LAKE UMBAGOG NATIONAL WILDLIFE REFUGE

Errol, New Hampshire

ANNUAL NARRATIVE REPORT

Calendar Year 1994

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

REVIEW AND APPROVALS

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Calendar Year 1994

Refuge Manager — DATE: 12-15-95

Associate Manager, Refuges & Wildlife — DATE:

Regional Office Approval — DATE: Jan. 16, 1996

INTRODUCTION

Wow! Fall colors are an annual surprise.

Lake Umbagog National Wildlife Refuge is part of an ongoing comprehensive cooperative protection and management effort to preserve wildlife, wildlife habitat, wetlands, and timber resources along the northern Maine/New Hampshire border. The refuge is projected to include 15,865 acres in Coos County, New Hampshire and Oxford County, Maine. The current acreage acquired to date is almost 170 acres. The acreage did not increase in 1994 but a lot of progress was made in the negotiation process that will undoubtedly lead to more acquisition in 1995. The project includes the cooperation of federal and state agencies, conservation organizations, land trusts and local landowners. Besides the Service, active land acquisition and management, through both fee title and conservation easement, will be carried out by the New Hampshire's Land Conservation Improvement Program, the Land for Maine's Future Program, and the two major landowners - James River Timber Corporation and Oxford Paper Company (Boise Cascade Corporation). The total conservation project could include as much as 35,000 acres if all land acquisitions go as planned.

Lake Umbagog is the westernmost lake of the Rangeley chain and straddles the northern New Hampshire/Maine border. It is located about 30 miles north of Berlin, NH, 20 miles south of the Canadian border, and immediately east of the rural town of Errol, NH. Situated in the low mountains just north of New Hampshire's White Mountain region, the lake is associated with three major rivers including the Magalloway and Androscoggin on the northwestern side,

and the Rapid River in Maine. In addition, the smaller Dead Cambridge River, also in Maine, flows into the southeastern end of the lake.

The Lake Umbagog wetland complex is listed in the Regional Concept Plan under the Emergency Wetlands Resource Act of 1986. It has also been included on the U.S. Environmental Protection Agency's list of Priority Wetlands in New England.

The refuge project includes lands that serve as important breeding and migration habitat for many wetland dependent migratory wildlife species of current concern to the Service. It protects habitat for species of federal concern including the bald eagle and peregrine falcon, waterfowl species of priority such as the declining black duck, and many species of state management concern including the common loon, northern harrier, osprey, woodcock, and others. The refuge serves to protect unique habitats that support a variety of migratory birds, resident mammals, fish, reptiles, amphibians, and invertebrates, as well as rare plant species, all of which will contribute to the biological diversity in the northeastern United States.

November 12, 1992, marked the first land acquisition by the Service for Lake Umbagog NWR. The purchase of the 128 acre Kronk farm (formerly the Potter farm) was a key to the overall protection effort. The farm had recently been subdivided and three of the lots had already been sold in a price range of $70,000. This property was located directly in the center of the refuge along the lake.

The uniqueness and importance of the habitat and wildlife that are found around Lake Umbagog have been recognized for many years. Both states had it listed as a priority site in the North American Waterfowl Management Plan. The primary threat to the area was the overdevelopment of the lakeshore and watershed through subdivision and second-home development. The majority of lands within the refuge acquisition area are privately owned by large timber and paper companies. Although the land base is very important to these companies, the high value of waterfront property is attractive during a slump in the paper industry. The Service recognizes that the previous land use patterns and private land stewardship have maintained the unique values associated with the area.

The refuge and adjoining conservation area lands will protect the best loon and osprey habitat within New Hampshire and presently harbors the only active bald eagle nest in the state. At least one active peregrine falcon nest is located on the bluffs near C Pond, within the Maine portion of the refuge. Mink, otter, and beaver are common in the lakes and rivers while black bear, white-tailed deer, and a dense population of moose inhabit the uplands. The refuge will also have an already designated National Natural Landmark - Lake Umbagog's Floating Island. This particular island is an open northern heath bog that has a tendency to move, shifting with the wind.

One wildlife component of the region that will receive management attention is the rich diversity of small passerine birds, especially warblers, that inhabit the area.

The Lake Umbagog NWR has been established for the following purposes: 1) the protection and management of wetlands, adjacent upland habitat, and lake shoreline for the benefit of wildlife; 2) the management and enhancement of wildlife populations, especially waterfowl and endangered species; 3) to contribute to the preservation of biological diversity in the northeastern United States; and 4) to provide environmental education opportunities and appropriate outdoor wildlife-oriented public uses such as wildlife observation and photography, hunting, fishing, hiking, and others.

The refuge project includes approximately 117 ownerships. The majority of acreage, approximately 85%, is in large industrial forest ownership. These large landowners have been involved in planning for the cooperative protection effort, are currently being negotiated with, and have exhibited a dedication to the project. Preliminary acquisition costs, based on full fee acquisition, were estimated at approximately 10 million dollars. Acquisition will be funded by the Land and Water Conservation Fund.

Harper's Meadow is one of the main freshwater marshes within the refuge.

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Lake Umbagog National Wildlife Refuge
Errol, New Hampshire

ANNUAL NARRATIVE REPORT
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A. HIGHLIGHTS

* No new land negotiations were completed but tremendous progress was made. (C.1)

* Staff increased 100% with ROS Tammy Tisdale. (E.1)

* Staff was put on administrative leave due to headquarters asbestos contamination. (E.6)

* Hydro-ax was used to restore open fields at the Kronk Farm. (F.1)

* First year without production at the bald eagle nest since 1989. (G.2)

* Seventeen common loons were fitted with color-bands. (G.4)

* Thirty eight osprey fledged, up 81% from 1993. (G.6)

B. CLIMATIC CONDITIONS

January rang in the official new year in true spirit, with the whole month being cold and snowy. Sub-zero temperatures were recorded on 25 days and a total of 46" of snow fell during the month. February was much the same with 19 sub-zero days and 18" of snow. The trend continued with 41" in March but we could begin to see the rivers and marshes opening up and spring thaw was on us by April. Ice out on the lake occurred May 5. Weather warmed and was pleasant to hot through July. As usual, the black fly population in May and mosquito population in June were unwelcome visitors. Fall colors peaked beautifully in September. Snow returned in November but remained extremely light throughout the end of the year. The mildness at the year's end was much needed by many animals who struggled with the heavy snow pack early in the year, especially the deer. Table 1 gives an overview of the weather data for the area.

TABLE 1. Annual weather data for Lake Umbagog NWR, 1994.

	Temperature				Precipitation		
	Normal Ave.	1994 Ave.	High Temp.	Low Temp.	Normal	1994	Total Snow
January	16.0	2.6	44	-33	2.77"	4.39"	46.0"
February	17.1	10.2	61	-20	2.35"	1.26"	18.0"
March	26.8	25.9	52	-11	3.31"	3.42"	41.0"
April	40.2	36.7	75	6	3.12"	4.51"	-
May	52.4	48.2	86	25	3.21"	3.34"	-
June	61.7	62.3	93	35	4.07"	4.37"	-
July	66.2	67.6	90	46	3.60"	4.11"	-
August	64.2	60.5	83	38	3.19"	3.58"	-
September	56.1	53.3	77	34	3.96"	3.09"	-
October	46.0	44.7	76	21	3.01"	1.51"	-
November	23.9	34.1	62	1	3.56"	2.46"	9.0"
December	20.1	22.5	58	-11	2.98"	2.81"	11.0"
Totals	40.89	39.05			39.13"	38.85"	125.0"

The rivers and marshes started to break up with the spring thaw in April.

C. LAND ACQUISITION

1. Fee Title

The refuge project involves acquisition in fee title or conservation easement of 15,865 acres of wetland and forested upland. Portions of the northern and southern shores of the lake are not included in the acquisition proposal because of the high degree of development and subdivision that already occurs there. Lands within the acquisition boundary will be purchased from willing sellers only. The acquisition proposal will provide maximum protection and management control for the project area's unique wetland habitats. The refuge goal is to protect and manage these habitats for threatened, endangered, and other migratory wetland dependent species which congregate in the Lake Umbagog area. The core wetland area, primarily the backwaters of the Magalloway, Androscoggin, and Dead Cambridge Rivers, are to be purchased in fee title. This core area would also include a forested upland buffer surrounding major wetlands, averaging 1,000 feet in width. The buffer is designed to protect wetland dependent species from disturbance and habitat degradation, provide adjacent upland nesting habitat, protect the ecological integrity of the wetlands, and contribute towards the biodiversity in the Lake Umbagog area.

With the purchase of the 128.41 acre Kronk farm (tract 338) in 1992, the refuge became official. Acquisitions continued in 1993 with two new land options being purchased, one in January and one in July. The large house and storefront, known as the Old Brown Owl, that came with tract 437 continued to serve as refuge headquarters in 1994. It is ideally situated five miles north of Errol, along State Highway 16, the main north/south highway serving northeastern New Hampshire. The property is located on the banks of the Magalloway River which gives instant access to the refuge by boat. In 1994, acquisition emphasis remained fixed on the two timber companies, Boise Cascade and James River, that will be providing the majority of lands for the refuge. Total acreage of 169.63, previously reached in July 1993, remained the same during 1994. No actual acquisitions were processed during the year, but progress was made none the less. An acquisition of 1,800 acres from Boise Cascade was initially set for June 30. It was continually set back and still had not gone through at year's end. James River became tied up in other major land dealings but also showed a bit of reluctance in moving ahead with the Service because of appraised land values which they felt were too low. Dan Leahy, the main person from Realty dedicated to this project, was detailed to Alaska for a couple months. It was a tremendous opportunity for Dan but slowed the progress at Lake Umbagog. Upon his return, great progress was made by year's end and 1995 looks promising.

In October, RM Breeser, ROS Tisdale, and Dan Leahy met with Mike

Audley, tract 417, to see about purchasing the tract. Audley was in the process of building a road into his approved subdivision and was preparing to sell lots. The Service had an opportunity to negotiate with him in 1993 but because of other commitments, did not at that time. The subdivision got our attention as the tract is an important piece of the puzzle.

One landowner got impatient waiting on FWS to strike a deal.

This "highway" through his approved subdivision put negotiations on the front burner.

Civil Consultants was hired to complete the land surveys for all the Boise Cascade lands tracts. They started working on surveying the tract lines in the Little Berlin area. There are about 40 private camp owners that abut the property line. Over the years, there have been building and storage projects that stretch the private property limits. A lot of public relations and innovative planning will be necessary to clean up 20 years of non-enforcement on property lines. There is also a strip of Boise property that separates many of the camps from the riverfront. Over the years this property has been utilized for access. Additionally, there are Boise permitted camps in the land deal that will become FWS permitted camps.

Land surveys have revealed many examples of trespass over refuge boundary lines, especially in an area known as Little Berlin.

The Lake Umbagog Study Team (LUST) was reconvened on 1/24. The meeting was held to update land acquisition progress and to provide an overview of refuge happenings and future funding. Representatives were present from the Audubon Society of NH, the Land for Maine's Future Board (LMFB), James River Timber Corp., Boise Cascade, The Nature Conservancy, Society for the Protection of NH Forests, NH Fish and Game, and USFWS. A large part of the meeting dealt with the plans of the LMFB on the Maine side of the project. Jim Bernard indicated that the Board was not going to be able to protect the original goal of 13,000 acres. It looks like they will be limited to possibly protecting just the Rapid River corridor in Upton Township with a strip of land 500 feet south and 250 feet north of the Union Water Power Company lands along the river. Discussions were

held on the possible scenario of falling back to Alternative 3, the Modified Cooperative Effort, in the EA for the refuge. This would allow the Service to purchase a conservation easement on a 1000' buffer strip along all of the lake shoreline in Maine and around Pond in the River. It would also include the Heywood Marsh and all additional easement lands along the south shore of the lake in NH. This particular alternative was developed in case the State of Maine would not be able to carry out its planned acquisitions. Talk about foreshadowing!

An article on the compatibility lawsuit, titled "Feds Could Restrict Hunting, Fishing at Lake Umbagog" caused some concern with James River. Since their image with regards to the paper and timber products industry is extremely important to local people, they wanted to know if the suit was going to have a major impact on traditional uses of refuge lands. They are the major landowner involved with refuge acquisitions and negative publicity could very well influence their desire to sell lands to the Service. A meeting was held with their lands people to thoroughly discuss the lawsuit. Many of their concerns were alleviated.

2. Easements

Additional land protection would be provided for the refuge project through acquisition of conservation easements from the timber and paper companies, the major landholders within the acquisition boundary. Easements on surrounding forested timberlands and some lake shoreline would protect and buffer the core refuge area and associated wetland dependent species from increasing pressures accompanying subdivision and development on adjacent lands. Easement lands would not be included within the designated refuge but would be identified as associated conservation easement areas. The Service and the State of New Hampshire are cooperating to acquire easement protection.

The conservation easement agreements were designed to compliment the core refuge area and to ensure that the land is retained in perpetuity in its undeveloped, scenic, open space condition. It would also protect the unique wildlife values and high outdoor recreation/education potential of the area. The timber and paper companies would retain ownership of the easement lands. Timber management and traditional recreational uses would continue on these areas but the easement would preclude future development. The easement remains with the land, even if sold to a new owner. The Service will have the first right to acquire full fee ownership for the easement areas if and when the remaining interests are offered for sale.

Boise Cascade expressed a lack of interest in the conservation easement route. They wish to only deal with the refuge in fee title sales. Furthermore, there has been no word yet from James

River Timber Corp. regarding the wording of the language to be used in the conservation easements that we will be acquiring from them.

3. Other

Mountain Recreation, Inc. represented by Bill Altenburg continued to try to get negotiations going with a variety of landowners, including the Service, around Lake Umbagog. His development proposal included placing a Gateway Lodge and remote huts connected by a trail system around the lake. His proposal certainly merits some consideration because there are some associated benefits. However, given the fact that most refuge lands that the project would affect are yet to be purchased, the proposal could not have come at a worse time. The project influenced James River in their negotiations with the Service and could cause considerable work in the appraisal area. Additionally, the scope of the project has to be considered a major development plan that would take considerable effort on the part of the refuge to determine its compatibility status. There would also have to be a tremendous amount of interaction with all the refuge supporters and local people to hash out the benefits and drawbacks. RM Breeser, in their last meeting, told Mr. Altenburg that the refuge would not be interested in continuing any further planning until the land negotiations were completed.

D. PLANNING

1. Master Plan

Nothing to report.

2. Management Plan

Work continues on the refuge hunt plan, with maps being drawn and informal public input sessions from affected groups started. Meetings were held with NH Fish and Game Department and the NH Division of Parks at their district office in Lancaster to go over plan development and to receive their input. Other meetings were held with local town officials, county officials, and sportsmen's groups, namely the Umbagog Waterfowler's Association and the Berlin Fur, Fin, and Game Club, to go over the intent to develop the plan and to address the compatibility issue.

A major thrust by the Service in the development of Ecosystem Management planning started during May. RM Breeser, a team member, spent a considerable amount of time travelling to and attending these meetings throughout the year. Due to the dynamic and innovative membership on the team and the leadership of Mark Sweeny and Gordon Russell, the team hammered out an

acceptable draft plan. In October, the ecosystem management team held the first meeting to solicit input from the State Fish and Game departments.

3. Public Participation

Nothing to report.

4. Compliance with Environmental and Cultural Resource Mandates

After completion of compatibility training in January, a list of secondary uses that will be occurring on the refuge was prepared and submitted to the RO. Categorical exclusions and jurisdictional issues were noted. A narrative was attached that summarized information about secondary uses that was part of the Final Environmental Assessment for the establishment of the refuge.

The compatibility lawsuit generated a tremendous amount of paperwork, reading, and informational needs. The refuge had little to do with the actual determinations since there were no uses occurring yet. The public planning process will address the issues as lands are acquired for the refuge.

The major local newspaper ran an article in March regarding the compatibility issue. The headline read Feds Could Restrict Hunting, Fishing at Umbagog. Although RM Manager was interviewed as part of the article, and the lawsuit was explained, most people seemed to focus on the title and there was an immediate uproar. RM Breeser made a whirlwind tour to hold meetings explaining the suit. Most locals appeared to be satisfied but articles and statements still surface about the closure of Lake Umbagog to traditional uses.

In October of 1993, a new septic system was installed at the refuge headquarters. Also, one 4,000 gallon underground storage tank was removed. In the process, another 500 gallon tank was found and removed. Soil contamination was observed during the removal and was thought to be residual spillage around the pump island. As a result, contaminated soil was removed and three monitoring wells were installed by Environmental Technologies. The wells are currently used to check the extent of fuel contamination in the ground water around the removed underground tanks. Samples from the wells are sent to Eastern Analytical. As expected, results show that a contamination problem still exists. We will have to compare the data over the next couple years to see what is happening to the level of contamination over time.

Three wells were installed to monitor underground water contamination.

5. Research and Investigations

Carol Foss, former director of the Wildlife Division for the Audubon Society of NH, conducted a graduate study for the University of Maine on portions of the proposed refuge. She conducted the study to gather information on wildlife distribution, abundance, and productivity in forested landscapes. Foss did this by conducting fledgling surveys to assess avian nesting success in forested habitats. Study sites included managed hardwood stands, 8-12 year old regenerating clearcuts, and mature spruce-fir stands. The survey revealed 66 bird species on 12 study areas. A total of 60 of these species maintained territories or home ranges within the study area. Fifty species of fledglings were detected. Black-throated green warblers, white-throated sparrows, brown creepers, and golden-crowned kinglets were the species most frequently detected. Highlights included discovery of New Hampshire's first documented Merlin nest, which fledged successfully, a successful spruce grouse nest, several encounters with a gray jay family, and a pair of common mergansers nesting in a dead stub. The study will provide some wonderful knowledge for baseline information on neotropical migrants.

6. Other

Nothing to report.

E. ADMINISTRATION

1. Personnel

Things are looking up around here. Lake Umbagog staff now consists of two people.

Lake Umbagog staff increased by 100%. Tammy Tisdale, former co-op student and ROS at Chincoteague NWR, joined the staff at Lake Umbagog NWR officially at the end of March. Due to timing of Law Enforcement training, she did not actually show up in NH until May.

Being a new refuge, the requests for tours, programs, and interviews about Lake Umbagog were in no short supply. Throughout the year, RM Breeser gave several interviews to representatives of the following: Coos County Democrat, Berlin Reporter, Field and Stream, Boston Globe. In addition, 20 programs were presented by ROS Tisdale and RM Breeser to the following: Appalachian Mountain Club, UNH Cooperative Extension, Berlin Fur-Fin and Game Club, Twin Mountain Environmental Education Center, Umbagog Waterfowler's Association, New Hampshire Fish and Game, County Extension Foresters, Lake Umbagog Study Team, Audubon Society of NH, Errol

Selectmen, James River Timber Corporation, Coos County Retired Teachers Association, Errol Planning Board, Coos County Sportsmen's Group, Kiwanis, Tin Mountain Conservation Camp, and various schools throughout the states of NH and ME. A variety of meetings with different organizations were held through the course of the year to discuss the hunt plan, compatibility, water level management, ecosystem management, habitat management, and land acquisition. The following trainings were attended throughout the year: RM Breeser: compatibility, LE refresher, advocacy for ecosystem management, basic fire fighting (S-130, S-190, I-120), aircraft safety, administrative training, semi-annual firearms requalification. ROS Tisdale: aircraft safety, Fire Engine detail for three weeks in Burns Oregon starting on July 20, annual biology workshop; moist soil management, semi-annual firearms requalification.

The Umbagog area is rich with warblers and other neotropical migrants and is great for bird walks.

2. Youth Programs

Nothing to report.

3. Other Manpower Programs

Nothing to report.

4. Volunteer Program

Volunteers from the Umbagog Waterfowler's Association helped to set up a monitoring program for the numerous wood duck boxes that are scattered around the lake. The majority of the boxes already in place, were put out by this club.

A total of 55 volunteer hours were donated to the refuge by the Chewonki Foundation. A group of eight students, ages 13-18, and two group leaders participated in a "service project" on the Kronk Farm. In preparation for the arrival of the hydro-ax in late August, ROS Tisdale and the group cleared out around numerous wild apple trees. The clearing helped the hydro-ax operator to avoid the trees but also decreased shading that will hopefully increase the productivity of the trees for wildlife benefits.

Volunteers helped clear brush around apple trees before the hydro-ax operation.

Volunteers battled thick brush to clear out around apple trees at the Kronk farm.

5. Funding

With the receipt of the FY94 "Bluebook", it became evident that the station is truly operating at the MINIMUM LEVEL.

TABLE 2. Lake Umbagog NWR Funding Summary, 1993-1995.

Fiscal Year	FTE	Minimum Level	Other O&M	MMS	Base Maint.	Total Funds
93	1.00	56,859	2,000	25,000	9,000	92,859
94	1.46	32,146	50,000	0	14,000	96,136
95	2.00	93,077	20,000	175,000*	19,700	307,777

*earmarked for office rehabilitation

6. Safety

ROS Tisdale completed the written hazard communication program. Although the amount of hazardous chemicals being used at the refuge is minimal, a folder for material safety data sheets was also established.

Kurt Otting from RO Engineering travelled to the refuge to assess the office for rehab work. After his visit, he determined the office to be contaminated with asbestos. Refuge staff was put on Administrative Leave until a study could be conducted on the contamination level. ROS Tisdale travelled to the RO to pick up supplies to temporarily make do. A minimal amount of work was conducted out of personal homes until RM Breeser started to set up a new office in a cabin adjacent to refuge headquarters. The contamination study was postponed until the first of 1995.

7. Technical Assistance

Nothing to report.

8. Other

Due to the perseverance of Dawn Comish, Lake Umbagog received an organization code by the end of February. This ended a lot of duplication. Also, this made RM Breeser very happy because then he could tell what Denver was doing with the station funds without having to repeatedly make phone calls.

The colors speak for themselves.

F. HABITAT MANAGEMENT

1. General

The refuge project area exhibits a diversity of habitat types. It is enhanced by the meandering and flooding of the two main river systems, the Magalloway and Androscoggin. The extensive floodplain/lakeshore wetland complex and surrounding upland area contains a variety of boreal habitats. These include floating bogs, river and lakeshore marshes, spruce bogs, northern white cedar swamps, alder swamps, the eastern most existing stands of jack pine, and spruce-fir/northern hardwood forests. All of the upland portions and most of the bottomland woodlands have been managed by forestry practices over the last 100 years and are in various stages of succession.

RM Breeser and ROS Tisdale toured the Kronk farm with Greg Sepik, Region 5 Woodcock Specialist, to discuss upland management options for the area. The discussion resulted in recommendations to reclaim old fields in one area and to create early successional growth on another portion. In advance of the hydro-ax operation, Bert Von Dohrman-the NH District Forester and Sam Stoddard-the UNH Coop. Extension Agent visited the area to comment on the commercial forest aspects of the area. What we planned to do was determined to have no commercial value according to them.

Also in advance of the hydro-ax operation, RM Breeser and ROS Tisdale spent a considerable amount of time utilizing information on the management of wild apple trees, sent by Jan Taylor, Northern Zone Biologist. With a volunteer youth group, ROS Tisdale cleared out around the trees to open them up to sunlight and to make them more visible in order to be spared by the blades of the hydro-ax. Operator Jeff Enlow worked on the Kronk farm August 24-28 and did an excellent job for the refuge. Where there once was an impenetrable tangle of alder, hawthorn, and pine is now open fields with over 30 apple trees. Additionally, about three acres of a pure aspen stand (15-20 years old) were cut to promote forest opening and regeneration for grouse, woodcock, and deer plus creating edge for various neotropicals. In October, Tom Siekaniec from Moosehorn NWR spent a long day going over areas that had previously been knocked down by the hydro-ax but had started to stand up again. Tom also took out a few new small patches, mainly along the road into the farm. The farm looks great!

Clearing around apple trees opened them up to sunlight but most importantly made them visible to the hydro-ax operator.

A scotch pine plantation was cleared with the hydro-ax.

The Kronk farm went from impenetrable to restored open fields.

Open field habitat, scarce in northern NH, will benefit many wildlife species including woodcock.

2. Wetlands

The northern portion of the refuge project is characterized by wide, well developed floodplains with meandering rivers. In combination with the impounding effect of Errol Dam, the current diversity and distribution of wetlands has been in place for nearly 80 years. The majority of lakeshore is subject to wind action from the 12 mile long, 7,850 acre lake and has very little developed aquatic vegetation. The riparian zones associated with the Dead Cambridge River and numerous small brooks have well developed beaver flowages that provide important habitat.

Floodplain habitat is forest or shrub dominated, mainly red and silver maple, alder, spruce, fir, and cedar. Naturally formed river levees provide narrow, linear upland islands amidst the wetland and open water complex. There are three major marsh areas in the northern portion totaling nearly 600 acres. Dominating marsh vegetation includes spikerush, sedges, pondweeds, and scattered beds of wild rice (it does not seem to produce much of a seed crop for waterfowl but seems to be on the increase in recent years). Wet meadows are dominated by blue-joint grass and sedges while the bogs are characterized by alder, willow, leatherleaf, sweet gale, and sphagnum moss.

Two meetings were held to discuss water level management on Lake Umbagog. The first was held between RM Breeser and personnel from Union Water Power Company, the company that controls the flowage rights over the lake waters. It was basically an overview of their operations and the downstream requirement that must be met. The second meeting was a requirement of the FERC license for the Errol dam. It was attended by RM Breeser, personnel from Union Water Power, the State of NH, and the Loon Preservation Committee. Discussion focused on the stable water level agreement that has been signed. From the time the first loon initiates incubation of a nest on Lake Umbagog, the power company attempts to keep the water level from fluctuating. This agreement is a great benefit to loons and other wildlife. We would like to fine tune it a little bit to make sure that the water level is not too high when the stabilizing process begins. A benchmark level of 14 foot was discussed and even if the level was higher than that when the first loon started nesting, it would be allowed to drop to that level and then start a slow decline to about the 13.5 foot level. It is felt that water levels above the 14 foot level is having a detrimental effect on upland vegetation and shoreline erosion. All of the biologists felt that lowering the level to 14 foot would not impact the loon nesting, would be more beneficial for exposing nesting sites, and would have less impact on vegetation. Union Water Power thought they could make the adjustments. They have always appeared to be quite willing to work with the refuge.

The office paperwork released its hold for a short while.

Lake Umbagog is known for having the largest freshwater marsh system in New Hampshire.

Cottongrass at Leonard Bog has its own beauty.

The fall colors are a nice reminder that winter is on its way.

3. Forests

With very few exceptions, upland areas are forested with mixtures of northern hardwoods or spruce-fir. Red maple, silver maple, paper birch, beech, balsam fir, white and red spruce, and white pine predominate. In the lowlands, there are also a few stands of white cedar and tamarack. Occasionally, a person can still run across some old growth white pine that originally covered vast areas of the countryside. Most forestlands have been cut at least twice with some areas on their third or fourth cutover. A number of sawmills in the area and paper mills in Berlin, NH and Rumford, Maine create a ready market.

Timber management will probably be a large program on the refuge. Because of the fast regeneration of the tree species, it will be conducive to wildlife management to keep a rotational program on selected areas to provide for habitat diversity. Key species will include neotropical migrants, deer, moose, and woodcock. Certain stands will be managed for climax composition and some lowland swamps that are key deer yards will also need a great deal of attention.

4. Croplands

Nothing to report.

5. Grasslands

Hydro-ax work was done on Tract 338, the Kronk farm. This tract is one of the few areas on the entire refuge where old fields still exist. As an initial effort, approximately 10 acres of the more open fields were mowed to provide open grassland habitat. The old farmstead also has a large number of apple trees that were pruned and opened up to more sunlight. Other wildlife plants managed there include highbush cranberry, chokecherry, and raspberry.

6. Other Habitats

Nothing to report.

7. Grazing

Nothing to report.

8. Haying

Nothing to report.

9. Fire Management

Nothing to report.

10. Pest Control

Nothing to report.

11. Water Rights

All of the lakes in the Rangeley system are managed through a series of dams, to insure flow to downstream users throughout the year. The final dam on this system is located on the Androscoggin River as it exits Lake Umbagog on the west side. All of the water moving through the system flows through Lake Umbagog and down the Androscoggin River. This dam, known as the Errol Dam, causes an impounding effect that extends to the lake and the lower reaches of the Magalloway River. The dam was originally built in 1853 to store water for log drives. It was rebuilt in the early 1900's and has raised the lake level about nine and one-half feet. This greatly increased the surface area of the lake. Present size is about 7,850 acres.

Errol dam, initially installed to drive logs, raises the lake level over nine feet.

The Errol Dam, as are all the dams in the Rangeley system, is owned and operated by Union Water and Power Company. It maintains a continuous minimum flow in the Androscoggin River and provides hydropower under a license issued by the Federal Energy

Regulatory Commission. A reservoir level management plan was developed by the company, guided by Article 27 of the FERC license which takes wildlife/waterfowl nesting periods into consideration. A major objective of this plan is to minimize impacts on fish and wildlife while still meeting the objectives of the company. The plan also calls for continued input and review of the water level management through annual meetings between Union Water Power Company, the New Hampshire Fish and Game Department, the Maine Department of Inland Fisheries and Wildlife, the Loon Preservation Committee, and the Service.

12. Wilderness and Special Areas

A portion of the refuge project has already been designated as the Floating Island National Natural Landmark by the National Park Service. It is described as an outstanding 750 acre wetland including a 260 acre open northern heath bog surrounded on three sides by mixed swamp forest and an intricate water complex of meandering rivers, oxbows, and ponds. The landmark is located in the Leonard Pond area. The name "floating island" is kind of a misnomer. The whole area is actually attached to land, however, there is certainly a large area of floating bog mat.

13. WPA Easement Monitoring

Nothing to report.

G. WILDLIFE

1. Wildlife Diversity

The unique wildlife values of the area have been well documented and studied. The famous ornithologist William Brewster studied the area in depth in the late 1800's. His book, Birds of the Lake Umbagog Region of Maine, provides extensive knowledge about the area and its wildlife during that time. Interest in the area for the formation of a national wildlife refuge dates back to the early 1960's. The lake and its adjoining wetland/river complex are clearly recognized by the states of Maine and New Hampshire as some of the states' finest wildlife habitat. Significant interest is still obvious today with the State of New Hampshire's Audubon Society active in bald eagle monitoring and osprey surveys, and the Loon Preservation Committee's research and management program.

The richness of habitat provides important production and migration areas for waterfowl, wading birds, shorebirds, and a whole host of passerines including many of the neotropical migrants.

Resident animals include moose, black bear, white-tailed deer, coyote, bobcat, fisher, beaver, otter, mink, fox, and others.

2. Endangered and/or Threatened Species

In 1989, bald eagles successfully nested in New Hampshire for the first time since 1949. The nest was located in the Leonard Pond area, right at Lake Umbagog. It continues to be the only known active nest site in NH. This nest site is located within the acquisition boundary of the refuge. The nest is located just below the crown of a 75′ white pine that stands as a lone sentinel on a long narrow island. Core samples taken from the tree show evidence of extreme heart rot. One guess is as good as another on how long the tree will remain standing.

A snag adjacent to the bald eagle nest is a handy lookout.

In 1993, Mike Amaral, ES Biologist/Concord, and Chris Martin, ASNH Biologist, successfully banded two eaglets. In the last six years, there have been seven eggs hatched, of which one

eaglet died. In addition, there have been two foster chicks introduced and fledged. Unfortunately, the 1994 season ended with no productivity. The traditional pair initiated nesting at the Pine Point location on private property in Maine. They became active in the area in 1993, after the juveniles destroyed the traditional nest in the Leonard Marsh area. The female was observed incubating the nest the first of April. Both adults were observed at the new nest site on May 4. From behavior observations, it appeared that a hatch had occurred. During the two weeks following, the nest was abandoned after the adult male disappeared. The male, called YT because of a yellow wing tag, was 10 years old and was the original nesting male in the area. The remains of YT were found on July 31 along a trail near Glassby Cove. The remains were fluoroscoped and two lead shot were observed. The shot were different sizes, which probably indicated that they were in the digestive system and not in the body of the bird. The exact circumstances will never be known. After the female abandoned the nest, Mike Amaral, Concord Ecological Services, climbed the Pine Point nest. The climb revealed an unhatched egg, later determined to be fertile, and egg shell fragment/membrane in the nest. In a very short period of time after the adult female abandoned the nest, she paired up with a four year old sub-adult that had been observed in the area. They moved back to the New Hampshire side and started to add material to the old nest site. This was somewhat bad news since core samples of the tree indicate severe heart-rot, but good news that an eagle pair could be productive in 1995.

Two immature eagles and one adult eagle were seen regularly in the Rapid River area. Charlie Adkins, A Maine game warden confirmed the presence of a new bald eagle nest in Mooselookmeguntic lake about 12 air miles from Lake Umbagog.

In addition to eagles, the refuge area also provides nesting and migrating habitat for the peregrine falcon. One of the most important peregrine nesting sites in the State of Maine, active since 1988, is located in the C Pond area of the proposed refuge. The nest represents a site of special management concern. The Maine Department of Inland Fisheries and Wildlife has established a working relationship with the current landowners. The C Bluff site is also important because it is identified as a historic golden eagle eyrie.

3. Waterfowl

Important nesting species in the Lake Umbagog region include the black duck, ring-necked duck, and mallard, along with cavity nesters such as the wood duck, common goldeneye, and common and hooded mergansers. Although no official surveys were conducted, black ducks, ring-necked ducks, and common mergansers were the most prevalently seen in day to day observations. Lake Umbagog

is noted to have the highest nesting concentrations in the State of New Hampshire for black ducks, ring-necked ducks, and goldeneyes. The lake has been identified as a priority site for New Hampshire under the North American Waterfowl Management Plan.

Water started to open up in March and common mergansers and common goldeneyes increased gradually. A few common mergansers could be seen at the Errol Dam throughout the winter. The first pair of waterfowl were black ducks, showing up in late February. In March, migration was well underway with population estimates as follows: mallard (40), black duck (70), common merganser (120), hooded merganser (30), common goldeneye (40), wood duck (10). Most of the migrants had come and gone by the end of April and we were left with the small local populations. The first brood of the year was a black duck with 11 ducklings at the end of May. In June the following broods were observed: Canada goose (2), common goldeneye (5), mallard (1), and black duck (2). Unfortunately, there was very little time to spend on the water in July and August so no waterfowl information was collected. We took a trip on the lake before hunting season the first of October and waterfowl sightings were surprisingly higher than expected, although still not what one would call high. Mallards, black ducks, ring-necked ducks, common and hooded mergansers, wood ducks, and a few scaup were all noted. The first migrating Canada geese were noted on September 15.

A pair of mallards is not as common as you might think.

The refuge does not currently have a wood duck box program, although local conservation groups have placed in excess of 50 boxes on lands to be acquired by the refuge. Hopefully a cooperative program will be established with them to set up a procedure for checks, data collections, and repairs. Additionally, the refuge plans to install more boxes to enhance nesting not only for wood ducks but also common and hooded mergansers and goldeneyes. RM Breeser checked 18 of the 24 boxes that we are currently monitoring. His findings for the 1994 breeding season were as follows: ten boxes were unused, six boxes were used by starlings or flickers, and two boxes were used by common goldeneyes. One of the goldeneye nests revealed eight hatched eggs and one unhatched egg and the second nest revealed five hatched eggs and one unhatched egg. The majority of the boxes checked were plastic, although a few wooden ones remain. All were affixed to trees with no predator guards installed.

4. Marsh and Water Birds

Lake Umbagog offers the best breeding habitat for common loons in New Hampshire.

The common loon is formally listed as a threatened species in New Hampshire under NH RSA 212-A, the Endangered Species Conservation Act. There has always been considerable interest in the common loon population that inhabits Lake Umbagog. The population and productivity has been monitored annually since 1978, by the Loon Preservation Committee (LPC). The lake is recognized as the best breeding habitat in the State of New Hampshire. Marc Cook, a biologist for the LPC, spent many hours collecting data around Lake Umbagog and in other parts of the north country. Betsy Poirier provided us with the following information after Marc's observations had been tallied. The first nest on Lake Umbagog was confirmed on May 26. Union Power Water attempted to keep the water level stable from that point forward to prevent flooding of the nests. This first nest initiation date was approximately two to three weeks later than 1993. By July, 13 pairs had initiated nesting. There is a total of 25 established loon territories on Lake Umbagog. The last hatch of the season occurred on August 6. End of the season totals are as follows:

There was a total of 24 pairs of loons that occupied and defended territories on the lake and adjacent wetlands. Seventeen of those pairs nested and 13 of the pairs were successful in producing young. A total of 19 chicks hatched, of which 11 survived to fledge, down a little from the 13 in 1993.

For several years in the 1970's, water level changes caused by the dam were shown to adversely effect loon nesting success and productivity. Since that time, Union Water Power and LPC have cooperated to provide management steps to lessen these adverse effects. Management strategies have included the placement of artificial nesting islands (rafts) where possible and attempts to stabilize water levels during the nesting season. In 1994, the water levels were again stabilized during the nesting season and three rafts were put in place.

5. Shorebirds, Gulls, Terns, and Allied Species

Nothing to report.

6. Raptors

Besides the bald eagles and peregrines that were mentioned previously, the area has a good diversity of hawks and owls and one of the highest populations of osprey in the northeast. The following information on ospreys was provided by Chris Martin of the Audubon Society of NH:

The osprey is a threatened species in New Hampshire. Its statewide breeding distribution is restricted primarily to Coos County, the county that encompasses a large portion of the proposed refuge. In 1994, all but 2 of the 29 nests were in

Coos County with the remaining two near Great Bay in southeastern New Hampshire.

On the New Hampshire side of the Maine/New Hampshire border, 36 osprey nest sites (34 nests and two platforms) were monitored during the breeding season. Active nests totaled 27 in 1994. Nineteen of those nest were successful with a total of 38 fledged young, an increase of 81% over the 21 young fledged in 1993. Previously, the highs were 21 active nests in 1993 and 22 young fledged in 1990. An average of 1.41 young/active nest fledged in 1994. Pretty Good! It is felt by all involved that ospreys have saturated the available habitat around the lake and are now pioneering out into adjacent areas. No official surveys are taken over the Maine border, although it is on the "to do" list.

Osprey production was at a record high in 1994.

The annual osprey weekend occurred on July 16 and 17. This event is sponsored by the Audubon Society of NH. ROS Tisdale along with nearly 70 volunteers from all over the state, and

some even out of state, participated in monitoring and collecting data on individual nests. The results were outstanding.

ROS Tammy Tisdale attempted to fend off a few of the mosquitoes during osprey weekend.....to no avail!

7. Other Migratory Birds

No official bird list has yet been printed. However, neotropical migrants pour into the north country during migrations. There are 23 different species of warblers alone that nest in the area of the refuge. Since there is already a focus by other groups on bald eagles, osprey, loons, and northern harriers, and since this area is so rich in passerines, this is likely to be a main focus of the refuge in the future.

8. Game Mammals

The most prominent big game animal in the refuge area is the moose. It has been experiencing some fantastic growth rates. In talking with Steve Weber, NH Fish and Game Biologist responsible for this area, he indicates that the statewide

population is increasing between 20-30% each year with the total population estimated at 5,000 in 1992. This growth rate is possible because of a nearly 100% twinning rate, 100% of yearling cows being bred, some evidence of calf cows being bred, low predation rates, and a very restrictive hunting season. Refer to hunting section for details of the moose hunt in New Hampshire.

"Salt licks" are provided by the many passes of the snowplow.

Black bear populations are well established, however, no density estimates are available. Total black bear kill in 1994 was 239 (136 male, 103 female) in NH and 2,243 (1,290 male, 945 female, 8 unreported sex) in Maine. The data was collected by town, therefore it is impossible to determine the exact number of bear

taken within the refuge acquisition boundary. A total of six bears were taken within the towns of Errol and Wentworth Location, NH and a total of 11 bears were taken within Upton and Magalloway Plantation Maine. Portions of these towns are incorporated within the refuge boundary.

White-tail deer populations are on the rebound in the northern counties of New Hampshire. A series of extremely hard winters in the late 70's and a loss of deer yard habitat due to spruce bud worm infestation and salvage timber operations lowered populations dramatically. The very mild winter of 1991-1992 favored above-average winter survival and fawn production. However, significant snowfall was received in 1993/1994. By April, snow melt finally allowed the deer yards to open up and deer were observed moving out of the yards. The severity of the winter was the most obvious when the deer yards were observed. Browse damage was significant with nearly all browse that was available being utilized and stems up to 3\4 inch being taken. The deer, however seemed to come through fairly well. A heavy snowfall or hard winter in 1994/1995 would have had a large effect on the population because winter kill would have been very high. Fortunately, snowfall stayed at a minimum and in comparative terms winter was very mild to year's end. The population should have fared quite well. Time will tell.

Deer yards are known to exist in the Bear Brook area, near the refuge headquarters on the NH side of the lake. On the Maine side of the lake, yards are known around the mouth of the Dead Cambridge River and along the Rapid River corridor. In NH, 8,379 deer were taken, 12 coming from within the proposed refuge. Of those 12, four were taken with a muzzleloader, six with a firearm, and two during archery season. Eight of the 12 were bucks and four were does. For ME, 59 deer were taken in Upton and Magalloway Plantation combined. The state total was 24,683 deer (15,973 bucks, 8,713 does and fawns).

9. Marine Mammals

Nothing to report.

10. Other Resident Wildlife

The annual beaver colony survey along the Magalloway and Androscoggin Rivers was completed in November. The survey is timed as late as possible because the beaver in this area are late in securing their winter food source. The survey has been conducted since 1992. Boat failure prevented the completion of the survey in 1994, but 11 active beaver colonies were noted. A total of 13 active colonies were noted in 1993.

11. Fisheries Resources

Every lake in the Rangeley system is considered to be a cold water fishery except for Lake Umbagog. Its shallow waters, averaging only 11 feet in depth, make it a warm water fishery but there are also trout and salmon present. The Rapid River, which connects Lake Umbagog to Lower Richardson Lake, is one of Maine's blue ribbon trout and salmon waters. All of the area's smaller brooks and streams contain native populations of brook trout. There is a considerable amount of stocking that takes place in both New Hampshire and Maine. Brown trout, rainbow trout, and coho salmon have been introduced into many of the streams and lakes and continues on an annual basis. Lake Umbagog is known for its high population of pickerel and jumbo yellow perch. A number of fishermen reported catching smallmouth bass in significant numbers, and up to three pounds in weight. These fish have been recently introduced and appear to be fairing well in the lake.

An 18 pound northern pike was found floating dead in Thurston Cove. Although pike are not native to the drainage, there apparently were some introductions in the past. This is the second confirmed pike. The waters are alive with pickerel, but the pike do not seem to be able to establish themselves.

12. Wildlife Propagation and Stocking

Nothing to report.

13. Surplus Animal Disposal

Nothing to report.

14. Scientific Collections

Nothing to report.

15. Animal Control

Nothing to report.

16. Marking and Banding

A cooperative effort has led to a couple of successful years of loon banding on Lake Umbagog and surrounding lakes. The banding project on Lake Umbagog started in 1993 with the banding of one adult and one juvenile. Dave Evers, working on his PhD, along with members of the Loon Preservation Committee, Maine Audubon, Tufts University, and USFWS all joined together in the effort. At one time, 18 people were stationed at the HQ. In 1994, a total of 15 loons were banded during nightlighting operations on Lake Umbagog, two of which were chicks. Another 12 were banded

on Aziscohos Lake in Maine, just north of the refuge boundary. Blood samples were taken for toxicology and DNA work. ROS Tisdale participated in one night of the banding operation. A feature article on the banding operation was done by local reporter Dick Pinnette and printed in the Berlin Reporter. When you consider only a couple loons were banded last year, 1994 was remarkably successful.

Observing banded pairs in years to come will hopefully shed light on many questions still unanswered about the common loon. Information that will hopefully come from the effort include more knowledge on the pair bond, nest site fidelity, and chronology of arrival to and departure from the breeding grounds. In banding chicks, more information will eventually be gathered about age at first breeding, where young birds attempt to establish a territory, and lifespan. The following is a listing of the color-banded loons.

Table 3. Loons color-banded at Lake Umbagog NWR, 1993-1994.

1993

location	sex	bands left	bands right
Sweat Meadows	f	yellow/white	orange/silver
	j	orange/silver	green/green
1994			
Black Island Cove	f	blue/yellow	orange/silver
	m	white/blue	orange/silver
Metallak Cove	f	blue/white	orange/silver
	m	blue/none	orange/silver
Potter Cove	m	orange/silver	blue/red
Harper's Meadow	f	blue/orange	orange/silver
	m	blue/green	orange/silver
	j	orange/silver	blue/green
Rapid River	m	white/blue	silver/orange
Three Island Cove	f	green/green	orange/silver
Magalloway River	f	green/white	orange/silver
	m	green/red	orange/silver
	j	orange/silver	red/yellow
Lawrence	f	white/red	orange/silver
	m	green/yellow	orange/silver

17. Disease Prevention and Control

Although there are no confirmed cases of rabies in the immediate vicinity, the disease is rapidly advancing northward, primarily through raccoons and skunks. Luckily we don't have large populations of either.

H. PUBLIC USE

1. General

The waters around Lake Umbagog receive moderate to heavy recreational pressure during the summer period. Pleasure boating, visits to private camps, canoeing, kayaking, fishing, and general wildlife observation attract people from all over the neighboring states. However, the community of Berlin, NH, about 30 miles to the south accounts for most visits. Generally speaking, activities are related to the main lake and the two major rivers. Consumptive uses of hunting, fishing, and trapping would be considered light.

Use of the navigable waters has been and will continue to be under the jurisdiction of the two states. Boating, fishing, and other activities conducted on the water would not be controlled by the Service, but remain subject to state regulation. Because of the cooperative nature of this refuge project, MOU's that are to be developed would guide these uses if they were found to have a significant impact on the area's resources.

Entirely separate from the refuge project, the New Hampshire Legislature passed an Act in 1990 establishing a joint commission between the States of New Hampshire and Maine, to determine what controls and what restrictions should be imposed on the use and operation of watercraft on Lake Umbagog. This legislation directs three commissioners from each state, appointed by the governors, to consider restrictions on watercraft for the protection of the lake, the environment, and wildlife. The State of Maine has not yet enacted similar legislation which would be necessary before the commission could be established.

A considerable amount of discussion has been carried out between the RM and Bill Altenburg from Mountain Recreation, Inc. He has targeted the lands around Lake Umbagog to develop a trail/hut system based on the AMC concept in the White Mountains Nationals Forest. Although the concept has a lot of good values associated with it, ie. non-motorized use and an ability to control uses that are escalating, with the refuge still in the active acquisition stage it is viewed as a hot potato. RM Breeser does not want to get involved in any kind of development scenario that might affect land purchases. This is especially

true when the selling point for establishing the refuge was to protect it from any further development. A meeting was held in the RO so that Mr. Altenburg could present his development plans to a number of RO personnel so that ultimately the refuge could receive feedback and different perspectives. In attendance were ARD Don Young, AM-N Don Frickie, DAM-N Stan Skutek, George Gavutis, Carol Ann Flood, Dick Dyer, Pam Rooney, and Sarah Bevilacqua.

2. Outdoor Classrooms - Students

Nothing to report.

3. Outdoor Classrooms - Teachers

Nothing to report.

4. Interpretive Foot Trails

Nothing to report.

5. Interpretive Tour Routes

Nothing to report.

6. Interpretive Exhibits/Demonstrations

Nothing to report.

7. Other Interpretive Programs

Nothing to report.

8. Hunting

The only real hunting pressure that occurs within the refuge area is waterfowl hunting. Waterfowl season opened on October 6 in New Hampshire. Very little hunting activity occurs on the Maine portion of the lake. There is moderate activity in the New Hampshire marshes. It was estimated that less than 20 hunters were present at any given time. Opening day hunting was quite successful, with many of the hunters getting at least two ducks. Primarily the bag was mallards, black ducks, wood ducks, and some scaup. After opening day, hunters and ducks become much more scarce.

Moose season opened in Maine and New Hampshire during October. The portion of Maine in which the refuge is located is closed to moose hunting although some of the highest moose densities in the state are located in that area. NH moose hunters were again very successful, showing a 75% success rate, down a little from the 89% success rate in 1993. This was expected because 1994

was the first year that the entire state was opened and additional permits were issued in the southern and central areas. There was a 95% success rate in the northern area. Permits raised from 190 in 1992 to 317 in 1993 and finally to 405 in 1994. A total of 305 of those permits were filled. Totals revealed 200 bulls, 83 cows, and 22 calves taken in the state. A total of 23 moose were taken within the management area that the refuge exists but there is no way to break it down with any more detail.

White-tailed deer archery season opened on September 15 in NH. Muzzleloader season opened on October 22, then firearm season on November 2. Very little hunting pressure occurs on proposed refuge lands. An estimated 12 deer (8 bucks, 4 doe) out of the 8,379 NH total were taken near the proposed refuge area. The exact number of deer taken within the refuge boundary in ME cannot be tallied. The two towns that fall within the refuge boundary, Magalloway Plantation and Upton, ended up with 59 deer of the 24,683 state total. Based on personal observation and talking with hunters, there has been an increase in deer numbers in the last couple of years. Since the north country escaped the deep snow this winter, the deer herd should respond favorably. The loss of deer yarding area to insect damage and softwood harvesting is the main limiting factor.

Bear hunting pressure is very low within the refuge boundary. The state totals were 239 and 2,243 in NH and ME, respectively.

9. Fishing

Nothing to report.

10. Trapping

Very little trapping occurs around the lake. A small effort is put into beaver trapping on the New Hampshire side but no harvest numbers are collected. The following numbers were collected for Upton and Magalloway Plantation, ME: beaver (28), bobcat (4), Coyote (10), Fox (3), Fisher (2), Marten (0), Mink (2), Otter (2). No numbers were collected for raccoon.

11. Wildlife Observation

Nothing to report. (See the Endangered Species section.)

12. Other Wildlife Oriented Recreation

A small amount of snowshoeing has been noted in the Mile Long Pond area.

13. Camping

A concessionaire who holds leases with the large paper companies has 20 improved campsites around the shoreline of Lake Umbagog. He provides transportation to the sites and keeps them outfitted. The sites are booked solid during the camping season. The person that operates these sites, Jim Willard of Umbagog Lake Campgrounds, appears to have a real interest in the area wildlife and maintains neat campsites. He also provides pontoon boat tours of the lake and its wildlife.

14. Picnicking

Nothing to report.

15. Off-Road Vehicling

Although this portion of the north country is well known for its snowmobiling, nearly all of it is restricted to the state groomed trails that criss-cross all of the northern part of the state. One main trail travels along the proposed refuge area and part of the same trail runs for about a mile on the lake ice. Some snowmobiling occurs on the main lake itself too. Deep snow usually keeps people from venturing too far off the trails.

16. Other Non-Wildlife Oriented Recreation

Nothing to report.

17. Law Enforcement

RM Breeser made an appearance on the lake on October 6, opening day of waterfowl season. After that, hunters and birds were few and far between.

18. Cooperating Associations

Nothing to report.

19. Concessions

Nothing to report.

I. EQUIPMENT AND FACILITIES

1. New Construction

Nothing to report.

2. Rehabilitation

In November, Kurt Otting from RO Engineering was at the refuge

to assess the office for rehab-work. After his visit, he determined that the building was contaminated with asbestos. Refuge staff was put on Administrative Leave until a study on the contamination level could be conducted and a new refuge office was set up in an adjacent refuge cabin. This set-back obviously put the rehab-work on delay. Office rehabilitation was postponed until 1995.

3. Major Maintenance

In June, the last building adjacent to refuge headquarters was removed.

4. Equipment Utilization and Replacement

Nothing to report.

5. Communications Systems

Nothing to report.

6. Computer Systems

Nothing to report.

7. Energy Conservation

Nothing to report.

8. Other

J. OTHER ITEMS

1. Cooperative Programs

Nothing has been formally established but the success of Lake Umbagog NWR will depend upon close cooperation with state agencies, conservation organizations, local clubs, private land interests, and private individuals. Many people and organizations have a vested interest in the lake area and the Service is the newcomer.

The State of NH is one of the key players in the conservation project around Lake Umbagog. They have successfully acquired over 1,000 acres in fee title and more than 2,500 acres in conservation easement on the western portion of the lake.

2. Other Economic Uses

Nothing to report.

3. Items of Interest

Nothing to report.

4. Credits

This report was prepared by Tammy Tisdale and reviewed by Steve Breeser. Photos were taken by Tammy Tisdale and Steve Breeser except for those on pages 2, 14, 19, 24, 26, 27, and 31 which were graciously donated to the refuge by John Hollingsworth.

K. FEEDBACK

This year the Fish & Wildlife Service started down another road of great changes with Compatibility and Eco-system Management becoming new but significant workloads for refuge personnel. I know that there are pros and cons to both issues and only time will tell if they are beneficial. As usual, we need to ask the simple question -Is it doing something beneficial for the resources we are entrusted to protect and manage? If not, then we shouldn't be doing it. There is no more time and money is at a premium.

It truly is a beautiful place!