GREAT MEADOWS NATIONAL WILDLIFE REFUGE
Concord, Massachusetts

ANNUAL NARRATIVE REPORT
Calendar Year 1976

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



2 4 5 1

Permanent Personnel

1. Linda K. Gintoli. . . . . Refuge Manager
2. Robert A. Zelley. . . . . Assistant Refuge Manager (EOD 08/29/76)
3. Thomas L. Mountain . . . . . Assistant Refuge Manager (Transferred 09/12/76)
4. Harry E. Sears . . . . . Maintenanceman
5. Eleanor B. Norton. . . . . Refuge Clerk

Temporary Personnel

Thomas A. Goettel . . . . . Biological Technician (EOD 05/09 to 11/05/76)

Mark A. Braiewa . . . . . Biological Aid (EOD 07/04 to 08/20/76)

Seth E. Mott . . . . . Biological Aid (EOD 07/04 to 09/06/76)

Warren W. Prim . . . . . Biological Aid (EOD 07/04 to 08/25/76)

Review and Approvals

Submitted by Date	Charles R. Maloy 3/3/77 Area Office Date
Great Meadows N. W. Refuge Refuge	Tom McAndrews 3/4/77 Regional Office Date
Oxbow National Wildlife Refuge Complex Office	Monomoy National Wildlife Refuge Complex Office

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NARRATIVE SUMMARY REPORT July 1, 1975 - December 31, 1975

GREAT MEADOWS NATIONAL WILDLIFE REFUGE

Weather conditions during the report period were normal except for a record snowfall of two feet on December 23rd. This was the first major snow storm in six years.

The upper pool was drawn-down starting June 30th. Exposed mudflats were seeded with Japanese Millet. Growth was evident within a few days and natural vegetation, primarily cutgrass, had started throughout the pool. Large numbers of shorebirds were attracted to the shallow and exposed portions of the pool.

On September 15, an outbreak of botulism occurred in the Upper Pool. By the end of the week 70 ducks and shorebirds had been picked up. Hazing with cracker shells warded birds away from the area. No new kills occurred following heavy rains at the end of the month.

WNAC-TV visited on August 20th to film for the series "Gullivers Travels." On October 3, thirty-one teachers and nature enthusiasts attended "Mini Marsh Day" Environmental Education Workshop. At a meeting on November 13, with the refuge staff and Ms. Cynthia Kryston of the Minuteman National Park, cooperative arrangements were worked out for teacher workshops to be scheduled during the spring.

The refuge storage building was broken into on November 23. The 40 hp outboard motor and controls were stolen. The replacement of this equipment will cause much fiscal and operational inconvenience. Because of this and excessive vandalism arrangements were made to store some equipment at Minuteman National Park facilities.

During this six month period the following training or personnel actions occurred. Biological Technician, Ellie Horwitz, resigned from the staff July 15th to accompany her husband to work on a grant in Washington, D.C. Biological Technicians, Bill Rogers and Brad Daly terminated summer employment August 27th. Biological Aid, Allan Connell, terminated summer employment September 26. Assistant Refuge Manager, Tom Mountain, attended Supervision and Group Performance September 29 to October 3.

NARRATIVE REPORT

Great Meadows National Wildlife Refuge

Calendar Year 1976

I. GENERAL

A. Introduction:

The Great Meadows National Wildlife Refuge is located along the Concord and Sudbury Rivers. The refuge area encompasses extensive portions of the rivers' floodplain within Middlesex County.

B. Climatic and Habitat Conditions:

Precipitation and temperatures were about normal from January through the close of summer. Winter came a little earlier than usual in the fall. The first snowfall occurred in mid-November. Temperatures were below normal through most of November and December. The refuge impoundments were frozen over from mid-November through December.

The refuge habitat consists primarily of the river floodplain along the Sudbury and Concord Rivers. A situation that bears watching in the future is a proposal by the Metropolitan District Commission (M.D.C.) to take most of the water from the Sudbury River for use by the City of Boston. The idea has been shelved due to intensive local opposition.

C. Land Acquisition:

1. Fee Title

The total refuge area comprises 2751.7 acres. Land acquisition during 1976 consisted of 32.3 acres in the Sudbury Unit. Acquisition is only about 68% complete.

Numerous private inholdings interspersed with refuge lands makes for the usual frustrations with trespass. As 1976 came to a close, the refuge became aware that a property owner with land within the proposed refuge boundary had filed for bankruptcy. It is hoped that the Fish and Wildlife Service may be able to acquire the wetland portion of this holding before it is sold for development.

2. Easements:

Nothing to report.

3. Other:

Nothing to report.

D. System Status:

1. Objectives

The objectives set and approved for Great Meadows in 1971 are out of phase with the current situation. Not only has the local public's views of the refuge changed, but also two changes in managers have altered the emphasis placed in various refuge programs. Therefore, the refuge staff took some time during the early spring of 1976 to review and update the refuge objectives. A great deal of additional time is necessary to bring these objectives in line with PFMIS before they may be submitted for approval.

The major thrust of Great Meadows Refuge, as indicated in our objectives and by the Annual Work Plan Advise, is for Environmental Education. Located amidst an intellectual suburban community just 15 miles from the Boston/Cambridge area, the refuge serves as a "greenspace" in an otherwise rapidly developing megalopolis. The demand by school systems and nature enthusiasts is for all practicable purposes unsatiable. The refuge has the potential of becoming a major Environmental Education center of the nation. This outlandish statement is exhibited by the increase in E.E. outputs. from 515 AH in 1972 to 42,980 AH in FY 76 with only a minimum of effort by refuge staff members in providing teacher workshops. Unfortunately, the work done for

education on the refuge may be for naught should the recent funding trends continue.

Other refuge outputs in I and R and Wildlife Resources are occurring essentially independent of refuge input. As reflected in the program schedules for FY-77 the refuge is operating at or very close to NFIO. The staff's time is expended in simply maintaining the paper workload and old facilities visibly acceptable to the public.

The refuge may be considered currently in line with approved standards, but rapidly approaching a time where public use activities will be below standard. For example: unauthorized camping may be expected to increase dramatically on Monomoy Refuge; hunting and trapping trespass will increasingly detract from the refuge's image with the lack of enforcement capabilities; facilities such as the comfort station, observation towers, trails, and signs will deteriorate with the lack of maintenance manpower.

2. Funding

Rather than incumber the reader with a lengthy discussion on the refuge's funding pattern, the following charts and graph should be self-explanatory.

Consumer Price Index* and Percent Change from 1970
(1967 = 100)

YEAR	C.P.I.	% Change	% Cumulative from 1970
1970	116.3	4.3%	
1971	121.3	4.3%	
1972	125.3	3.3%	7.7%
1973	133.1	6.2%	14.4%
1974	147.7	11.0%	27.0%
1975	161.2	9.1%	38.6%
1976	173.2	7.4%	48.9%

*"Monthly Labor Review" October 1976 Table 22, Pg 89

Fiscal Year	FY Allocation	Permanent Salaries	Operating Funds (difference)	Percent Change from 1970
70	51,200	30,290	20,910	
71	52,000	29,265	22,735	8.7%
72	55,000	36,059	18,941	-9.4%
73	63,000	35,292	27,708	32.5%
74	94,000	51,951	42,049	101.1%
75	69,000	34,822	34,178	63.5%
76*	76,000	57,590	18,410	-12.0%
77	72,000	56,468	15,532	-25.7%

*Includes Transition Quarter

See following page for comparable chart.

II. CONSTRUCTION AND MAINTENANCE

A. Construction

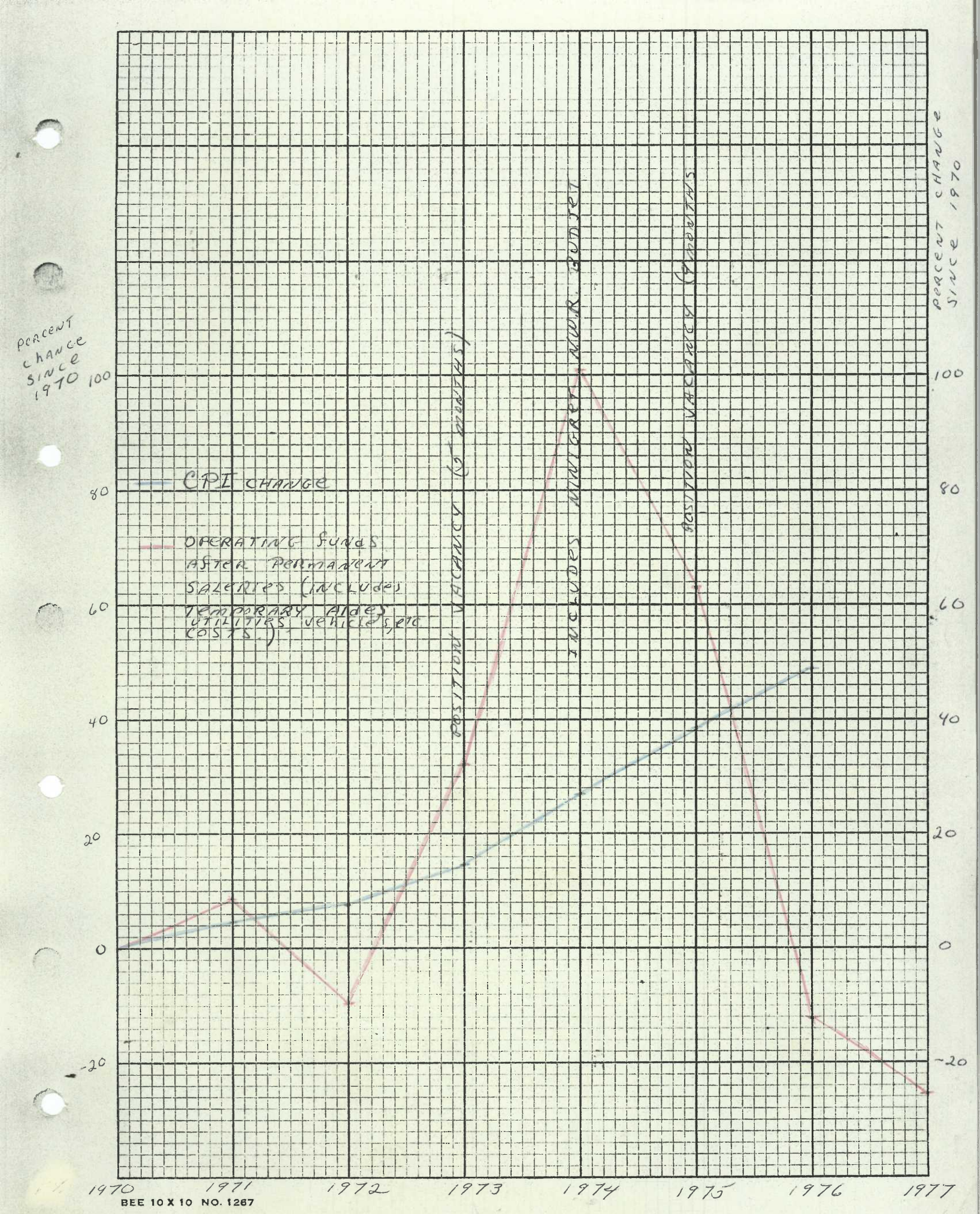
No significant construction activities were undertaken during 1976.

B. Maintenance

The Concord River annually floods and overtops the low level dikes. Two hundred yards of gravel were delivered and spread to repair the damage done by the winter high waters. Additional funds were made available towards the end of the fiscal year's transition quarter for rip-rap material. These funds were obligated for the purchase of rocks which will be placed along portions of the dike system that are most vulnerable to flood damage.

Other routine maintenance consisted of servicing and repair of wood duck nest boxes, repair or replacement of vandalized signs, and litter cleanup.

The refuge has been subjected to numerous break-ins and theft in the past. A silent alarm was installed in February connecting the refuge shop to the Concord Police Station. On November 20, a break-in occurred and two individuals were arrested by the police with refuge property in their possession. The alarm system eas extended to include an equipment



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storage shed after the break-in. The cost of installation of the alarm system was approximately $800. However, after having an outboard motor and an uncountable supply of power tools and other shop tools stolen, this has to be considered a necessary operating expense in today's world.

C. Wildfire

Nothing to report.

III. HABITAT MANAGEMENT

A. Croplands

The refuge contains 8 acres of fields which were planted to corn by a local cooperator. The fields were supposed to have been planted to a cover crop of rye in the fall. However, the cooperator declared bankruptcy and approximately 4 acres of corn were left unharvested.

The refuge will seed these fields to permanent grass and phase out cooperative farming agreements altogether. This will provide diversity of habitat with adjacent woodlands and wetlands.

B. Grasslands

Two fields totaling 13 acres that were cooperatively farmed in the past are in permanent grasses and forbs. Because active farmers are virtually non-existant in this heavily residential area, all refuge fields will be managed this way in the future to maintain habitat diversity on the refuge uplands.

C. Wetlands

Water levels were lowered in the two refuge impoundments during the month of June. A vigorous growth of emergents such as millet and wild rice occurred.

American Lotus has encroached over an extensive area of the lower pool. An attempt was made to control its spread using Aquathol Plus, granular, without any success. Control will be attempted again in the coming year if the use of a more effective pesticide such as 2,4D is approved.

D. Forestlands

No management practices are conducted with regard to woodlands on the refuge. These are mostly wet woodlands bordering the river floodplain. Dominant trees include alders and red maple on the wetlands with oaks and white pine on higher knolls.

E. Other Habitat

Nothing to report.

F. Wilderness and Special Areas

The "Two Brothers Rocks" location was submitted for possible listing in the National Register of Historic Sites. Two large boulders along the Concord River, known as the Two Brothers Rocks, served in the 1600s to delineate the boundary between the lands of Governor Winthrop and his son-in-law Thomas Dudley.

G. Easements for Waterfowl Management

Nothing to report.

IV. WILDLIFE

A. Threatened Species

Two osprey were observed throughout the spring and summer along the Concord and Sudbury Rivers. One bird frequented the vicinity of the refuge impoundments quite often to the enjoyment of local birders. Presently there is no known nesting by this species on or near the refuge.

Bald Eagle sightings are occasionally reported by birders during the spring.

B. Migratory Birds

1. Waterfowl

Geese: A non-migratory population of about 300 Canada Geese live along the Sudbury and Concord Rivers. The frequently mowed succulent greens of several country clubs located along the river provide an ideal brouse

for the geese. However, this does result in occasional calls from golfers who don't appreciate the droppings left on the greens and fareways.

Ducks: Waterfowl management has been directed principally towards wood duck enhancement throughout the history of the refuge. Wood duck nesting boxes are maintained within the refuge pools and along the Concord River floodplain.

Wood ducks, mallards and black ducks comprise the principal nesting species of ducks at Great Meadows. During the fall migration these species are supplemented with large flocks of Green-winged and Blue-winged Teal, Gadwall and American Widgeon.

Preseason banding has been done mostly by state personnel with some assistance from the refuge staff. Limited funds and manpower have reduced the capability of the refuge staff to get more actively involved in this activity. A total of 148 wood ducks and 79 black ducks were banded in 1976. These were the high priority species. Another 328 ducks were also banded incidently. These were mallards, green-wing and blue-winged teals.

Unusual sightings during the year included a Ruddy Shell Duck observed during the summer months. Also a European Widgeon was sighted during the period from mid-September to mid-November.

2. Marsh and Water Birds

The Virginia and the Sora Rail are the two most abundant birds of this category. A variety of herons and egrets are observed using refuge pools and marshes during the spring, summer and fall. However these are not particularly abundant. Peak numbers are estimated at no more than a dozen birds of such species. A local resident reported in November the existance of black-crowned night heron nests near the refuge impoundments. The nests had apparently gone unnoticed until after the leaves were off the trees. More intensive observation in the future may help to substantiate what if any heron nesting is occurring.

Unusual sightings included a glossy ibis during April and a green heron during August. The occurrences of birds such as the glossy ibis may bear closer attention since some species are extending their range. No solid proof

of nesting by this group of birds exists to date. However some areas along the river floodplain appear to contain suitable habitat.

4. Raptors

Twelve species of raptors were observed on the refuge during spring and fall migrations. The most frequently observed birds were the two ospry which flew over the refuge pools and marshes during the spring and summer. Red-tailed Hawks and Marsh Hawks were also frequently observed by visitors.

5. Other Migratory Birds

The following species, which are not on the refuge bird list, were recorded during 1976.

Black-throated Blue Warbler
Ruddy-shell Duck
Upland Sandpiper
Common Egret
Bonaparte's Gull
Florida Gallinule
Northern Water Thrush
European Widgeon
Snow Bunting

C. Mammals and Non-Migratory Birds and Others

1. Game Mammals

There are probably a few white-tailed deer on or near the refuge. One local resident has reported seeing some, but virtually all suitable habitat has gone to residential uses.

Cottontail rabbits and squirrels are abundant as these species adapt well to increased urbanization.

Muskrats are distributed throughout the river floodplain. Comments from local trappers trapping the private holdings adjacent to the refuge indicate a decline in numbers over the previous year. No house count has been conducted to date due to deep snow which is obliterating many of the houses. Observation of very little house building activity in the refuge pools tends to substantiate the subjective impressions expressed by local trappers.

2. Other Mammals

Red foxes occur on the refuge but their presence is seldom detected by observations. Raccoons are common in the area. We hear about these critters mostly when one takes up residence in someone's attic or ventilation ducts.

3. Resident Birds

The most visible resident birds are the ring-neck pheasants which are observed along the dikes. Grouse also occur in the Sudbury Unit and go mostly unnoticed by the staff and public at large.

4. Other Animal Life

Snapping Turtles abound in the refuge pools. A turtle-trapper, Mr. John Rogers, harvested 34 snapping turtles from the upper pool in August.

The Blanding's Turtle is found in refuge pools. This is one of the three locations in the state where observations have been recorded. The turtle's apparent rarity may be due to a limited interest in the ranges or distribution of reptiles in the state rather than actual scarcity.

V. INTERPRETATION AND RECREATION

The redefining of Interpretation and Recreation activities to include some work elements under wildlife resources has lent some confusion to reporting procedures. However, the refuge did muddle through and was able to accommodate 123,000 visitors during 1976.

Detailing staff members for weekend duty was initiated in 1973 to help control the crowded conditions in the Concord unit. With student aids taking the duty during summer months and the manager and assistant alternating in the fall, winter and spring some uncontrolable situations were avoided. There have been many Sunday afternoons where staff members have observed 80 to 90 cars trying to squeeze into our 35 car lot. Needless to say, some of our neighbors have been more than a little dismayed by the traffic.

A. Information and Interpretation

1. On-Refuge

A new trail guide (see appendix) was completed and made available during the latter part of 1975. The Trail Guide was developed with two concepts in mind: One, it should tell a story or have a theme; and Two, it should be designed so an individual could read it away from the area and still learn from the material. Recognizing that the station is located in an extremely environmentally aware area, the Trail guide was written at a higher level than would normally be used. Many positive comments have been received from organizations such as Mass. Audubon and Mass. Environmental Education Society during the year.

One teachers workshop was held during 1976. "Winter in The Marsh" a mini-workshop for teachers was conducted on February 11th. The 30 teachers present learned through outdoor activities how wildlife and native Americans have coped with winter.

A series of lessons have been developed cooperatively with the Concord School System. Copies are appended. Geered for the fourth, fifth and sixth grades the lessons and activities help students integrate their environmental studies with their subjects.

A cooperative environmental workshop was offered by the National Park Service and Great Meadows to 20 Boston University students and teachers on April 22. Although cold and wet all participants seemed to enjoy the grass-roots look at a National Wildlife Refuge. Activities included transects and soil studies.

2. Off-Refuge

Manager Gintoli, Asst. Manager Mountain and Asst. Manager Zelley have attended the quarterly meetings of the Mass. Environmental Education Society. The organization was born in January of 1975 in the Great Meadows office with 12 E.E. agencies getting together. It has now grown to a membership of over 250 from across the State.

A bi-weekly radio program was established with a local radio station, WIQH-FM. Programs aired related to the 1975 Botulism outbreak, the refuge teachers workshop, National Wildlife Week, employment procedures, spring migration of birds, etc. Unfortunately, time and staffing changes have not permitted us to carry on the program when school re-opened in the fall.

Manager Gintoli presented a statement on leg-hold trapping for Regional Director Larsen to the House Committee on National Resources on March 2nd. The trapping issue in Massachusetts has become very emotional as exhibited by the nearly 200 persons present at the hearing.

The "Great Meadows Update," a public meeting designed to meet the refuge neighbors was held on June 17. Although public turnout was low, nearly outnumbered by Service personnel, the questions asked were pertinent and general remarks after the meeting were positive.

On August 15, Manager Gintoli broadcasted a half hour interview on WCAS, a popular radio station in Cambridge. The program, "Future Earth," is on every Sunday morning to present environmental issues to the public. The discussion revolved around Great Meadows wildlife, public use, and Environmental Education programs.

An article on the educational requirements of a Refuge Manager was written by Manager Gintoli and published in the Wildlife Society's Northeast Section Newsletter.

B. Recreation

1. Wildlife Oriented

Recreation on Great Meadows Refuge is 90% wildlife oriented with wildlands observation, photography, etc. predominant. The area has no hunting, fishing or trapping program although all three activities are common on the river and unacquired tracks within the refuge. Often birdwatchers and hunters or trappers conflict because of misunderstandings regarding refuge boundaries. The confusion is understandable, with our checkerboard pattern of ownership and non-control of the rivers, Refuge staff members are frequently called in to clarify the situation.

2. Non-Wildlife Oriented

The only authorized non-wildlife oriented activities which occur on Great Meadows are winter sports such as ice skating, cross-country skiing, and snow shoeing. Some problems occur due to our inability to handle the number of cars seeking to enter the refuge lot on a weekend. Frequently the staff receives complaints from cross-country skiers for plowing the road out to our shop and making the skiing difficult. Each year we experience an increase in skaters and skiers as more people are looking for recreational activities during the winter months rather than hibernating in their homes.

C. Enforcement

To combat the vandalism problem at Great Meadows a silent security system has been installed with a direct connection to the Concord Police Department. The shop was first wired in February and the storage building added to the system in December. On November 20 two individuals were apprehended by the police after tripping the alarm, one pleaded guilty in court, the second pleaded innocent and is waiting for a jury trial.

Drinking parties and vandalism reached outrageous proportions during the summer months. The litter left by the teenagers would make "Johnny Horizon" roll over in his grave from the youths apparent disregard for the environment. The influx of youth was apparently a result of local police running the teenagers from Concord Center to the fringes of Town. By work-night-time patrols Gintoli and Mountain were able to slow it down somewhat. By the end of August an agreement was reached with the Town of Concord to install a gate at the Monsen Road entrance to be opened and closed by the police during their regular patrols at sunrise and sunset. The agreement has been relatively successful.

VI. OTHER ITEMS

A. Field Investigations

The Massachusetts Division of Fisheries and Game had been conducting a wood duck population study over the years. The formal study was concluded in calendar year 1975. The Mass. Division of Fisheries and Game continued banding and nesting surveys in accordance with a special use permit. The following chart is a summary of wood duck production within the refuge pools through 1976.

	UPPER MARSH				LOWER MARSH				
YEAR	Nest Starts	Successful Nests	Ducklings Hatched	Boxes Available	Nest Starts	Successful Nests	Ducklings Hatched	Boxes Available	Adj 1 River Boxes Nest Starts
1976	5	5	65	11	7	4	41	19	No Date
1975	6	6	63	12	11	9	102	19	1
1974	5	4	38	15	11	8	101	16	8
1973	0	0	0	20	2	2	21	15	12
1972	3	2	28	29	5	4	30	32	3
1971	5	3	25	29	3	3	34	33	2
1970	2	2	20	29	4	3	24	33	1
1969	12	12	130	27	1	1	9	18	No Date
1968	11	10	140	24	8	5	48	27	No Date
1967	14	13	153	51	16	10	106	50	No Date
1966	23	20	128	50	20	16	201	50	No Date
1965	16	15	174	50	19	18	216	50	No Date
1964	19	18	186	49	19	15	188	50	No Date
1963	18	15	154	50	22	13	114	50	No Date

1973 - Year of big algae bloom

1968 big ice storm reduced number of boxes in half

Buttricks property has picked up a couple of Great Meadows birds in last few years

B. Cooperative Programs

The refuge has joined a cooperative program with the National Park Service for joint teachers workshops. A joint teachers workshop was held on June 22. During the summer, refuge personnel attended the National Park Service summer training programs and assisted in orienting National Park Service employees about wetland biology and management. The Park Service is also aiding the refuge by storing some of our larger equipment.

C. Items of Interest

Following the Great Meadows Update of June 17, the Thoreau Chapter of the Sierra Club became concerned over the release of sewage effluent into the refuge upper pool by the Concord Sewage Treatment Plant. The effect of this attention to date has been a renewed effort to resolve the situation. The problem dates back to the 1920's before the refuge was established. The impoundments were originally built by an avid waterfowl hunter and the water supply from the treatment plant was considered a good thing back then. The problem today stems from the many-fold increase in output of nutrient laden effluent. The upper pool can no longer handle this nutrient load without extensive buildup of algae mats and the stench of decaying vegetation on a hot summer day. Current feelings are that a pipeline should be extended to the river with a diverter valve by which effluent could be used to maintain water levels as needed. At this writing, a resolution of this problem is being explored between representatives of the Town of Concord and the Fish and Wildlife Service and EPA. A past stumbling block has been the Town's inability or unwillingness to fund the construction of the pipeline.

Refuge Manager Gintoli attended a public hearing on the Metropolitan District Commission's (M.D.C.) preliminary Upper Sudbury River Watershed Study. The study recommends drawing water out of the Sudbury River 200 days a year to supplement Boston's water supply. A brief statement from the Fish and Wildlife Service was read at the hearing and a detailed written statement submitted. The proposal has been tabled by the M.D.C. after much local resistance was encountered.

A waterfowl disease workshop was held on June 3rd by Dr. Milton Friend of the National Fish and Wildlife Service National Laboratory, Madison, Wisconsin. Twenty-four persons were in attendance from across the northern portion of Region 5.

Asst. Manager Zelley was detailed from December 21-24 to assist in clean-up efforts of oiled birds on Nantucket Island after the grounding of the Argo Merchant.

Asst. Manager Mountain participated in the following details and training assignments during the year: detailed to the Wingbee in Laurel, Maryland January 26-30; attended the Department of Interior's course Supervisor's Job I, February 23-27; attended 8 weeks of law enforcement training by the Department of the Treasury, March 23-May 18; attended P.M.S. Evaluation Review with Manager Gintoli and Gordon Watson in Concord, New Hampshire, July 28; detailed to Missisquoi Refuge August 25-29 in preparation for his transfer to that station and operation of the Youth Waterfowlers Hunt. Asst. Manager Mountain transferred to Missisquoi Refuge effective September 12.

The following additional personnel actions occurred in 1976: Asst. Manager Zelley entered on duty August 29. Tom Goettel EOD on May 9 and terminated November 5 as a Biological Technician, GS-5, principally assigned to Monomoy Refuge. Three summer aids Seth Mott, Mark Braiewa, and Warren Prim, EOD on July 4 and terminated at the end of August.

In accordance with the Revenue Sharing Act, a check in the amount of $11,848.10 was presented to the Treasurer of Middlesex County, $706.19 to Barnstable County, and $676.27 to Worcester County.

Assistant Manager Zelley assisted in drafting Section I, II, III, IV, and VI of this report. Manager Gintoli drafted Section I and V and reviewed and edited the final narration. Special thanks are extended to Ellie Norton for typing the final report.

D. Safety

Monthly safety meetings were conducted and safety was included in on the job discussions with seasonal employees. There were no accidents during 1976.

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MONOMOY NATIONAL WILDLIFE REFUGE

During July the Keene camp, Building "C", was completely torn down. In addition to this planned removal of a former camp, several structures were destroyed by fires. On July 3rd, the refuge was notified that a fire had occurred on Monomoy Island. Investigation on July 5th revealed the loss of a storage building, 2-1/2 acres of grassland and a private camp (the Stello camp). Arson was suspected. Later, on October 12th, the George Goodspeed camp was destroyed by fire. Chief Greenough, Chatham Fire Chief, reported the fire was an accident caused by faulty installation of the flue pipe for a stove.

During September, the Chatham Board of Health objected to the issuance of an open burning permit to the refuge by the State for the disposal of camps on Monomoy Island. Prior notice is to be made to other camp owners who may salvage wood, the Air Pollution Control Board and the Town Fire Department before burning any camps.

During the month of August, the remains of the former Coast Guard Building and the Stello camp were completely buried.

On July 21, Bill Ashe, Acting Regional Director, Harvey Warner, Realty, and Howard Woon, Refuges met with refuge staff. A meeting was conducted with members of the Quitnesset Association to discuss public access onto the Morris Island portion of the Monomoy Refuge. The ongoing dispute over the right of public access still exists.

Erosion of the eastern portion of the Morris Island part of the refuge has continued such that it is virtually impossible to walk along this part of the refuge without getting one's feet wet.

NARRATIVE REPORT

Monomoy National Wildlife Refuge

Calendar Year 1976

I. GENERAL

A. Introduction

Monomoy Island is an eight mile long barrier beach island located on the "elbow" of Cape Cod. The refuge also includes a former headquarters facility and a small area of beach on Morris Island just north of Monomoy Island and connected to the mainland by a causeway to Chatham.

B. Climatic and Habitat Conditions

A natural process of beach erosion is occurring along the ocean side of Monomoy Island and along the southeast portion of Morris Island. The erosion has cut away almost all of the refuge beach frontage on the eastern portion of Morris Island. Some residents on adjacent private property are becoming more and more concerned about installation of some sort of permanent protection structure.

C. Land Acquisition

Land acquisition involves the gradual closing out of private inholdings and camp users. During the year negotiations have been underway to acquire the Massachusetts Audubon Society holdings and adjacent private holdings amounting to about 4 acres total. This acquisition has not been finalized to date.

Several people have life-time use of cabins on Monomoy Island. These lifetime use privileges date from the original establishment of the refuge in 1944. Six cabins in this category exist on the island to date.

Mr. Barclay Hayes, from Realty, visited Monomoy Refuge to appraise the Jones and Small properties on June 8th.

The refuge currently has a verbal agreement for the use of a right-of-way to the Morris Island unit of the refuge. A previously existing right-of-way was sold for a housing lot several years ago and the refuge is seeking a formal title to this second right-of-way so as to insure its permanence.

D. System Status

Monomoy Refuge should be considered out of line with objectives set in 1971. The wilderness designation of Monomoy Island enabled the complex to greatly reduce the cost of wildlife management, however, reducing the refuges operating budget has also reduced capabilities for enforcement and the control of undesirable public use activities. Unauthorized or undesirable activities such as camping, picnicking, illegal hunting, etc. may be expected to continue to increase until personnel with law enforcement authority can be stationed there to implement some control on the situation. For further discussion on the system status of the Great Meadows/ Monomoy complex see Great Meadows narrative.

II. CONSTRUCTION AND MAINTENANCE

A. Construction

None

B. Maintenence

On March 25, the remains of the Keene camp were burned by refuge personnel assisted by visiting personnel from Ecological Services, Concord, New Hampshire.

A military surplus M-37 4x4 was acquired by transfer from Parker River Refuge in the fall of 1976. Maintenanceman Sears replaced a worn-out front differential, radiator, and water pump. This vehicle will have to replace the rusted out 1967 Dodge Powerwagon.

Biological Technician, Tom Goettel, carried out a variety of needed maintenance tasks. The windows of the Headquarters were glazed and painted. The flag pole and oil tank were sanded and repainted and shot-up boundary signs were replaced. The fence along the beach, where erosion is proceeding rapidly, was taken down and a ramp was added to the wooden steps for access to the beach.



C. Wildfire

Nothing to report.

III. HABITAT MANAGEMENT

No habitat management is conducted on Monomoy Refuge. Except for the Morris Island Unit, it is all a National Wilderness Area.

IV. WILDLIFE

A. Endangered and/or Threatened Species

None

B. Migratory Birds

1. Waterfowl

The mussel shoals around Monomoy Island serve as an important winter feeding area for common eiders and scoters. The freshwater marsh at the south end of Monomoy Island also supports several hundred Black Ducks, Blue-wing and Green-wing Teal during migration. Also up to 1000 Canada Geese stop over along the southern tip of the island during the fall migration. Winter and early spring months offer an excellent opportunity to view brant near Inward Point.

2. Marsh and Water Birds

The saltmarsh and freshwater areas on the island host the usual variety of rails, herons and egrets. There is no nesting colony of herons or egrets on the island.

Double-crested Commorants and a few European Commorants are commonly found in the offshore shallow around Monomoy Island during the summer.

3. Shorebirds, Gulls, Terns and Allied Species

Monomoy Island is the last major nesting area for Common Terns, Least Terns, Roseate Terns in Massachusetts. Herring Gulls and Great Black-back Gulls seem to be expanding to the disadvantage of the Terns. Ian Nisbet of the Mass. Audubon Society has been collecting data on the tern nesting colonies and information about populationsis derived from his reports and observations of Mass. Audubon Society members who visit the area. In this way the refuge learned of a sighting of a European Curlew on Monomoy Island from September 19 to October 12. Mr. Ian Nisbet of the Mass. Audubon Society also conducts a banding program on the tern nesting areas.

C. Mammals and Non-Migratory Birds and Others

A few white-tailed deer inhabit Monomoy Island. There are no foxes on the island however domestic dogs from the residential properties were reported swimming across the channel.

V. INTERPRETATION AND RECREATION

A. Information and Interpretation

Since the refuge is in a caretaker level of operation very little interpretive work is done. However, Tom Goettel, Biological Technician, was assigned to Monomoy from May 9 to November 5. In addition to his aid in the operation of a visitor permit system, he was available to meet with visiting groups and provide information to the public at large. On October 8, Tom conducted a workshop for teachers at the Morris Island Unit.

A permit system had to be instituted for public visits to the refuge because the space for parking is severely limited at the Morris Island Unit and use demand in the summer is astronomical. A good deal of friction exists between the residents of Morris Island as represented by the Quitnesset Association, and the U.S. Fish and Wildlife Service over the right of public access to the refuge. Going to the headquarters facility, one passes signs stating that the road is a private drive and for residents only. One easily gets the impression of a beseiged outpost surrounded by hostiles.

B. Recreation

The Morris Island beach is popular for surf-fishing when blues and stripers are in. Shellfishing is also very popular during the summer. Visitors must have a license from the local clam warden to take shellfish within the Town of Chatham.

The south end of Monomoy Island is a favorite landing spot for summer boating enthusiasts. The refuge has very limited control over the quantity or quality of this activity due to the remoteness of the area.

C. Enforcement

Unleashed dogs belonging to the summer residents of Morris Island were a frequent problem during the beginning of the summer.

An inspection visit was made on October 2 to the private cabins on Monomoy to verify compliance with special use permit requirements. The permittee is required to be present whenever guests are using the cabins. However, the grapevine in Chatham warned of our arrival in time that no one was found using any of the buildings.

Several instances of aircraft flying low over the refuge were reported to F.A.A. Nothing of any consequence resulted.

VI. OTHER ITEMS

A. Field Investigations

Ian Nisbet of the Massachusetts Audubon Society has continued to monitor the nesting of the tern colonies on Monomoy Island in conjunction with his annual banding program.

B. Cooperative Programs

A special use permit was issued in December to Ms. Barbara Waters of the Barnstable Cooperative Extension Service for use of the Morris Island office during the winter and early spring of 1977 by classes studying marine ecology. The continuance of this agreement will depend on how well it works out this first year.

C. Items of Interest

Much of the information for this report was taken from the final report by Tom Goettel. Tom's appointment terminated on November 5th.

D. Safety

Under Great Meadows National Wildlife Refuge.

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NARRATIVE SUMMARY REPORT July 1, 1975 - December 31, 1975

OXBOW NATIONAL WILDLIFE REFUGE

Three trips were made during September. Two with reporters from the Harvard Post and Worcester Telegram for feature stories, and one to meet Ms. Phoebe Wray of the Nashua River Watershed Commission to discuss future Environmental Education use of the refuge.

Ever since its acquisition in 1974, there has been much interest expressed by the State to conduct a hunting program on the 662 acre refuge.

Because of limited staff and funding, very little time was spent on this refuge. The wildlife management specialist at Fort Devens have maintained wood duck boxes on the area and kept the refuge staff informed of any occurrances on the area.

NARRATIVE REPORT

Oxbow National Wildlife Refuge

Calendar Year 1976

I. GENERAL

A. Introduction

Oxbow Refuge was established in 1974 by transfer from the Department of Defense. The refuge was formerly a part of Fort Devens and it is still used for access to training areas on the post for armor and artillery units.

As its name implies, several natural oxbows have been formed from the meandering of the highly polluted Nashua River over the years.

B. Climatic and Habitat Conditions

The refuge consists mostly of wet woodlands with many small ponds scattered throughout.

The following photographs are inserted to provide the reader with a visual impression of the area.











C. Land Acquisition

The refuge contains 662 acres and there are no plans for expansion beyond this original acquisition.

D. System Status

This refuge is under the administration of Great Meadows National Wildlife Refuge. Funding for this refuge is borrowed from the Mother Refuge. Objectives are presently at a caretaker level with no plans for development that would increase outputs.

II. CONSTRUCTION AND MAINTENANCE

The refuge boundary was posted during the summer. This is the only maintenance carried out by the refuge in 1976.

III. HABITAT MANAGEMENT

No habitat management is conducted by refuge personnel at present.

The wildlife management specialists employed by Fort Devens to manage their lands for wildlife have installed wood duck nesting boxes supplied by the refuge.

IV. WILDLIFE

A. Endangered and Threatened Species.

None

B. Migratory Birds

The refuge hosts several hundred mallards, black ducks and wood ducks during fall migrations. Woodcock stop over and utilize clearings in the wet woodland areas.

C. Mammals and Non-Migratory Birds and Others

The most significant note here is the occurrence of the Blandings Turtle. As mentioned in the Great Meadows report, the uniqueness of this species may be more a function of a lack of knowledge of the range than a real scarcity.

V. INTERPRETATION AND RECREATION

There exists no interpretative programs for Oxbow Refuge. Refuge Manager Gintoli did provide a guided tour for a local garden club in September. Because this refuge is located further away from the Boston Metropolitan Area and access is through Fort Devens, there is very little public use demand in the refuge. This may work to the advantage of those birders and other outdoor enthusiasts who enjoy the quiet and tranquility of the area when the Great Meadows is swamped with people.

VI. OTHER ITEMS

A cooperative agreement had been worked out to permit the Massachusetts Division of Fisheries and Wildlife operate a hunting program for upland game on the Oxbow Refuge in conjunction with the hunt on Fort Devens. Shortly before the opening of the hunting season the hunting had to be cancelled. The solicitor's office had determined that this arrangement violated recent legislation enacted into law which prohibits the transfer of a National Wildlife Refuge to another agency. Unless this interpretation is modified somewhat many mutually beneficial cooperativeagreements, that have helped manage refuges when funding and manpower was limited or nonexistant, may be no more.

D. Safety

No personnel are assigned to this station. Safety matters are incorporated with the Great Meadows Refuge report.

PUBLIC USE REGULATIONS

All persons using this refuge are asked to comply with the following conditions as well as with local, state, and federal laws, regulations, and ordinances:

1. Public use of designated trails within the refuge for nature study, hiking, and photography is permitted only during daylight hours.

2. Pets are permitted on a leash not to exceed ten feet in length.

3. Motorized vehicles are restricted to the entrance roads and parking areas.

4. There are no picnic or camp sites on the refuge.

5. Hunting, shooting, camping, campfires, swimming, and horses are not permitted.

6. The disturbance, destruction, or removal of wildlife, vegetation, and facilities are prohibited.

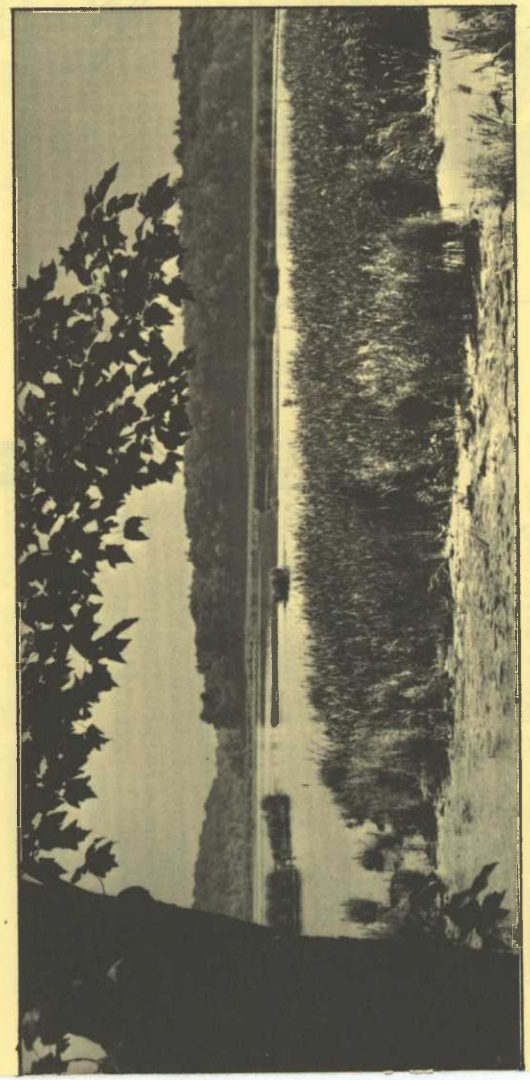
This is your refuge, but not only yours. Enjoy it, and please do nothing to harm it.

For more information contact the Refuge Manager, 191 Sudbury Road, Concord, Massachusetts 01742. Telephone: (617) 369-5518.

Refuge Leaflet 36-R2
May 1, 1975

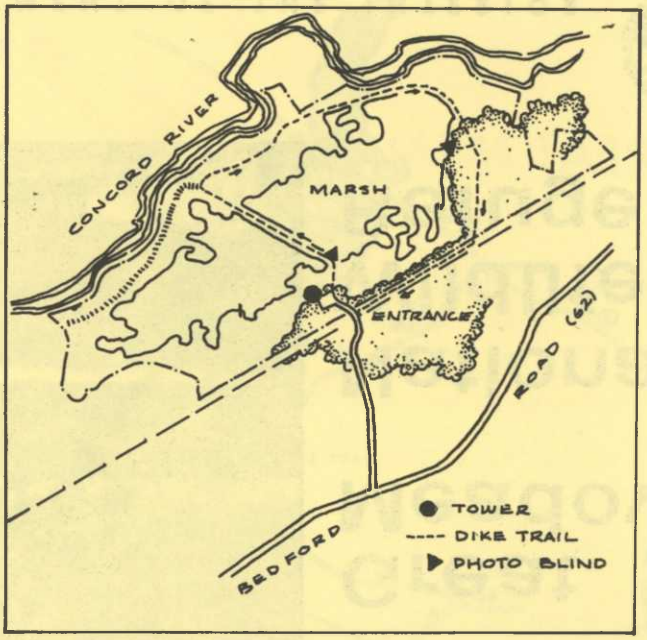
UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

Great Meadows National Wildlife Refuge



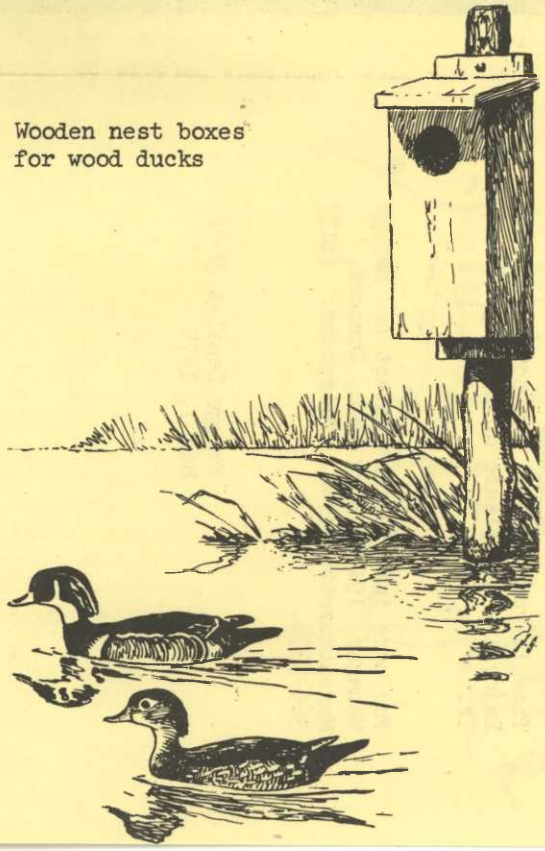
UNITED STATES DEPARTMENT OF THE INTERIOR

Wildlife. Wildlife species common to much of New England are found at Great Meadows Refuge. A great diversity of birds has been recorded on the refuge and an annotated list of more than 200 species is available upon request. A few whitetail deer live along the marsh borders and on uplands. Muskrat, fox, raccoon, cottontail, weasel, squirrel, and various small rodents are common. Amphibians and reptiles can be observed in the warmer months, but no poisonous snakes occur on the refuge. Several species of waterfowl, including Canada goose, mallard, black duck, wood duck, and blue-winged teal nest here. Wooden nesting boxes are provided for wood ducks and can be seen dispersed throughout the refuge.



DIKE TRAIL

This map shows the original 250-acre developed part of the refuge. The Dike Trail consists of a 1½-mile loop with two observation blinds and an observation tower. A trail leaflet is available at refuge headquarters.



Wooden nest boxes for wood ducks

Recreation. The refuge is available for a great variety of recreational uses including hiking, wildlife observation, photography, nature study, snowshoeing, fishing, and cross-country skiing. It always has been and still is a favorite haunt of area birdwatchers. Noted ornithologists consider the areas presently included in Great Meadows Refuge as some of the best inland birding areas in the state.

The refuge embraces a solitude that is remarkable considering its location in time and space. To "get away from it all," visitors need not travel far from the busy city.

GREAT MEADOWS



Great Meadows National Wildlife Refuge is located in the vicinity of historic Concord, Massachusetts. Its boundaries extend into seven area towns, all significant in United States history. These towns are Billerica, Bedford, Carlisle, Concord, Wayland, Sudbury, and Lincoln.

Located 20 miles west of Boston, the refuge is readily accessible to nearly 4,000,000 residents within 30 miles. It will be comprised of approximately 4,000 acres when acquisition is completed. Twelve miles of the Concord and Sudbury Rivers flow through the refuge.

The refuge is included in two large units separated by a four-mile stretch of area rich in American history, including Concord's North Bridge Battlefield and Thoreau's Walden Pond. Nathaniel Hawthorne, Ralph Waldo Emerson, Louisa Mae Alcott, William Brewster, Ephraim Wales Bull, and Ludlow Griscom add to the list of elite, past-citizenry. Many places in the area are preserved as historic shrines, some of them included in Minute Man National Historical Park.

Great Meadows Refuge helps fill a conservation need in this highly urban area by providing habitat for migrating and nesting birds, and it is vital to practically all forms of wildlife indigenous to the area. The refuge also offers excellent opportunities for conservation education and nature study at the doorstep of numerous schools, institutions, and organizations during this period of environmental awakening.

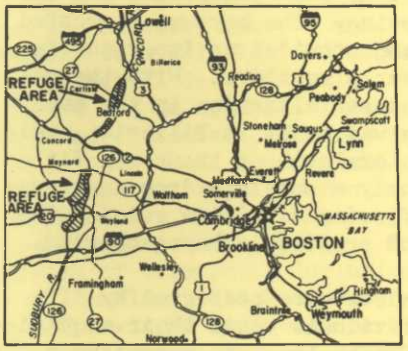
History. The Great Meadows area was named for the hay meadows annually left at the end of summer when the river had retreated from its floodplains and was barely flowing. The hay was harvested annually and provided an important income for early settlers. With the advent of industrialization in the area, a mill dam was built in Billerica, raising the water-level of the river (it averages only a one-inch drop in elevation per flowing mile) and ruining the meadows for profitable hay gathering.

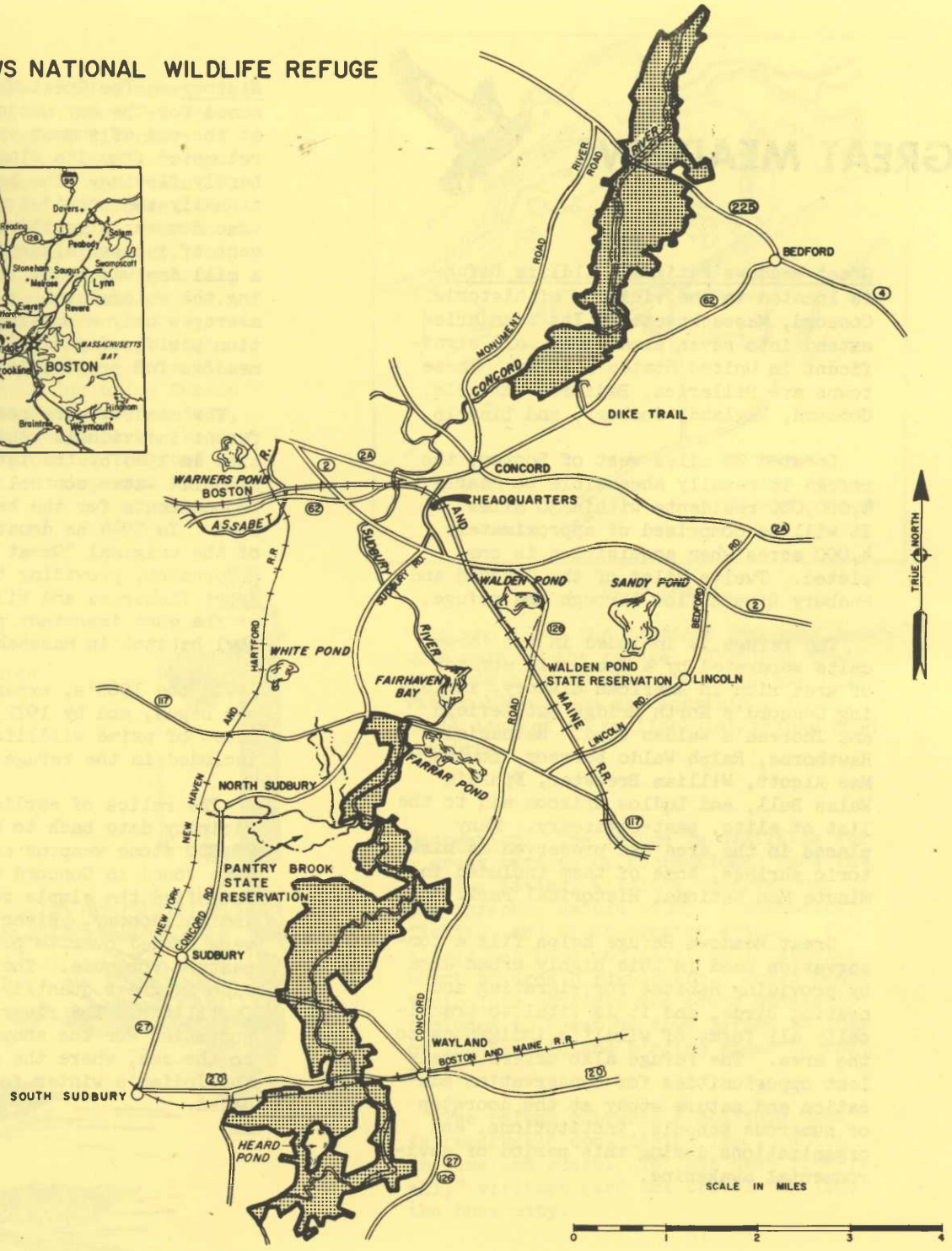
The meadows were preserved by different individuals until their acquisition in 1928 by the late Samuel Hoar. He built water control dikes to provide impoundments for the benefit of waterfowl. In 1944 he donated the 250 acres of the original "Great Meadows" to the government, providing the Bureau of Sport Fisheries and Wildlife with one of the most important parcels of waterfowl habitat in Massachusetts.

In the 1960's, expansion of the refuge began, and by 1972, nearly 3,000 acres of prime wildlife habitat were included in the refuge.

The relics of earlier man found in the vicinity date back to 2,000 B.C. Over 25,000 stone weapons and implements have been found in Concord alone. The valley satisfied the simple requirements of the Indian economy. River meadows and plains were burned over to provide cropland and pasture for game. The waters provided fish in great quantity for both food and fertilizer. The river furnished transportation for the annual summer movement to the sea, where the greater portion of the Indian's winter food was gathered and dried.

GREAT MEADOWS NATIONAL WILDLIFE REFUGE





The Dike

7 In the mid 1800s a dam was built across the Concord River at the site of Talbot Mills in Billerica. The dam raised the water level only slightly but, because the river drops so gradually, the resultant flooding extended to Concord and submerged much of the Great Meadows. The dike on which you now stand separates the "Meadow" from the Concord River. The other portion of the dike (cross dike) was built in 1958 to further aid in water control as well as for the convenience of refuge visitors.

The dike itself is helpful to wildlife. Turtles and muskrats live and nest in the banks. Birds use the gravel as grit for their digestive systems. The lush vegetation along the dike's banks provides food and cover for many wildlife species. Look closely to see if you can see any animals moving through the cattails and reeds.

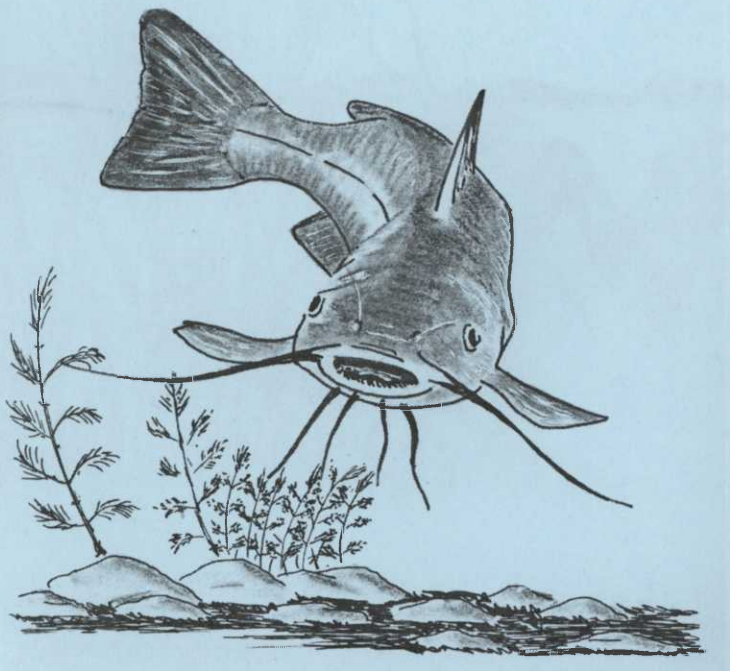
For Muskrats And Man

8 Cattails grow in the shallowest water and are one of the staples of the marsh. For the indian tribes which lived along the Musketaquid (now called the Concord) river, the shoots and tubers of the cattail provided food, and a flour was made from its pollen. The leaves were dried and woven into mats and baskets. Today the cattail is mostly an important food for muskrats as well as the major building material for their homes.

Managing The Marsh

9 Control of the water level is a most important tool of marsh management. For most marsh wildlife, optimum water depths range up to four feet. To maintain maximum water within this range, stop logs are added to or removed from the drain structure so that water running into the pools is either trapped or let flow out to the river.

In late Spring, bullhead from the river swim upstream through the culvert and become trapped in the drain basin. They persist in trying to swim through the structure into the pools. Those that refuse to return to the river must be removed.



Upland !

10 This area in which trees dominate the vegetation is called "upland". There may be swampy areas in such a woods but overall the soil is relatively dry. Notice the openness of the ground vegetation in this community. It is less favorable to the variety of birds and small mammals found in the marsh.



Notice the birds along this section of the trail – they are mostly quite different from those seen along the dike.

Last 1/2 Mile

11 Animals here are primarily ones which use trees. There are plenty of rabbits and it is an especially fine area for racoons. Can you figure out why?

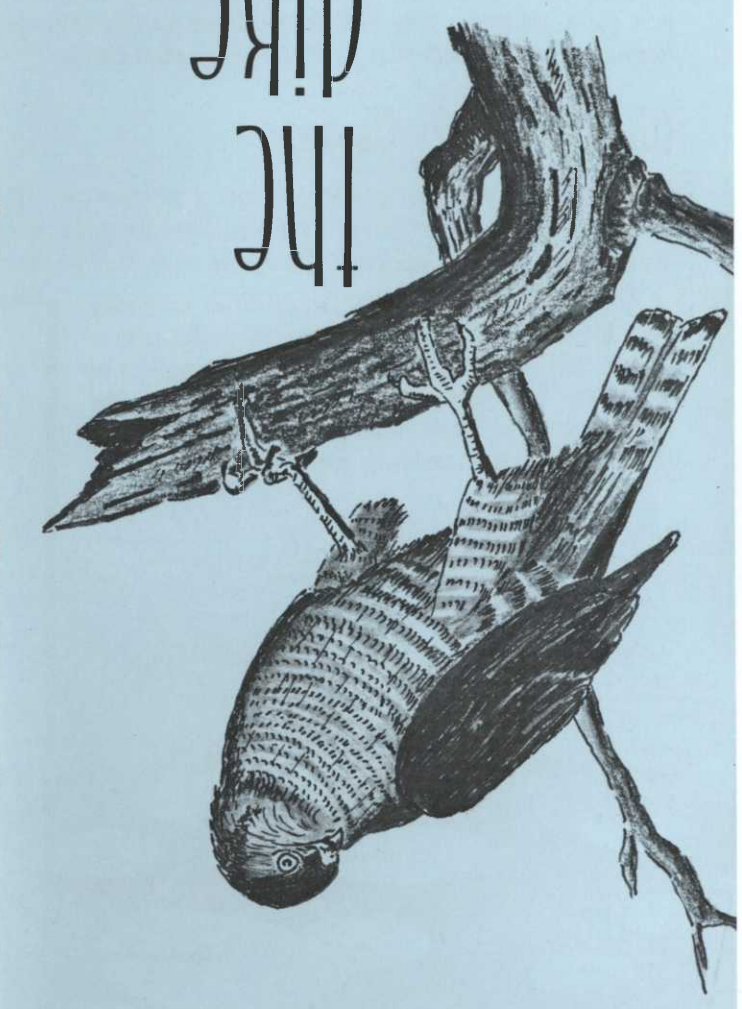
As you walk the last ½ mile of trail, stop along the railroad bed to get an overview across the different stages of marsh vegetation. Unmanaged, the marsh mat would gradually close and in time the marsh would disappear.



Management helps maintain the marsh and keep it open so that its excitement and variety will be available to wildlife and visitors for a long time to come.

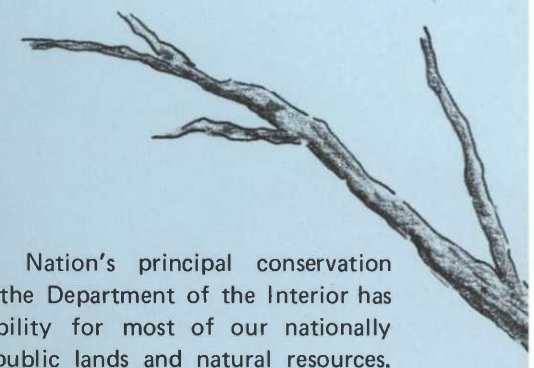
GREAT MEADOWS
National Wildlife Refuge
Concord, Massachusetts.

the dike trail



UNITED STATES
DEPARTMENT
OF THE INTERIOR

U.S. Fish and Wildlife Service



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 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.

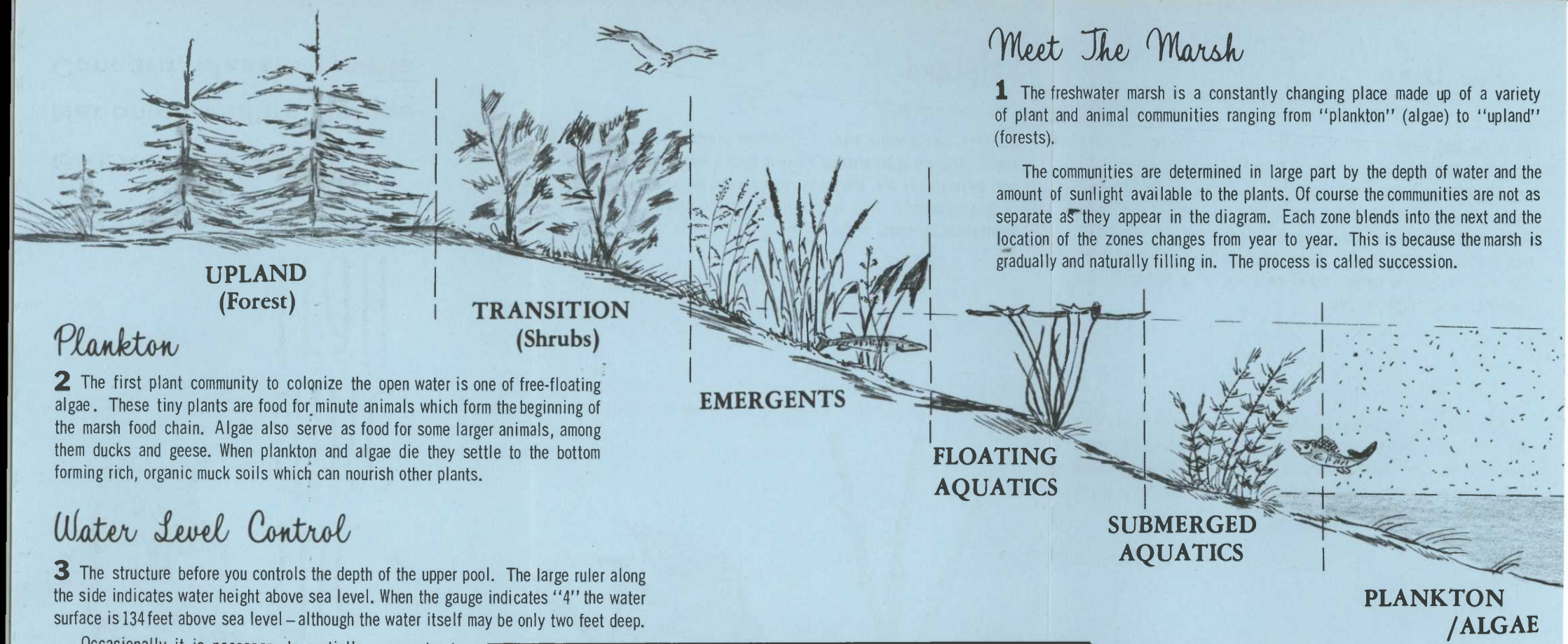
For further information, write to Refuge Manager, Great Meadows National Wildlife Refuge, 191 Sudbury Road, Concord, MA 01742. Telephone: (617) 369-5753.

August 1975

Meet The Marsh

1 The freshwater marsh is a constantly changing place made up of a variety of plant and animal communities ranging from "plankton" (algae) to "upland" (forests).

The communities are determined in large part by the depth of water and the amount of sunlight available to the plants. Of course the communities are not as separate as they appear in the diagram. Each zone blends into the next and the location of the zones changes from year to year. This is because the marsh is gradually and naturally filling in. The process is called succession.



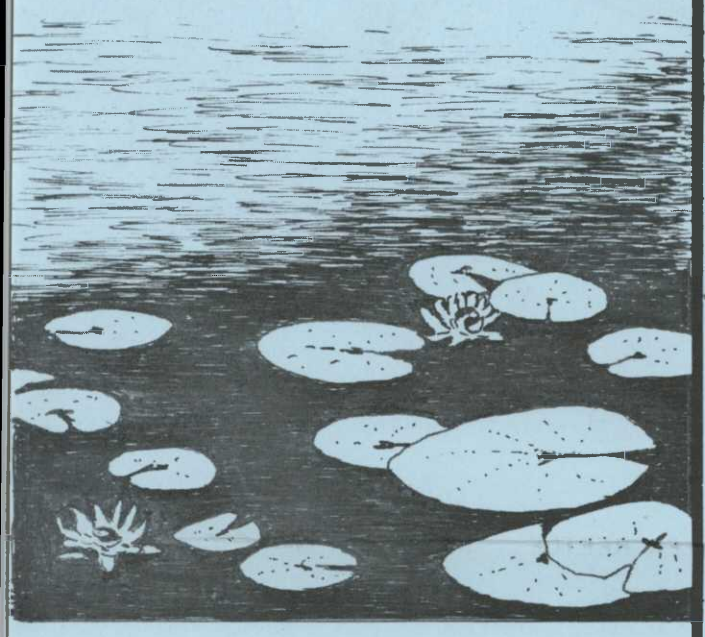
Plankton

2 The first plant community to colonize the open water is one of free-floating algae. These tiny plants are food for minute animals which form the beginning of the marsh food chain. Algae also serve as food for some larger animals, among them ducks and geese. When plankton and algae die they settle to the bottom forming rich, organic muck soils which can nourish other plants.

Water Level Control

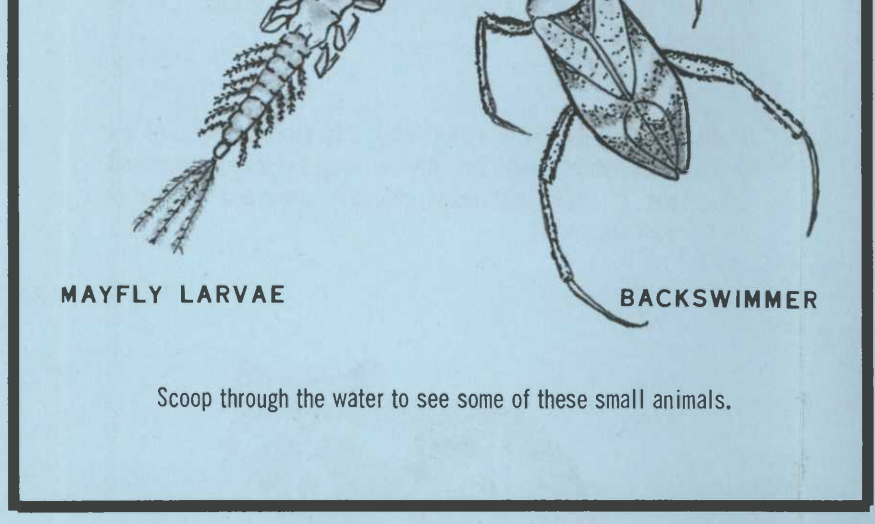
3 The structure before you controls the depth of the upper pool. The large ruler along the side indicates water height above sea level. When the gauge indicates "4" the water surface is 134 feet above sea level – although the water itself may be only two feet deep.

Occasionally it is necessary to partially or completely drain the marsh for some period of time. When the marsh is drained sunlight reaches the organic muck accumulated at the bottom. This speeds decomposition and enriches the marsh for the living plants. Often pest plants can be controlled by draining and favored foods can be encouraged.

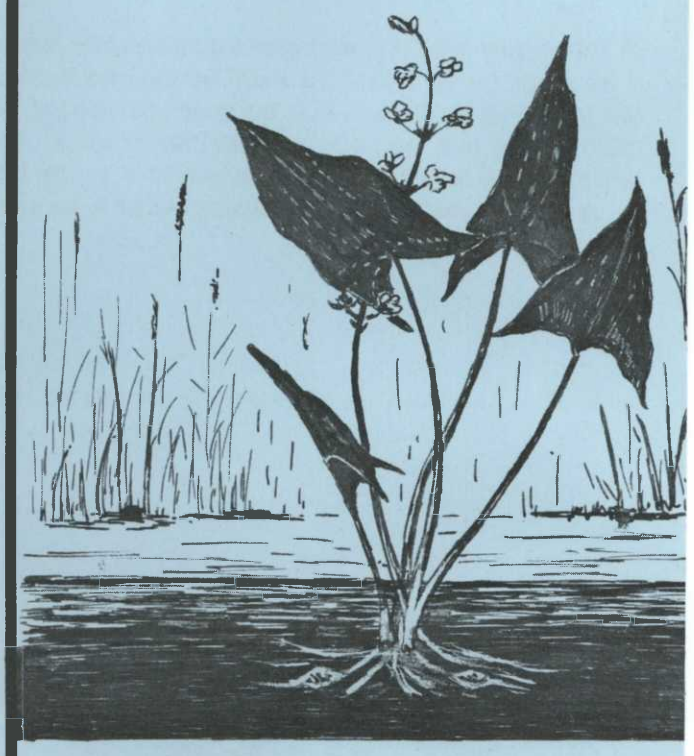


Plants That Float

4 The leaves of floating plants rest on the surface and so obtain maximum sunlight. These plants are connected to the soil by long, weak stems or float free in the water. They need water for support. Waterlillies and duckweeds are important foods for ducks, muskrats and beaver. They also provide anchorage for many insects and tiny crustaceans which are, themselves, important foods for other animals especially young ducks.

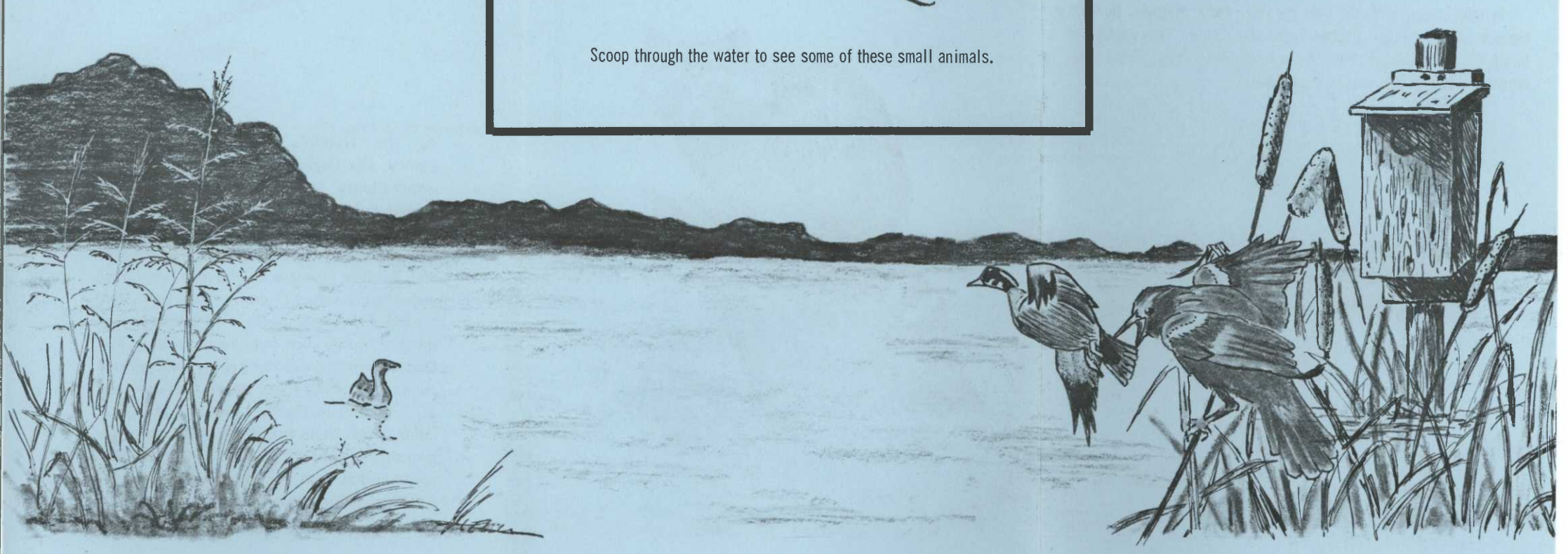


Scoop through the water to see some of these small animals.



The Emergents

5 Cattail, Pickerelweed, Wild Iris, Arrowhead and American Lotus are typical of plants in the emergent plant community. Their stems are relatively rigid so they can extend beyond the surface of the water. Plants in this community are especially important to wildlife as they provide nesting, resting and escape cover. Many are also prime foods for wildlife.

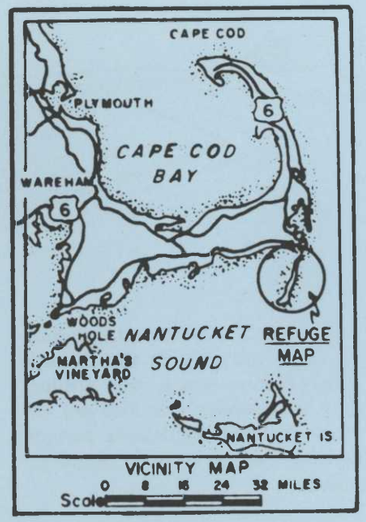


Transition

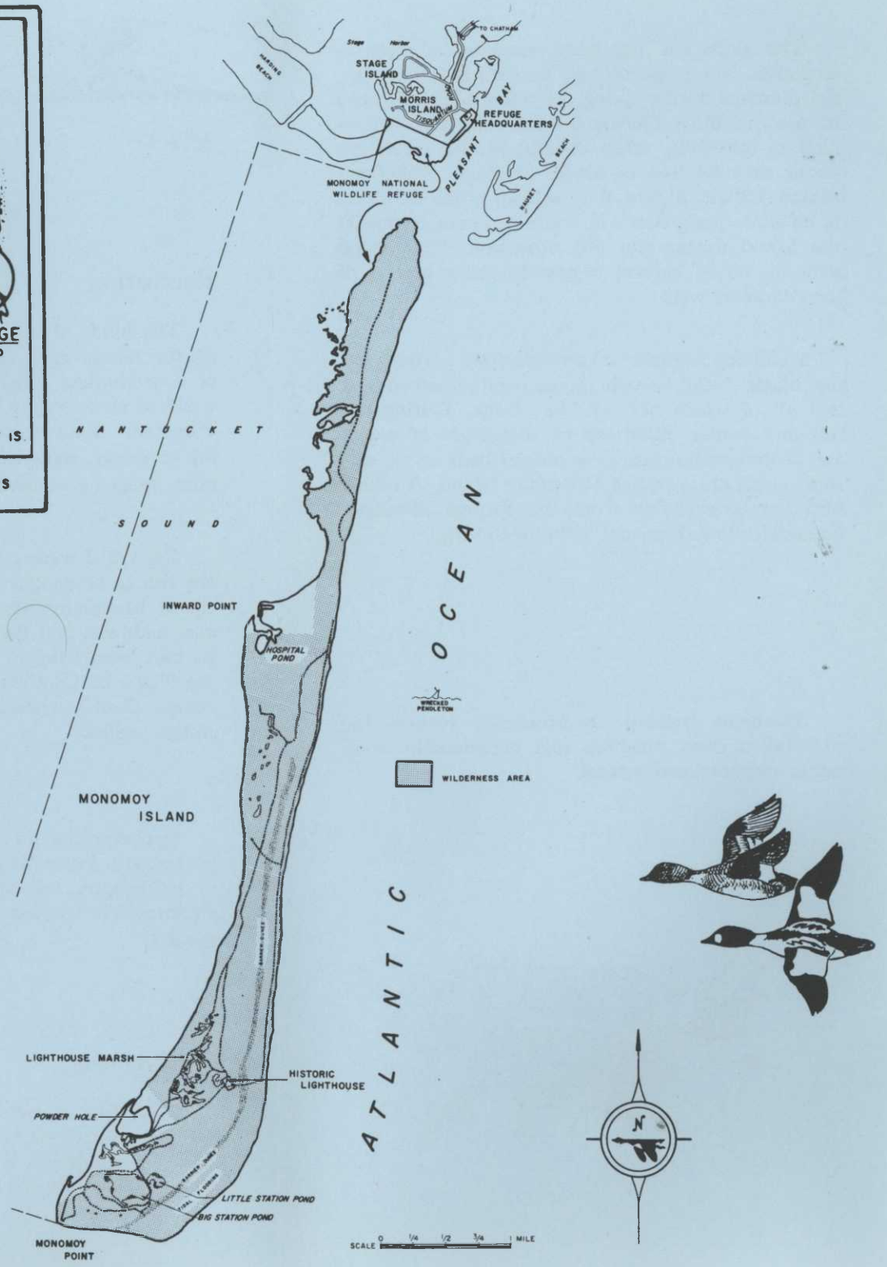
6 This community is characterized by the presence of shrubs and a few trees. It forms a transition or edge between the wetland and the upland areas.

Many animals live and nest in this zone for from this community they can easily reach the foods of the open areas as well as the protection of the forest. Wood ducks especially are found in the transition areas where they nest in cavities in dead trees. Where dead trees are scarce artifical nesting structures can be provided.

Specially designed wood duck boxes are set up to provide additional possible nesting sites. The boxes are placed in the water to discourage predators which might harm eggs or ducklings. Where predators are especially active a metal shield or predator guard may be mounted underneath for added protection.



NANTUCKET REFUGE MAP

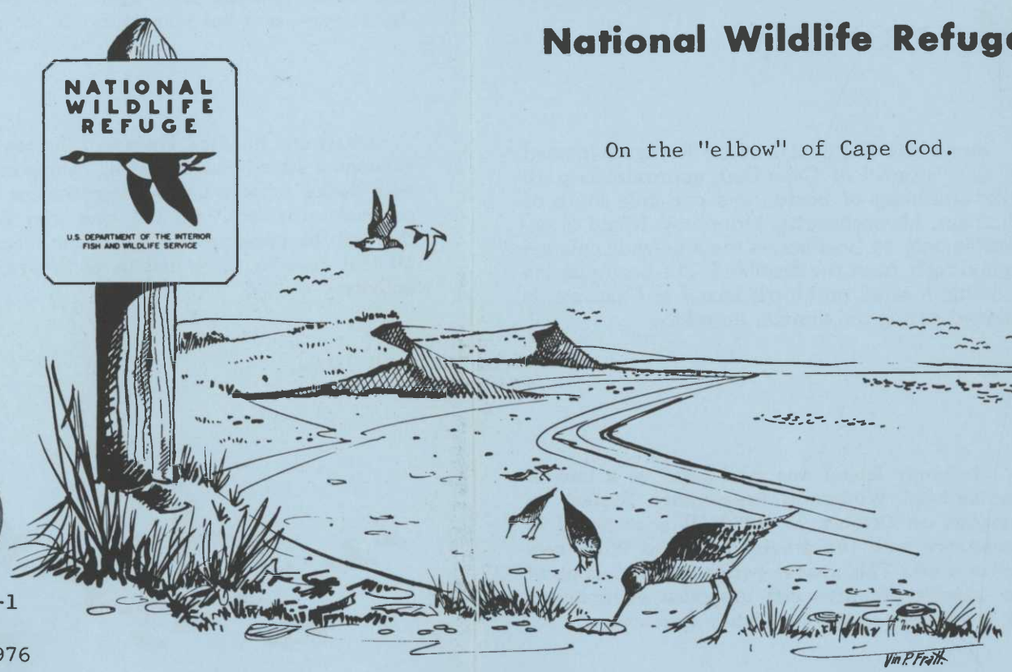


UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

MONOMOY

National Wildlife Refuge

On the "elbow" of Cape Cod.



RL 53511-1

August 1976

By act of Congress, Monomoy Island is an established

NATIONAL WILDERNESS AREA

☆ U. S. GOVT. PRINTING OFFICE 1976 - 602-925 #253



Monomoy

Monomoy National Wildlife Refuge is located on the "elbow" of Cape Cod, approximately 90 miles southeast of Boston and one mile south of Chatham, Massachusetts. Monomoy Island is accessible only by boat across the mile-wide channel separating it from the mainland. The headquarters building, located on Morris Island in Chatham, is manned during the summer months.

Monomoy Island was established as a unit of the National Wilderness Preservation System by Congress on October 23, 1970. It is managed in accordance with the provisions of the Wilderness Act of 1964. This assures permanent protection of the island's primitive and unspoiled environment for the benefit of this and future generations.

Monomoy Island is a coastal barrier beach of about 3,300 acres, up to 1½ miles wide and 8 miles long. It lies between the Atlantic Ocean and Nantucket Sound. It is a typical barrier beach island of sand dunes, salt and freshwater marshes, freshwater ponds, and sparse dune vegetation. It serves as a link in the chain of migratory bird refuges in the Atlantic Flyway, which extends from Canada to Florida and the Gulf.

History

When acquired as a wildlife refuge in 1944 Morris and Monomoy were one island. In 1960 a stormy sea cut through on the south side of Morris Island and isolated Monomoy Island. In time, the fickle Atlantic may again join Morris and Monomoy—as it has many times in the past.

About one hundred years ago the south end of Monomoy Island was a thriving fishing community with docks, schools, and all appearances of a permanent settlement. An old cast iron lighthouse, that will be preserved as an historic monument, is all that remains to remind us of this past human activity.



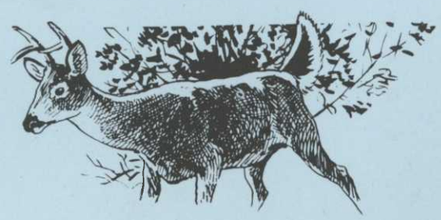
Wildlife

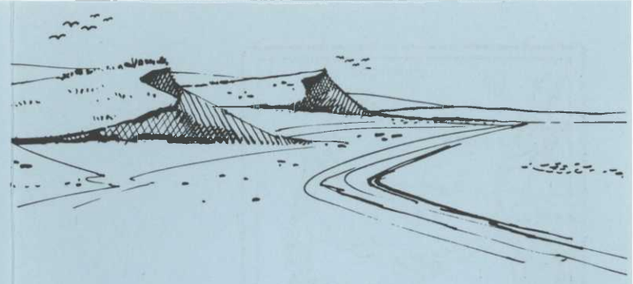
Because of its unique coastal location, Monomoy Refuge provides a haven for waterfowl, shorebirds, and others migrating from points throughout northeastern North America. Over 300 species of birds have been recorded, including nesting waterfowl, gulls, and terns.

The island has long been renowned as a shorebird area. Many species may be seen in bright nuptial plumage during spring migration which reaches its peak in May. During the fall migration, beginning in late July, adult shorebirds and immature young may be seen in winter plumage. The Hudsonian godwit, a bird that seldom stops en route to its wintering grounds in South America, frequents the island during the fall migration. The island with its varied habitat is host to many species of land birds as well.

Monomoy is important to waterfowl, particularly the black duck, Canada goose, and green-winged teal all of which nest on the refuge. During the fall and winter, hundreds of thousands of eiders and scoters congregate over mussel beds in the offshore shoal areas east of Monomoy Island. A refuge bird list is available from the Refuge Manager, Great Meadows National Wildlife Refuge.

Mammals isolated on Monomoy include the whitetailed deer, muskrat, and occasionally otter, mink, raccoon, and weasel.





Recreation

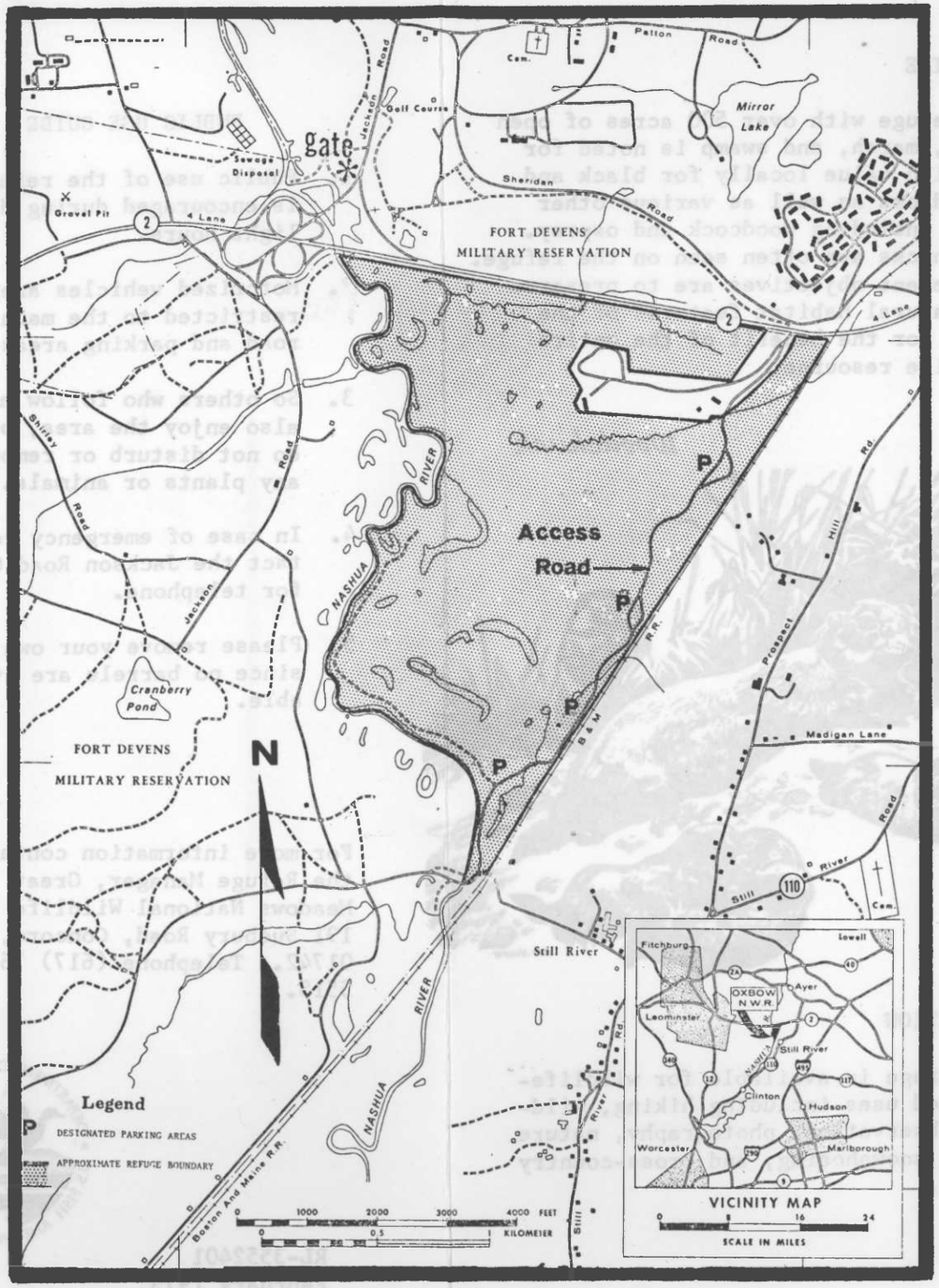
The kinds of recreation available to the public on the refuge must be in accord with the concept of a wilderness area. Nature study, surf fishing, walking, photography, and similar activities are encouraged. State and Federal regulations pertaining to safety, sanitation, and conduct on public lands must be observed.

Cape Cod waters offer excellent fishing. Among the fish to be caught off the ocean shore and south tip of Monomoy Island are striped bass, bluefish, cod, haddock, and flounder. Fishing is generally at its best from May to October. Persons licensed by the Town of Chatham may gather shellfish on the refuge. Boat liveries in and around Chatham serve refuge visitors.

Opportunities for photographers and artists are particularly interesting, as the island offers a variety of landscapes, seascapes, and wildlife. Long lens equipment is necessary for successful wildlife photography.

Information

Monomoy is under the supervision of the Refuge Manager, Great Meadows National Wildlife Refuge, 191 Sudbury Road, Concord, Massachusetts 01742, telephone (617) 369-5518.



OXBOW

NATIONAL WILDLIFE REFUGE

MASSACHUSETTS



UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE



OXBOW

Oxbow National Wildlife Refuge is located in the town of Harvard, Mass. Approximately 40 miles west of Boston, the 622 acre refuge is readily accessable from U.S. Route 2, Fort Devens exit, or Mass. Route 110 in the town of Still River.

Oxbow Refuge was established in 1974 by transfer from the Department of Defense. Visitors should be aware that Fort Devens borders the area on two sides. The sound of guns firing may be heard at any time but they are well out of range of the refuge.

The military still uses the main road through the refuge; therefore, visitors are requested to park only in the four designated lots. Do not be surprised to see a tank lumbering down the road.

Several years ago the area was used as a bombing site. If you discover any unusual metalic objects please, do not touch. Contact the Jackson Road Gate into Fort Devens immediately.

WILDLIFE

The refuge with over 500 acres of open water, marsh, and swamp is noted for its high value locally for black and wood ducks as well as various other birds including woodcock and osprey. Woodchucks are often seen on the refuge. Management objectives are to preserve the natural habitat features of the marsh for the benefit of the entire wildlife resource.

Woodchuck



RECREATION

The refuge is available for wildlife-oriented uses including hiking, wildlife observation, photography, nature study, snowshoeing, and cross-country skiing.

PUBLIC USE GUIDE

1. Public use of the refuge is encouraged during daylight hours.
2. Motorized vehicles are restricted to the main road and parking areas.
3. So others who follow may also enjoy the area, please do not disturb or remove any plants or animals.
4. In case of emergency contact the Jackson Road Gate for telephone.
5. Please remove your own trash, since no barrels are available.

For more information contact the Refuge Manager, Great Meadows National Wildlife Refuge, 191 Sudbury Road, Concord, Mass. 01742. Telephone (617) 369-5518.

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

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