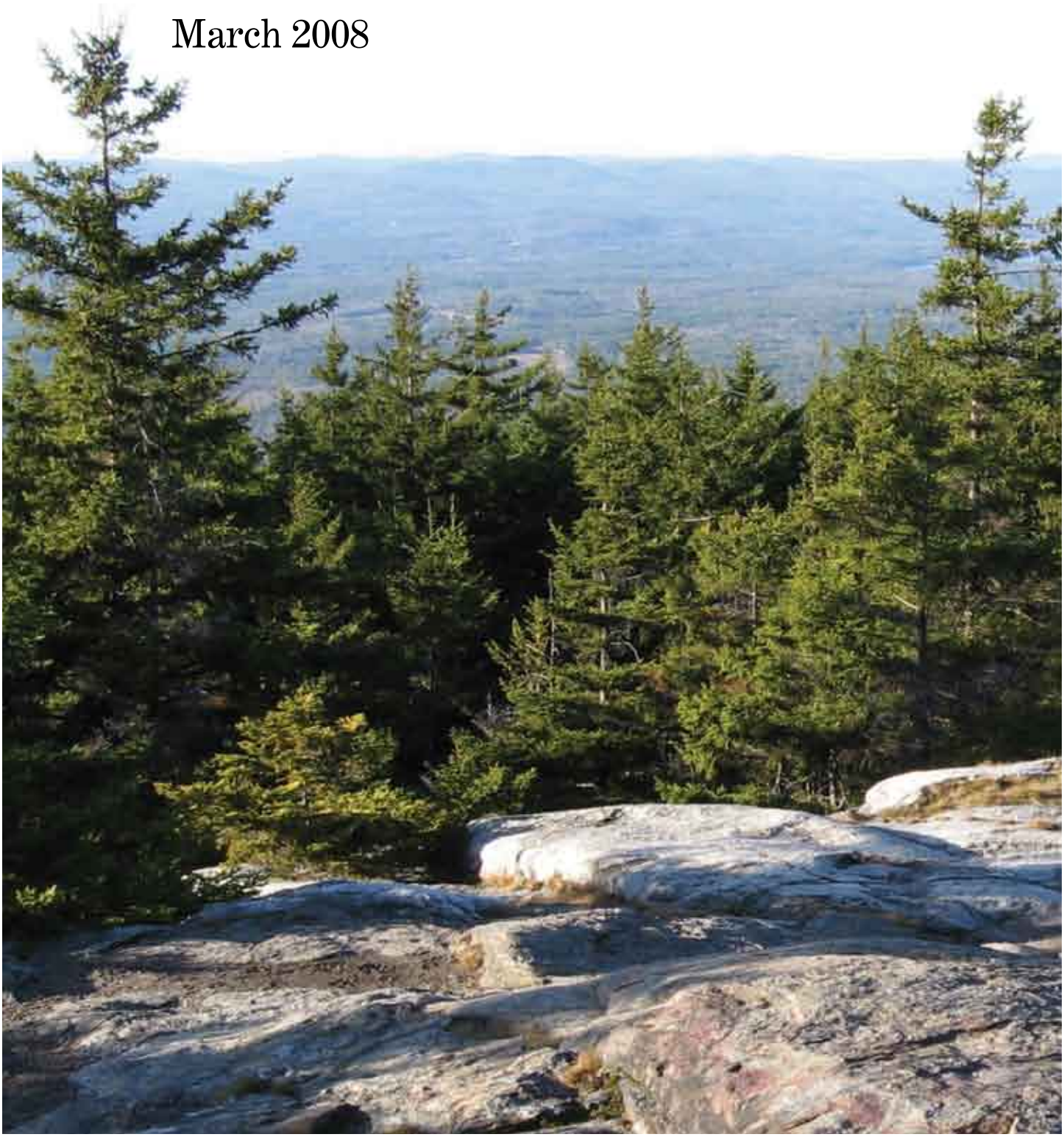
U.S. Fish & Wildlife Service

Wapack National Wildlife Refuge

Draft Comprehensive Conservation Plan and Environmental Assessment

March 2008



Cover Picture: *View from North Pack Monadnock.* Nancy McGarigal/USFWS

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 97-million acre National Wildlife Refuge System comprised of more than 548 national wildlife refuges and thousands of waterfowl production areas. It also operates 69 national fish hatcheries and 81 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.

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Refuge Vision Statement

Encompassing the North Pack Monadnock Mountain in southern New Hampshire, the Wapack National Wildlife Refuge provides exceptional mature spruce-fir and northern hardwood-mixed habitat for wildlife, particularly migratory birds. We will manage the refuge to preserve its natural conditions in a setting which appears to have been affected primarily by the forces of nature.

All visitors are welcome to enjoy opportunities to observe and photograph nature along refuge trails, including a 4-mile segment of the Wapack trail. The rock outcrop and cliff on the mountain peak afford an ideal location to view migrating hawks each fall. Old and new partnerships with other federal agencies, state agencies, local conservation organization, and volunteers will foster public stewardship of this refuge and its resources, and enhance public understanding of the role of the National Wildlife Refuge System in conserving our nation's trust resources.

Wapack National Wildlife Refuge
Draft Comprehensive Conservation Plan and Environmental Assessment
March 2008

Type of Action:	Administrative – Development of a Comprehensive Conservation Plan
Lead Agency:	U.S. Department of the Interior, Fish and Wildlife Service
Location:	Wapack National Wildlife Refuge Greenfield and Temple, NH
Administrative Headquarters:	Parker River National Wildlife Refuge Newburyport, MA
Responsible Official:	Marvin Moriarty, Regional Director, Region 5, Northeast
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This Draft Comprehensive Conservation Plan (CCP) and Environmental Assessment (EA) analyzes two alternatives for managing the 1,625 acre Wapack National Wildlife Refuge over the next 15 years. This document also contains four appendixes that provide additional information supporting our analysis. Following is a brief overview of each alternative:

Alternative A: This alternative is referred to as our "No Action" or "Current Management" alternative, as required by the National Environmental Policy Act (NEPA). This alternative would maintain the status quo in managing this 1,625 acre refuge for the next 15 years. No major changes would be made to current management practices.

Alternative B: This is the Service-preferred alternative. It represents the planning team's recommended strategies and actions for achieving refuge purposes, vision and goals and responding to public issues. Under this alternative, we focus on making improvements to our biological as well as our visitor services program through the expansion of partnerships with other federal agencies, state agencies, town departments, local conservation organizations, and individuals. We would utilize partnerships for continued maintenance of trails and the development and maintenance of a parking area. We would also work to increase Service presence and visibility at the refuge and in the local community. Although we would not pursue additional land acquisition at this time, we would work with partners to help them identify land that should be protected for wildlife conservation and help them choose the best methods/ techniques for managing those areas.

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Chapter 1

Top of North Pack Monadnock
Andrew Ward/Conway School of Landscape Design

The Purpose of and Need for Action

- Introduction
- The Purpose of and Need for the Proposed Action
- The Service and the Refuge System Policies and Mandates Guiding our Planning
- Conservation Plans and Initiatives Guiding the Project
- Refuge Establishment Purposes and its Land Acquisition History
- Refuge Administration
- Refuge Operational Plans ("Step-down" Plans)
- Refuge Vision Statement and Goals
- The Comprehensive Conservation Planning Process
- Issues
- Issues Outside the Scope of this Analysis or Not Completely Within the Jurisdiction of the Service

Introduction

The Wapack National Wildlife Refuge became the first national wildlife refuge in New Hampshire in 1972, when Laurence and Lorna Marshall donated land to the U.S. Fish and Wildlife Service (Service). The terms of their deed prohibit hunting, fishing and trapping, cutting trees (except for maintaining trails), or driving motorized vehicles. It also requires us to manage the refuge in a "wilderness-like" setting.

This 1,625 acre refuge was established with the purpose to protect migratory birds. It encompasses the 2,278-foot North Pack Monadnock Mountain in the towns of Greenfield and Temple (see map 1–1). Many people visit the refuge to hike its three trails, including a 4-mile section of the Wapack Trail, which passes over the top of the mountain and offers outstanding opportunities for viewing migratory hawks. Wapack refuge is administered by staff from the Great Bay National Wildlife Refuge in Newington, New Hampshire.

This draft comprehensive conservation plan (CCP) and environmental assessment (EA) for the refuge combines two documents, each required by federal law: a CCP, required by the National Wildlife Refuge System Administration Act of 1996 (16 U.S.C. 668dd–668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997 (Refuge Improvement Act) (Pub. L. 105-57; 111 Stat. 1253); and an EA, required by the National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. 4321 et seq.; 83 Stat. 852).

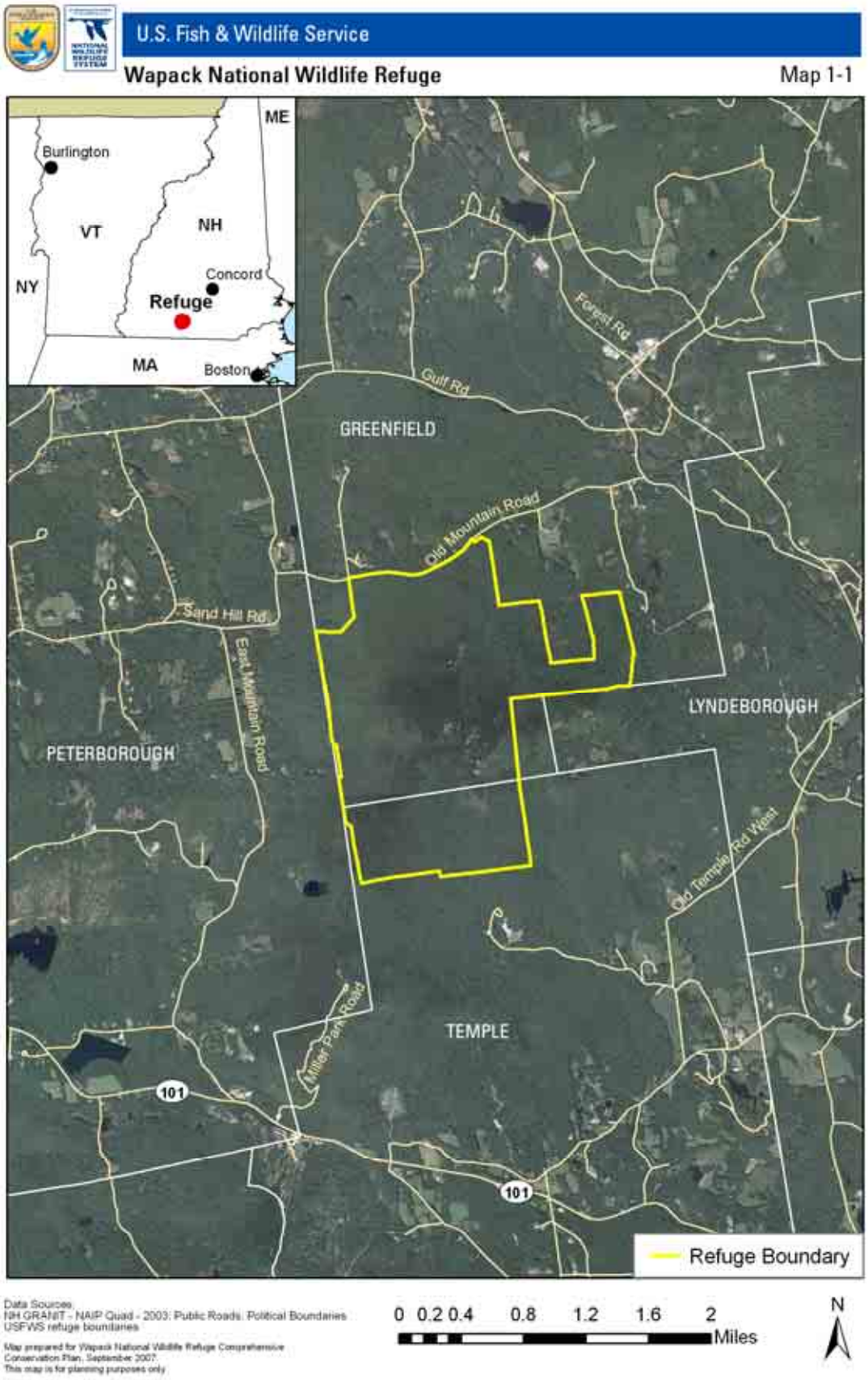
This chapter explains the purpose of and need for preparing a CCP/EA, and sets the stage for four subsequent chapters and four appendixes. It also

- defines our planning analysis area;
- presents the mission, policies and mandates affecting the development of the plan;
- identifies other conservation plans we used as references;
- lists the purposes for which we established the refuge and its land acquisition history;
- clarifies the vision and goals that drive refuge management;
- describes our planning process and its compliance with NEPA regulations; and,
- identifies public issues or concerns that surfaced in developing the plan.

Chapter 2, "Alternatives Considered, Including the Service-preferred Alternative," presents two management alternatives, each with different strategies for meeting refuge goals and objectives and addressing agency, partner, and public issues. After the public review of this draft CCP/EA, our regional director's decision on its management alternatives will produce a final CCP to guide refuge management decisions during the next 15 years. We will also use it to promote understanding and support for refuge management among state agencies in New Hampshire, our conservation partners, local communities and the public.

Chapter 3, "Affected Environment," describes the physical, biological, and human environment of the refuge.

Chapter 4, "Environmental Consequences," evaluates the effects on the environment from implementing each of the two management alternatives. That is, it describes their foreseeable benefits and consequences for the socioeconomic, physical, cultural, and biological environments described in chapter 3.


U.S. Fish & Wildlife Service
Wapack National Wildlife Refuge
Map 1-1
ME
Burlington
VT
NH
NY
Concord
Refuge
MA
Boston
Forest Rd
Gulf Rd
GREENFIELD
Old Mountain Road
Sand Hill Rd
East Mountain Road
PETERBOROUGH
LYNDEBOROUGH
Old Temple Rd West
Miller Park Road
TEMPLE
101
101
Refuge Boundary
Data Sources:
NH GRANIT - NAIP Quad - 2003; Public Roads; Political Boundaries
USFWS refuge boundaries
Map prepared for Wapack National Wildlife Refuge Comprehensive Conservation Plan, September 2007.
This map is for planning purposes only
0 0.2 0.4 0.8 1.2 1.6 2
Miles
N

Chapter 5, "Consultation and Coordination with Others and List of Preparers," tells how we involved the public and our partners in the planning process and credits this plan's contributors. Four appendixes, a bibliography, and a glossary provide additional supporting documentation and references.

The Purpose of and Need for the Proposed Action

We propose to develop a final CCP for the refuge that best achieves its purpose, vision, and goals; contributes to the mission of the National Wildlife Refuge System (Refuge System); adheres to Service policies and other mandates; addresses significant issues; and, incorporates the sound principles of fish and wildlife science.

NEPA regulations require us to evaluate a reasonable range of alternatives, including our preferred action and "no-action." The no-action alternative described in alternative A incorporates existing management practices. We did not consider among the range of reasonable alternatives either (1) continuing to manage the refuge without a CCP, or (2) not managing the refuge altogether, because each of those would require the Service to abdicate its statutory authorities and mandates.

The *purpose of* a CCP is to provide each refuge with strategic management direction for the next 15 years, by

- stating clearly the desired future conditions for refuge habitat, wildlife, visitor services, staffing, and facilities;
- explaining clearly to state agencies, refuge neighbors, visitors, and partners the reasons for our management actions;
- ensuring that our management of the refuge conforms to the policies and goals of the Refuge System and legal mandates;
- ensuring that present and future public uses are compatible with the purposes of the refuge;
- providing long-term continuity and direction in refuge management; and,
- justifying budget requests for staffing, operating and maintenance funds.

We identify several reasons as the *need for* this CCP. First, the Refuge Improvement Act requires us to write a CCP for every national wildlife refuge to help fulfill the mission of the Refuge System. Second, the Wapack refuge lacks a master plan to accomplish the purposes above. The need for a strategic plan is even more compelling because this is an unstaffed refuge, and we rely heavily on informal agreements with partners to assist in managing it. The proposals in this plan reflect the input of natural resource agencies in New Hampshire, affected communities, individuals and organizations, our partners, and the public.

The Service and the Refuge System Policies and Mandates Guiding our Planning

The U.S. Fish and Wildlife Service and its Mission

The Service is part of the Department of the Interior. Our mission is *"Working with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people."*

Congress entrusts to the Service the conservation and protection of these national natural resources: migratory birds and fish, federal-listed threatened or endangered species, inter-jurisdictional fish, wetlands, certain marine mammals, and national wildlife refuges. We also enforce federal wildlife laws and international treaties on importing and exporting wildlife, assist states with their fish and wildlife programs, and help other countries develop their conservation programs.

The Service manual, available online at *http://www.fws.gov/policy/manuals*, contains the standing and continuing directives on fulfilling our responsibilities. The 600 series of the Service manual addresses land use management: sections 601–609 specifically address the management of national wildlife refuges.

We publish special directives that affect the rights of citizens or the authorities of other agencies separately in the Code of Federal Regulations (CFR); the Service manual does not duplicate them (see 50 CFR 1–99 online at *http://www.access.gpo.gov/nara/cfr/index.html*).

The National Wildlife Refuge System and its Mission and Policies

The Refuge System is the world's largest collection of lands and waters set aside specifically for the conservation of wildlife and the protection of ecosystems. More than 548 national wildlife refuges encompass more than 97 million acres of lands and waters in all 50 states and several island territories. Each year, more than 40 million visitors hunt, fish, observe and photograph wildlife, or participate in environmental education and interpretation on refuges.

In 1997, President William Jefferson Clinton signed into law the National Wildlife Refuge System Improvement Act (Refuge Improvement Act). It establishes a unifying mission for the Refuge System.

> *"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans."*—Refuge Improvement Act; Public Law 105-57

It also establishes a new process for determining the compatibility of public uses on refuges, and requires us to prepare a CCP for each refuge. The act states that the Refuge System must focus on wildlife conservation. It also states that the mission of the Refuge System and the purposes for which each refuge was established will provide the principal management direction on that refuge.

The Refuge System Manual contains policy governing the operation and management of the Refuge System that the Service Manual does not cover, including technical information on implementing refuge policies and guidelines on enforcing laws. You can review that manual at refuge headquarters. These a few noteworthy policies affect this CCP.

Policy on Refuge System Planning

This policy (602 FW 1, 2, and 3) establishes the requirements and guidance for Refuge System planning, including CCPs and step-down management plans. It states that we will manage all refuges in accordance with an approved CCP that, when implemented, will help

- achieve refuge purposes;
- fulfill the Refuge System mission;
- maintain and, where appropriate, restore the ecological integrity of each refuge and the Refuge System;
- achieve the goals of the National Wilderness Preservation System and the National Wild and Scenic Rivers System; and,
- conform to other mandates.

The planning policy provides guidance, systematic direction, and minimum requirements for developing all CCPs, and provides a systematic decision-making process to fulfill those requirements. Among them, we are to review any existing special designation areas for their potential for such designations (e.g., wilderness and wild and scenic rivers), and incorporate a summary of those reviews into each CCP (602 FW 3).

Policy on the Appropriateness of Refuge Uses

Federal law and Service policy protect the Refuge System from inappropriate or harmful human activities, and ensure that visitors can enjoy its lands and waters. This policy (603 FW 1) provides a national framework for determining appropriate refuge uses and preventing or eliminating those that should not occur in the Refuge System. It describes the initial decision-making process the refuge manager follows when first considering whether to allow a proposed use. An appropriate use must meet at least one of the following four conditions.

1. The use is a wildlife-dependent recreational use, as identified in the Refuge Improvement Act.

2. The use contributes to fulfilling the purpose(s) of the refuge, the mission of the Refuge System, or the goals or objectives described in a refuge management plan approved after October 9, 1997, the date the Refuge Improvement Act became law.

3. The use involves the taking of fish and wildlife under State regulations.

4. The use has been found to be appropriate at the conclusion of a specified process that uses 10 criteria. You may view that policy online at *http://www.fws.gov/policy/library/06-5645.pdf*.

Policy on Compatibility

This policy (603 FW 2) complements the appropriateness policy. The refuge manager first must find a use appropriate before reviewing its compatibility. If the proposed use is inappropriate, the refuge manager will not allow it, and will not prepare a compatibility determination.

You may view this policy and its regulations online at *http://policy.fws.gov/library/00fr62483.pdf*, including a description of the process and the requirements for conducting compatibility reviews. Our summary follows.

- The Refuge Improvement Act and its regulations require an affirmative finding by the refuge manager on the compatibility of a public use before we allow it on a national wildlife refuge.
- A compatible use is one “that will not materially interfere with or detract from the fulfillment of the mission of the Refuge System or the purposes of the refuge.”—Refuge Improvement Act
- The act defines six wildlife-dependent uses that are to receive our enhanced consideration on refuges: hunting, fishing, wildlife observation and photography, and environmental education and interpretation.
- The refuge manager may authorize those priority uses on a refuge when they are compatible, and are consistent with public safety.
- A compatibility determination will stipulate the required maximum reevaluation dates: 15 years for wildlife-dependent recreational uses; or, 10 years for other uses.
- The refuge manager may reevaluate the compatibility of any use at any time: for example, sooner than its mandatory date or even before we complete the CCP process, if new information reveals unacceptable impacts or incompatibility with refuge purposes (602 FW 2.11, 2.12).
- The refuge manager may allow or deny any use, even one that is compatible, based on other considerations, such as public safety, policy, or available funding.

Policy on Maintaining Biological Integrity, Diversity, and Environmental Health

This policy provides guidance on maintaining or restoring the biological integrity, diversity, and environmental health of the Refuge System, including the protection of a broad spectrum of fish, wildlife, and habitat resources in refuge ecosystems.

Biological integrity refers to the composition, structure, and functioning of the biota at the genetic, organism, and community levels, when compared with historic conditions. The policy defines biological diversity as the variety of life and its processes, including the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur. Environmental health refers to the composition, structure, and functioning of soil, water, air and other abiotic features compared with historic conditions.

The policy provides refuge managers with a process for evaluating the best management direction to prevent the additional degradation of environmental conditions and restore lost or severely degraded environmental components. It also provides guidelines for dealing with external threats to the biological integrity, diversity, and environmental health of a refuge and its ecosystem (601 FW 3). It is available at *http://www.fws.gov/policy/library/01fr3809.pdf*

Other Mandates

Other federal laws, executive orders, treaties, interstate compacts, and regulations on conserving and protecting natural and cultural resources also affect how we manage refuges. The centralized library of Service-wide policies, executive orders, director's orders, and the "Digest of Federal Resource Laws of Interest to the U.S. Fish and Wildlife Service" are available at *http://www.fws.gov/policy/.*

Federal laws also require the Service to identify and preserve its important historic structures, archaeological sites, and artifacts. NEPA mandates our consideration of cultural resources in planning federal actions. The Refuge Improvement Act requires that the CCP for each refuge identify its archaeological and cultural values. Highlights of some of those laws affecting CCP development and implementation follows.

The National Historic Preservation Act (NHPA) (Pub. L. 102–575; 16 U.S.C. 470) requires federal agencies to locate and protect historic resources—archaeological sites and historic structures eligible for listing or listed in the National Register of Historic Places, and museum property—on their land or on land affected by their activities. It also requires agencies to establish a program for those activities and carry them out in consultation with State Historic Preservation Offices (SHPOs).

The NHPA also charges federal agencies with locating and evaluating sites on their land and nominating them for inclusion in the National Register of Historic Places. We maintain an inventory of known archaeological sites and historic structures in the Northeast Regional Office, and file copies at each refuge. Our regional historic preservation officer in Hadley, Massachusetts, oversees our compliance with the NHPA and our consultations with state SHPOs. We must also comply with the Archaeological Resources Protection Act (Pub. L. 96–95, 16 U.S.C. 470aa–mm). It requires that we protect our archaeological sites from vandalism or looting and issue permits for site excavation.

The Service also owns and cares for museum properties. The most common are archaeological, zoological and botanical collections, art, and historical photographs or objects. Each refuge maintains an inventory of its museum property. Our museum property coordinator in Hadley, Massachusetts, guides the refuges in caring for that property, and helps us comply with the Native American Graves Protection and Repatriation Act (25 U.S.C. 3001, et seq.) and federal regulations governing federal archaeological collections.
Our program ensures that Service collections will continue to be available to the public for learning and research.

Chapter 4, "Environmental Consequences," evaluates this plan's compliance with the cultural and historic acts cited above, the Clean Water Act, Clean Air Act, and Endangered Species Act. As we mentioned previously, we developed this draft CCP/EA to comply with NEPA.

Conservation Plans and Initiatives Guiding the Project

Birds of Conservation Concern 2002 Report

The Service developed this report (USFWS 2002) in consultation with the leaders of ongoing bird conservation initiatives and partnerships such as Partners In Flight (PIF), the North American Waterfowl Management Plan (NAWMP) and Joint Ventures, the North American Waterbird Conservation Plan (NAWCP), and the U.S. Shorebird Conservation Plan. The report fulfills the mandate of the 1988 amendment to the Fish and Wildlife Conservation Act (16 U.S.C. §§2901, et seq.), which requires the Secretary of the Interior to "identify species, subspecies, and populations of all migratory non-game birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act of 1973."

The 2002 report contains 45 lists that identify bird species of conservation concern at national, regional, and landscape scales. It includes a principal national list, seven regional lists corresponding to the seven regional administrative units of the Service, and species lists for each of the 37 Bird Conservation Regions (BCRs) designated by the North American Bird Conservation Initiative (NABCI) in the United States. NABCI defined those BCRs as ecologically based units in a framework for planning, implementing, and evaluating bird conservation. The refuge lies in the Atlantic Northern Forest BCR 14 (see additional discussion below).

Our agency's overarching goal in developing that report is to stimulate federal, state, and private agencies to coordinate, develop, and implement integrated approaches for conserving and managing the birds most in need of conservation. The report is available online at *http://www.fws.gov/migratorybirds/reports/BCC2002.pdf.*

Atlantic Northern Forest Bird Conservation Region Blueprint (BCR 14)

The Atlantic Coast Joint Venture partnership created its "Blueprint for the Design and Delivery of Bird Conservation in the Atlantic Northern Forest" (2003 draft and its update), in response to the NABCI challenge of building on existing partnerships to plan, implement, and evaluate cooperative bird conservation across North America. You may read the entire text of that document online at *http://www.acjv.org/documents/bcr14_blueprint.pdf*. It presents a strategic design of the key components that this BCR initiative will need to maintain healthy populations of birds native to the Atlantic Northern Forest (BCR 14). Specifically, it establishes a series of goals for moving BCR 14 toward a vision of sustained bird populations; it presents the biological foundation for its recommendations; and, it lays out a framework for implementing and evaluating those (Dettmers 2004).

The blueprint for BCR 14 identifies 53 bird species designated "highest" or "high" conservation priority in the region and 15 habitat types important for supporting one or more of those priority bird species during at least one of their life stages. Seven of the 53 highest and high-priority species have been observed on the refuge. The habitats identified either need critical conservation attention, or are crucial in long-term planning to conserve continentally and regionally important bird populations. The refuge offers 3 of the 15 priority habitat types. We considered each of those species and habitats in writing appendix C, "Species and Habitats of Conservation Concern," and in developing our objectives and strategies for goal 1.

Partners In Flight Bird Conservation Plans

In 1990, PIF began as a voluntary, international coalition of government agencies, conservation organizations, academic institutions, private industries, and citizens dedicated to reversing the population declines of bird species and "keeping common birds common." The foundation of its long-term strategy is a series of scientifically based bird conservation plans using physiographic areas as planning units.

The goal of each PIF plan is to ensure the long-term maintenance of healthy populations of native birds, primarily non-game birds. The plan for each physiographic area ranks its bird species according to their

conservation priority, describes their desired habitat conditions, develops biological objectives, and recommends conservation measures. That priority ranking also factors in habitat loss, population trends, and the vulnerability of a species and its habitats to regional and local threats.

Physiographic Area 27—Northern New England (June 2000 Draft).—Our planning area lies in Physiographic Area 27, Northern New England. In developing our habitat goals and objectives, we referred to its draft plan, now online at *http://www.blm.gov/wildlife/plan/pl_27_10.pdf.* That plan (Rosenberg and Hodgman 2000) includes objectives for the following habitat types and associated species of conservation concern on the refuge.

- *Northern hardwood and mixed forest*: black-throated blue warbler, Canada warbler, and blackburnian warbler; and,
- *Mature conifer (spruce-fir) forest*: blackburnian warbler, bay-breasted warbler, sharp-shinned hawk.

Partners in Amphibian and Reptile Conservation, National State Agency Herpetological Conservation Report (Draft 2004)

Partners in Amphibian and Reptile Conservation (PARC) was created in response to the increasing, well-documented national declines in amphibian and reptile populations. PARC members come from state and federal agencies, conservation organizations, museums, the pet trade industry, nature centers, zoos, the power industry, universities, herpetological organizations, research laboratories, forest industries and environmental consultants. Its five geographic regions—Northeast, Southeast, Midwest, Southwest and Northwest—focus on national and regional herpetofaunal conservation challenges. Regional working groups allow for region-specific communication.

The National State Agency Herpetological Conservation Report (NHCR), a summary report sponsored by PARC, provides a general overview of each state wildlife agency's support for reptile and amphibian conservation and research through September 2004. Each state report was compiled in cooperation with its agency's lead biologist on herpetofaunal conservation. The purpose is to facilitate communication among state agencies and partner organizations throughout the PARC network to identify and address regional and national herpetological priorities.

PARC intends to expand the scope of the NHCR to include other states, provinces, and territories. It will also include other state agencies that are supporting herpetofaunal conservation and research, such as transportation departments, park departments, and forest agencies. New Hampshire has completed reports included in the NHCR online at *http://www.parcplace.org/documents/PARCNationalStates2004.pdf.* The next NHCR will integrate the list of species of conservation concern from each state's wildlife action plan (see below). We used the latest draft NHCR plan in developing appendix C, "Species and Habitats of Conservation Concern."

New Hampshire Fish and Game Department, Wildlife Action Plan (WAP 2005)

In 2002, Congress created the State Wildlife Grant Program (SWG), and appropriated $80 million in state grants. The purpose of the program is to help state and tribal fish and wildlife agencies conserve fish and wildlife species of greatest conservation need. The funds appropriated under the program are allocated to the states according to a formula that takes into account their size and population.

To be eligible for additional federal grants, and to satisfy the requirements for participating in the SWG program, each state and territory was to develop its "Comprehensive Wildlife Conservation Strategy" (CWCS) and submit it to the National Advisory Acceptance Team by October 1, 2005. Each strategy was to address eight required elements, identify and focus on "species of greatest conservation need," yet address the "full array of wildlife" and wildlife-related issues, and "keep common species common."

The New Hampshire plan (NHFG 2005) resulted from that charge. The goal of the plan is to create a vision for conserving the state's wildlife and stimulate other state agencies, federal agencies, and conservation partners to think strategically about their individual and coordinated roles in prioritizing conservation.

In addressing the eight elements below, New Hampshire's WAP supplements and validates the information on species and habitat and their distribution in our planning analysis area, and helps us identify conservation threats and management strategies for species and habitats of conservation concern in this CCP. The expertise and the partner and public involvement that compiled the plan further enhance its benefit for us. We used it in developing the objectives and strategies for goal 1. These are the eight elements.

1. Information on the distribution and abundance of species of wildlife, including low and declining populations, as the state fish and wildlife agency deems appropriate, that are indicative of the diversity and health of the state's wildlife.
2. Descriptions of locations and relative condition of key habitats and community types essential to the conservation of species identified in element 1.
3. Descriptions of problems that may adversely affect species identified in element 1 or their habitats, and priority research and survey efforts needed to identify factors that may assist in restoration and improved conservation of these species and habitats.
4. Descriptions of conservation actions necessary to conserve the identified species and habitats and priorities for implementing such actions.
5. Plans proposed for monitoring species identified in element 1 and their habitats, for monitoring the effectiveness of the conservation actions proposed in element 4, and for adapting those conservation actions to respond appropriately to new information or changing conditions.
6. Descriptions of procedures to review the plan at intervals not to exceed 10 years.
7. Plans for coordinating, to the extent feasible, the development, implementation, review, and revision of the plan strategy with federal, state, and local agencies and Native American tribes that manage significant areas of land and water within the state, or administer programs that significantly affect the conservation of identified species and habitats.
8. Plans for involving the public in the development and implementation of plan strategies.

Other Regional Information Sources

We also consulted the plans and resources below as we refined our management objectives and strategies.

- New Hampshire Big Game Plan, 2006; available online at *http://www.wildlife.state.nh.us/Hunting/Hunting_PDFs/NH_Big_Game_Plan_FINAL.pdf*
- Society for the Protection of NH Forests, New Hampshire's Changing Landscape, 2005; available online at *http://www.spnhf.org/research/research-projects.asp#nhcl*
- New Hampshire Statewide Comprehensive Outdoor Recreation Plan, 2003; available online at *http://www.nh.gov/oep/programs/SCORP/documents/scorpweb.pdf*

Refuge Establishment Purposes and its Land Acquisition History

With the first donation of 738 acres of land in 1972, we established the refuge for the following purpose and under the following authority: "for use as an inviolate sanctuary, or for any other management purpose, for migratory birds" (Migratory Bird Conservation Act, 16 U.S.C. 715d).

In 1977, another donated tract totaling 934 acres increased the size of the refuge to 1,672 acres. A final land survey in 1998 adjusted the refuge boundary line, excluding the town of Lyndeborough. That adjustment resulted in a loss of 47 acres. The refuge now comprises 1,625 acres.

Refuge Administration

The refuge manager at the Great Bay refuge in Newington, NH, administers the unstaffed Wapack refuge. The 2006 Regional Strategic Downsizing Plan includes the decision to de-staff the Great Bay refuge and administer both it and the Wapack refuge from the Parker River refuge in Newburyport, MA. We expect to implement that downsizing and administrative change in 2008.

Refuge Operational Plans ("Step-down" Plans)

Refuge planning policy lists more than 25 step-down management plans that generally are required on refuges. Those plans contain specific strategies and implementation schedules for achieving refuge goals and objectives. Some plans require annual revisions; others require revision every 5 to 10 years. Some require additional NEPA analysis, public involvement, and compatibility determinations before we can implement them.

In 2005, we completed a Fire Management Plan for the Great Bay refuge that incorporated strategies for Wapack refuge. No other step-down plans are current.

Refuge Vision Statement and Goals

Refuge Vision Statement

Very early in the planning process, our team developed this vision statement to provide a guiding philosophy and sense of purpose in the CCP.

"Encompassing the North Pack Monadnock Mountain in southern New Hampshire, the Wapack National Wildlife Refuge provides exceptional mature spruce-fir and northern hardwood-mixed habitat for wildlife, particularly migratory birds. We will manage the refuge to preserve its natural conditions in a setting that appears to have been affected primarily by the forces of nature.

All visitors are welcome to enjoy opportunities to observe and photograph nature along refuge trails, including a 4-mile segment of the Wapack Trail. The rock outcrop and cliff on the mountain peak afford an ideal location to view migrating hawks each fall. Old and new partnerships with other federal agencies, state agencies, local conservation organizations, and volunteers will foster public stewardship of this refuge and its resources, and enhance public understanding of the role of the National Wildlife Refuge System in conserving our nation's trust resources."

Refuge Goals

We developed these goals after considering our vision and the purposes of the refuge, the missions of the Service and the Refuge System, and the mandates, plans, and conservation initiatives above. These goals are intentionally broad, descriptive statements of purpose. They highlight the elements of our vision for the refuge we will emphasize in its future management. The biological goals take precedence; but otherwise, we do not present them in any particular order. Each offers background information on its importance. In chapter 2, "Alternatives Considered, Including the Service-preferred Alternative," we evaluate different ways of achieving these goals.

Goal 1. Allow natural processes and disturbances to enhance biological diversity and integrity of upland wildlife habitat.

Goal 2. Establish a public use program that will encourage compatible, low-impact recreation on refuge trails.

Goal 3. Enhance the conservation and stewardship of wildlife resources through partnerships with public and private conservation groups, private landowners, State agencies and local entities.

The Comprehensive Conservation Planning Process

Service policy establishes an eight-step planning process that also facilitates our compliance with NEPA (figure 1.1).[1] Our planning policy and CCP training course materials describe those steps in detail. We followed that process in developing this draft CCP/EA.

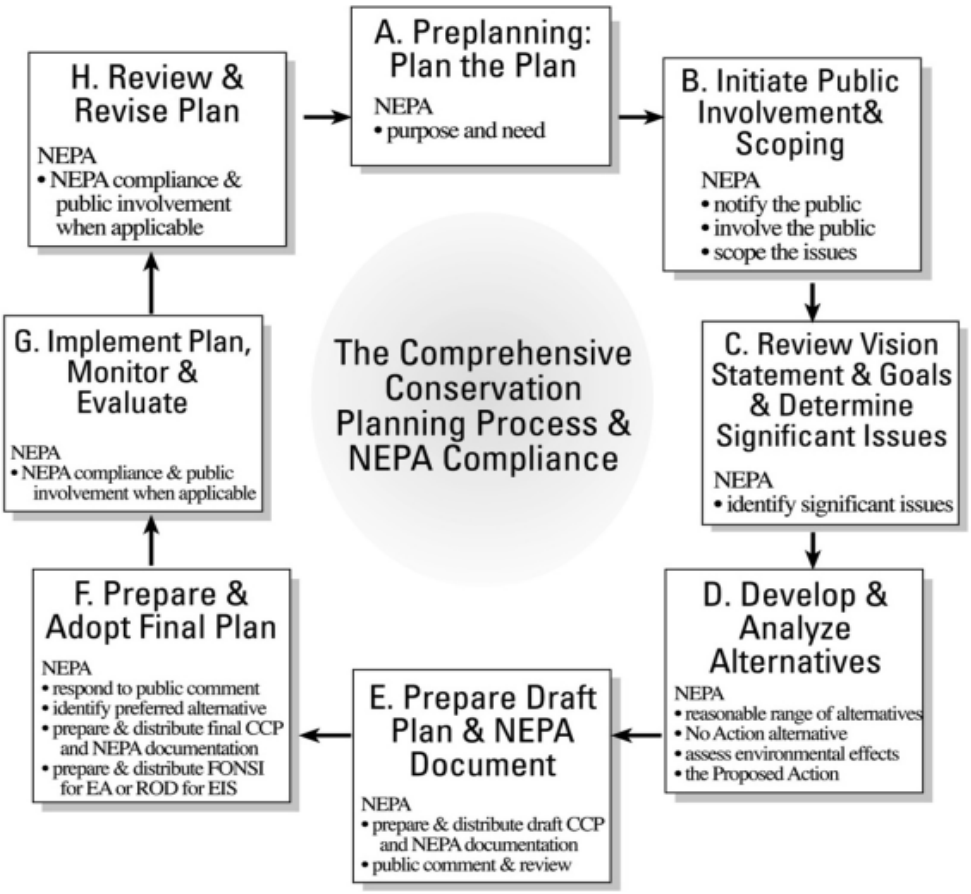


Figure 1.1. The Comprehensive Conservation Planning Process

Since the first donation of land in 1972, we have focused on managing the refuge as the deed requires, with minimal intervention, as in a wilderness area. We prohibit hunting, fish, trapping, cutting trees, and using motor vehicles.

In January 2007, we began to prepare for the CCP by collecting information about resources on the refuge and by requesting available information from surrounding conservation landowners (e.g., Miller State Park, Joanne Bass Bross Preserve). Graduate students from the Conway School of Landscape Design in Conway, MA, participated in that project from January to March 2007.

[1] 602 FW 3, "The Comprehensive Conservation Planning Process" (*http://policy.fws.gov/602fw3.html*)

In February 2007, we convened our core team, which consists of refuge staff, regional office staff, and representatives of the New Hampshire Fish and Game Department (NHFG) and the New Hampshire Department of Recreation and Economic Development (NH DRED), Division of Parks and Recreation. We discussed management issues, drafted a vision statement and goals, and compiled a project mailing list of known stakeholders, interested individuals, organizations, and agencies. We initiated all of those steps as part of NEPA Step A; "Preplanning" (figure 1.1, above).

In February 2007, we began NEPA Step B, "Initiate Public Involvement and Scoping," by publishing a newsletter to announce that we were starting the planning process, and to encourage community involvement. We also worked concurrently on Step C, "Review Vision Statement, Goals, and Identify Significant Issues." On February 23, 2007, we formally published the start of the planning process in a Federal Register Notice of Intent (NOI). We also announced one public scoping meeting in Peterborough to identify public issues and concerns, share our draft vision statement and tentative goals, describe the planning process, and explain how people could become involved in and stay informed about that process. The twenty-six people who attended helped us identify the public concerns we would need to address in the planning process.

During March 2007 we reviewed the public comments received at meeting and via email and regular mail to firm up our key issues. We also reviewed our draft vision and goals and made some refinements. This completed Step C, "Review Vision, Goals and Determine Issues." Next, we moved right into Step D, "Develop and Analyze Alternatives." The purpose of this step is to develop alternative objectives and strategies for addressing the issues and achieving the goals. Our preliminary ideas were presented at a second public meeting on March 6, 2007. We then worked from March to August 2007 to finalize our proposals to serve as a foundation for this draft CCP/EA. In November 2007, we distributed a newsletter summarizing the alternatives in detail and updating our planning timeframes.

We completed Step E, "Prepare Draft Plan and NEPA document," by publishing our Notice of Availability (NOA) in the Federal Register, announcing the release of this draft CCP/EA and distributing it for public review. During the 30-day period of public review, we will hold a public hearing to obtain comments. We also expect to receive comments by regular mail or electronic mail. After the comment period expires, we will review and summarize all of the comments we have received, develop our responses, and present them in an appendix to the final CCP.

Once we have prepared the final CCP, our regional director will determine whether it addresses all significant issues and our analysis was adequate. If he agrees with our analysis, and concludes that there are no significant impacts and compliance with federal laws and mandates is complete, he will issue a Finding of No Significant Impact (FONSI), and approve our final plan. That will complete Step F, "Prepare and Adopt a Final Plan." Then we can begin Step G, "Implement Plan, Monitor and Evaluate."

We will modify the final CCP by following the procedures in Service policy (602 FW 1, 3, and 4) and NEPA requirements as part of Step H, "Review and Revise Plan." Minor revisions that meet the criteria for categorical exclusions (550 FW 3.3C) will require only an environmental action memorandum. We must revise each CCP fully every 15 years. We may revisit the compatibility determinations that accompany it even sooner than that mandatory date, or even before we complete the CCP process, if new information reveals unacceptable impacts or incompatibility with refuge purposes.

Issues

During the scoping process, our partners and the public brought to our attention the issues they wanted us to address. We identified others in our planning team discussions. Initially, we distinguished between those issues whose resolution lies within the jurisdiction of the Service, and those that either lie outside the scope of this analysis or do not fall completely within Service jurisdiction. We summarize those in a separate section below.

Our discussion of the issues within Service jurisdiction generated a wide range of opinions on how to resolve them. How we will treat them creates the primary distinctions among the objectives and strategies in each alternative in chapter 2. A more detailed description of those issues follows.

Biological Surveys

Because the Wapack refuge is unstaffed, no one is available onsite to conduct biological surveys. Our limited budgets also make it difficult to contract those surveys to other organizations or individuals. Members of the community not only are concerned over the lack of biological surveys, but also want us to publish or make available, present and future refuge biological information.

Active Management for Forest Habitat

Some members of the public suggested that the Service manipulate habitat to provide more habitat diversity for wildlife species on the refuge. They also expressed an interest in reducing mature forest cover through selective cutting and prescribed burning, to attract more species of mammals (e.g., moose, bobcat) to the refuge.

Some suggested that the refuge establish clearings by cutting selectively along the trail, to provide better birding and viewing at the top of the mountain. We heard that tree growth is obscuring those views.

One person also expressed an interest in our actively managing refuge habitat to maintain blueberry bushes; they cannot survive under heavy shade. Annual or biannual selective cutting or prescribed burning would be necessary to remove that shade and promote the growth of blueberries. The deed of donation restricts any tree cutting on the refuge, except as necessary for maintaining trails.

Invasive Species

The establishment and spread of invasive species, particularly invasive plants, is a significant problem that spreads across all types of habitat. For this discussion, we use the definition of invasive species in the Service Manual (620 FW 1.4E): “Invasive species are alien species whose introduction [causes] or is likely to cause economic or environmental harm, or harm to human health. Alien species, or non-indigenous species, are species that are not native to a particular ecosystem. We are prohibited by executive order, law, and policy from authorizing, funding, or carrying out actions that are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere.”

The unchecked spread of invasive plants threatens the biological diversity, integrity and environmental health of all refuge habitats. In many cases, because of their competitive advantage over native plants, they form dominant cover types, thus reducing the availability of native plants as food and cover for wildlife. Over the past several decades, government agencies, conservation organizations, and the public have become more acutely aware of the negative effects of invasive species. Many plans, strategies, and initiatives target the more effective management of invasive species, including *The National Strategy for Management of Invasive Species* for the Refuge System (USFWS 2003c) and *Silent Invasion—A Call to Action,* by the National Wildlife Refuge Association (NWRA 2002). The Refuge System biological discussion database and relevant workshops continually provide new information and updates on recent advances in control techniques. Funding sources to conduct inventory and control programs also have grown, both within the Service budget and through competitive grants.

Trail Maintenance

The 4-mile section of the Wapack Trail that runs through the refuge is often difficult to maintain due to the rocky terrain. That terrain and the unsure footing of the trail may also create a safety issue for refuge visitors. The compaction of soil and vegetation can increase runoff and, consequently, increase erosion. In trying to circumvent problem areas, people have created braided trail sections and stream crossings.

Establishment of New Trails

When we established the refuge, only the 4–mile segment of the Wapack Trail and the 1.1-mile Cliff Trail were recognized. Since then, local residents have created two new trails: Ted's and Carolyn's trails (3 miles of their total 5.15 miles run on the refuge). We are concerned that other trails may be established without the consultation or knowledge of the Service.

Trailhead Access to the Northern End of the Refuge

The only way that visitors can access the northern end of the refuge now is by parking on the road shoulder of Old Mountain Road. Parking there can be problematic for several reasons. First, on many weekends, not enough parking is available for all the visitors who want access to the refuge. Because of the limited space for cars, visitors often park in unsafe areas. Once visitors have parked, they must walk along the road to access the trailhead. That creates another safety concern about traffic on the road. Parking on that road also creates a problem for the Town of Greenfield's Department of Transportation. In the winter, cars parked on the side of the already narrow road make clearing it safely even more difficult for snowplows. The Town of Greenfield is very concerned about this recurring problem, and wants us to work with them in solving it.

Minimal Service Presence on the Refuge

Our limited staff and funding have prevented us from improving the visibility and presence of the Service at the refuge and in the local community. Only one sign, erected by the Friends of the Wapack (FOW), shows a topographic map at the trailhead (the northern end of the refuge). It shows the layout of the Wapack Trail, but does not provide any information about the refuge (e.g., the refuge boundary, Service contact information, or refuge rules and regulations). We posted the refuge boundary with standard Refuge System "blue goose" signs; however, those are the only signs that notify the public they are on a national wildlife refuge.

Dog Walking

Before this CCP, we had not decided whether to allow leashed dogs on the refuge. Technically, without a finding of appropriateness or determination of compatibility, dog walking is prohibited on the refuge. However, our limited staff has been unable to enforce that prohibition, and many refuge visitors are unaware that the activity is prohibited. Consequently, many dogs have been seen on the refuge. During several visits this spring and summer, we observed dogs roaming freely without leashes on the refuge trail.

The public expressed an interest in dog walking on the refuge. Many would be satisfied with adhering to a regulation allowing only leashed dogs on the refuge. Others would like us to allow unleashed dogs that are under the command and control of their owners. Everyone we spoke with stated that prohibiting dog walking altogether on the refuge would create confusion when users of the Wapack Trail walk north from other areas, (e.g., Miller State Park), where dog walking on leash is allowed.

Illegal Camping

No camping is allowed on the refuge. Members of the FOW have seen evidence of camping on the refuge, but recently that evidence has decreased. The minimal Service presence makes it difficult to monitor the area regularly for illegal camping and enforce the "no camping" restriction.

Illegal Hunting

The deed restricts any form of hunting on the refuge. Landowners nearby have complained of hearing gunshots in the refuge area during the hunting season. In response, they called local wardens of the state game division, with whom we have a partnership agreement. Again, the minimal Service presence makes it difficult to monitor the area regularly for illegal hunting. Members of the community would like to see more law enforcement officials (whether state or federal) patrolling the area, particularly during the hunting season.

Refuge Expansion

Several members of the public suggested that the Service consider expanding the refuge to create better linkage with other conservation land areas. Some were interested specifically in acquiring adjacent, lower elevation habitat, including old farm fields. They believe this protection would ensure the support of a greater diversity of wildlife. Please refer to “Refuge Expansion” in chapter 2 for a more detailed discussion.

Issues Outside the Scope of this Analysis or Not Completely Within the Jurisdiction of the Service

Giving or transferring refuge lands to other local conservation organizations

Members of the public suggested that the Service transfer or give the refuge or refuge management authority to a state or local conservation organization. They are concerned that the Service is unable to manage the refuge effectively due to its limited staff and budget. Some feel that other conservation groups would do a better job of managing refuge resources and improving the visitor experience.

We have no plans to assign staff permanently to this refuge, as other regional priorities and current fiscal conditions prevent us from doing so. On the other hand, we plan to make several improvements to the refuge (under alternative B) through enhanced partnerships and cooperation with other federal agencies, local conservation groups, and the public. Those proposals will promote better stewardship of the refuge and raise the visibility and public awareness of its resources.

Although some suggest that we transfer or donate the refuge to another conservation entity, the deed prohibits us from doing so. Furthermore, the Service can only relinquish lands it owns in fee through a land exchange, legislation, or the disposal or transfer of excess property under the Transfer of Certain Real Property for Wildlife Conservation Purposes Act of 1948. For example, the Service can dispose of refuge lands only after congressional legislation requires it, or because the agency determines that those lands are excess to its needs and no longer serve the mission of the Refuge System or the purposes for which the refuge was established. The Service can also exchange refuge land for land of equal market value and equal or higher natural resource value. An equalization payment would settle any difference in value.

In summary, unless directed by congressional legislation to initiate a disposal or exchange process, the Service would have to determine that the land of the Wapack refuge no longer contributes to the conservation of migratory birds and, in the case of an exchange, that the agency would gain land more important to our federal trust resources. In our professional judgment, that determination is unwarranted.

Chapter 2

View from the top of North Pack Monadnock
Andrew Ward/Conway School of Landscape Design

Alternatives Considered, Including the Service-preferred Alternative

- Introduction
- Formulating Alternatives
- Actions Considered but Eliminated from Detailed Study
- Actions Common to Both Alternatives
- Alternative A. Current Management
- Alternative B. The Service-preferred Alternative
- Highlights of Respective Alternatives' Actions as they Relate to Goals

Introduction

This chapter presents

- the process for formulating alternatives,
- the actions common to both alternatives,
- the alternatives we considered but eliminated from detailed study, and
- the alternatives A, "Current Management," and B, "The Service-preferred Alternative."

At the end of this chapter, table 2.1 compares the alternatives: how they address the key issues in chapter 1, support major programs, and achieve refuge goals.

Formulating Alternatives

Relating Goals, Objectives, and Strategies

One of the earliest steps in the planning process is to formulate refuge goals: the intentionally broad, descriptive statements of the desired future condition of refuge resources. Goals articulate the principal elements of refuge purposes and the vision statement, and provide a foundation for developing specific management objectives and strategies. By design, goals are less quantitative and more prescriptive than their objectives in defining the targets of our management. The goals stay the same in both management alternatives below. Their objectives and strategies distinguish one alternative from the other.

The next step is to consider a range of possible management objectives that would help us meet those goals. Objectives are incremental steps toward achieving a goal; they also further define the management targets in measurable terms. They typically vary among alternatives, and provide the basis for determining more detailed strategies, monitoring refuge accomplishments, and evaluating our success. "Writing Refuge Management Goals and Objectives: A Handbook" (USFWS 2004) recommends that objectives possess five properties to be "SMART": They must be (1) specific, (2) measurable, (3) achievable, (4) results-oriented, and (5) time-fixed.

A rationale accompanies each objective to explain its context and why we think it is important. When we write our refuge step-down plans, we would base them on the objectives in the alternative selected for the final CCP, and measure our success by how well we achieve them.

For each objective, we develop strategies: the combination of specific actions, tools, or techniques we may use to achieve that objective. In writing our refuge step-down plans, we would reevaluate how, when, and where we should implement most of the strategies.

Developing Alternatives, including the "No Action" Alternative

The National Environmental Policy Act (NEPA) requires that we evaluate a reasonable range of alternatives for managing the refuge before selecting the best one possible. Alternatives are packages of complementary objectives and strategies designed to meet refuge purposes, the Refuge System mission, refuge goals, while responding to the issues and opportunities identified during the planning process. We believe the objectives in the two alternatives below offer that reasonable range of proposals for managing the refuge over the next 15 years.

Alternative A satisfies the 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 alternative B. For detailed descriptions of current refuge resources and programs, please see chapter 3, "Affected Environment."

Many of the objectives in alternative A do not strictly follow the guidance in the Service's goals and objectives handbook, because we are describing current management decisions and activities that we established prior to that guidance. Rather, our descriptions of those activities derive from a variety of formal and informal management decisions and planning documents. Thus, the objectives in alternative A are fewer and more subjective than those in alternative B.

Alternative B, the Service-preferred alternative, combines the actions that we believe would achieve the purposes, vision, and goals of the refuge and respond to public issues most effectively. It emphasizes the management of refuge species and habitats by engaging in partnerships to monitor refuge resources with the U.S. Forest Service (USFS) and local conservation organizations. This alternative also proposes several improvements in visitor services, including the establishment of a parking area and a greater presence and visibility of the Service, trail maintenance through memorandums of understanding (MOU) with both the Friends of the Wapack and Mountain View Hiking Club, and increased outreach and education through enhanced partnerships.

Actions Considered but Eliminated from Detailed Study

Federal-Designated Wilderness

During the scoping phase of our planning process, we learned of an interest in designating the refuge as part of the National Wilderness Preservation System (NWPS). Appendix B, "Wilderness Review," documents our analysis of the wilderness potential of the refuge, and explains that the formal designation requires an act of Congress. That usually is predicated upon a recommendation from a federal agency. Our analysis determined that such a recommendation is not warranted at this time. However, we will reassess that determination in 15 years, when we revise the CCP.

Refuge Expansion

Many responses in our public scoping process encouraged us to expand the refuge for a variety of reasons. Some were concerned about the rapid rate of development nearby. Some wanted to link refuge land with two large conservation areas nearby.

- One is the Quabbin to Cardigan Conservation Collaborative (Q2C), which focuses on protecting land along the Monadnock Highlands, from the Quabbin Reservoir in central Massachusetts north to New Hampshire's Mt. Cardigan (The Society for the Protection of New Hampshire Forests 2004). The refuge lies in the "Wapack Focus Area" of the Quabbin to Cardigan corridor. If you would like more information, please visit the website *http://www.spnhf.org/landconservation/q2c.asp*.

- The other is the Temple to Crotched Community Conservation Corridor. The Monadnock Conservancy, which leads this effort, envisions linking the conservation areas on Crotched Mountain, Pack Monadnock, and Temple Mountain with a network of conservation easements in the towns of Greenfield, Peterborough, Sharon, and Temple (Monadnock Conservancy 2006). As with Q2C, the refuge lies directly in the Temple to Crotched Mountain corridor. For the latest information, please visit *http://www.monadnockconservancy.org/html/what_news20.html*.

Despite our interest in seeing those lands conserved for wildlife, neither alternative recommends that we acquire additional land at this time. Our regional perspective on all the other land protection priorities of the Service leads to doubt we would be able to secure the funding to buy additional land here or hire staff to manage it. However, if conditions change in the future and more land acquisition becomes possible, we may pursue that under a separate environmental assessment, after public review. As always, we would evaluate separately any opportunities that arose to accept donations of land.

Vegetation Management

Some members of the public who suggested that we actively manage refuge habitats in order to support a larger diversity of wildlife species were interested in providing less dense forest habitat, through selective cutting and prescribed burning, to bring more mammal species (e.g., moose and bobcats) to the refuge.

Some suggested that the refuge establish clearings along the Wapack Trail to provide better views and bird watching at the top of the mountain. They recommended selective cutting along the trail, particularly because the tree growth at the top of the mountain has obscured some views. One individual expressed an interest in actively managing trees and shrubs on North Pack Monadnock to maintain blueberry shrubs, which cannot survive under heavy shade. That would require selective cutting or prescribed burning to remove the shade. The deed donating the land to the Service prohibits cutting trees on the refuge, except as necessary for maintaining trails. That restriction prevents us from implementing these proposals to manage vegetation.

Actions Common to Both Alternatives

The alternatives share some actions in common. Some are required by law, policy, or refuge regulations, or may be administrative actions that do not require public review, but we want to highlight them in this public document. Others may be actions we believe are crucial in achieving the refuge purpose, vision, and goals.

Controlling Invasive Plant Species

One national priority of the Refuge System is to manage and control the spread of invasive plants. We have not conducted an inventory of invasive species on the refuge; however, we recently initiated a partnership with the USFS to conduct one.

One particular concern is glossy buckthorn, which is well established near the refuge. That invasive plant rapidly forms dense, even-aged thickets in both wetlands and woodland understories. Its seedlings invade apparently stable habitats, and grow most successfully where there is ample light and exposed soils, such as along woodland edges and in forest openings created by windfalls (Nashua Conservation Commission 2004).

Those are the areas we would focus on in the future. Our objectives are to ensure that no new invasive plants establish themselves, and to control the spread of any that the USFS inventory may find.

Maintaining Partnerships

We would maintain our present partnerships with the Friends of the Wapack (FOW), the New Hampshire Fish and Game Department (NHFG), and the Mountain View Hiking Club. Those three groups are particularly important and valued partners, whose contributions are vital to our success in managing many aspects of the refuge. For example, the FOW maintains the 4-mile section of the Wapack Trail and the 1.1-mile Cliff Trail where they run through the refuge. The Mountain View Hiking Club maintains the combined 5.15-mile Ted's and Carolyn's trails where they run through the refuge. The NHFG assists us with law enforcement.

Permitting Special Uses, Including Research and Economic Uses

We would require the refuge manager to evaluate the appropriateness and compatibility of all activities that require a special use permit. All research and commercial or economic uses require special use permits.

Research

Research on species of concern and their habitats would continue as a priority. We would continue to approve permits that provide a direct benefit to the refuge, or for research that would strengthen our decisions on managing its natural resources. The refuge manager may also consider requests that do not

relate directly to refuge objectives, but rather to the protection or enhancement of native species and biological diversity in the region.

All researchers would be required to submit detailed research proposals following the guidelines established by Service policy and refuge staff. Special use permits would also identify the schedules for progress reports, the criteria for determining when a project should cease, and the requirements for publication or other interim and final reports. All publications must acknowledge the Service and the role of Service staff as key partners in funding and/or operations. We would ask our refuge biologists, other divisions of the Service, USFS, select universities or recognized experts, and the state of New Hampshire to review as peers and comment on research proposals or draft publications, and would share the research results both internally and with those reviewers and other conservation agencies and organizations.

Some projects, such as depredation and banding studies, require additional Service permits. The refuge manager would not approve those projects until all their required permits have been received.

Commercial and Economic Uses

All commercial and economic uses would adhere to Title 50 of the Code of Federal Regulations (CFR), Subpart A, §29.1 and Service policy, which allow those activities if they are necessary to achieve the Refuge System mission or refuge purposes and goals. Allowing those activities also requires the Service to prepare a finding of appropriateness, a compatibility determination, and an annual special use permit outlining the terms, conditions, fees, and any other stipulations to ensure compatibility.

We would consider issuing a special use permit to commercial operators for each activity, such as guided wildlife viewing, that takes place completely on refuge lands, if that activity meets the thresholds noted above, including compatibility. In addition, we would require all operators to complete a detailed summary of their activities on the refuge each year, and require that they conduct periodic visitor satisfaction surveys using a survey method we review and approve prior to its use. We would modify or deny any subsequent issuance of annual permits based on annual reports, our field reviews and inspections, and the results of those surveys.

Distributing Refuge Revenue Sharing Payments

In accordance with the Refuge Revenue Sharing Act (16 U.S.C. 715s), Congress appropriates funds each year for refuge revenue sharing payments, which are calculated by a formula based on the acreage and value of refuge land in each taxing jurisdiction. Those payments change with changes in the appraised market values of refuge lands and new appropriations by Congress. Both of the alternatives would continue the payments described in chapter 3 to the Towns of Greenfield and Temple.

Protecting Cultural Resources

As a federal land management agency, we are responsible for locating and protecting all historic resources on the refuge or on land affected by refuge activities: specifically, archeological sites and historic structures eligible for or listed in the National Register of Historic Places, and any museum properties. Section 106 of the National Historic Preservation Act (NHPA) requires our evaluation of the effects of our actions on any archeological and historical resources on the refuge, and our consultation with respective State Historic Preservation Offices. Our compliance with the act may require any or all of the following: a State Historic Preservation Records survey, literature survey, or field survey.

We know of no archeological or historic sites on the refuge. Nevertheless, both alternatives would comply with the NHPA, should we find any.

Managing the Refuge According to Deed Stipulations

When the land for the refuge was donated to the Service, it was given under the condition that we would manage the refuge in a “wilderness-like” setting. Although the Wapack refuge is not designated as part of

the National Wilderness Preservation System (NWPS), the donors wanted the land to be preserved "as a place where the earth and its community of life are untrammeled by man, where man is a visitor who does not remain." That wording in the deed closely resembles the text in the Wilderness Act of 1964. We explain in appendix B why we are not recommending the refuge for NWPS status. However, both of the alternatives would continue to manage the refuge in a "wilderness-like" setting and adhere to the restrictions listed in the deed: the prohibition of hunting, fishing, trapping, travel in or use of vehicles, and the cutting of trees except for the maintenance of trails. Neither of the alternatives would result in the manipulation of refuge habitat, including selective cutting or prescribed burning.

Establishment of New Trails on the Refuge

Since the establishment of the refuge in 1972, two new trails have been developed on the refuge in addition to the Wapack Trail and the Cliff Trail: the Ted's and Carolyn's trails. We provided the descendant of the donors with a map of all the refuge trails, after determining their exact locations by using the Global Positioning System (GPS). With her approval, we officially recognized those two new trails in September 2007.

Neither alternative would authorize additional trails on the refuge. Please see map 2–1 below to view all designated refuge trails.

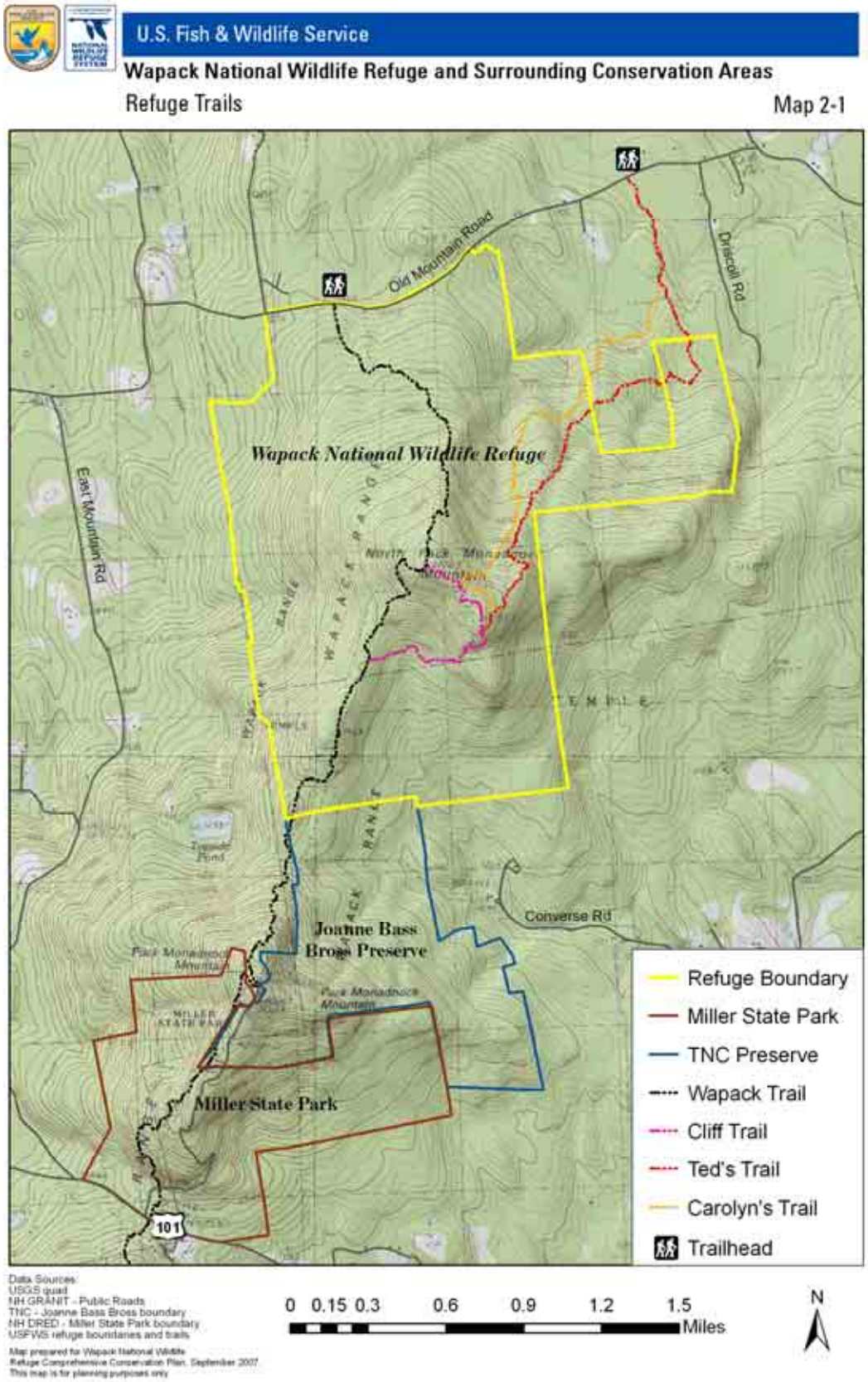
Staffing the Refuge

This unstaffed refuge is administered by the refuge manager at the Great Bay refuge, headquartered in Newington, NH. The 2006 Regional Strategic Downsizing Plan includes the decision to de-staff the Great Bay refuge and administer both the Wapack and Great Bay refuges from the Parker River refuge in Newburyport, MA.

We expect to implement that change in 2008. Under the new organization, we would continue to ensure that visitors have a safe visit, engage in approved appropriate and compatible activities, and understand and adhere to refuge regulations.

Operating Hours

We would continue to open the refuge for public use from one-half hour before official sunrise to one-half hour after official sunset, seven days a week, to ensure visitor safety and protect refuge resources. At the refuge manager's discretion, special use permits may allow organized, nocturnal activities, such as celestial observation or wildlife research.


U.S. Fish & Wildlife Service
Wapack National Wildlife Refuge and Surrounding Conservation Areas
Refuge Trails
Map 2-1
Old Mountain Road
Driscoll Rd
Wapack National Wildlife Refuge
East Mountain Rd
Joanne Bass Bross Preserve
Converse Rd
Miller State Park
101
Refuge Boundary
Miller State Park
TNC Preserve
Wapack Trail
Cliff Trail
Ted's Trail
Carolyn's Trail
Trailhead
Data Sources:
USGS quad
NH GRANIT - Public Roads
TNC - Joanne Bass Bross boundary
NH DRED - Miller State Park boundary
USFWS refuge boundaries and trails
Map prepared for Wapack National Wildlife Refuge Comprehensive Conservation Plan, September 2007
This map is for planning purposes only
0 0.15 0.3 0.6 0.9 1.2 1.5
Miles
N

Adaptive Management

Both alternatives would implement adaptive management. "Adaptive Management: The U.S Department of Interior Technical Guide (2007)," promotes flexible decision-making that can be adjusted in the face of uncertainties as we understand better the outcomes of management actions and other events. Careful monitoring of these outcomes advances scientific understanding and helps adjust policies or operations as part of an iterative process. Adaptive management does not represent an end in itself, but rather, a means to more effective decisions and enhanced benefits (William and Shapiro 2007).

The need for adaptive management is even more compelling, because our present information on refuge species and habitat is incomplete, provisional, and subject to change as our knowledge base improves.

We realize that we must adapt our objectives and strategies to respond to new information and spatial and temporal changes. We would continually evaluate management actions, both formally and informally through monitoring or research, to reconsider whether our original assumptions and predictions are still valid. In that way, management becomes a proactive process of learning what really works.

The refuge manager is responsible for changing management strategies or objectives if they do not produce the desired conditions. Significant changes may warrant additional NEPA analysis and public comment. Minor changes would not, but we would document them in our annual monitoring, in project evaluation reports, or in our annual narrative report.

Generally, we can increase monitoring and research that support adaptive management without additional NEPA analysis, and assuming the activities, if conducted by non-Service personnel, are determined compatible by the refuge manager in a compatibility determination.

Additional NEPA Analysis

NEPA generally requires site-specific analysis of impacts for all major federal actions in either an environmental assessment (EA) or an environmental impact statement (EIS). Our two alternatives propose many actions and associated impacts in enough detail to comply with NEPA without additional environmental analysis. The following examples fall into that category: implementing priority public use programs, new visitor services infrastructure and controlling invasive plants. Other activities are categorically excluded from the NEPA requirements to prepare environmental documents. Those generally include routine administrative actions, and are listed in chapter 4, "Environmental Consequences."
The only proposed action in this CCP that would require additional NEPA analysis is the construction of a parking area (see alternative B). We have yet to determine the design and location of that parking area, so we decided to postpone detailed NEPA analysis until that time.

Alternative A. Current Management

Introduction

This alternative portrays our current management activities and those already planned or approved.

- We would continue to manage the refuge in a “wilderness-like” setting.
- We would not actively manage habitat on the refuge. Rather, we would allow natural succession to continue without human interference.
- We would allow only uses that are consistent with the “wilderness-like” setting, other deed restrictions, and existing compatibility determinations. We would not allow hunting, fishing, trapping, driving motor vehicles or cutting trees (except in maintaining trails).
- We would continue to prohibit camping, mountain biking, horseback riding and dog walking.
- We would not take any new actions to improve the presence or visibility of the Service (e.g., posting an informational sign or posting refuge regulations) or access to the refuge (i.e., creating a parking area).
- We would continue our informal relationships with the FOW and the Mountain View Hiking club to maintain refuge trails, and continue to work under a MOA with the NHFG to resolve interjurisdictional issues on the refuge as they arise.

Goal 1. Allow natural processes and disturbances to provide biological diversity and integrity of upland wildlife habitat.

Objective 1a. (Natural Succession)

Continue to let the process of vegetative succession occur on the 1,625-acre refuge, primarily to provide breeding and migrating habitat for northern hardwood and spruce-fir-dependent birds.

Rationale for Objective

The deed of donation restricts the cutting of trees, except when necessary to maintain trails. That restriction prohibits us from actively managing the forest. Therefore, by engaging in passive management, we allow for the natural succession of the ecosystem. Succession is the natural, sequential change of the species composition of a community. Beginning in the eighteenth century, sheep and cattle were pastured on the hillsides. By the end of the nineteenth century, raising cattle became economically problematic and the fields were abandoned and allowed to grow back into forest. Throughout the 1900s, forests in the area were logged when demand was high. Since the last period of significant deforestation in the 1940s, timber harvests have been selective, resulting in mixed-aged stands of forest. The lower elevations of the refuge show signs of advanced succession into mature hemlock-beech-oak-pine forest. In higher elevations on the refuge, juniper is an indicator of transition from cleared field stage to a shrub stage to a spruce/fir forest.

If a natural disturbance was to occur on the refuge (e.g., an ice storm, hurricane, wildfire), the Service would not intervene unless the conditions became extreme. For example, if a fire posed a danger to surrounding landowners, we would take action to control it. In the case of less extreme conditions, we would not remove fallen trees, but rather, leave them to decompose as they would under natural conditions.

Strategies

Continue to

- Maintain the refuge in a "wilderness-like" setting with no development, minimal signs and other infrastructure.

- Allow natural succession and natural disturbances to occur without interference, except under extreme conditions, such as those that threaten human health and safety or the catastrophic loss of forest habitat.

Goal 2. Establish a public use program that will encourage compatible, low-impact recreation on refuge trails.

Objective 2a. (Trail Maintenance)

Continue our informal relationships with the Friends of the Wapack (FOW) for maintaining the sections of the Wapack Trail and the Cliff Trail that cross the refuge, and with the Mountain View Hiking Club for maintaining the sections of the Ted's and Carolyn's trails that cross the refuge.

Rationale for Objective

The FOW is an independent, non-profit organization of hikers, volunteers, supporters and landowners. The FOW encourages mutual courtesy, friendship and cooperation between hikers and landowners. Its volunteers are dedicated to the preservation of the Wapack Trail. We have maintained an informal agreement with FOW to maintain and preserve the 4-mile segment of the Wapack Trail and the 1.1-mile Cliff Trail that cross the refuge. This segment of the Wapack Trail is very popular among hikers, and sustains heavy use.

The Mountain View Hiking Club consists of neighboring landowners who provide maintenance of the Ted's and Carolyn's trails: 5.15 miles of hiking trails, of which 3 miles cross the refuge. Both trails cross both private and refuge land. From the top of North Pack Monadnock, one of their two spurs connects to the Wapack Trail; the other connects to the Cliff Trail.

Hiking facilitates wildlife observation and photography. Providing opportunities for the public to engage in those activities on the refuge promotes visitor appreciation of and support for refuge programs. According to the FOW and the Mountain View Hiking Club, the section of the Wapack Trail on the refuge, the spur of the Cliff Trail and the Ted's and Carolyn's trails are in very good shape. Continuing our informal agreements with the FOW and the Mountain View Hiking Club would maintain those conditions and ensure that refuge visitors enjoy a safe, quality experience.

Strategies

- Continue our informal agreement with the Friends of the Wapack to maintain the 4-mile segment of the Wapack Trail that runs through the refuge and the 1.1-mile Cliff Trail.

- Continue our informal agreement with the Mountain View Hiking Club to maintain the 3 miles of the Ted's and Carolyn's trails that cross the refuge.

Objective 2b. (Trailhead Access)

Continue to allow public access to the northern end of the refuge via the Wapack Trailhead on Old Mountain Road, and to the southern end via Joanne Bass Bross Preserve and Miller State Park.

Rationale for Objective

To access the northern end of the refuge and the start of the Wapack Trail, visitors must enter via Old Mountain Road. Parking is available only on the road shoulder; no established or developed parking area

exists. If visitors would like to begin at the southern end of the refuge, they can park at Miller State Park and hike north about 1 mile. Admission to the state park costs $3 for adults and $1 for children. Before entering the Wapack refuge, hikers would also pass through the Joanne Bass Bross Preserve, owned and maintained by The Nature Conservancy (TNC). This objective would not improve refuge access or parking. Maps, literature, and the refuge website direct visitors to these points of entry.

Strategies

Continue to

- Direct visitor access to the northern end of the refuge (beginning of Wapack Trail) via Old Mountain Road.

- Direct visitor access to the southern end of the refuge through Joanne Bass Bross Preserve; encourage parking at adjacent Miller State Park.

- Maintain the refuge website (profile page) to communicate points of entry and directions to the refuge.

Objective 2c. (Service and Refuge System Visibility)

Continue limited Service presence and visibility at the refuge and in the local community.

Rationale for Objective

Limited refuge resources have prevented us from being able to focus on establishing greater presence and visibility in the local community and to refuge visitors. Only one refuge sign, erected by the FOW at the trailhead, carries a topographic map (the northern end of the refuge). That map shows the layout of the Wapack Trail, but does not provide any information about the refuge or the Service. The boundary of the refuge is posted intermittently with standard Refuge System “blue goose” signs. This objective would not provide any additional signage or improve the visibility or presence of the Service.

Strategies

Continue to

- Allow the FOW to maintain one trailhead information sign.
- Maintain refuge boundary signs.

Objective 2d. (Public Uses on the Refuge)

Continue to allow uses that are consistent with the “wilderness-like” setting and have complete, approved compatibility determinations.

Rationale for Objective

As we discussed previously, the land for the refuge was donated under the condition that we would manage the refuge in a “wilderness-like” setting and adhere to other deed restrictions prohibiting hunting, fishing, trapping, traveling in or using vehicles, and the cutting of trees except to maintain trails.

The Refuge Improvement Act and our compatibility policy require an affirmative finding by the refuge manager on the appropriateness and compatibility of a public use before we allow it on a national wildlife refuge. In 1994, the refuge manager completed compatibility determinations for observing and photographing wildlife, berry picking, hiking/backpacking, jogging/walking, picnicking, and snowshoeing and cross-country skiing. Those were found to be compatible with the mission of the Refuge System and the purpose for which the refuge was established. We would continue to allow them in alternative A on the refuge. In addition to the activities listed in the deed, we would continue to prohibit in alternative A the following activities, which previous refuge managers either did not evaluate or determined them incompatible: dog walking, camping, mountain biking, and horseback riding.

Strategies

Continue to

- Prohibit those activities listed in the deed: hunting, fishing, trapping, traveling in or using vehicles, and cutting trees, except to maintain trails.

- Prohibit dog walking, camping, mountain biking, and horseback riding.

- Allow wildlife observation, photography, berry picking, hiking/backpacking, jogging/walking, picnicking, and snowshoeing and cross-country skiing

Goal 3. Enhance the conservation, management, and stewardship of wildlife resources through partnerships with public and private conservation groups, private landowners, State agencies and local entities.

Objective 3a. (Current Partnerships)

Continue to maintain our current partnerships with the New Hampshire Fish and Game Department (NHFG) for assistance with law enforcement.

Rationale for Objective

Our limited refuge staff and budget make it difficult for us to address law enforcement issues. Partnerships are essential in accomplishing the goals for this unstaffed refuge. In 1994, the Service and the NHFG approved a memorandum of agreement (MOA) for cooperative law enforcement. Alternative A would continue our work under that MOA. In it, our regional director delegated to the NHFG the authority to enforce the following federal laws dealing with the protection and conservation of fish, wildlife and natural resources: The

1. Lacey Act Amendments of 1981
2. Migratory Bird Treaty Act
3. Migratory Bird Hunting and Conservation Stamp Act
4. Bald and Golden Eagle Protection Act
5. Airborne Hunting Act
6. National Wildlife Refuge Systems Administration Act
7. Endangered Species Act of 1973.

Although the MOA allows conservation officers from the NHFG to enforce refuge regulations, we do not expect them to take on the duties of full-time refuge law enforcement officers. At this time, the conservation officer patrolling the surrounding area would be responsible only for responding to extreme situations or complaints as they arise. For example, a conservation officer would provide search and rescue on the refuge. Again, this relationship with NHFG is essential in protecting refuge resources and visitors.

Strategies

Continue to

- Work under the MOA for cooperative law enforcement with the NHFG.

Alternative B. The Service-preferred Alternative

Introduction

Alternative B is the one we are recommending to our regional director for implementation. It includes an array of management actions that, in our professional judgment, work best toward achieving the purpose of the refuge, our vision and goals for the refuge, and state and regional conservation plans. In our opinion, this alternative would most effectively address the key issues identified by the Service, the state, and the public (see chapter 1).

Alternative B proposes that we focus on improving our biological and visitor services programs by expanding our partnerships with other federal and state agencies, town departments, local conservation organizations, and individuals. We would assess and monitor threats to the integrity of refuge habitat. One important component of that assessment is gathering baseline data on plant and wildlife populations on the refuge. We would use partnerships to continue the maintenance of trails and the development and maintenance of a refuge parking area. We would also work to increase the presence of the Service and the visibility of the refuge in the local community, and better communicate information about the refuge, its rules and regulations, and contact information to the public.

Although we cannot acquire more land for the refuge at this time, we would offer our support in protecting other land in the area. We would help our partners identify land that should protected for wildlife conservation, and help them choose the best methods or techniques for managing that land. Please refer to alternative B, goal 3, for additional information on land protection partnerships.

Goal 1. Allow natural processes and disturbances to enhance the biological diversity and integrity of upland wildlife habitat.

Objective 1a. (Collecting Resource Information)

Over the 15 years following the approval of this CCP, this alternative would promote a biologically diverse, healthy, and mature forest habitat on 1,625 acres that supports breeding and migrating bird species of conservation concern, such as the bay-breasted warbler, black-throated blue warbler, black-throated green warbler, blackburnian warbler, blackpoll warbler, Canada warbler, eastern wood-pewee, ovenbird, veery, wood thrush, and yellow-bellied sapsucker. In addition, we would conserve habitat for other species listed in the NH Wildlife Action Plan whose presence is possible on the refuge, such as the American marten, bobcat, eastern small-footed bat, marbled salamander, spotted turtle, and northern leopard frog.

Rationale for Objective

The Service policy “Maintaining the Biological Integrity, Diversity, and Environmental Health of the National Wildlife Refuge System” provides refuge managers with an evaluation process to analyze their refuge and recommend the best management direction to prevent the further degradation of environmental conditions. To fully implement that policy, we must first assess the current status of the biological integrity, diversity, and environmental health through surveys of baseline vegetation, population surveys and studies, and any other environmental studies necessary. Fully assessing the current environmental conditions at the refuge would give us the information we need to maintain its biological integrity, diversity, and environmental health.

Because the Wapack refuge is unstaffed, resources are not readily available to conduct biological surveys. Limited refuge budgets also make it difficult to contract those surveys to other organizations or individuals. James Kowalsky completed the last surveys for the Wapack refuge in 2003. They included information on breeding bird species presence; no information was collected on productivity and survivorship. We have not conducted any surveys of forest health, mammals, amphibians and reptiles, or vegetation. Members of the

local community are concerned with that lack of biological data and its unavailability to the public. It is important that we obtain more up-to-date information on all refuge resources and make that information available to the public.

We would use a partnership with the U.S. Forest Service (USFS) Forest Health Protection Program (FHPP) to complete an assessment of forest health on the refuge. The FHPP works to protect and improve the health of America's forests. Its goal is to respond rapidly to forest health threats to avoid unacceptable losses of forest resources. The FHPP would compile a plant species list, identify tree mortality, and determine the presence of any invasive species. That assessment would allow us to identify and monitor any threats to the integrity of the refuge forest habitat.

To gather information about vegetation and wildlife populations on the refuge, we would use such partnerships as New Hampshire Audubon, The Nature Conservancy, the Keene State College citizen survey group, local conservation groups, and individual volunteers. That research would focus on species of concern that other state and conservation management plans have identified.

- The New Hampshire Wildlife Action Plan (WAP) (NHFG 2005) identifies the bay-breasted warbler, Canada warbler, veery, and wood thrush as forest-dependent species of concern. In addition to bird species, the New Hampshire WAP lists as species of concern some mammals known in the vicinity of the refuge, including the black bear, bobcat, and moose.

- The Atlantic Northern Forest Bird Conservation Region (BCR 14) Blueprint (Dettmers 2005) lists the black-throated blue warbler, black-throated green warbler, blackburnian warbler, blackpoll warbler, eastern wood-pewee, ovenbird, and yellow-bellied sapsucker as moderate to high conservation priority in forest types found on the refuge.

To provide consistent information that we can compare from year to year, the refuge would develop a Habitat and Species Inventory and Monitoring Plan (HSIMP). That HSIMP would outline the methodology to assess whether our assumptions and proposed management actions are, in fact, supporting our habitat and species objectives. A HSIMP would promote the use of coordinated, standardized, cost-effective, defensible methods for gathering and analyzing population data. It would also allow us to assess new and ongoing surveys and focus our limited resources on data collection for resources of conservation concern. Our primary interest in establishing a thorough, consistent inventory and monitoring program is that it would allow us to control threats to refuge resources (e.g., a threat from invasive species, or overuse of an area by recreational visitors).

Strategies

Within 2 years of CCP approval

- Meet with various partners (e.g., NHFG, New Hampshire Audubon, The Nature Conservancy, the Keene State College citizen survey group, local conservation groups, and individual volunteers) to discuss possible partnership opportunities for prioritizing, funding, and conducting compatible natural resource surveys.

- The USFS Forest Health Protection Program would complete a full forest health assessment and help us identify what to evaluate and monitor as threats to the biological integrity of the refuge.

Within 7 years of CCP approval

- Use partnerships (e.g., established from those contacts made in strategy above) for resource data collection following peer-reviewed or agency approved protocols. Obtain all required permits prior to field implementation.

- Complete a Habitat and Species Inventory and Monitoring Plan (HSIMP).

Goal 2. Establish a public use program that will encourage compatible, low-impact recreation on refuge trails.

Objective 2a. (Trail Maintenance)

Within 2 years of the approval of this CCP, develop a memorandum of understanding (MOU) with the Friends of the Wapack (FOW) for maintaining the segments of the Wapack Trail and the Cliff Trail that cross the refuge, and an MOU with the Mountain View Hiking Club for maintaining the sections of the Ted's and Carolyn's trails that cross the refuge.

Rationale for Objective

Under an informal agreement, the FOW maintains the 4-mile section of the Wapack Trail that crosses the refuge. They also maintain the 1.1-mile Cliff Trail, a spur off that 4-mile segment at the top of North Pack Monadnock. Both the Service and the FOW are interested in formulating a MOU for refuge trail maintenance. We would use as a template for our final MOU one we drafted in 2004 but never implemented. Under the final MOU, the FOW would be responsible for removing major obstructions and litter, installing water diversions to minimize erosion, or rerouting the trail if necessary to minimize erosion or mitigate the effects of heavy use. They would assist in marking the trail, with care to mark only what is necessary to keep people on the trail. Yellow triangles painted on trees or rock outcrops would designate the Wapack Trail, while blue triangles would designate the Cliff Trail. Given the amount of work and the help the FOW members provide to the refuge, it is important that we complete a formal agreement that documents their exact responsibilities. We would meet annually with the FOW to discuss plans for trail maintenance for the ensuing year. That would give both the FOW and the Service the opportunity to discuss any concerns over the safety or inappropriate uses of the trail.

The Mountain View Hiking Club maintains the combined 5.15-mile Ted's and Carolyn's trails. Three miles traverse the refuge, while the other 2.15 miles cross private land. The Mountain View Hiking Club is very interested in developing a MOU with the Service for the continued maintenance of the sections of the two trails that cross the refuge. As in the MOU with the FOW, the club would be responsible for removing major obstructions and litter, installing water diversions to minimize erosion, or rerouting the trail if necessary to minimize erosion or mitigate the effects of heavy use. They would also assist in marking the trail. Some of the refuge sections of the Ted's and Carolyn's trails are designated sporadically with yellow markers stamped with the Service logo. The Service would provide additional trail markers to the club so that the refuge sections of the trails can be more adequately marked. In addition, we would meet annually with the club to discuss plans for trail maintenance in the ensuing year.

During the planning process, we established communications with a direct descendant of Mr. and Mrs. Marshall (the couple who originally donated the refuge property), who lives locally and is very interested in the refuge and its management according to the deed restrictions.

Strategies

Within 2 years of CCP approval

- Complete a MOU with the Friends of the Wapack for trail maintenance on the refuge.
- Complete a MOU with the Mountain View Hiking club for trail maintenance on the refuge.
- Meet annually with the FOW and the Mountain View Hiking Club to review plans for trail maintenance.
- Establish contact with the Marshall family descendant, or designee, if refuge activities may result in significant removal of vegetation or ground disturbance.

Objective 2b. (Trailhead Improvements)

Within 15 years of the approval of this CCP, work with state and local partners to seek funding for the design, construction, or, if necessary, land acquisition for a trailhead parking area.

Rationale for Objective

The only way that visitors can access the northern end of the refuge is by parking on the shoulder of Old Mountain Road. That can be problematic for several reasons. First, we have seen up to 15 cars parked along the road shoulder during peak season weekends for access to the Wapack Trail. With limited space for cars, visitors are forced to park in unsafe areas or sometimes leave altogether. Once visitors have parked their cars, they have to walk along the road to the refuge entrance. That creates another safety concern, particularly when through-traffic on the road is heavy. Parking on the road also creates a problem for the Town of Greenfield Department of Transportation. In the winter, cars parked on the side of the road make it very difficult for snow plows to safely pass and clear a road that is already narrow. The Town of Greenfield is very concerned about this recurring problem, and would like us to work with them in solving it.

If visitors wanted to access the southern entrance of the refuge, they would have to park at Miller State Park and hike north through the Joanne Bass Bross Preserve (TNC). Parking at Miller State Park can be inconvenient, not only because visitors have to hike a farther distance to get to the refuge, but also because they have to pay for parking. In 2007, admission to the state park cost $3 for adults and $1 for children.

By creating a parking area at the northern entrance of the refuge, we would increase visitor convenience, improve public safety, and resolve concerns about snow plowing. We would like to build the parking area on a parcel of land on or near the refuge and the Wapack trailhead. We would consider purchasing a tract from a willing seller at market value to provide adequate space to establish a safe parking area. If possible, we would also like to work with the Town of Greenfield to arrange plowing for the new parking area. We do not have a location or a parking design yet; the location and ownership of the land would dictate the size and configuration of the parking area. Because the Town of Greenfield owns most of the land around the refuge, we would meet with the town to discuss possible options for establishing a parking area.

The Brantwood Camp also owns land next to the refuge. It provides a positive camping experience for boys and girls from various backgrounds who otherwise would miss the opportunity to attend summer camp (Brantwood Camp 2007). We know that campers quite often use the refuge trail, so they also might benefit from additional parking. We would also meet with the Brantwood Camp to discuss opportunities to work together in establishing the parking area. Because the location of the refuge is so close to Miller State Park, we also propose to meet with the NH Division of Parks and Recreation to discuss partnership and funding opportunities to develop parking.

Over the next 5 years, we would seek sources of funding for the design and construction of the parking area. Two possible sources are the Recreational Trails Program (RTP) and the Public Lands Highways Discretionary Program (PLHD).

The RTP is an assistance program of the Department of Transportation Federal Highway Administration (FHWA). Federal transportation funds benefit recreation by making funds available to the states to develop and maintain recreational trails and trail-related facilities for both nonmotorized and motorized recreational uses. RTP funds come from the Federal Highway Trust Fund, and represent a portion of the motor fuel excise tax collected from nonhighway recreational fuel use: fuel used for off-highway recreation by snowmobiles, all-terrain vehicles, off-highway motorcycles, and off-highway light trucks (FHWA 2006).

The PLHD Program was designed to improve access to and within federal lands. PLHD funds are available for transportation planning, research, engineering, and the construction of the highways, roads, parkways, and transit facilities on federal public lands. Those funds are also available for the operation and maintenance of transit facilities. In both of these programs, the state would assist in applying for a grant,

which could propose funds for designing, constructing or, if necessary, acquiring land on which to build the parking area.

Strategies

Within 2 years of CCP approval

- Meet with the Town of Greenfield, Brantwood Camp, and the NH DRED, Division of Parks and Recreation, to discuss possible partnership opportunities for establishing and maintaining a parking area on Old Mountain Road.

Within 5 years of CCP approval

- Determine a specific location for the construction of the parking area on Old Mountain Road.
- Work with the State of New Hampshire to seek funding for the design, construction, or, if necessary, land acquisition for a parking area.
- Work with an engineer to design the layout of the parking area.

Within 15 years of CCP approval

- Complete construction of the parking area.

Objective 2c. (Service and Refuge System Visibility)

Within 5 years of the approval of this CCP, increase the visibility of the Service in the local community and improve public recognition and awareness of the refuge and the Refuge System to the extent that 90 percent of visitors contacted know they are on a national wildlife refuge, can identify its purpose, and know that it is part of a national system of refuges.

Rationale for Objective

Limited resources have prevented us from improving the presence of the Service and the visibility of the refuge to the public as well as its recognition in the local community.

This alternative proposes that we increase Service visibility through increasing signage, engaging in new partnerships for outreach and education, and communicating regularly with federal, state and local elected officials. We would install a new informational panel at the northern trailhead of the refuge. That panel would provide general refuge resource and contact information. It would also publish refuge rules and regulations, including why keeping dogs on leash is important. Because the refuge does not provide any accessible trails, the panel would also identify the accessible trails in the area.

We would meet with the FOW to discuss providing more signage, and providing information on the refuge and the FOW. We would also work with the Mountain View Hiking Club to install standard "Welcome to your National Wildlife Refuge" signs at the refuge entrances of the Ted and Carolyn's trails. That sign would simply notify trail users that they are leaving private land and entering a national wildlife refuge.

By posting the rules and regulations on a trailhead sign, we hope to minimize the number of violations on the refuge. We hope that refuge visitors would respect and adhere to all rules and regulations.

We also propose to improve the posting of the refuge boundary. We would post additional signs around the refuge boundary to ensure that they are intervisible.[1] That would help visitors realize that they are on a national wildlife refuge, and reduce the number of trespassers that enter it.

[1] **intervisible** *adj* mutually visible (*surveying*): i.e., visitors can see from one sign to the next

Our proximity to Miller State Park makes it a great asset in our effort to increase our visibility. We propose to meet with the NH Division of Parks of Recreation to discuss developing a MOA for assistance in outreach and education. The MOA would lay the foundation to work with the Miller State Park to increase public recognition and awareness of the refuge. Ideas for further discussion include having park personnel hand out refuge information at the park entrance toll booth. A small information panel might also be constructed and placed at the end of the park's trail, where visitors leave the park and enter the Joanne Bass Bross Preserve. That panel would explain the detrimental effects of allowing unleashed dogs on the trail system, and would help reduce such violations both on the refuge and in the park.

To help increase knowledge about the refuge in the local community, we propose to develop and distribute at the Wapack trailhead an interpretative brochure describing key habitats, species and sights that visitors should look for as they travel the refuge trails. We hope that the brochure would not only increase public knowledge of the refuge, but also improve the visitor experience.

Strengthening our relationships with federal, state and local elected officials can strengthen political support for the refuge and its programs. This alternative proposes that we provide updates on the refuge to Congress each year, or as significant issues arise. We would also work to increase refuge visibility among state and local elected officials by improving communication about refuge resources, issues, and visitor activities.

Strategies

Within 1 year of CCP approval

- Meet with the FOW to cooperate in developing an informational panel at the Wapack trailhead.

Within 5 years of CCP approval

- Install an informational panel at the northern trailhead of the refuge that includes general refuge information, rules and regulations, and contact information.
- Install standard "Welcome to the National Wildlife Refuge" signs at the refuge entrances of both the Ted and Carolyn's trails to notify hikers that they are entering a national wildlife refuge.
- Increase the number of boundary signs posted around the refuge, where necessary to make them intervisible.
- Meet with the NH Division of Parks and Recreation to discuss the possibility of developing a MOA for assistance with outreach and education.
- Develop an interpretative brochure that describes key habitats, species and sights that visitors should watch for as they travel along refuge trails.
- Provide congressional updates each year or as significant issues arise.
- Improve refuge visibility among state and local elected officials through improved communication.
- Create a more informative website to provide better orientation to the refuge.
- Contact various authors of hiking guides that refer to the Wapack refuge to update refuge resource and contact information.
- Contact publishers of regional hiking guides (e.g., Appalachian Mountain Club) to share accurate information about refuge trails.

Objective 2d. (Public Uses on the Refuge)

Within 1 year of the approval of this CCP, communicate our findings of appropriateness and compatibility determinations for refuge uses to the public, refuge partners, and elected officials.

Rationale for Objective

A compatible use is one "that will not materially interfere with or detract from the fulfillment of the mission of the Refuge System or the purposes of the refuge." Please refer to "Policy on Appropriateness of Refuge Uses and Compatibility" in chapter 1 for additional, detailed information.

In 1994, we determined that the following activities on the refuge were compatible: berry picking, hiking/backpacking, jogging/walking, picnicking, cross-country skiing and snowshoeing, and observing and photographing wildlife. At least every 15 years, or sooner if new information warrants, we reevaluate our compatibility determinations for the six priority public uses: hunting, fishing, wildlife observation and photography, and environmental education and interpretation; we reevaluate all other uses every 10 years. Except for wildlife observation and photography, all of those compatibility determinations have passed their reevaluation date.

To comply with 2006 Service policy on appropriateness, we reevaluated all non-priority public uses and completed draft findings for these activities: berry picking; walking/hiking, backpacking, cross-country skiing, or snowshoeing; jogging; organized or facility supported picnicking; dog walking; research by non-Service personnel; camping; mountain biking; and, horseback riding. Appendix A includes those draft findings. Of those activities, we found jogging, picnicking, camping, mountain biking and horseback riding to be inappropriate; we would not allow them on the refuge.

Although we found jogging and picnicking compatible in 1994, this alternative would prohibit them. Since 1994, conditions at the refuge have changed and our new policies have raised the standard for determining appropriateness. We now feel the two activities could adversely impact refuge resources and other refuge visitors. An increase in refuge visitation and trail erosion has elevated our cause for concern about the effects on wildlife and public safety. After reevaluating those activities under current conditions and Service policies, we determined that they are not consistent with those policies and public safety and would hinder our ability to provide quality, wildlife-dependent recreation on the refuge. Furthermore, jogging and picnicking are rarely observed at the refuge, and they were not raised as activities of interest at our public scoping meetings. In our opinion, jogging would detract from the enjoyment of the refuge for other visitors engaged in wildlife dependent activities.

We reevaluated the compatibility determinations from 1994 as well as added a few others (e.g., dog walking, research by non-Service personnel). Prior to this CCP, no decision had ever been made on whether dogs were allowed on the refuge. Without a finding of appropriateness and a compatibility determination, this use technically is prohibited on the refuge. Alternative B would only allow dog walking if the dogs are leashed.

The public will have the opportunity to comment on all the draft compatibility determinations during the 30-day review and comment period for this draft CCP/EA.

Strategies

Within 1 year of CCP approval

- Develop outreach materials to communicate the prohibition of jogging, picnicking, camping, mountain biking, and horseback riding on the refuge.

- Work with partners and volunteers to monitor refuge uses and step up outreach and education on why these uses are considered inappropriate with refuge purposes.

Within 5 years of CCP approval

- With help from our partners, monitor dog walking to determine whether visitors are adhering to the "dog on leash" regulation. If we find that the majority are not complying, then we would prohibit dog walking altogether.

Goal 3. Enhance the conservation, management, and stewardship of wildlife resources through partnerships with public and private conservation groups, private landowners, State agencies and local entities.

Objective 3a. (Partnerships Focusing on Refuge Resources)

Within 15 years of the approval of this CCP, increase our efforts to maintain and expand partnerships with other federal agencies, state agencies, local conservation groups and individuals with similar conservation missions.

Rationale for Objective

The refuge is an unstaffed satellite of the Great Bay refuge. In 2008, both the Wapack and Great Bay refuges will become unstaffed satellites of the Parker River refuge in Newburyport, MA. Limited resources make it difficult for the Service to address key refuge issues, including data collection on refuge resources, trail maintenance, refuge access, outreach and education, and law enforcement. The refuge can receive help to deal with those issues through partnerships. They will be essential for this unstaffed refuge to accomplish its goals.

Goals 1 and 2 in alternative B propose several partnerships to fulfill our needs for inventorying and monitoring species and habitat. We propose to partner with several groups in the local community: the Monadnock Conservancy, the Society for the Protection of New Hampshire Forests, Open Space Committee of Greenfield, Piscataquaog Watershed Association, and local town conservation commissions. We would first contact each of these groups to converse about possible opportunities for their assistance in monitoring the refuge. That could range anywhere from general observations while hiking the trail, to detail analysis through scientific studies.

The Friends of the Wapack group is focused on maintaining the Wapack Trail both within and beyond the refuge. If we discover enough interest in the local community, we may consider forming a Friends of Wapack NWR group with a broader mission to help monitor refuge resources, facilitate visitor service programs, and advocate for the refuge with the local community and elected officials.

Goal 2, objective 2a proposes MOUs with the FOW and the Mountain View Hiking Club for trail maintenance. In conjunction with our proposed improvements to refuge access, under goal 2, objectives 2b and 2c, we identify partnerships with various groups to help establish a parking area and signage at the northern end of the refuge (Old Mountain Road). Those include the Town of Greenfield, Brantwood Camp, the NH Division of Parks and Recreation, and FOW. We would also like to pursue partnerships with the Harris Center for Conservation Education and the Brantwood Camp. They could play a crucial role in helping with environmental education and outreach.

The Harris Center is dedicated to promoting understanding and respect for our natural environment through education of all ages, direct protection and exemplary stewardship of the region's natural resources, and programs that encourage active participation in the great outdoors (Harris Center 2005). We would contact the Harris Center about distributing refuge information at their facility as well as using the refuge as a site for their outdoor programs and hiking trips. Although the refuge lacks an active environmental education program, the Harris Center could help in using the refuge as an outdoor classroom.

The Brantwood Camp provides a positive camping experience for boys and girls who would not otherwise have the opportunity to afford summer camp (Brantwood Camp 2007). Since the Brantwood Camp is adjacent to the refuge, it provides campers with a great opportunity to learn about nature without them having to travel too far. A part of their camping experience could incorporate a trip to the refuge, where the staff could introduce them to the forest ecosystem and the many species of wildlife that inhabit it. Outreach materials could also be handed out to campers at the main facility.

Our limited law enforcement capabilities are a concern on the refuge. We rely on the local community to be the "eyes and ears" of the refuge and continue to encourage notifying the refuge or the local conservation officer from the NHFG when any violations are observed. We would use this information to better focus our outreach efforts or refuge signage. We would continue work under the MOA for cooperative law enforcement with the NHFG (refer to alternative A, objective 3a). In addition, alternative B proposes to improve communication with the zone conservation officer from NHFG. The Service zone officer and the state conservation officer would discuss any new law enforcement issues, develop contingency plans for search and rescue operations, and/or discuss concerns that arise with implementing the CCP affecting NHFG.

Strategies

Within 1 year of CCP approval

- Meet with the FOW to cooperate in developing an informational sign, including refuge information, at the Wapack trailhead.

Within 2 years of CCP approval

- Complete a MOU with the FOW for trail maintenance on the refuge.
- Complete a MOU with the Mountain View Hiking club for trail maintenance on the refuge.
- Evaluate and monitor threats to the biological integrity of the refuge through a full forest health assessment to be completed by the USFS Forest Health Protection Program.
- Meet with the Town of Greenfield, Brantwood Camp, and the NH Division of Parks and Recreation to discuss possible partnership opportunities for establishing the parking area.
- Improve communication with the zone conservation officer from NHFG to discuss any new law enforcement issues or concerns that arise and possible solutions.

Within 5 years of CCP approval

- Meet with the NH Division of Parks and Recreation to discuss the possibility of developing a MOA for assistance with outreach and education.
- Contact various potential partners (i.e. Monadnock Conservancy, the Society for the Protection of New Hampshire Forests, Open Space Committee of Greenfield, Piscataquaog Watershed Association, and local town conservation commissions) to initiate a conversation about possible opportunities for assistance with refuge monitoring and inventories.
- Contact the Harris Center for Conservation Education and the Brantwood Camp to initiate a conversation about possible opportunities for education and outreach.
- Use partnerships (e.g., New Hampshire Audubon, The Nature Conservancy, Keene State College citizen survey group, local conservation groups, and individual volunteers) to collect data on vegetation and wildlife species on the refuge.

Objective 3b. (Partnerships Focusing on the Regional Landscape)

Over the next 15 years, expand our partnerships with state agencies, local conservation groups, town planning commissions, and individuals in support of regional land conservation.

Rationale for Objective

"Actions Considered but Eliminated from Detailed Study" in this chapter describes why we are not pursuing a refuge expansion. In chapter 1, we also identified regional land conservation partnerships that include the refuge. The first is the Quabbin to Cardigan Conservation Collaborative (Q2C). The second is the Temple to Crotched Community Conservation Corridor (see chapter 1). The refuge lies in both conservation planning areas.

We value the importance of land protection on the regional landscape, and would support those conservation efforts by offering assistance in identifying lands of high wildlife resource value, providing information for writing any management plans on the regional landscape, or identifying management techniques for various habitats and ecosystems. Although our ability to acquire refuge land is now limited, we believe we can provide unique expertise in support of those larger conservation efforts.

Strategies

Within 5 years of CCP approval

- Meet with the Society for the Protection of New Hampshire Forest and the Monadnock Conservancy to apprise them of what data we have available and what resources are available in other Service programs.

Over the next 15 years after CCP approval

- Provide support as requested to regional conservation efforts through identification of areas of high wildlife resource value and determination of proper management techniques for habitats and ecosystems.

Table 2.1. Highlights of respective alternatives' actions as they relate to goals

Refuge Resource or Program	Alternative A *Current Management*	Alternative B *Service-preferred alternative*
Goal 1. Allow natural processes and disturbances to provide biological diversity and integrity of upland wildlife habitat.		
Habitat and Species Management	Continue to manage refuge in a "wilderness-like" setting; no development, minimal signs and other infrastructure Continue to allow natural succession and natural disturbances to occur without interference, unless extreme situations occur.	*In addition to Alternative A:* Set up meetings with various partners (i.e. NH Audubon, the Nature Conservancy, Keene State College citizen survey group, local conservation groups, and individual volunteers) to discuss possible partnership opportunities for conducting wildlife surveys, and collecting vegetation data, consistent with Service protocols. Partner with USFS to complete a full forest health assessment and help us identify what to evaluate and monitor as threats to the biological integrity on the refuge. Complete a Habitat and Species Inventory and Monitoring Plan. Prioritize projects and identify the appropriate peer-reviewed or agency approved protocols for inventories and surveys.
Goal 2. Establish a public use program that will encourage compatible, low-impact recreation on refuge trails.		
Trail Maintenance	Continue informal agreement with the Friends of the Wapack to maintain 1.1-mile Cliff Trail and the 4-mile segment of the Wapack Trail that runs through the refuge. Continue informal agreement with Mountain View Hiking club to maintain 3 miles of Ted's and Carolyn's Trails that traverse the refuge.	Complete an MOU with both the Friends of the Wapack and the Mountain View Hiking Club for trail maintenance on the refuge. Establish annual meetings with the Friends of the Wapack and the Mountain View Hiking Club to discuss and review plans for trail maintenance activity. Maintain communication with the Marshall family descendant (or designee) when major refuge projects planned
Trailhead Improvements	No improvements planned. Continue to direct visitor access to the Wapack trailhead at the northern end of the refuge via Old Mountain Road, and to the southern end of the refuge through Joanne Bass Bross Preserve, with parking at adjacent Miller State Park.	*Continue to direct visitors to the refuge as in alternative A. In addition:* Within 2 years, set up meeting with the Town of Greenfield, Brantwood Camp, Friends of the Wapack, and the NH DRED, Division of Parks and Recreation, to discuss partnership opportunities for establishing and maintaining year round parking area. If needed, pursue land purchase with partners from willing seller. Work w/engineer to determine location/design for the construction of parking area on Old Mountain Rd. Within 15 years, implement construction.

Refuge Resource or Program	Alternative A *Current Management*	Alternative B *Service-preferred alternative*
Service Visibility	Continue to allow FOW to maintain one informational sign at Wapack trailhead. Continue to maintain refuge boundary signs.	Install an informational panel at the Wapack trailhead of the refuge that includes general refuge information, rules and regulations and contact information. Install standard "Welcome to your National Wildlife Refuge" signs at the refuge entrances of both Ted and Carolyn's Trails to notify trail users that they are entering a national wildlife refuge. Increase the number of boundary signs posted around the refuge to ensure they are intervisible. Meet with the NH Division of Parks and Recreation to discuss the possibility of developing a MOA for assistance with outreach and education. Provide congressional updates on an annual basis, or as significant issues arise. Improve refuge visibility among state and local elected officials through improved communication. Create a more informative website to provide better orientation to the refuge.
Public Uses on the Refuge	Continue to allow wildlife observation, photography, berry picking, hiking/backpacking, jogging/walking, picnicking, and snowshoeing and cross-country skiing. Continue to prohibit hunting, fishing, trapping, travel in or use of vehicles, and cutting of trees, except for the maintenance of trails (as listed in the deed). Continue to prohibit dog walking, camping, mountain biking, and horseback riding.	Finalize new findings of appropriateness and compatibility determinations for all refuge uses listed in alternative A. Differences from allowed uses in alternative A include formally opening refuge to dog walking on leash only, and closing the refuge to jogging and organized, or facility-supported, picnicking. Continue to prohibit hunting, fishing, trapping, travel in or use of vehicles, and cutting of trees, except for the maintenance of trails. Develop outreach materials to communicate prohibitions on jogging, picnicking, camping, mountain biking, and horseback riding on the refuge. Work with NH DRED, Division of Parks and Recreation, to develop outreach material on responsible dog walking. Monitor dog walking, with help from partners, to determine if visitors are adhering to "dogs-on-leash" regulation. If visitors are not complying, determine need for a prohibition on dog walking altogether. Work with partners and volunteers to monitor refuge uses and step-up outreach.

Refuge Resource or Program	Alternative A *Current Management*	Alternative B *Service-preferred alternative*
Goal 3. Enhance the conservation, management, and stewardship of wildlife resources through partnerships with public and private conservation groups, private landowners, State agencies and local entities.		
Partnerships	Continue to work under the MOA for cooperative law enforcement and search and rescue with the NHFG. Continue informal agreement with the Friends of the Wapack to maintain 1.1-mile Cliff Trail and the 4-mile segment of the Wapack Trail that run through the refuge. Continue informal agreement with Mountain View Hiking club to maintain 3 miles of Ted's and Carolyn's Trails that cross the refuge.	*In addition to other partnerships listed above in Alternative B:* Improve communication with zone conservation officer from NHFG to discuss any new law enforcement issues, develop contingency plans for search and rescue operations, and/or discuss any other concerns that arise with CCP implementation affecting NHFG. Contact various partners (i.e., Monadnock Conservancy, the Society for the Protection of NH Forests, Open Space Committee of Greenfield, Piscataquaog Watershed Association, and local town conservation commissions) to initiate conversation about possible opportunities for assistance with refuge monitoring. Contact the Harris Center for Conservation Education and the Brantwood Camp to initiate conversation about possible opportunities for assistance with education and outreach. Provide support as requested to regional conservation efforts through identification of areas of high resource value and determination of management techniques for habitats and ecosystems.

Chapter 3

Small waterfall on Ted's Trail
Lelaina Marin/USFWS

Affected Environment

- Introduction
- Geology and Land Use Setting
- Regional Demographics and Economic Setting
- Refuge Staffing and Operations
- Habitat Types and Vegetation
- Wildlife Resources
- Visitor Services
- Cultural or Historic Resources

Introduction

This chapter discusses the physical, biological, and human environment of the refuge.

Geology and Land Use Setting

Geology

The bedrock in this region is a type of rock is known as the Littleton Formation: schist and quartzite formed by the metamorphosis of shale and sandstone during the late Devonian period. The dominant subtypes in the Wapack Range are grey micaceous quartzite, grey coarse mica schist and rust-colored sulfidic schist. They provide little buffering of soil pH, resulting in acidic soils. However, over 18 percent of the area from Crotched Mountain to Temple Mountain contains mica schist that is capable of leaching calcium into groundwater seeps and springs, which in turn may enrich the soil. Those enriched areas have the potential to support communities of rare plants (Van de Poll 2006).

The Littleton Formation is very resistant to weathering, resulting in many monadnocks in the region. A monadnock—named for Mount Monadnock—is a resistant mountain rising above an eroded plain. That resistance varies according to the relative concentrations of various minerals in the Littleton Formation. That variation creates the hills and valleys of the Wapack Range (Flanders 2006).

Glaciers started advancing over the region about one million years ago, the last retreating about 10,000 years ago. They scoured the area, removing topsoil and eroding and polishing the bedrock. Groove marks oriented north-south can be seen in the bedrock along parts of the Wapack Trail. As the glacier moved up and over North Pack Monadnock, its rate of movement slowed, and glacial till dropped on the north and west slopes. As it moved down the south slope, it gouged away bedrock, creating steep slopes and cliffs on the south and east slopes. A hill or mountain created by such glacial activity is called a whaleback hill or a *roches moutonnees* (Flanders 2006).

The geology of the refuge has helped form habitat for many species of plants and animals, some of which are either rare or unique in southern New Hampshire. The mountains and valleys also create a setting for the Wapack Trail, which offers diverse woodland settings and ridge-top views.

Water

The Wapack Range is the source of the headwaters of the Contoocook and Souhegan rivers. The north slopes of North Pack Monadnock drain into Otter Brook, while the east slopes drain into Stoney Brook. Those brooks provide riparian habitat, groundwater recharge areas and vertical migration corridors (Van de Poll 2006).

Land Use

Since the retreat of the glaciers, erosion and weathering have worked slowly to create topsoil and influence the landscape of the Monadnock region of today. More recently, human influence has helped shape the landscape. Evidence shows use by Abenaki Indians for hunting before Europeans settled in the area. The Abenaki used burning to facilitate hunting, possibly clearing the forests of understory plants at that time. The first significant influx of Europeans in the late eighteenth and early nineteenth centuries cleared more than 55 percent of the land for farming. Thin soils on steep slopes were subject to water and wind erosion during this time period (Wessels 1997).

In the eighteenth and nineteenth centuries, sheep and cattle were pastured on the hillsides and many stone walls were built to clear fields of rocks and define property boundaries. Raising cattle remained economically viable until the end of the nineteenth century. At that time, fields were abandoned and allowed to grow back into forest. Throughout the 1900s, forests in the area were logged when demand was high.

Since the last period of significant deforestation in the 1940s, timber harvests have been selective, resulting in mixed-aged stands. Coinciding with the decline in agriculture, railroads started bringing visitors to the area for vacations. The mountains became a place for people to hike, relax and get away from the crowded cities. People began to build summer homes in the area, and as mobility and the ability to work from home increased, the year-round population began to climb in the 1970s.

Climate

The climate in this region provides abundant rainfall, potentially heavy snowfall, and a wide range of temperatures that helps to create the habitat types on the refuge. Although the refuge lies about 50 miles from the ocean, it has an inland climate. Its proximity to the ocean exposes it to hurricanes, and nor'easters that form off the coast can cause heavy snowfalls in winter or heavy rains in other seasons. The temperature extremes range from -35° to 90°F, with a summer average around 70˚F. The prevailing summer winds are west to southwest; prevailing winter winds tend west to northwest. The average precipitation for Peterborough, NH, approximately 5 miles from the refuge, is 44.6 inches a year.

Air Quality

The New Hampshire Department of Environmental Services (NH DES) says that air quality for the state is relatively good. Carbon monoxide, sulfur dioxide and particulate matter levels have decreased steadily since the 1980s. Despite emission controls, levels of nitrous oxide have remained constant due to the increased use of gas and diesel engines. An ozone smog forms on one out of every four or five days during the summer; the most affected areas lie in the southeastern part of the state. High ozone levels in New Hampshire are caused primarily by the transport of ozone and its precursors from areas upwind, in the Northeast and industrial Midwest. Acid rain, also known as acid deposition, is also believed to originate in the industrial Midwest, from coal-burning power plants (NH DES 2007).

Global Climate Change

Global climate change is a significant concern for the wildlife conservation community. The Service takes this issue very seriously, and is working with partners to analyze how a rise in global temperatures may affect plants, fish and wildlife across the continent, and how our management practices may have to change. For example, wildlife, and the plants that sustain them, could be greatly affected if they require a minimum temperature to initiate certain biological changes, such as seed germination or hibernation. Some species might face drastic changes or reductions in their distribution and range, and breeding success, thereby affecting their total population. Other species able to adapt quickly might react to those climate changes with population increases and range expansions. We expect that species ranges will shift northward or toward higher elevations as temperatures rise, but those responses likely will vary highly among species.

Climate change is already documented as affecting the timing of migration and reproductive success in birds. Some species have been shown to start migrating earlier in the spring and breeding earlier. Impacts on species ranges are predicted as habitats fluctuate, influencing the availability of food, breeding habitat and the length of the breeding season, and competition with other species for resources. Changes in bird ranges will in turn affect seed dispersal and pollination for plants, nutrient cycling, and natural pest control.

Since amphibians "breathe" through their porous skins during all the stages of their life cycle, they are considered especially sensitive to changes in temperature and precipitation in their environment. Most amphibian activities are triggered by rain and temperature conditions; thus, distribution and population size will change significantly if air and water temperatures change.

Global climate change may also threaten aquatic and semi-aquatic amphibians and reptiles by reducing wetland acreage due to the frequency and severity of storms and sea level rise. Latitudinal shifts in temperature and precipitation patterns also have implications to both the local and regional distribution of amphibians and reptiles, especially those on the edges of their ranges (*http://www.parcplace.org/education.html#threats*).

Global warming's effect on carbon sequestration is something we are considering in our comprehensive conservation planning. The Department of Energy defines carbon sequestration as "the capture and secure storage of carbon that otherwise would be emitted to or remain in the atmosphere" (DOE Office of Fossil Energy and Office of Science 1999). Vegetated land is a tremendous factor in carbon sequestration. Terrestrial biomes of all sorts—grasslands, forests, wetlands, tundra, and deserts—are effective both in preventing carbon emission and in acting as biological "scrubbers" of atmospheric CO_2. The DOE notes that ecosystem protection is important for carbon sequestration, and may reduce or prevent the loss of carbon now stored in the terrestrial biosphere. The actions we propose in this CCP would conserve land and habitat, and thus, would retain the carbon sequestration on the refuge. That, in turn, would contribute positively in mitigating human-induced global climate change.

The forests of New Hampshire are very important resources for ecological and economic reasons; the changes facing them will have profound effects. In response, both state and federal agencies have initiated studies to plan for and anticipate impacts.

Regional Demographics and Economic Setting

Population and Demographics

Southern New Hampshire's proximity to metropolitan areas, like Boston, Massachusetts and Manchester, New Hampshire, exposes it to urban sprawl. As the real estate in those areas becomes scarcer and more expensive, city residents look outward for more affordable housing. In addition, New Hampshire offers outdoor recreation and beautiful landscapes.

An analysis of population data by the New Hampshire Office of Energy and Planning (NH OEP) shows that the state can be divided casually into the slow-growing north and the fast-growing south. Since 1960, New Hampshire's population has increased by about 703,000. More than 60 percent of that growth occurred in Hillsborough and Rockingham counties. The population trend for state counties between 1960 and 2000 shows that Hillsborough County has the greatest share. Projections for 2010–2030 show that the county will maintain the highest share of state population. However, growth is expected to shift away from the county because of the decreasing availability and increasing cost of land, and greater freedom of location in the future (NH OEP 2006). The estimated 2006 population of Hillsborough County is 402,789, an increase of 66,716 since 1990 (US DOC 2006a). Hillsborough County's 876 square miles contained 460 persons per square mile in 2006, compared to 934 square miles of land area and 159 persons per square mile in Merrimack County, which borders Hillsborough County to the north (US DOC 2006b).

The population between the ages of 20 and 54 in 2005 was estimated at 201,157, more than half of the total population in Hillsborough County. The number of people moving into new homes between 2000 and 2005 was estimated at 68,888, compared to 24,643 people between 1995 and 1999. The US DOC estimates that 209,874 workers in Hillsborough County are age 16 and over, of which 195,694 drive, carpool, or take public transportation an average of 25 miles to work (US DOC 2005).

Business and Economic Climate

In Hillsborough County, management, service occupations, sales and office occupations make up 78 percent of the workforce, while the other 22 percent work in farming, construction, and manufacturing. In 2005, the median household income in Hillsborough County was estimated at $60,913, compared to the national average of $46,242 (US DOC 2005). Service industry jobs, including health care, education, and social assistance, are the number one employers in the county.

The Monadnock region of southern New Hampshire attracts visitors from all over New England. The appreciation of the landscape has fostered conservation efforts through which a significant amount of land surrounding the refuge has been preserved. That includes the NH Division of Parks and Recreation Miller

State Park and The Nature Conservancy Joanne Bass Bross Preserve. Both increase the opportunities for outdoor recreation.

Outdoor activities such as skiing, hiking, and observing wildlife are important components of New Hampshire's economy. Tourists spent around $2.2 billion on meals and rental tax in 2004, an increase of 5.4 percent from the previous year (Josten and Picard 2006). In 2004, every county in New Hampshire recorded increases in retail sales of outdoor equipment. Just over half of the $2.7 billion increase in sales was spent in either Hillsborough or Rockingham counties (Josten and Picard 2006).

Refuge Contributions to the Local Economy

A national wildlife refuge provides many benefits to the local economy. Those include the benefits of open space and associated reduced cost of community services and increased property tax values, revenues from the refuge revenue sharing program, and, revenues from refuge visitors who purchase equipment, lodging, or meals.

Refuge Revenue Sharing

Under the Refuge Revenue Sharing Act of June 15, 1935, local taxing authorities receive refuge revenue sharing payments based on the acreage and value of refuge land in their jurisdiction. The payments are calculated in one of three formulas, whichever yields the highest amount: three-quarters of 1 percent of the appraised value of that land, 25 percent of the gross receipts from the sale of refuge products, or 75 cents per acre of land held in fee title. We reappraise the value of refuge land every 5 years. Until we reappraise a newly acquired property, the formula uses the purchase price.

The money for refuge revenue sharing payments comes from the sale of oil and gas leases, timber, grazing, and other Refuge System resources, and from congressional appropriations. Those appropriations are intended to make up the difference between the net receipts in the refuge revenue sharing fund and the total amount due to local taxing authorities. The actual amount paid varies from year to year, because Congress may or may not appropriate funds sufficient for payments at full entitlement. Refuge revenue sharing payments are provided to the Towns of Greenfield and Temple (table 3.1).

Table 3.1. Refuge revenue sharing payments to the towns of Greenfield and Temple, 2000–2006

Years	*Town of Greenfield*	*Town of Temple*
2000	$2,422	$1,018
2001	$2,472	$1,040
2002	$2,309	$971
2003	$2,420	$1,017
2004	$2,140	$900
2005	Not Available	$1,016
2006	$2,237	$940

Revenues from Wildlife Watching

The refuge provides opportunities for wildlife watching enthusiasts, which aligns to local and statewide economic benefits. Those benefits are due to trip-related amenities such as food, lodging, transportation and other costs, such as equipment rental. According to the Service publication "2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation" (USFWS & US DOC 2007a), 698,000 people participated in wildlife watching in the State of New Hampshire. A Service study also found that, in New Hampshire, resident and non-resident wildlife watchers respectively spent about $27 and $151 per person, per day (USFWS 2003).

Benefits of Open Space

Forests can bring in a lot of revenue for the surrounding community. In 2001, for example, revenues from forest-related recreation and tourism in New Hampshire totaled $940 million (NEFA 2004). A review of cost of community services studies compared the cost per dollar of revenue generated by residential or commercial development to that of revenue and savings generated by an open space designation. On the one hand, residential development expands the tax base, but the costs of increased infrastructure and public services (e.g., schools, utilities, and emergency and police services) often offset any increases in tax revenue. On the other hand, undeveloped land requires few town services and places little pressure on the local infrastructure. That results of that review show that favoring residential development at the expense of open land does not alleviate the financial problems of communities, but rather, is likely to exacerbate them (Crompton 2004).

Refuges also provide valuable recreational opportunities for local residents, and maintain a rural character important to many people's quality of life. Ecologically, refuges maintained as natural lands perform valuable services in a local community, such as the filtration of pollutants from soil and water that otherwise would have to be provided technologically at great expense.

Refuge Staffing and Operations

We discussed previously in both chapters 1 and 2 that the Service's 2006 Regional Strategic Downsizing Plan includes the decision to de-staff Great Bay refuge, which currently administers Wapack refuge. In 2008, both of those refuges will be administered by Parker River refuge in Newburyport, Massachusetts. Up through fiscal year (FY) 2007, the budgets of Great Bay and Wapack were combined and the refuge manager made decisions about how to spend those funds based on annual priorities. The FY2007 operations and maintenance budget for the combined refuges was $287,512.68. Currently, there are no buildings or other structures located on Wapack refuge.

Habitat Types and Vegetation

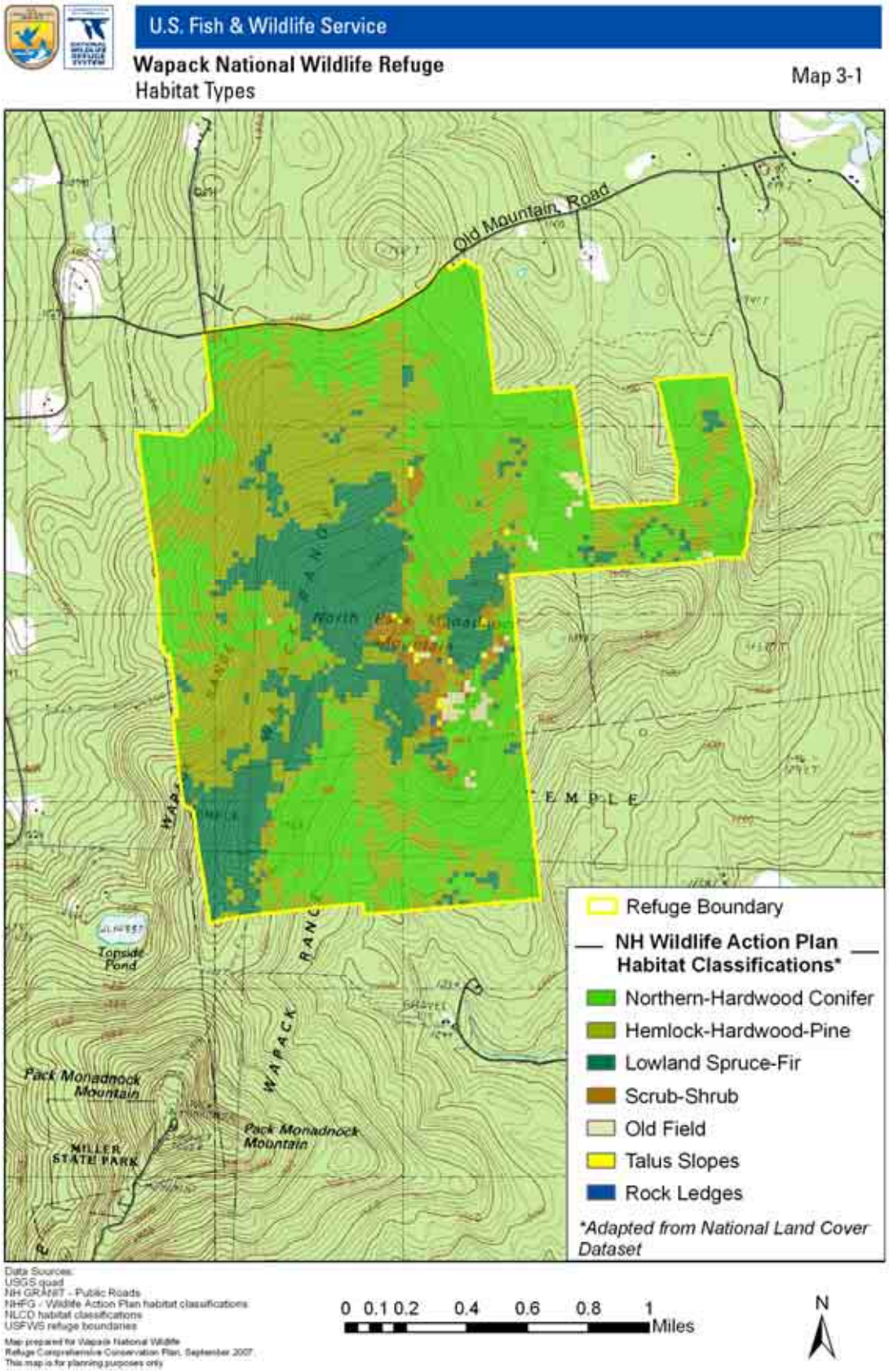
The following table summarizes the major habitat types on the refuge. Map 3-1 shows where they occur on the refuge. We have also included a narrative description of each habitat type.

Table 3.2. Acreage of habitat types at Wapack refuge

Habitat Type	*Acres**
Northern Hardwood-Conifer	710
Hemlock-Hardwood Pine	560
Lowland Spruce-Fir	329
Old Field	38
Scrub-Shrub	14
Talus Slopes	<5
Rock Ledges	<5

Source: National Land Cover Dataset, U.S. Geological Survey

**acres are approximated based on GIS data.*


U.S. Fish & Wildlife Service
Wapack National Wildlife Refuge
Habitat Types
Map 3-1
Old Mountain Road
Topside Pond
Pack Monadnock Mountain
Pack Monadnock Mountain
MILLER STATE PARK
WAPACK RANGE
EMPLE
Refuge Boundary
NH Wildlife Action Plan Habitat Classifications*
Northern-Hardwood Conifer
Hemlock-Hardwood-Pine
Lowland Spruce-Fir
Scrub-Shrub
Old Field
Talus Slopes
Rock Ledges
*Adapted from National Land Cover Dataset
Data Sources:
USGS quad
NH GRANIT - Public Roads
NHFG - Wildlife Action Plan habitat classifications
NLCD habitat classifications
USFWS refuge boundaries
Map prepared for Wapack National Wildlife Refuge Comprehensive Conservation Plan, September 2007
This map is for planning purposes only
0 0.1 0.2 0.4 0.6 0.8 1 Miles
N

Northern Hardwood-Conifer Forest

The northern hardwood-conifer forest is found around the refuge in the mid-and upper-elevations, serving as a transition from the lower hemlock-hardwood-pine forest to the high elevation spruce-fir forest. This is the most abundant refuge habitat type. Approximately 710 acres of northern hardwood-conifer forest are present on the refuge (table 3.2, map 3-1). The northern hardwood-conifer forest is characterized by American beech (*Fagus grandifolia*), sugar maple (*Acer saccharum*), and yellow birch (*Betula alleghaniensis*) (NHFG 2005). The northern hardwood-conifer forest supports a large diversity of plant life. The most common tree types are yellow birch (*Betula alleghaniensis*), eastern hemlock (*Tsuga canadensis*), American beech (*Fagus grandifolia*), white pine (*Pinus strobus*) and red oak (*Quercus rubra*). The understory of the northern hardwood-conifer forest is very diverse, including striped maple (*Acer pensylvanicum*), high bush blueberry (*Vaccinium corymbosum*), mountain laurel (*Kalmia latifolia*), and hobblebush (*Viburnum lantanoides*). Ephemeral plants and other woodland wildflowers thrive in this forest type. Trillium (*Trillium spp.*), goldthread (*Coptis trifolia*), wild sarsaparilla (*Aralia nudicaulis*), pink lady's slipper (*Cypripedium acaule*), wood sorrel (*Oxalis violacea*) and several ferns (*Pteridophyta spp.*) are found in the herbaceous layer of this forest type (Sperduto and Nichols 2004).

Hemlock-Hardwood-Pine Forest

Hemlock-hardwood-pine forests are transitional forest regions or "tension zones" in New Hampshire. They occur between hardwood-conifer forest to the north (above 1400 ft) and oak-pine forests to the south (below 900 ft). Hemlock-hardwood-pine forest is the most widely distributed forest type in New Hampshire, covering nearly 50 percent of the state's land area. Approximately 550 acres of hemlock-hardwood-pine forest are present on the refuge (table 3.2, map 3-1).The main matrix forest community that defines this system is hemlock-beech-oak-pine forest. Eastern hemlock (*Tsuga canadensis*) and American beech (*Fagus grandifolia*) are the primary late-successional trees in this community, while red oak (*Quercus rubra*) and white pine (*Pinus strobus*) also are typically abundant. Beech and oak trees are important for providing hard mast for many wildlife species in this ecosystem. Also common in the hemlock-hardwood-pine forest region are numerous herbs, including starflower (*Trientalis borealis*), wild sarsaparilla (*Aralia nudicaulis*), and Canada mayflower (*Maianthemum canadense*). The understory of this forest contains shrub species such as witch hazel (*Hamamelis virginiana*), black birch (*Betula lenta*), black cherry (*Prunus serotina*), ironwood (*Ostrya virginiana*), maple-leaved viburnum (*Viburnum acerifolium*), wintergreen (*Gaultheria procumbens*), and black huckleberry (*Gaylussacia baccata*) (NHFG 2005).

Lowland Spruce-Fir Forest

The spruce-fir forest, which is the dominant forest type in northern latitudes, covers approximately 10 percent of New Hampshire, occurs on the refuge mostly above 1,500 feet in elevation. Approximately 329 acres of spruce-fir forest are present on the refuge (table 3.2, map 3-1). In this latitude, this habitat type occurs primarily on high mountain ridges. Trees such as red spruce (*Picea rubens*) and balsam fir (*Abies balsamea*) dominate, while paper birch (*Betula papyrifera*) and poplar (*Populus spp.*) are common early successional species. The spruce-fir forest lacks the diversity of the northern hardwood forest because the dark shade cast by the canopy and the acidic needle-covered soil make it hard for most species to grow. The most common shrubs include mountain ash (*Sorbus Americana*), sheep laurel (*Kalmia angustifolia*), and low bush blueberry (*Vaccinium angustifolium*). The herbaceous understory contains clintonia (*clintonia* spp.), starflower (*Trientalis americana*), bunchberry (*Cornus canadensis*) as well as lichens (*Parmelia* spp.) and mosses (*Bryophyta* spp.). Another key feature of the spruce-fir forest is that the tree size becomes smaller as the elevation rises toward the summit (Sperduto and Nichols 2004). Upslope, lowland spruce-fir forest systems typically transition to northern hardwood-conifer systems (NHFG 2005).

Old Field

The stone walls which crisscross the land near the refuge show old field boundaries, which are clues to an agricultural history. Natural succession has converted most of the old field habitat to mature forest. The only old field habitat that remains is on the north slope of North Pack Monadnock. Approximately 38 acres of old field habitat are present on the refuge (table 3.2). Large junipers growing in this upland field, typical of old pastures, are now in succession to the spruce-fir forest which surrounds them. High bush blueberry plants (*Vaccinium corymbosum*) can also be seen growing in the understory of the forest, suggesting that they once grew in an open location (Flanders 2006).

Scrub-Shrub

Scrub-shrub habitat refers to shrub-dominated areas with scattered forbs and grasses. These habitats are typically the result of some disturbance and may include dry shrublands, utility rights-of-way, and old agriculture fields in our project area. The majority of this habitat type is transitional, and given time, will become forest. Approximately 14 acres of this habitat type occurs on the refuge (table 3.2, map 3-1).

The New Hampshire WAP describes the decline of this and other woody early-successional habitats in New Hampshire and throughout the Northeast. In our area land use changes including the loss of farmland, the increase in residential development, and the suppression of fire and beaver activity, are the reasons this habitat type is declining. Its decline has implications for many associated wildlife species. For example, nearly half of the 33 shrubland birds covered by Breeding Bird Survey routes in the Northeast have significantly declined in the last 35 years. The American woodcock, eastern towhee, and ruffed grouse are examples of birds documented on the refuge that rely on this habitat type.

Talus Slopes

Only four talus slope natural community systems occur in New Hampshire, and one is on the refuge. Temperate acidic talus slopes are found on the refuge at low elevations below 1800 ft. Fewer than 5 acres of talus slope are present on the refuge (table 3.2, map 3-1). They are characterized by oaks (*Quercus spp.*), black birch (*Betula lenta*), and other temperate species. This system tends to have an open woodland character, with frequent canopy gaps, sporadic large rocks, and occasional lichen-dominated talus barren openings. This system transitions to forested talus areas characterized by hemlock-hardwood-pine forest or oak-pine forest systems (NHFG 2005). This rare forest type provides excellent wildlife den sites for small- and medium-sized mammals (Van de Poll 2006).

Rock Ridges

Rocky ridges occur on outcrops and shallow-to-bedrock ridge and summit settings below those that are classified on alpine habitat (Sperduto and Nichols 2004). There are two major rocky ridge natural community systems in New Hampshire; one of them is on the refuge. The montane rocky ridges on the refuge are dominated by red spruce (*Picea rubens*), red pine (*Pinus resinosa*) and red oak (*Acer rubrum*). Fewer than 5 acres of rock ridge are present on the refuge (table 3.2, map 3-1). Outcrops include cliff slabs, which are steep bedrock exposures of $<65^{\circ}$ slope. These rocky ridges, summits, and slabs have a woodland to sparse woodland canopy structure ranging from completely open patches to thin forest cover $>65\%$, much open bedrock exposure, and one or more of the three primary diagnostic communities that overlap in their elevation ranges (see forest types above) (NHFG 2005). The refuge contains extensive areas of exposed rock. The amount of exposed bedrock increases with elevation. The numerous ledges and cliffs include a dramatic 200-foot vertical cliff facing south. That cliff is a fine example of a glacial whale back, with steep cliffs and talus boulder fields created by physical weathering.

Threatened and Endangered Plants or Rare Plant Communities

We know of no federal- or state-listed threatened or endangered plants or rare plant communities on the refuge.

Invasive Plants

No invasive plant species are known to grow on the refuge. However, we have not done an extensive survey. The areas most susceptible to invasion lie on the edges of the refuge. That is where we would focus our monitoring program in the future.

Wildlife Resources

Birds

The unfragmented upland forest on the refuge provides ideal habitat for many birds. It includes a wide variety of habitat of nesting and foraging substrates. Bird surveys were last completed on the refuge during the breeding season in 2002. Some of the birds observed on the refuge during those surveys include the ovenbird, hermit thrush, red-eyed vireo, Canada warbler, blackpoll warbler, bay-breasted warbler, black-throated blue warbler, black-throated green warbler, blackburnian warbler, golden-crowned kinglet, scarlet tanager, rose-breasted grosbeak and yellow-bellied sapsucker. Several of those species have been identified as species of concern or priority by the New Hampshire Wildlife Action Plan (WAP), the Atlantic Northern Forest Bird Conservation Region (BCR 14) Blueprint, or the Partners in Flight (PIF) Landbird Conservation Plan—Northern New England (Area 27).

The bay-breasted warbler, Canada warbler, and veery are identified by the New Hampshire WAP as species of concern or regional concern (NHFG 2005). The black-throated blue warbler, black-throated green warbler, blackburnian warbler, blackpoll warbler, ovenbird, and yellow bellied sapsucker are identified by the BCR 14 Blueprint as moderate or high priority species (Dettmers 2005). The rose-breasted grosbeak and scarlet tanager are identified by the PIF plan (Area 27) as species of high regional concern (Hodgedon & Rosenberg 2000). The priorities identified in these plans will help us in focusing our research and monitoring efforts. This forest provides ideal breeding grounds for these neotropical migrant birds who migrate to these forests to breed during the warm months. Many more species of neotropical and resident birds exist on the refuge and will be included in Appendix C, Species of Conservation Concern.

Raptors observed on the refuge during our 2002 survey include the red-tailed hawk and the sharp-shinned hawk. Several other species of raptors can be viewed migrating through in the fall and spring seasons. The steep cliff habitat on the south side of North Pack Monadnock may provide nesting habitat for the peregrine falcon. Ruffed grouse, located on the refuge in the wet forested areas is the only upland game bird observed on the refuge.

Mammals

The refuge provides habitat for many mammal species. Due to their daytime activity the species most commonly seen are the red and gray squirrel. The red squirrel occupies the upland spruce/fir forest where it feeds on spruce cones. The gray squirrel builds large nests in the high tree branches of the northern hardwoods. Many other rodents live in the refuge although they are seldom seen. Stone walls that run across the property offer habitat for these small animals. The white-footed mouse and the deer mouse build nests in burrows, hollow trees, and under rocks. The woodland vole is a likely resident of dense shrub areas. Moles and shrews dwell underground and feed on insects. The porcupine, the largest rodent in the refuge, has a healthy population due to the abundance of woodland habitat. The eastern chipmunk uses the deciduous forest for food and shelter (Flanders 2006).

Moose and white-tailed deer are the only hoofed animals on the refuge. The northern hardwood-conifer forest provides abundant understory browse for these animals. Hemlock trees provide ideal bedding habitat for the white-tailed deer. Moose use the refuge as an unfragmented upland corridor between wetland habitats to the east, north and west of the refuge.

The snowshoe hare can be found in thick shrub areas. The steep talus boulder fields offer den sites for bobcat, gray fox, red fox, coyote and black bear. The remnants of old fields provide hunting habitat for bobcat although most of this habitat type has gone through succession to forest cover. Black bear, bobcat and coyote have large home ranges and prefer to use unfragmented mountain ridges for their daily and seasonal movements. Red and gray fox habitat is abundant on the refuge since these species are opportunistic feeders and function well in many different habitat types (Flanders 2006).

Reptiles and Amphibians

The most common amphibian on the refuge is likely the red-backed salamander. The refuge also provides habitat for the red spotted salamander, which finds habitat in the darkness under rocks, humus, and old logs. The red-spotted newt in its larval stage can be seen on moist rocks and leaves after summer showers (Flanders 2006). The American toad, which prefers the lower elevations, is also a resident. The wetter areas may also provide habitat for frog species including the spring peeper, pickerel, and the bull and leopard frog. These areas may also provide habitat for the wood turtle (Flanders 2006).

The sunny ledges, wetlands, and open woodlands provide excellent snake habitat for the milk snake, garter snake, and ribbon snake (Flanders 2006).

Invertebrates

Compared to the wooded areas, the old fields on the refuge play host to a larger diversity of insects. Butterflies, dragonflies, beetles, wasps, bees, ants, and other bugs can be seen throughout the year (Flanders 2006). The insect diversity on the refuge provides an integral food source to many bird species. No invertebrate survey has ever been conducted at the refuge. Thus, we cannot list exact species' names.

Threatened or endangered wildlife

To date, no federal- or state-listed threatened or endangered species have been documented on the refuge.

Wildlife Inventories and Monitoring

Studies within the refuge have been limited to bird surveys completed in 2000-2002. Groups such as New Hampshire Audubon also use the refuge for bird observation and raptor migrations counts. We continue to encourage compatible wildlife studies on the refuge since it offers a unique opportunity to observe wildlife in a natural, undisturbed setting.

Visitor Services

Activities specifically allowed

The refuge is open for the following activities from official sunrise to sunset, seven days a week. Annually, the refuge receives approximately 30,000 visitors.

In 1994, the refuge manager completed compatibility determinations for berry picking, hiking/backpacking, jogging/walking, snowshoeing and cross-country skiing, wildlife observation, photography, and picnicking. All of those were found at that time to be compatible with the mission of the Refuge System and the purpose for which the refuge was established.

Berry picking only for personal use is allowed only in the areas next to the Wapack Trail.

Hiking and through-backpacking are popular on trails in the refuge. Hiking, through-backpacking, jogging and walking areas include the 4-mile section of the Wapack Trail, the 1.1-mile Cliff Trail loop off the Wapack Trail, and the 3 miles of the Ted's and Carolyn's trails that cross the refuge.

Snowshoeing and cross-country skiing are allowed on existing trails during daylight hours when there is sufficient snow cover.

Wildlife observation and photography are allowed along any of the trail systems only during daylight hours. All commercial photography must be approved in advance by special use permit.

Picnicking on the refuge is a secondary use currently allowed in conjunction with observing wildlife and hiking/backpacking. No facilities are provided for picnicking.

Activities specifically not allowed

The refuge was donated to the Service with certain deed restrictions. In addition to the requirement that we manage it in a “wilderness-like” or undeveloped, natural setting, the deed prohibits hunting, fishing, trapping, traveling in or using vehicles, and the cutting of trees except for the maintenance of trails. In adhering to the deed, we do not allow any of those activities on the refuge. Refuge managers in past years have determined the following activities are not compatible: camping, mountain biking, and horseback riding. Dog walking is an activity that occurs on the refuge that has not been formally determined compatible and is therefore technically prohibited. Each of these uses has been reevaluated in light of new policies on appropriate and compatible uses. See appendix A for our current evaluations.

Cultural or Historic Resources

The refuge holds no known archaeological or historic sites or structures, and owns no museum property. However, it is also important to note that we have conducted no archaeological surveys of the refuge. Some evidence indicates hunting by Abenaki Indians before Europeans settled in the area.

Chapter 4

View from Ted's Trail
Lelaina Marin/USFWS

Environmental Consequences

- Introduction
- Effects on the Socioeconomic Environment
- Effects on Air Quality
- Effects on Physical Resources
- Effects on the Natural Soundscape
- Effects on Biological Resources
- Effects on Public Use and Access
- Effects on Cultural and Historic Resources
- Cumulative Impacts
- Short-Term and Long-Term Productivity
- Unavoidable Impacts
- Potential Irretrievable and Irreversible Impacts
- Summary of Environmental Consequences by Alternative

Introduction

This chapter describes the foreseeable consequences of implementing the management alternatives described in chapter 2 on the physical, biological, and human environment of the refuge described in chapter 3. Specifically, it predicts the effects of implementing the strategies for each objective of the two alternatives: alternative A, "Current Management," and alternative B, "The Service-preferred Alternative."

For details of the alternatives for managing the refuge, see chapter 2, "Alternatives." For details of the physical, biological, and human environment of the refuge, see chapter 3, "Affected Environment."

We organized this chapter by major resources; the impacts of each alternative accompany them. It discusses the direct, indirect, short-term beneficial and adverse effects likely to occur over the 15-year period of this plan. We speculate more in describing those effects beyond that 15-year planning horizon. At the end of this chapter, table 4.1 compares side-by-side summaries of the predictable effects of each alternative.

This chapter also identifies any irreversible or irretrievable commitments of resources and the relationships between short-term and long-term productivity. When detailed information is available, we compare scientific analyses of the expected consequences, which we describe as impacts or effects. When detailed information is unavailable, we base those comparisons on our professional judgment and experience.

When we lack reliable, quantitative information, we use the terms "positive," "negative," or "neutral" as qualitative measures.

- A positive impact would benefit or enhance the resources under consideration and help accomplish refuge management goals and objectives over the short term (<15 years) or the long term (>15 years).
- A negative impact arises from an action that we predict would be detrimental to a resource over the short or long term and, possibly, affect our ability to achieve refuge purposes, goals and objectives.
- A neutral impact means either (a) no discernible effect either positive or negative, or (b) positive and negative effects would cancel each other out.

Some of the actions we propose in chapter 2 do not require additional NEPA analysis, because they are routine administrative actions that do not significantly affect, either individually or cumulatively, the human environment. This chapter does not describe those actions further. They are "categorically excluded" from further NEPA analysis or review, and include the following:

- Conducting research and inventories or collecting other information on resources;
- Conducting routine trail maintenance (e.g., installing water diversions or transporting large rocks to prevent erosion);
- Installing an interpretative sign;
- Making minor changes in the amount or types of public use; and,
- Enforcing laws and refuge regulations.

Effects on the Socioeconomic Environment

Alternative A

In summary, implementing alternative A would not affect the existing socioeconomic environment. The refuge helps to maintain the quality of life not only for local residents, but also for all refuge visitors. Alternative A would not change the opportunities for public use, and current refuge regulations would remain in effect (see chapters 2 and 3).

Refuge land provides socioeconomic benefits through refuge revenue sharing payments (see chapter 3, table 3.1 and narrative on page 3-4 for a complete description and a table of payments from 2000 through 2006). It also provides benefits from public use, as in the increasingly important ecotourism industry. The refuge complements the ecotourism in adjacent natural areas, including Miller State Park and the Joanne Bass Bross Preserve, which attract many outdoor enthusiasts (see chapter 3, pages 3-3 and 3-4 for complete descriptions and amounts of revenues). Applying the estimates for economic values for wildlife-related recreation in chapter 3, the refuge's annual visitation of approximately 30,000 could contribute $2,372,400 annually to the state or local economies. This estimate is also based on the assumption that 58 percent of visitors to the refuge are state residents and 42% are from out-of-state (USFWS 2003b).

Alternative B

In summary, implementing alternative B would not adversely affect the local socioeconomic environment, and the increase in visitation we predict in this alternative would contribute more to the local economy. We do not expect that prohibiting jogging, camping, mountain biking, horseback riding, and organized or facility-supported picnicking on the refuge will detract from the local economy or from the quality of life for local residents.

The benefits of refuge revenue sharing would resemble those in alternative A. The alternatives differ in that alternative B proposes some changes in our outreach and visitor services program (see chapter 2) that would contribute to a small increase in visitation.

The New Hampshire State Comprehensive Outdoor Recreation Plan finds that visitation at New Hampshire state parks increased by 82 percent between 1998 and 2001 (NH OEP 2003). We are not expecting as large an increase in the number of refuge visitors, because we do not allow such activities as hunting or fishing, which typically attract many visitors.

However, we are predicting an increase in visitation of up to 15 percent, based on the "2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation: State Overview," which finds a 15 percent increase in the number of people watching wildlife near their homes in New England between 2001 and 2006 (USFWS & US DOC 2007). Using that statistic, coupled with our proposed changes in outreach in allowed uses, we believe we can expect at least a 15 percent increase in refuge visitors over the next 15 years: an increase from the current estimated 30,000 visitors per year to an estimated 34,500 visitors per year.

Based on estimates that residents and non-residents respectively spend $27 and $151 per person, per day when watching wildlife (USFWS 2003a), and the New Hampshire state visitor ratio of 58 percent state residents and 42 percent non-residents (USFWS 2003b), we predict a contribution of $2,728,260 annually to the state or local economy each year. See chapter 3 for more information on social and economic values attributed to the refuge.

Effects on Air Quality

Alternative A

In summary, we do not expect any major impacts on the air quality on the refuge or the surrounding landscape from implementing alternative A. Refuge activities (e.g., vehicle emissions) would result in only a negligible adverse effect on air quality, and would not affect Class I air quality areas. We predict no violations of the Federal Clean Air Act from implementing alternative A.

We would not remove trees, or implement methods such as prescribed fire, either to manage vegetation or for any other purpose. Alternative A does not propose the use of pesticides or herbicides on the refuge. In alternative A, we would continue to protect the forest ecosystem to maintain carbon sequestration at its current level or increase it. Carbon sequestration in terrestrial ecosystems is either the net removal of carbon dioxide from the atmosphere or the prevention of carbon dioxide emissions into the atmosphere (DOE 1999). Thus, alternative A would continue to benefit regional air quality and would not cause any major impacts.

Alternative A would continue to protect refuge land from residential, commercial, or industrial development, and prevent the additional degradation of air quality from increased vehicle emissions or industrial air pollutants associated with that development. Although the emissions of visitors' vehicles contribute additional pollutants, such as ozone, that contribution is negligible compared to that of the urban and industrial centers within 100 miles of the refuge. In addition, protecting natural vegetation (see carbon sequestration, above) would partially offset those vehicle emissions.

The USFS Lye Brook Wilderness Area in Vermont is the Class I air quality area closest to the refuge, approximately 90 miles away. However, we do not expect any of our current activities to affect the air quality in those areas, because of their distance and the prevailing winds, and because our activities contribute virtually no pollutants.

Alternative B

In summary, implementing alternative B would result in only minimal impact on air quality, but would not affect Class I air quality areas. Therefore, we predict no violations of the Federal Clean Air Act from implementing alternative B or any impacts to Class I air quality areas. Alternative B would provide most of the same positive effects on air quality as those described in alternative A.

The only change that might cause a minimal impact on air quality is the anticipated increase in visitors, and thus, an increase in vehicles, as a result of improved Service and refuge outreach. Still, those car emissions would contribute only a negligible amount compared to those of the urban and industrial centers within 100 miles of the refuge.

Effects on Physical Resources

Water Quality

Alternative A

We do not expect any impacts on the current water quality on the refuge or the Wapack Range. Alternative A does not propose the application of pesticides or herbicides, nor does it propose the removal or installation of infrastructure, or the creation of non-permeable surfaces. It proposes no projects that would alter the hydrology of the refuge. It would protect refuge land from residential, commercial, or industrial development, and prevent the degradation of water quality associated with them: namely, non-point and point-source pollution. The natural vegetation on the refuge filters water pollutants, although we have not done a study to quantify that benefit.

Alternative B

In summary, we predict no violation of the Clean Water Act from implementing alternative B. It does not propose any major management or construction projects that would impact the hydrology of the refuge, nor do we expect any impacts on the current water quality of the Wapack Range. The only exception is our proposal to explore a location for a new trailhead parking area. Although we anticipate laying a permeable gravel surface, we lack the final design plans and definite location to fully analyze their impacts. We will conduct the appropriate level of NEPA analysis when we have the final plans and location.

As in alternative A, alternative B does not propose the application of any pesticides or herbicides that would degrade water quality. We would protect refuge land from residential, commercial, or industrial development, and prevent the effects on water quality associated with them, particularly point- and non-point-source pollution. Natural vegetation on the refuge would continue to filter water pollutants that might otherwise degrade water systems nearby.

Soils

Alternative A

In summary, this alternative proposes no major construction or demolition projects that require the disturbance of significant areas of earth or soil, other than the possible installation of water diversions to prevent soil erosion. Although foot travel leads to soil compaction, we do not expect any significant adverse impacts on refuge soils in alternative A.

The only management activity on the refuge with the potential to affect soils is maintaining the trails. That includes removing major obstructions and litter, creating water diversions, or rerouting a trail if necessary to minimize erosion. Only hand tools are used for those maintenance projects, thus mitigating soil compaction that might result from the use of larger construction equipment. We expect visitors to stay on the designated trails to minimize the compaction and erosion of off-trail areas. This alternative does not propose the use of herbicides or revegetation, thereby preventing additional mechanical or chemical impacts on soils.

Alternative B

In summary, alternative B proposes no major construction or demolition projects that would disturb significant areas of earth or soil, or cause additional soil compaction, erosion or loss of soil productivity. However , minor soil disturbance may result from several small maintenance projects and public use activities, described below.

We propose to install an informational sign at the Wapack trailhead and “Welcome to the National Wildlife Refuge” signs at the entrances to the Ted’s and Carolyn’s trails. Installing those signs would cause minimal soil compaction and negligible mechanical impacts on a very small area of the refuge. This alternative also would continue trail maintenance as described above in alternative A, with the same minimal effects. We may install water diversions throughout the trails which would cause minor soil disturbance during installation, but would provide long-term benefits against soil erosion. As in alternative A, alternative B does not propose revegetation or the use of herbicides that would result in additional mechanical or chemical impacts on the soil.

Foot travel from visitors using the refuge for walking/hiking, backpacking, cross country skiing, snowshoeing, dog walking, berry picking, or conducting research on the refuge may lead to soil compaction. However, under current levels of use on the refuge or with a 15 percent increase in visitation, we expect that soil compaction would be minor and insignificant; particularly if visitors stay on designated trails. Furthermore, prohibiting mountain biking and horseback riding should prevent future degradation and erosion of trails from these activities. Prohibiting organized picnicking and camping should reduce the number of visitors wandering off trail to find sites and consequently causing increased soil compaction.

We also anticipate laying a permeable gravel surface for a new trailhead parking area, but we lack the final design plans and definite location to fully analyze their impacts. When we have them, we will conduct the appropriate level of NEPA analysis.

Other than the small projects described below and the possible installation of water diversions throughout the trails, we predict no additional soil compaction, erosion, or loss of soil productivity from implementing alternative B.

Effects on the Natural Soundscape

Alternative A

In summary, this alternative proposes no projects that would change the natural noise levels of the refuge. Therefore, we do not expect implementing alternative A to cause any significant adverse impacts on the refuge soundscape[1].

The noise contributed by vehicles would be negligible, considering that no major highways pass nearby, and the only roads close to the refuge sustain minimal use. The only other activity on the refuge that may contribute minimal noise impacts is the use of a chainsaw in maintaining trails. However, that use is limited and temporary; we expect negligible to no impacts on the natural soundscape.

Alternative B

Same as alternative A

Effects on Biological Resources

Vegetation

Alternative A

In summary, we do not expect any major impacts on vegetation by implementing alternative A. Implementing alternative A would continue to maintain the “wilderness-like” setting of the refuge and, consequently, prohibit the removal of or other detrimental effect on refuge vegetation.

We would continue to comply with the deed restrictions which prohibit the removal of any trees, except for trail maintenance. The only shrub or herbaceous vegetation removal we expect on the refuge would result only if any major obstructions or litter were present on the trails. Because we expect refuge visitors to stay on the designated trails and the number and impact of berry pickers to be minimal (see alternative B discussion below), we expect minimal vegetation compaction.

Alternative B

In summary, as in alternative A, we would continue to comply with the deed restrictions that prohibit any removal of trees except for trail maintenance. Implementing alternative B would maintain the “wilderness-like” setting of the refuge, and thus, prohibit the removal of vegetation unless for trail maintenance purposes. Vegetation would be removed only if major obstructions or litter were present on the trails. Further, no collecting of native vegetation or materials is allowed, except for the picking of berries for personal-use.

[1] **soundscape** *n* the total acoustic environment associated with a given area (NPS 2003)

Foot travel from visitors using the refuge for walking/hiking, backpacking, cross country skiing, snowshoeing, dog walking, berry picking, or conducting research on the refuge increases root exposure, trampling effects, and crushing of plants. We would continue to expect and encourage refuge visitors to stay on designated trails, thus minimizing vegetation compaction and soil loss. Those impacts would primarily occur in the trail footprint. Under current levels of use on the refuge or with a 15 percent increase in visitation, we expect that any effects from foot traffic would be minor and insignificant. Furthermore, prohibiting mountain biking and horseback riding should prevent future degradation of trails and erosion from these activities. Prohibiting organized picnicking and camping should reduce the number of visitors wandering off trail to find sites and consequently causing increased soil compaction and trampling of vegetation.

In concentrated areas at high use, visitors walking off established trails to collect berries may impact plants indirectly by compacting soils and diminishing soil porosity, aeration and nutrient availability, affecting plant growth and survival (Kuss 1986). Re-colonization of plants can be limited because root growth and penetration becomes more difficult in compacted soils (Hammitt and Cole 1998). However, many of the berry bushes grow adjacent to the trail alleviating the need for much traffic off the trail. Furthermore, under alternative B berry picking would be permitted only in designated trail areas to minimize off-trail soil compaction and vegetation trampling. Our observations of harvest levels and technique indicate that berry picking is not efficient or extensive enough to impact the regeneration of berries. More of a long-term impact to the berries on the refuge is that the surrounding vegetation is beginning to shade out plants. Portions of the berry picking area or, if appropriate, the entire area can be closed at any time for any length of time if the refuge manager determines that wildlife or wildlife habitat is being impacted by the activity.

Visitors may also spread invasive plants. When people move from one area to another, they can be vectors for the seeds or other propagules of invasive plants. Once established, invasive plants can out-compete native plants, thereby altering habitats and indirectly impacting wildlife. Additionally, horse manure may contain viable seeds from invasive plants (Wells and Lauenroth 2007). Prohibiting horseback riding on the refuge would prevent the introduction of invasive plants through horse manure. The threat of invasive plants establishing themselves will always be an issue that requires monitoring. Within 2 years of CCP completion, the USFS Forest Health Protection Program would complete a full forest health assessment that would help determine if any invasive species inhabit the refuge.

This alternative proposes the installation of an informational sign at the Wapack trailhead and “Welcome to your National Wildlife Refuge” signs on the Ted’s and Carolyn’s trails which might require the removal of minimal, if any, vegetation.

Endangered and Threatened Species

No federal- or state-listed endangered or threatened species are known to use the refuge.

Birds

Alternative A

In summary, we expect minimal adverse effects on forest-dwelling birds from implementing this alternative. The refuge contains many forest-dwelling bird species. Several of those are identified as species of concern or priority by the New Hampshire Wildlife Action Plan (NHFG 2005) and the Atlantic Northern Forest Bird Conservation Region (BCR 14) Blueprint (Dettmers 2005). See chapter 3 for lists of species.

This alternative would continue the maintenance of the 1,625 acres of contiguous, mature forest habitat to benefit all of those species. Trail maintenance or visitor use may temporarily displace them, and disturbance may be elevated if dogs are present (see alternative B discussion below), but that impact is not permanent, limited in time and area, and focused on trail use. Berry picking for personal use occurs in the summer. Our

observations indicated that the harvest of berries by refuge visitors is not sufficiently efficient nor so extensive so as to negatively impact the use and availability of the overall berry crop by wildlife.

Alternative B

In summary, alternative B would continue to benefit forest-dependent birds on the refuge by maintaining 1,625 acres of mature forest and conducting bird surveys.

- It proposes no habitat management or manipulation, and consequently, would continue to provide 1,625 acres of contiguous mature forest habitat for the forest dwelling birds species identified in chapter 3.

- It proposes that our partners assist us in increasing the number of wildlife surveys conducted on the refuge. That would help us better quantify the effects of this alternative on bird populations on the refuge.

Visitors using the refuge may directly impact birds sensitive to human presence. We would continue to expect and encourage refuge visitors to stay on designated trails, thus minimizing disturbance to birds. However, we predict any disturbance from visitors would only result in a temporary displacement of birds without long-term effects on individuals or populations. Under current levels of use on the refuge or with the projected 15 percent increase in visitation, the incidence of any problems would be minor and insignificant. Furthermore, prohibiting mountain biking and horseback riding should prevent future disturbance and degradation of trails and wildlife habitat from these activities. Prohibiting organized picnicking and camping should reduce the incidences of visitors leaving behind trash and food waste that could attract nuisance species, and should also reduce the number of visitors who wander off trail and consequently cause increased soil compaction, trampling of vegetation, and disturbance to wildlife.

Some particularly sensitive bird species may avoid areas frequented by people, such as the trail. There are other birds, however, such as chickadees and titmice, which seem unaffected or even drawn to human presence. Visitors also have the potential to supply an unnatural food source for birds, either through feeding food scraps or littering. We will advise against feeding birds in our outreach program, and we already prohibit littering. We also describe under alternative A “Birds” the potential for berry picking to affect food resources for birds. However, as we describe, we estimate there is minimal impact. To ensure this is true, under alternative B berry picking will be permitted only in designated trail areas to minimize the damage to vegetation by trampling. Portions of the berry picking area or, if appropriate, the entire area can be closed at any time for any length of time if the refuge manager determines that wildlife or wildlife habitat is being impacted by the activity.

Dog walking might cause additional disturbance to birds. There can be an increase in wildlife disturbance from dog walking simply due to normal dog behavior (i.e. jumping, barking, running off a leash). At some level, domestic dogs maintain instincts to hunt and/or chase. Given the appropriate stimulus, those instincts can be triggered in many different settings. Even if the chase instinct is not triggered, dog presence in and of itself has been shown to disrupt many wildlife species (Sime 1999). Sime presents some effects of disturbance, harassment, and displacement on wildlife attributable to domestic dogs that accompany recreationists. Sime states that authors of many wildlife disturbance studies concluded that dogs with people, dogs on-leash, or loose dogs provoked the most pronounced disturbance reactions from their study animals. Dogs extend the zone of human influence when off-leash.

Although dogs can increase disturbance to wildlife, the refuge will enforce a leash law under alternative B to keep dogs and disturbances localized with the pedestrian. There are no documented incidences of domestic dog-wildlife disturbances, or dog-people problems on refuge trails. We have not observed or had reports about significant negative impacts from this use. Through increased signage and outreach by refuge staff and volunteers regarding dog walking proposed under alternative B, we will encourage visitors to comply with the leash law. We believe most dog walkers are local residents, who regularly visit the refuge for

wildlife-dependent recreation, and who will adhere to our regulation. Since alternative B would require that dogs be on leash, minimizing the zone of human influence compared to dogs running off leash under alternative A, we predict a reduced impact on birds under alternative B. We plan to use our volunteers and partners to help us monitor dog walking over the next 5 years to determine if visitors are adhering to the regulation. If we find that the majority of visitors are not complying, we would be prepared to prohibit dog walking altogether. We would print the availability of dog walking as an activity on the refuge as well as the rules and consequence of violating the new policies on the new orientation sign.

Disturbance to birds and other wildlife by researchers could occur through observation, mist-netting, banding, and accessing the study area by foot. It is possible that direct mortality could result as a by-product of research activities. Mist-netting for example, can cause stress, especially when birds are captured, banded and weighed. There have been occasional mortalities to these birds, namely when predators such as raccoons and cats reach the netted birds before researchers do. Overall, however, allowing well designed and properly reviewed research to be conducted by non-Service personnel is likely to have very little impact on refuge wildlife populations. If the research project is conducted with professionalism and integrity, potential adverse impacts are likely to be outweighed by the knowledge gained about an entire species, habitat or public use. Any request for research would require a Special Use Permit issued by the Service.

Effects on Fisheries

The refuge has no bodies of water that contain fish.

Effects on Mammals

Alternative A

In summary, we do not expect any adverse impacts on refuge mammal populations from implementing alternative A. It would maintain vegetative cover types at the same size and distribution, and does not propose any management activities that would permanently displace mammal populations or individual animals. Essentially, implementing alternative A would maintain the status quo.

Temporary displacement may occur during trail maintenance and visitor use, and may be elevated if visitors are walking dogs (see alternative B discussion below), but that impact would be limited in duration and area, and focused on trail use. Although we have conducted no mammal surveys on the refuge, we suspect that such species as black bear, bobcat, deer mouse, eastern gray squirrel, eastern chipmunk, porcupine, white-footed mouse, and white-tailed deer are present and benefit from the intact forest on the refuge.

Alternative B

In summary, alternative B primarily would benefit mammal species on the refuge by maintaining current vegetation cover types. Alternative B also proposes partnerships to increase the number of wildlife surveys on the refuge, to help us better quantify the effects of our management on mammal populations on the refuge. It does not propose any construction or management activities that would permanently displace individuals or populations.

The impacts of refuge visitors to mammals would be similar to that described under “Birds.” Likewise, the specific impacts from research conducted by non-Service personnel, berry picking, and dog walking we described under “Birds” are similar for mammals. In addition, many ungulate species such as deer and moose demonstrated more pronounced reactions to unanticipated disturbances, as a dog off-leash would be until within very close range (Sime 1999). Dogs, noted predators for various species of wildlife during all seasons, can force the movement of ungulates (avoidance or evasion during pursuit), which is in direct conflict with overwinter survival strategies which promote energy conservation (Sime 1999). Domestic dogs can also potentially introduce diseases (distemper, parvovirus, and rabies) and transport parasites into

wildlife habitats. While dog impacts to wildlife likely occur at the individual scale, the results may still have important implications for wildlife populations.

We have not observed, nor have we received, complaints about dogs directly disturbing wildlife. Dogs chasing wildlife violates both federal and state law and would be strictly enforced. In addition, under alternative B, our requirement to have dogs on leash would minimize the potential for wildlife disturbance. Further, we have no information that wildlife diseases are, or have been, a concern in this area. In summary, we do not expect that the number of visitors or visitors with dogs on-leash would significantly affect mammal populations.

Under current levels of use on the refuge or with the projected 15 percent increase in visitation, the incidence of any problems would be minor and insignificant. Furthermore, prohibiting mountain biking and horseback riding should prevent future disturbance and degradation of trails and wildlife habitat from these activities. Prohibiting organized picnicking and camping should reduce the incidences of visitors leaving behind trash and food waste that could attract nuisance species, and would also reduce the number of visitors who wander off trail and consequently cause increased soil compaction, trampling of vegetation, and disturbance to wildlife. As stated under “Birds,” we plan to step-up our monitoring program to insure compliance with regulations and would respond with further restrictions as appropriate to unacceptable levels of wildlife disturbance.

Effects on Amphibians and Reptiles

Alternative A

In summary, implementing alternative A would essentially maintain the status quo for these species and we do not expect it to adversely affect any amphibian and reptile populations. It would maintain the present size and distribution of vegetative cover types, and proposes no management actions that would permanently displace amphibian or reptile populations or individual animals. Trail maintenance or visitor use may temporarily displace them, but that effect would be limited in duration and area. Although we have not surveyed the refuge for populations of amphibians or reptiles, we suspect that species such as the red backed salamander, American toad, bull frog, eastern box turtle, garter snake, milk snake, pickerel frog, red-spotted newt, and spring peeper are present, and thus, would benefit from alternative A.

Alternative B

In summary, alternative B primarily would benefit amphibian and reptile species on the refuge by maintaining current vegetation cover types. Alternative B also proposes partnerships to increase the number of wildlife surveys on the refuge, to help us better quantify the effects of our management on mammal populations on the refuge. It does not propose any construction or management activities that would permanently displace individuals or populations.

The impacts of refuge visitors to amphibians and reptiles would be similar to that described under “Birds.” Likewise, the specific impacts from research conducted by non-Service personnel, berry picking, and dog walking we described under “Birds” are similar for reptiles and amphibians. Under current levels of use on the refuge or with the projected 15 percent increase in visitation, the incidence of any problems would be minor and insignificant. Furthermore, prohibiting mountain biking and horseback riding should prevent future disturbance and degradation of trails and wildlife habitat from these activities. Prohibiting organized picnicking and camping should reduce the incidences of visitors leaving behind trash and food waste that could attract nuisance species, and would also reduce the number of visitors who wander off trail and consequently cause increased soil compaction, trampling of vegetation, and disturbance to wildlife.

Effects on Invertebrates

Alternative A

We have not conducted surveys for invertebrates on the refuge. However, we predict that alternative A would yield generally neutral impacts on the current invertebrate community, because it would maintain vegetation cover types at their present size and distribution. Trail maintenance or visitor use may temporarily displace invertebrates, and disturbance may be elevated if dogs are present, but that impact is not permanent, limited in time and area, and focused on trail use.

Alternative B

Overall, alternative B would yield generally neutral impacts on the invertebrate community because it would maintain the existing vegetation cover types on the refuge. Visitors using the refuge for walking/hiking, backpacking, cross country skiing, snowshoeing, dog walking, berry picking, or conducting research on the refuge may disturb invertebrates and degrade habitat through increased root exposure, trampling effects, and crushing of plants. Non-Service personnel conducting research on invertebrates, depending on the type of research, will likely impact them in ways similar to those described for "Birds." Under current levels of use on the refuge or with the projected 15 percent increase in visitation, the incidence of any problems would be minor and insignificant. Furthermore, prohibiting mountain biking and horseback riding should prevent future disturbance and degradation of trails and wildlife habitat from these activities. Prohibiting organized picnicking and camping should reduce the incidences of visitors leaving behind trash and food waste that could attract nuisance species, and would also reduce the number of visitors who wander off trail and consequently cause increased soil compaction, trampling of vegetation, and disturbance to wildlife. The U.S. Forest Service forest health assessment proposed in alternative B would include a survey of invertebrates on the refuge. That survey would help us better quantify the effects of our management on invertebrate populations.

Effects on Public Use and Access

Alternative A

In summary, alternative A maintains the present level of programs and types of public use on the refuge. Those seem to satisfy visitor demand; we have not received any comments that we should allow new or different uses; nor have we received any complaints about current uses. That indicates we are now accommodating a reasonable number of activities on the refuge. Activities currently allowed on the refuge include observing and photographing wildlife, berry picking, hiking/backpacking, jogging/walking, picnicking, and snowshoeing and cross-country skiing. Activities prohibited by deed restrictions include hunting, fishing, trapping, traveling in or using vehicles, and the cutting of trees except to maintain trails. Previous refuge managers determined the following activities to be incompatible: camping, mountain biking, and horseback riding. Dog walking has never been formally evaluated by a refuge manager and is therefore technically prohibited.

Visitors are required to remain on the designated trail system to minimize environmental damage and prevent accidents. Collecting of any kind is not allowed, nor is disturbing or feeding wildlife. Trails are monitored and maintained by the Friends of the Wapack and the Mountain View Hiking Club to provide a safe and quality visitor experience. The trail surfaces are maintained each year as necessary.

For full discussions of the details of public use activities, see chapter 2, "Alternatives," and chapter 3, "Affected Environment."

Alternative B

In summary, we estimate an increase of approximately 15 percent in annual visitor use over the next 15 years based on recreational trend information from New Hampshire. Although we cannot quantify the

increase exactly, we expect that the increase in visitors can be supported on the refuge without impacts on other users or creating new user conflicts. Most visitors use the refuge during the spring and fall and primarily on weekends. We do not expect visitor use patterns to appreciably change as a result of alternative B management.

Jogging, mountain biking, and horseback riding would be prohibited under this alternative primarily as a result of a deed restriction which requires the refuge to be used "…for wilderness purposes ….. the preservation of the area as a place where the earth and its community of life remain untrammeled by man, where man is a visitor who does not remain, in order that the area will remain unimpaired for future use and enjoyment as a wilderness …..." Alternative B also proposes that we prohibit camping and organized or facility-supported picnicking on the refuge. By prohibiting camping, we would avoid the potential for law enforcement and safety issues for campers, as well as any aesthetic consequences for other visitors who may come across trampling, trash, or human waste that may be left behind. Prohibiting picnicking does not preclude those visitors walking on the trails from having a snack. We are simply indicating our intent that no facilities or improvements (e.g., picnic tables, trash cans) would be provided in the future to support this activity. Since none currently exist, the vast majority of visitors would not be impacted. We do not expect the impacts of prohibiting the activities above to be significant among current or future visitors because they are rarely observed on the refuge and were not activities in which the public expressed interest during public scoping. Furthermore, by not allowing jogging, mountain biking, and horseback riding we will avoid the potential of detracting from the enjoyment of the refuge for other visitors engaged in wildlife-dependent activities, particularly with the expected 15 percent increase in visitation.

Alternative B also proposes that we establish a parking area at the northern end of the refuge on Old Mountain Road. This would improve safety and convenience for visitors accessing the refuge since currently they must park on the road shoulder. However, describing all the effects before we have selected a definite location is difficult. We would conduct the appropriate NEPA analysis once we have selected a site. Until then, we would continue to direct visitor access as in alternative A. For full discussions of the details of those activities, see chapter 2, "Alternatives," and chapter 3, "Affected Environment."

Alternative B would officially open the refuge to dog walking on a leash. As we have already discussed, dog walking is currently prohibited, but we realize that at current levels of Service visibility and proper enforcement, visitors have been unaware of this prohibition and have walked their dogs. In fact, in our observations, most dogs are walked off-leash. That being said, we have not observed or received complaints about dogs impacting other visitors. We predict that if all dogs are kept on leash under the command and control of their owners, all visitors can continue to have a quality refuge experience. We understand that this policy will affect those refuge visitors who have enjoyed letting their dogs roam free. However, we feel the elevated potential to impact other visitors and wildlife is too great to allow it. Given that we do not expect a major increase in dog use with our new policy, we do not expect this activity will significantly effect other visitor's enjoyment of the refuge.

The entire refuge may be open and available for scientific research. Any request for research would require a Special Use Permit issued by the Service. Research by non-Service personnel is often conducted by colleges, universities, Federal, State, and local agencies, non-governmental organizations, and qualified members of the general public. An individual research project is usually limited to a particular habitat type, plant or wildlife species. On occasion research projects will encompass an assemblage of habitat types, plants or wildlife. The research location will be limited to those areas of the refuge that are absolutely necessary to conduct of the research project. Scientific research would be allowed to occur on the refuge throughout the year. The timing of each individual research project will be limited to the minimum required to complete the project. We do not expect research activities, if approved, will significantly effect visitor's enjoyment of the refuge.

Effects on Cultural and Historic Resources

Alternative A

We know of no archaeological or historic sites or structures on the refuge. The refuge owns no museum property. Please note, however, that we have conducted no archaeological surveys. Service policy requires us to survey for cultural and historic resources before disturbing any ground. No activities of that magnitude would occur under alternative A. Should we identify sites eligible for the National Register, we would coordinate their protection with our regional archeologists and the New Hampshire SHPO. We have submitted this document for their review of its compliance with Section 106 of the National Historic Preservation Act and the Archeological Resources Protection Act.

Alternative B

Same as in alternative A

Cumulative Impacts

Cumulative impacts on the physical, biological, and human environment result from the combined effects of the proposed actions added to those of other past, present, and reasonably foreseeable future actions. They can result from individually minor but collectively significant actions taking place over a period of time.

This assessment of cumulative impacts includes other agencies' or organizations' actions if they are interrelated and influence the same environment. Thus, it considers the interaction of activities at the refuge with others occurring in a larger spatial and temporal frame of reference.

Socioeconomic Resources

We expect none of the alternatives to have significant cumulative adverse impacts on the economy of the local community. Neither of the alternatives proposes Service land acquisition. Thus, property tax revenue, the cost of community services, and local property values would not be negatively impacted. In addition, the refuge provides such direct economic benefits as refuge revenue sharing payments to the Towns of Greenfield and Temple. Often, property adjacent to national wildlife refuges increases in market value due to their proximity. Moreover, the refuge preserves open spaces, and helps to maintain the rural character of the area, which is undergoing rapid residential development.

Alternative B proposes improvements in our visitor services program. Therefore, we expect minor, additional increases in economic benefits to the local community from the predicted 15 percent increase in the number of visitors. Promoting the refuge as a wildlife-dependent recreational destination will encourage more people to use local community businesses. Activities prohibited under this alternative will not

Air Quality

None of the proposed alternatives would result in a significant cumulative impact on air quality on the refuge or surrounding areas. We expect some minor, short-term deterioration in air quality from the emissions of refuge visitors' automobiles. We predict that contribution to be insignificant in comparison to others. The biggest contribution to air pollution comes from industrial and commercial centers outside the area.

Physical Resources (Water Quality and Soils)

None of the proposed alternatives would result in a significant cumulative impact on water quality or soils. Natural vegetation on the refuge would continue to filter water pollutants that might otherwise degrade water systems nearby. Neither of our alternatives proposes the use of pesticides or herbicides, the removal or installation of large infrastructure, or the creation of non-permeable surfaces.

Minimal soil compaction may result from the use of the trails by maintenance crews and refuge visitors participating in wildlife observation and photography, environmental education, interpretation, walking/hiking, backpacking, dog walking, berry picking, or conducting research. Snowshoeing and cross country skiing are less likely to impact soils since those activities take place only when there is snow covering the ground. Under current levels of use on the refuge, or with the projected 15 percent increase in visitation, the incidence of any problems would be minor and insignificant. Soil compaction would be partially offset by our trail maintenance techniques, which require only the use of hand tools. The installation of water diversions throughout the trail system would also minimize soil erosion. Soil erosion and compaction would be limited to the trail system. We encourage refuge visitors to remain on the designated trails to minimize the degradation of surrounding areas. Furthermore, prohibiting mountain biking, and horseback riding should prevent degradation and erosion of trails from these activities. Prohibiting organized picnicking and camping should reduce the incidences of visitors wandering off trail and consequently causing increased soil compaction.

In general, the highest present and foreseeable future adverse impacts on water quality and soils in the refuge and surrounding area will be from the increasing residential development and commensurate loss in vegetation, and the increasing contribution from run-off of household and landscape pollutants.

Natural Soundscape

None of the proposed alternatives would result in a significant impact to the natural soundscape on the refuge. Some short-term effect on the natural soundscape would result from vehicles on nearby roads and highways. In alternative B, the short-term, temporary degradation from noise on the refuge might result from trail maintenance (e.g., the use of a chainsaw). Generally, the highest present and foreseeable future adverse impacts of noise in the refuge and surrounding area will be from the increasing residential development and the resulting increase in road construction and vehicles.

Biological Resources (Vegetation and Wildlife)

Although visitors, visitors with leashed dogs, and researchers may directly disturb wildlife sensitive to human presence, the incidence of these disturbances would be minor and insignificant to the biological resources on the refuge or surrounding area under both alternatives. This would likely remain true even with the projected 15 percent increase in visitation. Furthermore, prohibiting mountain biking and horseback riding should reduce disturbance and degradation of trails and wildlife habitat. Prohibiting organized picnicking and camping should reduce the incidences of visitors leaving behind trash and food waste that could attract nuisance species, and would also reduce the number of visitors who wander off trail and consequently cause increased soil compaction, trampling of vegetation, and disturbance to wildlife.

We intend both alternatives to maintain the existing integrity and diversity of biological resources on the refuge and surrounding area. We would continue to prohibit hunting, fishing, trapping, travel in or use of vehicles, and the cutting of trees except for the maintenance of trails and manage the refuge in the “wilderness-like” setting as described in the deed. The combination of these refuge actions and partnerships with other federal agencies, state agencies, conservation organizations and individuals could result in considerable beneficial cumulative effects by (1) maintaining the protection of species of conservation concern; (2) maintaining forest habitat that is regionally declining with the increase in development; and (3) reducing, exotic, invasive plants if surveys find any on the refuge.

Increasing residential development, including road construction in the surrounding area, are factors that would create adverse impacts on wildlife in the present or in the foreseeable future through increased road kills and habitat fragmentation.

Public Use and Access

Both alternatives allow visitors to observe and photograph wildlife, participate in environmental education and interpretation programs, pick berries, walk/hike, backpack, snowshoe, and cross country ski. Deed

restrictions applicable to both alternatives prohibit hunting, fishing, trapping, traveling in or using vehicles, and the cutting of trees except to maintain trails. The differences between the two alternatives are that alternative A permits jogging and picnicking whereas alternative B would prohibit them; and alternative B would also prohibit camping, horseback riding, and mountain biking and proposes to allow dog walking and research conducted by non-Service personnel. The rationale for what activities to allow or prohibit in alternative B compared to alternative A were based on public demand, new Service policies, and changing conditions of the refuge; including a projected 15 percent increase in visitation. Since we have not received any comments that we should allow new or different uses, nor have we received any complaints about current uses we do not anticipate visitor use patterns to appreciably change as a result of alternative B management. However, by prohibiting jogging, mountain biking, and horseback riding we feel we reduce the potential for these activities to detract from the enjoyment of the refuge by visitors participating in other activities, particularly in light of the 15 percent increase in visitation. Without those three activities, we expect that the number of visitors can be supported on the refuge without impacts on other users or creating new user conflicts.

Cultural Resources

None of the proposed alternatives would have a significant cumulative adverse impact on cultural resources on the refuge or surrounding area. The refuge has not been surveyed for cultural resources; however; the state SHPO has no recorded sites. If we identify sites eligible for the National Register appropriate actions to protect those resources will be taken.

Short-Term and Long-Term Productivity

This section evaluates the relationship between local, short-term uses of the human environment and maintaining the long-term productivity of the environment. By long-term, we mean that the impact would extend beyond the 15 year planning horizon of this draft CCP/EA. Short-term means less than 15 years. Both alternatives clearly aim at enhancing the long-term productivity and sustainability of natural resources on the refuge, while also promoting this stewardship in the larger community. In varying degrees, the alternatives propose actions that promote long-term partnerships and land and resource protection. Both alternatives propose to reduce impacts on wildlife and habitats by continuing to restrict inappropriate and incompatible, non-wildlife-dependent uses. An example of a non-wildlife-dependent use considered inappropriate on this refuge is horseback riding.

Unavoidable Impacts

Neither alternative would result in an unavoidable, adverse environmental impact. We would undertake monitoring biological inventories as part of alternative B, to enable the Service to adapt its management actions as needed and address any unforeseen situations.

Potential Irretrievable and Irreversible Impacts

Irreversible commitments of resources are those which cannot be reversed, except perhaps in the extremely long term or under unpredictable circumstances. An example of an irreversible commitment is an action that contributes to a species' extinction. Once extinct, it can never be replaced.

By comparison, irretrievable commitments of resources are those which can be reversed. For example, an irretrievable commitment is the conversion of shrubland to grassland. If for some reason that conversion was terminated, the grassland would gradually revert to shrubland.

Neither alternative would result in irretrievable or irreversible impacts.

Summary of Environmental Consequences by Alternative

Table 4.1. A summary of the foreseeable consequences of each alternative

Refuge Resource or Program	Alternative A *Current Management*	Alternative B *Service-preferred alternative*
Effects on Socioeconomic Environment	No change in current condition. Estimate of total annual refuge visitation of 30,000 potentially contribute up to $2,372,400 to the state or local economy. Service land ownership would remain the same; refuge revenue sharing payments and impacts on property taxes are not affected.	Increase in refuge visitation by 15% over the next 15 years would contribute annually, up to approximately $2,728,260 to the state or local economy. Service land ownership would remain the same; refuge revenue sharing payments and impacts on property taxes are not affected.
Effects on Air Quality	No impacts; no change in current condition.	Short-term negative impacts from predicted increase in the number of visitors' car emissions These impacts are not expected to exceed federal Clean Air Act air quality standards. No Class I air quality areas are affected.
Effects on Water Quality	No impacts; no change in current conditions.	No impacts; no change in current conditions. No violations of the Federal Clean Water Act from any activities.
Effects on Soils	No impacts; no change in current condition.	Short-term soil compaction and erosion from trail maintenance crews and refuge visitors, but impact area limited to existing trail ways. No long-term loss of soil productivity expected.
Effects on Natural Soundscape	No impacts; no change in current condition.	Short-term negative impacts on natural soundscape from nearby vehicles and trail maintenance. No long-term effects on the natural soundscape of the refuge.
Effects on Vegetation	No impacts; no change in current condition.	Short-term vegetation compaction from trail maintenance crews and refuge visitors; but impact area limited to existing trail footprints. Minimal removal of vegetation. Vegetation removed only if any major obstructions or litter is present on the trails. Impacts from berry picking minimal. Visitors may potentially act as vectors in the spread of invasive species. Long-term positive impact on native vegetation from maintenance of "wilderness-like" setting.
Effects on Endangered and Threatened Species	No federal- or state-listed endangered or threatened species are known to use the refuge.	Same as alternative A.
Effects on Birds	No impacts on forest-dependent birds; no change in current condition.	Minimal habitat manipulation forest habitat would maintain distribution and quality for forest dwelling birds. Short-term, temporary impacts result from human presence on trails, research, and the presence of dogs; however, the requirement to stay on trails and the

Refuge Resource or Program	Alternative A *Current Management*	Alternative B *Service-preferred alternative*
		new requirements to keep dogs on leash will minimize the extent and duration of impacts. Increased knowledge and understanding of bird populations resulting from various surveys and inventories would help us better quantify effects on birds on the refuge.
Effects on Fisheries	The refuge has no water bodies that contain fish.	Same as alternative A.
Effects on Mammals	No impacts; no change in current condition.	Minimal habitat manipulation would maintain forest habitat distribution and quality for mammals. Short-term, temporary impacts resulting from the presence of humans on trails, research, and the presence of dogs; however, requirements to stay on trails and the new requirements to keep dogs on leash will minimize extent and duration of impacts. Increased knowledge and understanding of mammal populations resulting from various surveys and inventories would help us better quantify our effects on mammal species on the refuge.
Effects on Amphibians and Reptiles	No impacts; no change in current condition.	Minimal habitat manipulation would maintain forest habitat distribution and quality for amphibians and reptiles. Short-term, temporary impacts from the presence of humans on trails, research, and the presence of dogs; however, the requirement to stay on trails and the new requirement to keep dogs on leash will minimize extent and duration of impacts. Increased knowledge and understanding of amphibian and reptile populations resulting from various surveys and inventories would help us better quantify our effects on amphibian and reptile species on the refuge.
Effects on Invertebrates	No impacts; no change in current condition.	Increased knowledge and understanding of invertebrate populations resulting from U.S. Forest Service inventory would help us better quantify the effects on invertebrate species on the refuge.
Effects on Public Use and Access	No impacts; no change in current condition. Visitor demand seems to be satisfied. Accommodating a reasonable number and diversity of activities on the refuge. Parking on the side of the road leaves limited spaces for visitors' cars, creates possible safety concern, and causes problems for the Town of Greenfield Department of Transportation when plowing snow.	*Same as alternative A, with the following changes:* Expect increase of up to 15% in visitation; however, predict that programs and allowed uses would continue to satisfy demand. Officially opening the refuge to dog walking on leash would adversely affect people who have enjoyed walking dogs off leash. Having dogs on leash, under control of owners, would minimize impacts on other visitors who do not enjoy encountering dogs. Encouraging environmental education, interpretation and research by Service partners on refuge land would facilitate an expansion of wildlife-dependent recreation.

Refuge Resource or Program	Alternative A *Current Management*	Alternative B *Service-preferred alternative*
		Installing an informational sign at the Wapack trailhead and refuge entrance signs to the Ted and Carolyn's trails would result in long-term benefits for visitors by improving Service visibility and increasing visitor knowledge of the refuge. Until the establishment of the proposed new parking area, continue to direct visitor access to the northern end of the refuge (beginning of the Wapack Trail), with parking on Old Mountain Road, and to the southern end of the refuge through Joanne Bass Bross Preserve (with parking at Miller State Park).
Effects on Cultural and Historic Resources	No archaeological or historic sites or structures are known on the refuge. The refuge owns no museum property. If we should identify sites eligible for the National Register, we will coordinate their protection with our Regional Archeologists and the New Hampshire State Historic Preservation Office (SHPO).	Same as alternative A

Chapter 5

Public scoping meeting
Andrew Ward/Conway School of Landscape Design

Consultation and Coordination with Others

- A Public Involvement Summary
- Refuge Partnerships
- Refuge CCP Planning Team
- Assistance from Others

A Public Involvement Summary

Effective conservation begins with effective community involvement. To ensure that our future management of the refuge considers the issues, concerns, and opportunities expressed by the public, we used a variety of public involvement techniques in our planning process.

- We compiled a mailing list of approximately 75 organizations and individuals to ensure that we were contacting an array of interested parties.
- In January 2007, we distributed a planning newsletter that introduced the public to the Service and the refuge, described the purpose of a CCP, and explained the planning process.
- On February 7, 2007, we held a public scoping meeting in Peterborough, NH, to identify public issues and concerns, describe the planning process, and explain how people could become involved and stay informed about the process. We announced the location, date, and time in the local newspaper, on our planning website and through special mailings. Twenty-six people attended.
- On March 6, 2007 we held our second public meeting, where we presented our preliminary management alternatives. Participants had the opportunity to share any comments, issues, or ideas about the alternatives and the future of the refuge.
- In November 2007, we distributed a conservation planning update summarizing the alternatives in detail and updating our planning time frames.

Refuge Partnerships

Federal Agencies or Programs

- U.S. Forest Service, Forest Health Protection Program

State Agencies

- New Hampshire Fish and Game Department
- New Hampshire Department of Resources and Economic Development

National Organizations

- The Nature Conservancy

Regional or Local Groups and Organizations

- Monadnock Conservancy
- Friends of the Wapack

Refuge CCP Planning Team

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Stone wall on Wapack Trail
Nancy McGarigal/USFWS

Glossary and Acronyms

Glossary

accessibility	the state or quality of being easily approached or entered, particularly as it relates to complying with the Americans With Disabilities Act
accessible facilities	structures accessible for most people with disabilities without assistance; facilities that meet UFAS standards; ADA-accessible [E.g., parking lots, trails, pathways, ramps, picnic and camping areas, restrooms, boating facilities (docks, piers, gangways), fishing facilities, playgrounds, amphitheaters, exhibits, audiovisual programs, and wayside sites.]
adaptation	adjustment to environmental conditions
adaptive management	the process of treating the work of managing natural resources as an experiment, making observations and recording them, so the manger can learn from the experience.
aggregate	many parts considered together as a whole
alternative	a reasonable way to fix an identified problem or satisfy a stated need [40 CFR 1500.2 (cf. Amanagement alternative@)]
appropriate use	a proposed or existing use on a refuge that meets at least one of the following three conditions: 1. the use is a wildlife-dependent one; 2. the use contributes to fulfilling the refuge purpose(s), the System mission, or goals or objectives described in a refuge management plan approved after October 9, 1997, the date the National Wildlife Refuge System Improvement Act was signed into law; or 3. the use has been determined appropriate as specified in section 1.11 of that act.
avian	of or having to do with birds
avifauna	all birds of a given region
biological composition	biological components such as genes, populations, species, and communities.
biological diversity or biodiversity	the variety of life and its processes and includes the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur
biological function	processes undergone by biological component, such as genetic recombination, population migration, the evolution of species, and community succession.
biological integrity	biotic composition, structure, and functioning at genetic, organism, and community levels comparable with historic conditions, including the natural biological processes that shape genomes, organisms and communities
biological structure	the organization of biological components, such as gene frequencies, social structures of populations, food webs of species, and niche partitioning within communities.
biodiversity conservation	the goal of conservation biology, which is to retain indefinitely as much of the earth's biodiversity as possible, with emphasis on biotic elements most vulnerable to human impacts
biomass	the total mass or amount of living organisms in a particular area or volume
biota	the plant and animal life of a region
breeding habitat	habitat used by migratory birds or other animals during the breeding season

buffer species	alternate prey species exploited by predators when a more preferred prey is in relatively short supply; i.e., if rabbits are scarce, foxes will exploit more abundant rodent populations
buffer zones	land bordering and protecting critical habitats or water bodies by reducing runoff and nonpoint source pollution loading; areas created or sustained to lessen the negative effects of land development on animals, plants, and their habitats
candidate species	species for which we have sufficient information on file about their biological vulnerability and threats to propose listing them
canopy	the layer of foliage formed by the crowns of trees in a stand. For stands with trees of different heights, foresters often distinguish among the upper, middle and lower canopy layers. These represent foliage on tall, medium, and short trees. The uppermost layers are called the overstory.
carbon sequestration	the capture and secure storage of carbon that otherwise would be emitted to or remain in the atmosphere
community	the locality in which a group of people resides and shares the same government
community type	a particular assemblage of plants and animals, named for its dominant characteristic
compatible use	AThe term >compatible use= means a wildlife-dependent recreational use or any other use of a refuge that, in the sound professional judgment of the Director, will not materially interfere with or detract from the fulfillment of the mission of the System or the purposes of the refuge.@CNational Wildlife Refuge System Improvement Act of 1997 [Public Law 105-57; 111 Stat. 1253]
compatibility determination	a required determination for wildlife-dependent recreational uses or any other public uses of a refuge
Comprehensive Conservation Plan	mandated by the 1997 Refuge Improvement Act, a document that provides a description of the desired future conditions and long-range guidance for the project leader to accomplish purposes of the refuge system and the refuge. CCPs establish management direction to achieve refuge purposes. [P.L. 105-57; FWS Manual 602 FW 1.4]
concern	cf. Aissue@
conifer	a tree or shrub in the phylum Gymnospermae whose seeds are borne in woody cones. There are 500B600 species of living conifers (Norse 1990)
connectivity	community occurrences and reserves have permeable boundaries and thus are subject to inflows and outflows from the surrounding landscape. Connectivity in the selection and design of nature reserves relates to the ability of species to move across the landscape to meet basic habitat requirements. Natural connecting features within the ecoregion may include river channels, riparian corridors, ridgelines, or migratory pathways.
conservation	managing natural resources to prevent loss or waste [N.b. Management actions may include preservation, restoration, and enhancement.]
conservation agreements	written agreements among two or more parties for the purpose of ensuring the survival and welfare of unlisted species of fish and wildlife or their habitats or to achieve other specified conservation goals. Participants voluntarily commit to specific actions that will remove or reduce threats to those species.

conservation easement	a non-possessory interest in real property owned by another imposing limitations or affirmative obligations with the purpose of returning or protecting the property's conservation values.
conservation status	assessment of the status of ecological processes and of the viability of species or populations in an ecoregion.
consultation	a type of stakeholder involvement in which decision makers ask stakeholders to comment on proposed decisions or actions.
cooperative agreement	a usually long-term habitat protection action, which can be modified by either party, in which no property rights are acquired. Lands under a cooperative agreement do no necessarily become part of the National Wildlife Refuge System
critical habitat	according to U.S. Federal law, the ecosystems upon which endangered and threatened species depend
cultural resource inventory	a professional study to locate and evaluate evidence of cultural resources within a defined geographic area [N.b. Various levels of inventories may include background literature searches, comprehensive field examinations to identify all exposed physical manifestations of cultural resources, or sample inventories for projecting site distribution and density over a larger area. Evaluating identified cultural resources to determine their eligibility for the National Register follows the criteria in 36 CFR 60.4 (cf. FWS Manual 614 FW 1.7).]
cultural resource overview	A comprehensive document prepared for a field office that discusses, among other things, project prehistory and cultural history, the nature and extent of known cultural resources, previous research, manage-ment objectives, resource management conflicts or issues, and a general statement of how program objectives should be met and conflicts resolved [An overview should reference or incorporate information from a field offices background or literature search described in section VIII of the Cultural Resource Management Handbook (FWS Manual 614 FW 1.7).]
database	a collection of data arranged for ease and speed of analysis and retrieval, usually computerized
dbh	(diameter at breast height) – the diameter of the stem of tree measure at breast height (usually 4.5 feet above the ground). The term is commonly used by foresters to describe tree size.
dedicated open space	land to be held as open space forever
degradation	the loss of native species and processes due to human activities such that only certain components of the original biodiversity persist, often including significantly altered natural communities
designated wilderness area	an area designated by Congress as part of the National Wilderness Preservation System [FWS Manual 610 FW 1.5 (draft)]
desired future condition	the qualities of an ecosystem or its components that an organization seeks to develop through its decisions and actions.
digitizing	the process of converting maps into geographically referenced electronic files for a geographic information system (GIS)

distribution pattern	the overall pattern of occurrence for a particular conservation target. In ecoregional planning projects, often referred to as the relative proportion of the target's natural range occurring within a give ecoregion (e.g. endemic, limited, widespread, disjunct, peripheral).
disturbance	any relatively discrete event in time that disrupts ecosystem, community, or population structure and changes resources, substrate availability, or the physical environment
donation	a citizen or group may wish to give land or interests in land to the Service for the benefit of wildlife. Aside from the cost factor, these acquisitions are no different than any other means of land acquisition. Gifts and donations have the same planning requirements as purchases.
easement	a non-possessory interest in real property owned by another imposing limitations or affirmative obligations with the purpose of returning or protecting the property's conservation values. An agreement by which landowners give up or sell one of the rights on their property [E.g., landowners may donate rights-of-way across their properties to allow community members access to a river (cf. Aconservation easement@).]
ecological integrity	native species populations in their historic variety and numbers naturally interacting in naturally structured biotic communities. For communities, integrity is governed by demographics of component species, intactness of landscape-level ecological processes (e.g., natural fire regime), and intactness of internal community processes (e.g., pollination).
ecological land unit (ELU)	mapping units used in large-scale conservation planning projects that are typically defined by two or more environmental variables such as elevation, geological type, and landform (e.g., cliff, stream, summit).
ecological processes	a complex mix of interactions among animals, plants, and their environment that ensures maintenance of an ecosystem=s full range of biodiversity. Examples include population and predator-prey dynamics, pollination and seed dispersal, nutrient cycling, migration, and dispersal
ecological process approach	an approach to managing for species communities that manages for ecological process (e.g., flooding, fire, herbivory, predator-prey dynamics) within the natural range of historic variability. This approach assumes that if ecological processes are occurring within their historic range of spatial and temporal variability, then the naturally occurring biological diversity will benefit.
ecological system	Dynamic assemblages of communities that occur together on the landscape at some spatial scale of resolution, are tied together by similar ecological processes, and form a cohesive, distinguishable unit on the ground. Examples are spruce-fir forest, Great Lakes dune and swale complex, Mojave desert riparian shrublands.
ecoregion	a territory defined by a combination of biological, social, and geographic criteria, rather than geopolitical considerations; generally, a system of related, interconnected ecosystems.
ecosystem	a natural community of organisms interacting with its physical environment, regarded as a unit
ecosystem service	a benefit or service provided free by an ecosystem or by the environment, such as clean water, flood mitigation, or groundwater recharge

ecotourism	visits to an area that maintains and preserves natural resources as a basis for promoting its economic growth and development
ecosystem approach	a way of looking at socio-economic and environmental information based on the boundaries of ecosystems like watersheds, rather than on geopolitical boundaries
ecosystem-based management	an approach to making decisions based on the characteristics of the ecosystem in which a person or thing belongs [N.b. This concept considers interactions among the plants, animals, and physical characteristics of the environment in making decisions about land use or living resource issues.]
edge effect	the phenomenon whereby edge-sensitive species are negatively affected near edges by factors that include edge-generalist species, human influences, and abiotic factors associated with habitat edges. Edge effects are site-specific and factor-specific and have variable depth effects into habitat fragments.
endangered species	a Federal- or State-listed protected species in danger of extinction throughout all or a significant portion of its range
endemic	a species or race native to a particular place and found only there
environment	the sum total of all biological, chemical and physical factors to which organisms are exposed
environmental education	curriculum-based education aimed at producing a citizenry that is knowledgeable about the biophysical environment and its associated problems, aware of how to help solve those problems, and motivated to work toward solving them
environmental health	the composition, structure, and functioning of soil, water, air, and other abiotic features comparable with historic conditions, including the natural abiotic processes that shape the environment
Environmental Assessment	(EA) a public document that discusses the purpose and need for an action, its alternatives, and provides sufficient evidence and analysis of its impacts to determine whether to prepare an environmental impact statement or a finding of no significant impact (q.v.) [cf. 40 CFR 1508.9]
Environmental Impact Statement	(EIS) a detailed, written analysis of the environmental impacts of a proposed action, adverse effects of the project that cannot be avoided, alternative courses of action, short-term uses of the environment versus the maintenance and enhancement of long-term productivity, and any irreversible and irretrievable commitment of resources [cf. 40 CFR 1508.11]
evaluation	examination of how an organization's plans and actions have turned out – and adjusting them for the future.
even-aged	a stand having one age class of trees
exemplary community type	an outstanding example of a particular community type
extinction	the termination of any lineage of organisms, from subspecies to species and higher taxonomic categories from genera to phyla. Extinction can be local, in which one or more populations of a species or other unit vanish but others survive elsewhere, or total (global), in

	which all the populations vanish (Wilson 1992)
extirpated	status of a species or population that has completely vanished from a given area but that continues to exist in some other location
exotic species	a species that is not native to an area and has been introduced intentionally or unintentionally by humans; not all exotics become successfully established
extant	in biology, a species which is not extinct; still existing
fauna	all animal life associated with a given habitat, country, area or period
federal land	public land owned by the Federal Government, including national forests, national parks, and national wildlife refuges
federal-listed species	a species listed either as endangered, threatened, or a species at risk (formerly, a Acandidate species@) under the Endangered Species Act of 1973, as amended
fee-title acquisition	the acquisition of most or all of the rights to a tract of land; a total transfer of property rights with the formal conveyance of a title. While a fee-title acquisition involves most rights to a property, certain rights may be reserved or not purchased, including water rights, mineral rights, or use reservation (e.g., the ability to continue using the land for a specified time period, such as the remainder of the owner=s life).
fen	A type of wetland that accumulates peat deposits. Fens are less acidic than bogs, deriving most of their water from groundwater rich in calcium and magnesium
Finding of No Significant Impact	(FONSI) supported by an environmental assessment, a document that briefly presents why a Federal action will have no significant effect on the human environment, and for which an environmental impact statement, therefore, will not be prepared [40 CFR 1508.13]
flora	all the plants found in a particular place
flyway	any one of several established migration routes of birds
focal species	a species that is indicative of particular conditions in a system (ranging from natural to degraded) and used as a surrogate measure for other species of particular conditions. An element of biodiversity selected as a focus for conservation planning or action. The two principal types of targets in Conservancy planning projects are species and ecological communities.
focus areas	cf. Aspecial focus areas@
forest association	the community described by a group of dominant plant (tree) species occurring together, such as spruce-fir or northern hardwoods
forested land	land dominated by trees [For impacts analysis in CCP=s, we assume all forested land has the potential for occasional harvesting; we assume forested land owned by

	timber companies is harvested on a more intensive, regular schedule.]
fragmentation	the disruption of extensive habitats into isolated and small patches. Fragmentation has two negative components for biota: the loss of total habitat area; and, the creation of smaller, more isolated patches of habitat remaining.
glacial till	the mass of rocks and finely ground material carried by a glacier, then deposited when the ice melted. Creates an unstratified material of varying composition.
geographic information system	(GIS) a computerized system to compile, store, analyze and display geographically referenced information [E.g., GIS can overlay multiple sets of information on the distribution of a variety of biological and physical features.]
grant agreement	the legal instrument used when the principal purpose of the transaction is the transfer of money, property, services, or anything of value to a recipient in order to accomplish a public purpose of support or stimulation authorized by Federal statute and substantial involvement between the Service and the recipient is *not* anticipated (cf. Acooperative agreement@)
grassroots conservation organization	any group of concerned citizens who act together to address a conservation need
habitat block	a landscape-level variable that assesses the number and extent of blocks of contiguous habitat, taking into account size requirements for populations and ecosystems to function naturally. It is measured here by a habitat-dependent and ecoregion size-dependent system
habitat fragmentation	the breaking up of a specific habitat into smaller, unconnected areas [N.b. A habitat area that is too small may not provide enough space to maintain a breeding population of the species in question.]
habitat conservation	protecting an animal or plant habitat to ensure that the use of that habitat by the animal or plant is not altered or reduced
habitat	The place or type of site where species and species assemblages are typically found and/or successfully reproduce. [N.b. An organism's habitat must provide all of the basic requirements for life, and should be free of harmful contaminants.]
historic conditions	the composition, structure and functioning of ecosystems resulting from natural processes that we believe, based on sound professional judgement, were present prior to substantial human-related changes to the landscape
indicator species	a species used as a gauge for the condition of a particular habitat, community, or ecosystem. A characteristic or surrogate species for a community or ecosystem
indigenous	native to an area
indigenous species	a species that, other than a result as an introduction, historically occurred or currently occurs in a particular ecosystem
interpretive facilities	structures that provide information about an event, place, or thing by a variety of means, including printed, audiovisual, or multimedia materials [E.g., kiosks that offer printed materials and audiovisuals, signs, and trail heads.]

interpretive materials	any tool used to provide or clarify information, explain events or things, or increase awareness and understanding of the events or things [E.g., printed materials like brochures, maps or curriculum materials; audio/visual materials like video and audio tapes, films, or slides; and, interactive multimedia materials, CD-ROM or other computer technology.]
interpretive materials projects	any cooperative venture that combines financial and staff resources to design, develop, and use tools for increasing the awareness and understanding of events or things related to a refuge
introduced invasive species	non-native species that have been introduced into an area and, because of their aggressive growth and lack of natural predators, displace native species
invasive species	an alien species whose introduction causes or is likely to cause economic or environmental harm or harm to human health
inventory	a list of all the assets and liabilities of an organization, including physical, financial, personnel, and procedural aspects.
invertebrate	any animal lacking a backbone or bony segment that encloses the central nerve cord
issue	any unsettled matter that requires a management decision [E.g., a Service initiative, an opportunity, a management problem, a threat to the resources of the unit, a conflict in uses, a public concern, or the presence of an undesirable resource condition.] [N.b. A CCP should document, describe, and analyze issues even if they cannot be resolved during the planning process (FWS Manual 602 FW 1.4).]
lake	an inland body of fresh or salt water of considerable size occupying a basin or hollow on the earth's surface, and which may or may not have a current or single direction of flow
Land trusts	organizations dedicated to conserving land by purchase, donation, or conservation easement from landowners
landform	the physical shape of the land reflecting geologic structure and processes of geomorphology that have sculpted the structure
landscape	A heterogeneous land area composed of a cluster of interacting ecosystems that are repeated in similar form throughout.
landscape approach	an approach to managing for species communities that focuses on landscape patterns rather than processes and manages landscape elements to collectively influence groups of species in a desired direction. This approach assumes that by managing a landscape for its components, the naturally occurring species will persist.
large patch	Communities that form large areas of interrupted cover. Individual occurrences of this community type typically range in size from 50 to 2,000 hectares. Large patch communities are associated with environmental conditions that are more specific than those of matrix communities, and that are less common or less extensive in the landscape. Like matrix communities, large-patch communities are also influenced by large-scale processes, but these tend to be modified by specific site features that influence the community.

late-successional	species, assemblages, structures, and processes associated with mature natural communities that have not experienced significant disturbance for a long time
limiting factor	an environmental limitation that prevents further population growth
limits of acceptable change	a planning and management framework for establishing and maintaining acceptable and appropriate environmental and social conditions in recreation settings
local land	public land owned by local governments, including community or county parks or municipal watersheds
local agencies	generally, municipal governments, regional planning commissions, or conservation groups
long-term protection	mechanisms like fee title acquisition, conservation easements, or binding agreements with landowners that ensure land use and land management practices will remain compatible with maintaining species populations over the long term
macroinvertebrates	invertebrates large enough to be seen with the naked eye (e.g., most aquatic insects, snails, and amphipods)
management alternative	a set of objectives and the strategies needed to accomplish each objective [FWS Manual 602 FW 1.4]
management concern	cf. Aissue@ and Amigratory nongame birds of management concern@
management opportunity	cf. Aissue@
management plan	a plan that guides future land management practices on a tract [N.b. In the context of an environmental impact statement, management plans may be designed to produce additional wildlife habitat along with primary products like timber or agricultural crops (cf. Acooperative agreement@).]
management strategy	a general approach to meeting unit objectives [N.b. A strategy may be broad, or it may be detailed enough to guide implementation through specific actions, tasks, and projects (FWS Manual 602 FW 1.4).]
matrix forming (or matrix community)	communities that form extensive and contiguous cover may be categorized as matrix (or matrix-forming) community types. Matrix communities occur on the most extensive landforms and typically have wide ecological tolerances. They may be characterized by a complex mosaic of successional stages resulting from characteristic disturbance processes (e.g. New England northern hardwood-conifer forests). Individual occurrences of the matrix type typically range in size from 2000 to 500,000 hectares. In a typical ecoregion, the aggregate of all matrix communities covers, or historically covered, as much as 75-80% of the natural vegetation of the ecoregion. Matrix community types are often influenced by large-scale processes (*e.g.*, climate patterns, fire), and are important habitat for wide-ranging or large area-dependent fauna, such as large herbivores or birds.
mesic soil	sandy-to-clay loams containing moisture-retentive organic matter, well drained (no standing matter)

migratory nongame birds of management concern	species of nongame birds that (*a*) are believed to have undergone significant population declines; (*b*) have small or restricted populations; or (*c*) are dependent upon restricted or vulnerable habitats
mission statement	a succinct statement of the purpose for which the unit was established; its reason for being
mitigation	actions to compensate for the negative effects of a particular project [E.g., wetland mitigation usually restores or enhances a previously damaged wetland or creates a new wetland.]
monadnock	named for Mt. Monadnock—is a resistant mountain rising above an eroded plain
mosaic	an interconnected patchwork of distinct vegetation types.
National Environmental Policy Act of 1969	(NEPA) requires all Federal agencies to examine the environmental impacts of their actions, incorporate environmental information, and use public participation in planning and implementing environmental actions [Federal agencies must integrate NEPA with other planning requirements, and prepare appropriate NEPA documents to facilitate better environmental decision-making (cf. 40 CFR 1500).]
National Wildlife Refuge System	(Refuge System) all lands and waters and interests therein administered by the Service as wildlife refuges, wildlife ranges, wildlife management areas, waterfowl production areas, and other areas for the protection and conservation of fish and wildlife, including those that are threatened with extinction
native	a species that, other than as a result of an introduction, historically occurred or currently occurs in a particular ecosystem
native plant	a plant that has grown in the region since the last glaciation, and occurred before European settlement
natural disturbance event	any natural event that significantly alters the structure, composition, or dynamics of a natural community: e.g., floods, fires, and storms
natural range of variation	a characteristic range of levels, intensities, and periodicities associated with disturbances, population levels, or frequency in undisturbed habitats or communities
niche	the specific part or smallest unit of a habitat occupied by an organism
Neotropical migrant	birds, bats, or invertebrates that seasonally migrate between the Nearctic and Neotropics
non-consumptive, wildlife-oriented recreation	wildlife observation and photography and environmental education and interpretation (cf. Awildlife-oriented recreation@)
non-native species	See Aexotic species.@
non-point source pollution	a diffuse form of water quality degradation in which wastes are not released at one specific, identifiable point but from a number of points that are spread out and difficult to identify and control (Eckhardt 1998)

Notice of Intent	(NOI) an announcement we publish in the Federal Register that we will prepare and review an environmental impact statement [40 CFR 1508.22]
objective	cf. Aunit objective@
obligate species	a species that must have access to a particular habitat type to persist
occurrence site	a discrete area where a population of a rare species lives or a rare plant community type grows
outdoor education project	any cooperative venture that combines financial and staff resources to develop outdoor education activities like labs, field trips, surveys, monitoring, or sampling
outdoor education	educational activities that take place in an outdoor setting
partnership	a contract or agreement among two or more individuals, groups of individuals, organizations, or agencies, in which each agrees to furnish a part of the capital or some service in kind (e.g., labor) for a mutually beneficial enterprise
passive management	protecting, monitoring key resources and conducting baseline inventories to improve our knowledge of the ecosystem
payment in lieu of taxes	cf. Revenue Sharing Act of 1935, Chapter One, Legal Context
point source	a source of pollution that involves discharge of waste from an identifiable point, such as a smokestack or sewage-treatment plant (Eckhardt 1998)
population	an interbreeding group of plants or animals. The entire group of organisms of one species.
population monitoring	assessing the characteristics of populations to ascertain their status and establish trends on their abundance, condition, distribution, or other characteristics
priority general public use	a compatible wildlife-dependent recreational use of a refuge involving hunting, fishing, wildlife observation and photography, or environmental education and interpretation
private land	land owned by a private individual or group or non-government organization
private landowner	cf. Aprivate land@
private organization	any non-government organization
proposed wilderness	an area of the Refuge System that the Secretary of the Interior has recommended to the President for inclusion in the National Wilderness Preservation System
protection	mechanisms like fee title acquisition, conservation easements, or binding agreements with landowners that ensure land use and land management practices will remain compatible with maintaining species populations at a site (cf. Along-term ~@)

public	individuals, organizations, and non-government groups; officials of Federal, State, and local government agencies; Native American tribes, and foreign nationsCincludes anyone outside the core planning team, those who may or may not have indicated an interest in the issues, and those who do or do not realize that our decisions may affect them
public involvement	offering an opportunity to interested individuals and organizations whom our actions or policies may affect to become informed; soliciting their opinions. We thoroughly study public input, and give it thoughtful consideration in shaping decisions about managing refuges.
public involvement plan	long-term guidance for involving the public in the comprehensive planning process
public land	land owned by the local, State, or Federal Government
rare species	species identified for special management emphasis because of their uncommon occurrence within a watershed
rare community types	plant community types classified as rare by any State program; includes exemplary community types
recharge	refers to water entering an underground aquifer through faults, fractures, or direct absorption
recommended wilderness	areas studied and found suitable for wilderness designation by both the Director (FWS) and Secretary (DOI), and recommended by the President to Congress for inclusion in the National Wilderness System [FWS Manual 610 FW 1.5 (draft)]

Record of Decision	(ROD) a concise public record of a decision by a Federal agency pursuant to NEPA
	[N.b. A ROD includes:
	$ the decision;
	$ all the alternatives considered;
	$ the environmentally preferable alternative;
	$ a summary of monitoring and enforcement, where applicable, for any mitigation; and,
	$ whether all practical means have been adopted to avoid or minimize environmental harm from the alternative selected (or if not, why not).]

refuge goals	Adescriptive, open-ended, and often broad statements of desired future conditions that convey a purpose but do not define measurable units.@CWriting Refuge Management Goals and Objectives: A Handbook
refuge purposes	Athe terms ›purposes of the refuge= and ›purposes of each refuge= mean the purposes specified in or derived from the law, proclamation, executive order, agreement, public land order, donation document, or administrative memorandum establishing, authorizing, or expanding a refuge, refuge unit, or refuge subunit.@CNational Wildlife Refuge System Improvement Act of 1997
refuge lands	lands in which the Service holds full interest in fee title or partial interest like an easement

regenerating	establishing a new age class. Silviculture does this in a way that controls the species composition, seedling density, and other characteristics consistent with the landowner's objectives.
relatively intact	the conservation status category indicating the least possible disruption of ecosystem processes. Natural communities are largely intact, with species and ecosystem processes occurring within their natural ranges of variation.
relatively stable	the conservation status category between *vulnerable* and *relatively intact* in which extensive areas of intact habitat remain, but local species declines and disruptions of ecological processes have occurred
restoration	management of a disturbed or degraded habitat that results in the recovery of its original state [E.g., restoration may involve planting native grasses and forbs, removing shrubs, prescribed burning, or reestablishing habitat for native plants and animals on degraded grassland.]
restoration ecology	the process of using ecological principles and experience to return a degraded ecological system to its former or original state
rotation	the period of time from establishment of an even-aged stand until its maturity
runoff	water from rain, melted snow, or agricultural or landscape irrigation that flows over a land surface into a water body (cf. Aurban runoff@)
scale	the magnitude of a region or process. Refers to both spatial sizeCfor example, a (relatively small-scale) patch or a (relatively large-scale) landscape; and a temporal rateCfor example, (relatively rapid) ecological succession or (relatively slow) evolutionary speciation
Service presence	Service programs and facilities that it directs or shares with other organizations; public awareness of the Service as a sole or cooperative provider of programs and facilities
site improvement	any activity that changes the condition of an existing site to better interpret events, places, or things related to a refuge [E.g., improving safety and access, replacing non-native with native plants, refurbishing footbridges and trailways, and renovating or expanding exhibits.]
small patch	communities that form small, discrete areas of vegetation cover. Individual occurrences of this community type typically range in size from 1 to 50 hectares. Small patch communities occur in very specific ecological settings, such as on specialized landform types or in unusual microhabitats. The specialized conditions of small patch communities, however, are often dependent on the maintenance of ecological processes in the surrounding matrix and large patch communities. In many ecoregions, small patch communities contain a is proportionately large percentage of the total flora, and also support a specific and restricted set of associated fauna (*e.g.,* invertebrates or herpetofauna) dependent on specialized conditions.
soundscape	the total acoustic environment associated with a given area
source population	a population in a high-quality habitat where the birth rate greatly exceeds the death rate, and the excess individuals emigrate
spatial pattern	within an ecoregion, natural terrestrial communities may be categorized into three functional groups on the basis of their current or historical patterns of occurrence, as correlated with the distribution and extent of landscape features and ecological processes.

	These groups are identified as matrix communities, large patch communities, and small patch communities.
special habitats	wetlands, vernal pools, riparian habitat, and unfragmented rivers, forests and grasslands [N.b. Many rare species depend on specialized habitats that, in many cases, are being lost within a watershed.]
species	the basic category of biological classification intended to designate a single kind of animal or plant. Any variation among the individuals may be regarded as not affecting the essential sameness which distinguishes them from all other organisms.
species assemblage	the combination of particular species that occur together in a specific location and have a reasonable opportunity to interact with one another
species at risk	a species being considered for Federal listing as threatened or endangered (formerly, a "candidate species")
species of concern	species not Federal-listed as threatened or endangered, but about which we or our partners are concerned
species diversity	usually synonymous with Aspecies richness,@ but may also include the proportional distribution of species
species richness	a simple measure of species diversity calculated as the total number of species in a habitat or community (Fiedler and Jain 1992)
stand	an area of trees with a common set of conditions (e.g., based on age, density, species composition, or other features) that allow a single management treatment throughout
state agencies	natural resource agencies of State governments
state land	State-owned public land
state-listed species	cf. AFederal-listed species@
step-down management plan	a plan for dealing with specific refuge management subjects, strategies, and schedules, e.g., cropland, wilderness, and fire [FWS Manual 602 FW 1.4]
stopover habitat	habitat where birds rest and feed during migration
strategy	a specific action, tool, technique, or combination of actions, tools, and techniques for meeting unit objectives
strategic management	the continual process of inventorying, choosing, implementing, and evaluating what an organization should be doing.
structure	the horizontal and vertical arrangement of trees and other vegetation having different sizes, resulting in different degrees of canopy layering, tree heights, and diameters within a stand.
succession	the natural, sequential change of species composition of a community in a given area
sustainable development	the attempts to meet economic objectives in ways that do not degrade the underlying environmental support system. Note that there is

	considerable debate over the meaning of this termYwe define it as Ahuman activities conducted in a manner that respects the intrinsic value of the natural world, the role of the natural world in human well-being, and the need for humans to live on the income from nature-s capital rather than the capital itself.@
terrestrial	living on land
territory	an area over which an animal or group of animals establishes jurisdiction
threatened species	a Federal-listed, protected species that is likely to become an endangered species in all or a significant portion of its range
trust resource	a resource that the Government holds in trust for the people through law or administrative act [N.b. A Federal trust resource is one for which responsibility is given wholly or in part to the Federal Government by law or administrative act. Generally, Federal trust resources are nationally or internationally important no matter where they occur, like endangered species or migratory birds and fish that regularly move across state lines. They also include cultural resources protected by Federal historic preservation laws, and nationally important or threatened habitats, notably wetlands, navigable waters, and public lands like state parks and national wildlife refuges.]
trust responsibility	In the federal government, a special duty required of agencies to hold and manage lands, resources, and funds on behalf of Native American tribes.
understory	the lower layer of vegetation in a stand, which may include short trees, shrubs, and herbaceous plants
uneven-aged	a stand having three or more age classes of trees with distinctly different ages
unfragmented habitat	large, unbroken blocks of a particular type of habitat
unit objective	desired conditions that must be accomplished to achieve a desired outcome [N.b. Objectives are the basis for determining management strategies, monitoring refuge accomplishments, and measuring their success. Objectives should be attainable, time-specific, and stated quantitatively or qualitatively (FWS Manual 602 FW 1.4).]
upland	dry ground (i.e., other than wetlands)
urban runoff	water from rain, melted snow, or landscape irrigation flowing from city streets and domestic or commercial properties that may carry pollutants into a sewer system or water body
vision statement	a concise statement of what the unit could achieve in the next 10 to 15 years
watchable wildlife	all wildlife is watchable [N.b. A watchable wildlife program is one that helps maintain viable populations of all native fish and wildlife species by building an active, well informed constituency for conservation. Watchable wildlife programs are tools for meeting wildlife conservation goals while at

	the same time fulfilling public demand for wildlife-dependent recreational activities (other than sport hunting, sport fishing, or trapping).]
well-protected	in CCP analysis, a rare species or community type is considered well protected if 75 percent or more of its occurrence sites are on dedicated open space
wilderness study areas	lands and waters identified by inventory as meeting the definition of wilderness and being evaluated for a recommendation they be included in the Wilderness System (cf. Arecommended wilderness@) [N.b. A wilderness study area must meet these criteria: 4. generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; 5. has outstanding opportunities for solitude or a primitive and unconfined type of recreation; 6. has at least 5,000 contiguous, roadless acres, or sufficient size to make practicable its preservation and use in an unimpaired condition. (FWS Manual 610 FW 1.5 (draft)).]
wilderness	cf. Adesignated wilderness@
wildfire	a free-burning fire requiring a suppression response; all fire other than prescribed fire that occurs on wildlands [FWS Manual 621 FW 1.7]
wildland fire	every wildland fire is either a wildfire or a prescribed fire [FWS Manual 621 FW 1.3]
wildlife-dependent recreational use	a use of a national wildlife refuge involving hunting, fishing, wildlife observation and photography, or environmental education and interpretation (National Wildlife Refuge System Administration Act of 1966).
wildlife management	manipulating wildlife populations, either directly by regulating the numbers, ages, and sex ratios harvested, or indirectly by providing favorable habitat conditions and alleviating limiting factors
wildlife-oriented recreation	recreational activities in which wildlife is the focus of the experience [AThe terms ›wildlife-dependent recreation‹ and ›wildlife-dependent recreational use‹ mean a use of a refuge involving hunting, fishing, wildlife observation and photography, or environmental education and interpretation.@CNational Wildlife Refuge System Improvement Act of 1997]
working landscape	the rural landscape created and used by traditional laborers [N.b. Agriculture, forestry, and fishing all contribute to the working landscape of a watershed (e.g., keeping fields open by mowing or by grazing livestock).]

Acronyms

Acronym	*Full Name*
BCR	Bird Conservation Region
BLM	Bureau of Land Management
CCP	Comprehensive Conservation Plan
CFR	Code of Federal Regulations
DES	Department of Environmental Services
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FHWA	Department of Transportation's Federal Highway Administration
FONSI	Find of No Significant Impact
FOW	Friends of the Wapack, Inc.
FWS	US Fish and Wildlife Service
GIS	Geographic Information Systems
HMP	Habitat Management Plan
HSIMP	Habitat and Species Inventory and Monitoring Plan
IPM	Integrated Pest Management Plan
MOA	Memorandum of Agreement
NABCI	North American Bird Conservation Initiative
NAWMP	North American Waterfowl Management Plan
NEFA	North East State Foresters Association
NEPA	National Environmental Policy Act
NHCR	National State Agency Herpetological Conservation Report
NH DES	New Hampshire Department of Environmental Services
NHFG	New Hampshire Fish and Game Department
NHPA	National Historic Preservation Act
NOA	Notice of Availability
NOI	Notice of Intent
NWPS	National Wilderness Preservation System
NWR	National Wildlife Refuge
PARC	Partners in Amphibian and Reptile Conservation
PIF	Partners in Flight
PLHD	Public Lands Highways Discretionary
Q2C	Quabbin to Cardigan Conservation Collaborative
Refuge	National Wildlife Refuge
Refuge Improvement Act	National Wildlife Refuge System Improvement Act
Refuge System	National Wildlife Refuge System
ROD	Record of Decision
RONS	Refuge Operating Needs System
RTP	Recreational Trails Program
SAMMS	Service Asset Maintenance Management Systems
Service	US Fish and Wildlife Service
SHPO	State Historic Preservation Office
SWG	State Wildlife Grant Program
TEA-21	Transportation Equity Act for the 21st Century
TNC	The Nature Conservancy

WAP	Wildlife Action Plan
WSAs	Wilderness Study Areas
USDOC	United States Department of Commerce
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geologic Survey

Section of Wapack Trail on the refuge
Nancy McGarigal/USFWS

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Appendix A

View from opening on Wapack Trail
Lelaina Marin/USFWS

Findings of Appropriateness and Compatibility Determinations

- Findings of Appropriateness
  - Walking/Hiking, Backpacking, Cross Country Skiing, Snowshoeing
  - Dog Walking
  - Berry Picking
  - Research by Non-Service Personnel
  - Camping
  - Mountain Biking
  - Horseback Riding
  - Organized or Facility-supported Picnicking
  - Jogging

- Compatiblity Determinations
  - Wildlife Observation and Photography and Environmental Education and Interpretation
  - Walking/Hiking, Backpacking, Cross Country Skiing, Snowshoeing
  - Dog Walking
  - Berry Picking
  - Research Conducted by Non-Service Personnel

603 FW 1
Exhibit 1

Finding of Appropriateness of a Refuge Use

Refuge Name: Wapack National Wildlife Refuge

Use: Walking/Hiking, Backpacking, Cross Country Skiing, Snowshoeing

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ___ No _X__
When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate_____ **Appropriate**__X___

Refuge Manager: _____ Date: _____

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use.

If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence.

If found to be Appropriate, the refuge supervisor must sign concurrence:

Refuge Supervisor: _____ Date: _____

A compatibility determination is required before the use may be allowed.

603 FW 1
Exhibit 1
Page 2

Justification for a Finding of Appropriateness of a Refuge Use

Refuge Name: Wapack National Wildlife Refuge

Use: Walking/Hiking, Backpacking, Cross Country Skiing, Snowshoeing

Narrative

This use is appropriate as it allows refuge visitors the least impacting mode of transportation to participate in wildlife observation, photography and environmental education.

Visitors are required to remain on the designated trail system to minimize environmental damage and prevent accidents. Collecting of any kind is not allowed, nor is disturbing or feeding wildlife. Trails are monitored and maintained by the Friends of the Wapack and the Mountain View Hiking Club to provide a safe and quality visitor experience. The trail surfaces are maintained each year as necessary.

The presence of people walking, hiking, backpacking, skiing, and snowshoeing could result in some disturbance to wildlife located in habitats adjacent to the trail system. However, this disturbance should only be short term. The use of the trails could lead to soil compaction causing some tree roots to be exposed if they are close to the ground surface. Markers and refuge boundary signs encourage trail users to stay on the trail to minimize effects on surrounding vegetation. Other impacts in violation of refuge regulations such as littering or illegal take of wildlife could occur. Refuge staff believe that with the proper management, walking, hiking, backpacking, skiing, and snowshoeing will not result in any short- or long-term impacts that will adversely affect the purpose of the refuge or the mission of the National Wildlife Refuge System.

These are existing and longstanding uses on Wapack and most national wildlife refuges. This use allows refuge visitors to participate in priority public uses on a national wildlife refuge. This use may lead to a better understanding of the importance of the Refuge System to the American people and to their support for refuge acquisition and management.

The Service and the National Wildlife Refuge System maintain goals of providing opportunities to view wildlife. Allowing the use of the trail system by persons engaging in walking, hiking, backpacking, cross country skiing, and snowshoeing will provide visitors the chance to view wildlife. This activity promotes an appreciation for the continued conservation and protection of wildlife and habitat. Walking, hiking, backpacking, cross country skiing, and snowshoeing would not materially interfere with or detract from the mission of the National Wildlife Refuge System or the purposes for which the refuge was established.

603 FW 1
Exhibit 1

Finding of Appropriateness of a Refuge Use

Refuge Name: Wapack National Wildlife Refuge

Use: Dog Walking

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ___ No _X__

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate_____ **Appropriate**__X___

Refuge Manager: _____ Date: _____

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use.
If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence.

If found to be Appropriate, the refuge supervisor must sign concurrence:

Refuge Supervisor: _____ Date: _____

A compatibility determination is required before the use may be allowed.

Justification for a Finding of Appropriateness of a Refuge Use

603 FW 1
Exhibit 1
Page 2

Refuge Name: Wapack National Wildlife Refuge

Use: Dog Walking

Narrative

Dog walking will be allowed throughout the 4-mile segment of the Wapack Trail that cuts through the refuge, the 1.1-mile Cliff Trail, and the 3-mile section of Ted's and Carolyn's trail that traverses the refuge. The refuge trail is open daily, year-round, from half an hour before sunrise to half an hour after sunset, unless a conflict with a trail maintenance activity or an extenuating circumstance necessitates our deviating from those procedures. Examples are closures for snow and ice storms or other events affecting human safety.

We have never formally evaluated dog walking on this refuge, and therefore, technically, it has been prohibited on refuge lands. This has created confusion for visitors since The Nature Conservancy and Miller State Park, whose lands adjoin the refuge, both allow dog walking on leash on their sections of the Wapack Trail. Since there is demand for this use on the refuge and visitors can participate in wildlife-dependent recreation while walking a dog on a leash, we reevaluated our existing policy on dog walking to better meet the needs of our public while minimizing wildlife disturbances.

Our new policy would permit dog walking on the refuge provided that they are kept on a leash and under direct control of their owner at all times. Owners would be required to clean up after their dogs. We would strictly enforce these new policies to minimize wildlife and visitor disturbance. With our volunteers and partners, we would monitor dog walking over the next 5 years to determine if visitors are adhering to the policies. If we find that the majority of dog walkers are not complying, we would be prepared to prohibit dog walking altogether.

We would print the availability of dog walking as an activity on the refuge as well as the rules and consequence of violating the new policies on the new orientation sign. Working with partners (i.e. New Hampshire Parks and Recreation), we would develop a sign at the northern end of Miller State Park that would explain the detrimental effects of letting a dog off leash.

603 FW 1
Exhibit 1

Finding of Appropriateness of a Refuge Use

Refuge Name: Wapack National Wildlife Refuge

Use: Berry Picking

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ___ No _X__

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate_____ **Appropriate**__X__

Refuge Manager: _____ Date: _____

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use.
If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence.

If found to be Appropriate, the refuge supervisor must sign concurrence:

Refuge Supervisor: _____ Date: _____

A compatibility determination is required before the use may be allowed.

Justification for a Finding of Appropriateness of a Refuge Use

603 FW 1
Exhibit 1
Page 2

Refuge Name: Wapack National Wildlife Refuge

Use: Berry Picking

Narrative

Berry picking is not a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57).

Individuals seeking berries will be allowed to enter the trail and hand pick the fruit for personal consumption. The anticipated level of use is very low and it is not anticipated that it will be necessary to set any limit on the number of pickers allowed. Berry picking will be allowed only during daylight hours and use of rakes will be prohibited. Pickers will be limited to collecting only enough for personal or family consumption. Commercial picking will not be permitted. Berry picking has been a historic and traditional use and is known to have occurred in the area for many years.

Impacts such as trampling vegetation and temporarily disturbing wildlife would occur, but is not anticipated to be significant. Visitors walking off established trails to collect berries may impact plants indirectly by compacting soils and walking on young plants and reducing survival and regeneration. It is anticipated, however, that under current levels of use on the refuge or with the expected 15 percent increase in visitation, the incidence of these problems will be minor and insignificant. Many of the berry bushes are located right next to the trail, alleviating the need for a lot of traffic off the trail. As the forest habitat continues to mature, small openings containing berry bushes are being replaced by mature trees, thus reducing the number of berry bushes found on the refuge.

Wildlife may avoid using otherwise suitable habitat when temporarily disturbed by visitors. Again, it is anticipated that under current levels of use on the refuge or with the expected 15 percent increase in visitation, the incidence of this will be minor and insignificant.

It is generally held that the harvest of berries by people in a wild, difficult to access environment such as the refuge is not sufficiently efficient or so extensive so as to negatively impact the use and availability of the overall berry crop by wildlife.

Berry picking will be permitted only in designated trail areas to minimize the damage to vegetation by trampling. Portions of the berry picking area or, if appropriate, the entire area can be closed at any time for any length of time if the Refuge Manager determines that wildlife or wildlife habitat is being impacted by the activity.

With the above-mentioned consideration, berry picking on Wapack National Wildlife Refuge is considered appropriate. Berry picking has been a historical and traditional use of the refuge for the many years and this use is generally declining as berry bushes are being replaced by other shade tolerant vegetation in the forest understory. No adverse impacts from the activity are known or documented at this refuge.

603 FW 1
Exhibit 1

Finding of Appropriateness of a Refuge Use

Refuge Name: Wapack National Wildlife Refuge

Use: Research by Non-Service Personnel

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?	X	
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?	X	
(h) Will this be manageable in the future within existing resources?	X	
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ___ No _X__

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate_____ **Appropriate**__X___

Refuge Manager: _____ Date: _____

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use.
If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence.

If found to be Appropriate, the refuge supervisor must sign concurrence:

Refuge Supervisor: _____ Date: _____

A compatibility determination is required before the use may be allowed.

Justification for a Finding of Appropriateness of a Refuge Use

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Refuge Name: Wapack National Wildlife Refuge

Use: Research by Non-Service Personnel

Narrative

Research conducted by non-Service personnel is not identified as a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997. This use is not a priority public use of the Refuge System. However, research by non-Service personnel is often conducted by colleges, universities, Federal, State, and local agencies, non-governmental organizations, and qualified members of the general public. Research on Wapack NWR would further the understanding of the natural environment and could be applied to management of the refuge's wildlife.

Any request for research would require issuance of a Special Use Permit issued by the Service. At the time of request, a determination will be made by refuge staff whether the research benefits the understanding of the natural environment and will contribute useful information to the Service and National Wildlife Refuge System. The entire refuge may be open and available for scientific research. An individual research project is usually limited to a particular habitat type, plant or wildlife species. On occasion research projects will encompass an assemblage of habitat types, plants or wildlife. The research location will be limited to those areas of the refuge that are absolutely necessary to conduct of the research project.

The timing of the research will depend entirely on the individual research project's approved design. Scientific research would be allowed to occur on the refuge throughout the year. An individual research project could be short term in design, requiring one or two visits over the course of a few days. Other research projects could be multiple year studies that require daily visits to the study site. The timing of each individual research project will be limited to the minimum required to complete the project.

The methods of the research will depend entirely on the individual research project that is conducted. The methods of each research project will be scrutinized well before it will be allowed to occur on the refuge. No research project will be allowed to occur if it does not have an approved scientific method, negatively impacts upland birds and wintering raptors, or compromises public health and safety.

Wapack Refuge is an unstaffed satellite refuge administered by Great Bay NWR. No additional equipment, facilities, or improvements will be necessary to allow research by non-Service personnel. Staff time would be required to review research proposals and oversee permitted projects. We expect that conducting these activities will require less than one-tenth of a work-year for one staff member.

The Service encourages approved research to further the understanding of the natural resources. Research by other than Service personnel adds greatly to the information base for Refuge Managers to make proper decisions. Disturbance to wildlife and vegetation by researchers could occur through observation, mist-netting, banding, and accessing the study area by foot. It is possible that direct mortality could result as a by-product of research activities. Mist-netting for example, can cause stress, especially when birds are captured, banded and weighed. There have been occasional mortalities to these birds, namely when predators such as raccoons and cats reach the netted birds before researchers do.

Minimal impact will occur when research projects which are previously approved are carried out according to the stipulations stated in the Special Use Permit issued for each project. Overall, however, allowing well designed and properly reviewed research to be conducted by non-Service personnel is likely to have very little impact on refuge wildlife populations. If the research project is conducted with professionalism and integrity, potential adverse impacts are likely to be outweighed by the knowledge gained about an entire species, habitat or public use.

Allowing research to be conducted by non-Service personnel would have very little impact on Service interests. If the research project is conducted with professionalism and integrity, potential adverse impacts can far outweigh the data and knowledge gained

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Exhibit 1

Finding of Appropriateness of a Refuge Use

Refuge Name: Wapack National Wildlife Refuge

Use: Camping

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?		X
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?		X
(h) Will this be manageable in the future within existing resources?		X
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ___ No _X__

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate__X___ **Appropriate**_____

Refuge Manager: _____ Date: _____

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use.
If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence.

If found to be Appropriate, the refuge supervisor must sign concurrence:

Refuge Supervisor: _____ Date: _____

A compatibility determination is required before the use may be allowed.

Justification for a Finding of Appropriateness of a Refuge Use

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Refuge Name: Wapack National Wildlife Refuge

Use: Camping

Narrative

To comply with 2006 Service policy on appropriateness, we are evaluating all non-priority public uses for the refuge. Camping is not identified as a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997 (NWRSIA). Camping will not be allowed on the refuge for several reasons.

Deed restrictions exist for Wapack NWR requiring the refuge to be used "…for wilderness purposes ….. the preservation of the area as a place where the earth and its community of life remain untrammeled by man, where man is a visitor who does not remain, in order that the area will remain unimpaired for future use and enjoyment as a wilderness …..." The essence of the deed restrictions require that the refuge be left in a natural state where humans visit.

Additionally, if we allow camping on the refuge visitors may wander off trail to find suitable sites and consequently cause increased soil and vegetation compaction and disturbance to wildlife. Camping encourages visitors to stay overnight and leave behind trash, food, and human waste which are both ecological and aesthetic problems. Law enforcement and safety may also become greater concerns if campers are not responsible or do not exercise caution. We do not want to promote Wapack refuge as a destination for camping.

Finally, camping was not an activity in which the public expressed interest during our public scoping meetings.

After reevaluating camping under Service policies, deed restrictions, other complications, and demand, we conclude that we will not allow this activity. Since we have never observed any camping on the refuge, we do not expect that prohibiting this activity will significantly impact current or future visitors. However, prohibiting camping may positively impact wildlife and wildlife habitat; if only by reducing the amount trash, food, and human waste left behind, and soil compaction, vegetation trampling, and the frequency and extent of wildlife disturbance.

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Exhibit 1

Finding of Appropriateness of a Refuge Use

Refuge Name: Wapack National Wildlife Refuge

Use: Mountain Biking

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?		X
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?		X
(g) Is the use manageable within available budget and staff?		X
(h) Will this be manageable in the future within existing resources?		X
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?		X

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ___ No _X__

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate__X___ **Appropriate**_____

Refuge Manager: _____ Date: _____

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use.
If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence.

If found to be Appropriate, the refuge supervisor must sign concurrence:

Refuge Supervisor: _____ Date: _____

A compatibility determination is required before the use may be allowed.

Justification for a Finding of Appropriateness of a Refuge Use

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Refuge Name: Wapack National Wildlife Refuge

Use: Mountain Biking

Narrative

To comply with 2006 Service policy on appropriateness, we are evaluating all non-priority public uses for the refuge. Mountain biking is not identified as a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997 (NWRSIA). Mountain biking will not be allowed on the refuge for several reasons.

Deed restrictions exist for Wapack NWR requiring the refuge to be used "…for wilderness purposes ….. the preservation of the area as a place where the earth and its community of life remain untrammeled by man, where man is a visitor who does not remain, in order that the area will remain unimpaired for future use and enjoyment as a wilderness …..." The essence of the deed restrictions require that the refuge be left in a natural state where humans visit. In our opinion, mountain biking would diminish the "wilderness-like" setting described in the deed and may detract from the enjoyment of the refuge for other visitors.

Changing conditions at the refuge further reinforces our decision. Mountain biking may degrade the trails and cause further erosion. Although foot travel is allowed on established trails so that visitors may experience the priority public uses of wildlife observation, photography and environmental education; mountain biking is not required to experience these uses. Furthermore, portions of the trails are very steep with rock outcroppings and some erosion due to foot travel. Mountain biking may degrade the trail, cause further erosion on steeper areas of trails, and cause safety hazards to other visitors.

Trail maintenance is another issue. Wapack NWR is an unstaffed refuge and will likely remain unstaffed for the near future. Trails are monitored and maintained by the Friends of the Wapack and the Mountain View Hiking Club to provide a safe and quality visitor experience. The trail surfaces are maintained several times during the year as necessary. Any additional damage to trails would put an unnecessary burden on the Friends of the Wapack and the Mountain View Hiking Club.

Finally, mountain biking was not an activity in which the public expressed interest during our public scoping meetings.

After reevaluating mountain biking under Service policies, deed restrictions, current conditions, required maintenance, and demand, we conclude that we will not allow this activity. Since we have never observed any bikers using the refuge, we do not expect that prohibiting this activity will significantly impact current or future visitors. However, prohibiting mountain biking may positively impact soils and wildlife; if only by reducing the amount of erosion and soil compaction that might occur on trails and the frequency and extent of wildlife disturbance. Mountain biking is not a wildlife dependent public use, nor is it necessary to support a priority public use, and it may decrease the enjoyment of the refuge for other visitors.

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Exhibit 1

Finding of Appropriateness of a Refuge Use

Refuge Name: Wapack National Wildlife Refuge

Use: Horseback Riding

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?		X
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?		X
(g) Is the use manageable within available budget and staff?		X
(h) Will this be manageable in the future within existing resources?		X
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?		X

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ___ No _X__

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate__X___ **Appropriate**_____

Refuge Manager: _____ Date: _____

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use.
If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence.

If found to be Appropriate, the refuge supervisor must sign concurrence:

Refuge Supervisor: _____ Date: _____

A compatibility determination is required before the use may be allowed.

Justification for a Finding of Appropriateness of a Refuge Use

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Refuge Name: Wapack National Wildlife Refuge

Use: Horseback Riding

Narrative

To comply with 2006 Service policy on appropriateness, we are evaluating all non-priority public uses for the refuge. Horseback riding is not identified as a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997 (NWRSIA). Horseback riding will not be allowed on the refuge for several reasons.

Deed restrictions exist for Wapack NWR requiring the refuge to be used "…for wilderness purposes ….. the preservation of the area as a place where the earth and its community of life remain untrammeled by man, where man is a visitor who does not remain, in order that the area will remain unimpaired for future use and enjoyment as a wilderness …..." The essence of the deed restrictions require that the refuge be left in a natural state where humans visit. In our opinion, horseback riding would diminish the "wilderness-like" setting described in the deed and may detract from the enjoyment of the refuge for other visitors.

Changing conditions at the refuge further reinforces our decision. Horseback riding may degrade the trails and cause further erosion. Although foot travel is allowed on established trails so that visitors may experience the priority public uses of wildlife observation, photography and environmental education; horseback riding is not required to experience these uses. Furthermore, portions of the trails are very steep with rock outcroppings and some erosion due to foot travel. Horseback riding may degrade the trail, cause further erosion on steeper areas of trails, and cause safety hazards to other visitors.

Horses may also leave piles of their manure along the trail, degrading the enjoyment of the refuge for other visitors. Additionally, Horse manure may contain viable seeds from invasive plants (Wells and Lauenroth 2007) which may become a management problem for the refuge.

Trail maintenance is another issue. Wapack NWR is an unstaffed refuge and will likely remain unstaffed for the near future. Trails are monitored and maintained by the Friends of the Wapack and the Mountain View Hiking Club to provide a safe and quality visitor experience. The trail surfaces are maintained several times during the year as necessary. Any additional damage to trails would put an unnecessary burden on the Friends of the Wapack and the Mountain View Hiking Club.

Finally, horseback riding was not an activity in which the public expressed interest during our public scoping meetings.

After reevaluating horseback riding under Service policies, deed restrictions, current conditions, aesthetic and ecological implications, required maintenance, and demand, we conclude that we will not allow this activity. Since we have never observed any horseback riders using the refuge, we do not expect that prohibiting this activity will significantly impact current or future visitors. However, prohibiting horseback riding may positively impact soils and wildlife; if only by reducing the amount of erosion and soil compaction that might occur on trails, the frequency and extent of wildlife disturbance, and disallowing a potential vector of invasive plants. Horseback riding is not a wildlife dependent public use, nor is it necessary to support a priority public use, and it may decrease the enjoyment of the refuge for other visitors.

References

Wells F.H., and W. K. Lauenroth. 2007. The Potential for Horses to Disperse Alien Plants Along Recreational Trails. Rangeland Ecology & Management: Vol. 60, No. 6 pp. 574–577.

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Exhibit 1

Finding of Appropriateness of a Refuge Use

Refuge Name: Wapack National Wildlife Refuge

Use: Organized or Facility-supported Picnicking

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?		X
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?		X
(h) Will this be manageable in the future within existing resources?		X
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?	X	

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ___ No _X__

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate__X___ **Appropriate**_____

Refuge Manager: _____ Date: _____

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use.
If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence.

If found to be Appropriate, the refuge supervisor must sign concurrence:

Refuge Supervisor: _____ Date: _____

A compatibility determination is required before the use may be allowed.

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Justification for a Finding of Appropriateness of a Refuge Use

Refuge Name: Wapack National Wildlife Refuge

Use: Organized Picnicking

Narrative

To comply with 2006 Service policy on appropriateness, we are reevaluating all non-priority public uses for the refuge. Organized picnicking is not identified as a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997 (NWRSIA). Since the decision to allow organized picnicking on the refuge in 1994, the Service's standards for what are appropriate and compatible public uses on refuges have increased. Organized picnicking, although permitted in the past, will no longer be allowed on the refuge for several reasons.

Deed restrictions exist for Wapack NWR requiring the refuge to be used "…for wilderness purposes ….. the preservation of the area as a place where the earth and its community of life remain untrammeled by man, where man is a visitor who does not remain, in order that the area will remain unimpaired for future use and enjoyment as a wilderness …..." The essence of the deed restrictions require that the refuge be left in a natural state where humans visit.

Additionally, we do not have the infrastructure in place to accommodate for organized picnicking activities. Therefore, if we continued to allow this use visitors may wander off trail to find a suitable site and consequently cause increased soil and vegetation compaction and disturbance to wildlife. Continuing to allow this use may also result in trash and food waste that may attract nuisance species to the area. We do not want to promote Wapack refuge as a destination for picnicking. Although we are prohibiting organized picnicking, this does not preclude visitors from bringing food with them for nutrition or safety while they participate in other appropriate and compatible activities on the refuge such as hiking, backpacking, or wildlife observation.

Finally, organized picnicking was not an activity in which the public expressed interest during our public scoping meetings.

After reevaluating organized picnicking under Service policies, deed restrictions, required infrastructure, and demand, we conclude that we will no longer allow this activity. Since we have never observed any organized picnics on the refuge, we do not expect that prohibiting this activity will significantly impact current or future visitors. However, prohibiting organized picnicking may positively impact wildlife and wildlife habitat; if only by reducing the amount of soil compaction, vegetation trampling, and trash and food waste that might occur on and off trails and the frequency and extent of wildlife disturbance.

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Exhibit 1

Finding of Appropriateness of a Refuge Use

Refuge Name: Wapack National Wildlife Refuge

Use: Jogging

This exhibit is not required for wildlife-dependent recreational uses, forms of take regulated by the State, or uses already described in a refuge CCP or step-down management plan approved after October 9, 1997.

Decision criteria:	YES	NO
(a) Do we have jurisdiction over the use?	X	
(b) Does the use comply with applicable laws and regulations (Federal, State, tribal, and local)?	X	
(c) Is the use consistent with applicable Executive orders and Department and Service policies?	X	
(d) Is the use consistent with public safety?	X	
(e) Is the use consistent with goals and objectives in an approved management plan or other document?		X
(f) Has an earlier documented analysis not denied the use or is this the first time the use has been proposed?	X	
(g) Is the use manageable within available budget and staff?		X
(h) Will this be manageable in the future within existing resources?		X
(i) Does the use contribute to the public's understanding and appreciation of the refuge's natural or cultural resources, or is the use beneficial to the refuge's natural or cultural resources?	X	
(j) Can the use be accommodated without impairing existing wildlife-dependent recreational uses or reducing the potential to provide quality (see section 1.6D. for description), compatible, wildlife-dependent recreation into the future?		X

Where we do not have jurisdiction over the use ("no" to (a)), there is no need to evaluate it further as we cannot control the use. Uses that are illegal, inconsistent with existing policy, or unsafe ("no" to (b), (c), or (d)) may not be found appropriate. If the answer is "no" to any of the other questions above, we will generally not allow the use.

If indicated, the refuge manager has consulted with State fish and wildlife agencies. Yes ___ No _X__

When the refuge manager finds the use appropriate based on sound professional judgment, the refuge manager must justify the use in writing on an attached sheet and obtain the refuge supervisor's concurrence.

Based on an overall assessment of these factors, my summary conclusion is that the proposed use is:

Not Appropriate__X___ **Appropriate**_____

Refuge Manager: _____ Date: _____

If found to be Not Appropriate, the refuge supervisor does not need to sign concurrence if the use is a new use.
If an existing use is found Not Appropriate outside the CCP process, the refuge supervisor must sign concurrence.

If found to be Appropriate, the refuge supervisor must sign concurrence:

Refuge Supervisor: _____ Date: _____

A compatibility determination is required before the use may be allowed.

Justification for a Finding of Appropriateness of a Refuge Use

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Refuge Name: Wapack National Wildlife Refuge

Use: Jogging

Narrative

To comply with 2006 Service policy on appropriateness, we are reevaluating all non-priority public uses for the refuge. Jogging is not identified as a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997 (NWRSIA). Since the decision to allow jogging on the refuge in 1994, the Service's standards for what are appropriate and compatible public uses on refuges have increased. Jogging, although permitted in the past, will no longer be allowed on the refuge for several reasons.

Deed restrictions exist for Wapack NWR requiring the refuge to be used "…for wilderness purposes ….. the preservation of the area as a place where the earth and its community of life remain untrammeled by man, where man is a visitor who does not remain, in order that the area will remain unimpaired for future use and enjoyment as a wilderness …..." The essence of the deed restrictions require that the refuge be left in a natural state where humans visit. In our opinion, jogging would detract from the enjoyment of the refuge for other visitors engaged in wildlife-dependent activities.

Foot travel is allowed on established trails so that visitors may experience the priority public uses of wildlife observation, photography and environmental education; jogging is not required to experience these uses. Furthermore, portions of the trails are very steep with rock outcroppings that hikers must traverse. Joggers attempting to run along these portions may endanger themselves and other visitors.

Trail maintenance is another issue. Wapack NWR is an unstaffed refuge and will likely remain unstaffed for the near future. Trails are monitored and maintained by the Friends of the Wapack and the Mountain View Hiking Club to provide a safe and quality visitor experience. The trail surfaces are maintained several times during the year as necessary. Any additional damage to trails would put an unnecessary burden on the Friends of the Wapack and the Mountain View Hiking Club.

Finally, jogging was not an activity in which the public expressed interest during our public scoping meetings.

After reevaluating jogging under Service policies, deed restrictions, required maintenance, and demand, we conclude that we will no longer allow this activity. Since we have never observed any joggers using the refuge, we do not expect that prohibiting jogging will significantly impact current or future visitors. Jogging is not a wildlife dependent public use, nor is it necessary to support a priority public use, and it may decrease the enjoyment of the refuge for other visitors.

Compatibility Determination

Use: Wildlife Observation and Photography and Environmental Education and Interpretation

Refuge Name:: Wapack National Wildlife Refuge

Date Established: May 17, 1972

Establishing Authority: Migratory Bird Conservation Act [16 U.S.C. 715d]

Purposes for which Established:
The Wapack National Wildlife Refuge was established "for use as an inviolate sanctuary, or for any other management purpose, for migratory birds…." [16 U.S.C. 715d; Migratory Bird Conservation Act]

Mission of the National Wildlife Refuge System:
"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans." — National Wildlife Refuge System Improvement Act of 1997 (Public Law 105–57; 111 Stat. 1282)

Description of Use:
(a) What is the use? Is the use a priority public use?
The uses are wildlife observation and photography, and environmental education and interpretation. They are priority public uses of the National Wildlife Refuge System, under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997.

(b) Where would the uses be conducted?
Wildlife observation and photography, environmental education, and interpretation will be conducted throughout the 4-mile segment of the Wapack Trail that cuts through the refuge, the 1.1-mile Cliff Trail, and the 3 –mile section of Ted's and Carolyn's trail that traverses the refuge.

(c) When would the uses be conducted?
We will conduct them daily, year-round, from half an hour before sunrise to half an hour after sunset, unless a conflict with a trail maintenance activity or an extenuating circumstance necessitates our deviating from those procedures. Examples are closures for snow and ice storms or other events affecting human safety.

(d) How would the uses be conducted?
We will allow wildlife observation and photography, environmental education and interpretation on the 4-mile segment of the Wapack Trail that cuts through the refuge, the 1.1-mile Cliff Trail, and the 3 –mile section of Ted's and Carolyn's trail that traverses the refuge. To support these activities, there is currently a topographic map at the northern terminus of the trail and the *Guide to the Wapack Trail* provided by the Friends of the Wapack. No mountain biking, motorized vehicles, or horseback riding are allowed.

The Service's preferred alternative would enhance the infrastructure to increase wildlife observation, photography, environmental education, and interpretation opportunities on the refuge. We will utilize partnerships (i.e. Town of Greenfield) to establish a parking area at the Northern terminus of the refuge (at Old Mountain Road). We will also develop a memorandum of understanding (MOU) with the Friends of the Wapack (FOW) for maintenance of the segment of the Wapack Trail and the Cliff Trail that goes through the refuge, and with the Mountain View Hiking Club for maintenance of the sections of Ted's and Carolyn's Trail that cross into the refuge. Improvements in signage will include installing an informational sign at the Wapack trailhead and refuge entrance signs to Ted and Carolyn's trail. We would also increase the number

of boundary signs posted around the refuge, where necessary to make them intervisible. Partnerships with various local organizations (i.e. New Hampshire Division of Parks and Recreation, Harris Center for Conservation Education) will be utilized to enhance outreach and education efforts on the refuge.

(e) Why are these uses being proposed?
The Refuge System Improvement Act defines wildlife observation, photography, environmental education and interpretation as priority public uses that, if compatible, are to receive our enhanced consideration over other general public uses. Authorizing these uses will produce better-informed public advocates for Service programs.

These uses will provide opportunities for visitors to observe and learn about wildlife and wild lands at their own pace in an unstructured environment, and observe wildlife in their natural habitats firsthand. They will provide visitors with compatible educational and recreational opportunities to enjoy refuge resources and gain better understanding and appreciation of wildlife, wild lands ecology, the relationships of plant and animal populations in an ecosystem, and wildlife management. They will enhance public understanding of ecological concepts, enable the public to better understand the problems facing our wildlife and wild lands resources, help them realize what effect the public has on wildlife resources, learn about the Service role in conservation, and better understand the biological facts upon which we base Service management programs.

Professional and amateur photographers alike will gain opportunities to photograph wildlife in its natural habitat. Those opportunities obviously will increase the publicity and advocacy of Service programs. These uses will provide wholesome, safe, outdoor recreation in a scenic setting, and entice those who come strictly for recreational enjoyment to participate in the educational facets of our public use program and become advocates for the refuge and the Service.

Availability of Resources: Estimates derived from the Service's Region 5 *Construction and Rehabilitation Cost Estimating Guide* in part.

Parking area construction	$20,000 (10 – 12 spaces)
3-panel information sign	$5,000

Anticipated Impacts of the Uses:
These uses can produce positive or negative and direct or indirect impacts on wildlife or habitats.

Direct Effects
Direct impacts are those where the activity has an immediate effect on wildlife. We expect those to include the presence of humans disturbing wildlife, which typically results in a temporary displacement without long-term effects on individuals or populations. Some species will avoid areas frequented by people, while others seem unaffected or even drawn to human presence. Overall, direct effects should be insignificant, because public use will be limited to the designated trail system.

Indirect Effects
When people move from one area to another, they can be vectors for the seeds or other propagules of invasive plants. Once established, invasive plants can out-compete native plants, thereby altering habitats and indirectly impacting wildlife. The threat of invasive plants establishing themselves will always be an issue that requires monitoring. Within 2 years of CCP completion, the USFS Forest Health Protection Program would complete a full forest health assessment that would help determine if any invasive species inhabit the refuge.

Cumulative Effects
Effects that are minor when we consider them separately but may be important when we consider them collectively are cumulative effects. The principal concerns are repeated disturbances of birds that are

nesting, foraging, or resting. Opening refuge land to public use can often result in litter, vandalism, or other illegal activities.

Our observations and knowledge of the areas involved provide no evidence that, cumulatively, these proposed wildlife-dependent uses will have an unacceptable effect on the wildlife resource. Although we do not expect a substantial increase in the cumulative effects of public use in the near term, it will be important for refuge staff to monitor public use and respond, if necessary, to conserve the high-quality wildlife resources on the refuge.

We expect no additional effects from wildlife observation, wildlife photography, environmental education or interpretation. Refuge staff will monitor and evaluate the effects of public use in collaboration with volunteers to discern and respond to unacceptable impacts on wildlife or habitats.

Public Review and Comment:
As part of the comprehensive conservation planning process for Wapack refuge, this compatibility determination will undergo extensive public review, including a comment period of at least 30 days following the release of the Draft CCP/EA.

Determination (check one below):

___ Use is Not Compatible

_X _Use is Compatible, with the following stipulations

Stipulations Necessary to Ensure Compatibility:
We will monitor public use on the trail at various times of the year to assess the disturbance of wildlife. The *Guide to the Wapack Trail*, published by the Friends of the Wapack, identifies the refuge wildlife resources, and the prohibition against disturbing wildlife. Wildlife observation, photography, environmental education, and interpretation will only be allowed on the refuge from half an hour before sunrise to half an hour after sunset.

Justification:
Wildlife observation and photography, and environmental education and interpretation are priority wildlife-dependent uses, through which the public can develop an appreciation for fish and wildlife [Executive Order 12996, March 25, 1996, and the National Wildlife Refuge System Administration Act of 1966, as amended by the National Wildlife Refuge System Improvement Act of 1997].

Service policy is to provide expanded opportunities for those uses when they are compatible and consistent with sound fish and wildlife management, and ensure that they receive enhanced consideration in refuge planning and management. Allowing them on the refuge will not materially interfere with or detract from the mission of the Refuge System or the purposes for which the refuge was established.

Signature: Refuge Manager: _____
(Signature and Date)

Concurrence: Regional Chief: _____
(Signature and Date)

Mandatory 15-year Reevaluation Date: _____
(Date)

Compatibility Determination

Use: Walking/Hiking, Backpacking, Cross Country Skiing, Snowshoeing

Refuge Name: Wapack National Wildlife Refuge

Date Established: May 17, 1972

Establishing Authority: Migratory Bird Conservation Act of 1929

Purposes for which Established:

The Wapack National Wildlife Refuge was established "… for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." Migratory Bird Conservation Act 16 U.S.C. 715-715d, 715f – 715r

Mission of the National Wildlife Refuge System:

"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans." — National Wildlife Refuge System Improvement Act of 1997 (Public Law 105–57; 111 Stat. 1282)

Description of Use:

(a) What is the use? Is the use a priority public use?

The uses are walking/hiking, backpacking, cross country skiing, and snowshoeing. These are not priority public uses of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), and the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57). However, refuge staff believe by allowing these activities, that the participants will be positively exposed to the refuge and the Refuge System. This exposure may lead to a better understanding of the importance of the Refuge System to the American people. The aforementioned activities have occurred on the refuge for many years.

(b) Where would the use be conducted?

These activities will be conducted throughout the 4-mile segment of the Wapack Trail that cuts through the refuge, the 1.1-mile Cliff Trail, and the 3 –mile section of Ted's and Carolyn's trail that traverses the refuge.

(c) When would the use be conducted?

We will conduct them daily, year-round, from half an hour before sunrise to half an hour after sunset, unless a conflict with a trail maintenance activity or an extenuating circumstance necessitates our deviating from those procedures. Examples are closures for snow and ice storms or other events affecting human safety.

(d) How would the use be conducted?

Refuge trails are open from half an hour before sunrise to half an hour after sunset daily, unless closed for maintenance or safety reasons.

Bicycles are not allowed on the refuge.

Visitors are required to remain on the designated trail system to minimize environmental damage and prevent accidents.

Collecting of any kind is not allowed, nor is disturbing or feeding wildlife.
Trails are monitored and maintained by the Friends of the Wapack and the Mountain View Hiking Club to provide a safe and quality visitor experience. The trail surfaces are maintained each year as necessary

Currently, dogs are allowed on the trails while on a leash and under the control of their master.

(e) Why is this use being proposed?
These are existing and longstanding uses on Wapack and most national wildlife refuges. These are not priority public uses on national wildlife refuges, however, refuge staff believe, by allowing these activities, that the participants will be positively exposed to the Refuge and the Refuge System. This exposure may lead to a better understanding of the importance of the Refuge System to the American people and to their support for refuge acquisition and management.

Availability of Resources:
The resources necessary to provide and administer this use are available within current and anticipated refuge budgets. Trail maintenance is provided by the Friends of the Wapack and the Mountain View Hiking Club.

Anticipated Impacts of the Use:
The presence of people walking, hiking, backpacking, skiing, and snowshoeing could result in some disturbance to wildlife located in habitats adjacent to the trail system. However, this disturbance should only be short term. The use of the trails could lead to soil compaction causing some tree roots to be exposed if they are close to the ground surface. Markers and refuge boundary signs encourage trail users to stay on the trail to minimize effects on surrounding vegetation. Other impacts in violation of refuge regulations such as littering or illegal take of wildlife could occur. Refuge staff believe that with the proper management, walking, hiking, backpacking, skiing, and snowshoeing will not result in any short- or long-term impacts that will adversely affect the purpose of the refuge or the mission of the National Wildlife Refuge System.

Public Review and Comment:
As part of the comprehensive conservation planning process for Wapack refuge, this compatibility determination will undergo extensive public review, including a comment period of at least 30 days following the release of the Draft CCP/EA.

Determination (check one below):

_____Use is Not Compatible

__X____Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:
To minimize or avoid negative impacts to wildlife and habitat:

- Harassment, baiting, playback tapes, or electronic calls are not allowable methods to attract wildlife for observation or photography (this does not necessarily apply to management activities, e.g., approved research or surveys, which are evaluated on a case-by-case basis).
- Currently dogs must be kept and controlled on a leash.
- Collecting of any kind is prohibited. This does not necessarily apply to management activities, e.g., approved research or surveys, which are evaluated on a case-by-case basis.

Justification:
The Service and the National Wildlife Refuge System maintain goals of providing opportunities to view wildlife. Allowing the use of the trail system by persons engaging in walking, hiking, backpacking, cross country skiing, and snowshoeing will provide visitors the chance to view wildlife. This activity promotes an appreciation for the continued conservation and protection of wildlife and habitat. Walking, hiking,

backpacking, cross country skiing, and snowshoeing would not materially interfere with or detract from the mission of the National Wildlife Refuge System or the purposes for which the Refuge was established.

Signature: Refuge Manager: _____
(Signature and Date)

Concurrence: Regional Chief: _____
(Signature and Date)

Mandatory 10-year Reevaluation Date: _____
(Date)

Compatibility Determination

Use: Dog Walking

Refuge Name: Wapack National Wildlife Refuge

Date Established: May 17, 1972

Establishing Authority: Migratory Bird Conservation Act of 1929

Purposes for which Established:

The Wapack National Wildlife Refuge was established "… for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." Migratory Bird Conservation Act 16 U.S.C. 715-715d, 715f – 715r

Mission of the National Wildlife Refuge System:

"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans." — National Wildlife Refuge System Improvement Act of 1997 (Public Law 105–57; 111 Stat. 1282)

Description of Use:

(a) What is the use? Is the use a priority public use?

The use is dog walking. Dog walking is not a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997.

(b) Where would the use be conducted?

Dog walking will be conducted throughout the 4-mile segment of the Wapack Trail that cuts through the refuge, the 1.1-mile Cliff Trail, and the 3-mile section of Ted's and Carolyn's trail that traverses the refuge.

(c) When would the use be conducted?

We will conduct this activity daily, year-round, from half an hour before sunrise to half an hour after sunset, unless a conflict with a trail maintenance activity or an extenuating circumstance necessitates our deviating from those procedures. Examples are closures for snow and ice storms or other events affecting human safety.

(d) How would the use be conducted?

Refuge trails are open from half an hour before sunrise to half an hour after sunset daily, unless closed for maintenance or safety reasons.

For education and outreach purposes, the new orientation sign (northern terminus of the refuge) proposed under the preferred alternative would provide a list of activities that are allowed and prohibited on the refuge. Dog walking would be one of the activities listed on the sign. We would also work with partners (i.e. New Hampshire Parks and Recreation) to develop a sign at the northern end of Miller State Park that would explain the detrimental effects of letting a dog off leash.

Dogs must be kept on a leash and under direct control of their owners at all times. Owners will be required to clean up after their dogs. We would strictly enforce these new policies to minimize wildlife and visitor disturbance. With our volunteers and partners, we would monitor dog walking over the next 5 years to

determine if visitors are adhering to the leash law. If we find that the majority of dog walkers are not complying, we would be prepared to prohibit dog walking altogether. We will print the rules and consequence of violating the leash law on the new orientation sign.

(e) Why is this use being proposed?
Visitors can participate in wildlife-dependent recreation while walking a dog. There is a current demand for this use on the refuge, and therefore, we have reevaluated our existing policy on dog walking to better meet the needs of our public and minimize wildlife disturbances.

Availability of Resources:
The resources necessary to provide and administer this use are available within current and anticipated refuge budgets. There is no additional staff or material costs incurred to the refuge.

Anticipated Impacts of the Use:
There can be an increase in wildlife disturbance from dog walking simply due to normal dog behavior (i.e. jumping, barking, running off a leash). At some level, domestic dogs maintain instincts to hunt and/or chase. Given the appropriate stimulus, those instincts can be triggered in many different settings. Even if the chase instinct is not triggered, dog presence in and of itself has been shown to disrupt many wildlife species (Sime 1999). Sime presents some effects of disturbance, harassment, and displacement on wildlife attributable to domestic dogs that accompany recreationists. Sime states, authors of many wildlife disturbance studies concluded that dogs with people, dogs on-leash, or loose dogs provoked the most pronounced disturbance reactions from their study animals. Dogs extend the zone of human influence when off-leash. Many ungulate species demonstrated more pronounced reactions to unanticipated disturbances, as a dog off-leash would be until within very close range. In addition, dogs can force movement by ungulates (avoidance or evasion during pursuit), which is in direct conflict with overwinter survival strategies which promote energy conservation. Sime continues to highlight that dogs are noted predators for various wildlife species in all seasons. Domestic dogs can potentially introduce diseases (distemper, parvovirus, and rabies) and transport parasites into wildlife habitats. While dog impacts to wildlife likely occur at the individual scale, the results may still have important implications for wildlife populations. For most wildlife species, if a “red flag” is raised by pedestrian-based recreational disturbance, there could also be problems associated with the presence of domestic dogs.

Lastly, dog waste can create sanitation issues and an unsightly environment to other refuge visitors.

Public Review and Comment:
As part of the comprehensive conservation planning process for Wapack refuge, this compatibility determination will undergo extensive public review, including a comment period of at least 30 days following the release of the Draft CCP/EA.

Determination (check one below):

_____Use is Not Compatible

__X____Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:
Dogs must be on a leash under direct control of their owners at all times.

Owners must pick up after their dog(s) and remove the feces from the refuge.

Over the next five years, we would monitor dog walking with our volunteers and partners.

If we find that the majority of dog walkers are not complying, we would be prepared to prohibit dog walking altogether.

Dog walking will be listed on the new orientation sign as an acceptable use of the refuge.

We will print the rules and consequence of violating the leash law on the new orientation sign.

We will work with partners to develop a sign at the northern end of Miller State Park that will explain the detrimental effects of letting a dog off leash.

Justification:
Although dogs can increase disturbance to wildlife, the refuge will enforce a leash law to keep dogs and disturbances localized with the pedestrian. There are no documented incidences of domestic dog-wildlife disturbances, or dog-people problems. We have not had significant negative impacts from this use. Through increased signage and outreach by refuge staff and volunteers regarding dog walking we will encourage visitors to comply with the "dog on leash" policy. We believe most dog walkers are local residents, who regularly visit the refuge for wildlife-dependent recreation, and who understand our policy.

Dog walking would not materially interfere with or detract from the mission of the National Wildlife Refuge System or the purposes for which the Refuge was established.

Signature: Refuge Manager: _____
(Signature and Date)

Concurrence: Regional Chief: _____
(Signature and Date)

Mandatory 10-year Reevaluation Date: _____
(Date)

References
Sime, C. A. 1999. Domestic Dogs in Wildlife Habitats. Pages 8.1-8.17 *in* G. Joslin and H. Youmans, coordinators. Effects of recreation on Rocky Mountain wildlife: A Review for Montana. Committee on Effects of Recreation on Wildlife, Montana Chapter of The Wildlife Society. 307pp.

Compatibility Determination

Use: Berry Picking

Refuge Name: Wapack National Wildlife Refuge

Date Established: May 17, 1972

Establishing Authority: Migratory Bird Conservation Act of 1929

Purposes for which Established:

The Wapack National Wildlife Refuge was established "… for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." Migratory Bird Conservation Act 16 U.S.C. 715-715d, 715f – 715r

Mission of the National Wildlife Refuge System:

"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans." — National Wildlife Refuge System Improvement Act of 1997 (Public Law 105–57; 111 Stat. 1282)

Description of Use:

(a) What is the use? Is the use a priority public use?
The use is berry picking. Berry picking is not a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997 (Public Law 105-57).

(b) Where would the use be conducted?
Recreational berry picking will be conducted throughout the three mile segment of the Wapack Trail that cuts through the refuge.

(c) When would the use be conducted?
Berries are usually ripe and suitable for picking from mid-July until the end of August.

(d) How would the use be conducted?
Individuals seeking berries are allowed to enter the trail and hand pick the fruit for personal consumption. The anticipated level of use is very low and it is not anticipated that it will be necessary to set any limit on the number of pickers allowed. Berry harvesting is allowed only during daylight hours and use of rakes is prohibited. Pickers will be limited to collecting only enough for personal or family consumption. Commercial picking is not permitted.

(e) Why is this use being proposed?
Berry picking is a historic and traditional use of the area. This use is known to have occurred in the area for many years.

Availability of Resources:
The resources necessary to provide and administer this use are available within current and anticipated refuge budgets. Staff time associated with the administration of this use is primarily related to answering general questions from the public and monitoring impacts of the use on refuge resources. The use of the refuge staff to monitor the impacts of public uses on refuge resources, and visitors is required for

administering all refuge public uses. Therefore, these responsibilities and related equipment are accounted for in budget and staffing plans.

Anticipated Impacts of the Use:
Impacts such as trampling vegetation and temporarily disturbing wildlife would occur, but is not anticipated to be significant.

Significant numbers of visitors walking off established trails to collect berries can impact plants indirectly by compacting soils and diminishing soil porosity, aeration and nutrient availability, affecting plant growth and survival (Kuss 1986). Re-colonization of plants will be limited because root growth and penetration becomes more difficult in compacted soils (Hammitt and Cole 1998). Foot travel increases root exposure, trampling effects and crushing of plants. Plants adapted to wet or moist soils are most sensitive to disturbance from trampling effects (Kuss 1986).

In this manner, this use will cause some vegetation loss. It is anticipated, however, that under current levels of use, the incidence of these problems will be minor and insignificant. Many of the berry bushes are located right next to the trail, alleviating the need for a lot of traffic off the trail.

Wildlife may avoid using otherwise suitable habitat when temporarily disturbed by visitors. Again, it is anticipated that under current levels of use, the incidence of this will be minor and insignificant.

It is generally held that the harvest of berries by people in a wild, difficult to access environment such as the refuge is not sufficiently efficient nor so extensive so as to negatively impact the use and availability of the overall berry crop by wildlife.

Public Review and Comment:
As part of the comprehensive conservation planning process for Wapack refuge, this compatibility determination will undergo extensive public review, including a comment period of at least 30 days following the release of the Draft CCP/EA.

Determination (check one below):

_____Use is Not Compatible

__X____Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:
Berry picking will be permitted only in designated trail areas to minimize the damage to vegetation by trampling. Portions of the berry picking area or, if appropriate, the entire area can be closed at any time for any length of time if the Refuge Manager determines that wildlife or wildlife habitat is being impacted by the activity.

Justification:
With the above-mentioned consideration, berry picking on Wapack National Wildlife Refuge is compatible with refuge purposes. Berry picking has been a historical and traditional use of the refuge for the many years. No adverse impacts from the activity are known or documented at this refuge.

Berry picking will not materially interfere with or detract from the mission of the National Wildlife Refuge System or the purposes for which the Refuge was established.

Signature: Refuge Manager: _____
(Signature and Date)

Concurrence: Regional Chief: _____
(Signature and Date)

Mandatory 10-year Reevaluation Date: _____
(Signature and Date)

References

Hammitt, W. E. and Cole, D. N. 1998. Wildland Recreation. John Wiley & Sons, New York, 361pp.

Kuss, F. R. 1986. A review of major factors influencing plant responses to recreation impacts. Environmental Management 10:638-650.

Compatibility Determination

Use: Research conducted by non-Service personnel

Refuge Name: Wapack National Wildlife Refuge

Date Established: May 17, 1972

Establishing Authority: Migratory Bird Conservation Act of 1929

Purposes for which Established:

The Wapack National Wildlife Refuge was established "… for use as an inviolate sanctuary, or for any other management purpose, for migratory birds." Migratory Bird Conservation Act 16 U.S.C. 715-715d, 715f – 715r

Mission of the National Wildlife Refuge System:

"The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans." — National Wildlife Refuge System Improvement Act of 1997 (Public Law 105–57; 111 Stat. 1282)

Description of Use:

(a) What is the use? Is the use a priority public use?

The use is research conducted by non-Service personnel. It is not identified as a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd-668ee), as amended by the National Wildlife Refuge System Improvement Act of 1997. This use is not a priority public use of the Refuge System.

(b) Where would the use be conducted?

The location of the research will vary depending on the individual research project that is being conducted. The entire refuge is open and available for scientific research. An individual research project is usually limited to a particular habitat type, plant or wildlife species. On occasion research projects will encompass an assemblage of habitat types, plants or wildlife. The research location will be limited to those areas of the refuge that are absolutely necessary to conduct of the research project.

(c) When would the use be conducted?

The timing of the research will depend entirely on the individual research project's approved design. Scientific research would be allowed to occur on the refuge throughout the year. An individual research project could be short term in design, requiring one or two visits over the course of a few days. Other research projects could be multiple year studies that require daily visits to the study site. The timing of each individual research project will be limited to the minimum required to complete the project.

(d) How would the use be conducted?

The methods of the research will depend entirely on the individual research project that is conducted. The methods of each research project will be scrutinized well before it will be allowed to occur on the refuge. No research project will be allowed to occur if it does not have an approved scientific method, negatively impacts upland birds and wintering raptors, or compromises public health and safety.

(e) Why is this use being proposed?

Research by non-Service personnel is conducted by colleges, universities, Federal, State, and local agencies, non-governmental organizations, and qualified members of the general public. This research would further the understanding of the natural environment and could be applied to management of the refuge's wildlife.

Availability of Resources:
Wapack Refuge is an unstaffed satellite refuge administered by Great Bay NWR. No additional equipment, facilities, or improvements will be necessary to allow research by non-Service personnel. Staff time would be required to review research proposals and oversee permitted projects. We expect that conducting these activities will require less than one-tenth of a work-year for one staff member.

Anticipated Impacts of the Use:
The Service encourages approved research to further the understanding of the natural resources. Research by other than Service personnel adds greatly to the information base for Refuge Managers to make proper decisions. Disturbance to wildlife and vegetation by researchers could occur through observation, mist-netting, banding, and accessing the study area by foot. It is possible that direct mortality could result as a by-product of research activities. Mist-netting for example, can cause stress, especially when birds are captured, banded and weighed. There have been occasional mortalities to these birds, namely when predators such as raccoons and cats reach the netted birds before researchers do.

Minimal impact will occur when research projects which are previously approved are carried out according to the stipulations stated in the Special Use Permit issued for each project. Overall, however, allowing well designed and properly reviewed research to be conducted by non-Service personnel is likely to have very little impact on refuge wildlife populations. If the research project is conducted with professionalism and integrity, potential adverse impacts are likely to be outweighed by the knowledge gained about an entire species, habitat or public use.

Allowing research to be conducted by non-Service personnel would have very little impact on Service interests. If the research project is conducted with professionalism and integrity, potential adverse impacts can far outweigh the data and knowledge gained.

Public Review and Comment:
As part of the comprehensive conservation planning process for Wapack refuge, this compatibility determination will undergo extensive public review, including a comment period of at least 30 days following the release of the Draft CCP/EA.

Determination (check one below):

_____Use is Not Compatible

__X____Use is Compatible with the Following Stipulations

Stipulations Necessary to Ensure Compatibility:
We will require all researchers to submit a detailed research proposal that follows Wapack National Wildlife Refuge study proposal guidelines (see attachment I) and Service Policy (FWS Refuge Manual Chapter 4, Section 6). Researchers must give us at least 45 days to review proposals before the research begins. If the research involves the collection of wildlife, the refuge must be given 60 days to review the proposal. Researchers must obtain all necessary scientific collecting or other permits before starting the research. We will prioritize and approve proposals based on the need, benefit, compatibility, and funding required for the research.

Proposals
We will expect researchers to submit a final report to the refuge on completing their work. For long-term studies, we may also require interim progress reports. We also expect that research will be published in

peer-reviewed publications. All reports, presentations, posters, articles or other publications will acknowledge the Refuge System and the Wapack refuge as partners in the research. All posters will adhere to Service graphics standards. We insert that requirement to ensure that the research community, partners, and the public understand that the research could not have been conducted without the refuge having been established, its operational support, and that of the Refuge System.

We will issue Special Use Permits (SUPs) for all research conducted by non-Service personnel. The SUP will list all conditions necessary to ensure compatibility. The SUPs will also identify a schedule for annual progress reports and the submittal of a final report or scientific paper.

We may ask our regional refuge biologists, other Service divisions, state agencies, or academic experts to review and comment on proposals. We will require all researchers to obtain appropriate state and federal permits.

Justification:
The Service encourages approved research to further our understanding of refuge natural resources and management. Research by non- Service personnel adds greatly to the information base for refuge managers to make proper decisions. Research conducted by non-Service personnel will not materially interfere with or detract from the mission of the National Wildlife Refuge System or the purposes for which the refuge was established.

Signature: Refuge Manager: _____
(Signature and Date)

Concurrence: Regional Chief: _____
(Signature and Date)

Mandatory 10-year Reevaluation Date: _____
(Date)

References

U.S. Fish and Wildlife Service. 1985. Refuge Manual. Washington, D.C.: U.S. Government Printing Office.

Attachment I. Wapack National Wildlife Refuge Study Proposal Guidelines

A study proposal is a justification and description of the work to be done, and includes cost and time requirements. The proposals must be specific enough to serve as blueprints for the investigation. They must spell out in advance systematic plans for the investigation at a level of detail commensurate with the cost and scope of the project and the needs of management. Please submit proposals electronically as a Microsoft® Word® document or hard copy to the refuge manager.

The following list provides a general outline of first-order headings/sections for study proposals.

- Cover Page
- Table of Contents (for longer proposals)
- Abstract
- Statement of Issue
- Literature Summary
- Objectives/Hypotheses
- Study Area
- Methods and Procedures
- Quality Assurance/Quality Control
- Specimen Collections
- Deliverables
- Special Requirements, Concerns, Necessary Permits
- Literature Cited
- Peer Review
- Budget
- Personnel and Qualifications

Cover Page
The cover page must contain the following information.

- Title of Proposal
- Current Date
- Investigator's(s')—name, title, organizational affiliation, address, telephone and fax numbers and e-mail address of all investigators or cooperators.
- Proposed Starting Date
- Estimated Completion Date
- Total Funding Support Requested from the U.S. Fish and Wildlife Service
- Signatures of Principal Investigator(s) and other appropriate institutional officials

Abstract

The abstract should contain a short summary description of the proposed study, including reference to major points in the sections "Statement of Issue," "Objectives," and "Methods and Procedures."

Statement of Issue

Provide a clear precise summary of the problem to be addressed and the need for its solution. This section should include statements of the importance, justification, relevance, timeliness, generality, and contribution of the study. Describe how any products will be used, including any anticipated commercial use. What is the estimated probability of success of accomplishing the objective(s) within the proposed timeframe?

Literature Summary

This section should include a thorough but concise literature review of current and past research that pertains to the proposed research, especially any pertinent research conducted at the Wapack National Wildlife Refuge. A discussion of relevant legislation, policies, and refuge planning and management history, goals, and objectives should also be included.

Objectives/Hypotheses

A very specific indication of the proposed outcomes of the project should be stated as objectives or hypotheses to be tested. Project objectives should be measurable. Provide a brief summary of what information will be provided at the end of the study and how it will be used in relation to the problem. These statements should flow logically from the statement of issue and directly address the management problem.

Establish data quality objectives in terms of precision, accuracy, representativeness, completeness, and comparability as a means of describing how good the data need to be to meet the project's objectives.

Study Area

Provide a detailed description of the geographic area(s) to be studied and include a clear map delineating the proposed study area(s) and showing specific locations where work will occur.

Methods and Procedures

This section should describe as precisely as possible, how the objectives will be met or how the hypotheses will be tested. Include detailed descriptions and justifications of the field and laboratory methodology, protocols, and instrumentation. Explain how each variable to be measured directly addresses the research objective/ hypothesis. Describe the experimental design, population, sample size, and sampling approach (including procedures for sub-sampling). Summarize the statistical and other data analysis procedures to be used. List the response variables and tentative independent variables or covariates. Describe the experimental unit(s) for statistical analysis. Also include a detailed project time schedule that includes start, fieldwork, analysis, reporting, and completion dates.

Quality Assurance/Quality Control

Adequate quality assurance/quality control (QA/QC) procedures help insure that data and results are credible and not an artifact of sampling or recording errors; of known quality; able to stand up to external scientific scrutiny; and accompanied by detailed method documentation. Describe the procedures to be used to insure that data meet defined standards of quality and program requirements, errors are controlled in the field, laboratory, and office, and data are properly handled, documented, and archived. Describe the various steps (e.g. personnel training, calibration of equipment, data verification and validation) that will be used to identify and eliminate errors introduced during data collection (including observer bias), handling, and computer entry. Identify the percentage of data that will be checked at each step.

Specimen Collections

Clearly describe the kind (species), numbers, sizes, and locations of animals, plants, rocks, minerals, or other natural objects to be sampled, captured, or collected. Identify the reasons for collecting, the intended use of all the specimens to be collected, and the proposed disposition of collected specimens. For those specimens to be retained permanently as voucher specimens, identify the parties responsible for cataloging, preservation, and storage and the proposed repository.

Deliverables

The proposal must indicate the number and specific format of hard and/or electronic media copies to be submitted for each deliverable. The number and format will reflect the needs of the refuge and the refuge manager. Indicate how many months after the project is initiated (or the actual anticipated date) that each deliverable will be submitted. Deliverables are to be submitted or presented to the refuge manager.

Deliverables that are required are as follows.

Reports and Publications

Describe what reports will be prepared and the timing of reports. Types of reports required in fulfillment of natural and social science study contracts or agreements include:

1). Progress report(s) (usually quarterly, semiannually, or annually): (may be required)
2). Draft final and final report(s): (always required).

A final report must be submitted in addition to a thesis or dissertation (if applicable) and all other identified deliverables. Final and draft final reports should follow refuge guidelines (attachment I).

In addition, investigators are encouraged to publish the findings of their investigations in refereed professional, scientific publications and present findings at conferences and symposia. Investigator publications will adhere to Service design standards. The refuge manager appreciates opportunities to review manuscripts in advance of their publication.

Data Files

Provide descriptions of any spatial (GIS) and non-spatial data files that will be generated and submitted as part of the research. Non-spatial data must be entered onto Windows CD-ROMs in Access or Excel. Spatial data, which includes GPS-generated files, must be in a format compatible with the refuge's GIS system (ArcGIS 8 or 9, Arcview 3.3, or e00 format). All GIS data must be in UTM 19, NAD 83. A condition of the permit will be that the Service has access to and may utilize in future mapping and management all GIS information generated.

Metadata

For all non-spatial and spatial data sets or information products, documentation of information (metadata) describing the extent of data coverage and scale, the history of where, when, and why the data were collected, who collected the data, the methods used to collect, process, or modify/ transform the data, and a complete data dictionary must also be provided as final deliverables. Spatial metadata must conform to U.S. Fish and Wildlife Service (FGDC) metadata standards.

Oral Presentations

Three types of oral briefings should be included: pre-study, annual, and closeout. These briefings will be presented to refuge staff and other appropriate individuals and cooperators. In addition, investigators should conduct periodic informal briefings with refuge staff throughout the study whenever an opportunity arises. During each refuge visit, researchers should provide verbal updates on project progress. Frequent dialogue between researchers and refuge staff is an essential element of a successful research project.

Specimens and Associated Project Documentation

A report on collection activities, specimen disposition, and the data derived from collections, must be submitted to the refuge following refuge guidelines.

Other:
Researchers must provide the refuge manager with all of the following.

1) Copies of field notes/ notebooks/ datasheets
2) Copies of raw data (in digital format), including GIS data, as well as analyzed data
3) Copies of all photos, slides (digital photos preferred), videos, films
4) Copies of any reports, theses, dissertations, publications or other material (such as news articles) resulting from studies conducted on refuge.
5) Detailed protocols used in study
6) Aerial photographs
7) Maps/GIS
8) Interpretive brochures and exhibits
9) Training sessions (where appropriate)
10) Survey forms
11) Value-added software, software developed, models

Additional deliverables may be required of specific studies.

Special Requirements, Permits, and Concerns

Provide information on the following topics where applicable. Attach copies of any supporting documentation that will facilitate processing of your application.

Refuge Assistance

Describe any refuge assistance needed to complete the proposed study, such as use of equipment or facilities or assistance from refuge staff. It is important that all equipment, facilities, services, and logistical assistance expected to be provided by the Fish and Wildlife Service be specifically identified in this section so all parties are in clear agreement before the study begins.

Ground Disturbance

Describe the type, location, area, depth, number, and distribution of expected ground-disturbing activities, such as soil pits, cores, or stakes. Describe plans for site restoration of significantly affected areas.

Proposals that entail ground disturbance may require an archeological survey and special clearance prior to approval of the study. You can help reduce the extra time that may be required to process such a proposal by including identification of each ground disturbance area on a USGS 7.5-minute topographic map.

Site Marking and/or Animal Marking

Identify the type, amount, color, size, and placement of any flagging, tags, or other markers needed for site or individual resource (e.g. trees) identification and location. Identify the length of time it is needed and who will be responsible for removing it. Identify the type, color, placement of any tags placed on animals (see special use permit for stipulations on marking and handling of animals)

Access to Study Sites

Describe the proposed method and frequency of travel to and within the study site(s). Explain any need to enter restricted areas. Describe the duration, location, and number of participants, and approximate dates of site visits.

Use of Mechanized and Other Equipment

Describe any vehicles, boats, field equipment, markers, or supply caches by type, number, and location. You should explain the need to use these materials and if or how long they are to be left in the field.

Safety

Describe any known potentially hazardous activities, such as electro-fishing, scuba diving, whitewater boating, aircraft use, wilderness travel, wildlife capture or handling, wildlife or immobilization.

Chemical Use

Identify chemicals and hazardous materials that you propose using within the refuge.
Indicate the purpose, method of application, and amount to be used. Describe plans for storage, transfer, and disposal of these materials and describe steps to remediate accidental releases into the environment. Attach copies of Material Safety Data Sheets.

Animal Welfare

If the study involves vertebrate animals, describe your protocol for any capture, holding, marking, tagging, tissue sampling, or other handling of these animals (including the training and qualifications of personnel relevant to animal handling and care). If your institutional animal welfare committee has reviewed your proposal, please include a photocopy of their recommendations. Describe alternatives considered, and outline procedures to be used to alleviate pain or distress. Include contingency plans to be implemented in the event of accidental injury to or death of the animal. Include state and federal permits. Where appropriate, coordinate with and inform state natural resource agencies.

Literature Cited

List all reports and publications cited in the proposal.

Peer Review

Provide the names, titles, addresses, and telephone numbers of individuals with subject-area expertise who have reviewed the research proposal. If the reviewers are associated with the investigator's research institution or if the proposal was not reviewed, please provide the names, titles, addresses, and telephone numbers of 3 to 5 potential subject-area reviewers who are not associated with the investigator's institution. These individuals will be asked to provide reviews of the proposal, progress reports, and the draft final report.

Budget

The budget must reflect both funding and assistance that will be requested from the U.S. Fish and Wildlife Service and the cooperator's contributions on an identified periodic (usually annual) basis.

Personnel Costs

Identify salary charges for principal investigator(s), research assistant(s), technician(s), clerical support, and others. Indicate period of involvement (hours or months) and pay rate charged for services. Be sure to include adequate time for data analysis and report writing and editing.

Fringe Benefits

Itemize fringe benefit rates and costs.

Travel

Provide separate estimates for fieldwork and meetings. Indicate number of trips, destinations, estimated miles of travel, mileage rate, air fares, days on travel, and daily lodging and meals charges. Vehicle mileage rate cannot exceed standard government mileage rates if federal funds are to be used. Charges for lodging and meals are not to exceed the maximum daily rates set for the locality by the Federal Government (contact Wapack NWR for appropriate rates).

Equipment

Itemize all equipment to be purchased or rented and provide a brief justification for each item costing more than $1,000. Be sure to include any computer-related costs. For proposals funded under US Fish and Wildlife Service agreement or contract, the refuge reserves the right to transfer the title of purchased equipment with unit cost of $1,000 or more to the Federal Government following completion of the study. These items should be included as deliverables.

Supplies and Materials

Purchases and rentals under $1,000 should be itemized as much as is reasonable.

Subcontract or Consultant Charges

All such work must be supported by a subcontractor's proposal also in accordance with these guidelines.

Specimen Collections

Identify funding requirements for the cataloging, preservation, storage, and analyses of any collected specimens that will be permanently retained.

Printing and Copying

Include costs for preparing and printing the required number of copies of progress reports, the draft final report, and the final report. In general, a minimum of two (2) copies of progress reports (usually due quarterly, semiannually, or as specified in agreement), the draft final report, and the final report are required.

Indirect Charges

Identify the indirect cost (overhead) rate and charges and the budget items to which the rate is applicable.

Cooperator's Contributions

Show any contributing share of direct or indirect costs, facilities, and equipment by the cooperating research institution.

Outside Funding

List any outside funding sources and amounts.

Personnel and Qualifications

List the personnel who will work on the project and indicate their qualifications, experience, and pertinent publications. Identify the responsibilities of each individual and the amount of time each will devote. A full vita or resume for each principal investigator and any consultants should be included here.

Interim Final Report Guidelines

Draft final and final reports should follow Journal of Wildlife Management format, and should include the following sections.

- Title Page
- Abstract
- Introduction/ Problem statement
- Study Area
- Methods (including statistical analyses)
- Results
- Discussion
- Management Implications
- Management Recommendations
- Literature Cited

Appendix B

Cliffs on the refuge
Nancy McGarigal/USFWS

Wilderness Review

- Documentation of Wilderness Inventory
- Inventory Criteria
- Inventory Conclusions

Documentation of Wilderness Inventory

The wilderness review process consists of three phases: inventory, study, and recommendation. The purposes of the wilderness inventory phase are

- to identify areas of System lands and waters with wilderness character and establish those areas as Wilderness Study Areas (WSAs);
- to identify areas of Refuge System lands and waters that do not qualify as WSAs; and
- to document the inventory findings for the planning record.

Inventory Criteria

WSAs are areas that meet the criteria in the Wilderness Act. Section 2(c) provides the following definition.

A wilderness, in contrast with those areas where man and his works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions, and which generally

1) appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable;

2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation;

3) has at least 5,000 acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and

4) may also contain ecological, geological or other features of scientific, educational, scenic, or historical value.

Section 4(c) of the act prohibits permanent roads in wilderness, so WSAs also must be roadless. For the purposes of the wilderness inventory, a "roadless area" is defined as "A reasonably compact area of undeveloped Federal land that possesses the general characteristics of a wilderness and within which there is no improved road that is suitable for public travel by means of four-wheeled, motorized vehicles intended primarily for highway use. A route maintained solely by the passage of vehicles does not constitute a road."

In summary, the inventory to identify WSAs is based on an assessment of the following criteria: absence of roads (roadless); size; naturalness; and either outstanding opportunities for solitude or primitive and unconfined recreation.

We initially assessed the Wapack refuge based on the size criteria. The size criterion is satisfied for areas under Service jurisdiction in the following situations:

- An area with over 5,000 contiguous acres (2,000 ha). State and private land inholdings are not included in calculating acreage.
- A roadless island of any size. A roadless island is defined as a roadless area that is surrounded by permanent waters or that is markedly distinguished from surrounding lands by topographical or ecological features such as precipices, canyons, thickets, or swamps.

- An area of less than 5,000 contiguous acres that is of sufficient size as to make practicable its preservation and use in an unimpaired condition, and of a size suitable for wilderness management.

- An area of less than 5,000 contiguous acres that is contiguous with a designated wilderness, recommended wilderness, or area of other Federal lands under wilderness review by the U.S. Forest Service (USFS), Bureau of Land Management (BLM), or National Park Service (NPS).

Inventory Conclusions

The 1,625-acre Wapack refuge does not meet the size criteria for a WSA. It is less than 5,000 acres and its size is not sufficient to preserve natural ecological processes. It lies within a landscape matrix of old farm and managed forests and its character is influenced by that land use. We will reevaluate this determination in 15 years with the revision of this CCP, or sooner if significant new information warrants a reevaluation. In summary, at this time additional study is not warranted.

Appendix C

Ovenbird
S. Maslowski/USFWS

Species Known or Suspected on the Refuge, Including Species of Conservation Concern

- Birds
- Mammals
- Reptiles and Amphibians

Table C.1. Bird Species Known or Suspected on the Refuge, Including Species of Conservation Concern

Species Name	Scientific Name	Observed on Refuge	Federal T & E Species[1]	New Hampshire T & E Species[2]	NH Wildlife Action Plan[3]	BCR 14: Atlantic Northern Forests	PIF[4]
American crow	*Corvus brachyrhynchos*	X					
American goldfinch	*Carduelis tristis*	X					
American redstart	*Setophaga ruticilla*	X					
American robin	*Turdus migratorius*	X					
American woodcock	*Scolopax minor*				C	high priority	IA
Bay-breasted warbler	*Dendroica castanea*	X			C	high priority	IB
Bicknell's thrush	*Catharus bicknelli*				RC, SC	high priority	IA
Black and white warbler	*Mniotilta varia*	X					
Black-backed woodpecker	*Picoides arcticus*					moderate priority	IIC
Black-billed cuckoo	*Coccyzus erythropthalmus*					moderate priority	
Black-capped chickadee	*Poecile atricapilla*	X					
Blackburnian warbler	*Dendroica fusca*	X				moderate priority	IA
Blackpoll warbler	*Dendroica striata*	X				moderate priority	V
Black-throated blue warbler	*Dendroica caerulescens*	X				high priority	IA
Black-throated green warbler	*Dendroica virens*	X				moderate priority	
Blue-headed vireo	*Vireo solitarius*	X					
Blue jay	*Cyanocitta cristata*	X					
Brown creeper	*Certhia american*	X				moderate priority	
Canada warbler	*Wilsonia canadensis*	X			RC	high priority	IA
Cape may warbler	*Dendroica tigrina*					high priority	
Cedar waxwing	*Bombycilla cedrorum*	X					
Chestnut-sided warbler	*Dendroica pensylvanica*					high priority	IA
Chimney swift	*Chaetura pelagica*					high priority	IIC
Chipping sparrow	*Spizella passerina*	X					
Common nighthawk	*Chordeiles minor*			T			V
Common raven	*Corvus corax*	X					
Cooper's hawk	*Accipiter cooperii*			T			V
Dark-eyed junco	*Junco hyemalis*	X					

Species Name	Scientific Name	Observed on Refuge	Federal T & E Species[1]	New Hampshire T & E Species[2]	NH Wildlife Action Plan[3]	BCR 14: Atlantic Northern Forests	PIF[4]
Downy woodpecker	*Picoides pubescens*	X					
Eastern phoebe	*Sayornis phoebe*	X					
Eastern screech owl	*Otus asio*						V
Eastern towhee	*Pipilo erythrophthalmus*				C		
Eastern wood-pewee	*Contopus virens*					high priority	IIA
Evening grosbeak	*Coccothraustes vespertinus*	X					
Gray catbird	*Dumetella carolinensis*						IIA
Gray jay	*Perisoreus canadensis*					moderate priority	
Golden-crowned kinglet	*Regulus satrapa*	X					
Hairy woodpecker	*Picoides villosus*	X					
Hermit thrush	*Catharus guttatus*	X					
Least flycatcher	*Empidonax minimus*	X					IIA
Magnolia warbler	*Dendroica magnolia*	X					
Mourning dove	*Zenaida macroura*	X					
Myrtle warbler	*Dendroica coronata*	X					
Nashville warbler	*Vermivora ruficapilla*	X					
Northern flicker	*Colaptes auratus*					moderate priority	
Northern goshawk	*Accipiter gentilis*				C	moderate priority	V
Northern harrier	*Circus cyaneus*			E	RC	moderate priority	V
Northern parula	*Parula americana*					moderate priority	
Northern raven	*Corvus corax*	X					
Northern saw-whet owl	*Aegolius acadicus*						V
Olive-sided flycatcher	*Contopus cooperi*					high priority	V
Ovenbird	*Seiurus aurocapillus*	X				moderate priority	IIB
Peregrine falcon	*Falco peregrinus*			E		moderate priority	
Philadelphia vireo	*Vireo philadelphicus*	X					
Pileated woodpecker	*Dryocopus pileatus*	X					
Pine grosbeak	*Pinicola enucleator*					moderate priority	

Species Name	Scientific Name	Observed on Refuge	Federal T & E Species[1]	New Hampshire T & E Species[2]	NH Wildlife Action Plan[3]	BCR 14: Atlantic Northern Forests	PIF[4]
Purple finch	*Carpodacus purpureus*	X			C		IIA
Red-breasted nuthatch	*Sitta canadensis*	X					
Red-eyed vireo	*Vireo olivaceus*	X					
Red-headed woodpecker	*Melanerpes erythrocephalus*						III
Red-shouldered hawk	*Buteo lineatus*				SC		
Red-tailed hawk	*Buteo jamaicensis*	X					
Rose-breasted grosbeak	*Pheucticus ludovicianus*	X				moderate priority	IIA
Ruffed grouse	*Bonasa umbellus*	X			C	moderate priority	
Rufous-sided towhee	*Pipilo erythrophthalmus*	X					
Scarlet tanager	*Piranga olivacea*	X					IIA
Sharp-shinned hawk	*Accipiter striatus*	X					V
Short-eared owl	*Asio flammeus*					moderate priority	
Slate-colored junco	*Junco hyemalis*	X					
Three-toed woodpecker	*Picoides tridactylus*			T			
Tufted titmouse	*Baeolophus bicolor*	X					
Turkey	*Meleagris gallopavo*				C		
Veery	*Catharus fuscescens*	X			C	high priority	IIB
Whip-poor will	*Caprimulgus vociferus*				RC, SC	moderate priority	IIC
White-breasted nuthatch	*Sitta carolinensis*	X					
White throated sparrow	*Zonotrichia albicollis*	X					
Winter wren	*Troglodytes troglodytes*	X					
Wood thrush	*Hylocichla mustelina*				C	high priority	IA
Yellow-bellied flycatcher	*Empidonax flaviventris*					moderate priority	
Yellow-bellied sapsucker	*Sphyrapicus varius*	X				high priority	
Yellow-rumped warbler	*Dendroica coronata*	X					

[1] Federal Threaten and Endangered Species
T = threatened, E = endangered

[2] New Hampshire Threatened and Endangered Species
T = state threatened, E = state endangered

[3] New Hampshire Wildlife Action Plan
C = species of concern, RC = species of regional concern, SC = species of special concern

[4] Partners in Flight Landbird Conservation Plan - Northern New England (Area 27)
IA = high continental priority - high regional responsibility
1B = high continental priority - low regional responsibility
IIA = high regional concern
IIB = high regional responsibility
IIC = high regional threats
III = US national watch list
IV = additionally federally listed
V = additionally state listed

Table C. 2. Mammal Species Known or Suspected* on the Refuge, Including Species of Conservation Concern

Species Name	Scientific Name	Federal T & E Species[1]	New Hampshire T & E Species[2]	NH Wildlife Action Plan[3]
American marten	*Martes americana*		T	
Black bear	*Ursus americanus*			C
Bobcat	*Lynx rufus*			SC
Coyote	*Canis latrans*			
Deer mouse	*Peromyscus maniculatus*			
Eastern chipmunk	*Tamias striatus*			
Eastern gray squirrel	*Sciurus carolinensis*			
Eastern small-footed bat	*Myotis leibii*		E	RC
Gray fox	*Urocyon conereoargenteus*			
Hairy-tailed mole	*Parascalops breweri*			
Moose	*Alces alces*			C
Porcupine	*Erethizon dorsatum*			
Red fox	*Vulpes vulpes*			
Red squirrel	*Sciurus vulgaris*			
Snowshoe hare	*Lepus americanus*			
Star-nosed mole	*Condylura cristata*			
Shrews	*Sorex spp., Blarina sp.*			
White-footed mouse	*Peromyscus leucopus*			
White-tailed deer	*Odocoileus virginianus*			C
Woodland vole	*Microtus pinetorum*			

* At this time, no surveys have been completed for mammal species

[1] Federal Threaten and Endangered Species
T = threatened, E = endangered

[2] New Hampshire Threatened and Endangered Species
T = state threatened, E = state endangered

[3] New Hampshire Wildlife Action Plan
C = species of concern, RC = species of regional concern, SC = species of special concern

Table C. 3. Reptile and Amphibian Species Known or Suspected* on the Refuge, Including Species of Conservation Concern

Species Name	Scientific Name	Federal T & E Species[1]	New Hampshire T & E Species[2]	NH Wildlife Action Plan[3]
REPTILES				
Eastern garter snake	*Thamnophis sirtalis*			
Eastern milk snake	*Lampropeltis triangulum*			
Eastern painted turtle	*Chrysemys picta*			
Eastern ribbon snake	*Thamnophis sauritus*			RC
Northern red-bellied snake	*Storeria dekayi*			
Smooth green snake	*Opheodrys vernalis*			SC
Spotted turtle	*Clemmy guttata*			RC, SC
Wood turtle	*Clemmys insculpta*			RC, SC
AMPHIBIANS				
American toad	*Bufo americanus*			
Bull frog	*Lithobates catesbeianus,*			
Marbled salamander	*Ambystoma opacum*		E	
Northern dusky salamander	*Desmognathus fuscus*			
Northern leopard frog	*Rana pipiens*			RC, SC
Northern slimy salamander	*Plethodon glutinosus*			
Northern spring salamander	*Gyrinophilus porphyriticus*			
Northern two-lined salamander	*Eurycea bislineata*			
Pickerel frog	*Rana palustris*			
Red-spotted newt	*Notophthalmus viridescens*			
Spotted salamander	*Ambystoma maculatum*			
Spring peeper	*Pseudacris crucifer*			

* At this time, no surveys have been completed for reptile and amphibian species

[1] Federal Threaten and Endangered Species
T = threatened, E = endangered

[2] New Hampshire Threatened and Endangered Species
T = state threatened, E = state endangered

[3] New Hampshire Wildlife Action Plan
C = species of concern, RC = species of regional concern, SC = species of special concern

Appendix D

Section of Ted's Trail
Lelaina Marin/USFWS

Service Asset Maintenance Management System (SAMMS)

Service Asset Maintenance Management System

Existing Assets in SAMMS

Asset #	*Existing Assets**
10024379	Boundary signs indicating the boundary of Wapack refuge
10024381	Wapack Trail
10058990	Cliff Trail
10058988	Ted's Trail
10058989	Carolyn's Trail

**Maintenance of these assets is determined and funded by refuge manager as needed.*

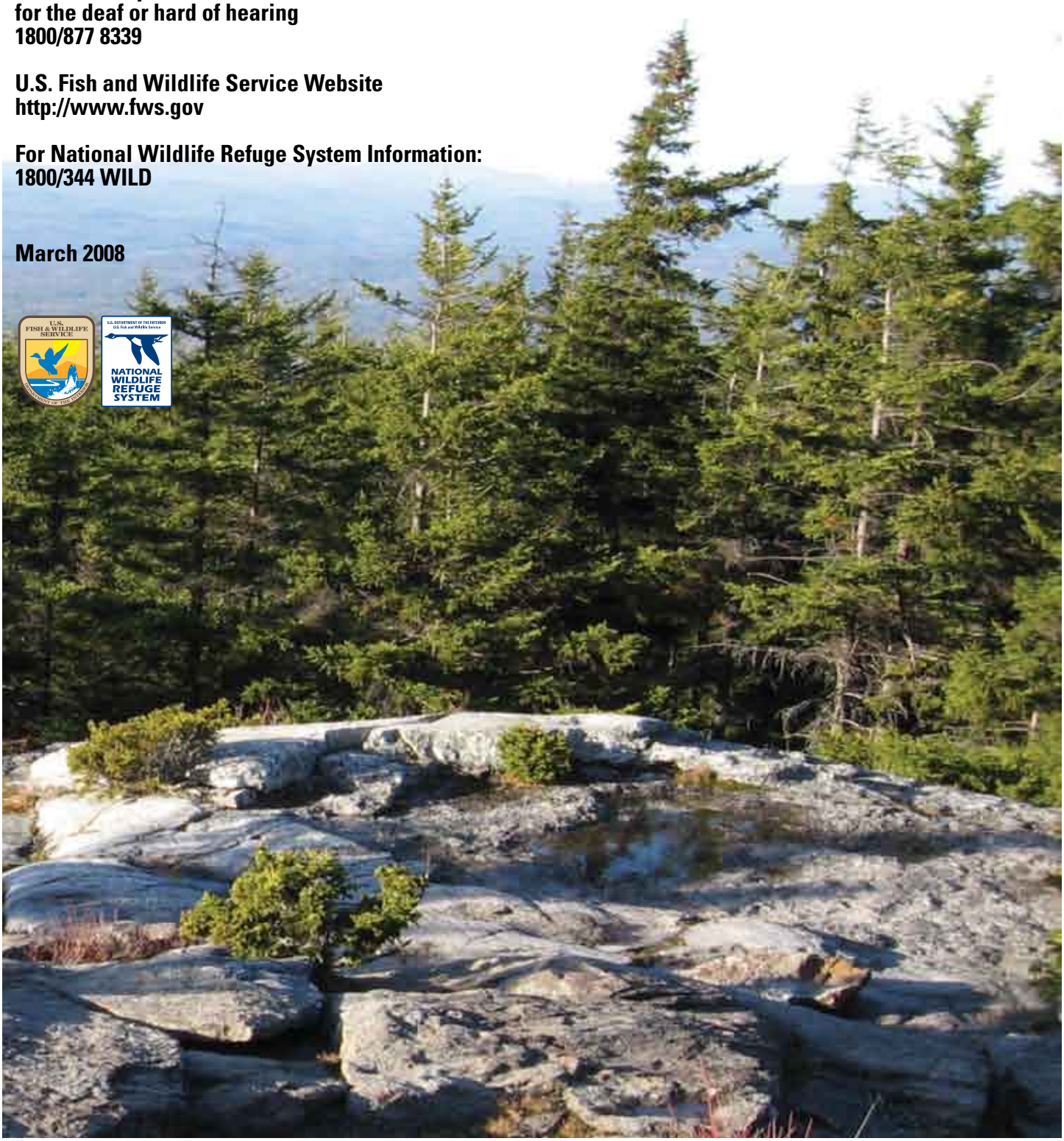
Proposed Deferred Maintenance Projects to be added to SAMMS

Project	*Estimated Cost ($)*
Install information panel at Wapack trailhead on refuge	5,000
Install "Welcome to Your National Wildlife Refuge" signs at refuge entrances on Ted's and Carolyn's trails	2,000

Wapack National Wildlife Refuge
c/o Parker River National Wildlife Refuge
6 Plum Island Turnpike
Newburyport, MA 01950
Phone: 978/465-5753
Fax: 978/465-2807
Email: fw5rw_prnwr@fws.gov
http://www.fws.gov/Refuges/profiles/index.cfm?id=53572

Federal Relay Service
for the deaf or hard of hearing
1800/877 8339

U.S. Fish and Wildlife Service Website
http://www.fws.gov

For National Wildlife Refuge System Information:
1800/344 WILD

March 2008