water, placed in the boat, and taken to the nearest shoreline for color-marking.

Results: Ten nights of experimentation (67 field hours) between July 13-23, 1989, formed the described capture technique. Only 1 adult loon was captured during the first 8 nights. During the final 2 nights, however, 3 adult loons were captured; each within a 15-minute period of boat time. The capture technique is not limited by physical constraints and can be employed on any lake with proper weather conditions and equipment, an understanding of capture timing and technique, and experienced personnel. Several juvenile loons were captured, with one 6-week old individual being color marked. The following table summarizes the employed color-marking scheme (table 2).

TABLE 2. Seney NWR loon color-marking scheme

Date (1989)	Age	Specific Location	USF&WS ¹	Yellow Pigeon Band ^{2,3}	Color Band ⁴	Red Wing Tag ⁵
7/15	Juv.	A2-Pool	-01 (LL)	-- (LL)	Green(RL)	None
7/18	Adult	B-Pool	-02 (RL)	76 (RL)	Green(LL)	Right
7/22	Adult	D-Pool	-03 (RL)	98 (RL)	Red (LL)	Right
7/23	Adult	C3-Pool	-05 (RL)	77 (RL)	Blue (LL)	Right
7/23	Adult	A2-Pool	-06 (RL)	92 (RL)	Yellow(LL)	Right

*Note: Codes LL & RL correspond to left leg & right leg, respectively

1. The USF&WS band series was 758-78101 through 06
2. The yellow pigeon band has black numbers and identifies it to Seney NWR.
3. The USF&WS band was placed above the yellow pigeon band, except for #-02.
4. The color-band marking scheme allows individual identification.
5. The red wing tag is the color-marker designated to Michigan.

Summary of Research Potential: The research that was developed in 1989 will provide a reference for gathering data on adult loon use of more than one pool during the nesting season and sexual differences exhibited in the loon's nesting ecology. This focus alone will provide much needed information for the understanding and management of the species. Additional knowledge also will be available due to the uniqueness of a color-marked common loon population. This includes, in part, individual and population turnover rates, nesting territory fidelity, longevity, first-year breeding age, dispersal of paired loons (e.g. Great Lakes usage by inland territorial pairs), migratory routes, and wintering grounds.

SNY - NR-84-31510-1 AND OHIO COOPERATIVE FISH AND WILDLIFE RESEARCH UNIT (14-16-0009-1539). BEHAVIOR AND SURVIVAL OF CAPTIVE-REARED JUVENILE SANDHILL CRANES INTRODUCED VIA GENTLE RELEASE INTO A MIGRATORY FLOCK OF SANDHILL CRANES--PROJECT SUMMARY THROUGH DECEMBER 1989, Richard Urbanek

In an effort to develop a practical, cost-effective re-introduction technique for the whooping crane (*Grus americana*), the Ohio Cooperative Fish and Wildlife Research Unit used a puppet/costume technique to isolation-rear 16 sandhill crane chicks (*G. canadensis tabida*), which were released on Seney NWR during 1988. During autumn migration 1988, 8 of these chicks migrated unassisted from Seney to Wisconsin; the remaining 8 chicks were transported to Wisconsin in boxes and released. Fourteen chicks subsequently migrated from Wisconsin to Jasper-Pulaski Fish and Wildlife Area, Indiana (J-P), another chick (#7) was transported to J-P in a box, and another (#18) appeared alone in east-central Illinois. Six chicks, including 5 of the 8 that migrated unassisted from Seney to Wisconsin, were located on wintering areas in Florida. Two birds wintered in western Tennessee. Eleven cranes reappeared at J-P during spring migration, including 6 for which the wintering areas were unknown. Ten were found in Wisconsin during spring migration.

At least 15 of the 16 cranes (94%) of the 1988 cohort survived their first winter and were later located in central Wisconsin or the Upper Peninsula of Michigan. At least 11 birds (6 males and 5 females), consisting of all 8 of the chicks that migrated unassisted from Seney to Wisconsin the previous autumn and 3 of the birds that had been transported to Wisconsin in boxes, summered on the Upper Michigan/Ontario study area. One of these latter 3 was the bird that had also been transported to J-P in a box. Eight cranes returned to Seney NWR or the immediate vicinity, 1 summered near the NE corner of the East Unit of the Hiawatha National Forest, and 2 were found on St. Joseph Island, Ontario, in June and near Rudyard in the Upper Peninsula in August.

Crane #18, missing since 7 December 1988 in Illinois, was found with a defective transmitter on 18 October 1989 in central Wisconsin, only 17 km from where he had been released the previous autumn. Unlike in 1988, he subsequently proceeded to J-P, and later migrated southbound along the correct route toward Florida.

Thirteen chicks were isolation-reared and released on Seney NWR during 1989. We successfully induced all of these chicks to migrate from the Upper Peninsula on their own by dividing their flock into smaller groups of 1 to 5 chicks and by use of Crane #7, isolation-reared in 1988, as a migration guide. Seven of these chicks migrated normally to central Wisconsin staging areas with wild birds. A problem chick, released at the staging area near Pickford, 120 km E of the rearing area, migrated to near Pentwater in the Lower Peninsula, became separated from wild cranes, and lost fear of humans. However, we recaptured and transported her to J-P on 18 November, and after rejoining wild birds there she resumed normal crane

behavior. The remaining 5 chicks migrated from Seney on 16 October by following #7 of the 1988 cohort. Unfortunately, I was not available to track these birds on that date, and the group has not yet been relocated. Crane #7 was 1 of the 2 birds that demonstrated significant non-conformity to the wild pattern in the previous migration, and he was probably not a good choice as a migration leader. Twelve and 7 cranes of the 1988 and 1989 cohorts, respectively, were monitored at J-P during autumn migration 1989; these birds departed southbound from 19 November to 21 December.

BALD EAGLE ECOLOGY AND AQUATIC ECOSYSTEMS AT SENEY NATIONAL WILDLIFE REFUGE, William W. Bowerman, IV

During the summer of 1989, nineteen volunteers from across the United States came to Seney to study bald eagles under the direction of William Bowerman, a doctoral student in Environmental Toxicology/Fisheries and Wildlife at Michigan State University. The volunteers were affiliated with Earthwatch, an organization that funds over 105 research projects throughout the world and supplies over 2,000 volunteers to assist in labor intensive research projects.

The Earthwatch teams helped study the food habits of eagles in Michigan, radio-tracked fledglings from both Seney and the Hiawatha National Forest, observed the active eagle nest on the refuge, helped in fisheries and aquatic vertebrate surveys, all in order to give land managers in Michigan a better idea about managing bald eagle habitat.

A new technique in tracking adult bald eagles was also tested at Seney this fall. Satellite transmitters, such as the one pictured below, were attached to an adult eagle on the refuge in September. This adult was a 9 year old female originally from interior Wisconsin, that had set up a territory at Seney.

The adult migrated within 2 weeks to the shore of Lake Michigan and stayed between Blaney Park and Gulliver Lake until late October. On Halloween, the eagle was tracked for the last time as it flew between Manistique and Munising and was last located in Marquette County near the USDA-Forest Service Dukes Experimental Forest.



Figure 1. Researcher Bill Bowerman attaching satellite transmitter to refuge eagle. DAF

6. Other

The following refuge plans were drafted or revised by the staff in 1989:

- a. Long-term Fur Management Plan
- b. ADP Security Plan
- c. ADP Continuity of Operations Plan

E. ADMINISTRATION

Figure 2. Seney NWR staff, 1989

MGT

1.	Michael G. Tansy, Refuge Manager	EOD 1/15/89	GS-12 (PFT)
2.	James W. Kurth, Assn't Manager	Trans 7/2/89	GS-11 (PFT)
3.	Gary C. Heet, Assn't Manager	EOD 9/10/89	GS-11 (PFT)
4.	Denise Fehribach, Assn't Manager	EOD 5/15/89	GS- 7 (PFT)
5.	Sandra M. Siekaniec, Assnt Manager	Trans 4/24/89	GS- 7 (PFT)
6.	Deborah Kesel, Administrative Tech	EOD 10/4/81	GS- 6 (PFT)
7.	Timothy W. Loose, Biological Tech	EOD 5/12/89	GS- 4 (Temp)
8.	Terrence Papple, Maintenance Wrkr	EOD 1/24/69	WG- 7 (PFT)
9.	Lawrence Zellar, Automotive Worker	EOD 12/23/66	WG- 9 (PFT)
10.	James Sibbald, Tractor Operator	EOD 4/24/89	WG- 5 (Temp)
11.	James A. Wethy, Forester	EOD 7/31/89	GS- 7 (PFT)
12.	Rebecca A. McLaren, Refuge Guide	EOD 4/24/89	GS- 5 (Temp)
13.	Paul H. Stoetzer, Social Svs. Aid	EOD 6/12-8/18	GS- 5 (Temp)
14.	Amy Sprunger, Student Trainee	EOD 7/2-9/8	GS- 4 (Coop)



Figure 2a. Ohio State Student Trainee Amy Sprunger

1. Personnel

Project Leader Michael Tansy transferred from Ottawa NWR and reported onboard 1/15/89.

Assistant Manager James Kurth was promoted to GS-12 as Project Leader at Ninigret NWR. Jim departed Seney 7/2/89.

Assistant Manager Gary Heet transferred from Santee NWR to replace Jim Kurth. Gary reported onboard 9/10/89.

Assistant Manager Sandra Siekaniec transferred to Ottawa NWR 4/25/89.

Assistant Manager Denise Fehribach transferred from Ottawa NWR to Seney NWR on 5/15/89.

James Wethy, Forester, reported onboard 7/3/89. Jim transferred from the U.S. Forest Service.

Timothy Loose, Biological Aid, reported onboard 5/12/89, and was still with us at the end of the year.

Rebecca McLaren, Refuge Guide, worked from 4/24/89 to 10/7/89.

James Sibbald, Tractor Operator, worked from 4/24/89 to 11/3/89.

Paul Stoetzer, Social Services Aid, supervised the YCC program and worked from 6/12/89 to 8/18/89.

Student Trainee Amy Sprunger from Ohio State began her first work period 7/2/89 to 9/8/89.

TABLE 3. Personnel staffing since FY 1985

	<u>Full-Time</u>	<u>Part-Time</u>	<u>Temporary</u>	TOTAL FTE's
FY 1989	7	0	4	8.9
FY 1988	8	0	2	8.6
FY 1987	8	0	1	7.8
FY 1986	8	0	1	7.6
FY 1985	7	0	6	8.7

TABLE 4. Summary of 1989 training/activities for refuge staff

Staff	Date	Course	Location
TANSY	2/27-3/3	Law Enforcement Refresher	Ft. McCoy, WI
	3/27-4/5	Fire in Resource Management	Marana, AZ
	3/10	How to Supervise People	Marquette, MI
	9/11-14	Wilderness Conference	Minneapolis, MN
	10/2-3	Firearms Requalification	Shiawassee NWR
	12/1	MultiPlan Computer Program	Marquette, MI
HEET	10/2-3	Firearms Requalification	Shiawassee NWR
	12/1	MultiPlan Computer Program	Marquette, MI
FEHRIBACH	8/14-17	Clear Lake Wetland Conf.	Clear Lake, MI
	9/12-15	Prairie Grouse Conference	Escanaba, MI
	10/23-24	Soc. of Am Foresters/ Wildlife Society Mtg	Grayling, MI
	12/1	MultiPlan Computer Program	Marquette, MI
WETHY	9/12-15	Prairie Grouse Conference	Escanaba, MI
	10/23-24	Society of Am. Foresters & Wildlife Society Mtg	Grayling, MI
	12/1	MultiPlan Computer Program	Marquette, MI
KESEL	1/17	Powerful Communication Skills	Marquette, MI
	3/14-16	ADP Regional Workshop	Twin Cities, MN
	3/14	Advanced WordPerfect	Bloomington, MN
	3/15	Basic R:Base Training	Bloomington, MN
PAPPLE	2/27-3/3	Law Enforcement Refresher	Ft. McCoy, WI
	10/2-3	Firearms Requalification	Shiawassee NWR
SPRUNGER	8/14-17	Clear Lake Wetland Confer.	Clear Lake, MI

Michael Tansy, Deborah Kesel, James Kurth, Lawrence Zellar and Terry Papple received Special Achievement awards for their outstanding performance in 1989.

A Special Achievement award was presented to Sandra Siekaniec for her involvement in the Refuge Manager Training Program, public use program, entrance fee implementation, coordination of volunteers, and assisting in the start-up of the Seney Natural History Association.

2. Youth Program

A non-resident Youth Conservation Corps (YCC) program was hosted at Seney again this year. The five member camp was supervised by Paul Stoetzer, Social Services Aid, and ran from 6/19/89 to 8/11/89.

The following enrollees were selected by random drawing.



Figure 3. Crystal LeGault, Daniel Metcalf, Kenneth Seeley, Kim Tervo, Kim Zellar
MGT

The YCC camp was a tremendous success this year. The enrollees worked through the summer accident free while accomplishing many labor intensive projects.

Work completed included (1) rehabilitation of 1/4 mile section of nature trail; (2) cleared vistas along the 7-mile auto tour route; (3) scraped paint from buildings; (4) maintained refuge lawns, checked wood duck boxes; (5) planted bulrush in Pool J-8 for erosion control, maintained the visitor center; (6) posted boundary along highways M-77, M-28 and the Creighton Truck Trail; (7) assisted with fish sampling; (8) spread hay on Riverside Dike for road stabilization.



Figure 4. One of many YCC projects included transplanting hardstem bulrush to form a protective barrier around eroding dikes.
MGT

A picnic was held August 2 to recognize the efforts and contribution of YCC and volunteers. Breads and hamburgers were purchased by the Seney Natural History Association. Old timers (25+) beat the socks off the YCC youngsters in a game of softball.

3. Other Manpower Programs

Cherry McGahan worked 240 hours during the summer months as part of the Summer Youth Employment and Training Program (SYETP)/Michigan Youth Corps (MYC). Cherry served as an office assistant, gaining valuable work experience in the process.



Figure 4a. Nature trail after rehabilitation.

4. Volunteer Program

The refuge experienced a banner year in terms of the quality and quantity of its volunteer output. A total of 4358 hours were contributed by the refuge's volunteers, including a 50% increase in volunteer hours at the Visitor Center.

TABLE 5. 1989 volunteers

Florence Adler (RSVP)	Elizabeth Anderson (RSVP)
Don Dexter (RSVP)	Madeline Dexter (RSVP)
Richard Dohmen (RSVP)	Kathleen Dunlap (RSVP)
Frank Goodenough (RSVP)	Don Hallman (RSVP)
Al Howell (RSVP)	Mary Howell (RSVP)
Delpha Jones (RSVP)	Charles Jones (RSVP)
Agnes Lixey (RSVP)	Walt Lixey (RSVP)
Harold Peters (RSVP)	Dick St.Martin (RSVP)
Myrtle St.Martin (RSVP)	Les Walstrom (RSVP)
Julie Loose (visitor center)	Ed Miller (visitor center)
Kristi Whaley (visitor center)	
David Evers (loon banding)	
Jean Reuther (sandhill crane research)	
Ted Reuther (sandhill crane research)	
Eileen Stoetzer (sandhill crane research)	
Gary Slater (biological aid)	
Earthwatch (12 volunteers, eagle research)	

*RSVP-Retired Senior Volunteer Program

The volunteer program has become a vital link in the success of our Visitor Center operation. The Retired Senior Volunteer Program (RSVP) volunteers who staff the information desk are an invaluable asset. Their knowledge, enthusiasm, and help have freed the staff from many of the time consuming chores, allowing us to spend more time on program development and implementation.

The sandhill crane research project continues to receive strong volunteer support. A total of 1189 hours were donated by three dedicated volunteers this summer.

Earthwatch made its debut on the refuge this summer, as 12 volunteers from around the country spent several weeks working on bald eagle research.

Three potluck suppers were held during the course of the summer. These gave both the volunteers and the staff an opportunity to get to know one another better. We also took these opportunities to show our appreciation for their help and to recognize their achievements.

5. Funding.

Total funding from all sources for FY 89 was \$415,218. This was a 12 percent decrease from FY 88 and 27 percent decrease from FY 85. Permanent change of station transfers accounted for \$52,509.

There were no ARMMS funds this year and no funding for special projects, construction, or rehabilitation.

A challenge grant for \$7,000 with the Seney Natural History Association made possible the purchase of an interactive laser display for the visitor center. The unit was purchased but due to technical problems will not be delivered until April, 1990.

One piece of equipment, a trailer for transporting heavy fire equipment, was purchased with fire funds that were added to 1261.

Maintenance expenditures including equipment and supplies amounted to 9,421 and included such items as hydraulics, tools, lawn mowers, and miscellaneous.

Quarters receipts (8610) were used to upgrade the quarters and included the installation of carpeting, satellite dish and range.

Fire funds included in 1261, that were expended during the year, totalled \$18,683. Funds were used to purchase a fire trailer, hydraulic hookups, and miscellaneous fire fighting items.

TABLE 6. Five year funding comparison

	1989	1988	1987	1986	1985
OPERATING FUNDS	\$385,700	\$271,811	\$346,650	\$270,500	\$279,850
ARMMS	-----	\$109,661	\$ 56,000	\$135,800	\$262,220
YCC	\$ 8,500	\$ 8,500	\$ 5,250	\$ 18,500	\$ 19,000
QRTS	\$ 14,018	\$ 11,857	\$ 8,601	\$ 12,266	\$ 8,245
CONTAMINANT STUDY	-----	\$ 64,028	\$ 10,000	-----	-----
CHALLENGE GRANT	\$ 7,000	\$ 5,000	-----	-----	-----
ENTRANCE FEES	-----	\$ 1,365	-----	-----	-----
TOTAL	\$415,218	\$472,222	\$426,501	\$437,006	\$569,315

TABLE 7. Fiscal budget - 1989

<u>QUARTERS</u>	
8610	\$ 14,018
<u>O & M FUNDS</u>	
1261	\$261,400
1262	\$139,800
TOTAL FUNDS	\$415,218

6. Safety

The refuge had a very safe year in 1989. Only one accident occurred that resulted in property damage, but no physical injury. The incident involved a collision between a refuge and deer hunter's vehicle on a narrow one lane refuge road that is open to vehicular traffic only during the deer season. There were two main factors that contributed to the accident; one was snow and ice and the other was a blind curve. The latter is very common throughout the refuge road system, and corrective action to increase visibility in blind curves is planned for 1990.

The safety program was reorganized and upgraded during the year. Two safety officers were appointed to organize the program. Safety meetings were held each month and included a film and discussion period. Each meeting was conducted by a different staff person. Topics were chosen that were relevant to situations at Seney. Programs included:

- a. Training session on fire pumps, well points, water use, and fire management
- b. Different types of fire extinguishers and their proper use
- c. Winter driving
- d. Wood stove safety
- e. Lifting techniques to avoid back injury
- f. Snowmobile safety and winter survival

As a safety precaution, radon detectors were installed in all refuge buildings.

7. Technical Assistance

Technical assistance was given to the following agencies:

- a. Michigan Department of Natural Resources about wetland management and dikes in Chippewa County.
- b. Soil Conservation Service about wetland restoration sites in Chippewa County.
- c. Hiawatha National Forest about wetland restoration.

8. Other

The former Young Adult Conservation Corps buildings at the southern end of the refuge continues to be used by the Schoolcraft County Medical Health Department for their adult activity day care program called the Germfask Adult Activity Center. The agreement ensures the upkeep of buildings that would otherwise stand empty and deteriorate.

The activity center took care of janitorial duties at the refuge office and visitor center. This provided participants a work experience while saving the refuge the cost of contractual janitorial services.

F. HABITAT MANAGEMENT

1. General

Wetlands comprised a major portion of refuge management time and planning. The change in management staff this year was accompanied by a change in management emphasis from ducks to a more diversified, holistic approach that also includes eagles, loons and other species.

With the addition of the new forester, the forest management program was also revitalized with ideas for future habitat manipulations.

TABLE 8. Habitat types - Seney NWR

Habitat Type	Acres	% of Total
String Bog	33,391	34
Forested Land	24,252	24
Marsh/Water	18,856	20
Brush	14,525	15
Grass	2,647	3
Roads, Dikes & Developed Areas	1,859	2
Fields	686	1
Islands	130	<1
Total	95,455	100%

2. Wetlands

Refuge wetlands included 21 managed impoundments totalling approximately 7,000 acres, plus thousands of acres of unmanaged marsh/bog/fen habitat. These wetlands made up a small portion of what was known as the "Great Manistique Swamp". In addition to precipitation and local runoff, water sources for these pools are the southerly flow from the Clark and Holland Ditches, and the Driggs River into eastern pools. The Walsh Ditch, Marsh and Ducey Creeks are the principal water sources for Unit III pools. Lastly, the Creighton River flows through five sections of the west edge of the refuge but does not have a major effect on water levels.

The objective of water management was to create habitat diversity while increasing wetland productivity. Management activities that focused at accomplishing this objective include manipulation and monitoring of water levels, aquatic plant surveys and mapping pool vegetation. In 1989, partial drawdowns were conducted on 5 pools. These manipulations were used primarily to produce a food source for migrating waterfowl and increase emergent and submergent vegetation.

Two pools (B1 and H1 pools) were held high to stress and drown the heavy brush invasion in the back of the pools. Several others were held at a uniform level so loon nesting was not disrupted. The water level manipulations accomplished their immediate objectives.



Figure 5. Woolgrass invasion J-G. A dense stand of woolgrass invaded the G-J pool area, reducing its value to waterfowl. MGT



Figure 6. Brush/Reed Canary Grass. Brush and reed-canary grass provide a difficult combination to control. DAF



Figure 7. Red pine/open water. Typical view of Seney marshes-
open water surrounding sand ridges. DAF



Figure 8. Marsh. One of the more productive areas of the
refuge. DAF



Figure 9. The Marsh Creek dike, created in the 1930's and 40's, is losing the battle with high water. Fortunately, most refuge dikes are in far better condition. DAF

3. Forests

Seney contains 95,455 acres of which 22,884 acres are typed as forest habitat. This does not include 1,368 acres reserved as Society of American Foresters National Areas or the 25,150 acre Wilderness Area.

Twenty acres of aspen site preparation for natural regeneration was accomplished in September. By removing residual one inch to five inch aspen and hardwoods, stocking will be increased through stump sprouting. All dead trees, balsam fir, white pine, and hemlock were reserved from cutting. The dead trees provide both hard and soft snags. Non-game wildlife will use snags as a food source, cavities for nesting, and they also serve as raptor perches. The balsam fir and white pine will ensure species diversity and provide cover for wildlife. In reserving hemlock from cutting, a vital thermal area will remain intact, providing cover for whitetail deer. Another factor in saving the hemlock is the potential for a pine martin travel way in this area along the Manistique River.



Figure 10. Two year old aspen regeneration adjacent to the Manistique River watershed. JW

Compartment 2 was type mapped and a presale evaluation completed which indicates a majority of the area was in need of thinning or final harvest. During the field exam several of the stands were deleted due to inaccessibility or low timber volumes. As a result, the Driggs River timber sale will consist of eight cutting units, with an anticipated award date of July, 1990. The purpose of this sale is to create openings, provide for species and age class diversity, regenerate aspen for grouse and woodcock breeding and nesting habitat, and to provide food and cover to upland wildlife. See next page for Compartment #2 map.

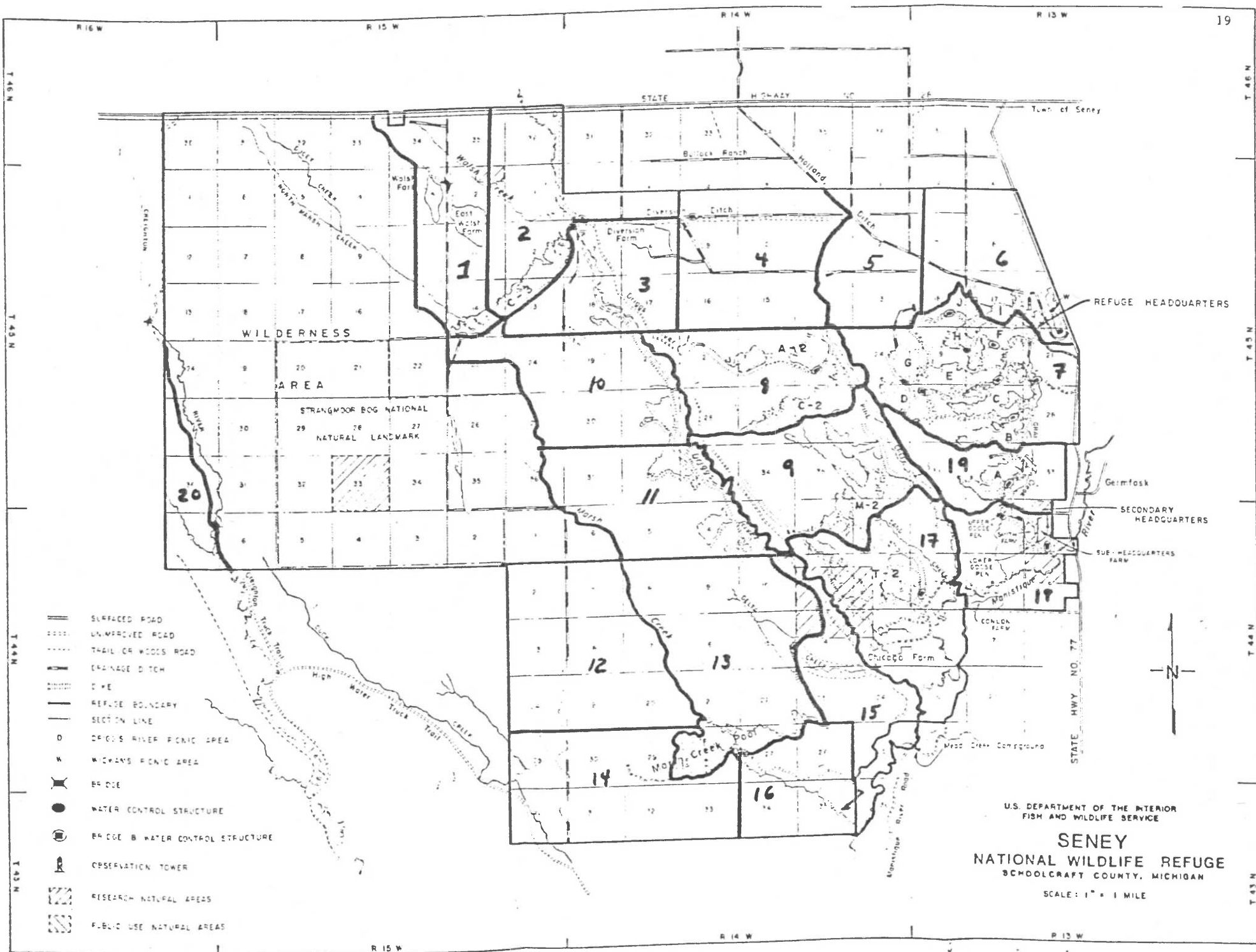


Figure 11. Compartment #2 Map

As a result of the proposed land exchange with the State of Michigan which will transfer all of Compartment 20 and parts of Compartment 14, forest management activities have been curtailed in these compartments.

TABLE 9. Forest management on Seney NWR 1974-1989

Calendar Year	New Permits	Acres Treated	Cords Removed	Revenue Received
1974	2	621	1,251	\$ 6,644
1975	3	687	242	2,287
1976	0	200	1,133	5,011
1977	3	395	1,881	10,858
1978	5	125	1,448	7,095
1979	3	255	879	9,939
1980	0	0	0	0
1981	0	65	0	0
1982	3	920	2,710	1,613
1983	0	690	310	0
1984	3	227	270	2,038
1985	2	41	390	2,843
1986	1	20	100	200
1987	1	0	0	1,496
1988	0	20	163	0
1989	0	0	0	0
TOTAL	26	4,266	10,777	\$50,024

8. Haying

This summer was the last year of the 5-year Hayland Management program. The purpose of the 5-year plan was to upgrade and maintain refuge legume grasslands (415 acres) for the benefit of wildlife, while providing a fairly stable supply of hay for the successful bidder. The fields provided important openings in the refuge's extensive forested land.

To keep the haylands productive, the bidder was required to seed, fertilize, topdress, and fall lime according to the schedule provided by the refuge. The current contract holder followed the schedule well until this year. He was required to topdress 228 acres plus hay (or at least cut and leave) all units. None of the fields were topdressed, and only the most productive areas were cut in late July after the hay and alfalfa peaked nutritionally. This was an excellent growing year for hay on and off the refuge after last year's drought. The farmer cuts many units off the refuge and in most years has just enough to feed his cattle. He had enough hay stored for winter before starting on the refuge, so he only hayed the more productive southern units.

9. Fire Management

There were no wildfires on the refuge in 1989. Twice during the year the fire danger approached extreme, and each time two emergency firefighters were brought on board to provide additional manpower in case of an incident.

Emergency firefighters Jerry Zellar and Alan Duszynski were detailed to Idaho on July 30 to assist in suppressing large wildfires in that state. They were assigned to the U.S. Forest Service crew, Hiawatha No. 1, and saw action for two weeks on the Warm Lake Complex Fire of the Boise National Forest in Cascade, Idaho.

Fire Officer Wethy hosted District 3 personnel of the Michigan Department of Natural Resources for a demonstration on placement of well points during wildfire suppression. A tour of the compound was given, with the highlight being the Go-Tract A.T.V. This impressive piece of fire equipment is equipped with high flotation tracks, a fire plow, and eventually a 500 gallon water supply with pump. Fire suppression cooperative agreements with the Michigan Department of Natural Resources, National Park Service, Pictured Rocks National Lake Shore, and U.S. Forest Service Hiawatha National Forest were renewed for 1989. Seney Refuge continues to have an excellent relationship with all three agencies.

An example of this cooperation was evident on September 19, when the refuge Thiokal was requested by the Michigan Department of Natural Resources and subsequently dispatched to the Walsh Creek Fire, burning on state of Michigan land, one mile north of the refuge boundary. This fire was burning in a wet marshy area and spreading rapidly to the north. Due to equipment failure of the Michigan Department of Natural Resources, the Seney Thiokal was the only equipment working the head of the fire. As night approached, the fire died down, enabling the refuge Thiokal to place several well points, ensuring the next day's fire crews a water supply on this unlined portion of the fire. This strategy worked, and the fire was contained the next morning. Seney Refuge received a letter of thank you from the Area Manager of the Michigan Department of Natural Resources for its assistance, and assuring that if the refuge needs help in the future, the Michigan Department of Natural Resources will help in any way they can.

In late October, the Hiawatha National Forest asked for Seney's assistance on a prescribed burn, proposed on the Rapid River Ranger District. This burn was an attempt to regenerate a cedar clearcut, and the refuge Go-Tract was to be the main water source for emergency and mop-up. Although the weather did not cooperate and the burn cancelled, this is another example of agencies working together in land management.

Several prescribed burns were planned for the spring and fall on the refuge, but weather conditions prevented burning. Seney is planning an expanded prescribed burning program for

1990-1991. Both the Michigan Department of Natural Resources and the Hiawatha National Forest have offered manpower and equipment to help accomplish refuge prescribed fire goals, and provide an extra element of safety.

10. Pest Control

Gypsy moth traps were set out in early July for three different agencies and retrieved in September. No gypsy moths were noted.

Purple Loosestrife is slowly expanding it's range north and was recorded thirty miles south of the refuge. It was introduced to the Upper Peninsula by the waters of Lake Michigan and by unsuspecting flower gardeners. Several large patches can be found along the lakeshore. Fortunately, the refuge water sources enter from the north, so the seed source should not be introduced from that direction.

12. Wilderness and Special Areas

The Seney Wilderness Area and Strangmoor Bog National Natural Landmark was visited by refuge personnel and Park Service Biologist Water Loop. The area was surveyed by helicopter as part of the Park Service's duties to monitor National Natural Areas.

14. Farm Bill Activities

This was a busy year for Farm Bill activities. Much of the summer was spent making initial visits to inventory properties to determine if criteria were present for a wetlands easement.

By year's end, a total of 17 properties were identified to be checked. Seven properties were checked and easements were identified and marked. Six properties had easements approved and recorded; easements encompassed 237.7 areas. Two easements consisted of 65 acres were proposed, but not approved yet.

15. Private Land Wetlands Restoration

The maintenance staff at Seney, consisting of Lawrence Zellar and Terry Papple, transported equipment to Wisconsin, and restored 37 wetlands in 12 days. The Green Bay field office coordinated the effort.

G. WILDLIFE

1. Wildlife Diversity

Seney has a wide diversity of wildlife habitats which range from rare string bogs to common northern hardwoods. However, much of this area tends to be in large blocks of unproductive red and jack pine stands with only a small percentage of mast producing species intermixed. To increase the habitat diversity and therefore the wildlife diversity, the refuge actively maintains its preciously few grasslands and is creating new openings through forest management.

In a recent aspen clearcut along the Manistique River Road, many small residual hardwoods were removed to reduce competition with aspen regeneration. Small conifers were left for winter cover and the larger snags saved for cavity nesters, raptor perch trees and to provide feeding trees for woodpeckers. Another timber sale is planned and marked for next year. The objectives of this sale are threefold:

1. In one portion, a clearcut will decrease red and jack pine while increasing aspen regeneration for grouse/woodcock habitat and improve the beaver/deer food source.
2. In another area, large tree red pine stands will be thinned to increase cherry and other soft mast producing shrubs in the understory.
3. The third area involves thinning a red and jack pine stand and underplanting oak trees to increase hard mast production.

See Section F-3 for more details.

2. Endangered and Threatened Species

Cameron Kepler of Patuxent and four assistants conducted a survey for Kirtland's Warbler on the refuge on June 10. They focused on the portion of the 1976 Seney Burn along Marsh Creek pool road and Delta Creek pool road. They split into 2 teams and conducted 20 5 minute counts along the roads and also hiked through two likely-looking jack pine stands for an additional hour per team. No Kirtland's were found.

It appears that the area is unsuitable for Kirtland's Warbler's for two reasons. First, the Jack Pine is sparsely-distributed on raised ground in a mosaic of moisture-loving habitats, and may be overall, either too fragmented or too damp to support Kirtland's, who prefer a well drained soil. Also, the burn is now 14 years old, and the trees are past the stage where they are attractive to new colonists.

There are currently three active and one inactive bald eagle nests on the refuge. The only productive nest is located along the auto tour route and provided an excellent oppor-

tunity for the summer visitors to observe adults with their two eaglets. The two other nests were active, but produced no young.

Three groups of Earthwatch volunteers assisted in observing the only viable nest on the refuge. Observations began in early July and continued until August 15th. The young were banded, blood samples collected and prey remains analyzed. The project was expanded to include sampling the fish population in refuge pools and invertebrate sampling. (See Section D-5). Earthwatch also observed eagles in Hiawatha National Forest.

The Michigan Department of Natural Resources confirmed that a wolf was killed by a car south of Germfask in August and that one wolf and a hybrid were shot in traps on the Hiawatha National Forest in November. This is the first substantial evidence of wolves being present on or near the refuge for many years. In 1987, a large male was seen dragging a car killed, adult deer from the shoulder of Highway M-28 1/8 of a mile into the refuge's Wilderness Area. Infrequent sightings have been regularly reported on adjacent and nearby State and Forest Service lands.

3. Waterfowl

Weekly waterfowl surveys began the first week of June, with brood counts conducted in conjunction with the survey. The leucocytozoon parasite was not a significant factor in goose production. This is in contrast with 1985 when 35% to 40% of production was lost to the parasite. No pair counts or spring aerial transects were done.

TABLE 10. 1989 waterfowl production estimate.

Species	1987	1988	1989	1995 Objective
Mallards	390	320	213	500
Wood Ducks	150	185	68	250
Black Ducks	310	295	162	350
Ring-necked Ducks	390	410	324	700
Blue-winged Teal	345	210	119	225
Green-winged Teal	5	0	4	50
Canada Geese (Max.)	360	411	346	450
Hooded Merganser	280	222	134	425
Total	2230	2053	1370	3600

The fall Canada geese migration peaked at about 5,054 the second week of October. This included the geese that fed in neighboring fields during the day and roosted on the refuge at night. Collar color and number codes of goose neckbands were recorded in cooperative effort with the University of Wisconsin Cooperative Wildlife Unit.

Total use days for ducks steadily increased from 1985 to 1987, declined sharply during the 1988 drought year, but rose again in 1989. Goose use days rose from 1985 to 1986, but has declined every year since (see figure 12). Figure 13 shows the distribution of total waterfowl use days through the year for the last three years.

One tundra swan spent a month in the Unit II pools during the fall migration, but there was no summer resident this year. Since 1982, the refuge normally has at least one summer resident swan which is usually a second year juvenile.

TABLE 11. Fall peak # for black & ring-necked ducks

Year	Ring-necked	Black
1979	14,145	962
1980	9,075	1,041
1981	11,400	535
1982	11,000	323
1983	1,487	432
1984	1,010	510
1985	1,550	785
1986	1,456	1,535
1987	2,210	410
1988	1,810	451
1989	6,341	422
AVERAGE	5,389	673

Fall peak migration of ring-necked ducks was the highest in eight years while the peak black duck numbers dropped slightly. Unfortunately, the higher ring-necked duck numbers are probably the result of weather and good timing rather than improved management.

WATERFOUL USE DAYS

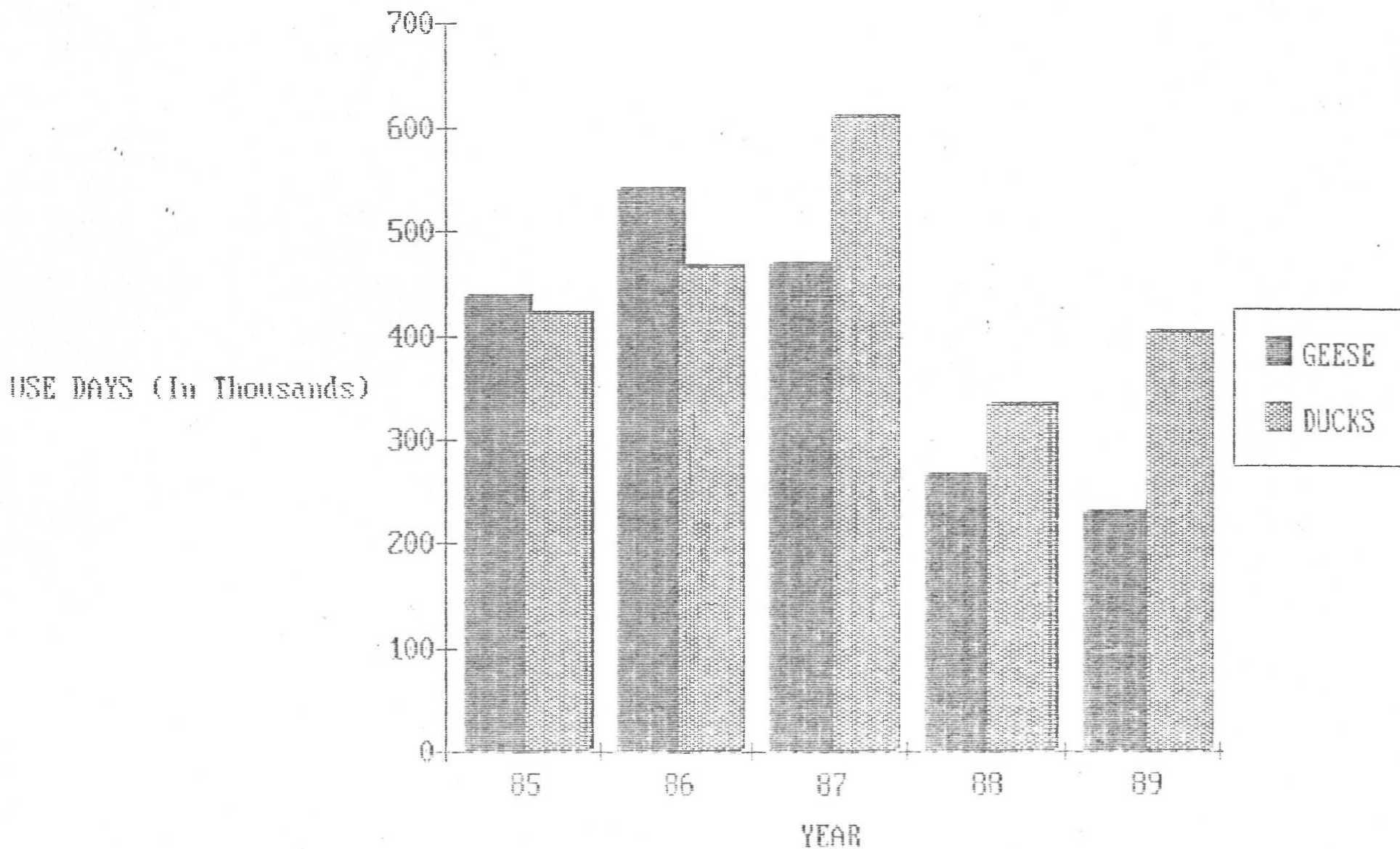


Figure 12. Total use days of geese and ducks from 1985-1989

WATERFOWL USE DAYS BY MONTH

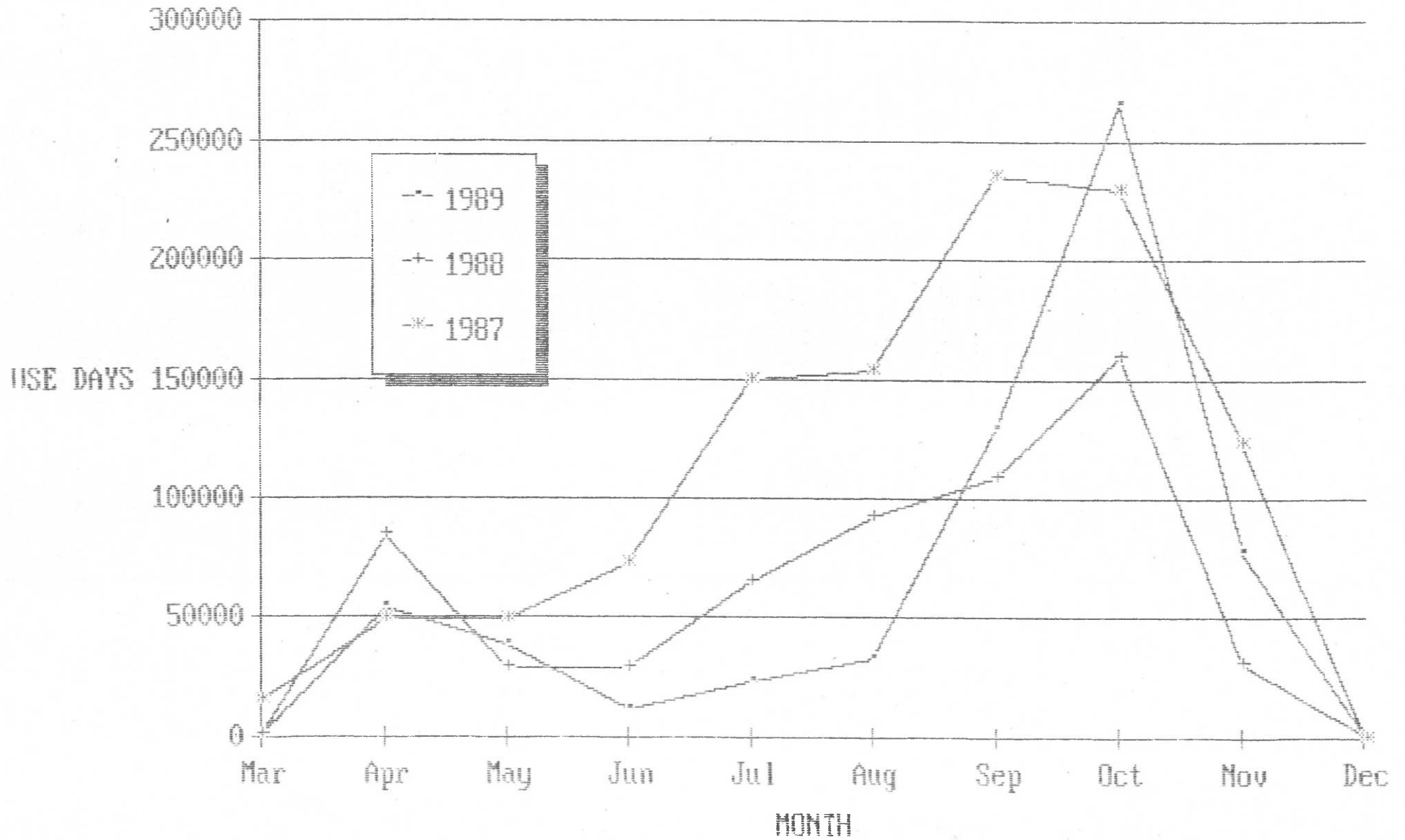


Figure 13. Waterfowl Use Days by Month for 1987-1989

FALL WATERFOWL USE DAYS

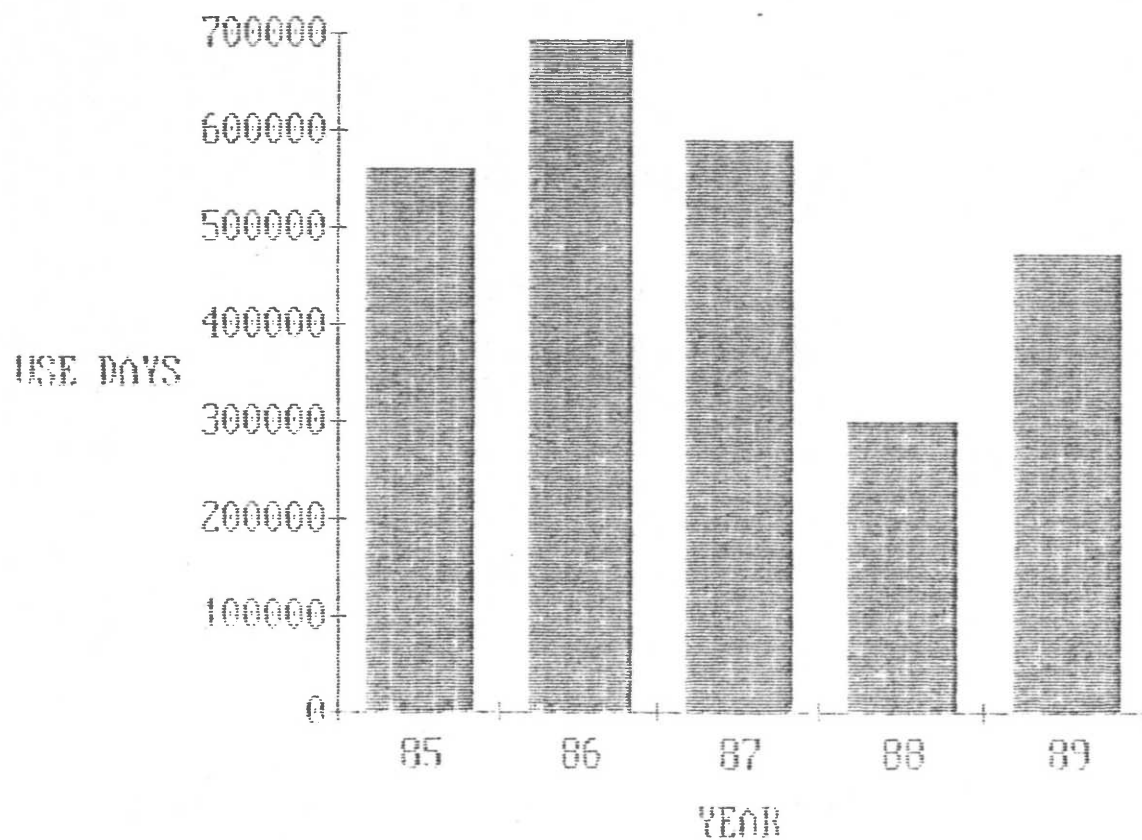


Figure 14. Fall waterfowl use days from 1985-1989

4. Marsh and Water Birds

The sandhill crane research project completed its third year with full funding. (See Section D-5) Sandhill cranes returned to the refuge in March with Crane Research Biologist Urbanek hot on their trail.

The 1 1/2 weeks of rain in early June destroyed several loon nests. Only two loons hatched on time, the remaining 4 pair had only one chick two weeks later. There were no twins. The loon families were found on pools B1, D1, E1, A2, M2, and C3. Marsh Creek and G1 pools both had pairs defending territories, but did not produce young. David Evers, from the Kalamazoo Nature Center arrived July 13th to band adult loons for a future Master's study (see Section D-5). All but two of the chicks were too young to band because of the late hatching date. Five to six weeks is generally the best time to band them because their feathers are developed enough to handle without harm, but not so well developed that they easily elude capture. One chick and four adults were banded after 9 nights out.

5. Shorebirds, Gulls, Terns, and Allied Species

Ten black tern nesting structures were placed in Pool F to entice the birds to nest. Thirty to forty had been observed feeding in the area for a week beforehand. Pairs showed interest in the structures immediately after placement - one pair landed to inspect a structure before the last one was put out! A nest with one egg was discovered upon later inspection. As with the loons, the 1 1/2 weeks of rain wiped out 2/3 of the 20 known nests before they hatched.



Figure 15. Eggs on nesting platform. Ten confirmed nests were built on the platforms. Unfortunately, 6 inches of rain in two weeks destroyed all but two. MGT



Figure 16. Black tern on nest. One of several black terns using a nesting platform built by the refuge. MGT

Woodcock surveys were conducted on two routes. These routes have been run annually since 1965. This year's count on the Driggs River route was the highest in 14 years and almost double the 1988 results. Only one bird was heard on the Sub-headquarters route because of the lack of open areas.

TABLE 12. Male woodcock singing grounds survey.

Year	Number 39 Sub-headquarters		Number 37 Driggs River		Total
	Date	No.	Date	No.	
1973	5/21	1	5/15	38	39
1974	5/21	1	5/15	38	39
1975	5/19	0	5/20	42	42
1976	5/19	3	5/13	21	24
1977	5/13	0	5/12	19	19
1978	5/17	1	5/16	16	17
1979	5/14	2	5/15	13	15
1980	5/15	2	5/01	8	10 *
1981	5/18	0	5/19	11	11
1982	5/11	0	5/01	17	17
1983	5/01	1	5/03	21	22
1984	5/03	0	5/10	19	19
1985	5/01	0	5/03	10	10
1986	5/03	3	5/01	18	21
1987	5/01	0	5/02	15	15
1988	5/04	1	5/03	21	22
1989	5/18	1	5/15	40	41

* Timber sale conducted adjacent to the route following annual census.

6. Raptors

Marsh and broad winged hawks returned to the refuge during April. These along with sharp-shinned hawks, kestrels and goshawks are the most common raptors that nest on the refuge.

An unusually light colored marsh hawk with dark wing tips was sighted for the third year. It has been observed repeatedly around the Chicago Farms - Delta Creek Pool area.

Osprey regularly use the refuge pools to feed but there are no records of them nesting here. An osprey nesting platform was installed on an island in D-1 pool in late July for next year's breeding season. Three trees, two on the island and one on the shoreline, were girdled to provide perching trees. The lack of dead snags in the Unit I pools appears to be a limiting factor in osprey nesting. There is one osprey nest located 3 miles from the refuge on the Fox River.

7. Other Migratory Birds

Due to the lack of personnel around Christmas time, the Audubon Christmas Bird Count was postponed until January 3rd. Results of the count will be reported in next year's narrative.

Only one of the two Mourning Dove Call Count routes was run this year due to inclement weather and a busy staff schedule. Only two doves were heard on the 20 mile route.

8. Game Mammals

The annual bear census conducted in cooperation with the Michigan Department of Natural Resources (MDNR) was discontinued. This research was initiated to determine the best black bear censusing methodology. Pork baits were placed out once a month April - August for seven days. Stations were then checked to determine if a visit was made. Unfortunately, baiting did not work as an index because of the availability of soft mast. The project was expanded in 1987 to include post marking to overcome the natural food bias, but this method was not reliable because the bears prefer older, softer posts (refuge signs posts).

In 1989, the MDNR initiated a study to estimate bear population by marking them with a biomarker placed in baits. Tetracycline, a commonly used antibiotic, is deposited in teeth and produces a permanent mark. The refuge cooperated by placing 5 tetracycline baits and checking them 7 days later. Unfortunately, it rained every day that week removing the anisil scent that was placed to attract the bears. Consequently, no baits were taken. The study was conducted between May 31 and June 24.

The refuge bear population is roughly estimated to be 60 bears or one bear per 2.5 square miles. There was one bear

registered with the MDNR as harvested from the refuge and two taken right on the border this year.

Whitetail deer numbers seem to have dropped during a moderately severe winter. Summer deer observations indicated a decrease of 16% in the population. The refuge's deer winter severity index (WSI) registered 116.4 points (average 102) by the third week in April. But despite the high WSI numbers, the MDR reported that the deer were not completely confined to their yards at Gulliver, Lakefield, and Manistique and that there were no major starvation or dog problems. It should be noted that when the WSI reaches 100 points, deer begin to starve and at 120 points fawn mortality is severe and does begin to absorb their fetuses.

The refuge staff assisted the MDNR in gathering deer physical data from the 1 1/2 year age class for inclusion into MDNR's data base for herd health. The bucks appeared to be healthy and many 6 -9 pointers were observed. However, the majority of the harvest consisted of "fork-horns" (2-4 points). No diseased animals were noted. See Section H-8 for harvest information.

TABLE 13. Deer observation per field man-hour in July, August and September

Year	Hours in Field	Bucks		Does		Fawns		Unknown		Total	
		No.	/hrs	No.	/hrs	No.	/hrs	No.	/hrs	No.	/hrs
1973	588	25	.04	139	.24	89	.15	52	.09	305	.52
1974	355	23	.06	117	.33	78	.22	80	.22	298	.84
1975	232	9	.04	50	.20	14	.06	64	.27	136	.58
1976	275	4	.01	41	.15	21	.08	49	.18	114	.42
1977	353	18	.05	80	.23	51	.14	43	.12	192	.54
1978	228	22	.10	88	.39	83	.36	162	.71	349	.50
1979 ⁶	948	22	.02	140	.15	101	.11	38	.04	301	.32
1980	328	27	.08	138	.42	82	.25	16	.05	263	.80
1981	647	50	.08	141	.22	36	.05	80	.12	307	.47
1982	816	10	.01	125	.15	40	.05	37	.04	196	.24
1983	702	14	.02	91	.13	32	.05	29	.04	166	.23
1984 ⁷	1368	48	.04	211	.07	82	.06	102	.07	443	.32
1985	3062	37	.01	300	.10	109	.04	38	.01	484	.16
1986 ⁸	710	21	.03	81	.09	49	.05	36	.05	187	.26
1987	720	29	.02	158	.17	58	.07	59	.06	337	.32
1988	400	27	.07	275	.69	80	.20	9	.02	391	.98
1989 ⁹	136	2	.01	67	.49	23	.17	19	.14	111	.82

1. On-site inspection of new water control structure accounted for many "Field Man-Hours." Although these hours were unproductive in spotting deer, they were included in calculations, therefore lowering the deer/hour figures.
7. Sandhill crane researchers accounted for approximately 40% of the total "Man-Hours." These hours generally occurred at or near dawn or dusk, therefore raising the total deer/hour figures.
8. Only biological and maintenance crew data used.
9. Only one full-time staff making observations.

Despite a relatively mild winter last year, personal observations of snowshoe hare numbers were down from last year. The decrease could be attributed to the increase of coyotes noted on the refuge. Snowshoes reached their highest numbers during the 1950's, but have lost a major portion of their preferred habitat (aspen and lowland conifer regeneration) since that time. In the past, only a few hares were harvested from the refuge annually and these were generally taken in aspen/conifer stands along the refuge's north boundary.

10. Other Resident Wildlife

No confirmed moose sightings were made on the refuge this year, but refuge staff found moose droppings near the Wilderness Area. In 1987, tracks were seen on the C-3 dike and along the Riverside dike. A large bull was observed crossing Highway M-28 during summer months and was subsequently killed by a truck in August. Sightings in the Upper Peninsula increase every year, and it should be a matter of time before a viable population is established.

Sharp-tailed grouse numbers appear to be down significantly, and two lek counts were negative. Results were more the consequence of late checks (late May rather than the usual late April) and bad weather than the complete absence of grouse. A total of thirty-two birds on 3 leks were tallied in 1988. Sharp-tailed grouse numbers have been steadily declining since the 1940's and 50's because succession is reclaiming the abandoned farm fields they require to survive.

11. Fishery Resources

The Fisheries Management Plan is currently being revised with the aid of Reed Glesne of Fisheries Assistance in Ashland Wisconsin. Trap and gill nets were set in refuge pools to determine fish populations. Several large northern pike and snapping turtles were netted, but the majority of the catch was brown bullheads and a few yellow perch and sunfish mixed in. An electroshocking trip on the few first miles of the Driggs river produced nothing but shiners and red-bellied dace. No brown or brook trout were found. Results of sampling have not been received from Ashland.

Approximately 500 small-mouth bass fingerlings were released in August into the Show Pools to provide better, more diverse fishing and improve the predator - prey relationship.

15. Animal Control

A porcupine that insisted on eating the Adult Activity Center (former YACC building) was trapped and disposed of. Two nuisance beaver permits were issued to the Unit C trappers



Figure 16a. Gill netting to check fish populations.

to remove the colonies plugging the Lower Goose Pen and M-2 Pool water control structures. Three beaver were caught under these permits.

16. Marking and Banding

Two bald eagle nestlings were banded with FWS bands and radio transmitters were attached to their back by eagle researcher Bill Bowerman. Mr. Bowerman also captured one adult of the M-2 Pool pair and fitted it with a prototype satellite transmitter that relayed its location every two days to a computer. The transmitter was expected to last for seven months, but failed after three.

One loon chick and four adults were banded with FWS and colored leg bands in an effort to establish a color marked population of loons. The adults also had red, patagenal bands placed on their wings. The research is being conducted by David Evers of the Kalamazoo Nature Center.

See Section D-5 for more information on both projects.

17. Disease Prevention and Control

With the explosion of the tick population the last two years, concern that Lyme disease may become a major health problem has also increased. All but one permanent staff member, two emergency firefighters and all YCC were tested for Lyme disease at the beginning of the season and results were negative. The YCC crew was retested at the end of the summer, and again results were negative. No deer ticks have been found on the refuge yet.

H. PUBLIC USE

1. General

Overall public use on the refuge was up sharply in 1989. 33,855 people toured the Visitor Center in 1989, an increase of 7,724 more people than in 1988. During the summer we welcomed visitors from all 50 states and many countries. The vast majority of public use was non-consumptive, wildlife oriented recreation and occurred during May through October.

We were fortunate again this past summer, to have the talents of the Retired Senior Volunteer Program (RSVP) to help run our Visitor Center information desk. As these individuals have matured in their knowledge and understanding of the refuge, they have freed up valuable staff time, allowing our public use program to expand. Picture below is Refuge Guide Rebecca McLaren, who along with Biological Aid Tim Loose were hired to staff the visitor center and work with the volunteers.



Figure 17. Refuge Guide McLaren and RSVP Volunteer Harold Peters. RD

After collecting entry fees during the 1988 season, a decision was made to discontinue collection in 1989. In 1988, the only year fees were collected, Visitor Center use declined 3,781 people, the only decline in the past five years.

A total of 11 news releases were issued during the year:

- a. Winter Film Festival Begins January 26
- b. Winter Activities at Seney NWR
- c. YCC Program at Seney NWR
- d. RSVP Volunteers of Seney Refuge
- e. Refuge Visitor Center Open
- f. Summer Activity Calendar
- g. New Refuge Visitor Center Hours
- h. Month Long Celebration of the Common Loon
- i. Photo Contest Winners Announced
- j. National Hunting and Fishing Day
- k. Deer Hunting on Seney Refuge

2,3. Environmental Education - Students, Teachers

This year the refuge made a decision to expand its environmental education program. Our first step was to integrate Project Wild into all our visiting classroom activities. The feedback from the students and their teachers was very positive. One of the side benefits was an increased interest into the availability of a Project Wild workshop. Unfortunately, Project Wild training is not yet available in the State of Michigan. In an effort to help bring the program to the state, the refuge has been working with the Grand Rapids Junior College in their efforts to establish a statewide coordinator. A decision will be made soon, by the state, whether or not to provide financial or personnel support.

A total of 572 students participated in environmental education activities during the months of May and September.

4. Interpretive Foot Trails

An estimated 7,756 visitors hiked the Pine Ridge Nature Trail during 1989. A perennial favorite with our visitors, the trail is in need of a face lift, and the staff will be working on a new interpretive theme and signs for the 1991 season.

In early June the Driggs River Nature Trail was dismantled and removed. The trail had slowly grown in with vegetation, and the infrequent use did not warrant our continued maintenance.

5. Interpretive Tour Routes

The seven mile, self-guided Marshland Wildlife Drive was open from May 15 to October 15. Car count figures showed a total 18,440 vehicles used the tour route during 1989, compared with 13,315 in 1988, 12,068 in 1987, and 12,406 in 1986. The drive was open 15 days earlier in 1989 than 1988.

In December, a new Marshland Wildlife Drive leaflet was submitted to the regional office for approval. In 1990, the number of stops on the drive will drop from the current 20, to only 10. The new leaflet will stress a Wildlife Management theme developed by the regional ORP staff.

The evening guided tour program was reinstated this summer. A total of seven tours were given during the summer season, with 218 people participating. This was a very popular activity, but also very time consuming in terms of staff time.

6. Interpretive Exhibits/Demonstrations

The refuge visitor center was open seven days a week, 9:00 a.m. to 5:00 p.m., from May 15 to September 30, including holidays. During the months of July and August the evening hours were extended to 7:00 p.m.. Visitor center use figures over the last five years are summarized below.

TABLE 14. Visitor center use 1985-1989

<u>YEAR</u>	<u>TOTAL VISITS</u>
1989	33,855
1988	26,131*
1987	29,912
1986	26,617
1985	23,904

* Fees collected

An "Activity Calendar" was developed in May and 18 programs were held during the summer. Activities ranged from guided hikes for birdwatchers, insect enthusiasts, and wildflower buffs, to an evening stroll to listen to the symphony of sounds on a late spring evening. All programs were well received and attended. It is interesting to note that even in a remote community like ours, we often had very knowledgeable people attending the activities. The limiting factor in having a successful program did not always hinge on having an extremely knowledgeable tour guide, but a tour guide capable of channeling the interest and abilities of the people attending.

A winter film festival was held again this year. Films were shown each Thursday evening from January 26 through March 2 at the refuge visitor center. This was the sixteenth consecutive year for the program and it was a welcome event for the rather remote local communities. Total attendance at the films was 284 people.

A month long celebration of the Common Loon was held at the visitor center from August 15th to September 15th. During this period, a traveling exhibit on loons from the Sigurd Olson Environmental Institute, Ashland, Wisconsin, was displayed in the Visitor Center. Two other displays, one on the status of the common loon at Seney, and the second on the current loon research being carried out at the refuge were prepared and displayed. During the final week, Dr. Bill Robinson from Northern Michigan University, presented a slide program at the Visitor Center on the "Status of the Loon in Michigan." This program was well received, and an effort to present similar programs during the coming years will be made.

National Hunting and Fishing day was celebrated at the refuge on September 23. Over 200 people turned out for the annual event which included exhibits and demonstrations by local conservationist and wildlife enthusiasts. Among the exhibits were a woodworking for wildlife display by Joe Hilliard of the Germfask Adult Activity Center; hunting and fishing relics from the past by Dick Dohmen; a duck and fish decoy carving exhibit by Marge and Jim Wicks; a Sea Lamprey display by Mark Dougherty of the U.S. Fish and Wildlife Sea Lamprey Control Station in Marquette, Michigan; and a trapping display by Mark Spencer of the Michigan Trapper's Association.



Figure 18. Paul and Jonathon Stoetzer admire the decoy carvings of local artists, Marge and Jim Wicks. RD

A photo contest was held during the summer, with all entries placed on display at the Visitor Center. All winning entries were awarded prizes donated by the Seney Natural History Association.



Figure 19. 1989 photo contest winning entries. RD

7. Other Interpretive Programs

Refuge staff gave 36 group presentations in 1989. Visiting groups included college and high school students, Michigan DNR, U.S. Forest Service, Canadian Resource Managers, Boy Scouts and Girl Scouts. Only four off-refuge presentations were made.

8. Hunting

Approximately 85,000 acres of the refuge was open to hunting with deer and ruffed grouse hunting drawing the most visits. Other species hunted on the refuge included woodcock, snipe, snowshoe hare and black bear. Sharp-tailed grouse hunting was discontinued on the refuge in compliance with state regulations. Sharp-tailed grouse numbers have been steadily declining for years, and only a remanent population remains. Complete regulations can be found on the hunting map at the back of the report.

Hunting season opened September 15 in refuge Area B (33,000 acres) for ruffed grouse, woodcock and snipe. Hunting pressure on grouse has increased as the population increases. The majority of the birds are taken in the NE corner of the refuge where the best habitat occurs, and M-28 provides fairly easy access.



Figure 20. Terry and Calvin Papple with a small forkhorn Cal got on opening day. GH

The deer hunt was met with the usual enthusiasm as 24 camp permits were issued to 92 hunters. Some of these hunters have been making the trek for 40 years. Hunting pressure was light during the archery season which opened October 1. The 16-day bucks only firearms deer season that runs from November 15 to November 30 attracted the most participants of any refuge hunts. An estimated 50 bucks were harvested, however, since the mandatory check station was discontinued a few years ago, an exact harvest figure was unattainable. Refuge personnel checked as many deer as possible while working deer hunters and also collected biological data for the MDNR.

A blizzard occurred on day 2 - 4 of the hunt, prompting many hunters to pack up and head for home. During the second week of gun season, there was virtually no hunting pressure on the

refuge. No accidents occurred and miraculously, no hunters became lost on the 86,000+ acres open to hunting.

Bear hunting was permitted during the early State season from September 10 to October 31 on Area B, and on both Area A and B during the November 15 to 30 late season. Most bear hunting on the Upper Peninsula is done with the aid of dogs or bait and because both practices are prohibited by refuge regulations, there is very little bear hunting pressure. This year one bear was harvested on the refuge and two along the borders.

9. Fishing

All refuge pools were open to ice fishing January 1 through February 28. Fishing pressure during the winter is extremely light (to non-existent some years) largely because access roads to the pools are not plowed and excellent ice fishing is available on nearby lakes off the refuge.

Summer fishing in the pools was much more popular. The main pools were open to fishing June 1 through September 30. The fishing here was rarely spectacular because shallow pools, low soil fertility and low dissolved oxygen levels in winter limit what can be produced. However, barrow ditches adjacent to dikes concentrate northern pike (especially during drawdowns) making them easier to catch. A few pike over 10 pounds are caught each year. Other species occupying the pools include yellow perch, some sunfish and brown bullhead. Brook and brown trout were planted into the Driggs River in 1982 and 1983, but the majority of the river has not been censused to confirm their continued presence. Few fishermen utilize the river because the only access points are on the borders of the refuge with 13+ miles inbetween.

10. Trapping

The trapping program consists of the yearly permit contract sale of three trapping units totalling approximately 48,500 acres. Seasons and limits follow those of the state except where they conflict with refuge objectives. The general season usually runs October 1 through April 30. Spring trapping is prohibited within one mile of the active bald eagle nests.

The following species may be taken on the refuge:

beaver	weasel	mink
raccoon	skunk	muskrat
red fox (incidental)		coyote

TABLE 15. Trapping bids for the three units

UNIT	1988-89 BID	1989-90 BID
A	\$ 316.00	\$ 361.60
B	\$ 286.00	\$ 176.00
C	\$ 461.61	\$ 471.02
	-----	-----
Totals	\$1,063.61	\$1,008.62

TABLE 16. Reported fur harvest from the units.

SPECIES	1988-89 SEASON	FALL 1989
Beaver	74	58
Muskrat	285	346
Mink	43	51
Raccoon	18	28
Coyote	3	2
Weasel	6	0
Red Fox	0	2

The refuge is closed to the taking of otter, but they continue to be trapped accidentally with beaver sets. Trappers are required to turn in all accidentally caught otters, 1989 saw three otters turned in. The refuge appears to have an abundant supply of otters with as many as 12 seen in one group during 1989. Refuge otters have been used to establish new populations in other states and as such are protected.

11. Wildlife Observation

Thousands of people come to Seney each summer to see wildlife and very few drive away disappointed. Upon arrival, they are immediately greeted by a flock of resident geese that mills around the visitor center and headquarters parking lots

loafing, preening, and taking advantage of the lush grass on the lawns for grazing. The geese are not particularly wary and they provide the public with a rare opportunity to view wildlife at a close range.

During the past year, a 20 power weatherproof telescope was purchased and mounted on a newly constructed, portable observation deck. The entire deck was then placed along the Marshland Wildlife Drive, within view of an active Bald Eagle nest. A fiber embedded, eagle interpretive panel was purchased by the Seney Natural History Association and placed in front of the deck. For many of our visitors, this telescope provided a once in a lifetime opportunity to observe and enjoy our national symbol.



Figure 21. Eagle observation deck.

MGT

Other species of major interest that were commonly observed by visitors included: great blue herons, common loons, sandhill cranes, black terns, ring neck ducks, wood ducks, black ducks, mergansers, deer, beaver, and otter.

One of the greatest drawing cards for the refuge was its diversity. For the patient explorer a wide range of beautiful flowers, trees, aquatic and terrestrial plants and animals could be found and observed.

The refuge has been receiving many requests for tours/ opportunities to observe the illusive yellow rail. Researchers from OSU (Urbanek/Bookhout) and Biological Technician Loose led a lucky few to observe the coveted creature.



Figure 21a. This 2' x 6' fiberglass embedded interpretive panel was constructed by Wilderness Graphics for \$1,800.00.

12. Other Wildlife Oriented Recreation

Camping was again permitted during the firearms deer season with 24 camps registering this year, down from 42 in 1988. Camps are permitted only west of the Driggs River and outside of the Wilderness Area. Typical of deer season just about anywhere, a major winter storm blew in on the 2nd day of the season, bringing with it 12 inches of new snow. By morning of the 3rd day, the temperature had plummeted to near zero. The deer camp is a strong tradition in the north woods and most of the camps were well prepared for the arctic conditions.

Canoeing is a popular activity on the Manistique River, especially since it flows through the Southeast corner of the refuge. Two canoe outfitters located in the nearby town of Germfask were busy throughout the summer months providing rentals and shuttle service to the public. An estimated 850 canoeist paddled through the refuge during the summer months.

Cross-country skiing and snowshoeing were permitted throughout the refuge during the winter months. In the past most visitors used the marked trails near headquarters where parking was provided. In December of 1989 a new groomed ski trail system was created at the old sub-headquarters site. Response to these new trails was tremendous, with more people skiing the trails in the first month of operation than normally ski all winter long. The new trail, was simply laid out on top of the refuge road system. Needless to say, it is very flat and susceptible to drifting. Our hopes are that we will be able to develop a series of loops during the next few years, which will incorporate some of the natural terrain and diversity found in this area. Our ultimate goal is to have a ski trail which includes both intermediate and advanced loops, and a beginner's loop which will be posted with interpretive signs.



Figure 22. Cross country ski area.

TL

14. Picnicking

The Wigwam picnic area received a total of 17,838 visitors in 1989. The Driggs River picnic area on M-28 was closed when the state constructed a new rest facility just a few miles east of the picnic area.

16. Other Non-Wildlife Oriented Recreation

A few individuals were seen picking morel mushrooms and raspberries in 1989. Overall, berry picking was slow and blueberry production was down, due to the dry, spring and late summer weather.

17. Law Enforcement

The effective enforcement of regulations on a 95,000 acre refuge requires a substantial investment of time. Our staffing does not allow for such, therefore, enforcement efforts are aimed at the prevention of violations through high visibility patrols during peaks of anticipated problems. While this approach does not have the same deterrent value as the apprehension of violators, it does serve to minimize potential problems.

Someone set a stump on fire just outside the visitor's center Memorial weekend. Luckily a conscientious visitor dosed the flame with water from their coolers and canteens.

Our park ranger also reported that wood chips were being placed in the visitor center restroom doors (outside entrance) to make them appear to be locked so that entry could be made into the building later. Patrols of the area did not turn anything up.

Two citations and one warning were issued during the year. One citation involved fishing in a closed area. A vehicular trespass on the auto tour route after dark got a warning. The second warning was issued to a hunter hunting deer over bait (apples). The State allows hunting deer and bear over bait; the refuge does not.

Refuge Manager Tansy and Assistant Heet assisted Law Enforcement, Ann Arbor, Michigan in a migratory waterfowl enforcement project at Sault Saint Marie on October 6-8 for the waterfowl opener. The enforcement effort was a tremendous success and resulted jointly in 28 violations by 24 subjects, and totaled \$5,050 in Federal fines. The State filed additional charges.

18. Cooperating Associations

The year 1989 marked the second year that our visitor center bookstore was operated by the Seney Natural History Association (SNHA). SNHA was founded in the spring of 1988 with the help of a \$10,000 interest free loan from the National Fish and Wildlife Foundation, and the donation of the 1987 end of year stock by the Lake States Interpretive Association

(SNHA's predecessor). In only two years, the net return (donations) to the refuge from the bookstore profits increased from \$1,660 in 1987 to \$17,250 in 1989. Gross sales for the 1989 season totaled \$40,113.

One of the primary reasons for the dramatic increase in the bookstore profits and donations to the refuge, was the leadership and guidance of the SNHA Board of Directors:

C.R.(Dick) St.Martin, President
Dick Dohmen, Secretary
Harold Peters, Treasurer and Business Manager
Paul Stoetzer, Vice President
Don Dexter, Director
Albert Howell, Director
Myrtle St.Martin, Director
Les Walstrom, Director

In May of 1989 they were presented with an Outstanding Contribution Award by the Regional Office. The dedication and volunteer services of Harold Peters, the Treasurer and Business Manager of the SNHA, has undoubtedly served as a catalyst for their success. During the summer of 1989 Mr. Peters donated 496 hours of service. He is seen below during the celebration of his 85th birthday.



Figure 23. Volunteer Harold Peters 85th birthday. TL

The gross sales and donations to the refuge by the cooperative associations for the past three years are summarized below.

TABLE 17. SNHA gross sales and donations(\$), 1987-1989.

Year	Gross Sales	Profit Donations(\$)*
1989	\$41,953	\$17,250
1988**	\$30,753	\$10,165
1987	\$24,603	\$ 1,660

* Indicates monies donated to the refuge, but not necessarily spent in that calendar year.

** First year of operation of the Seney Natural History Association. Prior to 1988, the book store was operated under a cooperative agreement with the Lake State Interpretive Association.

The refuge and its visitors have received many benefits, both direct and indirect from the operation of the bookstore. For our visitors, their experience is often enhanced with the purchase of a field guide or resource book. The value of the knowledge learned or shared from their purchase is difficult to quantify, yet undoubtedly has a positive effect. Many of our visitors were thrilled to learn that the profits from their purchases were funneled directly back into the refuge for the interpretive and environmental education programs.

The physical benefits are much easier to measure. At the end of the 1988 season \$10,000 was donated to the refuge by the SNHA to be used in applying for a Challenge Grant. This \$20,000 total was then used to purchase the new Eagle Observation Deck, telescope, eagle interpretive panel, and a \$14,000 Interactive Laser Display. In 1989, \$17,250 was donated by the SNHA to the refuge. Of this total \$7,250 will be spent on acquiring new interpretive and environmental education materials, and for funding a small renovation to the bookstore. The other \$10,000 was matched by a Regional Office Challenge Grant to launch a multi-year renovation project on the Visitor Center displays.

I. EQUIPMENT AND FACILITIES

1. New Construction

The crane research facility received a new 10 foot by 15 foot addition. The job was accomplished force account.

New shelving was built into the office conference room to facilitate the storage of manuals, plans, resource publications, etc.

2. Rehabilitation

The YCC building, water treatment building, and public restrooms received major rehabilitation in the form of new doors, windows, and a paint job.



Figure 24. Buildings around the recently remodeled headquarters didn't blend with the "new look." MGT



Figure 25. A fresh coat of paint on the old eyesores completed the transformation. MGT

New gates were installed at the entrance to the 7-mile auto tour route and the subheadquarters (Germfask) entrance to the refuge. The gates are heavy gauge steel painted brown in accordance with specifications. This was a vast improvement over the old log gates.

A new kiosk was constructed and installed adjacent to the office to replace an antiquated informational kiosk. A new leaflet dispenser and temporary informational panel were mounted on the kiosk. New panels are on order and the job will be finished in 1990.

The bridge at the Show Pools adjacent to highway M-77 was replaced to enhance public access and maintenance equipment to the foot trail.

Liquid petroleum heaters and tanks were installed in the student cabin (Quarters 7) and log cabin (Quarters 11). These modern heating units replaced old fuel oil stoves that were unsafe and inefficient. Total cost of the project was \$1,682.48 and was awarded to the lowest bidder, Petroleum Gas Service, Newberry. In addition, nine inches of insulation was blown into the attic of the student cabin.



Figure 25a. Replacement bridge on nature trail and show pool.

Other rehabilitation projects included:

- a. New carpet in Quarters #1, #136 and #137.
- b. Replaced old routed public use signs with silk screened ones and replaced sign posts with treated 4x4's.
- c. Rehabilitated 1/4 mile of Driggs River road with gravel and removed a culvert.
- d. Installed a satellite dish at Quarters #1 to replace the conventional antenna that received very little. The cost of the system was added to the rent.

3. Major Maintenance

Maintenance projects for 1989 included:

- a. Spread hay on Riverside Dike to protect sandy areas from blow-out.
- b. Painted Quarters #136 garage.
- c. Replaced lead contaminant water cooler at the visitor center.
- d. The air conditioner motor in the visitor center was rebuilt.

4. Equipment Utilization and Replacement

The Go-Tract marsh/snow machine was considerably modified for mounting a fire plow on the rear.

An old surplused fire plow was acquired from the Michigan Department of Natural Resources and completely rehabilitated for mounting on the Go-Tract.

A new Load King trailer was purchased for transporting the Go-Tract. The trailer is a 24-foot, 16-ton tilt bed.

One of the two dump trucks used for hauling heavy equipment was outfitted with a new pintle hitch, air brakes and exhaust system.

A used snowmobile in excellent condition was acquired from Shiawassee NWR.

The brakes and hitch on the new trailer were rebuilt.

A rear seal on the Thiokal wide-track machine was replaced.

5. Communications System

Two low band radio base stations were replaced at the office; one for the refuge radios and another for State frequency. A new remote unit for the State radio was installed at the front desk. In addition, a radio was installed in the John Deere 550 fire dozer and the Go-Tract swamp machine.

6. Computer Systems

The Seney Refuge has two Personal System/2 (PS/2) computers that were received in 1987. One computer has a 70 MB hard disk drive and the other has a 44 MB hard disk drive. Both PS/2 computers have one high capacity disk drive, Math Co-Processor and color display. A low capacity external disk drive was also purchased in 1987 to use with the PS/2 70 MB so that information could be interchanged with the AT. An external streaming tape drive was purchased in 1987 to facilitate back up procedures. An IBM Proprinter XL24 was purchased in 1987 for graphics and spreadsheet capabilities, and an IBM Proprinter was received through excess property so that each computer system had printing capabilities.

The Seney Refuge's third computer is an IBM PC AT that has a 30 MB hard disk drive, IBM enhanced color display, math co-processor, enhanced graphics adapter, communications adapter, and serial/parallel adapter that was received in 1986. In 1988, telecommunication capabilities became operational using the Hayes Smartmodem 2400 and Procomm program. The majority of telecommunications is through CompuServe but some direct telecommunications have been done.

The Refuge software library consists of Chart, SY-TOS, and Multiplan for the all three systems, as well as, Procomm for the AT and FORS MicroBehave for the PS/2's. In FY 89 all three systems software for WordPerfect and R:Base were upgraded to WordPerfect 5.0 and R:Base for DOS. The AT's software in Procomm was upgraded to Procomm Plus in FY 89.

A computer training plan was established and staff members will be completing introductory courses in MultiPlan, WordPerfect 5.0 and R:Base for DOS. The Refuge Manager, Primary Assistant, Assistant Refuge Manager, and Forester attended a classroom, MultiPlan course provided by MicroAge Computer Stores. The Local Support Person Deborah Kesel attended the ADP workshop in March in the Twin Cities that was an excellent training session for regional computer coordinators and users. She also attended Advanced WordPerfect and beginning R:Base training while in the Twin Cities for the ADP workshop. The Local Support Person has providing in-house training throughout the year for several programs including newly released Regional programs such as the Farm Bill Database, revised Maintenance Management Systems and Initial Project Worksheet, and the Regional Accounting program.

When the manufacture's warranties expired, the refuge purchased a maintenance agreement for the three main computer units, the Proprinter XL24, Wheelprinter, streaming tape drive and the external disk drive. The cost of the 1989-1990 maintenance agreement covering these units was \$1,213 under the Federal Supply Schedule contract through IBM. The refuge had both the PS/2 70 MB and the AT serviced under the manufacture's warranty so it was felt an extended warranty was necessary to ensure that all computers were kept in good working order. In 1988 the PS/2 70 MB had major part replacement that took over three days of work by the IBM service person that would have cost a great deal if it had not been under warranty.

The ADP Security Plan and the Continuity of Operations Plan were revised according to new Regional directives in 1989. The following computerized files were either developed or revised in 1989: software inventory file, configuration log, 1989 training plan, major database listing and system maintenance log.

J. OTHER ITEMS4. Credits

Fehribach: D-5; F-1-2,4-8, 10; G; H-8-10
Heet: C-1-3, D-1-4,6; E, F-12,13; H-17, I-1-4,6-8; J-1-3,
edited entire narrative.
Kesel: B, I-6, J-4
Loose: E-3,4; H-1-7, 11-19
Tansy: A, K, Review and edited the entire narrative
Wethy: F-3,9

Dr. Richard Urbanek, Ohio Cooperative Wildlife Research Unit,
wrote D. Planning, Section 5 "Nesting and Movements of
Sandhill Cranes at Seney NWR."

William Bowerman, wrote D. Planning, Section 5 "Bald Eagle
Ecology and Aquatic Ecosystems at Seney NWR."

David Evers wrote D. Planning, Section 5 "Study of Multiple-
Lake Usage and Sexual Differences in the Nesting Ecology of
the Common Loon."

Photo Credits:

DAF-Denise A. Fehribach
TL-Timothy Loose
GH-Gary Heet

MGT-Michael G. Tansy
JW-James Wethy
RD-Richard Domen

HURON ISLANDS
NATIONAL WILDLIFE REFUGE

ANNUAL NARRATIVE REPORT
Calendar Year 1989

U.S. DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
NATIONAL WILDLIFE REFUGE SYSTEM

INTRODUCTION

The Huron Islands National Wildlife Refuge is located five kilometers off the south shore of Lake Superior and 30 kilometers east of the Keweenaw Peninsula. The refuge is comprised of eight islands totalling 147 acres, and is administered as a satellite refuge of the Seneey National Wildlife Refuge. Refuge designation came in Executive Order 7795 on January 21, 1938. The islands were designated as Wilderness by the Omnibus Wilderness Act of 1970 (P.L. 91-504).

A lighthouse was built on West Huron Island in 1868 and is listed in the National Register of Historic Places. Four other buildings are present. Two buildings are located on an 11-acre parcel which comes under the primary jurisdiction of the U.S. Coast Guard. Two additional buildings are located on Fish and Wildlife Service lands on the west end of Lighthouse Island.

Habitat of this unmanned refuge varies from a sparse covering of red pines and white birch with ground vegetation to barren granite with scattered lichen growth. The refuge was established for the protection of migratory birds; namely a large nesting colony of herring gulls.



Figure 1. Huron Islands NWR.

MGT

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K. FEEDBACK NA

L. INFORMATION PACKET

A. HIGHLIGHTS

One visit was made to the island in August and information signs were erected.

B. CLIMATIC CONDITIONS

The weather on the Islands can best be described as cold and damp with ice sometimes persisting along their shorelines until the first of June. Sudden and fierce Lake Superior storms frequent the area during spring and fall.

E. ADMINISTRATION

8. Other

In past years the U.S. Coast Guard has maintained primary jurisdiction over 11 acres of the refuge for the purpose of operating and maintaining the islands automatic lighthouse. In association with the lighthouse are four buildings and two boat docks at various locations on the island. During 1989 the Coast Guard leased three buildings to a private individual who planned on restoring the very old structures, and then charge the public a fee for visiting them. A problem arose when refuge staff visited the island in August to erect refuge informational signs on one of the buildings at the dock, and were informed by the private individual that the buildings were his. Then the question of ownership surfaced and whose property was it to lease. After consultations with the Coast Guard and Region 3 Realty, it was determined that the Coast Guard owned 11 acres, the lighthouse, and light keepers dwelling adjacent to the lighthouse. The Service owns the remainder of the island and associated structures. Therefore, it appears the Coast Guard leased buildings that belonged to the Service. Furthermore, the Coast Guard would like to relinquish their 11 acres to us and keep only the lighthouse and one dock. The whole situation will be discussed at an April, 1990 meeting with the Coast Guard, U.S. Fish and Wildlife Service, the lessee and the Region 3 archaeological preservation officer.

F. HABITAT MANAGEMENT

1. General

As a result of the damage to the refuge's forests by a severe 1986 wind storm, intolerant and/or second growth tree species have been released or encouraged to grow. Aspen and balsam fir appear to be the most benefited. The plant site index for this site is very low due to its very cool marine environment. White spruce having a diameter of five inches was noted to be 70 years of age. Plant diversity is high with six different orchids found to grow on East Huron Island. These habitats are sensitive to disturbance from man's activities.

G. WILDLIFE

5. Shorebirds, Gulls, Terns and Allied Species

A small colony of double-crested cormorants nest off Huron Island NWR. A large herring gull colony is also located on Cattle and nearby Rock Islands.

6. Raptors

Merlins are believed to nest on Lighthouse Island. No active nests have actually been located however.

H. PUBLIC USE

1. General

Public use of the refuge is generally day visits by boaters and occasionally unauthorized camping. Limited staff time and the remote location of the refuge makes law enforcement very difficult.

Informational signs were erected at two locations on the island during August. Hopefully, the signs will reduce illegal camping and maybe vandalism.



Figure 2. New informational signs temporarily mounted on old structure. MGT

J. OTHER ITEMS4. Credits

Narrative by Gary C. Heet, Assistant Manager

Photo credits: Michael G. Tansy (MGT)

HARBOR ISLAND NATIONAL
WILDLIFE REFUGE

ANNUAL NARRATIVE REPORT
Calendar Year 1989

U.S. DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
NATIONAL WILDLIFE REFUGE SYSTEM

INTRODUCTION

The Harbor Island National Wildlife Refuge is located one mile north of Drummond Island, Michigan and 3.5 miles south of the United States-Canadian (Ontario) border in Potagannissing Bay on Lake Huron. This refuge is comprised of a single island totalling 695 acres.

Refuge designation came as a result of a purchase from The Nature Conservancy on December 14, 1983. The refuge was purchased as part of the Unique Ecosystem Program, waterfowl production area, and is administered as a satellite refuge of the Seney National Wildlife Refuge located 117 miles to the east.

Habitats included on this Island consist of balsam/cedar lowlands and oak uplands. Soils consist of shallow organics or sands over dolomitic rock.

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5. Research and Investigation (Nothing to Report)	NA
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G. WILDLIFE

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11.	Fisheries Resources (Nothing to Report)	NA
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- 18. Cooperating Associations (Nothing to Report) NA
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- 1. New Construction (Nothing to Report). NA
- 2. Rehabilitation (Nothing to Report) NA
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J. OTHER ITEMS

- 1. Cooperative Programs (Nothing to Report) NA
- 2. Other Economic Uses (Nothing to Report) NA
- 3. Items of Interest (Nothing to Report) NA
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K. FEEDBACK

NA

L. INFORMATION PACKET

A. HIGHLIGHTS

Two refuge identifier signs were erected during a two-day visit to the island.

B. CLIMATIC CONDITIONS

Harbor Island National Wildlife Refuge's climate is typical of northern Great Lakes islands with the winter low temperatures in the -20 degree range and summer highs in the mid to upper 70 degree range. Annual snowfall averages 200 plus inches per year.

F. HABITAT MANAGEMENT

1. General

A balsam fir conversion and a loss of the birch/aspen type continued on the north end of the island. Little or no reproduction of oak was occurring on the east side of the island.

G. WILDLIFE

1. Wildlife Diversity

The refuge is the largest Island in the Drummond-Potagannissing archipelago. As such, it is the only Island to have resident populations of fox, grouse and snowshoe hare. It also provides nesting habitat for many migratory birds which include white-throated sparrows, gray jays and magnolia warblers.

2. Endangered Species

Timber wolves frequently leave St. Joseph Island, Ontario, each winter to hunt the smaller islands for deer and snowshoe hare. It is not known if wolves visited the island during 1989.

Eagles also use the island's large bay for fishing each spring and fall. A nest is located seven miles northwest on St. Joseph Island.

H. PUBLIC USE

1. General

Harbor Island National Wildlife Refuge has a sheltered bay which is used by boaters for fishing, water skiing and as an overnight anchorage for small boats. The bay is part of Lake Huron and does not come under the jurisdiction of the Fish and Wildlife Service.

In addition, the Island has one of two sand beaches in Potagannissing Bay suitable for swimming. Heaviest use occurs during late July and August when Lake Huron water temperatures approach 70 degrees.

Two refuge identifier signs were erected during a two-day visit to the island.

8. Hunting

Hunting on Harbor Island was the same as State season. Ruffed grouse and woodcock were scarce in 1988; a survey on wildlife was not made in 1989. Consequently, the abundance of game species including deer was unknown. Historically, hunting pressure on the island has been light to absent. Inclement weather during deer season prevented visits to the island by refuge staff, and probably by hunters as well.

J. OTHER ITEMS

4. Credits

Narrative written by Gary C. Heet, Assistant Manager



Seney

National Wildlife Refuge

FISHING REGULATIONS



Sportfishing on Seney National Wildlife Refuge is permitted in accordance with all applicable State regulations and refuge special regulations listed below.

Since Seney's primary function is the production and support of Canada geese and other waterfowl, open fishing areas and seasons are selected to minimize disturbance of these species of wildlife. Also, fishing along the auto tour opens later than other pools due to the large numbers of people using the route for wildlife observation during the summer months.

Species

POOLS:	Northern pike, yellow perch, brown bullhead, sunfish
RIVERS/STREAMS:	Northern pike, walleye, yellow perch, bass, brook and brown trout

Special Regulations

- Boats, canoes and other flotation devices are NOT permitted on refuge pools and ditches.
- Non-motorized watercraft permitted on the Creighton and Driggs rivers, and Walsh Ditch and Creek. Motor use permitted on the Manistique River.
- No size limit on Northern pike in pools. Live bait or artificial lures may be used.
- Vehicles allowed only on main refuge roads and trails where gates are open. No off-road travel allowed with ANY motorized vehicle.
- Fishing permitted during daylight hours only.
- Camping and fires are NOT permitted on the refuge.
- Dispose of fishing line properly. Monofilament line left lying on the ground or in the water will entangle and kill fish and wildlife.

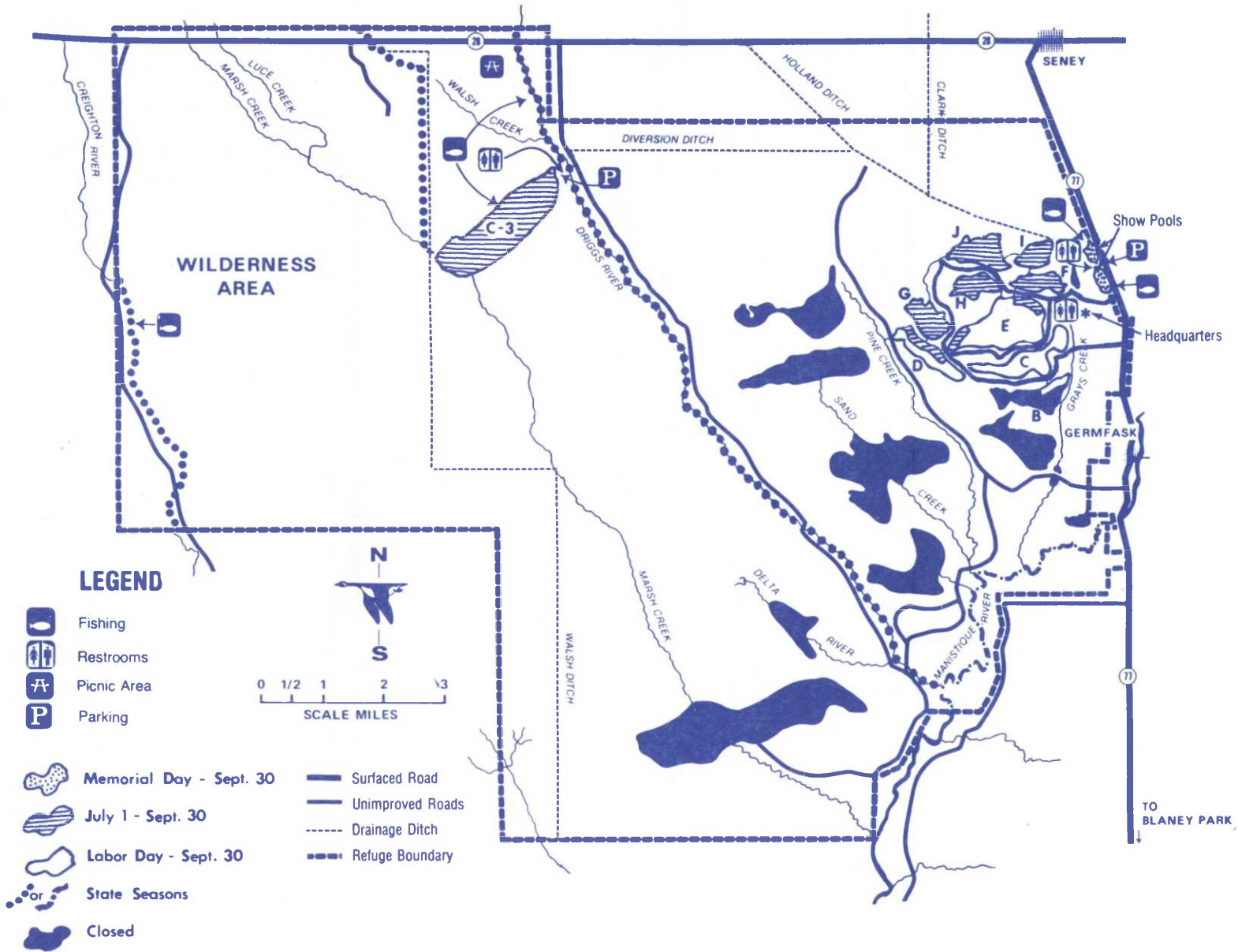
Open Areas & Dates

See map on reverse side for summer and fall fishing.

Ice Fishing

Ice fishing is permitted on all refuge pools from January 1 thru February 28. Shanties may be used on all pools except F Pool, and must be removed no later than March 15. Most roads and trails are not maintained during winter months. No snowmobiles or all-terrain vehicles are permitted.

FISHING MAP SENEY NATIONAL WILDLIFE REFUGE



Seney

National Wildlife Refuge



Visitor Information

Although its primary purpose is the management of wildlife and its habitat, Seney National Wildlife Refuge offers a variety of wildlife-oriented recreational and educational opportunities. The refuge's office and visitor center complex, the starting point for many activities, is located off Highway M-77, about five miles south of Seney, Michigan and about two miles north of Germfask, Michigan.

Visitor Center Visitor center is open 9 a.m. to 5 p.m. seven days a week from May 15 to September 30. Exhibits explain refuge history, ecology, wildlife and management; while a different wildlife film is featured each week with daily showings on the hour. Refuge volunteers or staff are on-duty to answer questions and orient visitors. A small bookstore offers an array of natural history publications.

Wildlife Viewing The careful observer will find a wide variety of wildlife at Seney. Over 200 species of birds and nearly 50 species of mammals have been recorded. Except for Canada geese which have become accustomed to people around headquarters, the wildlife is truly "wild" and as such easily missed by casual observation. Timing for wildlife viewing is of utmost importance. Spring, late summer and fall are best, while early morning and evening hours are when most species are active.

Drives The seven-mile Marshland Wildlife Drive begins near the visitor center and is open daylight hours from May 15 to October 15. This self-guided auto tour features numbered stops keyed to a leaflet available at the visitor center or drive beginning. In recent years, an active bald eagle nest has been clearly visible on the route.

Regular evening guided tours led by trained staff are sometimes offered during the summer months depending on yearly budget and personnel levels. Availability of the tours is announced through area media or visitors may call the refuge office for tour status.

Remember, all wildlife has the right-of-way, and this is especially true of geese using the dikes. Breaking up a brood of geese is often fatal for those goslings separated from adults.

Hiking Two looped nature trails are available offering an intimate look at refuge habitat, plants and wildlife. The 1.4 mile Pine Ridge Nature Trail begins just outside the visitor center, while the 1.0 mile Driggs River Nature Trail begins at the Driggs Picnic area off Highway M-28 eight miles west of Seney, Michigan. The trails are open year round during daylight hours.

Rest Areas Areas complete with tables, fireplaces, toilets and water pumps are available. The "Wigwams" rest area is located a half mile north of the headquarters on M-77, while the "Driggs" rest area is eight miles west of Seney on M-28. Use is limited to daylight hours with no overnight camping or parking allowed. Hiking trails lead from each area.

Hunting/Fishing Limited hunting and fishing is allowed during certain seasons. Current year regulations and maps are available at the visitor center or refuge office.

Berrypicking Much of the refuge is open to the picking of morel mushrooms, blueberries and other wild foods and fruits.

Canoeing Boats and canoes are prohibited on refuge pools. However, canoeing is allowed on the Driggs, Manistique and Creighton Rivers and Walsh Creek. Use is limited to daylight hours with no overnight camping permitted.

Winter Rec. Cross-country skiing and snowshoeing is permitted throughout the refuge during winter months. Skiing along the Marshland Wildlife Drive and Pine Ridge Nature Trail is most popular with parking provided at the visitor center. No grooming of trails is done. All refuge pools are open to ice fishing from January through February.

General Regulations

- Use of refuge limited to daylight hours. - No camping or overnight parking allowed.
- Fires permitted ONLY at rest area fireplaces.
- Possession or discharge of firearms or other weapons prohibited except during established hunting seasons.
- Dogs and other pets must be kept on a leash at all times.
- Vehicles are allowed only on refuge roads and trails where gates are open.
- No off-road vehicles of ANY kind are allowed.
- The disturbance, injury or collection of any plant or animal is prohibited.

For more information, write or call:

SENEY NATIONAL WILDLIFE REFUGE

HCR 2, BOX 1

SENEY, MICHIGAN 49883

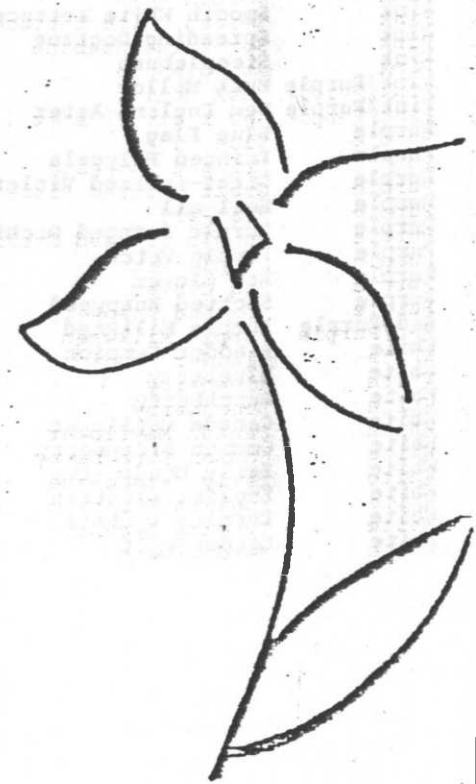
906/586-9851

This leaflet will help you to identify most of the wildflowers along the Pine Ridge Nature Trail.

Common names are listed for each flower, as well as flower color and the months during which the plants are in bloom. Page numbers have been given for each of the flowers from the two most commonly used wildflower guides, The Audubon Society Field Guide to North American Wildflowers and Peterson's Field Guide to North American Wildflowers.



Wildflowers of the Pine Ridge Nature Trail



PAGE NUMBERS IN:					
COLOR	COMMON NAME	BLOOM DATES	AUDUBON GUIDE (photo)	GUIDE (text)	PETERSON GUIDE
Blue	Bedstraw Bellflower	August		439	340
Brown	Common Cattail	May-June	309	809	388
Orange	Orange Hawkweed	June-Sept.	374	387	208
Orange	Spotted Touch-me-not	Aug.-Sept.	413	413	208
Pink	Moccasin-flower	May-June	493	651	212
Pink	Smooth Rose	June-July		756	256
Pink	Smooth White Lettuce	Aug.-Sept.		398	292
Pink	Spreading Dogbane	July-Aug.	557	335	292
Pink	Steeplebush	July-Aug.	539	761	224
Pink/Purple	Musk Mallow	June-Aug.	467	628	218
Pink/Purple	New England Aster	Aug.-Oct.	479	362	308
Purple	Blue Flag	May-July	620	565	314
Purple	Fringed Polygala	May-June	496	701	214
Purple	Great-spurred Violet	May-July		819	328
Purple	Heal-all	June-Sept.	646	578	350
Purple	Purple fringed Orchis	June-Aug.		659	224
Purple	Purple Vetch	May-July	534	542	252
Purple	Red Clover	May-Sept.	516	541	246
Purple	Spotted Knapweed	July-Sept.	486	371	92
Red/Purple	Purple Milkweed	June-July		350	294
White	Bladder Campion	June-Sept.	71	460	34
White	Blueberry	May-June	232	508	
White	Bunchberry	May-July	60	477	4
White	Canada Mayflower	May-July	125	603	66
White	Common Strawberry	May-June	58	749	28
White	Early Meadow-rue	May-June	168	741	72
White	English Plantain	April-Nov.	107	680	62
White	Evening Lychnis	June-Sept.	69	456	34
White	Meadowsweet	July-Sept.	219	760	2

PAGE NUMBERS IN:					
COLOR	COMMON NAME	BLOOM DATES	AUDUBON GUIDE (photo)	GUIDE (text)	PETERSON GUIDE
White	Ox-eye Daisy	June-Sept.	91	371	92
White	Pearly Everlasting	Aug.-Sept.	196	356	90
White	Raspberry	June-July			
White	Rough Bedstraw	August		763	40
White	Rush Aster	July			96
White	Shinleaf	July-Aug.	132	723	26
White	Starflower	May-June	61	721	22
White	Tradescant's Aster	June-Sept.			96
White	Turtlehead	July-Aug.	113	786	58
White	Water-arum	May-Aug.	109	341	6
White	White Sweet Clover	May-Oct.	135	534	80
White	Wintergreen	July-Aug.		722	38
White	Yarrow	June-Sept.	192	354	44
Yellow	Black-eyed Susan	June-Sept.	281	399	112
Yellow	Butter-and-eggs	Aug.-Sept.	331	789	104
Yellow	Common Buttercup	May-Sept.	264	738	132
Yellow	Common Evening-primrose	June-Sept.	354	644	106
Yellow	Common Mullein	June-Sept.	336	798	106
Yellow	Common St. Johnswort	June-Sept.	352	558	106
Yellow	Cow-wheat	July-Sept.	116	790	124
Yellow	Frostweed	June-July	258	466	142
Yellow	Goldenrod sp.	July-Nov.	343	401	200
Yellow	Hare's-ear Mustard	June-Aug.		424	158
Yellow	Least Hop Clover	April-Oct.		540	150
Yellow	Rough-fruited Cinquefoil	June-Aug.	247	753	134
Yellow	Swamp Candles	June-Sept.	324	720	106
Yellow	Yellow Goat's-beard	June-Oct.	295	408	110
Yellow	Yellow Hawkweed	June-Sept.	306	389	174
Yellow	Yellow Sweet Clover	June-Aug.	326	534	150

Birds



Seney National Wildlife Refuge on the Upper Peninsula of Michigan was established in 1935 for the protection and production of waterfowl and other wildlife. More than half of the refuge's 95,455 acres is marshy, and at least 7,000 acres are open water impounded in 21 man-made pools.

Waterfowl, bald eagles, and sandhill cranes are among the birds that may be seen along the Marshland Wildlife Drive and the Pine Ridge Nature Trail. Check with the Refuge Manager, Seney National Wildlife Refuge, Seney, Michigan 49883, or call 906-586-9851 as to times when these facilities are open.

This folder lists 206 birds observed on the refuge since 1935. Another 31 species, very rare or accidental and out of their normal range, are listed at the end. Season, abundance, and nesting status, are coded as follows:

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

a—abundant—common species that is very numerous
c—common—certain to be seen in suitable habitat
u—uncommon—present but not certain to be seen
o—occasional—seen only a few times during a season
r—rare—seen at intervals of 2-5 years

*Indicates birds which nest locally
 (E) Endangered Species

Bird	S	s	F	W
Common Loon	c	c	u	
Pied-billed Grebe*	c	u	c	
Horned Grebe	o	r	u	
Red-necked Grebe	r	r	r	
Double-crested Cormorant	r	r	r	
American Bittern*	c	c	c	
Least Bittern*	r	r		
Great Blue Heron*	c	c	c	
Green-backed Heron	r	o	r	
Black-crowned Night-Heron		r	r	
Tundra Swan	u	r	u	
Snow Goose	o	u	u	
Canada Goose*	c	c	c	u
Wood Duck*	c	c	c	
Green-winged Teal*	u	o	u	
American Black Duck*	c	c	o	
Mallard*	c	c	o	
Northern Pintail	u	r	o	
Blue-winged Teal*	c	u	c	
Northern Shoveler	o	r	o	
Gadwall	r	r	r	
American Wigeon*	c	u	c	
Canvasback	o	r	o	
Redhead	o	r	o	
Ring-necked Duck*	c	c	c	
Lesser Scaup	c	r	o	
Common Goldeneye*	c	o	c	o
Bufflehead	c	r	c	
Hooded Merganser*	c	c	c	
Common Merganser*	c	c	c	r
Ruddy Duck	r	r	r	
Turkey Vulture	o	o		
Osprey	o	o	o	
Bald Eagle*(E)	u	u	u	o
Northern Harrier*	c	c	c	
Sharp-shinned Hawk*	o	o	o	
Cooper's Hawk*	o	o	o	
Northern Goshawk*	o	o	o	o
Broad-winged Hawk*	u	u	u	
Red-tailed Hawk*	u	u	u	
Rough-legged Hawk	u	u	u	
American Kestrel*	c	c	c	
Merlin*	r	r	r	
Peregrine Falcon (E)	r	r	r	
Spruce Grouse*	u	u	u	u
Ruffed Grouse*	c	c	c	c
Sharp-tailed Grouse*	u	u	u	u

Bird	S	s	F	W
Yellow Rail*	r	r	r	
Virginia Rail*	u	c	u	
Sora*	u	c	u	
American Coot	u	o	u	
Sandhill Crane*	c	c	c	
Black-bellied Plover	o	o	o	
Lesser Golden-plover	o	o	r	
Semipalmated Plover	u	u	u	
Killdeer*	c	c	c	
Greater Yellowlegs	c	c	c	
Lesser Yellowlegs	c	u	c	
Solitary Sandpiper	c	c	c	
Spotted Sandpiper*	c	c	c	
Upland Sandpiper*	o	o	o	
Semipalmated Sandpiper	u	u	u	
Least Sandpiper	u	u	u	
White-rumped Sandpiper		r	r	
Baird's Sandpiper		r	r	
Pectoral Sandpiper	u	u	u	
Dunlin	o	o	o	
Common Snipe*	c	c	c	
American Woodcock*	c	c	c	
Bonaparte's Gull	o	o	o	
Ring-billed Gull	c	u	c	
Herring Gull	c	u	c	
Caspian Tern	u	o	u	
Common Tern*	c	c	c	
Black Tern*	o	c	o	
Mourning Dove	o	o	o	
Black-billed Cuckoo*	c	c	c	
Great Horned Owl*	c	c	c	c
Snowy Owl	o	o	o	
Barred Owl*	r	r	r	r
Long-eared Owl	o	o	o	
Short-eared Owl	o	o		
Northern Saw-whet Owl*	o	o	o	o
Common Nighthawk*	c	c	c	
Whip-poor-will*	u	u	u	
Chimney Swift*	c	c	c	
Ruby-throated Hummingbird*	u	u	u	
Belted Kingfisher*	c	c	c	
Red-headed Woodpecker	r	r	r	
Yellow-bellied Sapsucker*	u	u	u	
Downy Woodpecker*	c	c	c	c
Hairy Woodpecker*	c	c	c	c
Black-backed Woodpecker* (Three-toed)	r	r	r	r
Northern Flicker*	c	a	a	r

Bird	S	s	F	W
Pileated Woodpecker*	o	o	o	o
Olive-sided Flycatcher*	u	u	u	u
Eastern Wood-pewee*	c	c	c	c
Yellow-bellied Flycatcher*	o	o	o	
Alder Flycatcher*	c	c	u	
Least Flycatcher*	c	c	c	
Eastern Phoebe* (Wood)	c	c	c	
Great Crested Flycatcher*	o	o	u	
Eastern Kingbird*	o	c	u	
Horned Lark	u	o	c	
Purple Martin*	c	a	c	
Tree Swallow*	a	a	o	
Northern Rough-winged Swallow*	u	u	u	
Bank Swallow*	c	c	c	
Cliff Swallow*	u	u	u	
Barn Swallow*	c	c	c	
Gray Jay	o	r	u	c
Blue Jay*	c	u	c	c
American Crow* (Common)	a	c	c	
Common Raven*	a	c	c	c
Black-capped Chickadee*	c	a	a	a
Boreal Chickadee*	r	r	r	r
Red-breasted Nuthatch*	u	u	u	u
White-breasted Nuthatch*	u	u	u	u
Brown Creeper*	u	u	u	o
House Wren	u	u	u	
Winter Wren*	o	o	o	
Sedge Wren* (Short-billed)	u	u	u	
Marsh Wren* (Long-billed)	a	a	a	
Golden-crowned Kinglet*	c	c	c	c
Ruby-crowned Kinglet*	u	u	u	
Eastern Bluebird*	u	u	c	
Veery*	c	c	c	
Swainson's Thrush*	c	c	c	
Hermit Thrush*	c	c	c	
Wood Thrush*	u	u	u	
American Robin*	c	c	c	
Gray Catbird*	o	u	o	
Northern Mockingbird	r	r		
Brown Thrasher*	c	c	c	
Water Pipit	u		c	
Bohemian Waxwing	o		o	
Cedar Waxwing*	c	a	a	
Northern Shrike	o		o	o
European Starling*	a	a	a	c

Bird	S	s	F	W
Solitary Vireo*	u	u		
Warbling Vireo	r	r		
Red-eyed Vireo*	a	a	a	
Golden-winged Warbler*	r	r		
Tennessee Warbler	c	r	c	
Orange-crowned Warbler			o	
Nashville Warbler*	a	a	a	
Northern Parula*	u	u	u	
Yellow Warbler*	c	c	c	
Chestnut-sided Warbler*	c	c	c	
Magnolia Warbler*	c	c	c	
Cape May Warbler*	c	u	c	
Black-throated Blue Warbler*	u	u	u	
Yellow-rumped Warbler*	a	a	a	
Black-throated Green Warbler*	c	c	c	
Blackburnian Warbler*	u	u	u	
Pine Warbler*	c	c	c	
Palm Warbler*	c	u	c	
Bay-breasted Warbler	c		c	c
Blackpoll Warbler	c		c	c
Black-and-white Warbler*	c	c	c	
American Redstart*	c	c	c	
Ovenbird*	c	c	c	
Northern Waterthrush	c	u	c	
Connecticut Warbler	o	r	o	
Mourning Warbler*	u	u	u	
Common Yellowthroat*	c	c	c	
Wilson's Warbler	u		u	
Canada Warbler*	c	c	c	
Scarlet Tanager*	o	u	o	
Rose-breasted Grosbeak*	c	c	u	
Indigo Bunting	u	u		
Rufous-sided Towhee	o	o	o	
American Tree Sparrow	c		c	r
Chipping Sparrow*	c	c	c	
Clay-colored Sparrow	o	o	o	
Vesper Sparrow*	c	c	c	
Savannah Sparrow*	c	c	c	
Le Conte's Sparrow*	o	o	o	
Fox Sparrow	o		o	
Song Sparrow*	a	a	a	
Lincoln's Sparrow*	u	u	u	
Swamp Sparrow*	a	a	a	
White-throated Sparrow*	c	c	c	
White-crowned Sparrow	c		c	
Harris' Sparrow			f	
Dark-eyed Junco*	a	c	a	o
Lapland Longspur	o		o	r

Bird	S	s	F	W
Snow Bunting	c		c	a
Bobolink*	u	c	u	
Red-winged Blackbird*	a	a	a	
Eastern Meadowlark*	u	c	o	
Western Meadowlark		r	r	
Rusty Blackbird	c		c	o
Brewer's Blackbird*	u	o	u	
Common Grackle*	a	a	a	o
Brown-headed Cowbird*	a	a	c	
Northern Oriole*	c	c	u	
Pine Grosbeak	u	r	u	c
Purple Finch*	c	c	c	
Red Crossbill*	u	u	o	c
White-winged Crossbill*	o	o	f	u
Common Redpoll	c		c	c
Pine Siskin	u	r	u	c
American Goldfinch*	u	u	u	u
Evening Grosbeak*	o	o	o	c
House Sparrow*	o	o	o	o

Incidental Birds

Western Grebe	Willet
American White Pelican	Hudsonian Godwit
Great Egret	Marbled Godwit
Greater White-fronted Goose	Stilt Sandpiper
Brant	Short-billed Dowitcher
Eurasian Wigeon	Wilson's Phalarope
Oldsquaw	Red-necked Phalarope
Surf Scoter	Franklin's Gull
White-winged Scoter	Eastern Screech-owl
Barrow's Goldeneye	Northern Hawk-owl
Red-breasted Merganser	Boreal Owl
Golden Eagle	Western Kingbird
Greater Prairie-chicken	Scissor-tailed Flycatcher
King Rail	Loggerhead Shrike
Piping Plover	Field Sparrow
	Yellow-headed Blackbird

Seney and Huron Island Wilderness Areas Michigan

Lighthouse Island reveals signs of human habitation. Abandoned in 1972 when the lighthouse was automated, the beacon has deterred sailors from the treacherous rocks since 1877. Today, it has a place in the National Register of Historic Places.

Only Lighthouse Island is open to the public for hiking and nature study, by daily permit.

Gnarled red and white pine, white birch and white cedar cling precariously to the islands' wave-worn surfaces. The granite faces of the Huron Islands are marred by deep cuts left like dueling scars from ancient glaciers.

The Huron Islands once supported a variety of wildlife including bald eagles, deer, coyotes and raccoon. But today, the desolate rocks have been forsaken by the larger birds and animals. The islands have become an important nesting ground for herring gulls, who share their rocky outcroppings with snowshoe hare, deer mouse, ravens and numerous smaller birds.



What is "Wilderness"?

Each of us has our own idea of what wilderness means and our own way to fill our need for wilderness and wild things.

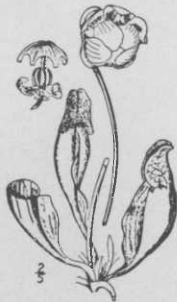
To the veteran backpacker, wilderness may be represented by a bighorn sheep grazing in the high country. To the urban youth, wilderness may be thought of as an evening walk through a city park.

In 1964, the Federal government acknowledged Thoreau's dictum that "In wildness is the preservation of the world." The Wilderness Act of 1964 required that every roadless area of 5,000 acres or more and every roadless island within the National Wildlife Refuge System be evaluated for possible designation as a Wilderness Area to be preserved for all time.

On October 23, 1970, Congress conferred wilderness status on 25,150 acres of the Seney National Wildlife Refuge and the eight islands comprising the 147-acre Huron Islands National Wildlife Refuge.

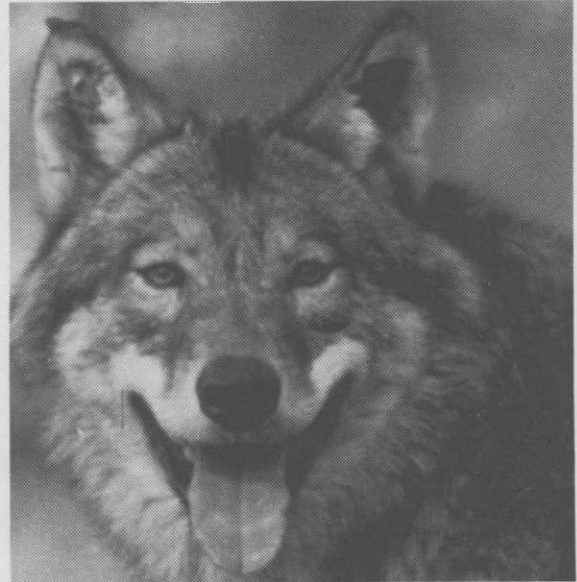
Administered by the U.S. Fish and Wildlife Service of the Department of the Interior, the Seney and Huron Islands Wilderness Areas shall remain undeveloped and be subject to management practices in keeping with their wilderness character.

Sarracenia purpurea L.
The Pitcher Plant is a characteristic plant of the Strangmoor Bogs.



Seney National Wildlife Refuge Wilderness Area

Although it appears wild to the untrained eye, most of the 95,500 acres of the Seney National Wildlife Refuge are carefully managed to provide quality habitat for a diversity of wildlife species.



But like the timber wolf it harbors, Seney has an untamed spirit—a 25,000 acre Wilderness Area the public seldom sees.

HISTORY

Centuries ago, the lands of the Seney Wilderness Area were overlain with sand in an extinct glacial lake bed. The sand from the lake bed was blown into dunes which, in time, became covered with trees and brush to form a necklace of islands in the midst of a vast bog. Today, most of the Seney Wilderness Area is characterized by these "string bogs". They are characteristic of the 9,500 acre Strangmoor Bog Registered National Landmark.

The bogs' unique habitat supports such uncommon life forms as the carnivorous pitcher plant. The remainder of the Wilderness Area still boasts the giant stumps of white pines logged before the turn-of-the-century. After many years of lumbering and burning, the fragrant pine forests have been succeeded by growths of aspen and jackpine.



WILDLIFE

The Seney Wilderness Area today is managed for its two most important tenants: the endangered eastern timber wolf and the bald eagle. In addition to common species such as deer, fox, mink and muskrat, the Wilderness Area is home to moose, black bear and coyote. Bird species include waterfowl such as the black duck, mallard, American wigeon and wood duck. Spruce, ruffed and sharp-tailed grouse, and numerous songbirds also dwell within the Wilderness Area.

Huron Islands National Wildlife Refuge Wilderness Area



The beacon of Lighthouse Island gleams into the northern Michigan night from its lonely vantage point in Lake Superior. Lighthouse Island, or West Huron, is the second largest of eight islands comprising the Huron Islands National Wildlife Refuge. Despite their small size, totalling only 147 acres, the remoteness and primitive quality of these islands have earned them the designation of a Wilderness Area.

Special Regulations for Use of Wilderness Areas

SENEY WILDERNESS AREA:

1. Open to hiking and nature study from August 1 through March 14 during daylight hours only. Registration at Refuge Headquarters required for the period August 1 through September 14.
2. Open to small game hunting September 15 through February 28, and to deer hunting November 15 through 30.
3. Camping prohibited except by Special Use Permit to biologists, botanists, or other persons in conjunction with approved studies. Primitive type camping only when permitted.

HURON ISLANDS WILDERNESS AREA:

1. Only West Huron Island (Lighthouse Island) open to public, during daylight hours, for hiking and nature study. Registration at refuge headquarters required.
2. All remaining islands closed to public, except by Special Use Permit to biologists, botanists, or other qualified persons in conjunction with approved studies. Exceptions are emergency landings by boats in distress.
3. Camping is prohibited on all islands, except that bonafide biologists, botanists and other qualified applicants may be permitted prescribed primitive-type camping only on West Huron Island (Lighthouse Island) by Special Use Permit, in conjunction with approved studies.

INFORMATION

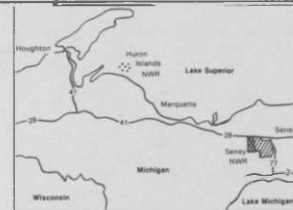
Additional information may be obtained by writing Refuge Manager, Seney National Wildlife Refuge, Seney, Michigan 49883. Local lodging accommodations and services are available in Germfask and

Seney. Additional facilities can be found within 35 miles at Newberry, Manistique and Munising.

LOCATION

Seney Wilderness Area is in the northwest quadrant of the Seney National Wildlife Refuge in Michigan's Upper Peninsula. Refuge headquarters is off Highway M-77 near the villages of Seney and Germfask. Refuge headquarters is approximately 80 miles northwest of the Mackinac bridge.

The Huron Islands Wilderness Area is three miles off the south shore of Lake Superior, approximately 40 miles east of Houghton, Michigan.



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



RF-31510-14

May 1979

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Seneey

National Wildlife Refuge



Refuge headquarters is located on Highway M-77 approximately 3 miles north of Germfask, Michigan. Correspondence should be addressed to: Refuge Manager, Seneey National Wildlife Refuge, Seneey, Michigan 49883. Local lodging accommodations and services are available in Germfask and Seneey. Additional facilities can be found within 35 miles at Newberry, Manistique and Munising.

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.



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



RF31510-3/87



GREAT MANISTIQUE SWAMP



Seney

National Wildlife Refuge

Seney National Wildlife Refuge was established in 1935 for the protection and production of waterfowl and other wildlife species. The refuge is in the Great Manistique Swamp which is characterized by open marshes with immense areas of rushes and sedges. Here and there in the vast marshes are shallow pools of clear, cold water and sandy knolls and ridges that support stands of mature red pine that survived the day when Michigan led the nation in lumber production. The great timber-cutting period began about 1870, and by 1890 the Upper Peninsula was nearly stripped of its pine forests.

Often fires were deliberately set to clear away the debris of past lumbering operations and to make way for new attempts. These uncontrolled fires burned the humus to the sandy substratum and

killed the seeds that would have produced a new forest. After the fires burned out, but before nature could restore the area, Seney was exploited by a land development company that drained acre after acre of soil unsuited for agriculture. The reclaimed acreage was sold through extravagant promises of agricultural productivity, but the buyer-farmers soon learned that crops of sufficient size to provide a livelihood could not be grown. One by one they left the area, and the exploited lands reverted to the State for taxes.

In 1934 the Michigan Conservation Department recommended to the Federal Government that the Seney area be developed for wildlife. This proposal was accepted and a National Wildlife Refuge was established the following year.

Physical development and restoration of the refuge's 95,455 acres began soon after establishment. An intricate system of dikes, water control structures, ditches and roads was built. This system now impounds over 7,000 acres of open water in 21 major pools. Much of the construction work was done by emergency agencies, such as the Civilian Conservation Corps, to relieve unemployment in the 1930's.

WILDLIFE AND MANAGEMENT

Eighty years ago the forests of Michigan's Upper Peninsula echoed to the ring of the lumberman's axe. The pleasant sound of honking Canada geese has since been added at Seney National Wildlife Refuge. The welcome accompaniment is a result of inducing Canadas to nest on refuge lands. This has been a major wildlife management achievement of the U.S. Fish and Wildlife Service working in harmony with other conservation organizations.

The response of wildlife to habitat restoration at Seney has been better than anticipated. The success of the Canada goose as a nesting species is a fine example of this response. In January 1936, Henry Wallace, a resident of Detroit, gave the refuge a flock of 332 captive-bred Canada geese. The pinioned birds were placed in a 440 acre goose pasture, and the best conditions possible were provided through control of water levels and nesting habitat. Goslings reared by this captive breeding flock migrated to southern wintering grounds, as do other wild Canada geese.

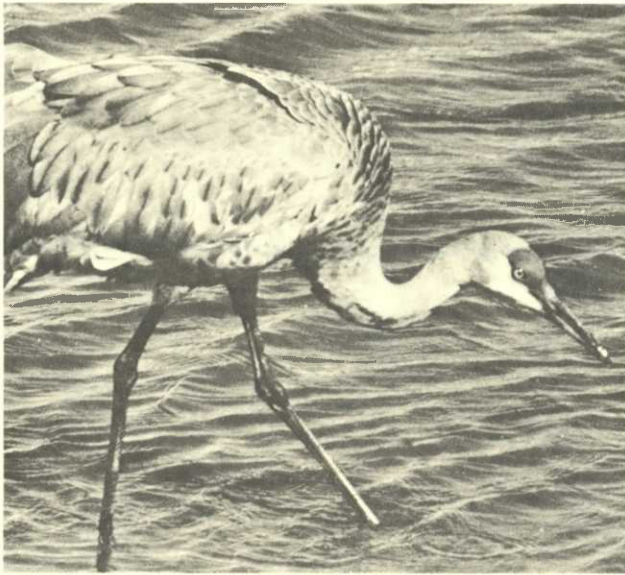
These first Seney-reared birds returned the following and subsequent springs, to breed, nest and produce more goslings. The cycle continued and the Canada goose was definitely established as a nesting species by 1944. Although goose numbers fluctuate annually, the present flock is large enough to provide a valuable addition to Upper Michigan wildlife.

Seney also provides a stopping place for migrating ducks and other geese each fall. Heavy snow and ice formation hasten the final departure of all toward southern wintering grounds.

Geese, Canadas plus snows and blues, are not the only migratory waterfowl that have been attracted to Seney. The refuge is within the nesting range of several species of ducks. The mallard and black duck are the most prolific nesters followed by ring-necks, and common and hooded mergansers. Other ducks that nest at Seney in lesser numbers are blue-winged teal and wood ducks.

Other birds such as sandhill cranes, bald eagles, sharp-tailed grouse and pileated woodpeckers find Seney equally attractive. In all, over 200 species are found, offering a wide variety for those interested in birds.

Beaver, or their work products, are easily found. Trapping is carried on as necessary to keep these



SANDHILL CRANE

and other furbearing animals within the carrying capacity of the habitat. Other mammals found on the refuge include white-tailed deer, black bear, otter, coyote, fox, mink, muskrat, bobcat and an occasional wolf.

A forest management program involving timber cutting to improve wildlife habitat is conducted on the refuge. Sprouting and reproductive growth of new trees increases cover and places an available food supply in reach of game animals such as white-tailed deer.

Local farmers, working cooperatively with the refuge staff, harvest hay from 250 acres of refuge land. These open fields provide excellent feeding areas for Canada geese, sandhill cranes, and white-tailed deer.

Refuge receipts from trapping, timber removal and other economic uses benefit the local community. Schoolcraft County annually receives three-fourths of 1 percent of the current value of the land or 25 percent of the net receipts, whichever is greater, to be used for schools and roads. The return of some 96,000 acres to a more natural and productive condition under controlled management benefits wildlife, as well as the people of Michigan and the general public.



VISITOR CENTER

RECREATION

VISITOR CENTER Refuge recreational program activity begins at the Visitor Center located at Refuge Headquarters. The building is open from May 15 through September 30, and a receptionist is on duty during the summer months. Dioramas, exhibits and environmental information are displayed. During the summer months, movie and slide shows are presented in the auditorium.

AUTO TOURS The Marshland Wildlife Drive is a seven mile self-guiding auto tour. It is open from June 1 through October 31 during daylight hours. Guide leaflets are available at the Visitor Center.

NATURE TRAIL A 1.4 mile nature trail around one of the smaller pools is open for hiking. The trail begins at the Visitor Center and completes a loop ending back at the Visitor Center.

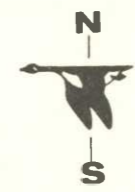
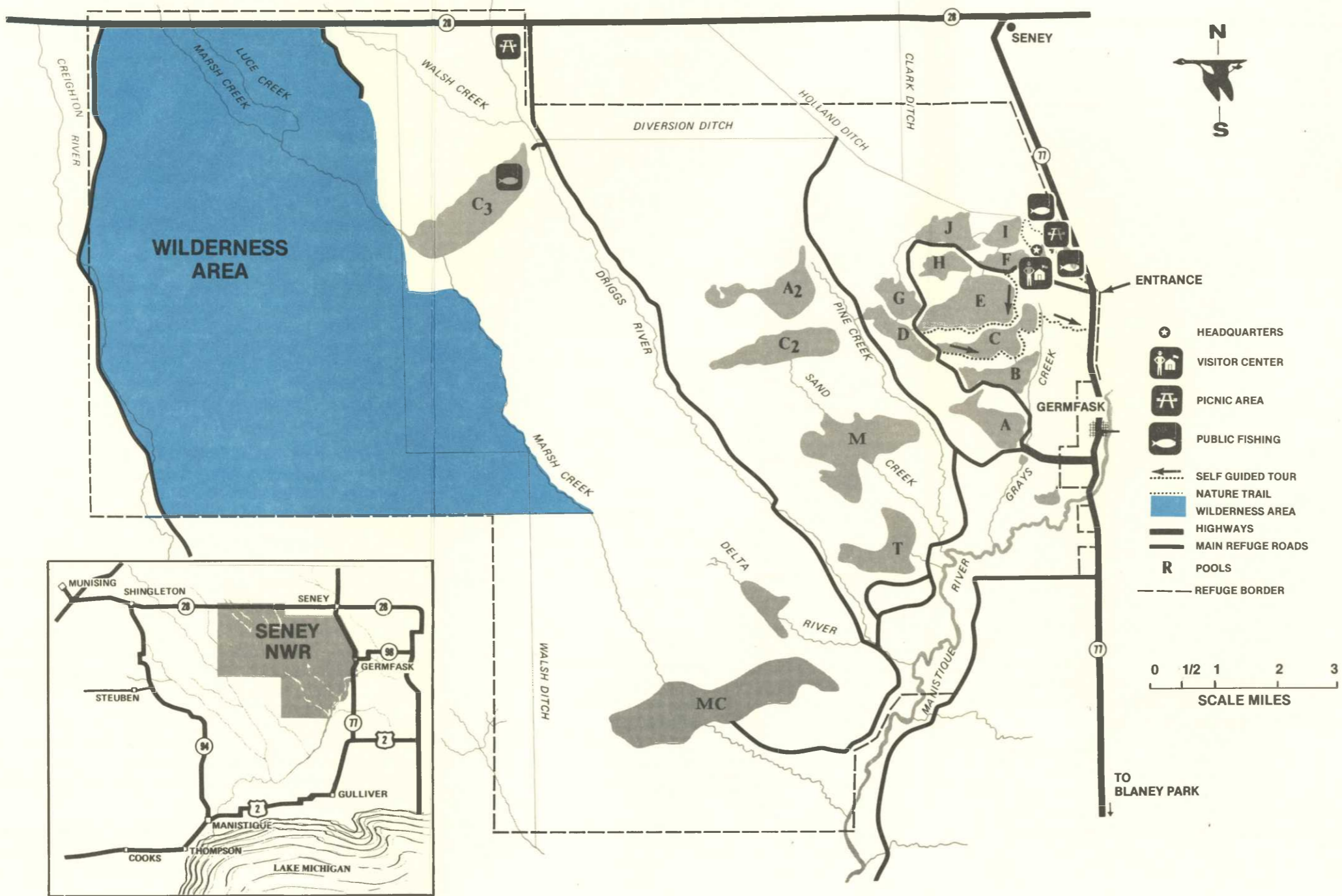
PICNICKING There are two picnic areas on the refuge. Both areas are open from Memorial Day through October. Tables, fireplaces, water pumps and toilets are available. Locations are shown on the leaflet map.

FISHING Certain selected refuge pools are open during the year. Fishermen may obtain current regulations and open pool locations at the Refuge Headquarters.

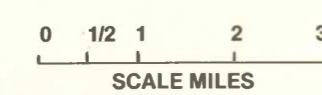
HUNTING Portions of the refuge are open to deer, bear, and small game hunting in season. Hunting regulations and maps may be obtained from the Refuge Headquarters.

Seneey

National Wildlife Refuge

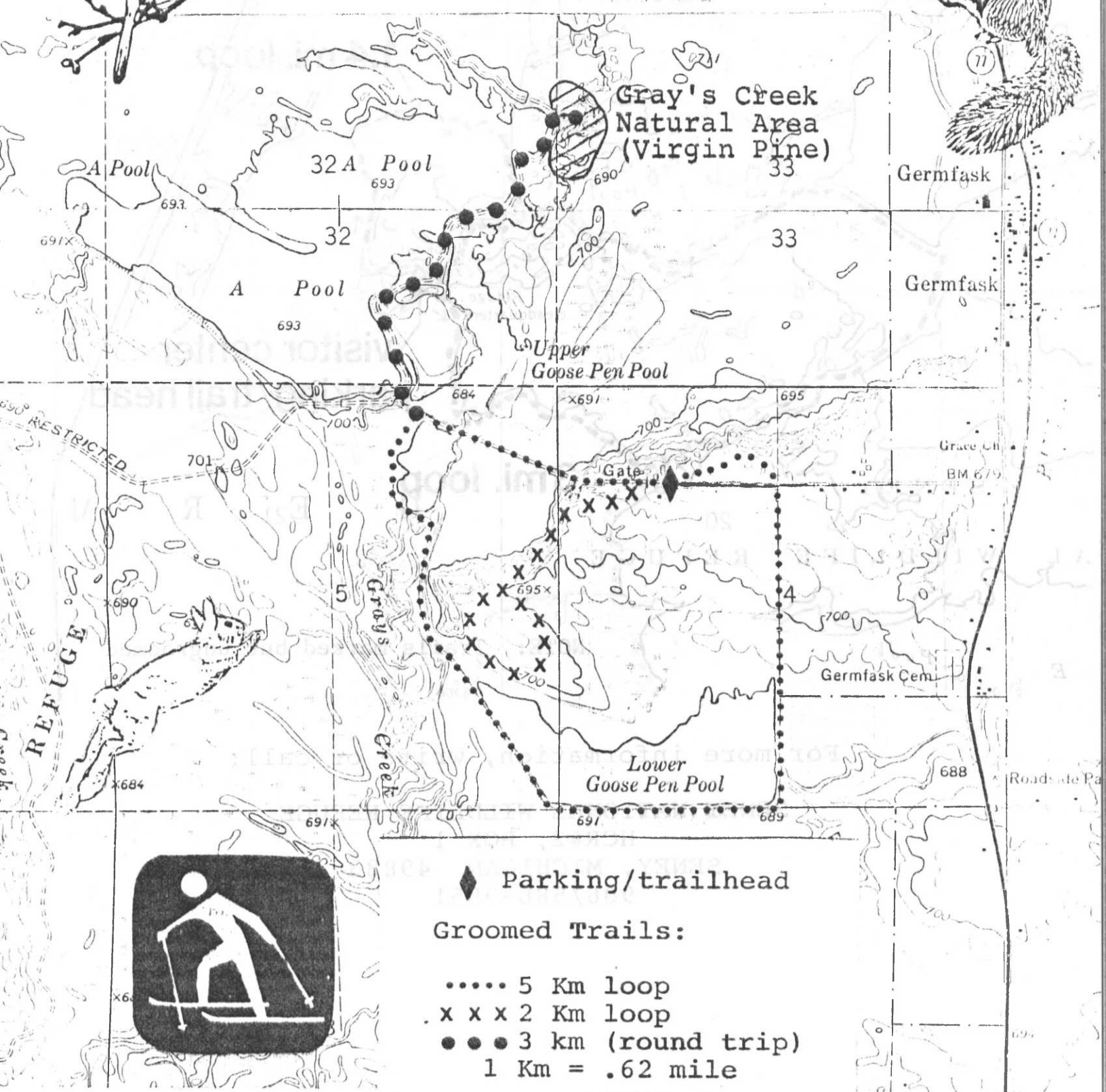


- HEADQUARTERS
- VISITOR CENTER
- PICNIC AREA
- PUBLIC FISHING
- SELF GUIDED TOUR
- NATURE TRAIL
- WILDERNESS AREA
- HIGHWAYS
- MAIN REFUGE ROADS
- POOLS
- REFUGE BORDER

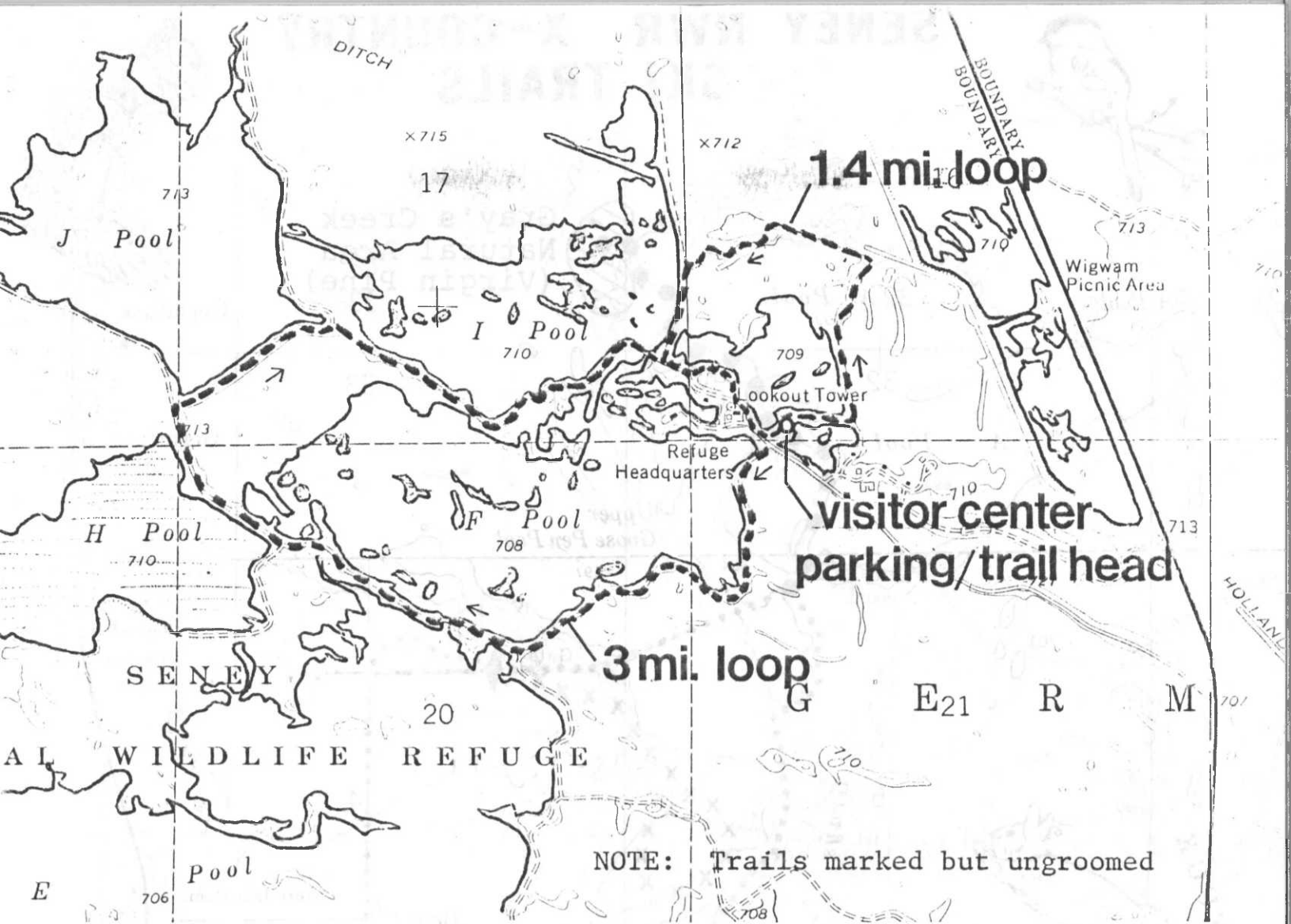


TO BLANEY PARK

SENEY NWR X-COUNTRY SKI TRAILS



Welcome to the Seney National Wildlife Refuge. Cross-country skiing and snowshoeing are permitted throughout the refuge during the winter months. All refuge pools are open to ice fishing from January through February. No off-road vehicles of ANY kind are allowed. Enjoy your Wild Refuge!



For more information, write or call:

SENEY NATIONAL WILDLIFE REFUGE
 HCR#2, BOX 1
 SENEY, MICHIGAN 49883
 906/586-9851

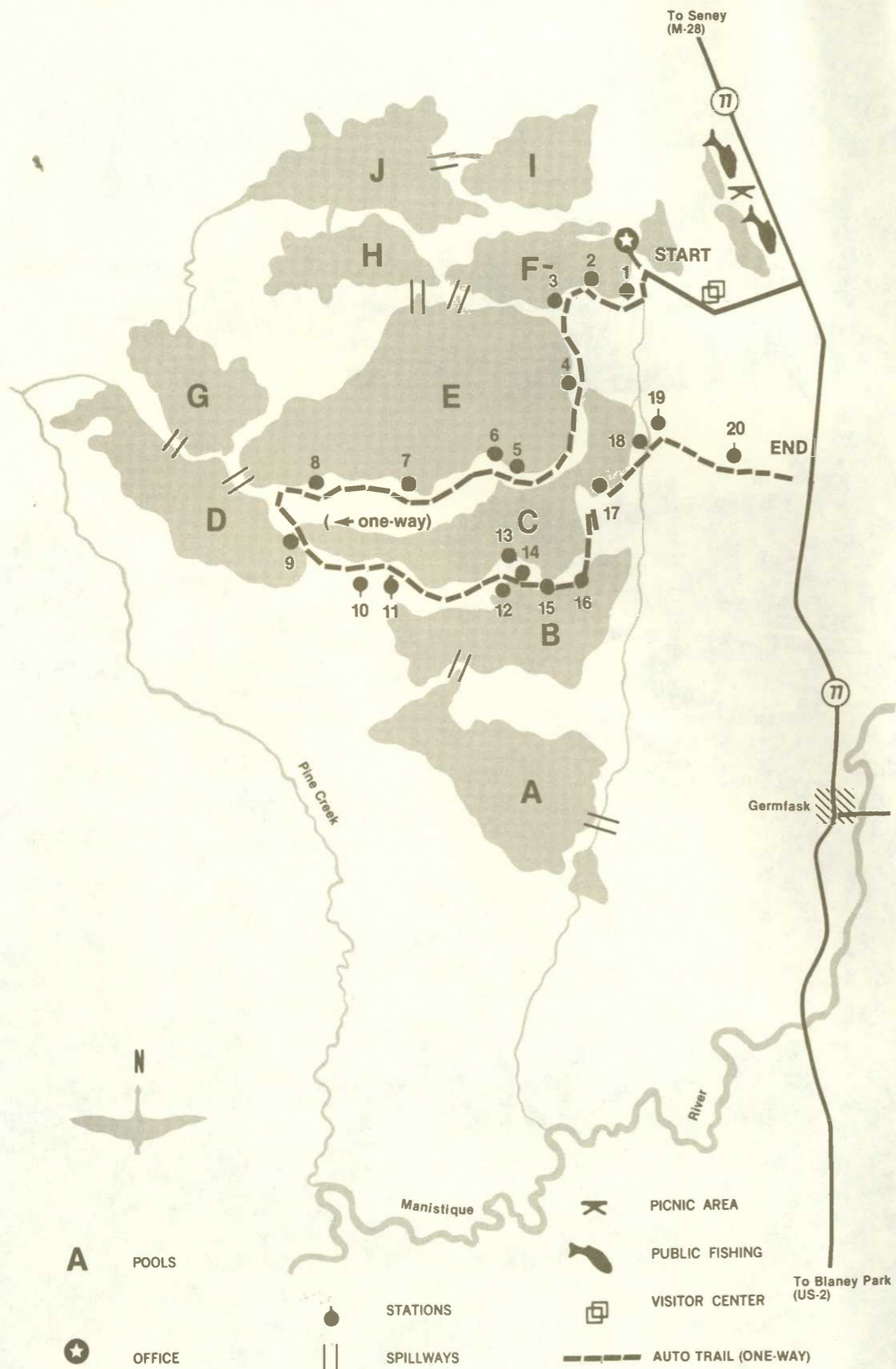


Welcome to the SENEY National Wildlife Refuge. Cross-country skiing and snowshoeing are permitted throughout the refuge during the winter months. All water pools are open to ice fishing from January through February. No off-road vehicles or ATVs are allowed. Enjoy your visit to the refuge.

An aerial photograph of a marshland area, likely a wildlife refuge. The image shows a large body of water in the foreground, with a long, narrow strip of land extending into it. In the middle ground, there are several buildings, including a large white structure and a smaller one, surrounded by trees. A road or path winds through the area. The background shows more water and distant land.

Marshland Wildlife Drive

SENEY NATIONAL WILDLIFE REFUGE • MICHIGAN



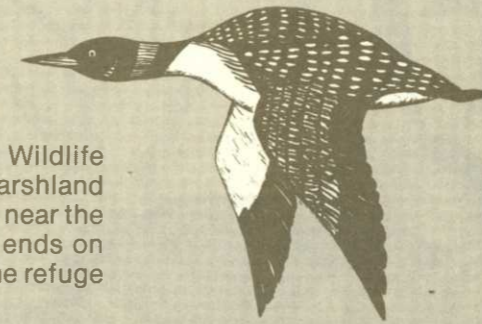
WELCOME to Seney National Wildlife Refuge and the self-guided Marshland Wildlife Drive. The drive starts near the visitor center parking lot and ends on Highway M-77, just south of the refuge entrance.

You will find numbered stops along the route keyed to the text in this booklet. These stops will explain the refuge's history, management activities and wildlife.

Except for Canada geese, which have become accustomed to people around headquarters, the wildlife is truly wild. Many wildlife critters may go undetected by simple, casual observation. Keep your eyes moving and look for movement and different shapes and colors both near and far. Timing for seeing wildlife on the tour is also important. Spring, late summer and fall are the best seasons, and most species are active in the morning and evening hours.

Please note the following:

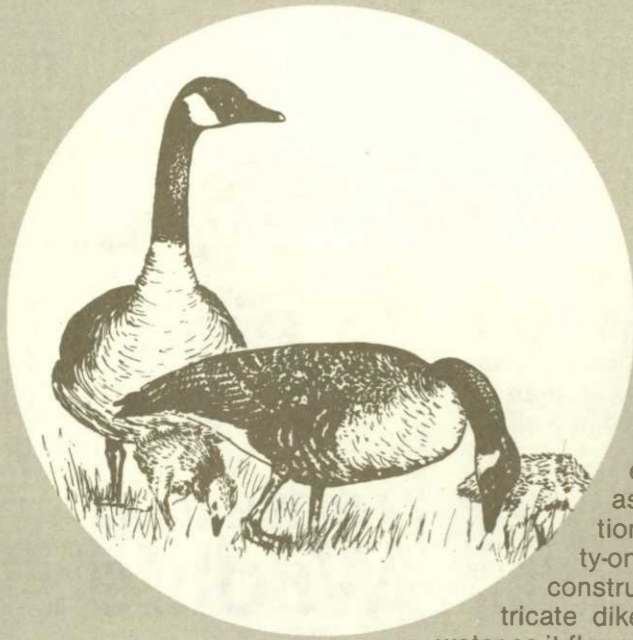
- Watch out for geese! All wildlife has the right-of-way, especially geese using the dikes. Breaking up a brood of geese may prove fatal for goslings separated from adults.
- You may stop anywhere on the tour where road width permits passing by other vehicles. Beware of soft shoulders and steep banks.
- Obey all traffic and directional signs. Travel is ONE-WAY-ONLY on the route.
- Do not disturb any wildlife.



MARSHLAND Wildlife Drive

Length - 7 miles
 Time - approximately 1 hour
 Open - June 1 to Oct. 30
 Hours - daylight hours only





Station 1.

REFUGE DEVELOPMENT

Established in 1935, Seney National Wildlife Refuge now encompasses 95,455 acres of land set aside for wildlife preservation and management. Twenty-one man-made pools were constructed on the refuge by intricate dike system which catches water as it flows south through the refuge. The pools contain more than 7,000 acres of open water suitable for waterfowl use.

Canada geese once nested in this area but they disappeared soon after European settlement. Geese were re-introduced in 1936 and have since become established. Approximately 1,000 adult birds return each spring to nest.

Geese are often found on the road and along the dikes where they feed. Stop and wait to give them plenty of time and room to move out of your way. Be especially careful not to separate the parents from any of the young for the goslings may become lost.

Station 2.

HABITAT REQUIREMENTS

The environment in which an animal lives is its habitat. For an animal to remain in an area, the habitat must provide food and water, shelter and protection and enough room to roam.

Here at Seney, we have been working to provide suitable habitat for geese and ducks. This development has also proved beneficial for loons, eagles, herons and a variety of other wetland species.

Station 3.

NESTING ISLANDS

Most of the geese choose islands for their nest sites soon after returning to the refuge in March from their wintering grounds in western Tennessee. The islands are comparatively safe from skunks, raccoons, coyotes and other predators. Incubation begins about mid-April after five or six eggs have been laid. Hatching occurs about the middle of May.

Of 750 islands on the refuge, less than 200 are considered satisfactory for nesting. Some of the larger islands are used by more than one family of geese. In recent years, there have been over 200 nests with over 1,000 goslings hatched each year.

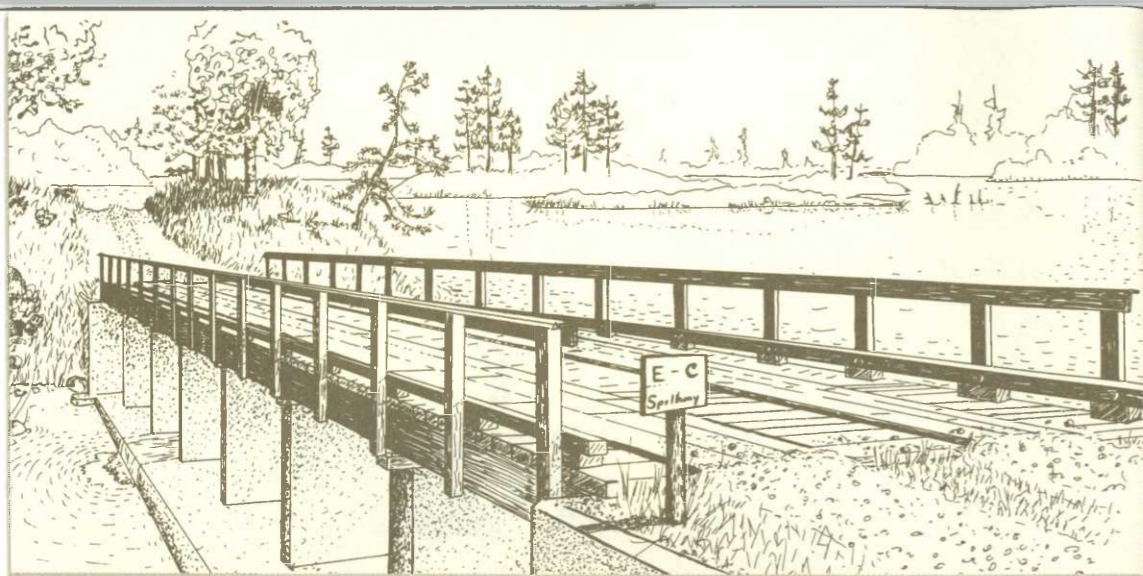
Station 4. FOREST COMMUNITIES

The most common trees along the tour are red and jack pine. These trees thrive on sandy soil common on Seney and throughout most of the Upper Peninsula.

Red pine is identified by its straight growth, red bark and long needles. Jack pine has nearly black bark, short needles and many scraggly branches.

Both trees provide limited food value to wildlife; however, some birds use their branches and trunks for nesting. Seney's bald eagles use tall pines near refuge pools to support their huge nests.





Station 5.

CONTROLLING WATER LEVELS

The structure you are about to cross not only is a bridge but also the spillway control structure for E pool to your right. Wooden stop-logs are used to control the pool's water level. These logs can be put in or taken out as necessary to obtain the desired water levels.

During the nesting period, the water level is kept high to discourage predators from crossing to the nesting islands to eat the goose eggs. After the nesting season, the water is lowered, called "drawdown", to expose muddy flats along the shoreline. Tender shoots of rushes and sedges quickly sprout in these areas and provide an abundance of food for the young goslings.

A pool in this drawdown stage also produces abundant supplies of insects and other invertebrates, while making minnows and other fish more accessible to other wildlife. As a result these areas attract great blue herons, sandhill cranes, ducks, shorebirds, raccoon and otter.

Station 6.

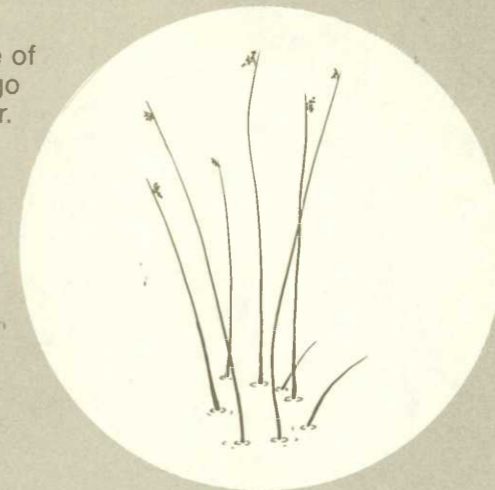
WOODLAND HOMES

The main trunks of wind-torn, burned or diseased trees often stand for years, providing homes for woodpeckers, flying squirrels, owls, deer mice and other assorted critters. Seney's timber management program is aimed at protecting these snags for continued wildlife use and providing a diverse selection of trees of various ages.



Station 7. **VALUABLE PLANTS**

Bulrushes grow well along the shore of the shallow pools. Young ducklings go into them to hide when danger is near. The seeds provide food for water fowl. Muskrats use the stems for their houses. Bulrushes are helpful in other ways; they slow the wave action which would damage the dikes.



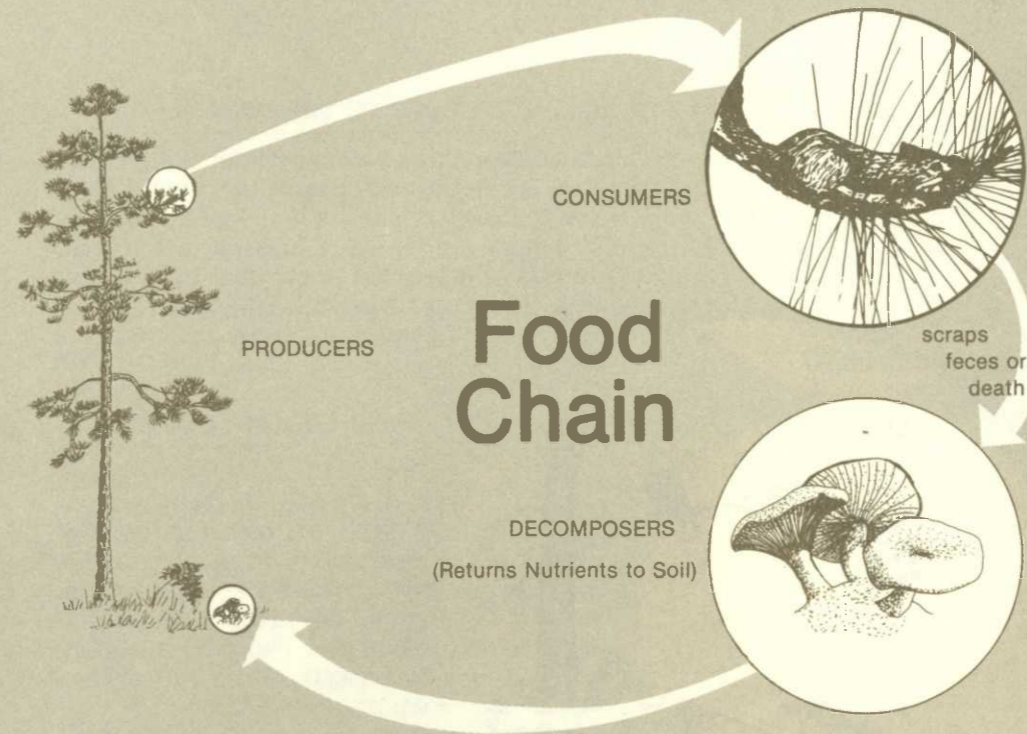
Station 8. WATER

The water in the streams and lakes throughout most of the north country is stained a golden brown. Much of this color is due to tannic acid and decayed organic matter which comes from the leaves and branches that cover the forest floor. The falling rains pick up these substances and carry them to streams and lakes. However, algae and iron compounds in the water sometimes cause it to look murky, as you see here. At times the iron compounds settle to the bottom to form layers of bog iron as can be seen in the Visitor Center.

Station 9. MARSH COMMUNITIES

On your left is another of our communities. The tall, graceful cattails outnumber all other plants in this marsh. The grass-like sedges along the bottom of the dike and bulrushes with which you already are acquainted are common members of the marsh community. All are important to the marsh and sedge wren, the sora rail and red-winged blackbird which nest here. Muskrats are fond of the thick starchy roots of the cattail and the tops are used in building their houses. Openings in the cattail marsh, made by muskrats, are good nesting sites for ring-necked ducks.

Sometimes, management of cattail areas is needed to thin out the dense vegetation. Management methods may include burning, dug-outs using heavy equipment or flooding.

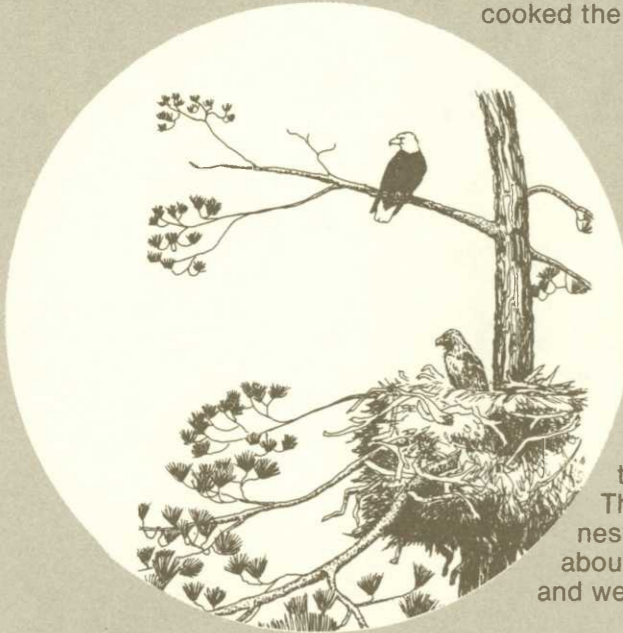


Station 10. THE WEB OF LIFE

The web of life is a complex cycle composed of three links: producers, consumers and decomposers. Producers are green plants which convert the sun's energy into food. Consumers are plant eaters (herbivores) or flesh eaters (carnivores) incapable of manufacturing their own food. Decomposers are microorganisms such as bacteria, yeast and fungi which break down producer and consumer wastes and remains into nutrients which are then reabsorbed into the soil. Each of these links is dependent on, and directly influenced by, the other two links. Any disturbance or disruption to one link will cause a similar disruption to the other two links.

Station 11. CLUES TO THE PAST

The scars on many of the larger red pine are fire scars. In the early part of this century fires were started to clear the land for farming. Red pines survived because they have thick bark and can withstand a great deal of heat, but trees with thin bark were killed as the heat cooked the cambium or growing layer.



Station 12. EAGLE NEST

One of Seney's active eagle nests is in a tall, dying red pine directly across the wetland meadow in front of you. The high-powered scope is aimed at the nest and will provide a close-up view of the nest, and hopefully, the adults and young.

After several years of disuse this nest was reoccupied in 1982. The eagles add new sticks to their nest each year. This nest is now about 8 feet across by 5 feet deep, and weighs several hundred pounds!

The adult eagles begin nesting in mid-to-late March, and the 1-3 eggs hatch in April. The young spend about 3 months in the nest, with the parent birds bringing in large quantities of fish and other foods snatched from refuge pools, rivers or nearby lakes.

Management for Seney's eagles include the protection of nesting trees near pools, banding of the eaglets to monitor migration routes and survival rates and protecting the nest areas from human disturbance during the critical nesting periods.

Although bald eagles have made a dramatic comeback in Michigan and throughout the U.S. during the past decade, loss of nesting habitat, the effects of acid rain and other pollutants continue to raise concern over the plight of the eagle.

Station 13. SKILLED WORKERS

Carpenters of the forest have been at work! On the right we see where the crow-sized pileated woodpecker worked deep into the trunk of a jack pine to get at wood borer larvae.

To your left, you will see several horizontal rows of tiny holes through the bark of a pine. This is the "signature" of the yellow-bellied sapsucker. After making these wounds in the tree, the bird will return to feed on the oozing sap and insects attracted to it.

Station 14. QUIZ YOURSELF


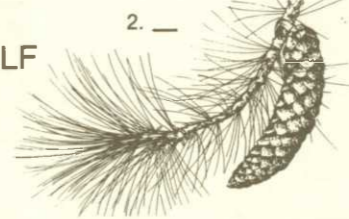
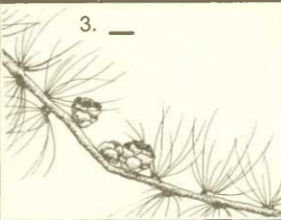
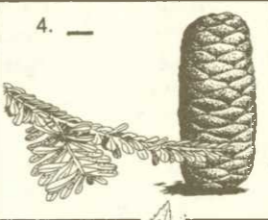
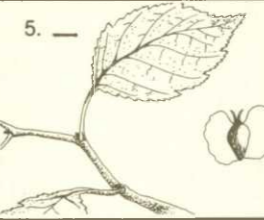
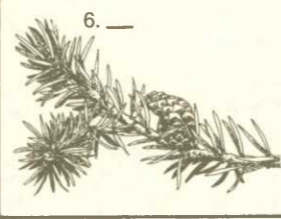
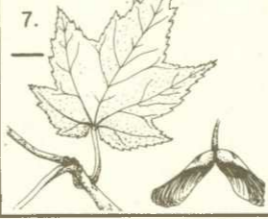
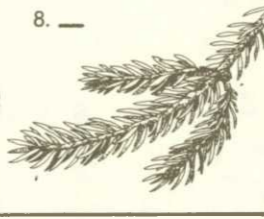
There are eight species of trees in this vicinity. Although many trees and other plants look alike, each species has features all its own. See how many of the lettered trees you can identify. Leaves and fruit of each tree are shown in the drawings. The names corresponding to the letters are given below the drawings.



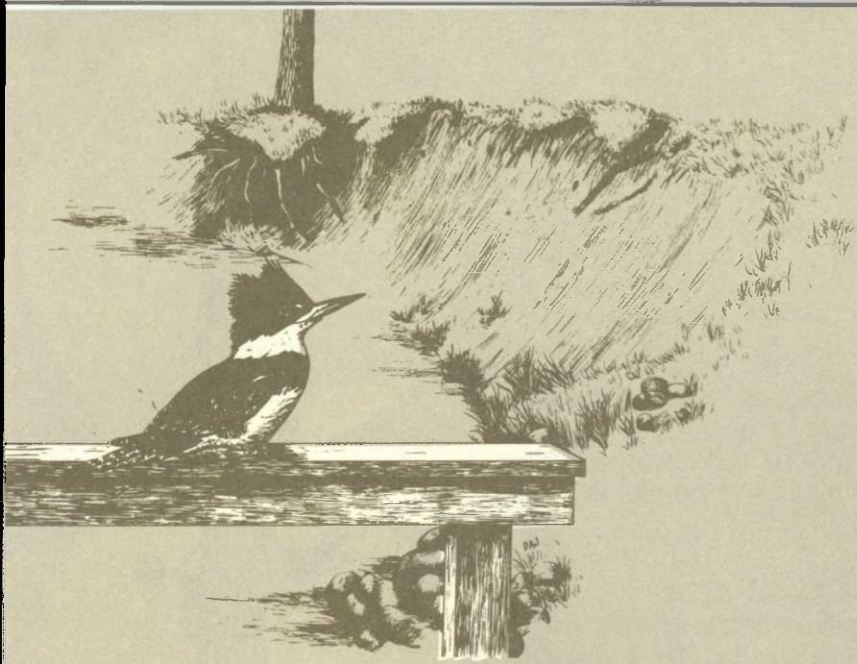
Pileated Workings



Sapsucker Workings

QUIZ YOURSELF		
1. 	2. 	
3. 	4. 	5. 
6. 	7. 	8. 
A. TAMARACK B. JACK PINE C. BLACK SPRUCE	D. RED MAPLE E. WHITE PINE F. BALSAM FIR	G. RED PINE H. WHITE BIRCH

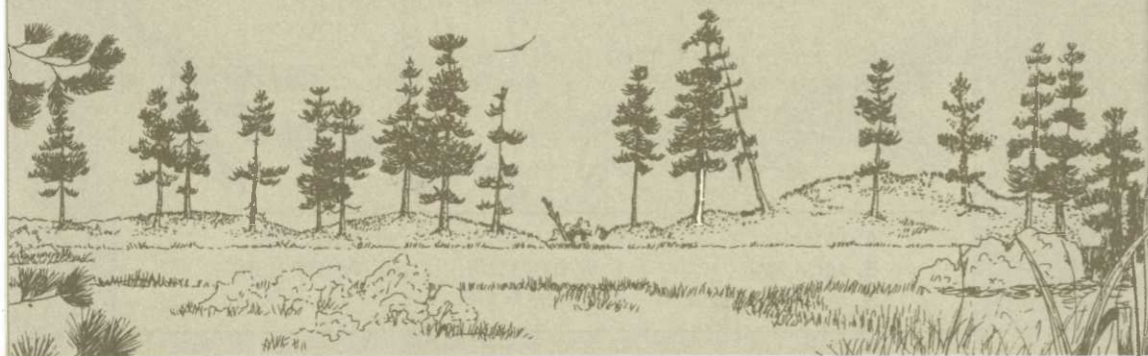
ANSWERS:
1-G, 2-E, 3-A, 4-F, 5-H, 6-B, 7-D, 8-C



Station 15. APARTMENT HOUSE

In some years bank swallows and kingfishers nest in the sandy bank behind you and to the right. Both birds excavate tunnels in the soft sand, some of which are still visible. Bank swallow burrows are usually 1½ to 3 feet deep, while the fish-eating kingfisher may dig one up to 15 feet deep! The swallows nest in colonies while the kingfishers are loners.

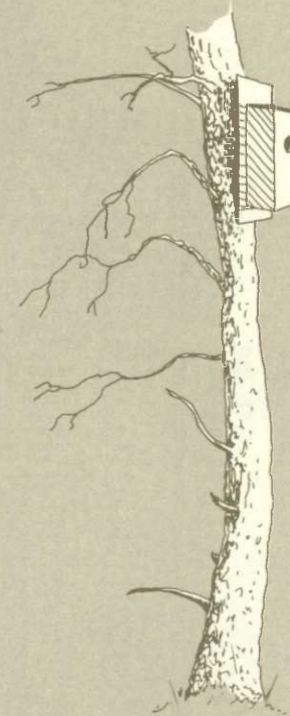
On your left, bordered by posts, is a goose grazing site periodically worked and seeded with grasses and clovers to provide additional browse for Canada geese.



Station 16. NESTING BOXES

The nesting box on the tree trunk in front of you is one of about 100 erected on the refuge. Since suitable tree cavities are scarce in this predominantly pine forest, these artificial boxes provide alternative nesting sites necessary for wood ducks and hooded mergansers. Other wildlife like the red and flying squirrels, tiny saw-whet owls, and our smallest falcon, the kestrel also use the boxes.

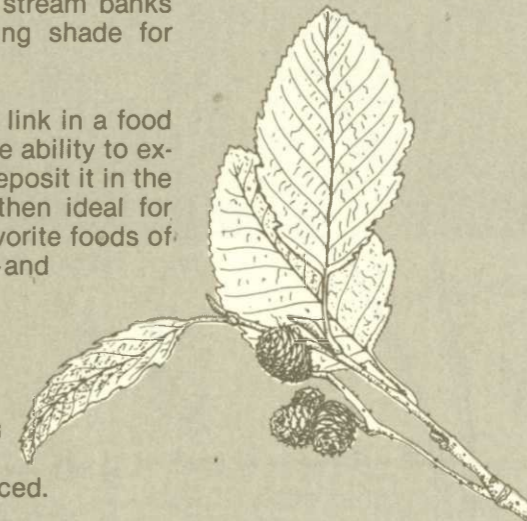
The boxes must be cleaned out and wood shaving nest material replaced each year for optimum usage. Members of the Youth Conservation Corps perform these tasks as well as record box usage.



Station 17. WETLAND SHRUBS

Tag alder never reaches stately heights but seems to make up for it by growing abundantly. This moisture-loving species lines the banks of trout streams, harassing fly fishermen. Although sometimes bothersome, this plant is greatly beneficial in protecting stream banks against erosion and in providing shade for trout.

Tag alder is important as a vital link in a food chain. The wetland shrub has the ability to extract nitrogen from the air and deposit it in the soil. The fertile, moist soil is then ideal for earthworms. They in turn, are favorite foods of woodcock and common snipe—and so the chain continues.



Note the deep veins in leaves and hard, conelike structures in which the seeds are produced.

Station 18.

FOOD PLOT

On your left behind the guide posts is yet another food plot for geese, cranes and deer. Succulent grasses and clovers are seeded and fertilized to supplement the rather infertile sandy soil which is common here. Several of these sites are maintained throughout the refuge pool system and are an important part of Seney's goose management program.

Station 19.

CHANGING HABITAT

The pool to your left was created by the road or dike you are standing on. The level of the pool is controlled by a large culvert control at the end of the "dock." Ring-necked ducks, loons and beaver occupy this man-made wetland and the dead trees in the pool provide nest sites for tree swallows.

This area is also a haven for wildflowers through the summer, with wild daisies and the lavender knapweed the most common. Knapweed, whose flowers look like miniature thistles, produces a mild toxin that ward off other plants and allows it to expand its area of domain.



Station 20.

CHANGING WETLAND

The shallow wetland to your left provides a feeding and resting area for waterfowl at certain times of the year. A beaver family once lived here, but moved on as food supplies diminished. The old beaver lodge can still be seen on the left edge of the marsh. Now no more than a hump in the water covered by dense plant growth, the lodge reminds us that the only thing in nature that doesn't change, is change.

The staff of Seney National Wildlife Refuge hope you have enjoyed this drive on your refuge. Please come again.

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As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interest of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.



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