



U.S. Fish & Wildlife Service

Lake Umbagog National Wildlife Refuge

*Draft Comprehensive Conservation Plan
and Environmental Impact Statement*

Summary

June 2007





This goose, designed by J.N. "Ding" Darling, has become the symbol of the National Wildlife Refuge System.

The *U.S. Fish and Wildlife Service* is the principal Federal agency responsible for conserving, protecting, and enhancing fish, wildlife, plants, and their habitats for the continuing benefit of the American people. The Service manages the 95-million acre National Wildlife Refuge System comprised of more than 545 national wildlife refuges and thousands of waterfowl production areas. It also operates 65 national fish hatcheries and 78 ecological services field stations. The agency enforces Federal wildlife laws, manages migratory bird populations, restores nationally significant fisheries, conserves and restores wildlife habitat such as wetlands, administers the Endangered Species Act, and helps foreign governments with their conservation efforts. It also oversees the Federal Assistance Program which distributes hundreds of millions of dollars in excise taxes on fishing and hunting equipment to state wildlife agencies.

Comprehensive Conservation Plans provide long term guidance for management decisions and set forth goals, objectives, and strategies needed to accomplish refuge purposes and identify the Service's best estimate of future needs. These plans detail program planning levels that are sometimes substantially above current budget allocations and, as such, are primarily for Service strategic planning and program prioritization purposes. The plans do not constitute a commitment for staffing increases, operational and maintenance increases, or funding for future land acquisition.

Lake Umbagog National Wildlife Refuge

Draft Comprehensive Conservation Plan and Environmental Impact Statement

Abstract

Type of action:

Administrative

Lead agency:

U.S. Department of the Interior, Fish and Wildlife Service

Responsible official:

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The “Draft Comprehensive Conservation Plan and Environmental Impact Statement for the Lake Umbagog National Wildlife Refuge” fully compares three management alternatives. Its 14 appendixes provide additional information supporting our analysis.

**Alternative A.—
Current Management:**

This “no action” alternative, required by regulations under the National Environmental Policy Act of 1969, would simply extend the way we now manage the refuge over the next 15 years. It also provides a baseline for comparing the two “action” alternatives. We would continue to protect the refuge from external threats, monitor its key resources, and conduct baseline inventories to improve our knowledge of its ecosystem. We would continue our public use programs for wildlife observation, hunting and fishing, allow snowmobiling and camping at their present capacities in designated areas, and offer limited environmental education and interpretation. We would continue to acquire from willing sellers 6,392 acres within the approved refuge boundary, adding to its current 20,513 acres.

**Alternative B.—
Focal Species Habitat
Management (Service-
preferred):**

We recommend this alternative for approval. Its highest priority is to protect the biological integrity, diversity, and environmental health of Umbagog Lake and its associated rivers and tributaries. Its second priority is to conserve the upland mixed forest and associated species. Management will focus on enhancing habitats for selected refuge focal species: species of regional conservation concern whose habitat needs generally represent the needs of many other federal trust resources. Alternative B would also improve the quality of our wildlife-dependent recreation programs, and strengthen our partnerships with state and local entities offering similar programs in the area. Another partnership would focus on developing a Land Management Research Demonstration (LMRD) program for applying the best available science in management decisions that affect wildlife resources in the Northern Forest. This alternative includes expanding the refuge as part of a network of conservation lands by acquiring 49,718 acres from willing sellers: 65 percent in fee simple and 35 percent in easements. Those habitats are important for conserving refuge focal species and other federal trust resources. Alternative B also proposes a new refuge headquarters and visitor contact facility. Refuge staffing and budgets would increase commensurately.

**Alternative C.—
Natural Landscape
Composition, Patterns,
and Processes
Management:**

This alternative focuses not so much on benefiting selected species, but rather, on passively or actively manipulating vegetation to create or hasten the development of natural communities, landscape patterns and processes. Similar to alternative B, it improves wildlife-dependent recreation, strengthens our partnerships, develops the LMRD program, and adds a new headquarters and visitor contact facility. It expands the refuge by 76,304 acres, which we will purchase in fee simple from willing sellers. Our target is to create contiguous blocks of hydrologically connected conservation habitat greater than 25,000 acres: the size we estimate as the minimum necessary to facilitate the natural progression of ecological processes in the Northern Forest conservation network.

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Introduction

As part of its congressional mandate, the U.S. Fish and Wildlife Service conserves habitat and protects fish, wildlife and plants on the more than 545 refuges in the National Wildlife Refuge System (Refuge System), in cooperation with the American public, States, and our other partners in conservation. On the public lands in that System, “Wildlife Comes First.”

The Lake Umbagog National Wildlife Refuge comprises 20,513 acres in Coos County, New Hampshire, and Oxford County, Maine. It protects the wetlands, habitats and species noted for their importance in the Upper Androscoggin River watershed.

We prepared the draft Comprehensive Conservation Plan and Environmental Impact Statement (draft CCP/EIS) to describe three alternatives for managing the refuge for the next 15 years. Each alternative proposes varying strategies to achieve important objectives in managing habitat, species, and public use. Two alternatives also propose to expand the boundary of the refuge by a number of acres determined in part by the environmental impacts of implementing those strategies and achieving those objectives. This document summarizes that draft CCP/EIS.

Proposed Action

We propose to implement a CCP for the refuge that best achieves its vision and goals, best addresses its significant management issues, best conforms to its conservation mandates, best applies sound science in managing fish and wildlife, and best contributes to the mission of the System.

We examined a wide range of alternatives for managing the refuge. From among them, we fully developed three. We then selected as our preferred alternative the one that, in our professional judgment, would best accomplish all of the actions above.

Alternative B.—Focal Species Habitat Management: This Service-preferred alternative manages refuge habitats for selected focal species, improves existing opportunities for compatible, wildlife-dependent recreation, and proposes a refuge expansion of 49,718 acres acquired from willing sellers as part of a regional conservation lands network.

Purpose and Need for Action

Our purpose in developing a CCP by fully involving others is crucial for our future success. It allows interested individuals, organizations, and elected officials to engage in resolving management issues and public concerns. The CCP explains the reasons for our management actions, and clearly links them to desired future conditions for refuge habitat, wildlife, visitor services, staffing, and facilities. It ensures that our refuge management conforms to the mandates of the System, and that wildlife-dependent recreational uses are compatible with the purposes for which the refuge was established. Finally, it provides long-term direction and continuity in developing refuge program priorities and annual budgets.

Our need to develop a CCP for the refuge is manifold. The National Wildlife Refuge System Improvement Act of 1997 requires us to write CCPs for all national wildlife refuges by 2012 to help fulfill the mission of the Refuge System. This refuge lacks a master plan to accomplish the actions above; yet, the economy and land ownership patterns in local communities have changed; pressures for public access have continued to grow; and new ecosystem and species conservation plans bearing directly on refuge management have developed. In response, we need to evaluate locations for a proposed new refuge headquarters and visitor contact facility. We have developed strong partnerships vital for our continued success, and we must convey to them our vision for the refuge. Finally, we need a CCP to guide us in future land conservation designed to sustain federal trust species and wetlands in the Northern Forest. Refuge lands are

Brief History and Purposes for Establishing the Refuge

part of a much larger land conservation partnership network. Map 1 depicts the refuge in relationship to other conserved land in the Upper Androscoggin River Watershed.

Congress authorized the establishment of the refuge in 1992 for the purposes of conserving the unique diversity of wetlands habitats and associated wildlife and protecting water quality in the area. The current, approved acquisition boundary for the refuge encompasses 26,905 acres. The Service has acquired 20,513 acres, leaving 6,392 acres still to be acquired as funding and landowner interest permit. The refuge has acquired most of its land in the last 5 years. Map 2 depicts the current refuge boundary.

The refuge was established for the following purposes, under the following authorities:

“the conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions....”
[Emergency Wetlands Resources Act of 1986; 16 U.S.C. 3901(b)];

“for use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” [Migratory Bird Conservation Act; 16 U.S.C. 715d];

“for the development, advancement, management, conservation, and protection of fish and wildlife resources....” [Fish and Wildlife Act of 1956; 16 U.S.C. 742f(a)(4)]; and

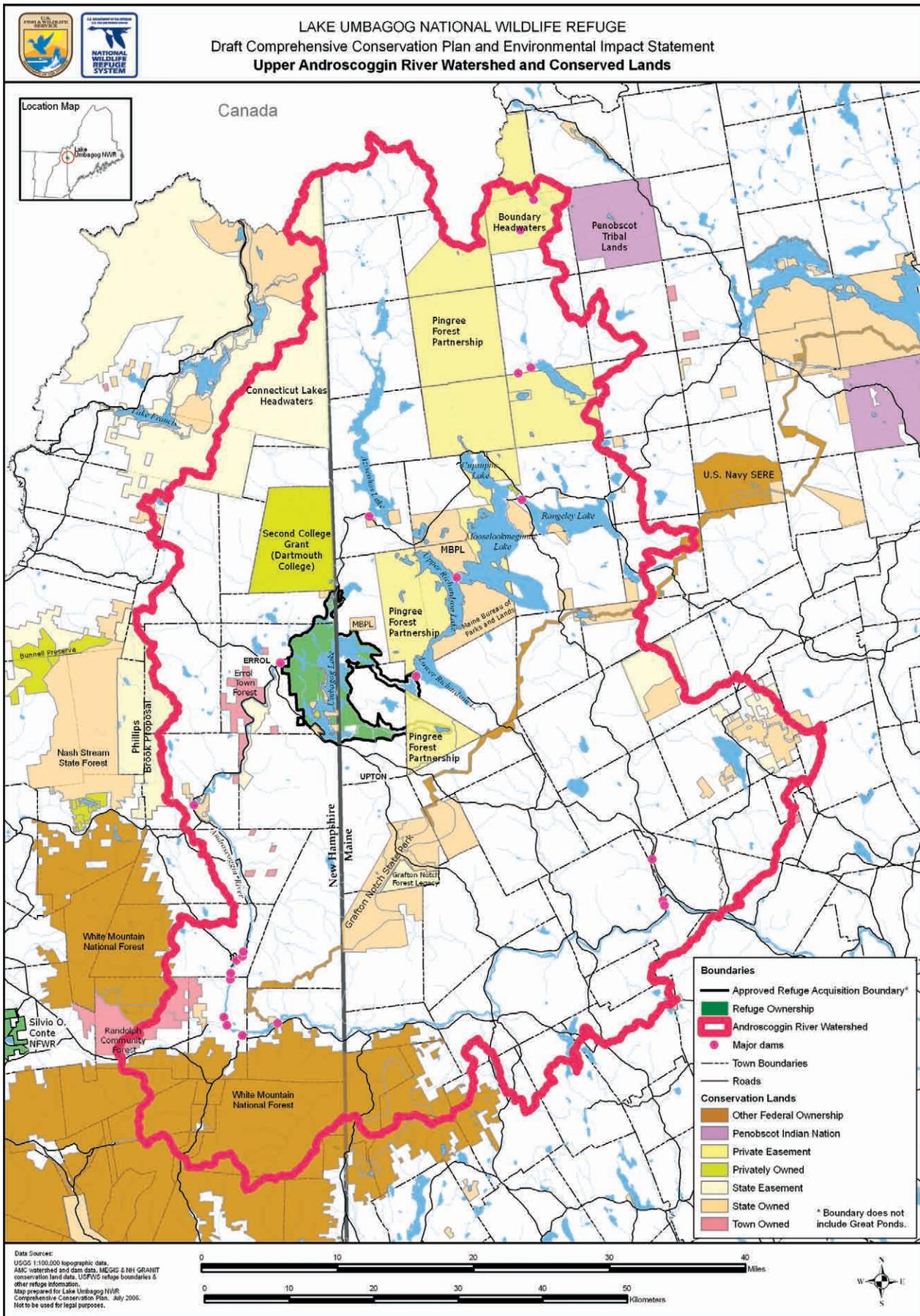
“for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude....” [16 U.S.C. 742f(b)(1)]

In the draft CCP/EIS, appendix A, “Land Protection Plan,” describes the lands we have acquired, and the lands we propose to acquire in expanding the refuge under the Service-preferred alternative.

Refuge Setting and its Resources

The towns of Errol, New Hampshire (pop. 298) and Upton, Maine (pop. 62) are the communities closest to the refuge. Historically they have had strong ties to forest-dependent industries: namely, lumber and paper. The recreation industry, based on activities such as snowmobiling and motor boating, is becoming increasingly important economically. The current refuge staff of five is headquartered in Errol. One of the refuge manager’s priorities has been to develop a positive relationship with these and other towns in the two-county area.

Geographically, the refuge lies in the Upper Androscoggin River watershed, a broad valley nearly surrounded by mountains above 3,000 feet. Refuge habitats are very diverse: approximately 50 percent of its 20,513 acres consists of wetlands, open water or floodplain; 50 percent is upland forest. They include several rare, unique wetland plant communities: namely, bog and peat lands, including the 850-acre Floating Island National Natural Landmark. The upland forest primarily consists of a mix of three habitat types: spruce-fir, mixed woods, and northern hardwoods. That diverse habitat supports a wide assemblage of wildlife native to the Northern Forest ecosystem. Federal-listed bald eagles nest on the refuge, as do 11 state-listed birds, including the highly visible osprey, common loon, and several species of waterfowl. Three state-listed mammals also live on the refuge. Map 3 depicts current habitats and their distribution on the refuge.

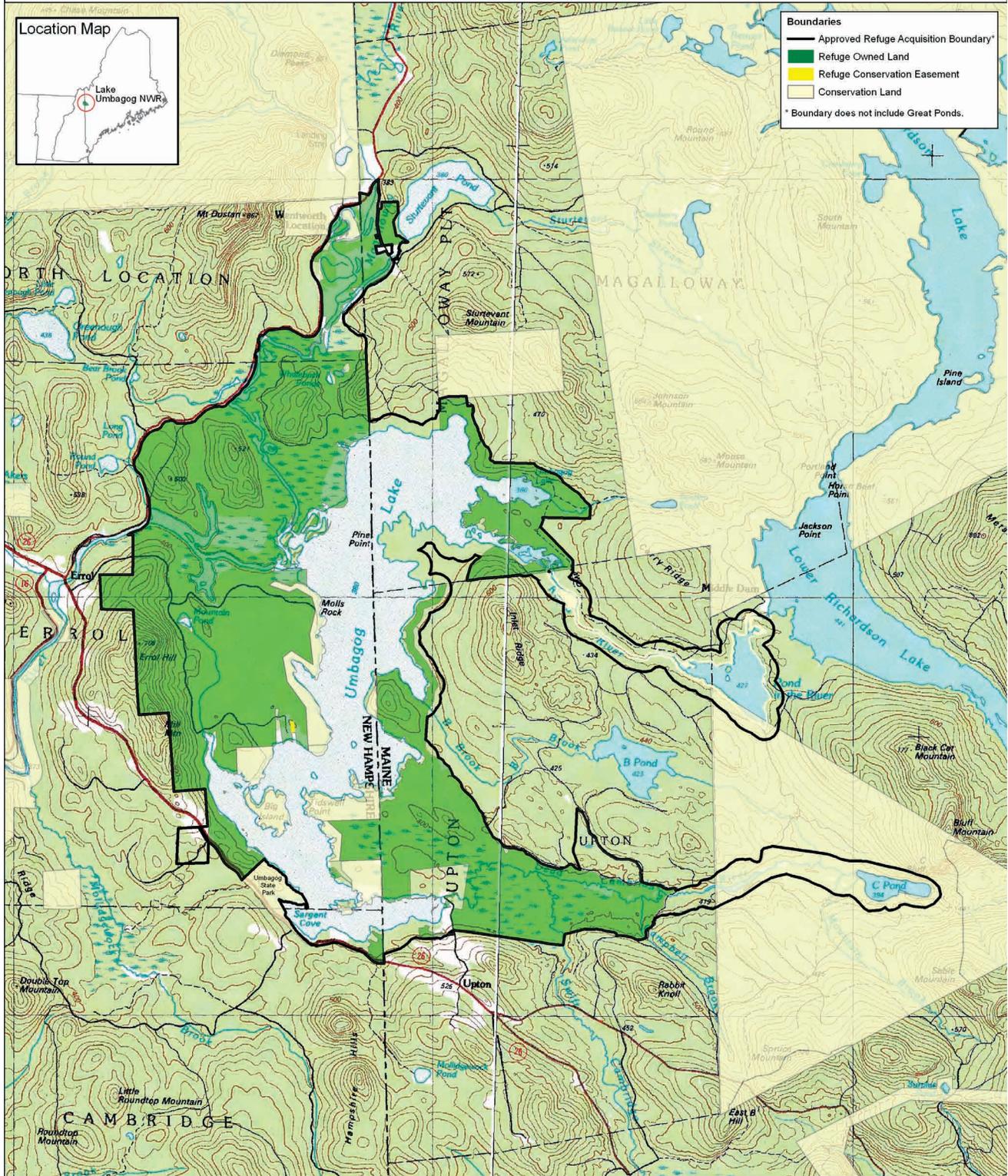




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Current Refuge Ownership Status

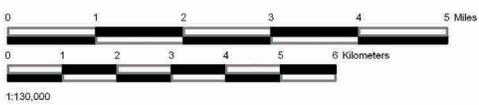


Boundaries

- Approved Refuge Acquisition Boundary*
- Refuge Owned Land
- Refuge Conservation Easement
- Conservation Land

* Boundary does not include Great Ponds.

Data Sources:
 USGS 1:100,000 topographic data.
 MEGIS & NH GRANIT conservation land data.
 USFWS refuge boundaries & other refuge information.
 Map prepared for Lake Umbagog NWR
 Comprehensive Conservation Plan. July 2006.
 Not to be used for legal purposes.

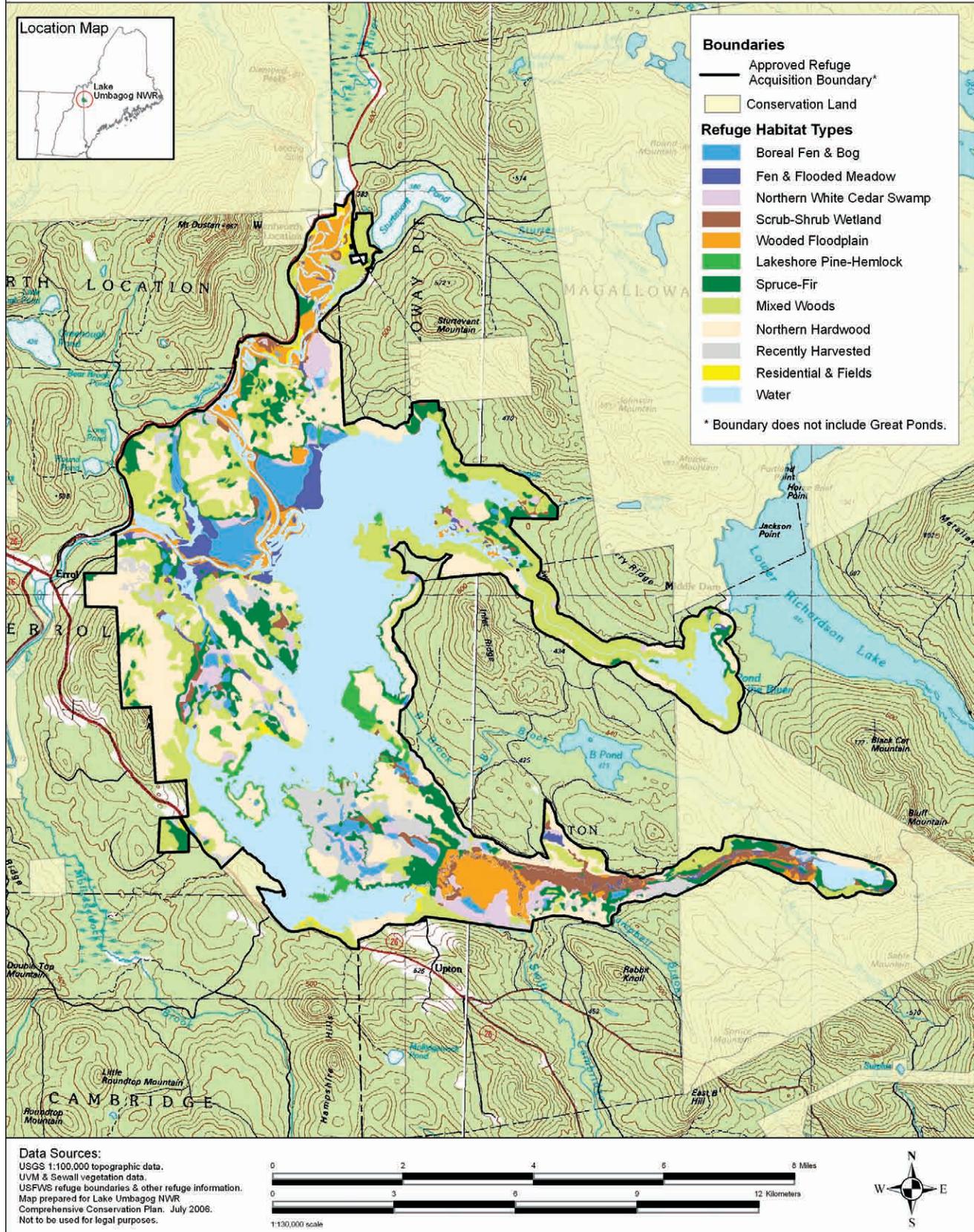




LAKE UMBAGOG NATIONAL WILDLIFE REFUGE

Draft Comprehensive Conservation Plan and Environmental Impact Statement

Existing Refuge Habitat Types



Refuge Complex Vision and Goals

The refuge is a very popular destination, especially for water recreation. It is now open for hunting, wildlife observation and photography, and environmental education and interpretation. We also allow snowmobiling and camping in designated locations. Chapter 3 of the draft CCP/EIS presents detailed descriptions of the refuge setting and its natural and cultural resources.

Vision

“We envision Umbagog National Wildlife Refuge as an essential link in the network of conservation lands in the Northern Forests. We will showcase science-based, adaptive management in a working forest landscape and provide an outstanding center for research. We will achieve this through strong partnerships with State agencies, conservation organizations, land managers, and neighboring communities.

“Our management will perpetuate the diversity and integrity of upland spruce-fir and northern hardwood forests, boreal and riverine wetlands, and lake habitats for the continued health of native fish and wildlife populations. These habitats will provide an important regional breeding area for migratory land birds, waterfowl, and other species of regional significance, such as the common loon and bald eagle.

“Visitors of all ages will feel welcome to enjoy the full complement of priority wildlife-dependent public uses. We will foster their knowledge of and support for conserving northern forest habitats through exceptional outreach and visitor programs. We want all our visitors to return home filled with enthusiasm for promoting and practicing resource stewardship in their own communities.

“We hope residents of neighboring communities in Maine and New Hampshire will value the refuge for enhancing their quality of life. Within the National Wildlife Refuge System, the refuge will be treasured for conserving Federal trust resources and providing inspirational outdoor experiences for present and future generations of Americans.”

Goals

These are intentionally broad statements of our purposes and the focus of our management actions. We have not ranked them in any sequence; however, the biological goals will take precedence in decisions about refuge management.

Goal 1: Manage open water and wetland habitats to benefit Federal trust species and other species of conservation concern.

Goal 2: Manage floodplain and lakeshore forests to benefit Federal trust species and other species of conservation concern.

Goal 3: Manage upland forest habitats, consistent with site capabilities, to benefit Federal trust species and other species of conservation concern.

Goal 4: Provide high quality wildlife-dependent activities such as hunting, fishing, wildlife observation and photography.

Goal 5: Develop high-quality interpretative opportunities, and facilitate environmental education, to promote an understanding and appreciation for the conservation of fish and wildlife and their habitats, as well as the role of the refuge in the Northern Forest.

Goal 6: Enhance the conservation and management of wildlife resources in the Northern Forest Region through partnerships with public and private conservation groups, private landowners, State and local entities.

Goal 7: Develop the refuge as an outstanding center for research and development of applied management practices to sustain and enhance the natural resources in the Northern Forest in concern with the Land Management and Research Demonstration Area program.

Alternatives Considered, Including the Service-Preferred Alternative

Relating Goals, Objectives, and Strategies

Refuge goals and objectives define each of the management alternatives identified below. Developing refuge goals was one of the first steps in our planning process. By design, they are less quantitative, and more prescriptive, in defining the targets of our management. All of the goals appear in each of the alternatives.

Objectives are essentially incremental steps toward achieving a goal; they also further define the management targets in measurable terms. They typically vary among the alternatives and provide the basis for determining more detailed strategies, monitoring refuge accomplishments, and evaluating our success.

Strategies are specific actions, tools, techniques, or a combination of those that we may use to achieve the objective. We will evaluate most of the strategies further as to how, when, and where refuge step-down plans should implement them.

Developing Alternatives, including the “No Action” Alternative

Simply put, alternatives are packages of complementary objectives and strategies designed to meet refuge purposes and goals, the Refuge System mission, while responding to the issues and opportunities identified during the planning process. We fully analyze in this draft CCP/EIS three alternatives which characterize different ways of managing the refuge over the next 15 years. We believe they represent a reasonable range of alternative proposals for managing the refuge.

Alternative A satisfies the National Environmental Policy Act (NEPA) requirement of a “no action” alternative, which we define as “continuing current management.” It describes our existing management priorities and activities, and serves as a baseline for comparing and contrasting alternatives B and C.

Alternative B, the Service-preferred alternative, combines the actions we believe would most efficiently and effectively achieve refuge purposes, vision and goals, and respond to public issues. It emphasizes management of specific refuge habitats to support focal species whose habitat needs benefit other species of conservation concern in the Northern Forest. In particular, we emphasize habitat for priority bird species of conservation concern identified for the Northern Forest Ecosystem Bird Conservation Region (BCR 14).

Alternative C emphasizes management to restore, where practicable, the distribution of natural communities in the Upper Androscoggin River watershed that would have resulted from natural processes without the influence or intervention of human settlement and management. While this alternative does not propose breaching the Errol Dam that expanded Umbagog Lake, it proposes actions to modify the flow and timing of water to mimic the annual natural historic high and low water events, within the requirement of the existing Federal Energy Regulatory Commission (FERC) license. In the uplands, it proposes actions to restore the structure and function of native vegetation that resulted from natural historic ice and windstorms.

Actions Common to All of the Alternatives

Although the alternatives differ in many ways, they also share some similarities. These are highlights of some of the actions common to all alternatives.

Developing Refuge Step-down Plans

- All alternatives include the same schedule for completing 11 refuge step-down plans. We will assign first priority to the Habitat Management Plan (HMP), which we will complete within 1 year of CCP approval.

Coordinating Umbagog Lake Water Level Management

- Continue to work cooperatively with the licensee of the Errol Project (currently Florida Power & Light Energy Hydro Maine, LLC (FPLE)). Specifically under Article 27 of the current license, we will continue to develop a yearly water level management plan with the licensee and other regulatory agencies “to benefit nesting wildlife”; pursue a Memorandum of Understanding (MOU) with the current licensee to formalize coordination within the current FERC boundary.

Controlling Invasive Plant Species

- Develop a list of invasive species of greatest concern on the refuge, identify priority areas with which to be vigilant, and establish monitoring and treatment strategies.
- Continue to work with state agencies to prevent introduction of invasive species to all water bodies on the refuge; increase enforcement to check boats and equipment to protect against invasive plant transport

Implementing and Prioritizing a Biological Monitoring and Inventory Program

- Initiate several priority studies during 2006–2007, including visitor use and impact; wildlife disturbance; ecological systems analysis to identify the ecological processes that historically and currently influence the lake; and, a baseline contaminants assessment.
- Continue to coordinate with state agencies in the monitoring of bald eagle, osprey, and loon nests, and to evaluate the effectiveness of our protection measures
- Work with the Lynx Recovery Team to determine whether a monitoring or inventory program on the refuge is warranted.
- Develop a priority list of monitoring and inventory needs for the 15-year planning cycle.

Protecting Vernal Pools and other Unique or Rare Communities

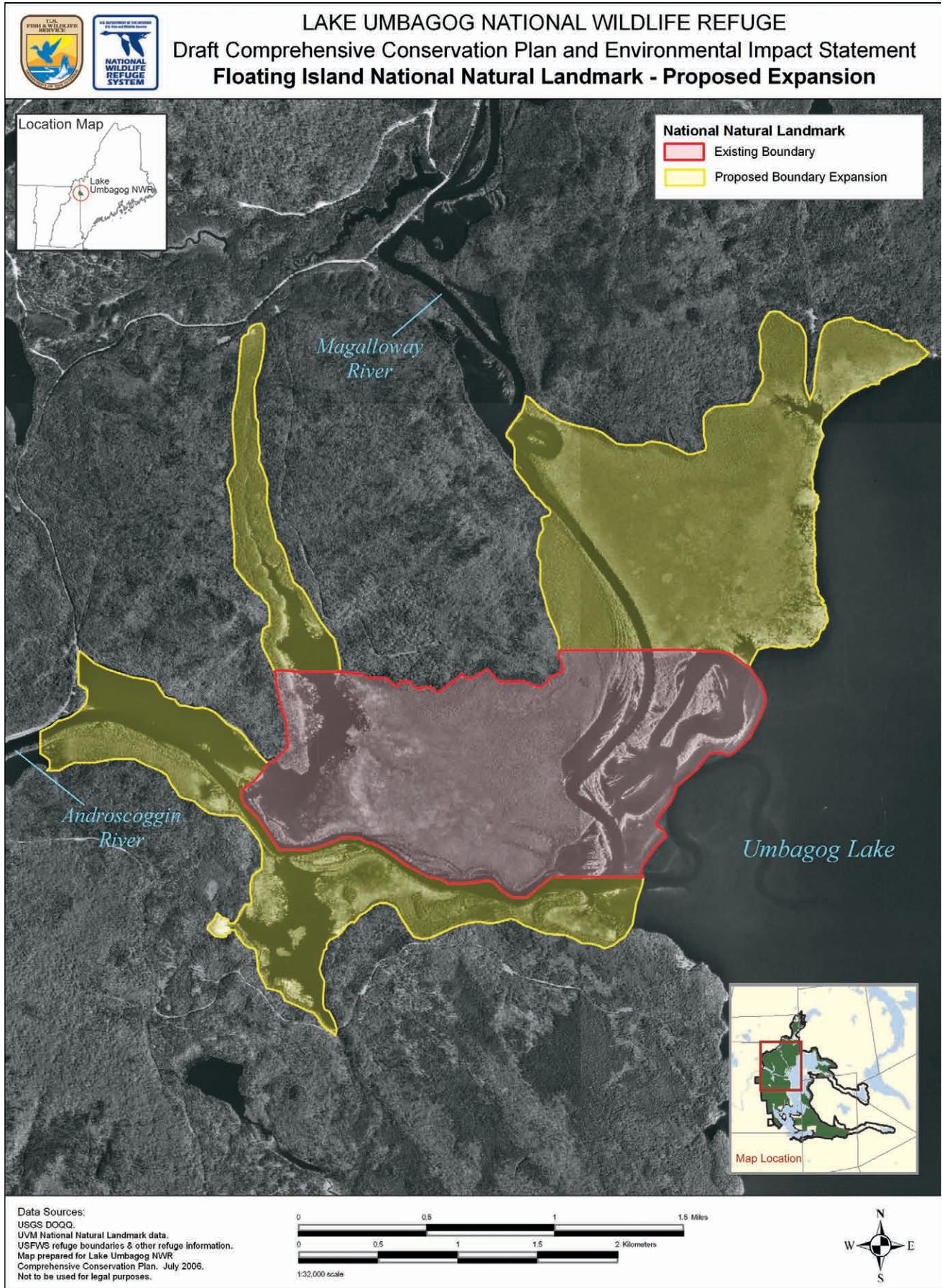
- Conserve and maintain all natural vernal pools, including those pools embedded in wetland or riparian habitats, on existing refuge lands and within the respective refuge expansion areas.
- Conserve and protect cliffs, talus slopes, and other unique, significant, or rare upland habitat types identified on these same lands.

Expanding and Protecting the Floating Island National Natural Landmark (FINNL)

- In cooperation with the National Park Service (NPS), expand the boundary of the FINNL to one that is more ecologically based using the 2002-2003 vegetation survey results (see map 4).
- Convene a workshop with wetlands ecologists to determine what information should be collected and what monitoring should occur to document any potential loss or degradation.

Creating an Umbagog Lake “Working Group”

- Create an Umbagog Lake Working Group, whose mission would be to voluntarily coordinate, facilitate, or streamline management affecting the lake as a partnership to reduce resource threats and resolve user conflicts on the lake and associated rivers.



Protecting Cultural Resources

- Ensure compliance with section 106 of the National Historic Preservation Act. Evaluate the potential for refuge projects to impact archeological and historical resources, and consult with respective State Historic Preservation Offices (SHPOs). Compliance may require any or all of the following: a State Historic Preservation Records survey, literature survey, or field survey.

Refuge Staffing and Administration

- Fill our currently approved but vacant positions we believe necessary to accomplish our highest priority projects. Alternatives B and C also propose additional staff to provide depth in our biological and visitor services programs.
- Establish a new headquarters and visitor contact facility at the Potter Farm site. Alternatives A and B propose a small office facility, defined by the new Service facility standards, while alternative C proposes a medium office facility.
- Maintain the present headquarters building as a research or auxiliary field office.
- Change the name of the refuge to “Umbagog National Wildlife Refuge,” to better represent the broader geographic context and management emphasis we would pursue under all alternatives.

Visitor Services

- Continue to allow priority public uses such as hunting, wildlife observation and photography, and environmental education and interpretation, and officially open the refuge to fishing.
- Continue to allow camping and snowmobiling in designated areas.
- Continue to conduct outreach and enforce against activities not allowed on the refuge including: sled dog mushing, mountain biking, horseback riding, ATV or ORV or motorbike use, competitions or organized events (e.g. fishing derbies, dog trials, or mountain bike, foot, cross-country ski, or boat races), and geocaching.

Actions Common to Alternatives B and C Only

Implementing Forest Management to Achieve Habitat Objectives

- Actively manage upland forested habitats, within site compatibility and natural potential, to achieve habitat and wildlife objectives.
- All commercial and non-commercial tree cutting would adhere to accepted silvicultural prescriptions, and the best management practices in each respective state at a minimum.
- Our management activities in the proposed expansion areas, within the 15 year life of this CCP, would be more pre-commercial operations in nature, such as thinning, habitat restoration (e.g. restoring log landings, slash piles, etc), and/or vegetation manipulations to create openings and enhance woodcock habitat in woodcock focus areas.

Implementing a Furbearer Management Program

- Within three years of CCP approval, develop a furbearer management plan. Establish furbearer management units as warranted and identify where habitat management or reintroductions, increases, or reductions of native furbearer species, such as beaver, is desirable.

Enhancing Visitor Programs

- Construct a series of interpretive trails at the Potter Farm site; at least one would be designed to allow travel by people with disabilities.
- Provide additional visitor facilities along major travel routes, including roadside pullouts on Routes 16, and a roadside pullout with overlook platform on Route 26. Each of these sites would have an information kiosk, and provide parking for several vehicles.
- Complete a ¼-mile loop extension to the Magalloway River trail accessible to people with disabilities.
- Within one year of CCP approval, initiate administrative process to open the refuge to two new seasons: turkey hunting on refuge lands in both states, and a bobcat hunt on refuge lands in Maine. A new Hunt Plan package, including associated NEPA document, Federal Register Notice, and public involvement would be required.

Expanding the Refuge Boundary

- Pursue a refuge expansion, through fee acquisition and/or conservation easements, to support habitat and species goals and objectives; size of expansion varies by alternative.

Alternative A – Current Management

This alternative portrays current, planned, or approved management activities, and is the baseline for comparing the other two alternatives. Our biological program would continue its present priorities, such as cooperating with partners in the monitoring of loon, bald eagle, and osprey populations on the lake; protecting loon, bald eagle, and osprey active nest sites from human disturbance on refuge lands; and, conducting annual bird and amphibian inventories according to regional protocols. We would continue those projects with the help of volunteers, our conservation partners, and our own staff as funding and staffing allow. We would continue to facilitate biological research studies, if they would benefit the Service and the refuge manager determines them compatible. Map 5 depicts the broad habitat types we predict would result after 100 years of implementing the management objectives in alternative A.

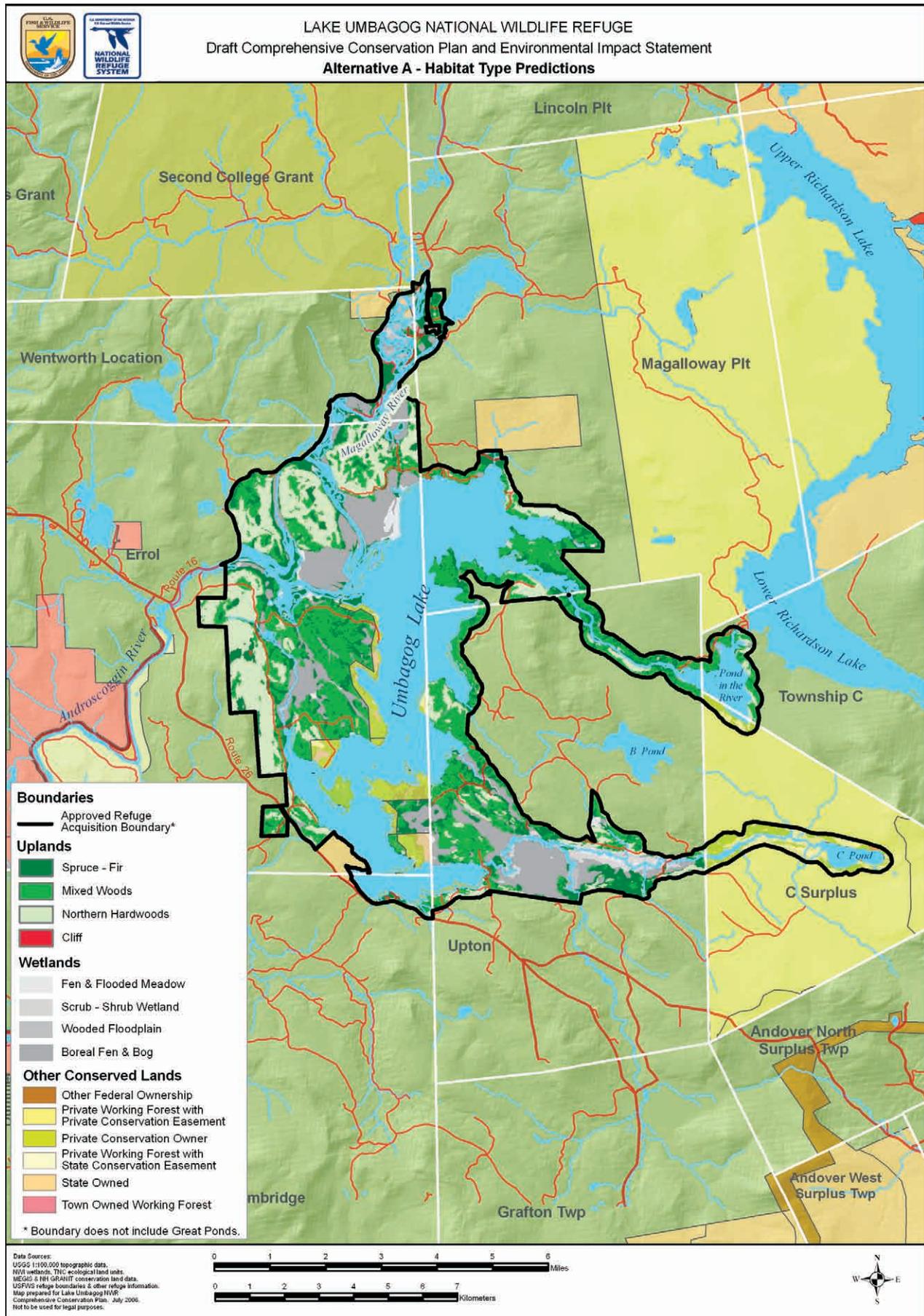
Canoeing on the Magalloway River

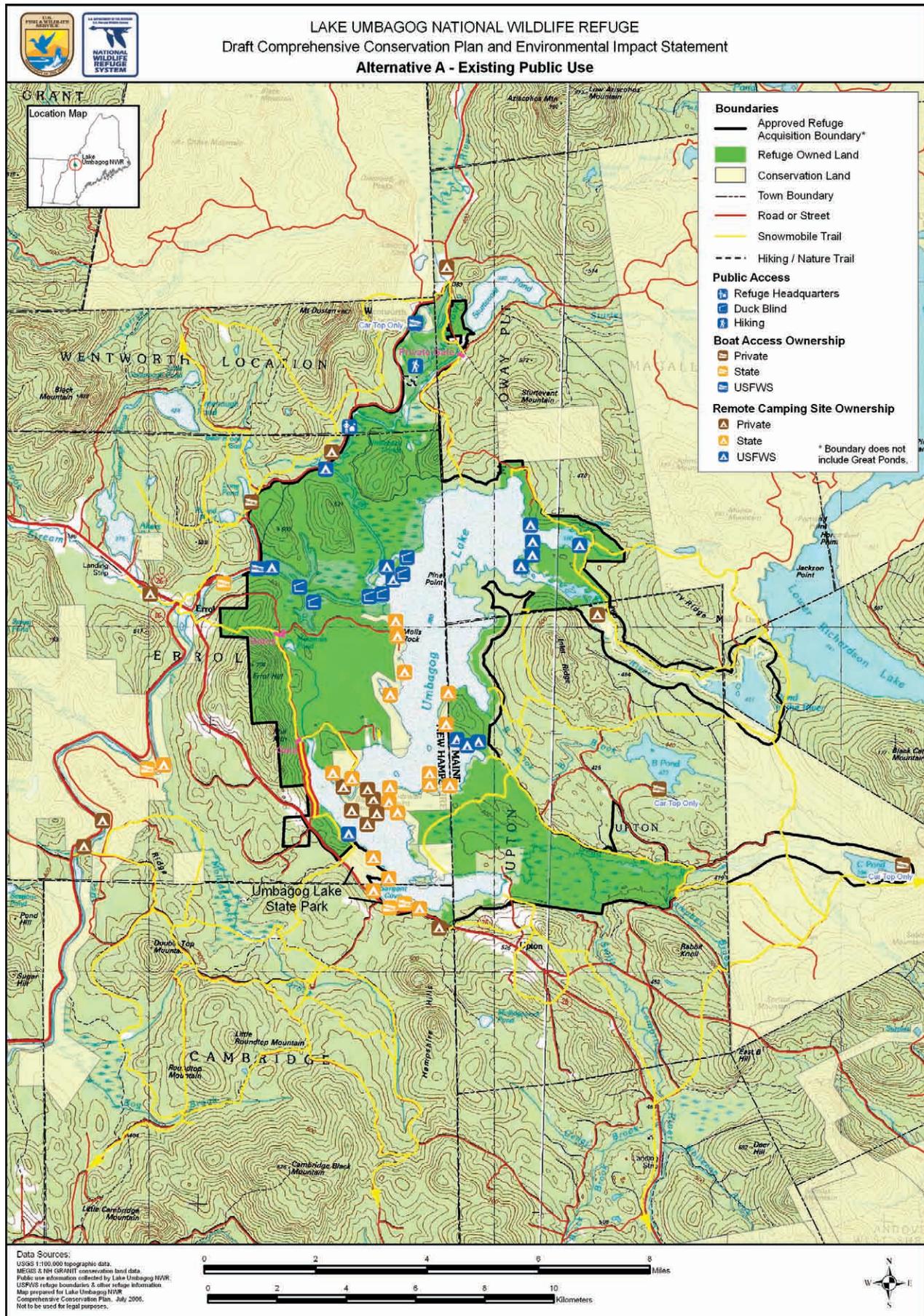


Tom Meredith/USFWS

As for visitor services, we would continue to offer hunting and fishing opportunities on refuge lands, and respond to requests for interpretive and school programs. However, we would not to be able to meet most requests because of limited staff and resources. We would also continue to partner with the State of New Hampshire to provide remote camping sites on Umbagog Lake. We would continue to allow snowmobiling confined to the designated trails. The Magalloway River Trail would continue to be the only walking trail maintained on the refuge. We would continue to coordinate two annual community events: the “Umbagog Wildlife Festival” and “Take Me Fishing.” Map 6 depicts the public use facilities under current management.

We would continue to seek acquisition from willing sellers of the 6,392 acres that remain in private ownership within our currently approved acquisition boundary.





Alternative B – Preferred Alternative: Management for Particular Habitats and Focal Species

Alternative B is the alternative our planning team favors for implementation. It includes an array of management actions that, in our professional judgment, work best toward achieving the refuge purposes, its vision and goals, and contribute to conserving federal trust resources of concern in the Northern Forest. This alternative would most effectively address the significant issues identified in chapter 1 of the draft CCP/EIS. We believe it is reasonable, feasible, and practicable within the 15-year period of the CCP.

We designed this alternative to emphasize the conservation of a mixed forest matrix landscape and its component habitat types: spruce-fir, mixed woods, and northern hardwoods. Our analysis of site capability and natural potential indicates that the refuge is in a unique position to make an important contribution to the mixed forest matrix in the watershed, as well as in the larger Northern Forest landscape, and within the Refuge System. The three habitat types we describe support a wide variety of federal trust resources: in particular, birds of conservation concern identified in the BCR 14 region and those that depend on wetlands. We identify focal species for each habitat type objective whose life requirements would guide management activities in that habitat type. We selected those focal species because, in our opinion, they are federal trust resources whose habitat needs broadly represent the habitat requirements for most of the other federal trust species and native wildlife dependent on that habitat type.

Appendix N in the draft CCP/EIS describes in detail our process for selecting focal species by habitat type. Our actions in alternative B for Goals 1–3 below identify the habitat type, acres conserved, and the focal species that would be a target of our management. The presentation in the draft CCP/EIS includes a rationale that identifies each focal species' particular habitat needs. We identify strategies as potential management actions for accomplishing the objectives and meeting those habitat needs. Map 8 depicts the broad habitat types we predict would result after approximately 100 years of implementing the management objectives in alternative B for upland habitats.

Similar to alternative A, and in keeping with the original purposes for which we established the refuge, the wetlands actions under goal 1 are our highest priority for implementation in the biological program. Protecting the biological integrity, diversity, and environmental health of Umbagog Lake and its associated rivers is paramount. As our second habitat management priority under alternative B, we propose implementing the actions under goal 3, which would promote and sustain a mixed forest matrix: that is, a mosaic of spruce-fir, mixed woods, and northern hardwood habitat types, with emphasis on promoting the conifer component. As our third habitat management priority, we propose to implement those actions that would improve American woodcock habitat.

In support of those priorities and our other habitat goals and objectives, alternative B proposes to expand the existing, approved refuge boundary by 49,718 acres, through a combination of Service acquisition in fee-simple (65 percent) and conservation easement (35 percent) (map 7). All of the lands we propose to acquire are undeveloped. They either are or have the potential to be high quality wildlife habitat. Their amount and distribution provides us management flexibility in achieving our habitat goals and objectives. Collectively, they would form a land base that affords vital links to other conserved lands in the Upper Androscoggin watershed and Northern Forest region. As we acquire lands in fee, we would manage them by the goals, objectives, and strategies under this alternative.



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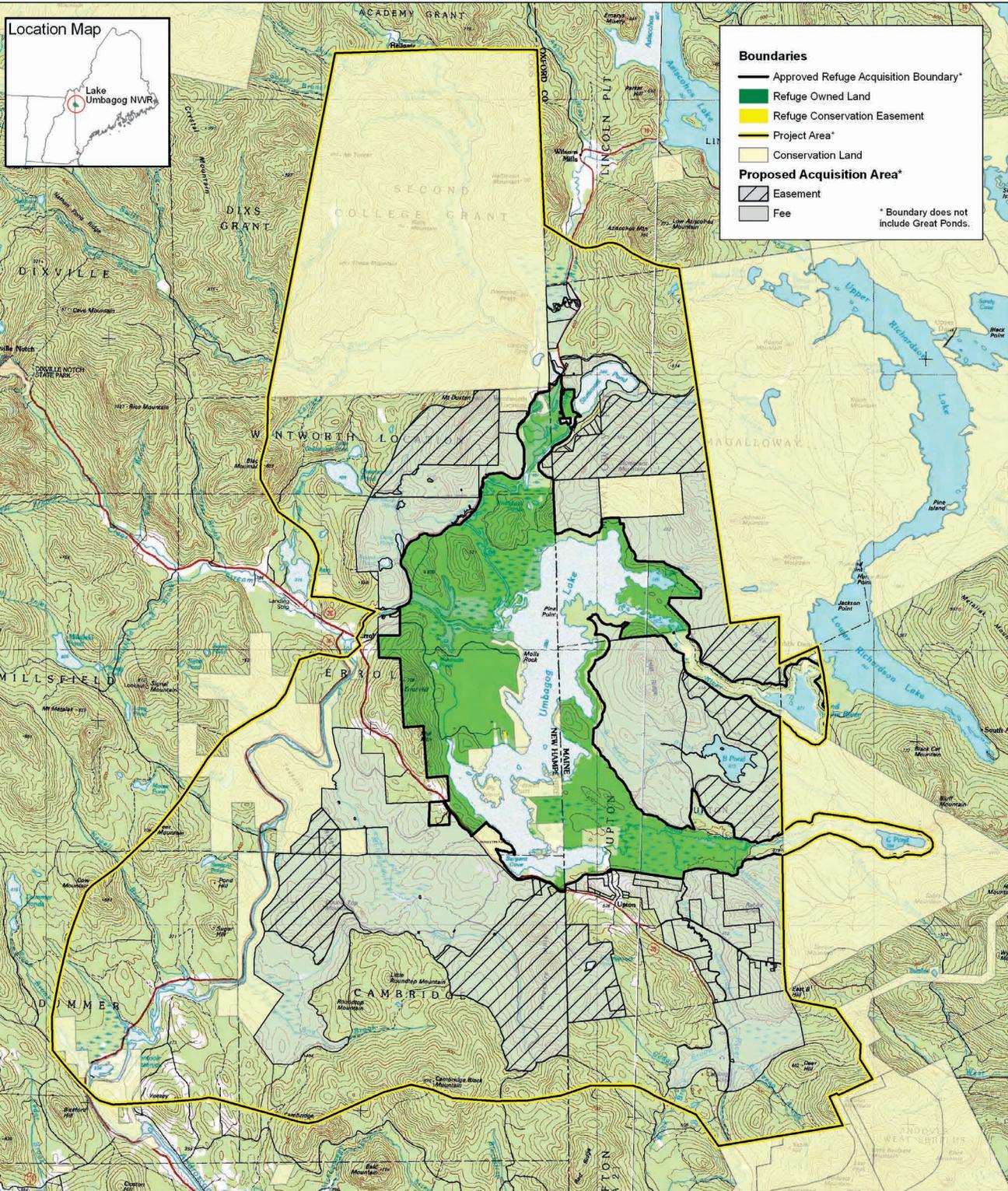
Harper's Meadow



LAKE UMBAGOG NATIONAL WILDLIFE REFUGE

Draft Comprehensive Conservation Plan and Environmental Impact Statement

Alternative B - Proposed Refuge Expansion



Boundaries

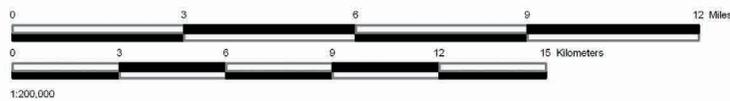
- Approved Refuge Acquisition Boundary*
- Refuge Owned Land
- Refuge Conservation Easement
- Project Area*
- Conservation Land

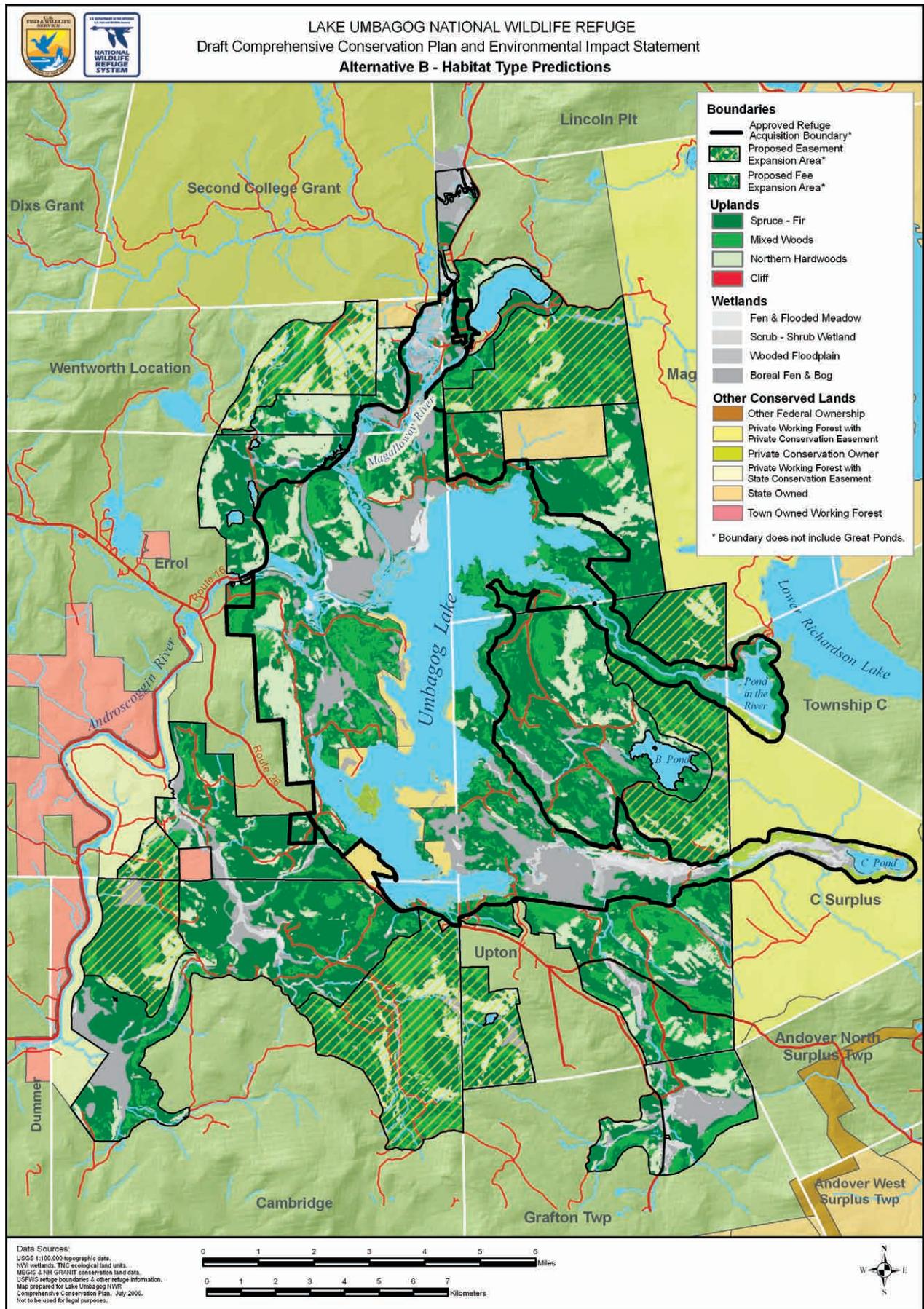
Proposed Acquisition Area*

- ▨ Easement
- ▨ Fee

* Boundary does not include Great Ponds.

Data Sources:
 USGS 1:100,000 topographic data.
 MEGIS & NH GRANIT conservation land data.
 USFWS refuge boundaries & other refuge information.
 Map prepared for Lake Umbagog NWR
 Comprehensive Conservation Plan, July 2006.
 Not to be used for legal purposes.





*Fishing on
Leonard Pond*

Ian Drew/USFWS



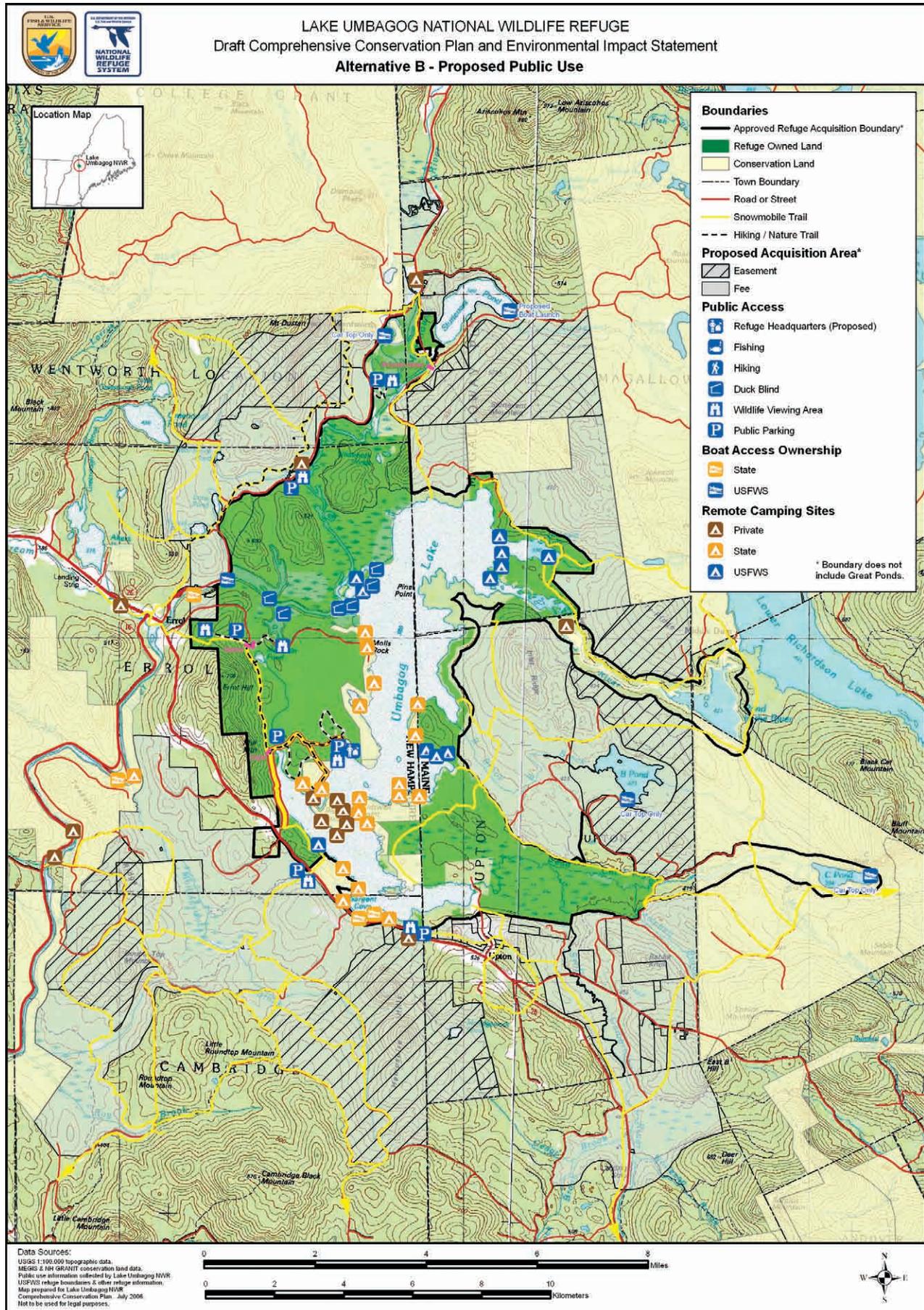
Our land conservation objectives result from a very active regional partnership, and fully complement the management on both public and private adjacent conserved lands. Our proposal also complements the original purpose and intent for which the refuge was established. It identifies the significance of the refuge expansion in contributing to the current and planned network of conservation lands and wildlife resources in the regional landscape. Working in partnership with these surrounding landowners is crucial for its successful implementation. We developed its strategies cooperatively with our state fish and wildlife agency partners and other land conservation partners working in the Northern Forest region who support it.

Regarding our visitor services programs, alternative B would enhance existing, priority, public use opportunities for hunting and fishing by providing better outreach and information materials and improving access and parking (map 9). We propose to open the refuge to two new hunts as we previously described. Implementation of these hunts would require a separate environmental analysis, including public involvement opportunities. Opportunities for viewing and photographing wildlife and interpretation would expand, primarily providing new infrastructure such as trails and viewing areas. In addition, we propose new roadside pullouts, informational kiosks, and viewing platforms along the major travel corridors. Further, we would develop new visitor infrastructure, including a series of interpretive trails, in conjunction with the proposed new location for a refuge administrative headquarters and visitor contact facility at the former Potter Farm site. We would also pursue a partner-managed regional visitor contact facility in the Town of Errol.

As for other uses of the refuge, we would continue to allow snowmobiling on the trails now designated. In cooperation with the Department of Resources and Economic Development (NH DRED) we would also continue to allow and manage remote camping on the 12 lake sites so designated; although we would increase their monitoring, and rehabilitate or relocate those in need of restoration. We would eliminate the two river sites; we would not replace them. We do not plan to increase opportunities for either snowmobiling or camping. We also plan to open the refuge to furbearer management under permit, in conformance with a Furbearer Management Plan.

Under alternative B, the lands we acquire in the proposed expansion area would be open to long-term public access for compatible, priority public uses such as hunting, fishing, wildlife observation and photography and environmental education and interpretation. We would keep open the major road corridors in the expansion lands to facilitate access to those activities.

We would also enhance local community outreach and partnerships, continue to support a Friends Group, and provide valuable volunteer experiences as we implement alternative B. As described under goal 7, we would pursue the establishment of a Land Management and Research Demonstration (LMRD) site on the refuge to promote research and the development of applied management practices to benefit the species and habitats identified in this alternative.



Alternative C – Management to Create Natural Landscape Composition, Patterns, and Processes

This alternative strives to establish and maintain the ecological integrity of natural communities on the refuge and surrounding landscape in the Upper Androscoggin River watershed. Ecological integrity is defined by having all native species present, and allowing ecological processes and natural disturbance events to occur within their respective distribution, abundance or frequency, and natural range of variability characteristic of that community type under natural conditions. A natural community with high integrity is also defined as being resilient and able to recover from severe disturbance events. Management under alternative C would range from passive, or “letting nature take its course,” to actively manipulating vegetation to create, or hasten the development of, mature forest structural conditions shaped by natural disturbances. No particular wildlife species are a focus of management.

As a priority, we would implement studies, consult experts, and conduct literature reviews, to further refine our knowledge of disturbance patterns and structural conditions in both wetlands and uplands natural communities. Under alternative C, we would continue to recognize the current FERC license agreement; however, we would also discuss with the licensee opportunities to manage at water levels that mimic a more natural hydrologic flow throughout the year. Our wetland management would also pursue restoration projects where past land uses hinder natural hydrologic flow and wetlands development.



© Robert Quinn

Whaleback Pond

In refuge uplands, we would manage to restore the forest communities predicted as the “potential natural vegetation,” using both Kuchler’s delineations of potential types and ecological land units (ELUs), as the basis to determine which types are best -suited and most capable of growing on these sites. Our management would be designed to create similar mature stand structural conditions that would be expected from the natural disturbances that shaped the Northern Forest landscape. Those disturbances include hurricanes, flooding, ice storms, and small blow-downs. We would manage the distribution of forest age-class, species, and diameter, understory development, the amount of dead and dying and cavity trees, large and old trees, coarse woody debris, and canopy closure indicated by historic accounts or as described by experts. Notwithstanding those actions, we would also ensure protection of current or future threatened and endangered species, and control the establishment and spread of any non-native, invasive species. Introduced pests and pathogens, including beech-scale disease, gypsy moth, and hemlock and balsam wooly adelgid, may present management issues in the future that require intervention. Map 11 depicts the broad habitat types we predict would result after approximately 150 years of implementing the management objectives in alternative C.

The proposed refuge expansion of 76,304 acres is essential for the success of alternative C (map 10). Experts have suggested that 25,000 contiguous acres, hydrologically connected and in a relatively undisturbed condition, is a reasonable approximation of the minimum size at which ecological processes, structure and function could occur naturally, including the disturbances we identified above. We designed our expansion proposal in alternative C to protect and conserve large, contiguous habitat blocks exceeding 25,000 acres and connect them to other conserved lands. Unlike alternative B, our need for adjacent conservation landowners to work cooperatively and complement our management is less important, because the extent of the lands we propose to acquire would allow

us to meet our objectives independent of adjacent lands. We would acquire all of the 76,304 acres we identified from willing sellers in fee simple. Fee simple acquisition ensures full management control and flexibility. As we acquire those lands, we would manage them by the goals, objectives, and strategies under this alternative.

Compared to the proposals in alternative B for visitor services programs and refuge uses, alternative C would limit new infrastructure for wildlife observation, photography, and interpretation to those around the Potter Farm facility and roadside pullouts along Routes 16 and 26; however, it would similarly enhance the existing opportunities for hunting and fishing (map 12). It would also open the refuge for furbearer trapping under permit, although, unlike alternative B, the program would emphasize natural furbearer population dynamics. Like alternative B, remote camping on the existing designated lake sites would continue to be allowed, and we would increase monitoring of individual sites, and rehabilitate, or close permanently or seasonally those in need of restoration.

Also similar to alternative B, under alternative C, we would enhance local community outreach and partnerships, continue to support a Friends Group, and provide valuable volunteer experiences. We would also pursue the establishment of a LMRD site on the refuge to promote research, and the development of applied management practices, to sustain and enhance the natural composition, patterns and processes within their range of natural in the Northern Forest.

*Winter view of the
Dead Cambridge*



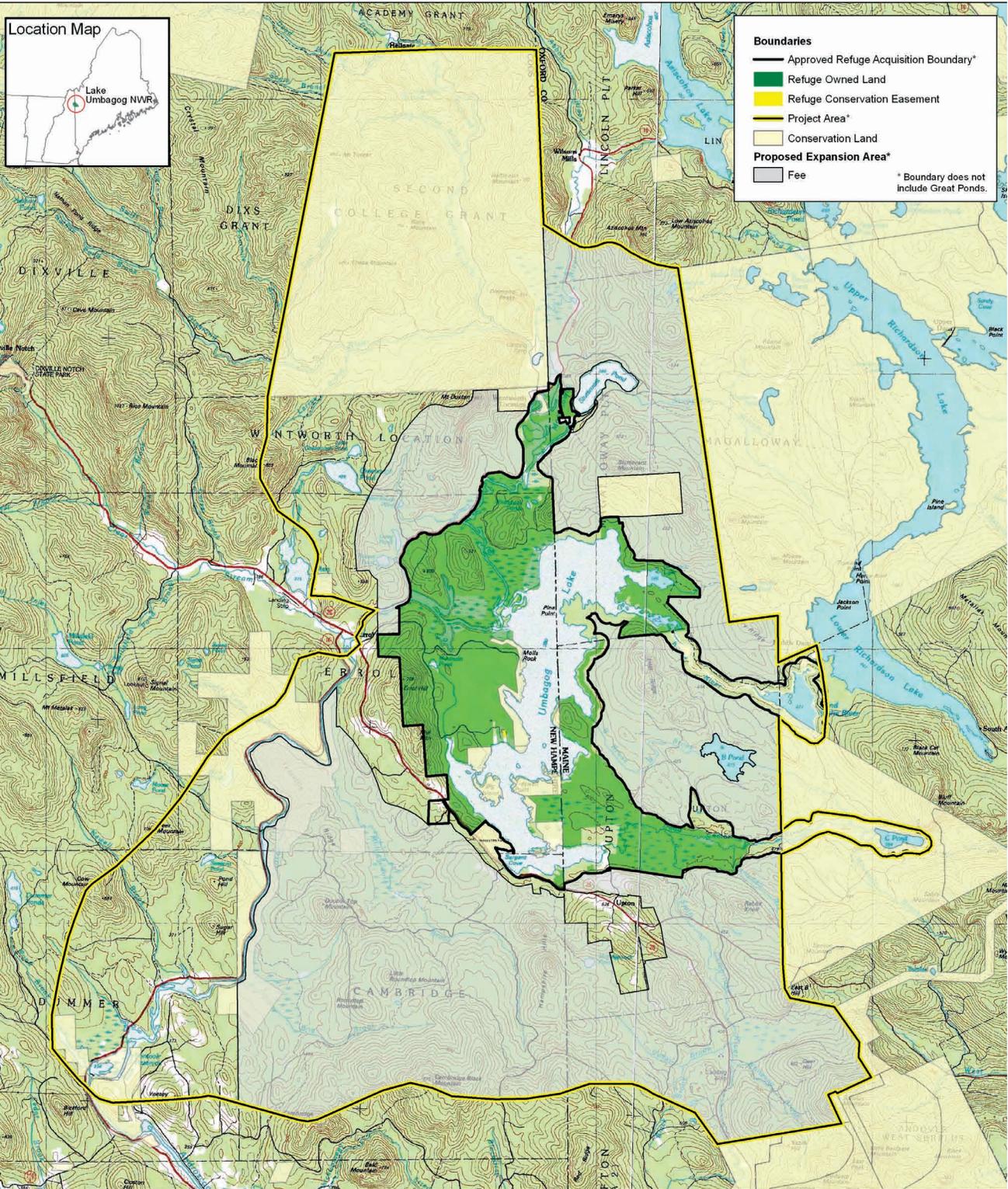
Paul Casey/USFWS



LAKE UMBAGOG NATIONAL WILDLIFE REFUGE

Draft Comprehensive Conservation Plan and Environmental Impact Statement

Alternative C - Proposed Refuge Expansion

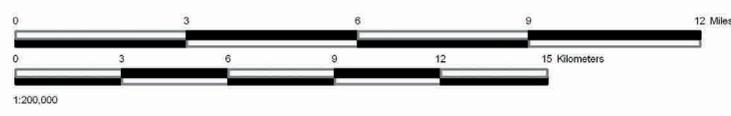


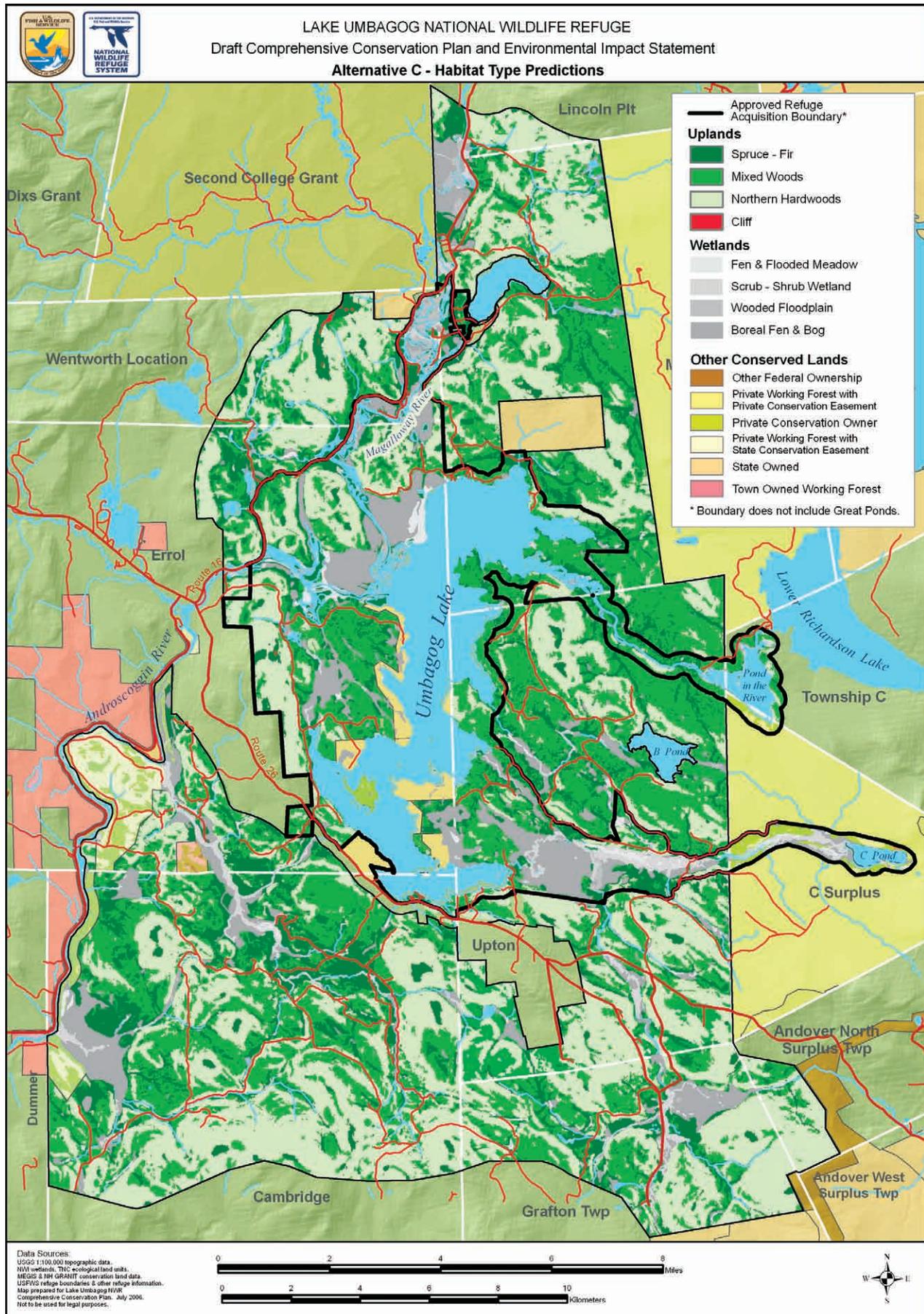
Boundaries

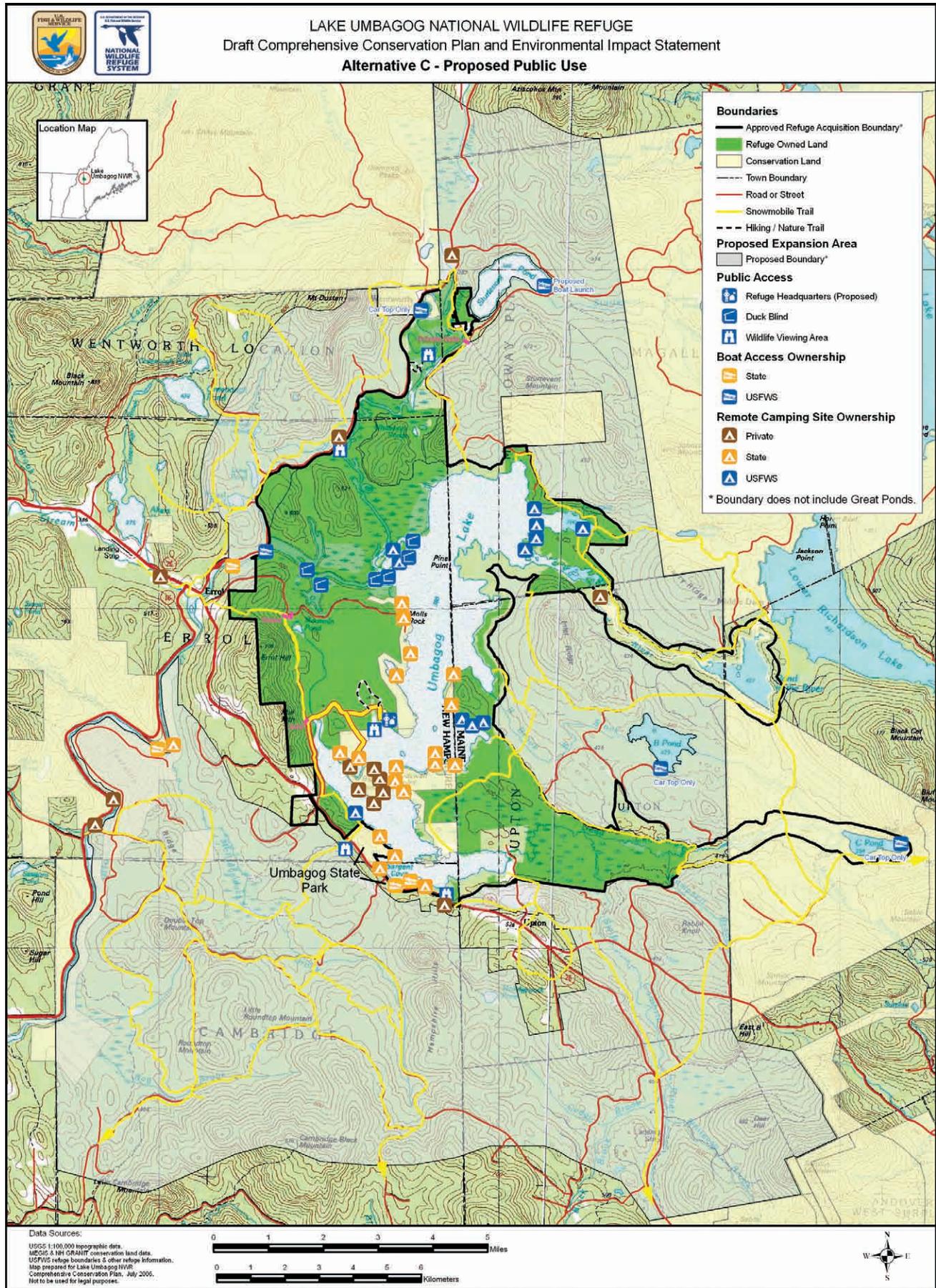
- Approved Refuge Acquisition Boundary*
- Refuge Owned Land
- Refuge Conservation Easement
- Project Area*
- Conservation Land
- Proposed Expansion Area*
- Fee

* Boundary does not include Great Ponds.

Data Sources:
 USGS 1:100,000 topographic data.
 MEGIS & NH GRANIT conservation land data.
 USFWS refuge boundaries & other refuge information.
 Map prepared for Lake Umbagog NWR
 Comprehensive Conservation Plan. July 2006.
 Not to be used for legal purposes.







Summary Comparison of Management Actions by Alternative

We describe above some actions that are common to all alternatives. These and other common actions are described in more detail in the draft CCP/EIS chapter 2, “Alternatives Considered, Including the Service-preferred Alternative”. In comparison, table 1 below highlights those actions that distinguish each alternative, how they relate to our goals, and how they address the significant issues identified in the draft CCP/EIS chapter 1, “Purpose of and Need for Action”. The reader is encouraged to read chapter 2 in its entirety for a complete perspective on each alternative.

Table 1. Summary comparison of management actions by alternative and their relationship to goals and significant issues

Refuge Resource or Program	Alternative A Current Management	Alternative B Service-preferred alternative	Alternative C
<p>Goal 1. Manage open water and wetlands to benefit Federal trust species and other species of conservation concern</p> <p><i>Responds to Issues: Which wetlands habitats and dependent species should be a management priority? How will we manage for them on the refuge? How will we manage furbearer populations?</i></p>			
<p>Fen and Flooded Meadow; Boreal Fen and Bog</p>	<p>Continue “passive” management on 1,666 acres of these habitat types; we define passive management as protecting, monitoring key resources, and conducting baseline inventories to improve our knowledge of the ecosystem</p> <p>Continue spring and fall migratory waterfowl and shorebird surveys and breeding marsh bird surveys</p>	<p>Actively manage to promote high quality habitat for focal species identified in draft CCP/EIS objective 1.1 and 1.2 (e.g. various waterfowl, marsh and wading birds), to the extent possible under the existing FERC license; expand wild rice production</p> <p>Expand alternative A bird surveys to include nesting, brood-rearing and migrating waterfowl, shorebird and marsh wading birds</p> <p>Evaluate recreational impacts on waterfowl and water bird brood rearing in the Dead Cambridge River area</p> <p>Determine a more favorable year round water level management regime for conserving priority habitats and focal species, including FINNL, and initiate dialogue with the holder of the FERC license for the Errol Project (currently FPLE) to determine feasibility of implementation</p>	<p>In addition to alternative A:</p> <p>Remove roads, culverts, and any other obstructions not critical for administrative purposes or priority programs, that affect natural wetlands development or interfere with natural hydrologic flow</p> <p>Determine historical distribution, composition, and development of wetlands prior to dam establishment and evaluate whether historical context can be reestablished</p> <p>Determine an annual hydrologic flow that more closely mimics a natural regime, and initiate dialogue with the current holder of the FERC license for the Errol Project to determine feasibility of implementation</p>
<p>Northern White Cedar</p>	<p>Continue passive management on the 829 acres in this habitat type</p> <p>Continue to inventory small mammals and amphibians as funding allows</p>	<p>Expand alternative A surveys to include more detailed surveys of rare plant and animal occurrences; and, working with state Heritage Programs, establish measures of ecological integrity and develop a monitoring program to evaluate overall condition</p> <p>Restore northern white cedar on sites where land use converted it to another type; treat competing vegetation on up to 150 acres in 15 years</p>	<p>In addition to alternative A:</p> <p>Determine historical distribution, composition, and development of this habitat type prior to dam establishment and evaluate whether historical context can be reestablished</p>

Refuge Resource or Program	Alternative A Current Management	Alternative B Service-preferred alternative	Alternative C
Goal 1. (cont'd)	Manage open water and wetlands to benefit Federal trust species and other species of conservation concern		
Northern White Cedar (cont'd)		Evaluate habitat needs of boreal species using this habitat type; manage to enhance those features, if not present	Work with state heritage programs to, conduct baseline studies of rare plant and animal occurrences, establish measures of ecological integrity and develop a monitoring program
Scrub-Shrub	Continue passive management on the 655 acres in this habitat type	In woodcock focus areas, identify treatment units and actively enhance habitat to juxtapose foraging, roosting, courtship, nesting and brood cover; e.g. promote alder, create openings, and encourage beaver	In addition alternative A: Use beaver to sustain this habitat type; manage beaver populations within their historic, natural range of density/mile found in suitable habitat in northern NH and ME
Open Water	Continue passive management on the 5,033 acres in this habitat type	Work with states, to protect and enhance SAV beds, improve water quality, and increase production of native brook trout	Same as alternative A
Common Loon	Continue to monitor and protect loon nesting sites (e.g. restrict public access, buoy lines, nest observers and monitors, outreach and education) in partnership with states and the holder of the FERC license for the Errol Project (currently FPLE) Continue to support research into the decline of the local loon population.	In addition to alternative A, initiate surveys and studies to: Map and monitor recreational use and pressure near loon nesting territories Evaluate loon interactions with waterfowl during the breeding season and determine impact of predators in loon nesting success; manage loon predators as warranted Evaluate availability and quality of natural nesting sites	Same as alternative A
Furbearer Management	No management	At refuge manager's discretion, use trapping as a furbearer management tool to achieve objectives.	Same as alternative B; although furbearer trapping less likely to be utilized under this scenario

Refuge Resource or Program	Alternative A Current Management	Alternative B Service-preferred alternative	Alternative C
Goal 2. Manage floodplain and lakeshore habitats to benefit Federal trust species and other species of conservation concern			
<i>Responds to Issue: Which habitats and dependent species should be a management priority? How will we manage for them on the refuge?</i>			
Wooded Floodplain	<p>Continue passive management on the 1,140 acres in this habitat type</p> <p>Continue to restore natural vegetation on unauthorized camp sites and surplus cabins sites that have been removed</p> <p>Continue vernal pool, small mammal, amphibian and breeding bird surveys as funding allows</p>	<p>In addition alternative A restoration and surveys:</p> <p>Actively manage to promote high quality habitat for focal species identified in objective 2.1 (northern parula and rusty blackbird).</p> <p>Protect/retain large legacy trees, and large standing and downed dead wood for cavity tree-dependent wildlife</p> <p>Evaluate isolated backwater areas with high potential for waterfowl brood rearing habitat to determine if seasonal boat access closures would enhance habitat quality; implement closures if determined beneficial</p>	<p>In addition to alternative A:</p> <p>Determine historical distribution, composition, and development of this habitat type and evaluate whether historical context can be reestablished.</p> <p>Restore the hydrology of the Day Flats area by plugging ditches and re-contouring the disturbed areas</p>
Lakeshore Pine-Hemlock	<p>Continue passive management on the 232 acres in this habitat type</p> <p>Monitor habitat impacts from public use</p>	<p>In addition alternative A monitoring:</p> <p>Work with New Hampshire Natural Heritage Inventory (NHNHI) to establish measures of ecological integrity and implement a monitoring program in the jack pine type</p> <p>Protect/retain large legacy trees, and large standing and downed dead wood, or any tree observed to be used by eagles and osprey for perching</p>	<p>In addition to alternative A:</p> <p>Determine historical distribution, composition, and development of this habitat type and evaluate whether historical context can be reestablished; overall objective would be to create a habitat complex that would eventually be sustained through natural ecological processes with minimal intervention</p>
Bald Eagle and Osprey	<p>In partnership with NHFG, MDIFW, and other conservation partners, continue to conduct annual bald eagle and osprey nest surveys</p> <p>Continue to actively protect nest sites where warranted</p>	<p>In addition to alternative A, protect:</p> <p>All active nest trees with a 600 foot no-disturbance buffer</p> <p>All historic nest sites, nest trees, and partially constructed nest trees</p> <p>All stands with replacement potential as nesting habitat</p>	<p>Same as alternative B</p>

Refuge Resource or Program	Alternative A Current Management	Alternative B Service-preferred alternative	Alternative C
<p>Goal 3. Manage upland forested habitats, consistent with site capabilities, to benefit Federal trust species and other species of conservation concern</p>			
<p><i>Responds to Issues: Which upland forest habitats and forest-dependent species should be a management priority? How will we manage for them on the refuge?</i></p>			
<p>Mixed Forest Matrix With 3 embedded habitat types: 1) Spruce-Fir 2) Mixed Woods 3) Northern Hardwood</p>	<p>Continue passive management on the 9,913 acres in this habitat type Continue to work with NHFG and MDIFW to identify and protect all deer winter yards Continue to conduct annual breeding bird surveys</p>	<p>Actively manage to promote and sustain high quality habitat for refuge focal species identified in objective 3.1 (e.g. blackburnian, Canada, and black-throated green warblers, and American woodcock); manage for a diversity of age and structural classes Continue to conduct alternative A breeding bird surveys. Work with lynx recovery team to determine any future management potential</p>	<p>Manage mixed forest matrix development across the refuge landscape to approximate the native species and the ecological processes, including natural disturbance regime, characteristic of the mixed forest matrix within their natural range of variation.</p>
<p>Goal 4. Provide high quality wildlife-dependent activities such as hunting, fishing, wildlife observation, and photography</p>			
<p><i>Responds to Issues: What is the appropriate level of use for each of the six priority public use programs on the refuge: hunting, fishing, wildlife observation and photography, environmental education and interpretation? What means of access will we allow for these activities? How will we manage remote camping on the refuge?</i></p>			
<p>Hunting</p>	<p>Continue to offer a hunt program. Continue to maintain 6 waterfowl hunt blinds and allow use under a reservation system</p>	<p>In addition to alternative A: Improve information materials provided to hunters (e.g. allowed access, other restrictions) Increase knowledge of refuge harvest information and hunter satisfaction. Within 1 year of CCP approval, initiate administrative process, including additional NEPA analysis and public involvement opportunities to open the refuge to 2 new hunting seasons.</p>	<p>Establish hunting units and distribute use and limit numbers through free special use permit program; No new developments, facilities, or improved access would be provided; majority of area is walk-in use only</p>
<p>Fishing</p>	<p>Continue to allow fishing. Continue to host Take Me Fishing event</p>	<p>In addition to alternative A: Complete all administrative actions to officially open the refuge to fishing Provide improved lake and river shoreline access at designated sites, and new proposed sites. Work with NHFG and MDIFW to maintain high quality brook trout fishery in the Rapid, Dead Diamond, and Dead Cambridge rivers</p>	<p>Same as alternative B, except the objective is to promote a remote, low density angling experience. Actions that would differ include: Consider permit system once thresholds have been breached No new developments, facilities, or improved access would be provided; majority of area is walk-in use only</p>

Refuge Resource or Program	Alternative A Current Management	Alternative B Service-preferred alternative	Alternative C
Goal 4. (cont'd)	Provide high quality wildlife-dependent activities such as hunting, fishing, wildlife observation, and photography		
Wildlife Observation and Nature Photography	<p>In addition to alternative A: Continue to maintain Magalloway River trail and viewing platform Continue to allow use of waterfowl blinds under a reservation system.</p>	<p>In addition to alternative A: Create safe, accessible wildlife viewing pull-outs on Route 16 and 26 in partnership with NHFG, MDIFW, and state highway departments Work with NHFG, MDIFW and other partners to develop regional wildlife viewing trails across Develop a wildlife viewing reporting system (e.g. web-based)</p>	<p>In addition to alternative A, the objective is to promote a backcountry, low density wildlife observation and photography experience. The only new developments would be around Potter Farm facility and the roadside pullouts on Routes 16 and 26. No other facilities, or improved access on-refuge would be provided; majority of area is walk-in use only.</p>
Camping	<p>Continue cooperative program with NH DRED-Parks and Recreation allowing them to administer 14 remote, designated camp sites on refuge lands (12 sites on lake; 2 on river) Continue to maintain and improve campsites on an annual basis</p>	<p>In addition to alternative A: Complete cooperative agreement with NH DRED-Division of Parks and Recreation to formalize administration, implementation and stipulations; Close the 2 river camp sites and rehabilitate them to native vegetation Utilize the proposed Umbagog Lake Working Group to advise on and help develop an interagency plan on remote camping across ownerships and jurisdictions.</p>	<p>Same as alternative B, except the objective is to promote a primitive, low impact experience. Actions that would differ include: Limit infrastructure at camping sites, limit number of campers/site, do not allow fires, and require campers to bring portable toilets</p>
Goal 5. Develop high quality interpretive opportunities, and facilitate environmental education, to promote an understanding and appreciation for the conservation of fish and wildlife and their habitats, as well as the role of the refuge in the Northern Forest.	Responds to Issues: What is the appropriate level of use for each of the six priority public use programs on the refuge: hunting, fishing, wildlife observation and photography, environmental education and interpretation? What means of access will we allow for these activities?		
Interpretation	<p>Continue to respond to requests for programs when staffing and funding allows. Continue efforts to complete Magalloway River interpretive trail.</p>	<p>In addition to alternative A: Develop Visitor Services Plan and implement all programs identified under goals 4 and 5; seek funding to hire a Visitor Services Professional Increase interpretive programs by providing guided walks and boat trips, or other programs at state campground Improve self-guided interpretive information at Magalloway River trail and along approved, designated snowmobile trails.</p>	<p>Same as alternative B, except, only the Potter Farm trail loop, which requires new construction, would be included. Other trail options may be considered in the future if no new construction is necessary. Limit group size to <20 individuals Maintain interpretive signage only at trailheads</p>

Refuge Resource or Program	Alternative A Current Management	Alternative B Service-preferred alternative	Alternative C
Goal 5. (cont'd)	Develop high quality interpretive opportunities, and facilitate environmental education, to promote an understanding and appreciation for the conservation of fish and wildlife and their habitats, as well as the role of the refuge in the Northern Forest.		
Community Outreach	<p>Continue to coordinate two annual community events: Umbagog Wildlife Festival, and Take Me Fishing.</p> <p>Continue to distribute brochures and literature on impacts to wildlife from lead fishing tackle</p>	<p>In addition to alternative A:</p> <p>Create new, and improve existing outreach materials (newsletter, website, media and press kits, fact sheets, virtual tours of refuge and webcams at bald eagle and loon nesting sites)</p> <p>Coordinate with states and Umbagog Lake Working Group to develop lake access management plan and outreach materials.</p> <p>Conduct outreach targeted at refuge neighbors to encourage their awareness, interest and involvement in refuge activities.</p>	Same as alternative B
Environmental Education	No current program	<p>Facilitate partner-led educational program development and implementation on the refuge; refuge staff and resources would be limited</p> <p>Evaluate potential for adult educational partnerships through universities or programs such as Elder Hostel</p>	Same as alternative B
Goal 6. Enhance the conservation and management of fish and wildlife resources in the Northern Forest Region through partnerships with public and private conservation groups, private landowners, State and local entities			
<i>Responds to Issues: What should be the refuge's role in land conservation efforts in the Upper Androscoggin River watershed? Should we pursue a refuge expansion? How can the refuge and its staff be an asset to local communities and support their respective vision and goals for the area?</i>			
Land Conservation and Protection	<p>Continue to participate in regional land conservation partnerships</p> <p>Continue to acquire 6,392 total acres of high priority habitat from willing sellers within the current, approved refuge. Acres are delineated by respective habitat type in chapter 2 of the draft CCP/EIS.</p>	<p>In addition to acquisition priorities under alternative A, increase the Service's contribution to conserving significant habitats and species of conservation concern through Service fee-simple easements. Acres proposed for acquisition from willing sellers are delineated by respective habitat type in chapter 2 of the draft CCP/EIS.</p>	<p>In addition to acquisition priorities under alternative A, increase contribution to conserving significant habitats, native species, and the ecological processes characteristic of the Northern Forest within their natural ranges of variation, through Service fee-simple acquisition of 76,304 acres. Acres proposed for acquisition from willing sellers are delineated by respective habitat type in chapter 2 of the draft CCP/EIS.</p>
Regional and Community Partnerships	<p>Continue working with the numerous partners identified under objective 6.1 to address both regional (e.g. Northern Forest and Upper Androscoggin watershed) and local (town, individual resource or program) issues and opportunities</p>	<p>In addition to alternative A:</p> <p>Explore the potential for a regional Umbagog Area Friends Group</p> <p>Participate in regional and local community economic development and conservation partnerships and initiatives, such as Upper Androscoggin Advisory Committee</p>	Same as alternative B

Refuge Resource or Program	Alternative A Current Management	Alternative B Service-preferred alternative	Alternative C
Goal 6. (cont'd)	Enhance the conservation and management of fish and wildlife resources in the Northern Forest Region through partnerships with public and private conservation groups, private landowners, State and local entities		
Cooperative Management of Umbagog Lake	Nothing formal established, but continue to work with NHFG and MDIFW to conduct boater and angler safety and ethics outreach during festivals and individual visitor contacts	In addition to alternative A: Promote the establishment of an interagency, inter-jurisdictional Umbagog Lake Working Group to develop voluntary best management practices, and to address user and resource issues that cross ownerships	Same as alternative B
Partner-managed Visitor Facilities	None	With local business and town officials and state partners, develop a visitor contact facility in Errol to orient visitors to the Umbagog region	Same as alternative B
Goal 7. Develop Umbagog National Wildlife Refuge as an outstanding center for research and development of applied management practices to sustain and enhance the natural resources in the Northern Forest in concert with the Land Management Research Demonstration (LMRD) Program			
Research and Applied Management	No program	Seek support and funding to establish the refuge as an LMRD site; hire an LMRD coordinator to facilitate implementation Conduct a research needs assessment for the refuge	Same as alternative B, except program emphasis is on natural landscape composition, patterns, and processes
Outreach for Research and Management Programs	None	Facilitate demonstration area on-refuge, and on other conservation ownerships, that showcase applied management to benefit natural resources Cooperate with Partners for Wildlife program to accomplish outreach, demonstration projects, and seek funding Conduct workshops, courses, and other technical forums Publish research findings in peer-reviewed publications	Same as alternative B

Environmental Consequences

Introduction

This section summarizes the environmental consequences we predict on selected resources because of implementing the three management alternatives. Chapter 4 in the draft CCP/EIS provides our detailed analysis of impacts on these and other important resources. We evaluate direct, indirect, short-term, beneficial and adverse effects likely over the 15-year life span of the plan. Beyond that planning horizon, we give a more speculative description of those effects. We do not predict any irreversible or irretrievable commitment of resources or significant adverse cumulative effects, nor do we expect any action would adversely affect short-term uses of the environment or its long-term productivity.

Effects on Socioeconomic Resources

We enlisted the U.S. Geological Survey Fort Collins Science Center to help analyze the potential impacts our actions could have on the local and regional socioeconomic environment. The economic impacts were assessed using the Impacts Analysis for Planning (IMPLAN) regional input-output modeling system developed by the U.S. Forest Service. The model uses information such as refuge revenue sharing payments, anticipated refuge visitor expenditures in the local community, refuge local purchases, and potential refuge economic activities, such as timber harvesting. IMPLAN reports effects for the following categories: local output (e.g. the change in local sales or revenue), personal income (e.g. the change in employee income in the region generated from a change in regional output, and employment (e.g. the changes in number of jobs generated from a change in regional output).

Alternative A – We predict the direct effects of refuge activities to result in an annual estimated \$1.45 million in local output, 17.7 jobs, and \$425,000 in personal income. Based on data from the U.S. Department of Commerce (2000), that represents well under 1 percent of total income and employment for Coos County, New Hampshire and Oxford County, Maine.

Alternative B - We predict the direct effects of refuge activities to result in an annual, estimated \$2.73 million in local output, 35.1 jobs, and \$842,400 in personal income. Based on 2000 data from the U.S. Department of Commerce, that represents less than 1 percent of total income and employment for Coos County, New Hampshire and Oxford County, Maine.

Alternative C - We predict the direct effects of refuge activities to result in an annual estimated \$2.84 million in local output, 37.4 jobs, and \$908,000 in personal income. Based on data from the U.S. Department of Commerce (2000), that represents less than 1 percent of total income and employment for Coos County, New Hampshire and Oxford County, Maine.

Effects on Air Quality

We predict that refuge activities under all alternatives will have primarily beneficial effects on air quality because of conserving more land and maintaining natural habitats, contributing to a reduction in greenhouse gases, and adopting energy efficient practices to help reduce emissions. However, we also expect some minor adverse effects on air quality from refuge activities, though limited in size, duration, and intensity. Limited burning of debris would contribute particulates, and the use of Service vehicles, other motorized equipment, and maintaining facilities could contribute emissions. None of the alternatives would cause effects that would exceed Federal or State Clean Air Act standards, or impact Class I areas; nor would any alternative result in a significant cumulative effect on regional ozone or particulate matter pollutant levels.

Alternative A – Undeveloped refuge lands and waters provide air quality benefits by filtering out many air pollutants; approximately 26,905 acres would be conserved under alternative A. Alternative A includes few ground disturbing activities requiring large equipment, thus minimizing additional emission sources. The new headquarters and visitor contact station at the Potter Farm would be a small facility according to regional Service standards. Construction activities would cause short-term, localized effects from construction vehicle and emission exhausts. Operation of the facility would slightly increase stationary source emissions over current contributions. A 10% increase to approximately 55,150 annual refuge visits, primarily by motor vehicles, would cause minor increase in air emissions in the long term, but contribute minimally to potential cumulative effects.

Alternative B – Similar to alternative A, refuge land and waters would filter out air pollutants; however, under alternative B, this would be expanded to 76,623 acres. Impacts from the new headquarters would be similar to alternative A. Additional facilities for our visitor services programs would be constructed (e.g. trails, pullouts, etc) and would cause short-term, localized effects from construction vehicle and equipment exhausts. A projected increase in the number refuge visits to 90,950 would increase emissions on and near the refuge over the long term. However, the contribution to the cumulative local and regional air quality effects would likely be compensated for, to a large degree, by precluding development in the proposed expansion area.

Alternative C – Impacts are similar as those described for alternative B except with the larger expansion proposed, 103,209 acres would be providing the air pollution filtering benefits. Other impacts described for alternative B are similar under alternative C, although their contribution may be slightly higher due to plans for a medium-sized headquarters and visitor contact facility, and an expected 93,700 annual visits.

Effects on Soils

Refuge activities under all alternatives are predicted to have primarily beneficial effects on soils due to increased land conservation affecting land development and other major land use changes, and the restoration of developed or disturbed areas not needed for refuge administration. However, we also expect some adverse effects on soils from refuge activities. The construction of buildings, parking areas, and trails, forest management, and a predicted increase in visitor use will each impact the soils resource.

Alternative A – Refuge lands (26,905 acres) described under the air quality discussion also provide long-term protection to soil quality and productivity. With exception of the new headquarters and visitor contact facility, we plan few ground-disturbing activities that would affect soils. We do not expect the increase in visitation to impact soils, because that increase is tied more to activities on the lake than on land. Camp restoration would increase soil productivity.

Alternative B – Similar to alternative A, refuge lands would provide long-term protection to soil quality and productivity; however under this alternative, 76,623 acres would provide this benefit. Local soil compaction and loss of soil productivity would occur where new visitor facilities are planned, including kiosks, parking areas, trails, and boat launches. There would constitute an unavoidable adverse impact, but in total, would not amount to more than 50 acres. The increased land-based visits predicted would primarily be confined to these developed areas, thus limiting in area and scope the expected impacts on soils from more refuge visitors. Offsetting these impacts would be the planned reclamation of natural soil productivity on restored cabin sites, campsites, trails, and roads. Other localized, short-term soil impacts could occur from planned forest management activities on approximately 4,000 acres. These impacts would be minimized by adhering to state forest best management practices.

Alternative C – This alternative would provide more benefits to the soils resource because of the increased expansion proposal described under air quality above (103,209 acres), and the fewer trail projects planned. The acres impacted by forest management would be similar to alternative B.

Effects on Hydrology and Water Quality

Refuge activities under all alternatives are predicted to have primarily beneficial effects on hydrology and water quality due to increased land conservation and watershed protection, maintaining natural habitats, the restoration of areas noted above under soils, water quality monitoring, and improved cooperation with other landowners and managers in the lake area. However, some minor adverse effects on hydrology and water quality are also expected primarily from a predicted increase in visitor use.

Alternative A – Refuge lands (26,905 acres) described under the air quality discussion also provide long-term protection to hydrology and water quality because we would prohibit potentially damaging development and other incompatible uses. Camp restoration activities would reduce erosion, restore hydrology, and eliminate the potential for household contamination at these sites. Increased boating activities predicted would have the potential to introduce an increase in petroleum products into lakes and rivers. However, the planned public outreach on this and other issues related to invasive aquatic weeds, invasive fish, and lead contamination from sinkers would help mitigate that risk.

Alternative B – Similar to alternative A, refuge lands would provide long-term protection to hydrology and water quality; however, in this alternative, 76,623 acres would provide that benefit. In addition to the camp restoration planned in alternative A, this alternative would restore roads and trails not needed for administrative use or visitor programs, thus improving the natural hydrology on those sites. We would also restore the hydrology of certain sites, such as the Day Flats area, by plugging ditches and re-contouring the disturbed areas. Increases in boating activity and associated impacts would be approximately 25 percent greater than in alternative A, but we would also implement the outreach program mentioned to help mitigate that risk.

Alternative C – This alternative would provide more benefits to the hydrology resources and water quality because of the increased expansion proposal described under air quality above (103,209 acres). Other impacts are similar to alternative B.

Effects on Habitats and Species

The purpose of the refuge is to conserve wildlife habitat and native species. Refuge activities often promote or enhance certain habitats or species to the disadvantage of others, but none of the alternatives proposes actions that would jeopardize the existence or viability of any native wildlife population or habitat. None of the alternatives would significantly modify the amount or distribution of wetlands and uplands habitats, but rather, are more likely to change their respective composition. Beneficial actions include the acquisition and conservation of native habitats, the control of invasive species, the restoration of areas noted above under soils, improved cooperation among lake landowners and land managers, active habitat enhancement, and management of visitor use to minimize impacts. Adverse effects may result from increased visitor use and its potential to disturb wildlife, despite management to minimize those impacts, and the construction of permanent facilities such as buildings and trails.

Alternative A – Refuge lands (26,905 acres) described under the air quality discussion provide long-term protection to wildlife and habitats. Continued passive management under this alternative would allow natural vegetative succession to progress, resulting in most forest types progressing to older age classes, including old fields and shrub lands changing to forest. That progression will benefit forest-dependent wildlife, but reduce habitat quality over the long term for those

species that favor early successional habitats. Protecting wetlands and wetland dependent species would continue to be a priority. The current management focus on protecting nesting territories for bald eagles, osprey, and common loons would also continue. The increased visitation predicted has the potential to create additional human disturbance impacts to these nesting sites; however, planned public outreach and increased law enforcement would help mitigate that risk.

Alternative B – Similar to alternative A, refuge lands would provide long-term protection to wildlife and habitats, but would increase to 76,623 acres. This alternative is designed to actively manage all habitat types to benefit federal trust resources and other species of conservation concern. Focal species were selected for each habitat type. The habitat attributes favored by selected focal species would guide management prescriptions. Age and structural class amounts and distribution would change from what is on the landscape today. Wetlands conservation, and sustaining a mature upland mixed forest with a high conifer component, would be the priorities for management. Species that favor extensive, pure hardwood stands would be adversely impacted the most over the long term. Also impacted would be species that prefer extensive (>50 acres) early successional single-aged forested openings, such as clear-cuts of this size. Forested areas undergoing treatment would directly impact wildlife sensitive to human disturbance. For some species this would be a temporary disturbance, but for others it may be long-term or permanent. Since birds and large mammals are more mobile, they would not be as impacted as much as a small mammal or reptile which may be permanently displaced. We would map rare plant communities and the Floating Islands National Natural Landmark in detail, and develop monitoring strategies to insure their permanent protection. As in alternative A, the increased visitation predicted has the potential to create additional human disturbance impacts on wildlife; however, planned public outreach and increased law enforcement would help mitigate that risk.

Alternative C – This alternative would provide more benefits for wildlife and habitat conservation because of the increased expansion proposal described under air quality above (103,209 acres). We designed this alternative to promote forest and wetland conditions similar to those that would occur under natural processes. Active habitat management would mimic the amount, distribution and timing of natural disturbances. No particular species would be a target of management. Over the next 15 years, active forest management would focus on creating small (half-acre) openings resembling small wind throws, promoting older age and structural classes through planting, creating snags, and other wildlife trees and downed woody debris. Other areas would not be managed at all, allowing vegetative succession to occur unimpeded. Impacts to forested wildlife in areas planned for management, and impacts predicted from increased visitation, would be similar to alternative B.

Effects on Public Use and Access

All of the alternatives predict an increase in annual refuge visitation. The level of increase varies among the alternatives due to the differences in their proposed expansions of the refuge boundary. Refuge ownership is beneficial to the public because it guarantees permanent access for compatible, priority, wildlife-dependent public uses, unless it would affect federal trust resources, or the activity would otherwise detract from refuge purposes, or because administrative resources are not available. The alternatives included visitor services infrastructure improvements, a better distribution of information about the refuge and its resources, and increased partnerships with local, regional, and state recreational interests to promote a diversity of experiences. We also expect refuge ownership and activities to have adverse impacts on public use and access. It may result in the elimination of non-priority, non-wildlife public uses on lands to be acquired, create increased conflicts and encounters among user groups, or create additional confusion over ownership boundaries and which rules, laws, and regulations apply.

Alternative A—We would continue to allow five of the six priority public uses at their present levels: hunting, wildlife observation and photography, and environmental education and interpretation. The sixth activity, fishing, is not allowed. Although we would meet the demand for hunting, wildlife observation and photography, we would be unable to meet all of the requests for environmental education and interpretation programs. We would continue to allow popular non-priority public uses, such as snowmobiling and camping, in designated areas, and maintain their current capacities. Conflicts among motorized and non-motorized boaters would continue to be the biggest challenge. Service acquisition of an additional 6,392 acres may affect users of those lands engaged in non-priority, non-wildlife dependent activities (e.g., ATV riding, mountain biking, etc.) because we would not allow those activities once the land becomes part of the refuge. Unfortunately, we do not have estimates on how many people that would affect.

Alternative B—We would officially open the refuge fishing under this alternative and increase opportunities for the other five priority public uses with the proposed refuge expansion. Our proposal to open the refuge to two new hunting seasons would require a separate environmental analysis, including public involvement opportunities, before it could be implemented. In addition, visitor opportunities on current refuge lands would be enhanced with planned trails, viewing areas, information kiosks, and boat launches. Snowmobiling and camping would not change from current management, except two popular river camping sites would be eliminated and restored to natural conditions due to resource degradation that has occurred from heavy use. Conflicts among motorized and non-motorized boaters would increase more than alternative A, but increased outreach, law enforcement, and the creation of an inter-jurisdictional Umbagog Lake Working Group would help resolve conflicts and evaluate capacity limits. Similar to alternative A, Service acquisition of an additional 56,110 refuge acres would impact users of those lands to be acquired who are engaged in non-priority, non-wildlife dependent activities.

Alternative C—Same as alternative B, except the Service acquisition planned under this alternative is an additional 82,696 acres, yielding a greater potential to affect users engaged in non-priority, non-wildlife dependent activities on those lands proposed for acquisition.

*Beaver activity
on the refuge*



Steve Wayne Rotsch, Painet, Inc.

