REFUGE LAND ACQUISITION

BIOLOGICAL RECONNAISSANCE REPORT

LAKE UMBAGOG

TOWN OF EROL, NEW HAMPSHIRE (COOS COUNTY)

AND

TOWN OF MAGALLOWAY, MAINE (OXFORD COUNTY)

I. INTRODUCTION

A. Location (See Maps 1-6)

This report describes a 15,600-acre area locally called Lake Umbagog. The lake surface is about 7,850 acres. This report concerns lake shore, marsh, swamp, and uplands, predominately on the lake’s western side from N.H. Route 16 east to the lake’s western shoreline. The property is found on the 1:62500 U.S.G.S. Quadrangle Maps for Errol, New Hampshire and Milan, New Hampshire.

B. Justification (See Map 6 and photos)

The proposed area totals 15,600 acres and consists of a combination of 25 miles of shoreline, upland forest, swamp, bog and marsh, all of outstanding value to northern species of wildlife. Over 8,330 acres are prime black duck nesting areas and includes five active osprey nests, and one recently active bald eagle nest. The remaining approximately 7,000 acres are predominately upland mixed with stream and swamps, and are important as a buffer area between developing Route 16 and the proposed area, plus protecting the balance of the western shore of Lake Umbagog. This latter area contains one additional active osprey nest, making a total of six in the proposed area. These lands contain the important floodplains and wetlands of the lower Magalloway River and the upper Androscoggin River which intermingle and form a large delta bog and marsh complex of outstanding value to waterfowl, particularly black ducks and fishing area for osprey. Offshore, the loon finds refuge and food, thus helping to preserve this dwindling species. About 600 acres of this proposal are within the State of Maine and are needed to protect floodplain areas of the Magalloway River near Sturdevant Pond. All islands on the New Hampshire side are included in this proposal; most are uninhabited, or contain only traces of former use.
A proposal to mine the bottom of Lake Umbagog for diatomaceous earth was recently turned down by the State of New Hampshire. However, the requester has carried his request on to a higher court. If he should be successful, his operation to remove the earth would deepen the lake by an estimated average of 30 feet from its present relatively shallow depth. The deepest known areas are only 19 feet. Most of the lake is much shallower. More than doubling the depth of the lake would create a major upset in its present ecological balance. The operation would create unknown quantities of silt by disturbance. Runoff from the processing plant and the operation is expected to continue for 50 years.

Lake Umbagog is the westernmost lake of the Rangeley chain, and is the immediate source of the Androscoggin River. The lake is shallow, wind-stirred, and does not thermally stratify. It provides localized fishing for landlocked salmon, brook trout, whitefish, yellow perch, and excellent fishing for pickerel and bullheads. The lake is considered by State biologists and conservationists as one of the finest waterfowl areas in New Hampshire, and is popular with fishermen, hunters, and outdoor enthusiasts in general. Immediate protective action is necessary to preserve the natural beauty, character, and values of this lake.
II. History and General Description of Area

A. Geology (See Map 6)

The study area varies from river floodplain marsh, bogs, and swamps to steeply rising wooded hills rising 1,000 feet to the mile. The shoreline is low, but hard, covered by cobbles and boulders (note 4th photo). Inner coves and bay areas have boggy, floating mat shorelines of tremendous value to waterfowl, waterbirds, and mammals. The study area has been repeatedly glaciated and the rock-core hills are rounded and polished, and covered with a thin soil mantle. The lower slopes and valleys have deep deposits of glacial till. The sub-layers of rock are chiefly granites and schists.

The entire project area was subject to several periods of glaciation. There are many lakes, ponds, and swamps which have been caused by glacial erosion and glacial and marine deposition which altered earlier drainage patterns. What is now Umbagog Lake once covered a larger area which was sufficiently shallow to support plant life, but which has since become filled with peat deposits. The sluggish Magalloway River still meanders through some of the partly filled valley, now and then cutting across land to erode new channels and leaving behind a variety of oxbows, sloughs, and backwater areas. Bordering these water areas, and in some of the true marshes of the region, the soil has been classed as peat, shallow phase. The underlying mineral soil is only 18 to 30 inches below the surface. Around the borders of the area is a limited band of stony loam or fine sandy loam. These soils are of low fertility, and best suited to growing of trees.

B. Topography (See Map 6)

Coos County, New Hampshire, is in the New England physical province. The highest and some of the most massive and rugged sections of the White Mountains are southwest of the project area. Hills and mountains bordering the suggested area are also steep and range in elevation from 1630 to 2845 feet. The Magalloway River is a major stream which meanders through a valley with an average width of approximately three-fourths of a mile. This stream flows along the western edge of Umbagog Lake and empties into the outlet to the lake. This outlet marks the beginning of the Androscoggin River. The elevation of Umbagog Lake is described on the topographic map as 1245 feet msl. The marshes, oxbows, sloughs, and coves bordering the Magalloway and Androscoggin Rivers all appear to have elevations of less than 1250 feet.
II. C. Climate

The following table, summarizing the monthly temperatures, precipitation, and evaporation, indicates periods of water surpluses and deficiencies:

<table>
<thead>
<tr>
<th>Month</th>
<th>Average Temperature*</th>
<th>Average Precipitation</th>
<th>Average Evaporation***</th>
<th>Gain</th>
<th>Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>16.0</td>
<td>2.77</td>
<td>+ 2.77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>February</td>
<td>17.1</td>
<td>2.35</td>
<td>+ 2.35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>March</td>
<td>26.8</td>
<td>3.31</td>
<td>+ 3.31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>April</td>
<td>40.2</td>
<td>3.12</td>
<td>2.19</td>
<td>+ .93</td>
<td></td>
</tr>
<tr>
<td>May</td>
<td>52.4</td>
<td>3.21</td>
<td>4.19</td>
<td>- .98</td>
<td></td>
</tr>
<tr>
<td>June</td>
<td>61.7</td>
<td>4.07</td>
<td>5.01</td>
<td>- .94</td>
<td></td>
</tr>
<tr>
<td>July</td>
<td>66.2</td>
<td>3.60</td>
<td>5.22</td>
<td>-1.62</td>
<td></td>
</tr>
<tr>
<td>August</td>
<td>64.2</td>
<td>3.19</td>
<td>4.20</td>
<td></td>
<td>-1.01</td>
</tr>
<tr>
<td>September</td>
<td>56.1</td>
<td>3.96</td>
<td>3.38</td>
<td>+ .58</td>
<td></td>
</tr>
<tr>
<td>October</td>
<td>46.0</td>
<td>3.01</td>
<td>1.86</td>
<td>+ 1.15</td>
<td></td>
</tr>
<tr>
<td>November</td>
<td>23.9</td>
<td>3.56</td>
<td>3.56</td>
<td>+ 3.56</td>
<td></td>
</tr>
<tr>
<td>December</td>
<td>20.1</td>
<td>2.98</td>
<td>+ 2.98</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>39.13</td>
<td>26.05</td>
<td>+17.63</td>
<td>-4.55</td>
<td></td>
</tr>
</tbody>
</table>

* Based on 62 years of record at Berlin, New Hampshire, which is 35 miles south of proposed area.

** Based on 67 years of record at Berlin, New Hampshire.

*** Based on records at Massabesic Lake, New Hampshire. Lesser evaporation losses occur during the remainder of the year.

D. Physical Improvements on Lands

1. Buildings

Five camps are so located that it would be difficult to exclude them from the purchase area. Only one is of any appreciable value.

2. Water Impoundments, Diversion, Control Structures and Supply

The dam across the Androscoggin River, within the proposed area, controls water levels throughout the greater part of the area described herein. It is operated by the Union Water Power Company as agent for a group of downstream water users. Within the streams within the acquisition area, primary use of the water is by the Brown Paper Company to transport pulpwood to its mills at Berlin. The storage facilities of Umbagog Lake also serve to provide water with which to sustain minimum flows downstream. Fluctuation of water levels during
II. D. 2. (Cont'd)

summer months is reported to be little more than one foot as a result of pulpwood sluicing. Water above Berlin is of good quality.

3. Roads and Trails

Primary access to most of the area is by water. State Route 16, along the western edge, and a road which crosses the outlet to Sturdevant Pond, provide limited access to portions of the region. A private road (trail) enters from Upton, Maine into the Tidswell Point Area.

4. Fences

No fences of any value or use were encountered.

5. Utilities

Power and telephone services are available along highways. Heat is by fuel oil, bottled gas, or wood. Water must be provided by dug or drilled wells. Interior camps use gas light, gas heat, and some little 3KW generators to operate a well or lights.
III. BIOLOGICAL CHARACTERISTICS

A. Water and Marsh Area

There are three major marsh areas totaling nearly 600 acres and swamp makes up another 3,000 acres bordering Umbagog Lake northeast of Leonard Pond, Sweat Meadows and a marsh across the stream from the latter, known locally as Harper Meadows. These marshes are characterized by dense mats of spikerush. Spikerush is also extremely abundant elsewhere throughout the project area. In the marshes, limited growths of sedge, arrowhead, and three-way sedge occur through the more open meadow portions. Bordering the spikerush meadows in open water and in the more shallow portions of streams, ponds or oxbows, wild rice grows sparingly. It is of poor quality, indicating that the mineral soils in which it grows are relatively infertile. Wooded portions of the marshes are bog or wooded swamp. Wooded bogs are typical of many in the northeast; high proportions of sphagnum, together with such shrub species as sweet gale, Labrador-tea, alder, white rod, and mountain holly. Other areas are wooded swamp in which grow red maple, white cedar, larch, etc. Soils underlying the more open areas appeared to be relatively firm, but the bog areas were rather shaky.

The marshy coves, ponds, oxbows and, in spots, the Magalloway and Androscoggin Rivers, vary in their content of aquatic vegetation. Where the water is relatively shallow, there are good growths of pondweeds, scattered wild rice, and in spots three-way sedge, arrowhead, spikerush, etc. Most of the ponds have one or more outlets to the stream. For the most part, shorelines rise to relatively steep banks; hence, there is little opportunity for growths of emergent aquatic vegetation. The water of some of the longer ponds remains rather stained which further discourages the growth of aquatic vegetation.

The pH of the water of the more marshy spots in Sweat Meadows was about 4.5 when tested on September 24, 1971. Elsewhere, pH values of the river water were 6.0 to 6.2.

B. Upland Area

With few exceptions, upland areas (or non-marsh) are forested with mixtures of northern hardwoods or spruce-fir. Red maple, balsam fir, white pine, paper birch, white cedar, and silver maple are the most dominant tree species. There is little or no abandoned agricultural land within the area, except the abandoned Potter Farm area, consisting of about 80 acres of grass-reverting fields.
III. C. Land Use

As has been indicated, with few exceptions, the entire upland area within the suggested purchase units is forested. There was some cutting of hardwoods (birch) and fir within the area at the time of the field investigation. The small amount of agricultural land is either abandoned or in meadow or pasture.

D. Wildlife Utilization

1. Waterfowl

The chief value of the aquatic habitat of this area appears to be for waterfowl production, particularly black ducks and wood ducks. An intensive brood study was conducted during the summer of 1951 to determine possible waterfowl production on approximately 1,610 acres of wetland habitat and nine miles of streams. The results of the study were:

<table>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>Number</th>
<th>Est.</th>
<th>Estimated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Broods</td>
<td>Young</td>
<td>No.</td>
<td>Total</td>
</tr>
<tr>
<td>Goldeneye</td>
<td>16</td>
<td>66</td>
<td>78</td>
<td>116</td>
</tr>
<tr>
<td>Ring-neck</td>
<td>2</td>
<td>12</td>
<td>17</td>
<td>23</td>
</tr>
<tr>
<td>Black duck</td>
<td>12</td>
<td>58</td>
<td>77</td>
<td>111</td>
</tr>
<tr>
<td>Wood duck</td>
<td>12</td>
<td>101</td>
<td>144</td>
<td>180</td>
</tr>
<tr>
<td>Hooded merganser</td>
<td>11</td>
<td>65</td>
<td>76</td>
<td>102</td>
</tr>
<tr>
<td>American merganser</td>
<td>11</td>
<td>80</td>
<td>89</td>
<td>115</td>
</tr>
<tr>
<td>Total</td>
<td>64</td>
<td>382</td>
<td>481</td>
<td>647</td>
</tr>
</tbody>
</table>

In assessing the value of the area for waterfowl production, it is important to keep in mind that much of the area classed as wooded swamp is of value to black ducks, wood ducks, and hooded mergansers.

The area is reported to be an important concentration point for migrating waterfowl. The number of ducks seen during extensive exploration, September 22-24, 1971, totaled about 150, but this was prior to migration build-up and well past brood season. Brood counts in the early 1950's indicate good populations considering the dense vegetation and difficulty of locating broods. Sampling and census of 1,610 acres of wetlands has resulted in an average annual production estimate of 0.3 ducks per acre in the wetland habitats.
III. D. 1. (Cont'd.)

The Branch of Management and Enforcement operated a banding station in this area for the five-year period 1957-1961, during which an average of slightly over 300 birds were banded annually, of which 75 percent were black ducks.

2. Other Water Birds

The area is one of the most important breeding areas for the declining common loon in the Northeast and most important in New Hampshire. A number of American mergansers nest on the area. The great blue heron is fairly common. Shorebirds migrate through the area. The common snipe nests in the area.

3. Upland Game Birds

The ruffed grouse is the most important upland game bird in the region. Woodcock are common in summer and during migration. No census figures are available.

4. Upland Big Game

The white-tail deer is the game species around which a considerable segment of the economy revolves. Deer signs were relatively abundant along the river bottomlands. There are a few black bear and moose sign was abundant in September 1971.

5. Fur Animals

Although no census data are available, a moderate muskrat population occurs over the area. There were some fresh signs of beaver. Other fur species known to occur include mink, raccoon, fisher, skunk, and weasel.

6. Upland Game Animals (Other than big game)

The snowshoe hare is relatively common in the dry swamp and hillside areas with heavy underbrush.

7. Problem Species

Raccoons and mink represent the major predators on waterfowl nests. Pickerel take some ducklings. Raccoons were particularly troublesome during banding operations.
III. D. 8. Fish and Shellfish

Umbagog Lake, contiguous to this area, contains a marginal population of trout and landlocked salmon. Also present in the lake and rivers are pickerel and horned pout.

9. Endangered Species Values

The study area contains six active osprey nests, and one recently inactive bald eagle nest in good condition (see photos 4 and 10). The area is one of the most important common loon nesting areas in the Northeast, and annual production of this scarce and declining species is estimated at 30 birds in Lake Umbagog.

If this area is not acquired, expected drastic mining, encroachment by summer camps, and indiscriminate logging and pulp-cutting will eventually destroy Lake Umbagog's value to the scarce and declining eagle, osprey, and common loon, and to all indigenous wildlife in general. Osprey nest in the area in the spring and summer, and fish in its waters. Bald eagles are frequent visitors, and with protection can be reasonably expected to resume nesting in the area. Common loons nesting and caring for their young in these silent, northern waters provide a wilderness thrill difficult to recapture in this present age.
IV. RECREATIONAL USE

A. Hunting Use

Only limited information is available on the extent of hunting within the area. It is reported that an average early-season waterfowl hunting pressure on Harper and Sweat Meadows includes eight to ten hunting parties. One permanent blind was seen on the former area. Remnants of other blinds were noted at other spots along the Magalloway River. Deer hunting is far more popular with both residents and non-residents. The deer kill for the township of Errol averages slightly over two per square mile. Hunting for ruffed grouse is quite common. It is doubtful if there are many woodcock hunters in this section of New Hampshire. Hunting pressure is not likely to show a marked increase.

B. Fishing Use

Fishing pressure is moderate in various parts of the area.

C. Boating Use

Considering the lateness of the season, there were surprising numbers of boats tied to moorings, stored in sheds, etc., along portions of the Magalloway and Androscoggin Rivers, both upstream and downstream from the acquisition area. Both streams provide access to Umbagog Lake. This lake is also accessible along State Route 26 between Errol, New Hampshire, and Upton, Maine. Boat use within the proposed acquisition area is considered to be moderately heavy.

D. Other Uses

Swimming appears to be relatively unimportant. No beaches were seen in the area studied. Umbagog Lake is undoubtedly the locale for many recreationists. There is some camping along its shores.
V. ACQUISITION AND DEVELOPMENT POTENTIALS

A. Role in Flyway Management (See Map 7)

There are no state-owned management areas near Lake Umbagog in either New Hampshire or Maine. Maine-owned Brownfield Game Management Area is roughly 55 miles south of Lake Umbagog. Many of the waterfowl migrating to or from the proposed area would pass through the Kezar Pond marshes. Merrymeeting Bay is at the mouth of the Androscoggin River approximately 80 miles southeast. The following are approximate distances to three national wildlife refuges:

- Missisquoi - 98 miles west
- Moosehorn - 180 miles east-northeast
- Parker River - 130 miles south

Lake Megantic in the Province of Quebec, a concentration area for fall migrants, is approximately 45 miles north of Lake Umbagog.

As previously indicated, the Umbagog Lake area has moderate values for nesting, migration, and hunting. It would undoubtedly be more attractive to waterfowl if there were opportunities for growing better waterfowl food, but these possibilities are exceedingly limited. This area, if acquired, would best serve as a production area. Waterfowl production would contribute to the population of the Atlantic Flyway. Migration values are, however, of considerable significance due to the location of the area along an inland travel route in which there is a paucity of good waterfowl habitat. By managing it as a production area, hunting could be permitted, which is important due to the scarcity of other suitable waterfowl hunting spots in this part of New Hampshire and the increasing loss to private acquisition, cutting up, and posting.

B. Attitude and Recommendations of State Conservation Department

The New Hampshire Fish and Game Department and the Maine Department of Inland Fisheries and Game are both favorably disposed to purchase of the Umbagog project as a production area, or as a national wildlife refuge to assure its continued protection.

C. Plans of County and Town Planning Boards

None.
V. PLANS FOR FLOOD ABATEMENT

None that are currently active.

The U.S. Corps of Engineers has reviewed all possible impoundment sites in the Androscoggin drainage. Development of additional storage at Umbagog Lake has been contemplated. Included in the original inventory plan was a high-level dam below the present Errol structure, which would add 28 feet to the water level in the proposed acquisition area. This level, at a crest elevation of 1,275 feet, would flood out all of the area's 1,600 acres of waterfowl habitat. An alternate suggestion for the Androscoggin basin is for a low dam at Errol at elevation 1,250 and a high structure downstream at the Pontook Reservoir. Holding water levels at 1,250 feet would probably greatly improve the present habitat; hence, the alternate proposal would enhance waterfowl values.
VI. PROPOSED DEVELOPMENT AND MANAGEMENT PLANS

A. Water Management

Both the Magalloway and Androscoggin Rivers are used to float pulpwood to mills of the Brown Paper Company at Berlin, New Hampshire. The channel of the Magalloway River is comparatively deep and well defined, yet the water level of the offstream water units are common to those of the river. Due to the many openings between the pools and the river, there appear to be few, if any, possibilities for establishing stabilized water levels independent of those in the main stream. The main dam appears to be the key water control structure.

B. Marsh Management

Due to the apparent limitations on water management, management possibilities within the marshes are meager. Some pothole blasting of the spikerush marshes bordering Umbagog Lake and Leonard Pond could open up portions of the area and make them more attractive to waterfowl. If funds permitted cross-diking, then a "rice-paddy" series of low marshes would create an outstanding habitat for waterfowl.

C. Land Management

The acreage of upland within the suggested acquisition area has been selected to benefit osprey and bald eagle nesting and feeding areas. Timber management, primarily for pulpwood, is most feasible. Selective logging could be accomplished well away from potential nesting sites.

D. Physical Plant Management

There is no immediate need for additional buildings or roads. Fences should be erected where the area boundary adjoins private land, and the boundary be posted. At least two recognition signs should be erected along State Route 16.

E. Recreational Management

The importance of the waterways for boating and as access to Umbagog Lake should be recognized. It would appear best to permit a continuation of present recreational pursuits, including hunting, fishing, boating, trapping, etc. Use for water skiing, snowmobiles, and trail bikes would be discouraged.
VI. F. Personnel Management

No permanent personnel will be needed. Periodic inspection and wildlife data would be secured by personnel of the nearest national wildlife refuge, and occasional patrol could be done by personnel of the Branch of Management and Enforcement. Temporary labor could be hired as needed.
VII. RECOMMENDATIONS FOR ACQUISITION

A. Summary

1. The Umbagog area comprises a variety of marshes, sloughs, oxbows, backwaters and stream habitat in the townships of Errol, New Hampshire, and Magalloway, Maine.

2. Water levels of most of the waterfowl habitat of the area are controlled by a dam across the Androscoggin River near Errol, New Hampshire.

3. The various wetland areas have significant values for waterfowl production and for feeding and nesting during migration. The area is along an inland migration route.

4. There are few other areas that provide opportunities for waterfowl hunting in the region.

5. The area is of outstanding value to nesting common loon and osprey, and contains high quality bald eagle habitat.

6. There is heavy boating use of the Magalloway and Androscoggin Rivers as access to Umbagog Lake from camps on the Androscoggin and Magalloway Rivers.

7. Wetland habitat of the entire region is threatened with destruction, due to possible mining, flooding, or development.

8. A new water level at elevation 1,275 feet would destroy 1,600 acres of wetland habitat, mostly within the proposed area, and would create approximately 200 acres of new shallow water area, but not in the acquisition area.

9. The area sustains a moderate waterfowl hunting pressure as one of the few available to gunners in the region.

10. If the proposed 15,600 acres were acquired, destruction of this habitat through inundation, encroachment, mining, or pulping would be precluded.

11. The wild, boreal habitat types of this area, its natural beauty, plus its value to the scarce common loon, osprey and bald eagle, make it a highly desirable addition to the National Wildlife Refuge System.

12. It appears feasible and highly desirable to acquire 15,600 acres in the towns of Errol, New Hampshire, and Magalloway, Maine, locally known as Lake Umbagog, and to be called the Umbagog National Wildlife Refuge.
VII. B. Recommendations

It is recommended that, based on its biological potential, the 15,600 acres described in this report be accepted by the Divisions of Realty and Engineering for further study.

Prepared by:

[Signature]
William L. French, Regional Biologist
March 2, 1972
Date

Reviewed by:

[Signature]
Howard D. Woon
Regional Supervisor, Div. of Refuges
March 3, 1972
Date

Approved for further study:

[Signature]
Richard E. Griffith
Regional Director
3-21-72
Date