

## FINDING OF NO SIGNIFICANT IMPACT

### **Integrated Natural Resources Management Plan at New Boston Air Force Station, New Hampshire**

The U.S. Air Force (USAF) proposes to implement an Integrated Natural Resources Management Plan (INRMP) at New Boston Air Force Station (NBAFS) in Hillsborough County, New Hampshire. As directed in Air Force Instruction (AFI) 32-7064, *Integrated Natural Resources Management*, the INRMP must be updated at least every five years. The 2006 INRMP is the five-year update to the existing INRMP. The INRMP identifies goals, objectives, and projects for natural resources management and focuses on seven topical areas: (1) threatened, endangered, and rare species; (2) wetlands; (3) rare natural communities; (4) forest management; (5) invasive nonnative plant species control; (6) outdoor recreation; and unexploded ordnance (UXO) remediation.

Potential impacts to the natural and human environment associated with implementation of the NBAFS INRMP are assessed in the accompanying Environmental Assessment (EA), entitled *Environmental Assessment for the Integrated Natural Resources Management Plan at New Boston Air Force Station, New Hampshire*. The EA was prepared in accordance with specific tasks and procedures of the USAF Environmental Impact Analysis Process (32 CFR Part 989), as it applies to the National Environmental Policy Act of 1969 (Public Law 91-190, 42 *United States Code* [USC] Sections 4321-4347). The EA evaluates the environmental consequences of the proposed action (implementation of the proposed INRMP), the existing INRMP alternative (continued implementation of the existing INRMP without modification) and the no-action alternative (NBAFS operations without an INRMP). The assessment evaluates the potential for impacts of INRMP implementation on air quality, noise, topography, geology, soils, water resources, ecological resources, cultural resources, land use, recreation, visual resources, socioeconomics, and health and safety. The general public was given a 30-day period (June 28 to July 27, 2006) to comment on the proposed action and the EA. All comments received from the public have been addressed in the final EA.

The proposed action (implementation of the proposed INRMP) is preferred over the existing INRMP and no-action alternatives. The proposed action would result primarily in small, localized, short-term adverse impacts, but overall benefits to the environment. Anticipated impacts include:

- Localized minor short-term adverse air-quality (fugitive dust, engine exhaust, and smoke) and noise impacts resulting from prescribed burning, timber harvests, and recreation facility construction projects. No violations are expected of Federal and State ambient air quality standards for criteria pollutants.
- Localized minor short-term adverse impacts to soils (erosion, compaction) resulting from prescribed burning, timber harvests, and recreation facility construction projects.
- Localized minor short-term adverse impacts to surface water quality (increases in turbidity, sedimentation, peak flow) resulting from runoff of areas of prescribed burning, timber harvests, and recreation facility construction projects.

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## 14. ABSTRACT

The U.S. Air Force (USAF) proposes to implement a revised Integrated Natural Resources Management Plan (INRMP) at New Boston Air Force Station (NBAFS), New Hampshire. As directed five-year update to the existing INRMP. The INRMP identifies goals, objectives, and projects for natural resources management and focuses on seven topical areas: (1) threatened, endangered and rare species; (2) wetlands; (3) rare natural communities; (4) forest management; (5) invasive non-native plant species control; (6) outdoor recreation; and (7) unexploded ordnance (UXO) remediation. The proposed action would result primarily in small, localized, short-term adverse impacts, but overall long-term benefits, to the environment. Anticipated impacts include &#61623; Localized minor short-term adverse air-quality (fugitive dust, engine exhaust, and smoke) and noise impacts resulting from prescribed burning, timber harvests, and recreation facility construction projects. No violations are expected of Federal and State ambient air quality standards for criteria pollutants. &#61623; Localized minor short-term adverse impacts to soils (erosion, compaction) resulting from prescribed burning, timber harvests, and recreation facility construction projects. &#61623; Localized minor short-term adverse impacts to surface water quality (increases in turbidity, sedimentation, peak flow) resulting from runoff of areas of prescribed burning timber harvests, and recreation facility construction projects. &#61623; Minor improvements in water quality of restored areas resulting from wetland restoration activities and invasive species control. &#61623; Minor short-term adverse impacts to ecological resources (vegetation destruction wildlife disturbance), but overall net long-term benefit, resulting from prescribed burning, timber harvest, recreation facility construction, wetland restoration, invasive species control, and projects involving capture, handling, and radiotelemetry of animals. &#61623; Overall benefit to ecological resources resulting from data gathering and development of management plans, because increased knowledge would be used to improve conditions on the station and avoid impacts. &#61623; Recreational benefits resulting from construction of a new interpretive trail, construction of a handicapped-accessible boat ramp, data gathering, trout stocking, and recreation planning projects. &#61623; Localized minor short-term adverse impacts to visual resources resulting from prescribed burning and timber harvests. &#61623; Overall benefit to land use resulting from reduced potential for conflicts between mission-related activities and natural resources. Two alternatives were considered?continued implementation of the existing INRMP (existing INRMP alternative) and the no-action alternative (NBAFS operations without an

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- Minor improvements in water quality of restored areas resulting from wetland restoration activities and invasive species control.
- Minor short-term adverse impacts to ecological resources (vegetation destruction, wildlife disturbance), but overall net long-term benefit, resulting from prescribed burning, timber harvest, recreation facility construction, wetland restoration, invasive species control, and projects involving capture, handling, and radiotelemetry of animals.
- Overall benefit to ecological resources resulting from data gathering and development of management plans because increased knowledge would be used to improve conditions on the station and avoid impacts.
- Recreational benefits resulting from construction of a new interpretive trail, construction of a handicapped-accessible boat ramp, data gathering, trout stocking, and recreation planning projects.
- Localized minor short-term adverse impacts to visual resources resulting from prescribed burning and timber harvests.
- Overall benefit to land use resulting from reduced potential for conflicts between mission-related activities and natural resources.

Several clearcut and construction projects are included within the proposed action and were assessed in the EA, but some aspects of the projects have not been finalized (e.g., location, project design). For these projects, project-specific assessments and consultations would be performed before the projects were implemented.

On the basis of the assessments detailed in the EA, it has been determined that the proposed action would not have a significant effect on the human environment. Therefore, an Environmental Impact Statement will not be required nor prepared for implementation of the INRMP at NBAFS.

22 Sep 06  
Date

  
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 U.S. Air Force  
 New Boston Air Force Station, New Hampshire

**ENVIRONMENTAL ASSESSMENT FOR THE  
INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN AT  
NEW BOSTON AIR FORCE STATION, NEW HAMPSHIRE**

**prepared by  
Environmental Science Division  
Argonne National Laboratory  
Argonne, Illinois**

**for**

**23 SOPS/MAN  
U.S. Department of the Air Force  
New Boston Air Force Station  
New Hampshire**

**September 2006**



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## NOTATION

The following is a list of the acronyms, initialisms, and abbreviations (including units of measure) used in this document.

### ACRONYMS, INITIALISMS, AND ABBREVIATIONS

|                   |                                                          |
|-------------------|----------------------------------------------------------|
| AFI               | Air Force Instruction                                    |
| AFSCN             | Air Force Satellite Control Network                      |
| CFR               | <i>Code of Federal Regulations</i>                       |
| COE               | U.S. Army Corps of Engineers                             |
| DoD               | Department of Defense                                    |
| DoDI              | Department of Defense Instruction                        |
| EA                | Environmental Assessment                                 |
| EPA               | U.S. Environmental Protection Agency                     |
| FONSI             | Finding of No Significant Impact                         |
| ICRMP             | Integrated Cultural Resources Management Plan            |
| INRMP             | Integrated Natural Resources Management Plan             |
| MSL               | mean sea level                                           |
| NAAQS             | National Ambient Air Quality Standards                   |
| NBAFS             | New Boston Air Force Station                             |
| NEPA              | National Environmental Policy Act                        |
| NHDES             | New Hampshire Department of Environmental Services       |
| NHDFG             | New Hampshire Department of Fish and Game                |
| NHNHB             | New Hampshire Natural Heritage Bureau                    |
| NRHP              | <i>National Register of Historic Places</i>              |
| OSHA              | Occupational Safety and Health Administration            |
| PM <sub>10</sub>  | particulate matter, less than or equal to 10 µm in size  |
| PM <sub>2.5</sub> | particulate matter, less than or equal to 2.5 µm in size |
| SOPS              | Space Operations Squadron                                |
| USAF              | U.S. Air Force                                           |
| USC               | <i>United States Code</i>                                |
| UXO               | unexploded ordnance                                      |

### UNITS OF MEASURE

|     |                                       |                 |                                           |
|-----|---------------------------------------|-----------------|-------------------------------------------|
| ac  | acre(s)                               | km              | kilometer(s)                              |
| cm  | centimeter(s)                         | L <sub>dn</sub> | day-night weighted equivalent sound level |
| dB  | decibel(s)                            | L <sub>eq</sub> | equivalent steady sound level             |
| dBA | unit of weighted sound-pressure level | m               | meter(s)                                  |
| ft  | foot (feet)                           | mi              | mile(s)                                   |
| gal | gallon                                | MT              | metric ton(s)                             |
| ha  | hectare(s)                            | µm              | micrometer(s)                             |
| in. | inch(es)                              | ton             | ton                                       |



**ENVIRONMENTAL ASSESSMENT FOR THE  
INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN AT  
NEW BOSTON AIR FORCE STATION, NEW HAMPSHIRE**

prepared by

Environmental Science Division  
Argonne National Laboratory  
Argonne, Illinois

**ABSTRACT**

The U.S. Air Force (USAF) proposes to implement a revised Integrated Natural Resources Management Plan (INRMP) at New Boston Air Force Station (NBAFS), New Hampshire. As directed in Air Force Instruction (AFI) 32-7064, *Integrated Natural Resources Management*, the INRMP must be updated at least every five years. The 2006 INRMP is the five-year update to the existing INRMP. The INRMP identifies goals, objectives, and projects for natural resources management and focuses on seven topical areas: (1) threatened, endangered, and rare species; (2) wetlands; (3) rare natural communities; (4) forest management; (5) invasive non-native plant species control; (6) outdoor recreation; and (7) unexploded ordnance (UXO) remediation. The proposed action would result primarily in small, localized, short-term adverse impacts, but overall long-term benefits, to the environment. Anticipated impacts include:

- Localized minor short-term adverse air-quality (fugitive dust, engine exhaust, and smoke) and noise impacts resulting from prescribed burning, timber harvests, and recreation facility construction projects. No violations are expected of Federal and State ambient air quality standards for criteria pollutants.
- Localized minor short-term adverse impacts to soils (erosion, compaction) resulting from prescribed burning, timber harvests, and recreation facility construction projects.
- Localized minor short-term adverse impacts to surface water quality (increases in turbidity, sedimentation, peak flow) resulting from runoff of areas of prescribed burning, timber harvests, and recreation facility construction projects.
- Minor improvements in water quality of restored areas resulting from wetland restoration activities and invasive species control.
- Minor short-term adverse impacts to ecological resources (vegetation destruction, wildlife disturbance), but overall net long-term benefit, resulting from prescribed burning, timber harvest, recreation facility construction, wetland restoration, invasive species control, and projects involving capture, handling, and radiotelemetry of animals.
- Overall benefit to ecological resources resulting from data gathering and development of management plans, because increased knowledge would be used to improve conditions on the station and avoid impacts.

- Recreational benefits resulting from construction of a new interpretive trail, construction of a handicapped-accessible boat ramp, data gathering, trout stocking, and recreation planning projects.
- Localized minor short-term adverse impacts to visual resources resulting from prescribed burning and timber harvests.
- Overall benefit to land use resulting from reduced potential for conflicts between mission-related activities and natural resources.

Two alternatives were considered—continued implementation of the existing INRMP (existing INRMP alternative) and the no-action alternative (NBAFS operations without an INRMP). The existing INRMP alternative would result primarily in impacts similar to those of the proposed action, but would trade off a slight reduction in adverse impacts with fewer overall benefits to the environment. The no-action alternative would result in even fewer adverse project-related impacts, but few of the benefits of the proposed action would be realized, and, without implementation of an INRMP, there is an increased potential for conflicts to arise between mission-related activities and natural resources.

## 1 INTRODUCTION

In 1985, the Natural Resources Planner at New Boston Air Force Station (NBAFS) prepared the first natural resources management plan to develop ongoing forest, fish, and wildlife management activities. That original plan was subsequently updated in 1993 (ENSR Consulting and Engineering 1993). The first Integrated Natural Resources Management Plan (INRMP) for NBAFS was prepared and published in 1998 (Najjar 1998) and has been reviewed and updated annually. The new proposed INRMP (LaGory et al. 2006) updates that plan, and was prepared in accordance with Air Force Instruction (AFI) 32-7064, *Integrated Natural Resources Management* (September 17, 2004), that sets policy and provides guidance for natural resources management at Air Force installations in conjunction with applicable Federal, State, and local laws and regulations. The proposed INRMP was developed with input from the U.S. Fish and Wildlife Service (USFWS) and from the New Hampshire Department of Fish and Game (NHDFG). A map of NBAFS is presented in Figure 1.

This Environmental Assessment (EA) was prepared in accordance with specific tasks and procedures of the U.S. Air Force (USAF) Environmental Impact Analysis Process (32 *Code of Federal Regulations* [CFR] Part 989), as it applies to the National Environmental Policy Act (NEPA) of 1969 (Public Law 91-190, 42 *United States Code* [USC] Sections 4321-4347). The EA evaluates the environmental consequences of the proposed action (implementing the proposed INRMP), the existing INRMP alternative (continued implementation of the existing INRMP without modification), and the no-action alternative (NBAFS operations without an INRMP). The assessment evaluates the potential for impacts on air quality, noise levels, topography, geology, soils, water resources, ecological resources (including threatened and endangered species and wetlands), cultural resources, land use, recreation, visual resources, socioeconomics, and health and safety. For some proposed INRMP projects, specific activities are not fully known at this time (either in terms of activity details or the specific location where activities would occur). For these activities, the assessments are programmatic in nature, and a project-specific assessment would be prepared before the project was implemented.

### 1.1 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

Each military installation in the United States under the jurisdiction of the Secretary of Defense must prepare and implement an INRMP unless a determination is made that the absence of significant natural resources makes preparation of such a plan inappropriate. INRMPs are prepared to ensure and document compliance with the Sikes Act (16 USC 670 et seq.), which provides for cooperation by the Departments of the Interior and Defense with State agencies in planning, development, and maintenance of fish and wildlife resources on military reservations throughout the U.S. INRMPs are prepared to assist the installation commander with the conservation and rehabilitation of natural resources consistent with the Sikes Act and other Federal laws. NBAFS has been identified as a Category I installation by both the NHDFG and the USFWS (Najjar 1998). This classification indicates that NBAFS has habitat suitable for conserving and managing fish and wildlife. An INRMP is required for Category I installations.

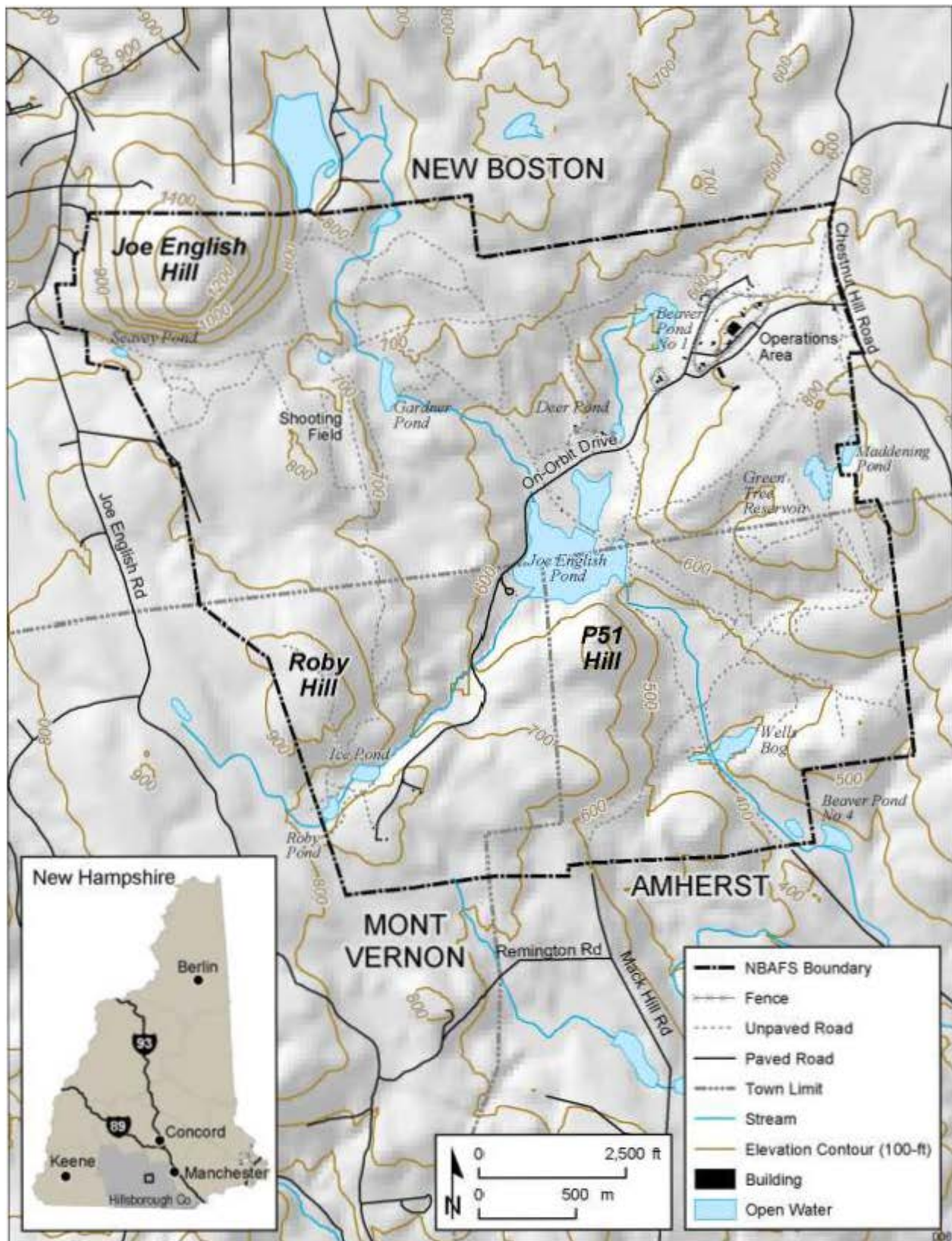


Figure 1. Map of New Boston Air Force Station, New Hampshire.

The NBAFS INRMP (LaGory et al. 2006) establishes natural resources management goals and objectives for the entire station that are consistent with the station mission and ensures no net loss in the capability of NBAFS lands to support that mission. This INRMP ensures that natural resources conservation and other mission activities are integrated and consistent with Federal mandates for land stewardship.

## **2 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES**

This EA considers three alternatives—the proposed action (implementation of the proposed INRMP), the existing INRMP alternative (continued implementation of the existing INRMP), and the no-action alternative (NBAFS operations without implementation of an INRMP). These alternatives are described and their impacts compared in this section.

### **2.1 PROPOSED ACTION**

The proposed NBAFS INRMP was developed in consultation with the USFWS and NHDGF to determine appropriate management and conservation practices for natural resources found on the station. The INRMP implements ecosystem management on the station by setting goals for attaining a desired ecological condition. Ecosystem management principles and guidelines presented in Department of Defense Instruction (DoDI) 4715.3, *Environmental Conservation Program*, were considered during development of this plan. These principles include:

- Maintenance or restoration of native ecosystems, when practical and consistent with the military mission.
- Maintenance or restoration of ecological processes, such as fire and other disturbance regimes, when practical and consistent with the military mission.
- Maintenance or restoration of hydrological processes in streams, floodplains, and wetlands, when feasible.
- Application of regional approaches to implement ecosystem management by collaboration with other Department of Defense (DoD) components as well as other Federal, State, and local agencies, and adjoining property owners.
- Providing for outdoor recreation, agricultural production, harvesting of forest products, and other practical utilization of the land and its resources, provided that such use does not inflict long-term ecosystem damage or negatively impact the station mission.

Other considerations for management of natural resources on NBAFS include:

- Maintenance or reestablishment of viable populations of all native species, when practical and consistent with the military mission.
- Implementation of programs to control or eradicate invasive nonnative species on NBAFS.

- Management of rare species (Heritage Status Ranks of G1 through G3, N1 through N3, and S1 through S3) and rare natural communities, when practical and consistent with the military mission.

Natural resources are managed at NBAFS using an adaptive-management process that integrates new findings and a developing understanding of human impacts on natural systems into future strategies and plans. Consequently, the INRMP is a living document that is modified in response to new information in a timely fashion.

Important components of the proposed NBAFS INRMP include forest management, fish and wildlife management (including threatened, endangered, and other protected species), water resources protection, wetlands protection, wildland fire management, outdoor recreation, and integrated pest management. Forest management techniques are applied to sustain healthy ecosystems with sufficient diversity to support native plants and animals, including threatened, endangered, and rare species, while allowing timber production and sales. Wildland fire management at NBAFS, including prescribed burning, targets the maintenance of native species through creation and maintenance of appropriate habitats and control of competing invasive nonnative species.

The proposed NBAFS INRMP describes the overall management goals and objectives at NBAFS. It identifies the projects planned over the next five years that would be implemented to support those objectives (Table 1). Goals, objectives, and projects have been developed for seven specific natural resources management topical areas. These topical areas include (1) threatened, endangered, and rare species populations; (2) wetlands; (3) rare natural communities; (4) forest management; (5) control of invasive nonnative plant species; (6) outdoor recreation; and (7) unexploded ordnance (UXO) remediation. These projects are discussed in the following sections and described in greater detail in the NBAFS INRMP (LaGory et al. 2006).

### **2.1.1 Threatened and Endangered Species Projects**

Goals, objectives, and projects associated with the management of threatened, endangered, and rare species on NBAFS focus on increasing an understanding of distributions, habitat use, and habitat needs; development of management strategies to sustain or improve habitat conditions; and ensuring that populations of these species continue to exist or expand on NBAFS (LaGory et al. 2006).

Fourteen threatened and endangered species projects are proposed in the NBAFS INRMP (Table 1). These projects focus on developing and implementing monitoring protocols and management plans for populations of the fern-leaved false-foxglove,<sup>1</sup> small-footed bat, eastern pipistrelle, Blanding's turtle, eastern hognose snake, and rare birds (pied-billed grebe, American bittern, osprey, Cooper's hawk, northern goshawk, and whip-poor-will). One project focuses on determining if the New England cottontail (*Sylvilagus transitionalis*) occurs on the station.

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<sup>1</sup> Scientific names for threatened, endangered, and rare species that are known to occur on NBAFS are provided in Table 3.



**Table 1. NBAFS Natural Resources Projects in the Proposed INRMP (Proposed Action) and Existing INRMP Alternative.**

| Project Number | Project Description                                                                                                                                                            | Management Units where Located <sup>a</sup>           | Year          | Priority | Proposed INRMP <sup>b</sup> | Existing INRMP <sup>b</sup> |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|---------------|----------|-----------------------------|-----------------------------|
| TE-1.1.1       | Develop a standard monitoring protocol for fern-leaved false-foxglove                                                                                                          | 1, 8, 19, 22                                          | 2006          | High     | X                           | —                           |
| TE-1.1.2       | Conduct surveys of fern-leaved false-foxglove                                                                                                                                  | 1, 8, 19, 22                                          | 2007          | High     | X                           | —                           |
| TE-1.2.1       | Conduct prescribed burn of fern-leaved false-foxglove habitats                                                                                                                 | 1, 8, 19, 22                                          | Annual        | High     | X                           | X                           |
| TE-2.1.1       | Conduct surveys and radiotelemetry study of eastern small-footed bat and eastern pipistrelle                                                                                   | 1, 2, 4, 5, 6, 7, 8, 9                                | 2006 and 2007 | High     | X                           | —                           |
| TE-2.2.1       | Develop and implement management plan for eastern small-footed bat and eastern pipistrelle                                                                                     | 1, 2, 4, 5, 6, 7, 8, 9                                | 2008          | High     | X                           | —                           |
| TE-3.1.1       | Monitor Blanding's turtles                                                                                                                                                     | 3, 4, 10, 11, 12, 14, 15, 18, 20, 21, possibly others | Annual        | High     | X                           | X                           |
| TE-3.2.1       | Develop and implement management plan for Blanding's turtles                                                                                                                   | 3, 4, 10, 11, 12, 14, 15, 18, 20, 21, possibly others | Annual        | High     | X                           | X                           |
| TE-3.2.2       | Minimize installation of new roadside curbs, evaluate removal or modification of existing curbs, and evaluate new culvert technology to minimize impacts to Blanding's turtles | 4, 10, 11, 12, 15                                     | 2006          | High     | X                           | —                           |
| TE-4.1.1       | Monitor eastern hognose snakes                                                                                                                                                 | 2, 7, 8, 9, 10, 18, 22, possibly others               | Annual        | High     | X                           | X                           |
| TE-4.1.2       | Conduct radiotelemetry study of adult eastern hognose snakes                                                                                                                   | 2, 7, 8, 9, 10, 18, 22, possibly others               | 2007 and 2008 | High     | X                           | —                           |
| TE-4.2.1       | Develop and implement management plan for eastern hognose snake                                                                                                                | 2, 7, 8, 9, 10, 18, 22, possibly others               | Annual        | High     | X                           | X                           |
| TE-5.1.1       | Develop protocol and conduct surveys for rare birds                                                                                                                            | All but 11                                            | Annual        | Moderate | X                           | X                           |
| TE-5.2.1       | Develop and implement management plan for rare birds                                                                                                                           | All but 11                                            | Annual        | Moderate | X                           | X                           |
| TE-6.1.1       | Determine cottontail species on NBAFS using DNA analysis                                                                                                                       | 6, 7, 8, 9, 10, 15                                    | 2006          | High     | X                           | —                           |

**Table 1 (Cont.)**

| Project Number | Project Description                                                                                                                                | Management Units where Located <sup>a</sup>     | Year                 | Priority        | Proposed INRMP <sup>b</sup> | Existing INRMP <sup>b</sup> |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|----------------------|-----------------|-----------------------------|-----------------------------|
| WE-1.1.1       | Monitor wetlands                                                                                                                                   | All but 11                                      | Annual               | High (required) | X                           | X                           |
| WE-1.2.1       | Evaluate erosion and its impacts on NBAFS wetlands                                                                                                 | 3, 4, 8, 9, 10, 11, 12, 15, 18, possibly others | 2006                 | Moderate        | X                           | —                           |
| WE-1.2.2       | Evaluate degraded wetlands for restoration potential and develop designs for wetland restoration                                                   | 3, 4, 8, 9, 10, 11, 12, 15, 18, possibly others | 2007                 | Moderate        | X                           | —                           |
| WE-1.2.3       | Implement wetland restoration activities                                                                                                           | 3, 4, 8, 9, 10, 11, 12, 15, 18, possibly others | 2009                 | Moderate        | X                           | —                           |
| NC-1.1.1       | Develop and implement a standard monitoring protocol for rare natural communities                                                                  | 1, 20                                           | 2006                 | High            | X                           | —                           |
| NC-1.1.2       | Revisit ecological systems on NBAFS to determine rare community status                                                                             | 5, 6, 9                                         | 2007                 | High            | X                           | —                           |
| NC-1.2.1       | Develop and implement management strategy for NBAFS rare natural communities                                                                       | 1, 5, 6, 9, 20                                  | 2008                 | High            | X                           | —                           |
| FO-1.1.1       | Perform forest inventories                                                                                                                         | All but 11                                      | Annual               | Moderate        | X                           | X                           |
| FO-1.1.2       | Update GIS to include forest attributes                                                                                                            | All but 11                                      | Annual               | High            | X                           | X                           |
| FO-1.2.1       | Perform prescribed burns                                                                                                                           | All but 11                                      | Annual               | High            | X                           | X                           |
| FO-1.2.2       | Create clearcut that is 5 to 15 ac (2 to 6 ha) in size to provide habitat for early succession wildlife (replaces Project FO-2.1.1 in these years) | All but 11                                      | 2007, 2009, and 2010 | Moderate        | X                           | X                           |
| FO-2.1.1       | Regenerate 10 to 20 ac (4 to 8 ha) of forest                                                                                                       | 2, 6, 13, 15, 19, 25                            | Annual               | Moderate        | X                           | X                           |
| FO-2.1.2       | Thin 20 to 50 ac (8 to 20 ha) of forest                                                                                                            | 2, 6, 13, 15, 19, 25                            | Annual               | Moderate        | X                           | X                           |
| IN-1.1.1       | Implement control plan for invasive nonnative plants                                                                                               | All                                             | Annual               | High            | X                           | —                           |
| IN-1.2.1       | Prevent introduction and spread of invasive nonnative plants                                                                                       | All                                             | Annual               | High            | X                           | —                           |
| OR-1.1.1       | Establish a self-guided nature trail originating at Joe English Pond Campground                                                                    | 15, 18                                          | 2010                 | Moderate        | X                           | —                           |

**Table 1 (Cont.)**

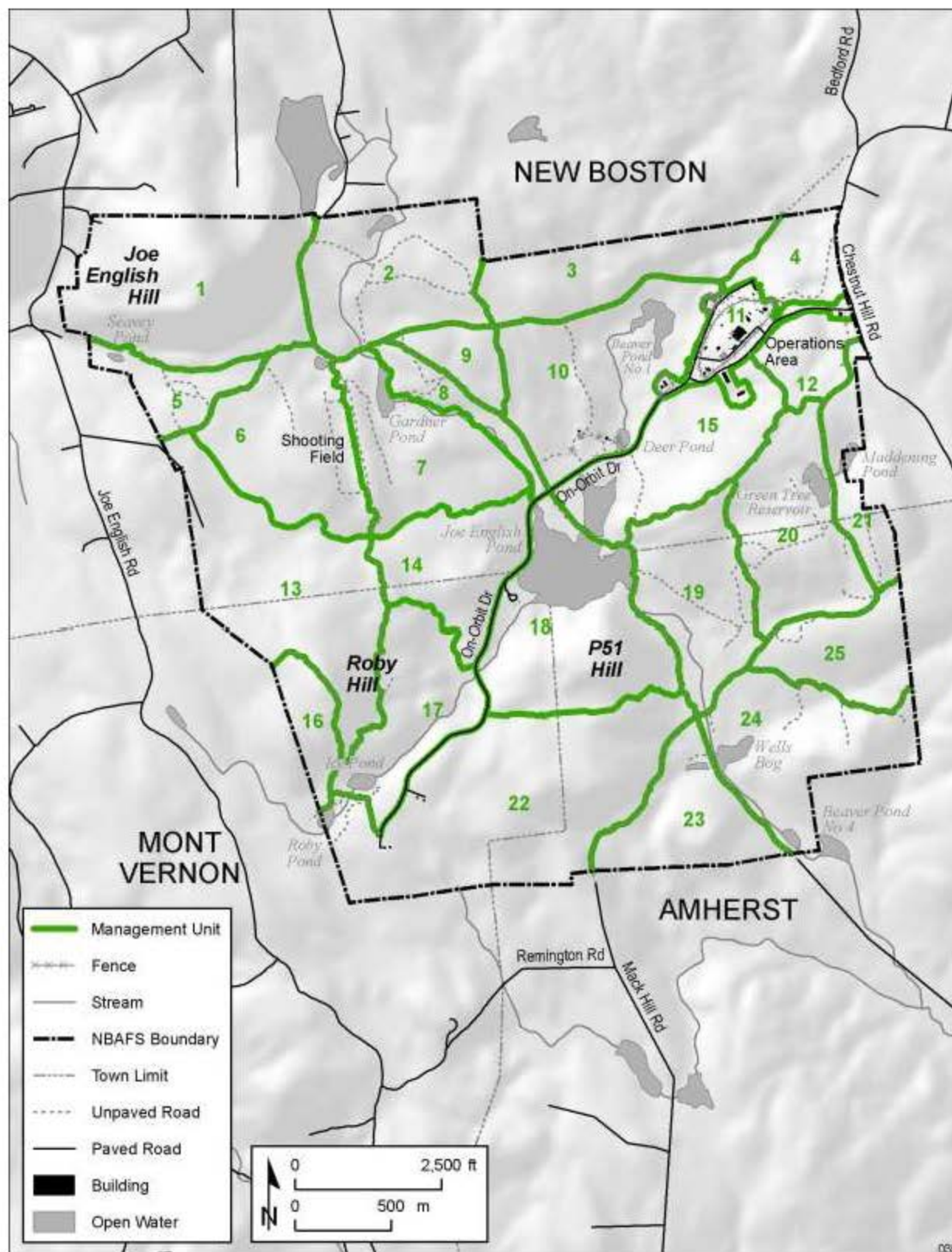
| Project Number | Project Description                                                                                                                                   | Management Units where Located <sup>a</sup>        | Year              | Priority | Proposed INRMP <sup>b</sup> | Existing INRMP <sup>b</sup> |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------------------|----------|-----------------------------|-----------------------------|
| OR-1.1.2       | Establish handicapped-accessible boat ramp at Joe English Pond after UXO remediation                                                                  | 18                                                 | 2010              | Moderate | X                           | —                           |
| OR-2.1.1       | Collect hunter harvest and usage data                                                                                                                 | All but 11                                         | Annual            | Moderate | X                           | X                           |
| OR-2.1.2       | Evaluate impact of moose on station vegetation and develop management strategy                                                                        | All                                                | 2008              | Moderate | X                           | —                           |
| OR-2.2.1       | Stock NBAFS waters with trout                                                                                                                         | 10, 17, 19, 22, 24                                 | Annual            | Moderate | X                           | X                           |
| OR-2.2.2       | Perform fish survey                                                                                                                                   | 2, 5, 6, 7, 10, 15, 17, 18, 19, 20, 21, 22, 23, 24 | 2006 through 2010 | Moderate | X                           | —                           |
| OR-2.3.1       | Determine sustainable levels and patterns of recreational usage at NBAFS                                                                              | All but 11                                         | 2007              | Moderate | X                           | —                           |
| RE-1.1.1       | Develop and implement study to evaluate the effects of remediation activities, establish standards for restoration, and determine restoration success | 6, 7, 8, 9, 14, 18                                 | 2006 through 2010 | High     | X                           | —                           |
| RE-1.1.2       | Work with USAF IRP staff to ensure inclusion of natural resources considerations in the remediation planning and contracting process                  | 6, 7, 8, 9, 14, 18                                 | Annual            | High     | X                           | —                           |

Source: LaGory et al. (2006)

<sup>a</sup> Natural Resources Management Units are shown in Figure 2.

<sup>b</sup> X = project is included in INRMP; — = project is not included in INRMP.

Monitoring programs for all species would involve nondestructive techniques, but protocols for bats, Blanding's turtles, and eastern hognose snakes would require capture, handling, and placement of transmitters on individuals. All such protocols would use accepted practices that minimize harm to individuals, and would require permits from the State. NBAFS Natural Resources personnel would continue to provide input to decisions that have the potential to affect these species and other natural resources on the station. The primary focus would be on avoiding impacts or developing mitigations for activities with the potential to affect the species or their habitats. Monitoring information would be used to refine management strategies. Prescribed burns in fern-leaved false-foxglove habitats would continue on a three to five year rotation to maintain conditions important for this species.



**Figure 2. Natural Resources Management Units at New Boston Air Force Station, New Hampshire.**

### **2.1.2 Wetlands Projects**

Goals, objectives, and projects associated with the wetland management on NBAFS focus on sustaining high-quality wetland habitats by monitoring trends, identifying threats, and restoring degraded wetlands. Wetlands at NBAFS perform important ecological functions such as maintenance of water quality, flood control, and groundwater recharge, and also provide habitat for plant and animal species including listed and rare species. Degradation could be caused by invasive nonnative plants, natural succession, encroachment of human developments, and runoff from developed or disturbed areas. Monitoring wetland change and developing response actions before problems arise or worsen are important components of the NBAFS INRMP.

Four wetlands projects are proposed in the NBAFS INRMP (Table 1). These involve regular monitoring of wetlands on the station, an evaluation of the effects of erosion on wetlands, and restoration of degraded wetlands. Although the scope and nature of restoration needs and activities have not been determined, these projects would utilize state-of-the-art techniques that minimize adverse impacts and maximize the potential benefit of activities. Restoration activities would be developed on a case-by-case basis with an emphasis on wetlands at highest risk of degradation. All restoration activities would be conducted in consultation with the New Hampshire Department of Environmental Services and the U.S. Army Corps of Engineers.

### **2.1.3 Rare Natural Community Projects**

Goals, objectives, and projects associated with the management of rare natural communities on NBAFS focus on sustaining high-quality rare natural communities by monitoring trends, identifying threats, and restoring degraded communities. Degradation could be caused by invasive nonnative plants, natural succession, encroachment of human developments, and runoff from developed or disturbed areas. Monitoring community change and developing response actions before problems arise or worsen are important components of the NBAFS INRMP.

Three NBAFS INRMP projects focus on rare natural communities on the station (Table 1). These projects involve monitoring to determine conditions and threats and management activities to maintain and protect these communities. Monitoring information would be used to develop management strategies. Monitoring protocols would use nondestructive techniques. Natural Resources personnel will continue to provide input to decisions that have the potential to affect rare natural communities and other natural resources on the station. The primary focus will be on avoiding or developing mitigations for activities with the potential to affect these communities. For fire-dependent communities, application of prescribed burning would be implemented in accordance with the NBAFS Wildland Fire Management Plan (Bernardy et al. 2003). Management strategies would be developed in consultation with NHHB.

### 2.1.4 Forest Management Projects

Because over 90% of NBAFS is forested, forest management is the dominant tool for natural resources management on NBAFS. Goals, objectives, and projects associated with forest management at NBAFS target the development of an overall forest management program that integrates the varied and sometimes disparate needs of a variety of forest-dependent species. Proposed forest management projects are presented in Table 1 and summarized below.

Six NBAFS INRMP projects focus on forest management (Table 1). These projects include inventories, prescribed burning, creation of clearcuts, regeneration cutting, and thinning<sup>2</sup> designed to provide habitat for a diversity of plant and animal species. Prescribed burns would be implemented in accordance with the NBAFS Wildland Fire Management Plan (Bernardy et al. 2003). Clearcuts would be harvested during the fall and winter when practical. Harvest plans and timber marking would be developed under the supervision of the NBAFS Natural Resources Planner. Forest thinning plans would be developed on the basis of USFS silvicultural guides. All forest harvests would be conducted in accordance with best management practices developed by the State of New Hampshire to prevent erosion (Cullen 2001) and in accordance with State law (RSA Title XIX Section 227-J:6), which governs operations in wetlands. Prior to timber harvest, an EA would be completed by the Natural Resources Planner. All contract harvesting would be managed by the Natural Resources Planner. Potential regeneration cutting (Project FO-2.1.1) and thinning (Project FO-2.1.2) areas are shown in Figure 3. The locations of clearcuts (Project FO-1.2.2) have not yet been determined. Project-specific assessments and consultations would be performed once specific locations and other project details were determined and before the projects were implemented.

### 2.1.5 Invasive Species Projects

Currently, invasive nonnative plant species problems at NBAFS are limited to the impact of relatively few species that could be effectively controlled if actions are taken soon. The most problematic species is the autumn olive (*Elaeagnus umbellata*), but other invasive nonnative species occur at relatively low density and could be effectively eliminated or controlled before their populations expand. Two invasive species projects are proposed in the NBAFS INRMP (Table 1)—implement a control plan for invasive species already on the station and implement a plan to prevent introduction and spread of invasive species. Autumn olive is primarily located along roadways, in recreation areas, and oldfields. Autumn olive control would entail manual cutting and treatment of stumps with glyphosate or basal-bark treatment. Japanese knotweed (*Polygonum cuspidatum*) and Japanese barberry (*Berberis thunbergii*) are found in only a few locations and would be controlled with herbicide (knotweed) or manual removal (barberry).

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<sup>2</sup> Projects involving the harvest and removal of timber (Projects FO-1.2.2, FO-2.1.1, and FO-2.1.2) are collectively referred to in this document as “timber harvest” projects.



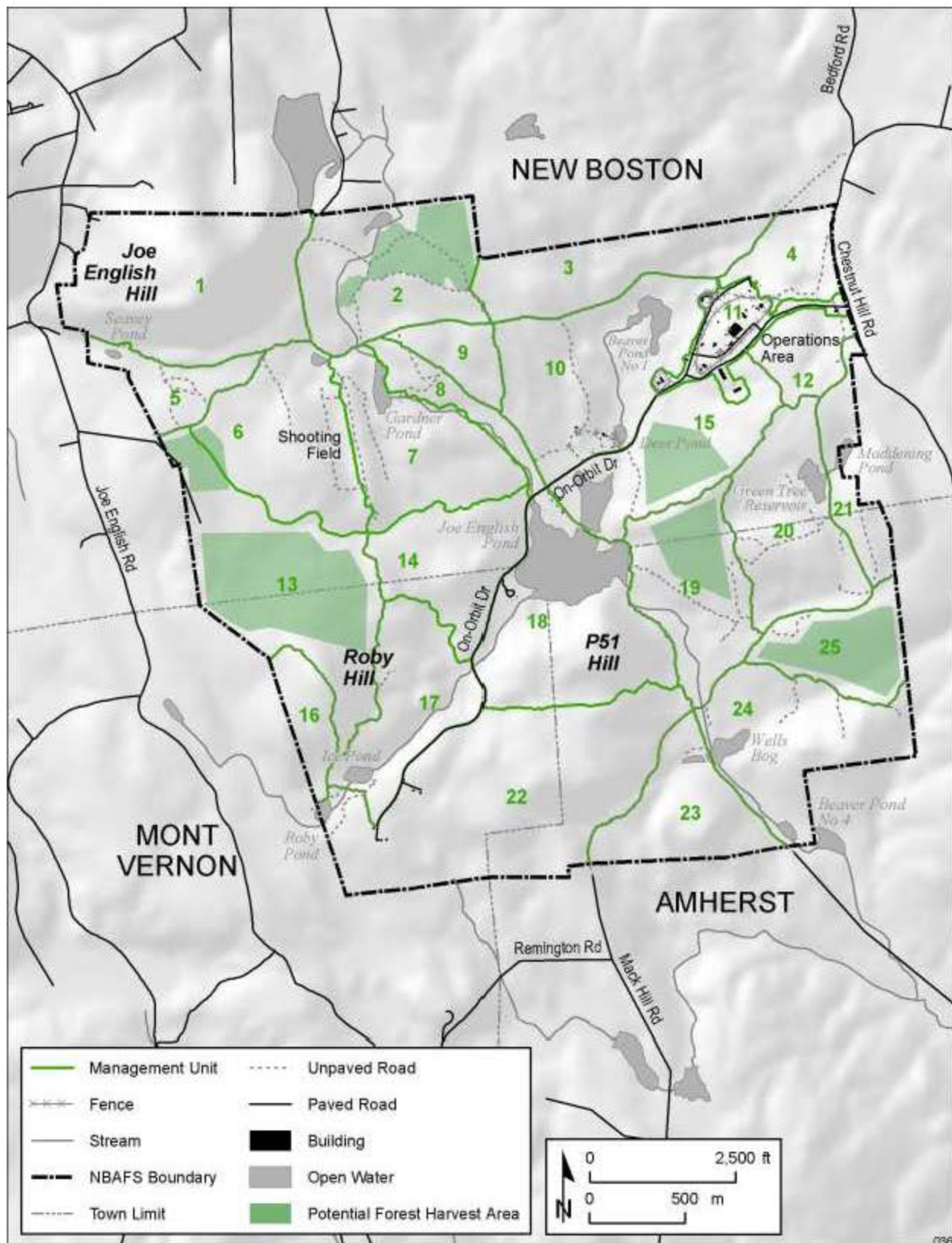


Figure 3. Potential Forest Harvest Areas for INRMP Projects FO-2.1.1 and FO-2.1.2.

### **2.1.6 Outdoor Recreation Projects**

Outdoor recreation at NBAFS involves hunting, fishing, and wildlife observation. Goals, objectives, and projects associated with outdoor recreation at NBAFS are related to developing a more well-established nonconsumptive nature-oriented recreational program (e.g., hiking, birding) that capitalizes on opportunities for outdoor education. In addition, management of hunting and fishing programs can result in high-quality hunting and fishing experiences for staff and visitors. Proposed outdoor recreation projects are presented in Table 1 and summarized below.

The NBAFS INRMP includes seven outdoor recreation projects (Table 1). These include developing interpretive and handicapped-accessible facilities, monitoring and enhancing hunting and fishing activities, and evaluating the sustainability of recreational usage of the station. Construction projects include an interpretive trail and a handicapped-accessible boat ramp at Joe English Pond. These new facilities would be designed to minimize impacts to wetlands and any other important habitats or features, and would be evaluated in project-specific assessments upon completion of final project designs. Also proposed is continued stocking of Roby Pond, Ice Pond, Deer Pond, and Joe English Brook with rainbow and brook trout, a fish survey, and a study of the moose population on the station. Hunter harvest data would continue to be collected for all game species.

### **2.1.5 UXO Remediation-Related Projects**

UXO remediation activities at NBAFS (which are not part of the proposed action) could adversely affect natural resources on the station. Goals, objectives, and projects associated with remediation activities address the restoration of disturbed habitats to predisturbance conditions. Two UXO remediation-related projects are proposed in the NBAFS INRMP (Table 1). These two projects are intended to provide the necessary information needed to inform remediation planning for the purpose of minimizing impacts to ecological resources and ensuring that acceptable ecological conditions are restored in remediated areas.

## **2.2 EXISTING INRMP ALTERNATIVE**

Under the existing INRMP alternative, NBAFS would continue to operate under the existing INRMP (Najjar 1998). The existing INRMP and subsequent operational component plans include a number of the projects that are contained within the proposed INRMP (Table 1). Several projects included in the proposed action are not included in the existing INRMP alternative. The following projects are not included in the existing INRMP alternative: (1) monitoring projects for fern-leaved false-foxglove and rare natural communities; (2) radiotelemetry studies of small-footed bat, eastern pipistrelle, and eastern hognose snake; (3) a study of the effects of curbs on Blanding's turtles; (4) development and refinement of species and habitat management plans; (5) wetland restoration; (6) development of new



recreational facilities; (7) invasive species control actions; (8) studies of fish and moose populations; and (9) incorporation of natural resources studies in future UXO remediation activities.

### **2.3 NO-ACTION ALTERNATIVE**

Under the no-action alternative, NBAFS would operate without an INRMP. Natural resources activities would be limited to wildland fire management as addressed in the existing Wildland Fire Management Plan (Bernardy et al. 2003) and ad hoc NEPA evaluations of proposed activities that have the potential to affect the human environment. The Wildland Fire Management Plan includes prescribed burning projects designed to improve ecological conditions on the station for wildlife benefits, reduce the probability of catastrophic fires, and maintain suitable conditions for the fern-leaved false-foxglove. Recreational planning would continue to be performed by NBAFS Services, but without the coordination provided by an INRMP. Under the no-action alternative, activities affecting natural resources would be conducted without benefit of integration or overall natural resources planning. In addition, data on important natural resources of the station would not be collected, and therefore the knowledge base used for operational planning would be relatively limited. Because USAF regulations and Federal law require an INRMP to guide natural resources management, the no-action alternative is technically not a legal option, and is presented here for comparative purposes only.

### **2.4 COMPARISON OF ALTERNATIVES**

A summary comparison of the expected environmental impacts of the proposed action (implementation of the proposed INRMP), existing INRMP alternative (continued implementation of the existing INRMP without modification), and the no-action alternative (NABFS operations without an INRMP) is presented in Table 2. Additional discussion of these environmental impacts is provided in Section 4.

The proposed action would result primarily in short-term, localized, and minor adverse environmental impacts. These adverse impacts would be offset by the anticipated and intended long-term benefits to natural resources that would result. The existing INRMP alternative would result in many of the same adverse impacts and long-term benefits, but under this alternative, there would be less information gathered, less planning and coordination, and wetland restoration and invasive species control would not occur. The no-action alternative would avoid many of the short-term adverse effects of both the proposed action and the existing INRMP alternative, but would also not accrue anticipated benefits. Under the no-action alternative, a potential exists for conflicts to arise between mission-related activities and natural resources.

**Table 2. Comparison of Impacts Associated with Implementation of the Proposed NBAFS INRMP (Proposed Action), the Existing INRMP Alternative, and the No-Action Alternative.**

| Environmental Parameter        | Proposed Action                                                                                                                                                                                                                                                                                                                                              | Existing INRMP Alternative                                                                                                                                                                                                                                                                               | No Action                                                                                                                                                                                                                                                    |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Air Quality and Noise          | Localized short-term minor air-quality (fugitive dust, engine exhaust, smoke) and noise impacts could occur as a result of prescribed burning, timber harvests, and recreation facility construction projects. No violations are expected of Federal and State ambient air quality standards for criteria pollutants.                                        | Similar to but slightly less than the impacts of the proposed action. This alternative includes prescribed burns and timber harvests, but not recreational facility construction projects.                                                                                                               | Less impact than the proposed action and existing INRMP alternative because timber harvests and construction projects would not occur.                                                                                                                       |
| Topography, Geology, and Soils | Localized minor short-term impacts to soils (erosion, compaction) could result from prescribed burning, timber harvests, and recreation facility construction projects.                                                                                                                                                                                      | Similar to but slightly less than the impacts of the proposed action. This alternative includes prescribed burns and timber harvests, but not recreational facility construction projects.                                                                                                               | Less impact than the proposed action and existing INRMP alternative because timber harvests and construction projects would not occur.                                                                                                                       |
| Water Resources                | No impacts on topography or geology.                                                                                                                                                                                                                                                                                                                         | Same as proposed action.                                                                                                                                                                                                                                                                                 | Same as proposed action.                                                                                                                                                                                                                                     |
|                                | Localized minor short-term impacts to surface water quality (increases in turbidity, sedimentation, peak flow) could result from runoff of areas of prescribed burning, timber harvests, and recreation facility construction projects. Wetland restoration activities and invasive species control are expected to improve water quality in restored areas. | Similar to but slightly less than the impacts of the proposed action. This alternative includes prescribed burns and timber harvests, but not recreational facility construction projects. Fewer benefits than proposed action because wetland restoration and invasive species control would not occur. | Less adverse impact than the proposed action and existing INRMP alternative because timber harvests and construction projects would not occur. Fewer benefits than proposed action because wetland restoration and invasive species control would not occur. |
|                                | No impacts to surface water supplies or groundwater are anticipated.                                                                                                                                                                                                                                                                                         | Same as proposed action.                                                                                                                                                                                                                                                                                 | Same as proposed action.                                                                                                                                                                                                                                     |

**Table 2 (Cont.)**

| Environmental Parameter                    | Proposed Action                                                                                                                                                                                                                                                                                                         | Existing INRMP Alternative                                                                                                                                                                                                                                                                                         | No Action                                                                                                                                      |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Ecological Resources                       | Minor short-term adverse impacts to ecological resources (vegetation destruction, wildlife disturbance) could result from prescribed burning, timber harvest, recreation facility construction, wetland restoration, invasive species control, and projects involving capture, handling, and radiotelemetry of animals. | Similar to but slightly less than the impacts of the proposed action. This alternative includes prescribed burns and timber harvests, but not recreational facility construction projects, wetland restoration, invasive species control, and projects involving capture, handling, and radiotelemetry of animals. | Less adverse impact than the proposed action and existing INRMP alternative because timber harvests and construction projects would not occur. |
|                                            | Prescribed burns, timber harvests, wetland restoration, and invasive species control are expected to result in an overall improvement in the ecological conditions on the station.                                                                                                                                      | Similar to the proposed action, but fewer benefits would be realized because wetland restoration and invasive species control would not occur.                                                                                                                                                                     | Long-term benefits of timber harvests, wetland restoration, and invasive species control would not be realized.                                |
|                                            | Data-gathering and development of management plans are expected to result in an overall benefit to ecological resources if increased knowledge was used to improve conditions on the station or avoid impacts.                                                                                                          | Data gathering, management plan development, and coordination would be reduced from that of the proposed action and fewer benefits realized.                                                                                                                                                                       | Long-term benefits of data gathering, management plan development, and coordination would not be realized.                                     |
| Cultural Resources                         | Although disturbance of cultural resources could result from prescribed burning, timber harvests, and recreation facility construction projects, avoidance measures should ensure protection.                                                                                                                           | Same as proposed action.                                                                                                                                                                                                                                                                                           | Same as proposed action.                                                                                                                       |
| Land Use, Recreation, and Visual Resources | Recreational benefits are expected to result from construction of a new interpretive trail and a handicapped-accessible boat ramp. Data gathering, trout stocking, and recreation planning projects are also expected to benefit recreational opportunities on the station.                                             | Fewer benefits anticipated because new recreational facilities would not be constructed and data gathering and recreational planning would be less than under the proposed action                                                                                                                                  | Diminished recreational opportunities resulting from lack of data gathering and planning.                                                      |

**Table 2 (Cont.)**

| Environmental Parameter | Proposed Action                                                                                                                                   | Existing INRMP Alternative                                                                                                                                                                                                  | No Action                                                                                                           |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
|                         | Localized minor short-term impacts to visual resources could result from prescribed burning and timber harvests.                                  | Same as proposed action.                                                                                                                                                                                                    | Less than proposed action because timber harvests would not occur.                                                  |
|                         | No adverse impacts to land use are anticipated. Projects expected to minimize conflicts between mission-related activities and natural resources. | Similar to proposed action, but the reduction in data-gathering, management plan development, and coordination with remediation efforts could result in conflicts between mission-related activities and natural resources. | Possible adverse impacts could occur if mission-related activities were compromised by natural resources conflicts. |
| Socioeconomics          | No significant beneficial or adverse socioeconomic impacts to the local population, labor force, or economy.                                      | Same as proposed action.                                                                                                                                                                                                    | Same as proposed action.                                                                                            |
|                         | No environmental justice impacts.                                                                                                                 | Same as proposed action.                                                                                                                                                                                                    | Same as proposed action.                                                                                            |
| Health and Safety       | No significant health and safety issues are anticipated.                                                                                          | Same as proposed action.                                                                                                                                                                                                    | Same as proposed action.                                                                                            |

### 3 AFFECTED ENVIRONMENT

This section presents a general description of NBAFS and the resources that could be affected by the proposed action, existing INRMP alternative, and no-action alternative.

#### 3.1 LOCATION, HISTORY, AND CURRENT MISSION

NBAFS is located in south-central New Hampshire about 19 km (12 mi) west of Manchester. The 1,144-ha (2,826-ac) site is located within the towns of New Boston, Amherst, and Mont Vernon, in Hillsborough County. On-Orbit Drive bisects the station from the southwest corner of the station to the 17.7-ha (44-ac) Operations Area in the northeastern portion of the station (Figure 1).

As part of the worldwide network of satellite command and control stations of the Air Force Satellite Control Network (AFSCN), the current mission of NBAFS is to serve as a remote tracking station for military and communications satellites. The 23rd Space Operations Squadron (SOPS) at NBAFS provides launch, operation, and on-orbit support for more than 170 military satellites, communication satellites, North Atlantic Treaty Organization satellites (and those of other allied nations), and for National Aeronautics and Space Administration Space Shuttle missions (Najjar 1998).

From 1941 until 1956, NBAFS (then known as the New Boston Bombing and Gunnery Range) was used as an air-to-ground bombing and strafing range. The USAF acquired rights to the site in 1957 for use as a satellite-tracking station. In 1959, the 6594th Instrumentation Squadron was activated at NBAFS. Squadron activities began in 1960; mobile radar units were used until permanent facilities were constructed and in operation by 1964. In the early 1960s, the Operations Area was cleared of UXO before the permanent facilities for the satellite-tracking mission were constructed. The site was formerly under the jurisdiction of the USAF Systems Command, which transferred the mission to the USAF Space Command in 1987 (Najjar 1998). The satellite-tracking mission is conducted from the Operations Area; the remainder of NBAFS is managed for military training, recreation, natural resources conservation, and cultural resources protection (LaGory et al. 1997).

#### 3.2 CLIMATE, AIR QUALITY, AND NOISE

The region around NBAFS is characterized by a humid continental climate. Precipitation is evenly distributed throughout the year, with no particular wet or dry season. Coastal storms can be a serious weather hazard in southeastern New Hampshire, but decrease in importance northward (Ruffner 1985). Such storms generate very strong winds and heavy rain or snow. Storms of tropical origin affect or threaten New Hampshire about once every two to three years. Thunderstorms occur 15 to 30 times per year. Ice storms occur in the winter, but are usually of short duration. However, a few widespread and prolonged ice storms have occurred. Data for the 9,130-km<sup>2</sup> (3,530-mi<sup>2</sup>) area that includes NBAFS indicate that fewer than two tornadoes occur

per year. The localized area affected by a tornado averages only 0.29 km<sup>2</sup> (0.11 mi<sup>2</sup>; Ramsdell and Andrews 1986).

The State of New Hampshire Ambient Air Quality Standards are identical to the National Ambient Air Quality Standards (NAAQS) for six criteria air pollutants: sulfur oxides (as sulfur dioxide); particulate matter with an aerodynamic diameter less than or equal to 10 µm and 2.5 µm (PM<sub>10</sub> and PM<sub>2.5</sub>, respectively); carbon monoxide; ozone; nitrogen dioxide; and lead (Sanborn 1998). In 1996, New Hampshire discontinued lead monitoring because lead concentrations were well below the NAAQS and at the detection limit. Hillsborough County (which includes NBAFS) is designated as an attainment area for all criteria pollutants except ozone. For ozone, portions of Hillsborough County are considered non-attainment; the town of Amherst is the only portion of NBAFS that is in the non-attainment part of the county.

Permitted air pollution sources at NBAFS include two large diesel-fuel backup generators at the station's power plant (Najjar 1998). These generators and other combustion sources are included in annual air emissions inventories for the station. Other combustion sources at NBAFS include 17 fuel-oil generators and heaters; propane space heaters, including four propane heaters for antenna deicing; and a cooling tower. In addition, NBAFS has three diesel, one gasoline, and 13 fuel-oil storage tanks. Fugitive emissions of volatile organic compounds, hazardous air pollutants from chemical use, and ozone-depleting substances are extremely low (Najjar 1998). A permit for the new A-Side antenna emergency generator is in development. NBAFS is not considered a major source for air pollution.

Currently, no quantitative noise-limit regulations exist in New Hampshire (ANL 1999). U.S. Environmental Protection Agency (EPA) guidelines recommend an L<sub>dn</sub> (the day-night weighted equivalent sound level) of 55 dBA,<sup>3</sup> which is considered sufficient to protect the public from the effect of broadband environmental noise in typically quiet outdoor and residential areas (EPA 1974). For protection against hearing loss in the general population from nonimpulsive noise, the EPA guidelines recommend an L<sub>eq</sub> of 70 dBA or less per day over a 40-year period.<sup>4</sup>

No noise monitoring data are available from the area around the NBAFS site. However, the acoustic environment around the NBAFS site can be considered that of a rural location, with typical residual sound levels of approximately 30 to 35 dBA (Liebich and Cristoforo 1988). The closest off-site residences in the project area occur immediately adjacent to the station boundary along Chestnut Hill Road. Ambient noise levels at these residences would be substantially increased at times when traffic passes by.

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<sup>3</sup> dBA is a unit of weighted sound-pressure level, measured by the use of the metering characteristics and the "A" weighting specified in the *American Standard Specification for Sound Level Meters*, ANSI S1.4-1983 and Amendment S1.4A-1985 (Acoustical Society of America 1983, 1985).

<sup>4</sup> L<sub>eq</sub> is the equivalent steady sound level that, if continuous during a specific time period, would contain the same total energy as the actual time-varying sound. For example, L<sub>eq</sub>(1-h) is the 1-hour equivalent sound level.

### 3.3 TOPOGRAPHY, GEOLOGY, AND SOILS

NBAFS is located within an area of hilly and mountainous terrain. The main physiographic features on NBAFS are Chestnut Hill, P51 Hill, Roby Hill, and Joe English Hill with Joe English Pond in the center of the station (Figure 1). Elevations on NBAFS range from 104 m (340 ft) mean sea level (MSL) where Joe English Brook exits the southeastern corner of the station to about 389 m (1,275 ft) MSL at the summit of Joe English Hill (Figure 1). The steepest areas of terrain include the near-vertical slopes on the southern cliffs of Joe English Hill and the northeast aspect of P-51 Hill, located south of Joe English Pond. The sides of stream ravines in the south-central and southwestern portions of the station are also relatively steep. The most extensive, nearly level areas are glacial till uplands that occur in the area east of Roby and Ice Ponds. Small, nearly level outwash plains or stream valley areas occur south of Joe English Hill, near Joe English Pond, and surrounding Wells Bog (ENSR 1993).

The bedrock geology underlying NBAFS consists of Pre-Quaternary metamorphic and igneous rocks. Generally, the bedrock is buried beneath glacial drift. Till is the dominant surficial deposit and is composed of an unsorted to poorly sorted mixture of clay, silt, sand, gravel, cobble, and boulders. However, swamp deposits and recent alluvium are also present. Glacial striations and drumlins (elongated or oval hills of glacial origin) are present throughout the area and provide evidence of general north-to-south glacial movement. Chestnut Hill (a drumlin, which is a symmetric hill of glacial drift) and Joe English Hill (a roche moutonnee, which is a large rock smoothed by ice on its upstream side) are two such glacial features.

Soil units, phases, and complexes of the area are described in the *Soil Survey of Hillsborough County, New Hampshire, Eastern Part* (Bond and Handler 1981). Twenty-three soil map units occur within the limits of NBAFS. Over 90% of the soils on NBAFS were formed in glacial till; the remainder formed in outwash plains, kame terraces, or stream valleys. Much of the Operations Area occurs on fill that was placed during the original development of the area. Soils formed in glacial till tend to be fine-textured and dense and contain many stones. Soils covering about one-half of NBAFS are classified as stony or very stony. The erosion hazard of the soils on NBAFS is slight if stabilized by vegetative cover; however, they have moderate to extreme erosion potential in bare areas because of their fine texture and the steep slopes present in portions of NBAFS. Activities that disturb or remove vegetation are likely to increase the erosion hazard, particularly on slopes (ENSR 1993). Some areas of NBAFS contain exposed bedrock. A more detailed description of the soils of NBAFS, including soil maps, can be found in Bond and Handler (1981).

### 3.4 WATER RESOURCES

There are three watersheds on NBAFS. Most of NBAFS is located within the Joe English Brook watershed, which flows towards the southeast. About half of the Operations Area is within the Bog Brook watershed, which flows towards the northwest. Drainage from the northwestern portions of the station flows off-site towards the west and north in the Meadow Brook watershed.

The station contains a number of open waters and stream segments (intermittent and perennial) (Figure 1). The approximate area of the station's larger water bodies (including associated wetlands) are Joe English Pond, 20 ha (50 ac); Green Tree Reservoir, 3.0 ha (7.5 ac); Gardner Pond, 2.4 ha (6.0 ac); Ice Pond, 1.1 ha (2.8 ac); Roby Pond, 0.3 ha (0.8 ac); and Seavy Pond, 0.5 ac (0.2 ha) (Najjar 1998). The ponds range between 0.3 and 8.5 m (1 and 28 ft) in depth. Seavy Pond is the only completely man-made impoundment on the site; the other ponds on the station have dams at their outlets (PES 1996). The only known water quality problem in these impoundments is an annual buildup of coliform bacteria during dry periods in the summer (Najjar 1998).

Streams on NBAFS include those that flow into Joe English Pond from the higher-elevation wetland areas of Murphy Swamp, Gardner Pond, Beaver Pond No. 1, Deer Pond, and Ice Pond. The majority of the 9.8 km<sup>2</sup> (3.8 mi<sup>2</sup>) Joe English Pond watershed is wooded with little development, and most is contained within the NBAFS boundary. Slopes in the watershed are generally steep. Drainage from Joe English Pond flows southeast in Joe English Brook, which exits the installation boundary about 1.6 km (1 mi) downstream. Joe English Brook is the largest on-site stream. It ranges from 3 to 6 m (10 to 20 ft) wide and between 0.6 and 1.5 m (2 and 5 ft) deep (PES 1995). Both Joe English Pond and Joe English Brook are designated as Class B waters and are considered suitable for swimming and other recreation, fish habitat, and, after adequate treatment, use as a water supply (PES 1995). UXO on the pond bottom currently precludes recreational use of the pond.

The major aquifer system at NBAFS is in the bedrock. Fractured metasedimentary rocks that have adequate effective porosity, permeability, and thickness to provide a high degree of groundwater transmissivity in the aquifer system are typical. Groundwater levels at NBAFS range from 22 m (73 ft) below land surface to flowing artesian conditions near Joe English Pond. Four wells have been drilled into the groundwater system on NBAFS to obtain potable water (only three are currently used). Four other wells have been drilled for nonpotable groundwater used for the satellite tracking facilities (ANL 2000).

### 3.5 ECOLOGICAL RESOURCES

This section provides a general overview of the ecological resources of NBAFS and a discussion of endangered, threatened, and rare species found at NBAFS. Three surveys have been conducted to determine the habitats and species that occur on NBAFS—wetland delineations (PES 1996), a biodiversity survey (LaGory et al. 1997), and a bat survey (LaGory et al. 2002). In 2004, an ecological survey of Joe English Pond and associated wetland habitats was conducted by Argonne National Laboratory and findings reported in the proposed INRMP (LaGory et al. 2006).

Much of the area surrounding NBAFS is rural with interspersed forests and residential areas. Land cover on the station is consistent with the surrounding area, and much of the habitat present on the station is represented elsewhere in the county and region. However, residential



development of surrounding lands has increased within the past decade, resulting in an increase in the ecological importance of the undeveloped land on the station grounds.

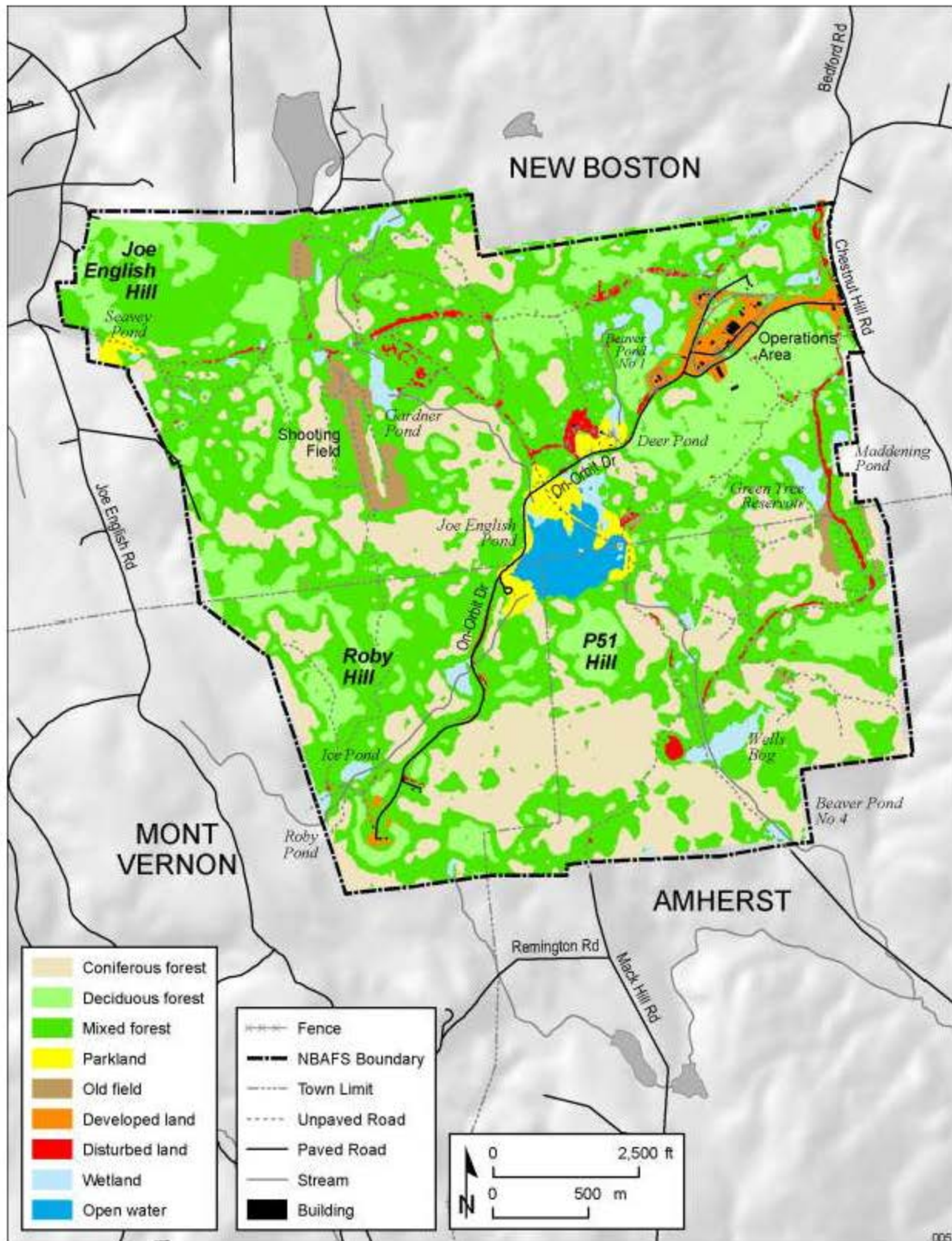
Over 450 species of plants have been identified on NBAFS (LaGory et al. 1997). About 98% of NBAFS is covered with native vegetation, and the majority of the site is forested. Dominant forest trees include red oak (*Quercus rubra*), eastern white pine (*Pinus strobus*), eastern hemlock (*Tsuga canadensis*), red maple (*Acer rubrum*), black birch (*Betula lenta*), and American beech (*Fagus grandifolia*). Cover types occurring on NBAFS include coniferous forest (288 ha [710 ac]), deciduous forest (219 ha [540 ac]), mixed forest (527 ha [1,300 ac]), oldfield (20 ha [49 ac]), parkland (19 ha [47 ac]), wetlands (80 ha [198 ac]), open water (18 ha [43 ac]), disturbed land (15 ha [37 ac]), and developed land (18 ha [44 ac]). These cover types are shown in Figure 4 and described in greater detail by LaGory et al. (2006).

Four areas on NBAFS support natural communities that are considered rare in the State (Figure 5). These rare natural communities include the black gum–red maple basin swamp (State rank S1S2), the Appalachian oak–pine rocky ridge communities (State rank S3), the red oak–black birch wooded talus community (State rank S3S4), and the dry Appalachian oak–hickory forest community (State rank S1S3). These communities are described by LaGory et al. (2006). LaGory et al. (1997) identified and described seven rare natural communities on NBAFS on the basis of the rare natural communities identified and described by Sperduto (1994); however, since that report was prepared, NHNHBB has published a description of the natural communities of New Hampshire that employs a different classification scheme (Sperduto and Nichols 2004). Several communities called “rare” by LaGory et al. (1997) are now tracked by the NHNHBB at the ecological system level and may or may not contain rare natural communities (Sperduto 2005). These include communities identified by LaGory et al. (1997) as the (1) coastal/southern dwarf shrub bog and acidic fen (now tracked as a medium-level fen system by Sperduto (2004); (2) hardwood-conifer basin swamp and coastal/southern dwarf shrub bog (now tracked as a poor-level fen/bog system); and (3) coastal/southern acidic fen (now tracked as a medium-level fen system).

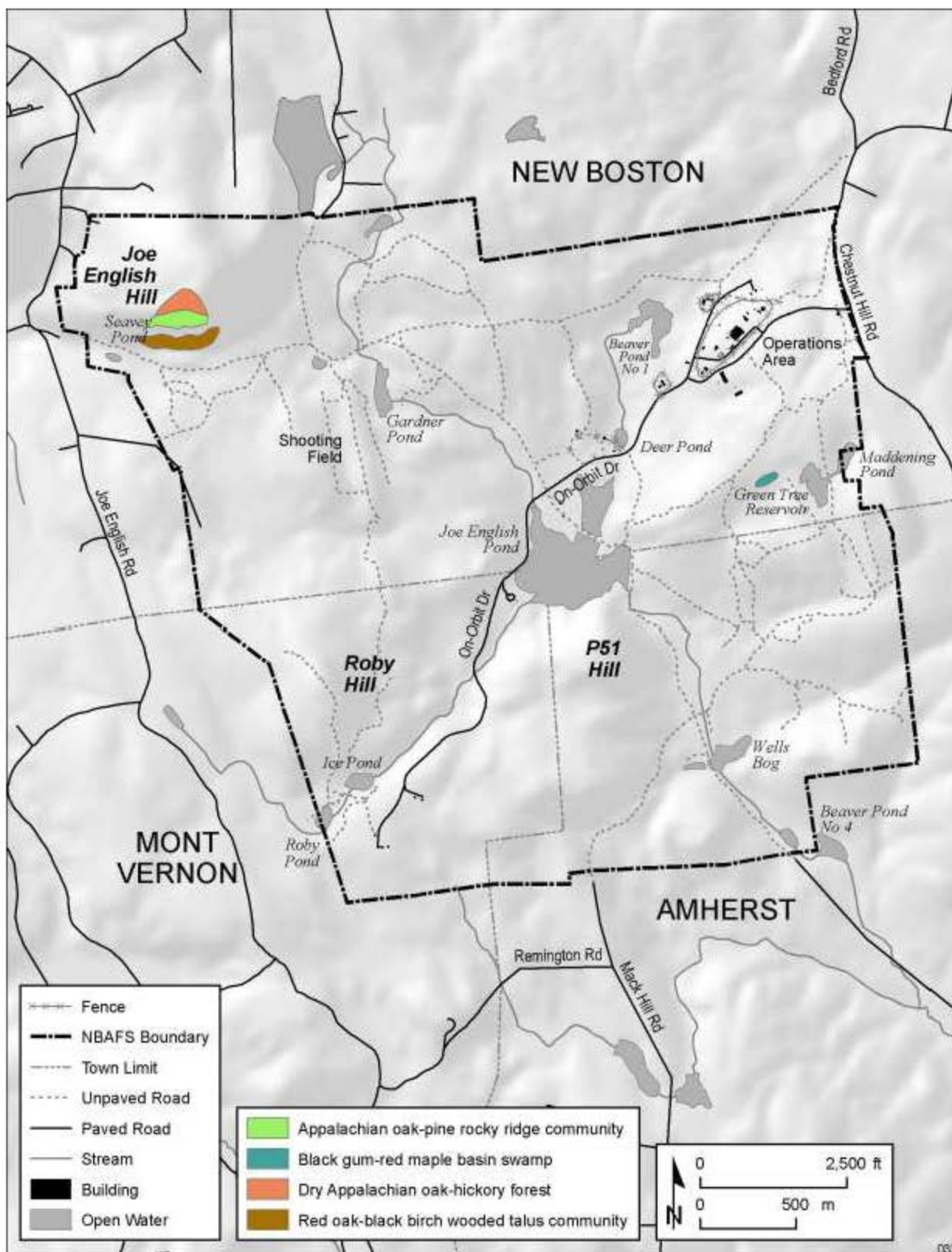
A total of 228 wetlands were identified by PES (1996) that represented a variety of wetland types<sup>5</sup> including forested, emergent, scrub-shrub, open water, riverine, lacustrine, and mixed wetland types (Figure 6). Wetland types differ in hydrology, soils, and plant species composition. Wetland species on NBAFS include cattail (*Typha latifolia*), sedges (*Carex* spp.), rushes (*Juncus* spp.), Virginia chain fern (*Woodwardia virginica*), pitcher plant (*Sarracenia purpurea*), meadowsweet (*Spiraea alba*), boneset (*Eupatorium perfoliatum*), button-bush (*Cephalanthus occidentalis*), leatherleaf (*Chamaedaphne calyculata*), sphagnum moss

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<sup>5</sup> Definitions of wetland types are provided by Cowardin et al. (1979).



**Figure 4. Cover Types of New Boston Air Force Station, New Hampshire.**  
Source: LaGory et al. (1997).



**Figure 5. Location of Rare Natural Communities on New Boston Air Force Station, New Hampshire.**



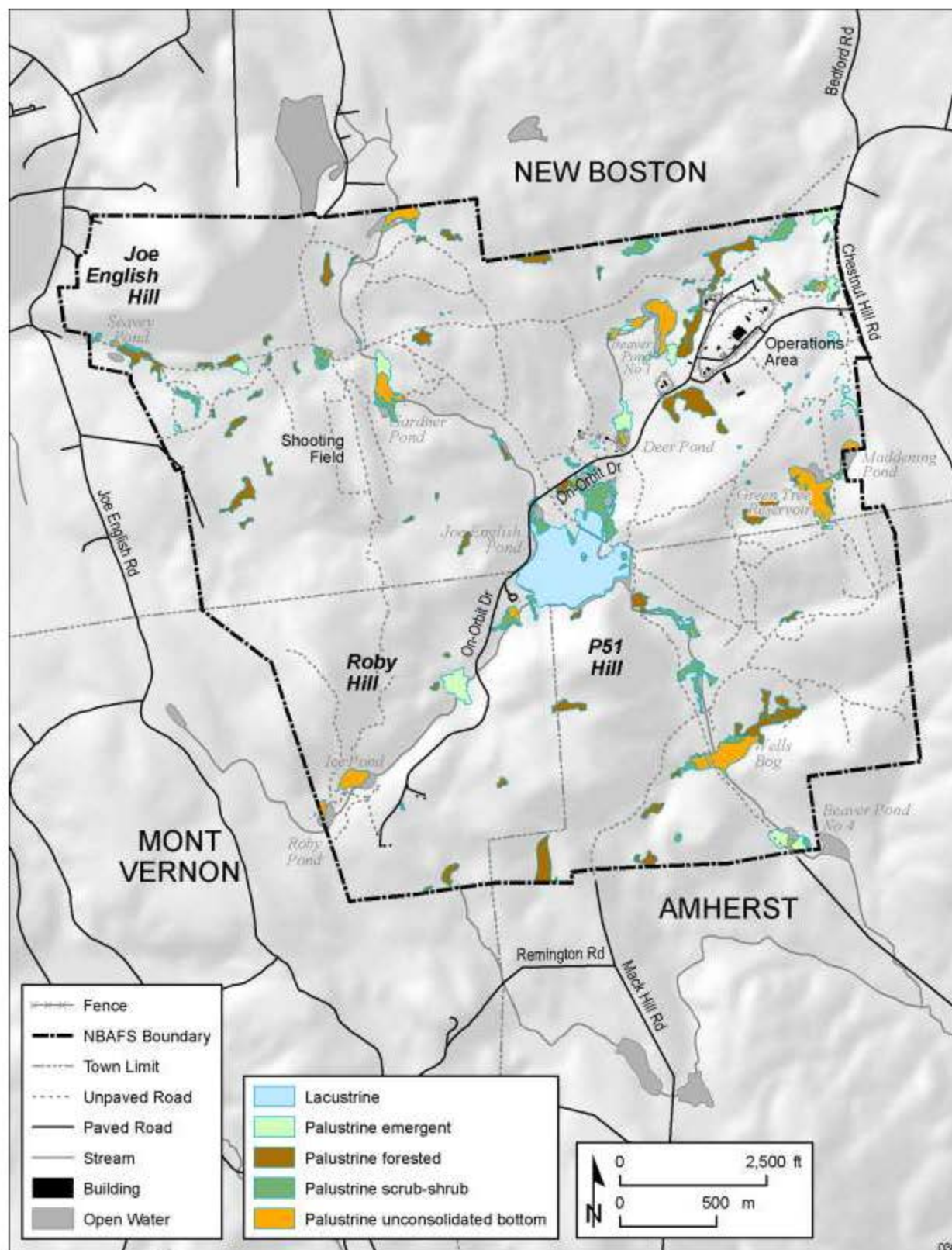


Figure 6. Wetlands of New Boston Air Force Station, New Hampshire. Source: PES (1996).

(*Sphagnum* spp.), sweet gale (*Myrica gale*), three-way sedge (*Dulichium arundinaceum*), red maple, and black gum. Wetland monitoring has been conducted on NBAFS annually since 2003 to determine current conditions, existing disturbance, and potential threats.

At least nine species of fish occur at NBAFS. The most important fish habitat on the station is provided by Joe English Pond, which supports a warmwater fishery. Aquatic surveys of Joe English Pond have not been conducted recently and are currently precluded by the presence of UXO in the pond sediments. Until recently, the pond was managed to support a recreational fishery (Najjar 1998). Fish species known to occur in Joe English Pond include American eel (*Anguilla rostrata*), brook trout (*Salvelinus fontinalis*), rainbow trout (*Oncorhynchus mykiss*), chain pickerel (*Esox niger*), golden shiner (*Notemigonus crysoleucas*), brown bullhead (*Ameiurus nebulosus*), largemouth bass (*Micropterus salmoides*), pumpkinseed (*Lepomis gibbosus*), and yellow perch (*Perca flavescens*). Brook trout and rainbow trout were stocked annually for a number of years, but stocking ceased when the pond was placed off limits to fishing in 1998. Rainbow trout and brook trout also have been stocked in Ice and Roby Ponds to provide an early spring fishery (PES 1995). Brook trout have also been stocked in Joe English Brook in the spring; however, summer water temperatures approach upper lethal limits for that species (PES 1995). Little information is available on the aquatic biota of other ponds and streams on NBAFS. Because most streams are intermittent and lack flowing water during most dry summer months, fish assemblages are limited.

Wildlife species on the station are apparently typical for the region. A total of 147 species of birds have been observed on NBAFS, with 109 of these species being neotropical migrants. The most common species on the station include Canada goose (*Branta canadensis*), broad-winged hawk (*Buteo platypterus*), tree swallow (*Tachycineta bicolor*), black-capped chickadee (*Parus atricapillus*), blue jay (*Cyanocitta cristata*), American crow (*Corvus brachyrhynchos*), American robin (*Turdus migratorius*), cedar waxwing (*Bombycilla cedrorum*), dark-eyed junco (*Junco hyemalis*), and common grackle (*Quiscalus quiscula*). At least 58 bird species breed on NBAFS, and 42 of these are neotropical migrants. The largest numbers of bird species have been observed in wetlands, parkland (e.g., Joe English Pond Campground), mature mixed forest, and mature deciduous forest; more than 80 species have been observed in each of these habitats. The fewest species were observed in developed, disturbed, and young coniferous forest; fewer than 50 species have been observed in each of these habitats (LaGory et al. 1997).

Twenty-eight mammal species have been observed on NBAFS. The eastern chipmunk (*Tamias striatus*), red squirrel (*Tamiasciurus hudsonicus*), coyote (*Canis latrans*), and white-tailed deer (*Odocoileus virginianus*) are abundant, while the woodchuck (*Marmota monax*), red-backed vole (*Clethrionomys gapperi*), porcupine (*Erethizon dorsatum*), red fox (*Vulpes fulva*), and fisher (*Martes pennanti*) are common. Among the 22 species of reptiles and amphibians observed on NBAFS, the most abundant species include the red-backed salamander (*Plethodon cinereus*), red-spotted newt (*Notophthalmus viridescens*), spring peeper (*Pseudacris crucifer*), wood frog (*Rana sylvatica*), pickerel frog (*Rana palustris*), painted turtle (*Chrysemys picta*), and garter snake (*Thamnophis sirtalis*) (LaGory et al. 1997).

**Table 3. Federally Listed, State-Listed, and Rare Species of Plants and Animals Found on New Boston Air Force Station, New Hampshire.**

| Common Name                     | Scientific Name                                       | Federal Status <sup>a</sup> | State Status <sup>a</sup> | State Rank <sup>b</sup> | Habitat and Location                                                                                  | Number of Observations on NBAFS <sup>c</sup> |
|---------------------------------|-------------------------------------------------------|-----------------------------|---------------------------|-------------------------|-------------------------------------------------------------------------------------------------------|----------------------------------------------|
| <b>Plants</b>                   |                                                       |                             |                           |                         |                                                                                                       |                                              |
| Fern-leaved false-foxglove      | <i>Aureolaria pedicularia</i> var. <i>intercedens</i> | NL                          | LE                        | S1                      | Dry upland woods with open canopy. Joe English Hill; near Gardner Pond, Joe English Pond, Wells Bog.  | >600                                         |
| <b>Moths</b>                    |                                                       |                             |                           |                         |                                                                                                       |                                              |
| Blueberry swallow               | <i>Apharetra purpurea</i>                             | NL                          | NL                        | S2                      | Open forest. Joe English Hill.                                                                        | 1                                            |
| Orange-spotted idia             | <i>Idia diminuendis</i>                               | NL                          | NL                        | S2S4                    | Open forest. Joe English Hill.                                                                        | 1                                            |
| <b>Butterflies and Skippers</b> |                                                       |                             |                           |                         |                                                                                                       |                                              |
| Appalachian brown               | <i>Satyrodes appalachia</i>                           | NL                          | NL                        | S1?                     | Sedge-dominated wetlands and adjacent forest. Joe English Pond, Murphy Swamp.                         | 18                                           |
| Delaware skipper                | <i>Anatrytone logan</i>                               | NL                          | NL                        | S3S4                    | Wetland habitat. Murphy Swamp.                                                                        | 1                                            |
| Mulberry wing                   | <i>Poanes massasoit</i>                               | NL                          | NL                        | S1S3                    | Sedge-dominated wetlands. Joe English Pond.                                                           | 4                                            |
| Little glassywing               | <i>Pompeius verna</i>                                 | NL                          | NL                        | SU                      | Wetland habitats near shaded woodland edges. Wells Bog.                                               | 2                                            |
| <b>Reptiles</b>                 |                                                       |                             |                           |                         |                                                                                                       |                                              |
| Spotted turtle                  | <i>Clemmys guttata</i>                                | NL                          | NL                        | S3                      | Small, shallow wetlands. Near Joe English Pond.                                                       | 1                                            |
| Wood turtle                     | <i>Glyptemys insculpta</i>                            | NL                          | NL                        | S3                      | Slow-moving streams. Near northern boundary of NBAFS.                                                 | 1                                            |
| Blanding's turtle               | <i>Emydoidea blandingii</i>                           | NL                          | NL                        | S3                      | Variety of wetland habitats. Northeastern portion of NBAFS. Breeds on site.                           | 48                                           |
| Eastern hognose snake           | <i>Heterodon platirhinos</i>                          | NL                          | LT                        | S3                      | Woodlands with sandy soils. Along Campbell Road, near borrow pit and Boresight Tower. Breeds on site. | 12                                           |
| <b>Birds<sup>d</sup></b>        |                                                       |                             |                           |                         |                                                                                                       |                                              |
| Pied-billed grebe               | <i>Podilymbus podiceps</i>                            | NL                          | LE                        | S1B                     | Large wetlands with emergent vegetation. Roby Pond, Joe English Pond. Possibly breeds on site.        | 10                                           |

**Table 3 (Cont.)**

| Common Name         | Scientific Name                 | Federal Status <sup>a</sup> | State Status <sup>a</sup> | State Rank <sup>b</sup> | Habitat and Location                                                                                                                       | Number of Observations on NBAFS <sup>c</sup> |
|---------------------|---------------------------------|-----------------------------|---------------------------|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| American bittern    | <i>Botaurus lentiginosus</i>    | NL                          | NL                        | S3B                     | Marshes with tall emergent vegetation. Joe English Pond and marsh north of Operations Area. Possibly breeds on site.                       | 3                                            |
| Osprey              | <i>Pandion haliaetus</i>        | NL                          | LT                        | S2B                     | Large water bodies with abundant fish. Joe English Pond, Green Tree Reservoir, over Joe English Hill. Non-breeding resident and transient. | 58                                           |
| Bald eagle          | <i>Haliaeetus leucocephalus</i> | LT                          | LE                        | S1                      | Large water bodies. Joe English Pond over Joe English Hill. Transient.                                                                     | 6                                            |
| Northern harrier    | <i>Circus cyaneus</i>           | NL                          | LE                        | S2B                     | Open habitats such as wetlands and oldfields. Over Joe English Hill. Transient.                                                            | 8                                            |
| Cooper's hawk       | <i>Accipiter cooperii</i>       | NL                          | LT                        | S2B                     | Woodlands. Near Joe English Pond, over Joe English Hill. Possibly breeds on site.                                                          | 14                                           |
| Northern goshawk    | <i>Accipiter gentilis</i>       | NL                          | NL                        | S3                      | Extensive forests with large trees. Nested on Roby Hill, over Joe English Hill. Breeds on site.                                            | 16                                           |
| Whip-poor-will      | <i>Caprimulgus vociferus</i>    | NL                          | NL                        | S3B                     | Open dry woods near openings. Wooded areas near Operations Area and north of Joe English Pond. Breeds on site.                             | 23                                           |
| <b>Mammals</b>      |                                 |                             |                           |                         |                                                                                                                                            |                                              |
| Eastern pipistrelle | <i>Pipistrellus subflavus</i>   | NL                          | NL                        | S1N, SUB                | Roost areas poorly known. North of Operations Area, near Joe English Hill. Possibly breeds on site.                                        | 4                                            |
| Small-footed bat    | <i>Myotis leibii</i>            | NL                          | LE                        | S1                      | Roosts near rock outcroppings. Near Joe English Hill. Possibly breeds on site.                                                             | 2                                            |

Source: LaGory et al. (2006).

<sup>a</sup> LE = listed as endangered; LT = listed as threatened; NL = not listed.

<sup>b</sup> State Rank Codes: S1 = Critically imperiled because of extreme rarity (5 or fewer occurrences, or very few remaining individuals), or because of some factor of its biology making it especially vulnerable to extinction. S2 = Imperiled because of rarity (6 to 20 occurrences), or because of other factors demonstrably making it very vulnerable to extinction throughout its range. S3 = Either very rare and local throughout its range, or found locally (even abundantly at some of its locations) in a restricted range, or vulnerable to extinction throughout its range because of other factors (in the range of 21 to 100 occurrences). S4 = Apparently secure, though it may be

**Table 3 (Cont.)**

quite rare in parts of its range, especially at the periphery. SU = Possibly in peril, but status uncertain; more information needed.

State Rank Modifiers: B = breeding status for a migratory species. N = non-breeding status for a migratory species. ? = the rank is uncertain due to insufficient information at the State or global level.

State ranks do not confer any official or legal status to a species. These ranks are assigned by the NHHNB to provide information on the population status of species within the State. State ranks are from NHHNB (2004a, 2004b).

- <sup>c</sup> Number of observations is the number of individuals encountered in surveys at NBAFS. For plants, this is estimated size of populations observed. For moths, butterflies, and skippers, this is the number of individuals collected or seen. For birds, this is the number of times individuals of the species were observed. For bats, this is the number of individuals captured with mist nets or recorded with ultrasonic detectors.
- <sup>d</sup> Some bird species found on NBAFS that are considered rare in New Hampshire only as breeders are not included in this table because they were not observed during the breeding season.

The threatened, endangered, and rare species and rare natural communities that are known to occur on NBAFS are listed in Table 3. No Federally listed plant species, or plant species proposed for listing, have been observed at NBAFS. Six populations of the State-listed endangered fern-leaved false-foxglove have been identified at the station. Most individuals occur on Joe English Hill in the northwestern portion of the station (ANL 1999), but another population occurs near Gardner Pond, on an upland slope to the northeast of Joe English Pond, and at the brow of a wooded cliff southwest of Wells Bog.

Five plant species at NBAFS are listed by the State as species of special concern (as identified in the Native Plant Protection Act, RSA 217-A), but are not listed by the State as threatened or endangered and are not considered rare in the State (LaGory et al. 1997). Plant species identified in the Native Plant Protection Act generally have secure populations within New Hampshire, but factors such as beauty, commercial value, or the potential for excessive collecting prompt their consideration as species of special concern. Species of special concern found on the station include pink lady's slipper (*Cypripedium acaule*), trailing arbutus (*Epigaea repens*), mountain laurel (*Kalmia latifolia*), rose pogonia (*Pogonia ophioglossoides*), and pitcher plant (*Sarracenia purpurea*). The protected nature of the station makes uncontrolled collection of these species by members of the public unlikely.

Several State-listed birds (bald eagle, pied-billed grebe, osprey, northern harrier, and Cooper's hawk), a State-listed snake (eastern hognose snake), and a State-listed bat (small-footed bat) have been observed on NBAFS (Table 3). The bald eagle is the only Federally listed species that has been observed on the station, but it is a transient in the area. In addition, several animal species that are listed by the New Hampshire Natural Heritage Bureau as rare have been observed. These include several moths and butterflies, spotted turtle, wood turtle, Blanding's turtle, American bittern, and eastern pipistrelle (Table 3; LaGory et al. 1997, 2002; Najjar 2005).

No critical habitat for Federally listed threatened or endangered species has been designated on NBAFS.



### 3.6 CULTURAL RESOURCES

Archaeological investigations within the Merrimack River system have documented prehistoric sites dating from the Early Archaic period (8000 to 5500 BC), with very limited evidence for sites dating from the earlier Paleo-Indian period (10500 to 8000 BC). The streams and wetlands present at NBAFS and its high natural resources potential made it a suitable location for both temporary single-purpose foraging locations and possible multicomponent campsites (i.e., sites containing evidence of several occupational periods). Two prehistoric sites and four isolated finds were recorded at NBAFS during subsurface testing (PAL 1993).

Cultural resources at NBAFS include both prehistoric and historic archaeological sites, as well as several Cold War era structures. Prehistoric resources include two sites near East Meadow Road and Wells Bog; both are remnants of temporary campsites that were used by small groups. Historic resources include 28 sites, of which 22 are classified as homesteads or farmsteads, three as rural industrial, and three that are related to civic functions (Whetsell and McLeod 2000). The two prehistoric sites and 26 of the historic sites are eligible for inclusion in the *National Register of Historic Places* (NRHP). In addition, there are six Cold War-related properties (Buildings 100, 102, 105/106, 108/109, 142/143, and the Boresight Tower) that are eligible for the NRHP, possibly as an historic district (Whetsell and McLeod 2000). To date, none of the sites has been nominated (HB&A 2004).

Protection and management of cultural resources at NBAFS are guided by an Integrated Cultural Resources Management Plan (ICRMP) (Whetsell and McLeod 2000). The ICRMP identifies measures that should be taken to protect cultural resources of the station. These measures apply to actions taken as part of this INRMP. Forest management activities and prescribed burns are designed by NBAFS Natural Resources staff to minimize or eliminate their impacts on cultural resources. The Wildland Fire Management Plan (Section 7.9) was specifically designed to recognize and minimize impacts to cultural resources sites during wildland fire management activities.

### 3.7 LAND USE, RECREATION, AND VISUAL RESOURCES

Facilities that support the satellite-tracking operations at NBAFS occupy about 17.7 ha (44 ac) of the 1,144-ha (2,826-ac) site (LaGory et al. 1997). Facilities located within the Operations Area include three enclosed satellite dish antennae, satellite-control buildings, and satellite-tracking and communications buildings. Support facilities include maintenance and administration buildings, a fire station, and storage facilities. Dormitories for enlisted personnel and several home structures are also present. Over the years, NBAFS has been restoring the remainder of the land to a natural state, while maintaining the recreational and military training uses of the station. The unimproved portions of NBAFS are not used to actively support mission operations, but military training could be conducted at any location within NBAFS (ANL 1999).

Recreational use of NBAFS is restricted primarily to active DoD staff and their families and eligible DoD retirees. Numerous active and passive outdoor recreational opportunities have been made available at NBAFS, including nature watching, fishing, swimming, camping, hiking,

rock climbing, hunting, archery, boating, cross-country skiing, ice fishing, ice skating, sledding, and snowmobiling (ANL 1990; Najjar 1998). Recreational activities have been restricted over the past several years for security reasons and because of the presence of UXO in some areas.

The Joe English Pond Campground provides the focus of most recreational activities at NBAFS. A number of primitive campsites occur around or near the northern and eastern margins of the pond. Twelve sites are equipped with drinking water and electricity to support recreational vehicles. Other campground facilities include a pavilion, office, and shower trailer. Three temporary trailer quarters are located on the west side of the pond. The largest number of visitors occurs between May and September, especially on weekends. Recreational use of Joe English Pond has been prohibited since 1998 because of safety concerns related to UXO in the pond. Prior to 1998, the pond was used for boating, fishing, and swimming. NBAFS is currently investigating options for UXO remediation, and eventual lifting of restrictions to recreational use of the pond.

The land immediately surrounding NBAFS is heavily wooded, representing some of the least developed and most rural portions of the towns of New Boston, Amherst, and Mont Vernon. The area is primarily designated for low-density residential use (USAF 2001). Single-family homes on parcels typically over 0.4 ha (1 ac), undeveloped lands, and several active farms (particularly along Chestnut Hill Road and Joe English Road) occur in the immediate vicinity of NBAFS. A computer software company is located opposite the main entrance to the station (ANL 1999).

Radomes associated with NBAFS antennas constitute the primary obstructions to views on the station. However, most of NBAFS provides a natural setting (e.g., forests, hills, wetlands, and ponds), and visual resources are considered excellent, with scenic vistas evident from the station's higher elevations. Views near Joe English Pond consist of a mix of natural landscapes and developed campground facilities including mowed lawns, landscaped areas, and some permanent, rustic campground buildings.

### **3.8 SOCIOECONOMICS**

NBAFS employs about 150 people (consisting of military, DoD civilian, or civilian contract employees; USAF 2001). Although rural in character, the three communities of New Boston, Amherst, and Mont Vernon that surround NBAFS have experienced population growth and are located within one of the most rapidly expanding residential areas of New England. Accordingly, residential development is expected to continue in the area surrounding NBAFS. The communities that surround NBAFS represent three of the most affluent communities of the State. All three are ranked in the top 25 of 234 communities in terms of median household income (USAF 2001).

## **4 ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION AND ALTERNATIVES**

Impacts of the proposed action (implementing the proposed INRMP), the existing INRMP alternative (continued implementation of the existing INRMP without modification), and the no-action alternative (NBAFS operations without an INRMP) are presented in this section. Consideration is given to impacts to air quality and noise; topography, geology, and soils; water resources; ecological resources; cultural resources; land use, recreation, and visual resources; socioeconomics; and health and safety. Direct effects (those effects caused by the action and occurring at the same time and place) and indirect effects (those effects caused by the action that occur later in time or at a distance) are considered in this section. Adverse impacts that cannot be avoided if the project is implemented, irreversible and irretrievable commitment of resources, and the relationship between short-term use and long-term productivity are discussed in Sections 4.4, 4.5, and 4.6, respectively. Cumulative impacts are presented in Section 4.7.

### **4.1 ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION**

As described in Section 2.1, the proposed action consists of implementation of the proposed INRMP (LaGory et al. 2006). The proposed INRMP includes a number of data gathering activities for important resources, development of resource management plans, recreational projects, and the integration of natural resources concerns into UXO remediation planning that are not included in the existing INRMP (Table 1). For some proposed INRMP projects (clearcutting, construction of new recreational facilities), specific activities are not fully known at this time (either in terms of activity details or the specific location where activities would occur). For these activities, the assessments are programmatic in nature, and a project-specific assessment would be prepared before the project was implemented.

The impacts of prescribed burning projects and several timber harvesting projects at NBAFS were evaluated in two recent EAs (ANL 2003 and USAF 2003, respectively). For both EAs, a Finding of No Significant Impact (FONSI) was issued. Additional prescribed burning above and beyond that evaluated in ANL (2003) is not anticipated under the proposed action, and, therefore, the conclusion regarding no significant impact is considered appropriate for the proposed action as well. The activities evaluated in the timber harvest EA included clearcutting and shelterwood cutting over a two to three year period on 60 to 80 ha (150 to 200 ac). These activities are representative of the type, rate, and intensity of activities that are proposed in the INRMP, and would differ from those in the proposed INRMP mostly in location and associated site-specific conditions.

A number of the projects in the proposed INRMP would not have any environmental impact because the projects are nondestructive data-gathering studies or plan development rather than actions that would physically disturb existing resources or ecological systems. Included in this category are the following projects whose descriptive titles appear in Table 1: TE-1.1.1, TE-1.1.2, TE-5.1.1, TE-6.1.1, WE-1.1.1, WE-1.2.1, WE-1.2.2, NC-1.1.1, NC-1.1.2, FO-1.1.1,

FO-1.1.2, OR-2.1.1, OR-2.1.2, OR-2.2.2, OR-2.3.1, RE-1.1.1, and RE-1.1.2. These projects are not evaluated further in this EA.

#### **4.1.1 Air Quality and Noise**

Localized, short-term air quality impacts could occur as a result of several proposed INRMP projects. Included would be any prescribed burning projects (TE-1.2.1, FO-1.2.1, IN-1.1.1, and potentially TE-2.2.1, TE-3.2.1, TE-4.2.1, TE-5.2.1, WE-1.2.3, NC-1.2.1, and IN-1.2.1, whose details are not yet known), all forest management projects involving timber harvests (FO-1.2.2, FO-2.1.1, and FO-2.1.2), and recreation facility construction projects (OR-1.1.1 and OR-1.1.2). None of the other projects in the proposed INRMP have the potential to impact air quality or noise.

Air quality impacts that could occur during prescribed burns include the generation of dust, engine exhaust emissions, and, particularly, smoke (ANL 2003). The potential impacts of these emissions on ambient air quality in the vicinity of NBAFS would be minor and of short duration. No violations of applicable Federal and State ambient air quality standards are expected. Prescribed burning is exempt from general conformity requirements under the Clean Air Act by 40 CFR 93.153 (c)(2) (Bernardy et al. 2003).

All prescribed fire plans at NBAFS would include project-specific smoke management guidelines (Bernardy et al. 2003). Considerations would include climatic conditions and dilution. Climatic considerations include not burning during a period of stable weather, which could restrict smoke movement.

Noise impacts would occur from the use of machinery and vehicles during fire suppression activities or prescribed fires (ANL 2003). Noise levels would be in compliance with Occupational Safety and Health Administration standards. Prescribed fires would occur mostly during daytime hours; thus, much of the noise would be masked by routine daytime noises. Also, residential areas are mostly located more than 1.6 km (1.0 mi) from prescribed fire areas. Much of the intervening areas are densely wooded, which would attenuate noise levels. Loudest noise levels would occur if helicopters were used to suppress a wildland fire from the air. Nearby local residents who are not accustomed to that kind of noise could be annoyed by helicopter operations, especially at night. However, helicopters would be used only if a wildfire was out of control and hard to suppress (Bernardy et al. 2003). Overall, noise impacts associated with implementation of the Wildland Fire Management Plan would be minor and of short duration (ANL 2003).

Localized, short-term air quality impacts that could occur during timber harvesting include the generation of fugitive dust and engine exhaust emissions (USAF 2003). Few heavy equipment engines and vehicles would be used, so total emissions would be rather small. No violations of applicable Federal and State ambient air quality standards are expected.

Noise impacts would occur from the use of machinery and vehicles during harvesting. Work would occur mostly during weekday daytime hours, thus much of the equipment noise

would be masked by background noises. Noise impacts associated with project activities would be minor and of short duration. Mitigating measures include ensuring work is scheduled during normal weekday work hours and ensuring the equipment noise controls are functional.

General conformity under the Clean Air Act, Section 176, was evaluated for the projects described in USAF (2003). The requirement of this rule were determined to be not applicable because total direct and indirect emissions from harvesting operations were estimated at 1.3 MT (1.4 tons) of nitrogen oxides (NO<sub>x</sub>) and 0.6 MT (0.7 tons) volatile organic compounds (VOCs) and are below the conformity threshold value established at 40 CFR 93.153(b) of 45.4 MT (50 tons) for ozone precursors.

Short-term negligible to minor increases in noise and fugitive dust could occur during construction of an interpretive trail around Joe English Pond and a handicapped-accessible boat ramp at Joe English Pond. Exposed soils would be minimized during construction to reduce fugitive dust production and vegetation cover, or other stable surface covering would be established immediately after project completion. Noise could be produced by equipment during construction, but any impacts would be limited by using only vehicles with working mufflers. Impacts for both projects would be further evaluated in project-specific assessments, but impacts to air quality and noise are expected to be minor and temporary.

#### **4.1.2 Topography, Geology, and Soils**

The proposed action would not affect the topography or geology of NBAFS. However, relatively minor impacts to soils could result from prescribed burning and timber harvesting projects listed in Section 4.1.1. Impacts to soils could also result from several recreational projects involving construction (OR-1.1.1 [establishment of an interpretive trail around Joe English Pond] and OR-1.1.2 [construction of a handicapped-accessible boat ramp on Joe English Pond]). No other projects are expected to affect soils on NBAFS.

Soil compaction could take place through the creation of firebreaks from the use of vegetation removal equipment (ANL 2003). Soil protection would be considered during all fire management activities. Prescribed fires would be planned to ensure soils are not intentionally damaged by extreme heat. Preference would be given to using natural and man-made firebreaks. Firebreaks constructed during wildfires and prescribed fires would be rehabilitated to ensure erosion does not occur (Bernardy et al. 2003). Post-fire rainstorms have the potential to severely erode burned slopes, depending on fire and storm intensity, time since the fire, and availability of erodible soil (Wondzell 2001). Smaller, less intense fires would lessen erosion potential over the long term (ANL 2003). Following the reestablishment of herbaceous vegetation, wind and water erosion would be reduced.

Erosion could result from timber harvest projects, but would be minimized by following established State best management practices for erosion control (Cullen 2001). Erosion-control measures would include the use of erosion fences, hay bales, geotextile fabric, sediment basins, and revegetation (USAF 2003). Timber landing areas would be located adjacent to a graveled surface to minimize soils disturbance. Refueling would take place in landing areas, and the

potential for impacts from fuel spills would be minimized by using spill kits. Vehicles and other equipment would be required to be clean and operating properly (e.g., no fuel or hydraulic leaks and motors reasonably clean of excess grease) to prevent leaks. Fuel oil and petroleum storage tanks would be surrounded by appropriately sized earthen berms to contain any spills or leaks. In the event of a spill or leak, response would be in accordance with established USAF and State regulations. Overall, the impact of timber harvests would vary according to site-specific conditions (soil types, slope, subcanopy vegetation cover) and the nature of the planned harvest (e.g., clearcuts, thinning, regeneration cuts). Impacts of projects not covered in USAF (2003) would be further evaluated in project-specific assessments.

Soils would be disturbed during construction of an interpretive trail along Joe English Pond. The potential for impact would vary depending on soil type, slope, and construction method, especially the degree of soil disturbance. Standard erosion-control methods would be used during construction, and the trail surface would be stabilized and drainage managed to minimize runoff and erosion. Soils would also be disturbed during the construction of a handicapped-accessible boat ramp at Joe English Pond, and, too, would depend on site-specific conditions and project-specific design and construction methods. Impacts for both projects would be further evaluated in project-specific assessments, but impacts to soils are expected to be minor and temporary.

#### **4.1.3 Water Resources**

Relatively minor impacts to surface water quality could result from the prescribed burning and timber harvesting projects listed in Section 4.1.1. Impacts to surface water quality could also result from several recreational projects involving construction (Project OR-1.1.1 [establishment of an interpretive trail around Joe English Pond] and Project OR-1.1.2 [construction of a handicapped-accessible boat ramp on Joe English Pond]), wetland restoration (Project WE-1.2.3), and invasive species control (Project IN-1.1.1). No other projects are expected to affect surface waters on NBAFS, and no impacts to surface water supplies or groundwater resources are anticipated for any proposed INRMP projects.

Surface runoff would increase following prescribed fires because of the loss of vegetation and surface litter (ANL 2003). Intermittent and perennial streams could experience greater peak flows and increases in turbidity and sedimentation. Overland flows would increase until vegetation is reestablished. In the long term, there would be an increase in infiltration because of the increase in herbaceous cover, resulting in a reduction of overland flow. Overall, the effects of a prescribed fire on surface waters would be less than those expected from larger wildfires. The greatest risks are posed by ground-disturbing activities, rather than the prescribed burn (Wondzell 2001).

Localized minor to negligible increases in turbidity and sedimentation of surface waters could occur in the vicinity of timber harvests (USAF 2003). These impacts would result from runoff from exposed soils, particularly during inclement weather, but required erosion-control practices and seasonal timing would mitigate potentially adverse impacts. The potential for fuel spills would be minimized through preventative actions and approved spill response procedures.

No long-term degradation in water resources is expected to result from timber harvests. Overall, the impact of timber harvests would vary according to site-specific conditions (soil types, slope, subcanopy vegetation cover) and the nature of the planned harvest (e.g., clearcuts, thinning, regeneration cuts). Impacts of projects not covered in USAF (2003) would be further evaluated in project-specific assessments.

Surface water quality in Joe English Pond could be affected by runoff of eroded sediment during construction of an interpretive trail along the pond (Project OR-1.1.1). Standard erosion-control methods would be used during construction, and the trail surface would be stabilized and drainage managed to minimize runoff and erosion. Barriers would be placed to ensure sediment does not run off into the pond. Water quality could also be affected by construction of a handicapped-accessible boat ramp at Joe English Pond (OR-1.1.2), and would depend on site-specific conditions and project-specific design and construction methods. Impacts for both projects would be further evaluated in project-specific assessments, but impacts to water quality are expected to be minor and temporary.

Wetland restoration activities (Project WE-1.2.3) would be implemented pending the outcome of Projects WE-1.2.1 and WE-1.2.2. These two projects would evaluate the effects of erosion on NBAFS wetlands and the potential for restoration of degraded wetlands. At this time, it is not clear what restoration activities would be required, but restoration projects would be designed to minimize impacts to water quality during the restoration process and to maximize the long-term benefit of restoration. The impacts of restoration activities would be evaluated in project-specific assessments, but impacts to water quality are expected to be minor and temporary during restoration, and produce long-term improvements to water quality.

Invasive species control has the potential to affect surface water quality, but exclusive use of EPA-approved herbicides by registered applicators, avoidance of herbicide application near surface water bodies, and use of only those herbicides approved for use near water bodies when activities are necessary in those locations (e.g., Japanese knotweed control) would minimize the potential for impacts to surface waters. In the long-term, invasive species control could improve water quality if nonnative plant species were replaced by native plants adapted to the region.

#### **4.1.4 Ecological Resources**

Relatively minor impacts to ecological resources could result from the prescribed burning and timber harvesting projects listed in Section 4.1.1. Impacts to ecological resources could also result from several recreational projects involving construction (Project OR-1.1.1 [establishment of an interpretive trail around Joe English Pond] and Project OR-1.1.2 [construction of a handicapped-accessible boat ramp on Joe English Pond]), trout stocking (Project OR-2.2.1), wetland restoration (Project WE-1.2.3), invasive species control (Project IN-1.1.1), and projects involving capture, handling, and radiotelemetry of animals (Projects TE-2.1.1 [bats], TE-3.1.1 [Blanding's turtles], TE-4.1.1 [eastern hognose snake], and TE-4.1.2 [eastern hognose snake]). No other proposed INRMP projects are expected to directly affect ecological resources on NBAFS because they relate to nondestructive data gathering or development of management

plans. These projects could ultimately result in an overall benefit to ecological resources if increased knowledge was used to improve conditions on the station or avoid impacts.

#### **4.1.4.1 Impacts of Prescribed Burning Projects**

Prescribed burning at NBAFS is intended to improve conditions for fire-adapted species and communities, control invasive nonnative species, and reduce the likelihood of catastrophic fire by managing fuel loads. These intended effects are generally considered ecological benefits. About 20 to 40 ha (50 to 100 ac) of vegetation would be burned on NBAFS annually by prescribed fires. Plant species composition following prescribed burns is expected to be an assemblage of many of the species that were growing on the site and represented in the seed bank at the time of the fire (ANL 2003). Plant communities in the first few years after a fire are comprised of individual plants that survived the fire intact, grow from sprouts or suckers that grow from the base or buried portions of top-killed plants, and establish from seeds (Brown and Smith 2000). Regular prescribed burning as proposed would result in a shift to more fire-adapted native species.

Impacts of fire on animals may include injury, mortality, immigration, or emigration (ANL 2003). During a burn, most small mammals seek refuge underground or in sheltered places within the burn, while large mammals must find a safe location in unburned patches within the fire perimeter or outside the burn area. Animals with limited mobility are more vulnerable to injury and mortality than more mobile animals (e.g., young are generally more susceptible than mature animals). Animals that are dormant or aestivating underground are generally well protected from direct fire effects (Smith 2000). Most nonburrowing mammals and birds leave their habitat while it is burning, but many return within hours or days. Others emigrate because the food and cover they require are not available in the burned area. Fires can have short-term adverse effects on bats through loss of roosting and foraging habitat that can lead to starvation or increased predation and exposure to the elements (BCI 2001). Vulnerability of invertebrates to fire depends on their location (e.g., on plants, soil surface, or burrows) and mobility (Smith 2000).

Season of burning is important to birds in two ways: (1) fire during the nesting season may reduce populations more than during other seasons (mortality would primarily occur to eggs, nestlings, and fledglings); and (2) migratory species may be affected only indirectly, or not at all, by burns that occur before or just after their arrival in spring or after their departure in fall (Smith 2000). Therefore, prescribed fires conducted between mid-April and mid-September would be most likely to adversely impact birds, especially the neotropical migrants that breed on NBAFS. However, the number and diversity of birds and other wildlife on NBAFS suggest that past wildfires and prescribed burns have had minimal adverse impacts on wildlife.

Fires often cause short-term increases in wildlife foods that contribute to increases in populations of some animals such as predators and scavengers (ANL 2003). However, these increases are moderated by the animals' ability to thrive in the altered, often simplified, structure of the post-fire environment (Smith 2000). Stand-replacing fires reduce habitat quality for species that require dense cover and improve it for species that prefer open sites. Population



explosions of wood-boring insects can be associated with fire-killed trees, which provide an important food source for insect predators and insect-eating birds. Woodpecker populations generally increase after fires if snags are available for nesting. Secondary cavity nesters, both birds and mammals, take advantage of the nest sites prepared by primary excavators (Smith 2000). Fires generally favor raptors by reducing hiding cover and exposing prey. Small carnivores respond to fire effects on small mammal populations (either positive or negative). Large carnivores and omnivores are opportunistic species with large home ranges. Their populations change little in response to fire, but they tend to thrive in areas where their preferred prey is most plentiful, often in recent burns (Smith 2000).

Prescribed burns could have short-term adverse impacts on threatened, endangered, and rare species on NBAFS, but are expected to result in long-term benefits through improvement in ecological conditions. The following bulleted items summarize anticipated impacts for each species group. No other threatened, endangered, or rare species are expected to be impacted by prescribed burning because they do not use forested habitats or they are transients through the area.

- The association of the fern-leaved false-foxglove with sites with known fire histories suggests that fire may play a role in the creation and maintenance of appropriate habitat and this habitat benefit is the specific objective of Project TE-1.1.1.
- Because they are fire-adapted, the rare natural communities on NBAFS are expected to benefit from prescribed burning by maintaining appropriate species composition and habitat structure.
- Some mortality of the rare moths, butterflies, and skippers that occur on NBAFS (especially their larvae) could occur, but long-term improvements in habitat conditions are anticipated.
- Fire could kill individual eastern hognose snakes, Blanding's turtles, spotted turtles, or wood turtles if they were unable to find shelter or escape from the fire, but long-term improvements in habitat conditions are anticipated.
- Habitats used by the State-listed Cooper's hawk and the rare northern goshawk and whip-poor-will could be affected by prescribed burns, but individual adult birds are expected to easily avoid injury by moving away from the fire. Set-back restrictions for raptor nests would prevent impacts to nests and young, but whip-poor-will nests could be damaged or destroyed by fire. Long-term habitat improvements are expected for these bird species.
- Fire or smoke could potentially impact the State-listed small-footed bat and the rare eastern pipistrelle or their habitats. However, impacts to these species would be negligible over the long term, as only limited areas would be burned annually in comparison to the amount of suitable habitat available on the station. In addition, habitat conditions for bats would improve as a result of the proposed action (e.g., through the creation of new roosts, opening of foraging areas and travel corridors, and, in some cases, increases in prey diversity and density (BCI 2001).

Surface runoff and sedimentation would increase after fires and could impact nearby aquatic habitats or wetlands. Vehicle use could result in damage to aquatic habitats and wetlands.

For example, ruts could cause localized changes in the hydrologic flow of a wetland, but these habitats would be specifically avoided during burning operations. Only negligible impacts to fish and other aquatic biota would be expected from the pumping and removal of water for use in wildland-fire and prescribed-fire suppression.

#### **4.1.4.2 Impacts of Timber Harvest Projects**

Impacts to ecological resources resulting from timber harvest activities would be limited primarily to the immediate harvest area (USAF 2003) and would depend on site-specific conditions and ecological resources in the project area. These factors would be considered in timber harvest planning and would be evaluated in project-specific environmental assessments. The following text describes in general the types of impacts that can be anticipated. These impact descriptions are summarized from the recent timber harvest EA (USAF 2003).

Timber harvest would create dust and other particulates, which could affect adjacent vegetation, but these emissions would be produced over a short period of time, and would be confined to a limited area near active harvesting (USAF 2003). Plant communities would be intentionally modified by timber harvests to improve overall ecological conditions on the station. Mature trees would be removed from patch clear-cut, shelterwood, and thinning areas. Forest regeneration would be expected during the following growing season from root suckers, coppice, and by natural seeding. Species composition would be expected to change to species adapted to higher light levels on the forest floor. Species composition of thinned forests is not expected to change. Residual trees would be expected to increase crown width and height as more growing space becomes available.

Timber harvest projects are designed and expected to have a net positive effect on wildlife species that utilize understory regeneration and small forest openings (USAF 2003). Examples of these species include ruffed grouse, white-tailed deer, moose, rufous-sided towhee, and several bat species. Harvests that create small forest openings may foster the development of suitable bat roosting and foraging habitat. Bat roost trees would be protected during harvesting by ensuring large dead and damaged trees are preserved and additional mature trees are available for future roost trees. The greatest bat activity occurs along edges between intact forest and cut areas (BCI 2001). Wildlife adapted to mature forest (e.g., red squirrel, red-eyed vireo) would be dislocated to adjacent mature forest on NBAFS. No major population impacts are expected to occur to wildlife that use mature forest because the majority of the forest at NBAFS is in a mature stage.

Wildlife (including threatened, endangered, and rare species and neo-tropical migrant birds) in the immediate vicinity of timber harvest areas could be disturbed during harvesting by the noise and visual disturbance caused by equipment and personnel (USAF 2003). Only a few individuals of the less mobile species (e.g., amphibians, reptiles, and small mammals) in harvest areas would potentially be destroyed. More mobile species (birds, bats, larger mammals) would avoid the area during the hours when activities were occurring. Most impacts including unintentional take of migratory birds would be prevented by enforcement of seasonal exclusions. Timber harvests would not be allowed during local nesting season dates (1 April to 15 July for

songbirds). These dates also include the most active periods for other species. Raptor nests would be protected by creating a no-harvest buffer within 328 ft (100 m) of nests during the nesting season (1 February to 15 July). Any impacts that would occur are expected to be minor, and would not jeopardize the survival of any of these species at NBAFS (USAF 2003).

Impacts of timber harvests on aquatic and wetland habitats and biota are expected to be temporary, minor, and indirect through sedimentation and runoff (USAF 2003). All timber harvests would follow State-recommended best management practices to reduce erosion (Cullen 2001), and any activities adjacent to or in wetland areas would be required to follow State law governing those activities (RSA Title XIX Section 227-J:6). No direct impacts (e.g., dredge or fill activities) to jurisdictional wetlands would occur.

#### **4.1.4.3 Impacts of Other Projects**

Ecological resources could be affected during construction of an interpretive trail and a handicapped-accessible boat ramp adjacent to Joe English Pond (Projects OR-1.1.1 and OR-1.1.2). Some herbaceous and shrub vegetation would be destroyed during construction of these facilities (within the project footprints), but no trees would be removed. Some excavation would almost certainly occur during boat ramp construction, but project design would intentionally minimize the amount of necessary disturbance. Standard erosion-control methods would be used during construction, and the disturbed soil surfaces would be stabilized and drainage managed to minimize runoff and erosion of soils. Barriers would be placed to ensure sediment does not run off into Joe English Pond and affect aquatic and wetland species. A few animals would likely be destroyed or displaced during construction, but neither project is expected to affect the population size or habitat carrying capacity for any species. No threatened, endangered, or rare species are expected to be affected by either project. Overall, the magnitude of impacts would depend on site-specific conditions and project-specific design and construction methods. Impacts for both projects would be further evaluated in project-specific assessments, but impacts to ecological resources are expected to be minor and temporary.

Wetland restoration activities (Project WE-1.2.3) would be implemented pending the outcome of Project WE-1.2.1 and WE-1.2.2. These two projects would evaluate the effects of erosion on NBAFS wetlands and the potential for restoration of degraded wetlands. At this time, it is not clear what restoration activities would be required, but restoration projects would be designed to minimize impacts to undisturbed portions of wetlands during the restoration process and to maximize the long-term benefit of restoration. A few animals would likely be destroyed or displaced during restoration activities, but restoration is not expected to adversely affect the population size or habitat carrying capacity for any species. No dredge or fill activities requiring a permit would be conducted as part of restoration activities. The impacts of restoration would be evaluated in a project-specific assessment, but impacts to ecological resources are expected to be minor and temporary during restoration, and produce long-term improvements for wetland species.

Studies that would involve the handling of individual animals (Projects TE-2.1.1 [bats], TE-3.1.1 [Blanding's turtles], TE-4.1.1 [eastern hognose snake], and TE-4.1.2 [eastern hognose

snake]) have a limited potential to adversely affect those individuals through injury or accidental death. Impacts are expected to be negligible, however, because all activities would (1) follow strict safe-handling guidelines, (2) follow recommendations for transmitter weight to body weight ratios, (3) be overseen by NHDFG, and (4) require a collection permit from this agency. The number of individuals anticipated to be involved would be relatively small and would not be large enough to affect local populations. Overall benefits to these species are anticipated because of the knowledge gained from planned studies and incorporation of this knowledge into management plans.

Invasive species control has the potential to affect ecological resources because target and some nontarget plants would be destroyed, but exclusive use of EPA-approved herbicides by registered applicators, avoidance of herbicide application near aquatic systems, and use of only those herbicides approved for use near aquatic systems when activities are necessary in those locations (e.g., Japanese knotweed control) would minimize the potential for adverse impacts. In the long term, invasive species control could improve ecological conditions if nonnative plant species were replaced by native plants adapted to the region.

Stocking of rainbow and brook trout in Roby Pond, Ice Pond, Deer Pond, and Joe English Brook would continue under the proposed action, and is not expected to have a significant adverse effect on these or other aquatic systems on or off the station.

#### **4.1.5 Cultural Resources**

Relatively minor impacts to cultural resources could result from the prescribed burning and timber harvesting projects listed in Section 4.1.1. Impacts to cultural resources could also result from several recreational projects involving construction (Project OR-1.1.1 [establishment of an interpretive trail around Joe English Pond] and Project OR-1.1.2 [construction of a handicapped-accessible boat ramp on Joe English Pond]). No other proposed INRMP projects are expected to affect cultural resources on NBAFS.

To date, prescribed fires that have been conducted at NBAFS have avoided all eligible cultural resources (ANL 2003). Similarly, future prescribed burning activities are not expected to impact any known cultural resources. All actions that could impact any site potentially eligible for nomination to the NRHP would have to comply with Section 106 requirements of the NHPA (Bernardy et al. 2003). Firebreak construction would avoid known archeological sites at all times. Unanticipated finds would be reported to the installation's Natural Resources Manager. Archeological sites in prescribed fire areas would be prepared to ensure no significant fuels exist that could damage subsurface resources. Procedures outlined in the Integrated Cultural Resources Management Plan would be followed (Bernardy et al. 2003).

Impacts to cultural resources from a prescribed fire could occur from the fire itself and from suppression activities that may result in surface disturbance (ANL 2003). Fire is most likely to impact historic structures that have aboveground features susceptible to burning or contain organic materials that might burn even if buried. Suppression activities, such as clearing of fire lines, could disturb sites located on the surface or below the surface (BLM 1999). The greatest risk of impacts on cultural resources from a wildfire would be from damage or destruction of historical structures. Other potential impacts to cultural resources could result from intense burning of the soils near buried artifacts or erosion resulting until revegetation of an area occurs after a burn. All historic structures at NBAFS are within the Operations Area, and no prescribed fires are planned there. If an unexpected discovery of cultural resources is made, work would cease immediately and the NBAFS Natural Resources Manager would be contacted (Bernardy et al. 2003).

Proposed timber harvests also could affect cultural resources, but steps would be taken to avoid harvest activities near any known resources (USAF 2003). Earth-disturbing activities and the use of heavy equipment could potentially encounter previously undiscovered cultural resources. However, if cultural resources are unexpectedly encountered during the harvest operations, activities would cease in the immediate area of the discovery until permission to resume work is given by NBAFS.

Once specific future clearcut and recreational facility construction plans are made, their impacts to cultural resources would be further evaluated in project-specific assessments and in consultation with the State Historic Preservation Office.

#### **4.1.6 Land Use, Recreation, and Visual Resources**

Relatively minor impacts to land use, recreation, and visual resources could result from the prescribed burning and timber harvesting projects listed in Section 4.1.1. Impacts to these resources could also result from several recreational projects involving construction (Project OR-1.1.1 [establishment of an interpretive trail around Joe English Pond] and Project OR-1.1.2 [construction of a handicapped-accessible boat ramp on Joe English Pond]). Data-gathering projects (Projects OR-2-1-1 and OR-2.1.2), trout stocking (Project OR-2-2-1), and a determination of sustainable patterns of recreational use (Project OR-2.3.1) should benefit recreational use of NBAFS. No other proposed INRMP projects are expected to affect these resources on NBAFS.

The proposed action is consistent with overall land use on NBAFS and does not conflict with mission activities. In fact, the proposed action is considered essential for supporting the NBAFS mission because it would minimize the potential for conflict between mission-related activities and natural resources. Construction of a new interpretive trail, construction of a new handicapped-accessible boat ramp, and stocking of trout would have no adverse effects on recreation and would improve recreational opportunities on the station. Data-gathering and planning projects are expected to improve recreational use of the station because they would ensure appropriate sustainable use patterns. Some short-term adverse effects of prescribed burning and timber harvests are possible until revegetation occurs (depending on the location and

extent of the disturbance), but affected areas could be used as opportunities to educate visitors to natural resources management goals of the station.

#### **4.1.7 Socioeconomics**

The proposed action would have a negligible effect on the local economy. Project activities would be confined to NBAFS. The proposed action would not result in any significant beneficial or adverse socioeconomic impacts to the local population, labor force, or economy. Because only a small workforce would be required to implement the INRMP (mostly NBAFS employees) and for a short period of time, impacts on the capacities of public services (e.g., schools, police, fire protection) would not occur. The proposed action is expected to require approximately 15 workers over a period of three months.

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires Federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. No environmental justice impacts would be expected to either minority or low-income populations because most impacts would be limited to within the station boundaries (and thus not affect populations of any kind), and no high and adverse impacts are anticipated.

#### **4.1.8 Health and Safety**

No significant health and safety issues are anticipated with the proposed action. Because some aspects of the proposed action would require excavation and ground disturbance, a survey for UXO would be required before any activities begin. The potential for serious injuries or fatalities to workers during excavation and construction activities is considered small. Any contractor would be responsible for complying with all Occupational Safety and Health Administration (OSHA) requirements and for instructing employees on accident prevention and safety. Although the risk of injury during field studies is low, health and safety protocols would be identified and followed for all such activities.

Health and safety impacts could result from conducting prescribed burns (ANL 2003). Impacts could include injuries from firefighting, equipment accidents, smoke inhalation, heat stress, or an escaped wildland fire. Proper training and outfitting would lessen the potential for impacts. The main smoke-related inhalation hazards to firefighters appear to be from CO, aldehydes, and total suspended particulates, particularly PM<sub>2.5</sub>. Health effects can include eye and respiratory irritation, shortness of breath, headaches, dizziness, and nausea lasting up to several hours. However, smoke exposure to firefighters is not considered to be hazardous (USFS 2003).

Health and safety issues related to timber harvests relate to the potential for injury during tree-felling and equipment operation. Following OSHA guidelines during timber harvests would minimize the potential for health and safety risks.

## **4.2 ENVIRONMENTAL IMPACTS OF THE EXISTING INRMP ALTERNATIVE**

Under the existing INRMP alternative, the existing INRMP (Najjar 1998) would continue to be implemented without modification. The existing INRMP and subsequent operational component plans include a number of the projects that are incorporated in the proposed action (Table 1). Proposed action projects not included in the existing INRMP alternative are a number of monitoring projects (fern-leaved false-foxglove, rare natural communities), radiotelemetry studies (small-footed bat, eastern pipistrelle, and eastern hognose snake), a study of the effects of curbs on Blanding's turtles, development and refinement of species and habitat management plans, wetland restoration, development of new recreational facilities, invasive species control actions, and incorporation of natural resources concerns in UXO remediation. The following sections describe the impacts of the existing INRMP alternative relative to those of the proposed action.

### **4.2.1 Air Quality and Noise**

The impacts to air quality and noise that would result from the existing INRMP alternative are similar to those that would occur under the proposed action and are related to the impacts of prescribed burning and timber harvesting, which would be the same for both alternatives. Impacts of the existing INRMP alternative would be negligibly smaller than those due to the proposed action because the two recreational facility construction projects, and associated impacts to air quality and noise, would not occur.

### **4.2.2 Topography, Geology, and Soils**

The existing INRMP alternative would not affect topography or geology. The impacts of this alternative on soils are similar to those that would occur under the proposed action and are related to the impacts of prescribed burning and timber harvesting, which would be the same for both alternatives. Impacts of the existing INRMP alternative would be negligibly smaller than those due to the proposed action because the two recreational facility construction projects and associated impacts to soils would not occur. The potential benefits to soils resulting from wetland restoration projects would not be realized under this alternative.

### **4.2.3 Water Resources**

The impacts to water resources that would result from the existing INRMP alternative are similar to those that would occur under the proposed action and are related to the impacts of prescribed burning and timber harvesting, which would be the same for both alternatives. Impacts of the existing INRMP alternative would be negligibly smaller than those due to the proposed action because the two recreational facility construction projects, and associated impacts to water resources, would not occur. The potential benefits to water resources resulting from wetland restoration and invasive species control projects would not be realized under this alternative.

#### **4.2.4 Ecological Resources**

The impacts to ecological resources that would result from the existing INRMP alternative are similar to those that would occur under the proposed action and are related to the impacts of prescribed burning and timber harvesting, which would be the same for both alternatives. Adverse impacts of the existing INRMP alternative would be negligibly smaller than those due to the proposed action because the two recreational facility construction projects would not occur, and none of the new proposed studies involving the handling (and possible harm) of study animals would occur.

Under the existing INRMP, a number of proposed action projects designed to ultimately benefit ecological resources or inform resource management planning would not occur (Table 1). As a consequence, the short-term adverse impacts of some projects (e.g., disturbance of individual study animals, removal of some vegetation) would not occur, but neither would the long-term benefits of improved knowledge, wetland restoration, and invasive species control. Without the benefits of the natural resources planning projects included only in the proposed action, mission-related activities, including UXO remediation and recreational development, could have significant adverse impacts to ecological resources.

#### **4.2.5 Cultural Resources**

The impacts to cultural resources that would result from the existing INRMP alternative are similar to those that would occur under the proposed action and are related to the impacts of prescribed burning and timber harvesting, which would be the same for both alternatives. The potential impacts of the existing INRMP alternative would be negligibly smaller than those due to the proposed action because the two recreational facility construction projects, and associated cultural resources impacts, would not occur.

#### **4.2.6 Land Use, Recreation, and Visual Resources**

The impacts to land use, recreation, and visual resources that would result from the existing INRMP alternative are similar to those that would occur under the proposed action and are related to the impacts of prescribed burning and timber harvesting, which would be the same for both alternatives. Under the existing INRMP alternative, the anticipated benefits of the two recreational facility construction projects, included only in the proposed action, would not occur.

#### **4.2.7 Socioeconomics**

The impacts to socioeconomics that would result from the existing INRMP alternative are similar to those that would occur under the proposed action, and, as with the proposed action, these impacts would be negligible. Under the existing INRMP alternative, the anticipated very minor benefits of the two recreational facility construction projects, included only in the proposed action, would not occur.



#### **4.2.8 Health and Safety**

The impacts to health and safety that would result from the existing INRMP alternative are similar to those that would occur under the proposed action and are related to the impacts of prescribed burning and timber harvesting, which would be the same for both alternatives. Impacts of the existing INRMP alternative would be negligibly smaller than those due to the proposed action because the health and safety impacts associated with the two recreational facility construction projects, wetland restoration, and invasive species control (which are not included in the existing INRMP alternative) would not occur.

### **4.3 ENVIRONMENTAL IMPACTS OF THE NO-ACTION ALTERNATIVE**

Under the no-action alternative, NBAFS would operate without an INRMP. Natural resources activities would be limited to wildland fire management as addressed in the existing Wildland Fire Management Plan (Bernardy et al. 2003) and ad hoc NEPA evaluations of proposed activities that have the potential to affect the human environment. The Wildland Fire Management Plan includes prescribed burning projects designed to improve ecological conditions on the station for wildlife benefits, reduce the probability of catastrophic fires, and maintain suitable conditions for the fern-leaved false-foxglove. Recreational planning would continue to be performed by NBAFS Services, but without the coordination provided by an INRMP. Under the no-action alternative, mission activities affecting natural resources would be conducted without benefit of integration or overall natural resources planning. In addition, data on important natural resources of the station would not be collected, and, therefore, the knowledge base used for operational planning would be relatively limited. Because USAF regulations and Federal law require an INRMP to guide natural resources management, the no-action alternative is technically not a legal option, and is presented here only for comparative purposes.

#### **4.3.1 Air Quality and Noise**

The impacts of the no-action alternative on air quality and noise would be less than the impacts of the proposed action and the existing INRMP alternative because timber harvesting and the two recreational facility construction projects, which have the potential to affect air quality and noise, would not occur. Impacts to air quality and noise under this alternative would result only from the prescribed burning that is included in all alternatives.

#### **4.3.2 Topography, Geology, and Soils**

The no-action alternative would not affect topography or geology. The impacts of the no-action alternative on soils would be less than the impacts of the proposed action and the existing INRMP alternative because timber harvesting and the two recreational facility construction projects, which both have the potential to affect soils, would not occur. Impacts to soils under this alternative would result only from the prescribed burning that is included in all

alternatives. The potential benefits to soils resulting from wetland restoration projects would not be realized under this alternative.

#### **4.3.3 Water Resources**

The impacts of the no-action alternative on water resources would be less than the impacts of the proposed action and the existing INRMP alternative because timber harvesting and the two recreational facility construction projects, which both have the potential to affect water resources, would not occur. Impacts to water resources under this alternative would result only from the prescribed burning that is included in all alternatives. The potential benefits to water resources resulting from wetland restoration projects would not be realized under this alternative.

#### **4.3.4 Ecological Resources**

The impacts of the no-action alternative on ecological resources would be less than the impacts of the proposed action and the existing INRMP alternative because timber harvesting and the two recreational facility construction projects, which have the potential to affect ecological resources, would not occur. None of the existing and proposed studies included in the proposed action and the existing INRMP alternative and involving the handling (and possible harm) of study animals would occur. Direct adverse impacts to ecological resources under this alternative would result only from the prescribed burning that is included in all alternatives.

Under the no-action alternative, projects designed to ultimately benefit ecological resources or inform resource management planning (Table 1) would not occur. As a consequence, the short-term adverse impacts of some projects (e.g., disturbance of individual study animals, removal of some vegetation) would not occur, but neither would the long-term benefits of improved knowledge, wetland restoration, and invasive species control. Without the benefits of natural resources planning projects included in the proposed action and existing INRMP alternative, mission-related activities, including UXO remediation and recreational development, could have significant adverse impacts to ecological resources. The magnitude of these adverse impacts is likely to be greater under the no-action alternative than the existing INRMP alternative because the latter already includes some study and planning efforts.

#### **4.3.5 Cultural Resources**

The impacts of the no-action alternative on cultural resources would be less than the impacts of the proposed action and the existing INRMP alternative because timber harvesting and the two recreational facility construction projects, which both have the potential to affect cultural resources, would not occur. Impacts to cultural resources under this alternative would result only from the prescribed burning that is included in all alternatives.

#### **4.3.6 Land Use, Recreation, and Visual Resources**

The impacts of the no-action alternative on land use, recreation, and visual resources would be less than the impacts of the proposed action and the existing INRMP alternative because timber harvesting would not occur. Under the no-action alternative, the anticipated benefits of the two recreational facility construction projects, included only in the proposed action, would not occur.

#### **4.3.7 Socioeconomics**

The impacts of the no-action alternative on socioeconomics would be even less than the negligible impacts of the proposed action and the existing INRMP alternative because timber harvesting would not occur. Under the no-action alternative, the anticipated very minor benefits of the two recreational facility construction projects, included only in the proposed action, would not occur.

#### **4.3.8 Health and Safety**

The impacts of the no-action alternative on health and safety would be less than the impacts of the proposed action and the existing INRMP alternative because fewer activities that have the potential to affect health and safety would occur. Impacts to health and safety under this alternative would result only from the prescribed burning that is included in all alternatives.

### **4.4 ADVERSE EFFECTS THAT CANNOT BE AVOIDED IF THE PROPOSED ACTION IS IMPLEMENTED**

Implementation of the proposed INRMP could result in some minor temporary adverse environmental impacts. Many of these would be eliminated, avoided, or further reduced, however, through implementation of a variety of standard operating procedures and good engineering practices. Those adverse impacts that cannot be eliminated or avoided are identified below.

Smoke, fugitive dust, and engine exhaust emissions would be produced during prescribed burns. Fugitive dust and engine exhaust emissions would be released during timber harvest projects. Noise would also be produced by these activities. Some unavoidable increases in soil erosion would result after burns, timber harvests, and proposed construction projects, especially if heavy rains occur shortly after soils were exposed. Turbidity and suspended solids in nearby surface water bodies could temporarily increase. Wildlife also would be affected and some individuals and nests destroyed during these activities. These losses would be counterbalanced by the improvement of habitats that could lead to overall increases in populations. Vegetation would also be destroyed during prescribed burns, but regular burning would favor more native, fire-adapted species. The potential would exist, albeit small, for serious injuries or fatalities to personnel conducting prescribed burns or timber harvesting.

#### **4.5 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES**

Resources that would be committed irreversibly or irretrievably during implementation of the proposed action would include materials that could not be recovered or recycled and materials or resources that would be consumed or reduced to irrecoverable forms. Use of fuel, oil, concrete, steel, chemicals, and other materials would constitute an irreversible and irretrievable commitment of those resources.

#### **4.6 RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM PRODUCTIVITY**

Most adverse impacts of the proposed action on the environment would be short-term (e.g., smoke, erosion, timber removal, construction impacts). However, the proposed action is intended to result in long-term improvements in natural resources. The proposed action would provide a more stable environment at NBAFS for a greater diversity of plant and animal species. In addition, the proposed action would increase the likelihood that rare natural communities and populations of the threatened, endangered, and rare species that occur on the station would persist over the long term. This improved long-term persistence is expected because the proposed action would result in an increase in the understanding of the status and requirements of these resources, development of management plans for these species, and assurance that these resources would be considered in UXO remediation and recreational planning.

#### **4.7 CUMULATIVE IMPACTS**

Cumulative impacts are those impacts to the environment that result from the incremental effect of the proposed project when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such actions. Cumulative impacts could result from individually minor but collectively significant actions taking place over a period of time. No significant cumulative effects are anticipated for the proposed action.

The past and current missions at NBAFS, military training, recreation, and natural resources management activities have resulted in localized minor adverse cumulative impacts and moderate to high widespread beneficial cumulative impacts to the ecological resources of the site. The Operations Area and disturbed lands at NBAFS occupy less than 40 ha (100 ac) of the site. While military training, recreation, and other activities cause short-term, localized adverse impacts, natural resources management has created highly diverse conditions over most of NBAFS. Ongoing and proposed natural resources management activities are expected to result in continued improvement in ecological conditions on NBAFS. While there are no major natural areas or parks located within about 16 km (10 mi) of NBAFS, there are small conservation areas maintained by the local towns, including the 200-ha (500-ac) Joe English Reservation that abuts the southwest portion of the site (Najjar 1998).

The potential impact of the proposed action on ambient air quality (e.g., fugitive dust, smoke, and engine exhaust emissions) would be a negligible short-term increase in emissions

from NBAFS and within Hillsborough County. However, emissions associated with the proposed action would be mostly confined to the station, since most emissions would be released near ground level. Emission rates would be low; thus, the potential for cumulative impacts to ambient air quality would be minor.

NBAFS is currently investigating options for UXO remediation in Joe English Pond and other range areas, and eventually lifting restrictions to recreational use of the pond. These actions would contribute to cumulative impacts to water resources, ecological resources, recreation, and visual resources at the pond. Although a detailed remediation plan has not been developed, it is likely that any UXO-removal actions would be important contributors to cumulative impacts at the station. The proposed action would lessen the cumulative impact associated with remediation.

NBAFS is currently replacing the existing wastewater treatment plant with a septic system. This project would result in a negligible change in inflow to Joe English Pond and a minor incremental contribution to cumulative impact on the station. Other impacts of the proposed septic system (ANL 2004) are not expected to result in an increase in the cumulative impact of the proposed action.

Only about 150 people are employed at NBAFS, and they make only a minor contribution to the socioeconomic conditions of the region. The residential communities near NBAFS are relatively affluent, and are expected to continue to be so into the future. The proposed action would not contribute to cumulative socioeconomic impacts.

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| Daniel J. O'Rourke | M.S. Industrial Archaeology; 15 years of experience in archaeological research; 6 years of experience in environmental assessment | Cultural resources           |

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## **APPENDIX A: CORRESPONDENCE**

APR - 7 2006

DEPARTMENT OF THE AIR FORCE  
50TH SPACE WING (AFSPC)

MAR 29 2006

MEMORANDUM FOR NH DIVISION OF HISTORICAL RESOURCES  
ATTN: JAMES MCCONAHA  
STATE HISTORIC PRESERVATION OFFICER  
STATE OF NH DEPARTMENT OF CULTURAL AFFAIRS  
19 PILLSBURY STREET BOX 2043  
CONCORD NH 03302-2043

FROM: 23 SOPS/CC  
317 Chestnut Hill Road  
New Boston AFS NH 03070-5125

SUBJECT: Implementation of the Integrated Natural Resources Management Plan at New  
Boston Air Force Station (NBAFS), New Hampshire

1. Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, we are requesting comments from your office regarding the U.S. Air Force's proposal to implement an Integrated Natural Resources Management Plan (INRMP) for NBAFS in Hillsborough County, New Hampshire. The plan includes 37 projects whose objectives are to maintain and enhance natural resources on the station without affecting the mission of the station (see Atch 1 for a list of proposed projects).
2. The majority of the proposed projects in the INRMP involve monitoring the various species found on the station. These activities do not appear to have any potential to impact cultural resources. Included in the INRMP are six forest management projects. These projects include inventories, prescribed burning, creation of clearcuts, regeneration cutting, and thinning designed to provide habitat for a diversity of plant and animal species. Your office was previously contacted concerning the potential effects of the prescribed burning projects on cultural resources. The location of the clearcuts has yet to be determined. When the locations are chosen, your office will be consulted to determine if any cultural resources would be impacted.
3. Two of the six projects, regeneration cutting (FO-2.1.1) and thinning (FO-2.1.2) have the potential to affect cultural resources (see Atch 2 for locations). No cultural resources appear within the areas selected for treatment. However, five potentially eligible sites do appear in close proximity of treatment areas (Atch 3).
4. The first is Site 27-HB-258, the remains of a historic farmstead tentatively dating to the late 18th century, is east of the treatment area in Management Unit 19. The second is Site 27-HB-266, a dry laid fieldstone dam, is located in Management Unit 2 on a stream exiting Beaver Pond #5. Site 27-HB-266 is on the western edge of a treatment area. The final three sites appear on the periphery of Management Unit 25. Site 27-HB-255 is the remains of an 18th to 19th century farmstead, which contains several partial structures. Site 27-HB-255 is located south of a

treatment area. Site 27-HB-256 is also the remains of an 18th to 19th century farmstead that contains several structural features. This site is reported to have been used as part of the Underground Railroad for freeing slaves. Site 27-HB-256 is located west of the treatment area. Site 27-HB-257 is the remains of an early 19th century farmstead that was demolished in 1942. The site has several structural features. Site 27-HB-257 is located north of the treatment area.

5. Cultural resource sites will be avoided at all times during the timber harvest activities. No heavy equipment would be used in close proximity to the sites to avoid vibration damage to the dry laid stone remains. In the event of an unexpected discovery, work would be suspended and the Natural Resources Planner would be contacted.

6. On the basis of the enclosed information, request your concurrence that implementation of the INRMP at NBAFS will result in a finding of "no historic properties adversely affected" (in accordance with 800.5 (d)(1)).

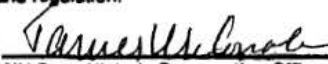
7. If you have any questions regarding this matter, please contact Mr. Stephen Najjar, NBAFS Natural Resources Planner, at (603) 471-2426.



STANLEY STAFIRA, JR., Lt Col, USAF  
Commander

Attachments:

1. List of Proposed Projects in INRMP
2. Map Showing Location of Forest Harvest Areas
3. Map Showing Cultural Resources at NBAFS

|                                                                                                                                                                             |                                                                                                                                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Conditions required for NEPA & Section 106 of the NHPA have been met.                                                                                                       |                                                                                                                                |
| <input checked="" type="checkbox"/>                                                                                                                                         | Concur                                                                                                                         |
| <input type="checkbox"/>                                                                                                                                                    | No Resources Present                                                                                                           |
| <input type="checkbox"/>                                                                                                                                                    | No Adverse Effect                                                                                                              |
| If plans change or resources are discovered in the course of this project, you must contact the Division of Historical Resources as required by federal law and regulation. |                                                                                                                                |
| 4/23/06                                                                                                                                                                     | <br>NH State Historic Preservation Officer |

**Attachment 1. NBAFS Natural Resources Projects in the Proposed INRMP (Proposed Action) and Existing INRMP Alternative.**

| Project Number | Project Description                                                                                                                                                            | Management Units where Located <sup>a</sup>           | Year          | Priority |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|---------------|----------|
| TE-1.1.1       | Develop a standard monitoring protocol for fern-leaved false-foxglove                                                                                                          | 1, 8, 19, 22                                          | 2006          | High     |
| TE-1.1.2       | Conduct surveys of fern-leaved false-foxglove                                                                                                                                  | 1, 8, 19, 22                                          | 2007          | High     |
| TE-1.2.1       | Conduct prescribed burn of fern-leaved false-foxglove habitats                                                                                                                 | 1, 8, 19, 22                                          | Annual        | High     |
| TE-2.1.1       | Conduct surveys and radiotelemetry study of eastern small-footed bat and eastern pipistrelle                                                                                   | 1, 2, 4, 5, 6, 7, 8, 9                                | 2006 and 2007 | High     |
| TE-2.2.1       | Develop and implement management plan for eastern small-footed bat and eastern pipistrelle                                                                                     | 1, 2, 4, 5, 6, 7, 8, 9                                | 2008          | High     |
| TE-3.1.1       | Monitor Blanding's turtles                                                                                                                                                     | 3, 4, 10, 11, 12, 14, 15, 18, 20, 21, possibly others | Annual        | High     |
| TE-3.2.1       | Develop and implement management plan for Blanding's turtles                                                                                                                   | 3, 4, 10, 11, 12, 14, 15, 18, 20, 21, possibly others | Annual        | High     |
| TE-3.2.2       | Minimize installation of new roadside curbs, evaluate removal or modification of existing curbs, and evaluate new culvert technology to minimize impacts to Blanding's turtles | 4, 10, 11, 12, 15                                     | 2006          | High     |
| TE-4.1.1       | Monitor eastern hognose snakes                                                                                                                                                 | 2, 7, 8, 9, 10, 18, 22, possibly others               | Annual        | High     |
| TE-4.1.2       | Conduct radiotelemetry study of adult eastern hognose snakes                                                                                                                   | 2, 7, 8, 9, 10, 18, 22, possibly others               | 2007 and 2008 | High     |
| TE-4.2.1       | Develop and implement management plan for eastern hognose snake                                                                                                                | 2, 7, 8, 9, 10, 18, 22, possibly others               | Annual        | High     |
| TE-5.1.1       | Develop protocol and conduct surveys for rare birds                                                                                                                            | All but 11                                            | Annual        | Moderate |
| TE-5.2.1       | Develop and implement management plan for rare birds                                                                                                                           | All but 11                                            | Annual        | Moderate |
| TE-6.1.1       | Determine cottontail species on NBAFS using DNA analysis                                                                                                                       | 6, 7, 8, 9, 10, 15                                    | 2006          | Moderate |

**Attachment 1 (Cont.)**

| Project Number | Project Description                                                                                                                                | Management Units where Located <sup>a</sup>     | Year                 | Priority        |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|----------------------|-----------------|
| WE-1.1.1       | Monitor wetlands                                                                                                                                   | All but 11                                      | Annual               | High (required) |
| WE-1.2.1       | Evaluate erosion and its impacts on NBAFS wetlands                                                                                                 | 3, 4, 8, 9, 10, 11, 12, 15, 18, possibly others | 2006                 | Moderate        |
| WE-1.2.2       | Evaluate degraded wetlands for restoration potential and develop designs for wetland restoration                                                   | 3, 4, 8, 9, 10, 11, 12, 15, 18, possibly others | 2007                 | Moderate        |
| WE-1.2.3       | Implement wetland restoration activities                                                                                                           | 3, 4, 8, 9, 10, 11, 12, 15, 18, possibly others | 2009                 | Moderate        |
| NC-1.1.1       | Develop and implement a standard monitoring protocol for rare natural communities                                                                  | 1, 20                                           | 2006                 | High            |
| NC-1.1.2       | Revisit ecological systems on NBAFS to determine rare community status                                                                             | 5, 6, 9                                         | 2007                 | High            |
| NC-1.2.1       | Develop and implement management strategy for NBAFS rare natural communities                                                                       | 1, 5, 6, 9, 20                                  | 2008                 | High            |
| FO-1.1.1       | Perform forest inventories                                                                                                                         | All but 11                                      | Annual               | Moderate        |
| FO-1.1.2       | Update GIS to include forest attributes                                                                                                            | All but 11                                      | Annual               | High            |
| FO-1.2.1       | Perform prescribed burns                                                                                                                           | All but 11                                      | Annual               | High            |
| FO-1.2.2       | Create clearcut that is 5 to 15 ac (2 to 6 ha) in size to provide habitat for early succession wildlife (replaces Project FO-2.1.1 in these years) | All but 11                                      | 2007, 2009, and 2010 | Moderate        |
| FO-2.1.1       | Regenerate 10 to 20 ac (4 to 8 ha) of forest                                                                                                       | 2, 6, 13, 15, 19, 25                            | Annual               | Moderate        |
| FO-2.1.2       | Thin 20 to 50 ac (8 to 20 ha) of forest                                                                                                            | 2, 6, 13, 15, 19, 25                            | Annual               | Moderate        |
| IN-1.1.1       | Implement control plan for invasive nonnative plants                                                                                               | All                                             | Annual               | High            |
| IN-1.2.1       | Prevent introduction and spread of invasive nonnative plants                                                                                       | All                                             | Annual               | High            |
| OR-1.1.1       | Establish a self-guided nature trail originating at Joe English Pond Campground                                                                    | 15, 18                                          | 2010                 | Moderate        |

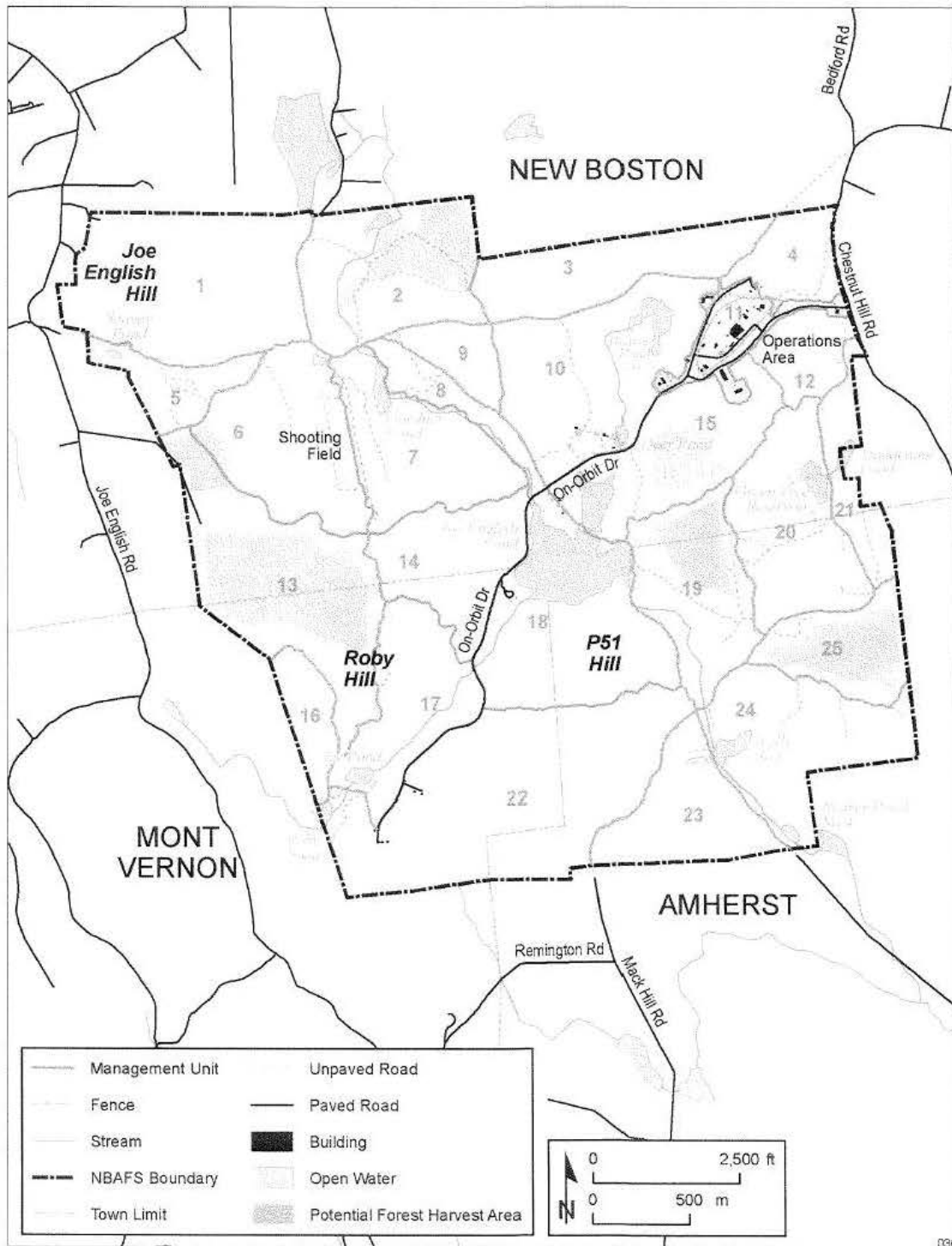
**Attachment 1 (Cont.)**

| Project Number | Project Description                                                                                                                                   | Management Units where Located <sup>a</sup> | Year              | Priority |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------------------|----------|
| OR-1.1.2       | Establish handicapped-accessible boat ramp at Joe English Pond after UXO remediation                                                                  | 18                                          | 2010              | Moderate |
| OR-2.1.1       | Collect hunter harvest and usage data                                                                                                                 | All but 11                                  | Annual            | Moderate |
| OR-2.1.2       | Evaluate impact of moose on station vegetation and develop management strategy                                                                        | All                                         | 2008              | Moderate |
| OR-2.2.1       | Stock NBAFS waters with trout                                                                                                                         | 10, 17, 19, 22, 24                          | Annual            | Moderate |
| OR-2.3.1       | Determine sustainable levels and patterns of recreational usage at NBAFS                                                                              | All but 11                                  | 2007              | Moderate |
| RE-1.1.1       | Develop and implement study to evaluate the effects of remediation activities, establish standards for restoration, and determine restoration success | 6, 7, 8, 9, 14, 18                          | 2006 through 2010 | High     |
| RE-1.1.2       | Work with USAF IRP staff to ensure inclusion of natural resources considerations in the remediation planning and contracting process                  | 6, 7, 8, 9, 14, 18                          | Annual            | High     |

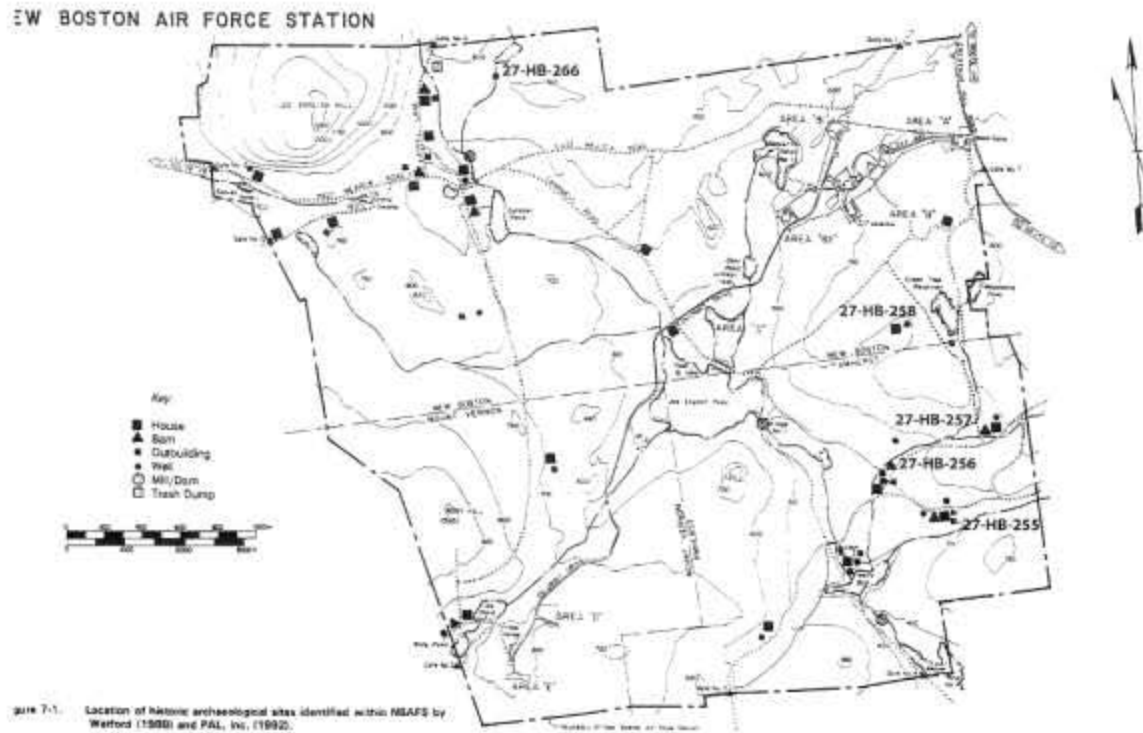
Source: LaGory et al. (2006)

<sup>a</sup> Natural Resources Management Units are shown in Figure 2.<sup>b</sup> X = project is included in INRMP; — = project is not included in INRMP.



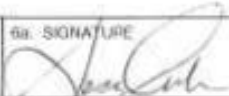


Attachment 2. Potential Forest Harvest Areas for INRMP Projects FO-2.1.1 and FO-2.1.2.



**Attachment 3. Location of Historic Archaeological Sites at NBAFS. Site numbers of sites near potential treatment areas are shown.**

**APPENDIX B: REQUEST FOR ENVIRONMENTAL IMPACT ANALYSIS  
(AF FORM 813)**

| REQUEST FOR ENVIRONMENTAL IMPACT ANALYSIS                                                                                                                                                                                                              |                                                                                                       | Report Control Symbol<br>RCS:       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|-------------------------------------|
| INSTRUCTIONS: Section I to be completed by Proponent; Sections II and III to be completed by Environmental Planning Function. Continue on separate sheets as necessary. Reference appropriate item number(s).                                          |                                                                                                       |                                     |
| <b>SECTION I - PROPONENT INFORMATION</b>                                                                                                                                                                                                               |                                                                                                       |                                     |
| 1. TO (Environmental Planning Function)<br>MAN                                                                                                                                                                                                         | 2. FROM (Proponent organization and functional address symbol)<br>MAN                                 | 2a. TELEPHONE NO.<br>2426           |
| 3. TITLE OF PROPOSED ACTION<br>Update Integrated Natural Resources Management Plan (INRMP) for New Boston Air Force Station                                                                                                                            |                                                                                                       |                                     |
| 4. PURPOSE AND NEED FOR ACTION (Identify decision to be made and need date)<br>INRMP is required by Sikes Act, NBAFS INRMP was in need of significant changes due to new information on presence of rare and state listed species on the installation. |                                                                                                       |                                     |
| 5. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES (DDPAA) (Provide sufficient details for evaluation of the total action.)<br>Implement new INRMP, Continue using existing INRMP or No Action                                                         |                                                                                                       |                                     |
| 6. PROPONENT APPROVAL (Name and Grade)<br>Sean Drake                                                                                                                                                                                                   | 6a. SIGNATURE<br>    | 6b. DATE<br>1/17/06                 |
| <b>SECTION II - PRELIMINARY ENVIRONMENTAL SURVEY.</b> (Check appropriate box and describe potential environmental effects including cumulative effects.) (+ = positive effect; 0 = no effect; - = adverse effect; U = unknown effect)                  |                                                                                                       |                                     |
| 7. AIR INSTALLATION COMPATIBLE USE ZONE/LAND USE (Noise, accident potential, encroachment, etc.)                                                                                                                                                       | <input type="checkbox"/>                                                                              | <input type="checkbox"/>            |
| 8. AIR QUALITY (Emissions, attainment status, state implementation plan, etc.)                                                                                                                                                                         | <input type="checkbox"/>                                                                              | <input type="checkbox"/>            |
| 9. WATER RESOURCES (Quality, quantity, source, etc.)                                                                                                                                                                                                   | <input checked="" type="checkbox"/>                                                                   | <input type="checkbox"/>            |
| 10. SAFETY AND OCCUPATIONAL HEALTH (Asbestos/radiation/chemical exposure, explosives safety quantity-distance, bird/wildlife aircraft hazard, etc.)                                                                                                    | <input type="checkbox"/>                                                                              | <input checked="" type="checkbox"/> |
| 11. HAZARDOUS MATERIALS/WASTE (Use/storage/generation, solid waste, etc.)                                                                                                                                                                              | <input type="checkbox"/>                                                                              | <input checked="" type="checkbox"/> |
| 12. BIOLOGICAL RESOURCES (Wetlands/floodplains, threatened or endangered species, etc.)                                                                                                                                                                | <input checked="" type="checkbox"/>                                                                   | <input type="checkbox"/>            |
| 13. CULTURAL RESOURCES (Native American burial sites, archaeological, historical, etc.)                                                                                                                                                                | <input checked="" type="checkbox"/>                                                                   | <input type="checkbox"/>            |
| 14. GEOLOGY AND SOILS (Topography, minerals, geothermal, Installation Restoration Program, seismicity, etc.)                                                                                                                                           | <input checked="" type="checkbox"/>                                                                   | <input type="checkbox"/>            |
| 15. SOCIOECONOMIC (Employment/population projections, school and local fiscal impacts, etc.)                                                                                                                                                           | <input type="checkbox"/>                                                                              | <input checked="" type="checkbox"/> |
| 16. OTHER (Potential impacts not addressed above)                                                                                                                                                                                                      | <input type="checkbox"/>                                                                              | <input type="checkbox"/>            |
| <b>SECTION III - ENVIRONMENTAL ANALYSIS DETERMINATION</b>                                                                                                                                                                                              |                                                                                                       |                                     |
| 17. <input type="checkbox"/> PROPOSED ACTION QUALIFIES FOR CATEGORICAL EXCLUSION (CATEX) # _____; OR<br><input checked="" type="checkbox"/> PROPOSED ACTION DOES NOT QUALIFY FOR A CATEX. FURTHER ENVIRONMENTAL ANALYSIS IS REQUIRED.                  |                                                                                                       |                                     |
| 18. REMARKS<br>EA will evaluate impacts from Natural Resources projects over next five years and will serve as public participation requirement for INRMP under Sikes Act.                                                                             |                                                                                                       |                                     |
| 19. ENVIRONMENTAL PLANNING FUNCTION CERTIFICATION (Name and Grade)<br>Stephen Najjar, GS-11                                                                                                                                                            | 19a. SIGNATURE<br> | 19b. DATE<br>1/17/06                |

- Minor improvements in water quality of restored areas resulting from wetland restoration activities and invasive species control.
- Minor short-term adverse impacts to ecological resources (vegetation destruction, wildlife disturbance), but overall net long-term benefit, resulting from prescribed burning, timber harvest, recreation facility construction, wetland restoration, invasive species control, and projects involving capture, handling, and radiotelemetry of animals.
- Overall benefit to ecological resources resulting from data gathering and development of management plans because increased knowledge would be used to improve conditions on the station and avoid impacts.
- Recreational benefits resulting from construction of a new interpretive trail, construction of a handicapped-accessible boat ramp, data gathering, trout stocking, and recreation planning projects.
- Localized minor short-term adverse impacts to visual resources resulting from prescribed burning and timber harvests.
- Overall benefit to land use resulting from reduced potential for conflicts between mission-related activities and natural resources.

Several clearcut and construction projects are included within the proposed action and were assessed in the EA, but some aspects of the projects have not been finalized (e.g., location, project design). For these projects, project-specific assessments and consultations would be performed before the projects were implemented.

On the basis of the assessments detailed in the EA, it has been determined that the proposed action would not have a significant effect on the human environment. Therefore, an Environmental Impact Statement will not be required nor prepared for implementation of the INRMP at NBAFS.

22 Sep 06  
Date

  
 Stanley Stafira, Jr., Lt. Col.  
 Commander, 23rd Space Operations Squadron  
 U.S. Air Force  
 New Boston Air Force Station, New Hampshire