# FINDING OF NO SIGNIFICANT IMPACT

## Forest Harvesting
## at New Boston Air Force Station, New Hampshire

The U.S. Air Force (USAF) at New Boston Air Station (NBAFS), New Hampshire proposes to conduct forest harvesting in three locations (see attachment 1) on approximately 150-200 acres over the next two-three years. Harvesting would occur primarily during fall and winter months (September-March). Forest management practices would include the application of several silvicultural techniques designed to improve forest and wildlife habitat quality including, thinning, shelterwood and patch clear-cutting (1-2 acres)

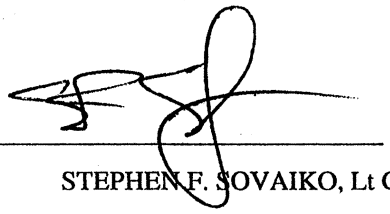
Potential impacts to the natural and human environment associated with forest harvesting at NBAFS are assessed in the attached Environmental Assessment (EA) entitled "Environmental Assessment For Forest Harvesting at New Boston Air Force Station, New Hampshire". The EA was prepared in accordance with specific tasks and procedures of the USAF Environmental Impact Analysis Process (EIAP; Air Force Instruction 32-7061), as it applies to the National Environmental Policy Act of 1969 (Public Law 91-190, 42 U.S.C. §§4321-4347).

The EA evaluates the environmental consequences of a proposed action (forest harvesting), alternative action (clear-cut and plant), and the no-action alternative (i.e., allowing forest to mature). The assessment evaluates the potential for impacts to 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. Based on a comparison of alternatives, the proposed action is preferred over the other alternatives.

The Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI) were both made available to the affected public for a 15-day public comment period. The affected public was notified by advertisements placed in the state's largest newspaper. The EA and FONSI were made available by placing on file in the town libraries in Amherst, Mont Vernon and New Boston, New Hampshire.

On the basis of the assessments presented in the EA, the proposed action would not result in any significant impacts to the environment.

Based upon these reviews and 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 forest harvesting at New Boston Air Force Station, New Hampshire.



10 May 03
Date

STEPHEN F. SOVAIKO, Lt Col, USAF
Commander

# Report Documentation Page

*Form Approved*
*OMB No. 0704-0188*



| 1. REPORT DATE | 2. REPORT TYPE | 3. DATES COVERED |
|---|---|---|
| **20 MAY 2003** | | **00-00-2003 to 00-00-2003** |

| 4. TITLE AND SUBTITLE | 5a. CONTRACT NUMBER |
|---|---|
| **Finding of No Significant Impact: Forest Harvesting at New Boston Air Force Station, New Hampshire** | 5b. GRANT NUMBER |
| | 5c. PROGRAM ELEMENT NUMBER |
| 6. AUTHOR(S) | 5d. PROJECT NUMBER |
| | 5e. TASK NUMBER |
| | 5f. WORK UNIT NUMBER |
| 7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **23rd Space Operations Squadron (23 SOPS/MAFCVN),317 Chestnut Hill Rd,New Boston AFS,NH,03070** | 8. PERFORMING ORGANIZATION REPORT NUMBER |
| 9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) | 10. SPONSOR/MONITOR'S ACRONYM(S) |
| | 11. SPONSOR/MONITOR'S REPORT NUMBER(S) |

12. DISTRIBUTION/AVAILABILITY STATEMENT
**Approved for public release; distribution unlimited**

13. SUPPLEMENTARY NOTES

14. ABSTRACT

**The proposed action evaluated in this environmental assessment (EA) is to conduct forest harvesting in three locations (see attachment 1) on approximately 150-200 acres over the next two-three years, primarily during fall and winter months (September-March). Forest management practices would include the application of several silvicultural techniques designed to improve forest and wildlife habitat quality including, thinning, shelterwood and patch clearcutting (1-2 acres). The proposed action is needed to regenerate desirable forest tree species and implement the 2000 Integrated Natural Resources Management Plan at New Boston Air Force Station (NBAFS). Additionally an alternative that included clear-cutting and planting and the no-action alternative (i.e., allowing forest to mature) were also assessed in this EA. This EA evaluated the potential impacts to air quality, noise levels, topography, geology, soils, water resources, ecological resources, cultural resources, land use, recreation, visual resources socioeconomics, and health and safety. On the basis of this assessment, it was determined that the proposed action would result in only minor to negligible localized, short-term, or temporary impacts to the environment as compared to the no-action alternative. The impacts associated with the proposed action would be similar to the alternate action. The harvesting would result in a negligible to minor incremental addition to impacts that have occurred from other activities. A long-term benefit to natural resources would result from increased availability of multiple forest age classes at New Boston Air Force Station.**

15. SUBJECT TERMS

| 16. SECURITY CLASSIFICATION OF: | | | 17. LIMITATION OF ABSTRACT | 18. NUMBER OF PAGES | 19a. NAME OF RESPONSIBLE PERSON |
|---|---|---|---|---|---|
| a. REPORT **unclassified** | b. ABSTRACT **unclassified** | c. THIS PAGE **unclassified** | **Same as Report (SAR)** | **50** | |

# ENVIRONMENTAL ASSESSMENT
# FOR
# FOREST HARVESTING
# AT NEW BOSTON AIR FORCE STATION, NEW HAMPSHIRE


**Prepared by**

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

**April 2003**

## TABLE OF CONTENTS

## TABLES



## FIGURES

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| AFSCN | Air Force Satellite Control Network |
| ANL | Argonne National Laboratory |
| CFR | Code of Federal Regulations |
| CO | carbon monoxide |
| CTV | cable television |
| EA | environmental assessment |
| EIAP | environmental impact analysis process |
| EPA | Environmental Protection Agency |
| MSL | mean sea level |
| NAAQS | National Ambient Air Quality Standards |
| NASA | National Aeronautics and Space Administration |
| NATO | North Atlantic Treaty Organization |
| NBAFS | New Boston Air Station |
| NEPA | National Environmental Policy Act |
| NHDHR | New Hampshire Division of Historical Resources |
| $NO_2$ | nitrogen dioxide |
| NPDES | National Pollutant Discharge Elimination System |
| $O_3$ | ozone |
| OSHA | Occupational Health and Safety Act |
| PAL | Public Archaeology Laboratory, Inc. |
| Pb | lead |
| PES | Parsons Engineering Sciences, Inc. |
| $PM_{2.5}$ | particulate matter with an aerodynamic diameter of 2.5 μm |
| $PM_{10}$ | particulate matter with an aerodynamic diameter of 10 μm |
| SHPO | State Historic Preservation Officer |
| $SO_2$ | sulfur dioxide |
| SOPS | Space Operations Squadron |
| SAAQS | State of New Hampshire Ambient Air Quality Standards |
| USAF | United States Air Force |
| UXO | unexploded ordnance |

## UNITS OF MEASURE

| | |
|---|---|
| cm | centimeter(s) |
| dB | decibel(s) |
| dBA | unit of weighted sound-pressure level |
| ft | foot (feet) |
| h | hour(s) |
| ha | hectare(s) |
| in. | inch(es) |
| km | kilometer(s) |
| $km^2$ | square kilometer(s) |
| kV | kilovolt |
| $L_{dn}$ | day-night weighted equivalent sound level |
| $L_{eq}$ | equivalent steady sound level |
| m | meter(s) |
| $m^2$ | square meter(s) |
| $m^3$ | cubic meter(s) |
| mi | mile(s) |
| $mi^2$ | square mile(s) |
| mm | millimeter(s) |
| µm | micrometer(s) |
| $yd^3$ | cubic yard(s) |

# ENVIRONMENTAL ASSESSMENT
# FOR
# FOREST HARVESTING
# AT NEW BOSTON AIR STATION, NEW HAMPSHIRE

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

This Environmental Assessment (EA) was prepared in accordance with
* The National Environmental Policy Act (NEPA)
*The Council on Environmental Quality regulations for implementing NEPA
*32 Code of Federal Regulations (CFR) Part 989, Environmental Impact Analysis Process (EIAP)
*AFI 32-7060, Interagency and Intergovernmental Coordination for Environmental Planning; and
*AFI 32-7061, The Environmental Impact Process

## ABSTRACT

The proposed action evaluated in this environmental assessment (EA) is to conduct forest harvesting in three locations (see attachment 1) on approximately 150-200 acres over the next two-three years, primarily during fall and winter months (September-March). Forest management practices would include the application of several silvicultural techniques designed to improve forest and wildlife habitat quality including, thinning, shelterwood and patch clear-cutting (1-2 acres). The proposed action is needed to regenerate desirable forest tree species and implement the 2000 Integrated Natural Resources Management Plan at New Boston Air Force Station (NBAFS). Additionally an alternative that included clear-cutting and planting and the no-action alternative (i.e., allowing forest to mature) were also assessed in this EA. This EA evaluated the potential impacts to air quality, noise levels, topography, geology, soils, water resources, ecological resources, cultural resources, land use, recreation, visual resources, socioeconomics, and health and safety. On the basis of this assessment, it was determined that the proposed action would result in only minor to negligible localized, short-term, or temporary impacts to the environment as compared to the no-action alternative. The impacts associated with the proposed action would be similar to the alternate action. The harvesting would result in a negligible to minor incremental addition to impacts that have occurred from other activities. A long-term benefit to natural resources would result from increased availability of multiple forest age classes at New Boston Air Force Station.

# 1 PURPOSE AND NEED FOR THE PROPOSED ACTION

The proposed action evaluated in this environmental assessment (EA) forest harvesting on approximately 150-200 acres over the next two-three years, primarily during fall and winter months (September-March). Forest management practices would include the application of several silvicultural techniques designed to improve forest and wildlife habitat quality including, thinning, shelterwood and patch clear-cutting (1-2 acres). This EA evaluates the environmental consequences of implementation of the proposed action. An alternative that included clear-cutting and planting and the no-action alternative (i.e., allow forest to continue maturing) were also assessed. This EA was prepared in accordance with specific tasks and procedures of the U.S. Air Force (USAF) Environmental Impact Analysis Process (EIAP), as it applies to the National Environmental Policy Act (NEPA) of 1969, 40 Code of Federal Regulations (CFR) Parts 1500-1508, as amended.

# 2 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

This section provides a brief description of the proposed action (Section 2.1), one alternative for the proposed action (Section 2.2.1), and the no-action alternative (Section 2.2.2).

## 2.1 Proposed Action

The proposed action evaluated in this EA is to conduct forest harvesting in three locations (see attachment 1) on approximately 150-200 acres over the next two-three years. Harvesting would occur primarily during fall and winter months (September-March). Forest management practices would include the application of several silvicultural techniques designed to improve forest and wildlife habitat quality including, thinning, shelterwood and patch clear-cutting (1-2 acres).

Proposed shelterwood cutting is intended to regenerate 40-60 acres eastern white pine and red oak. The shelterwood method of regeneration involves a heavy removal of mature overstory trees leaving a residual stand of approximately 30-40 percent of the pre-entry stand. Overstory trees are left to provide a seed source and effect the forest floor microclimate by providing shade. The residual overstory can be removed during a later stand entrance; after a suitable amount of regeneration is achieved or can be permanently retained. Shelterwood cutting is generally applied throughout a suitable stand with the intention of keeping an even age forest

structure. Shelterwood cutting would take place in stands located adjacent to Meadow Road and near Wells Bog.

Proposed patch clear cutting is intended to regenerate a broader variety of vegetation than other methods including more shade intolerant species. Patch clear cutting generally involves identification of an area suitable for harvesting and skidding, removal of 100 percent of tree growth, followed by natural regeneration. Patch clear cuts provide a wide range of microclimates allowing for regeneration of shade tolerant and intolerant species. Patch clear cutting results in small even-aged areas geographically distributed widely over a larger landscape and separated temporally from other clear cuts. No more than 20 percent of the forest in a +/- 100-acre area would be harvested on Mack Hill.

Proposed thinning would be intended to remove undesirable (poor health and form) trees and some dominant trees from the overstory to encourage increased growth on residual trees in younger stands. Thinning is generally applied to a predetermined stocking level expressed in basal area per acre. Thinning would be applied to approximately 40 acres near the southern portion of the installation. Thinning would be intended to improve red oak mast production and growth on white pine.

Forest harvesting would be completed using a range of heavy equipment including 1-2 skidders or forwarders (operating at once), mechanical harvester or men with chainsaws. Material harvested would be removed from the installation using 1-2 log trucks.

## 2.2 Alternatives to the Proposed Action

Two alternatives to the proposed action are considered in this EA—Clear-Cut and Plant (Alternative 1) and the no-action alternative.

### 2.2.1 Alternative Action

The Alternative Action would include clear-cutting approximately 40-60 acres of white pine, red oak forest and planting with white pine seedlings obtained from local sources. Clear-cutting would take place in stands located adjacent to Meadow Road and near Wells Bog. Mack Hill patch clear-cuts would be enlarged to 1-5 acre blocks and planted with white pine seedlings obtained locally. No more than 20 percent of the forest in a +/- 100-acre area would be harvested on Mack Hill. Thinning would be applied to approximately 40 acres near the southern portion of the installation. Thinning would be intended to improve red oak mast production and growth on white pine.

Forest harvesting would be completed using a range of heavy equipment including 1-2 skidders or forwarders (operating at once), mechanical ? harvested or men with chainsaws. Material harvested would be removed from the installation using 1-2 log trucks.

### 2.2.2 No-Action Alternative

The no action alternative would allow the forest stands included in this EA to continue through succession. In the absence of a catastrophic disturbance more shade tolerant species would eventually prevail. Wildlife species that favor early-mid successional forest would become less abundant or absent in these stands.

## 2.3 Comparison of Alternatives

A summary comparison of the expected environmental impacts of the proposed action, alternative 1, and no-action alternatives is presented in Table 1. Additional discussion of these environmental impacts is provided in Section 4.

Only minor or negligible impacts are expected to result from the proposed action. The impacts would be localized and of short duration. A long-term benefit to natural resources would result from increased availability of early-mid successional forest stands

**Table 1 Summary Comparison of Impacts Associated with the Proposed Action, Alternate Action, and No Action Alternatives (Adapted from ANL 2000)**

| | Impacts | | |
|---|---|---|---|
| **Environmental Parameter** | **Proposed Action** | **Alternative 1** | **No-Action** |
| **Air Quality and Noise** | Minor dust and engine emissions during harvest. No violations are expected of federal and state ambient air quality standards for criteria pollutants. | Same as proposed action. | No impacts. |
| | Occasional short-term noise from truck traffic and equipment operation. | Same as proposed action. | No impacts. |
| **Topography, Geology, and Soils** | Localized minor soil erosion and compaction. | Same as proposed action. | No impact. |
| **Water Resources** | Potential for localized minor increases in turbidity and sedimentation during harvesting (from erosion). | Same as proposed action. | No impacts. |
| **Ecological Resources** | Potential minor indirect impact to wetlands resulting from sediment runoff during harvesting. | Similar to proposed action. | No Impact |
| | Potential localized impacts to state listed threatened or endangered species. | Similar to proposed action. | No impact. |
| **Ecological Resources (continued)** | Localized minor noise and visual disturbance to wildlife during project. | Similar to proposed action. | No impacts. |
| **Cultural Resources** | Negligible potential for damage to underground cultural resources. | Similar to proposed action. | No impacts. |
| **Socioeconomics** | Negligible, short-term benefits to the local economy during the project period. | Similar to proposed action. | No impacts. |
| | No environmental justice impacts. | No impacts. | No impacts. |
| **Health and Safety** | | | |

# 3 AFFECTED ENVIRONMENT

This section presents a general description of NBAFS and the resources that could be affected by the proposed forest harvest. The descriptive material is drawn mostly from various EAs and natural resources reports that pertain to the NBAFS (e.g., ANL 1990, 1997, 1999; PES 1995, 1996).

## 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-acre) site is located within the towns of New Boston, Amherst, and Mont Vernon in Hillsborough County (Figure 2).

As one 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 23 Space Operations Squadron (SOPS) at NBAFS provides launch, operation, and on-orbit support for more than 100 military satellites, communication satellites, North Atlantic Treaty Organization (NATO) and other allied nation satellites, and for National Aeronautics and Space Administration (NASA) Space Shuttle missions.

From 1941 until 1956 the site (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 6594$^{th}$ Instrumentation Squadron was activated at NBAFS. Squadron activities began in 1960 with use of mobile radar units until the permanent facilities were constructed and in operation by 1964. In the early 1960s, the Operations Area was cleared of unexploded ordnance (UXO) before the permanent facilities for the satellite-tracking mission were constructed. The site was formerly under the jurisdiction of the USAF Systems Command, and moved under the USAF Space Command in 1987 (PES 1995). As mentioned, the satellite tracking mission is conducted from the

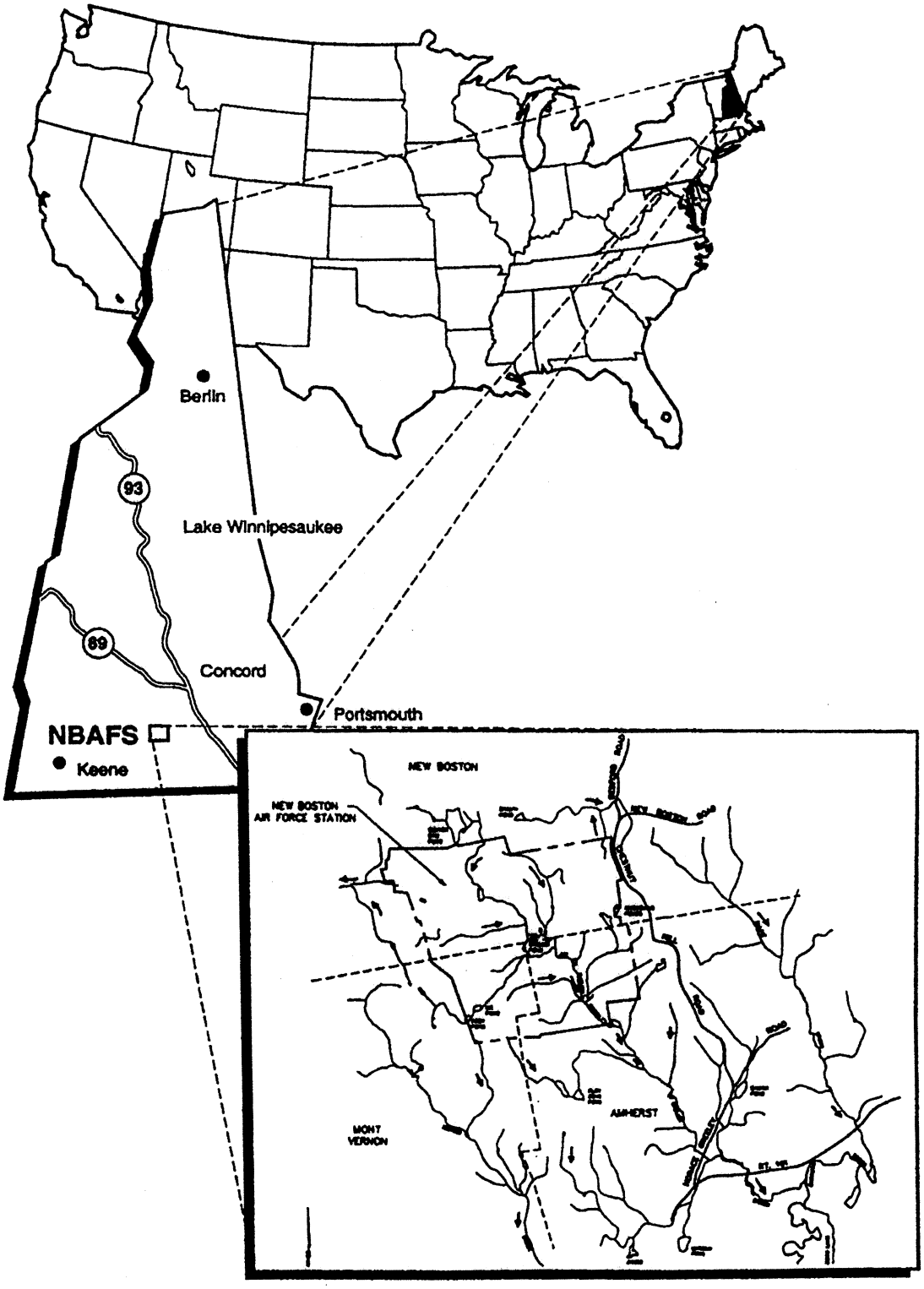



**Figure 2 Location of New Boston Air Station, New Hampshire (Source: ENSR 1993)**

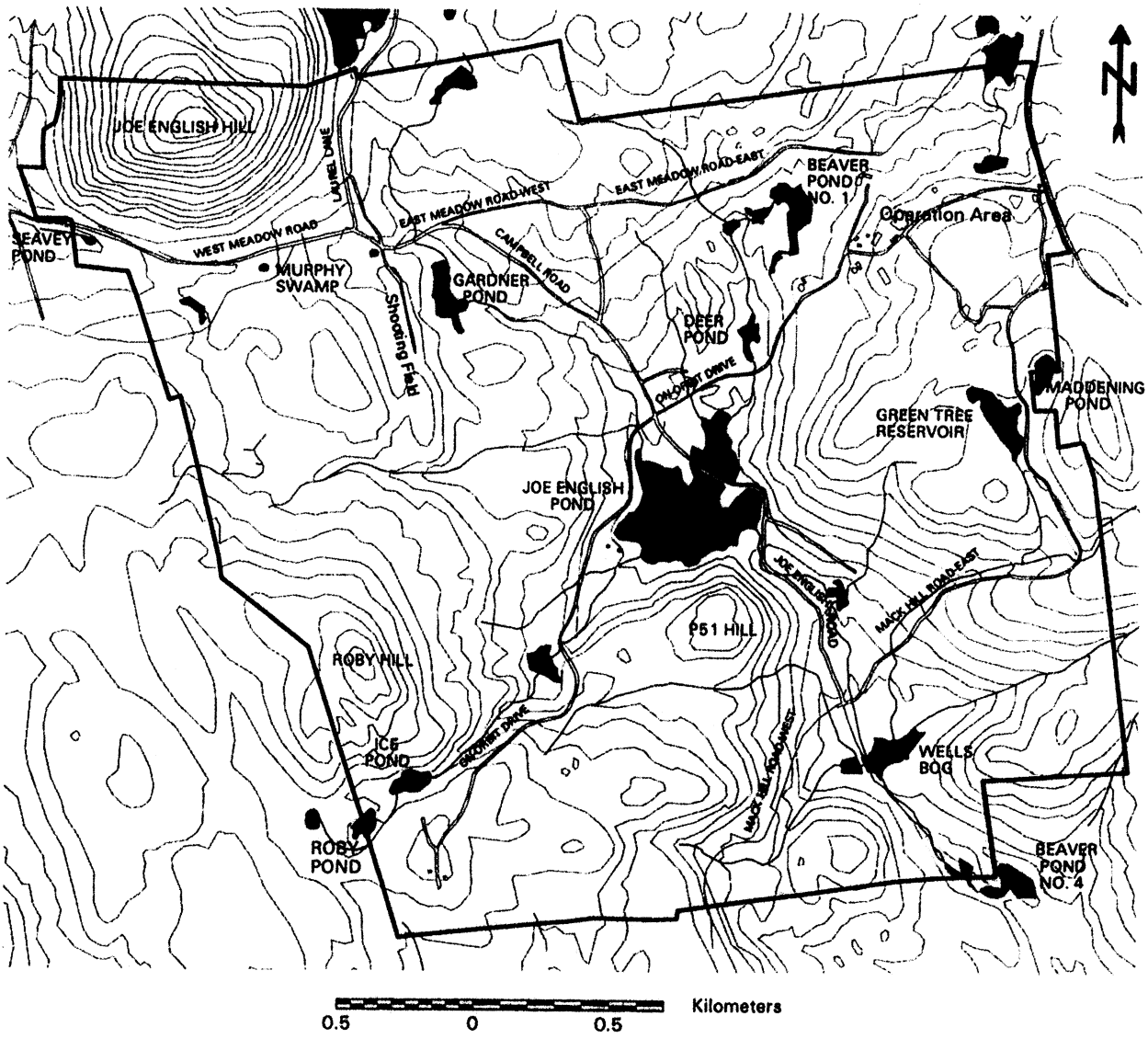



**Figure 3 Station Boundaries, Roads, Facilities, and Natural Features on New Boston Air Station, New Hampshire (Source: ANL 1997)**

Operations Area. The remainder of NBAFS supports military training exercises, recreation, and natural resource management (ANL 2000).

## 3.2 Climate, Air Quality, and Noise

### 3.2.1 Climate

The region around the NBAFS is characterized by a humid continental climate. Precipitation is distributed throughout the year, with no particular wet or dry season. Coastal storms can be a serious weather hazard in southeastern New Hampshire, decreasing 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 2 to 3 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. Based on the data for the 9,130 $km^2$ (3,530 $mi^2$) area that includes the NBAFS, less than two tornadoes occur per year. The localized area effected by a tornado averages only 0.29 $km^2$ (0.11 $mi^2$; Ramsdell and Andrews 1986) (ANL 2000).

### 3.2.2 Air Quality

The State of New Hampshire Ambient Air Quality Standards (SAAQS) are identical to the National Ambient Air Quality Standards (NAAQS) for six criteria air pollutants: sulfur oxides (as sulfur dioxide [$SO_2$]), particulate matter with aerodynamic diameters of $\leq$10 μm and equal to 2.5 μm ($PM_{10}$ and $PM_{2.5}$ respectively), carbon monoxide (CO), ozone ($O_3$), nitrogen dioxide ($NO_2$), and lead (Pb) (Sanborn 1998). In 1996, New Hampshire discontinued Pb monitoring because Pb concentrations were well below the NAAQS and at the lowest levels of the detection limit (Argonne 2000). As of November 4, 2002, Hillsborough County (which includes NBAFS) was designated as an attainment area for all criteria pollutants, except ozone. New Boston AFS is located in two Ozone non-attainment areas, Boston-Lawrence-Worcester (E. MA), MA-NH Serious and Manchester NH (Marginal)(source http://www.epa.gov/air/oaqps/greenbk/oindex.html).

Permitted air pollution sources at NBAFS include two backup generators at the power plant (Building 157) and 15 boilers located in various buildings in the Operations Area.

### 3.2.3 Noise

Currently, no quantitative noise-limit regulations exist in New Hampshire (ANL 1999). The U.S. Environmental Protection Agency (EPA) guidelines recommend an $L_{dn}$ (the day-night weighted equivalent sound level) of 55 dBA[1], which is considered sufficient to protect the public from the effect of broad-band environmental noise in typically quiet outdoor and residential areas (EPA 1974). For protection against hearing loss in the general population from non-impulsive noise, the EPA guidelines recommend an $L_{eq}$[2] of 70 dBA or less per day over a 40-year period.

No noise monitoring data is available from the area around the NBAFS site. However, the acoustic environment around the NBAFS site can be considered that of a rural location, having typical residual sound levels of approximately 30 to 35 dBA (Liebich and Cristoforo 1988). The closest off-site residences to the Operations Area occur immediately adjacent to the site boundary along Chestnut Hill Road. Ambient noise levels at these residences would be substantially increased at times when traffic passes by (ANL 2000).

## 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 in the northeastern section, Roby Hill in the southwestern section, and Joe English Hill in the northwestern section. Within the center of the station is Joe English Pond (Figure 3).

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, composed of an unsorted to poorly sorted mixture of clay, silt, sand, pebble, cobbles, gravel, and boulders. However, swamp deposits and recent alluvium is also present. Glacial striations and drumlins (elongate or oval hills) are present throughout the area, providing evidence of the general north to south glacial movement. Chestnut Hill is one such glacial feature, a drumlin (PES 1995).

---

[1] 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 SI.4-1983* and *Amendment S1.4A-1985* (Acoustical Society of America 1983, 1985).

[2] $L_{eq}$ 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, $L_{eq}$(1-h) is the 1-hour equivalent sound level.

Over 90 percent of the soils on NBAFS were formed in glacial till; the remainder formed in outwash plains, kame terraces, or stream valleys. 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 soils at NBAFS tend to be highly resistant to erosion if stabilized by vegetative cover. However, the soils have moderate to extreme erosion potential in bare areas due to the fine texture of the soils and 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).

The primary soils in the project areas include: (1) Chatfield-Hollis-Rock outcrop complex, 15-35 percent slopes (pine/hemlock shelterwood in SE corner of installation and patch clear cutting), (2) Chatfield-Hollis-Canton complex, 15-25 percent slopes (oak/pine shelterwood) (3) Canton very stony fine sandy loam, 8 to 15 percent slopes, (4) Chatfield-Hollis Complex, 8 to 15 percent slopes (patch clear cutting) (Bond and Handler 1981). None of these soils meet the requirements for prime farmland. Depths to bedrock are 25 to 51 cm (10 to 20 in.) for Hollis soils, 51 to 102 cm (20 to 40 in.) for Chatfield soils.

## 3.4 Water Resources

Most of NBAFS is located within the Joe English Brook watershed. The station contains a number of open waters and stream segments (intermittent and perennial; Figure 3). Most surface water drains into Joe English Pond or Brook and eventually exits the installation in the South East corner.

The major aquifer system at NBAFS is in the bedrock. Groundwater levels at NBAFS range from 22 m (73 ft) below land surface to flowing artesian conditions near Joe English Pond. Six wells have been drilled into the groundwater at NBAFS for potable water (only five are currently used). Four other wells have been drilled for non-potable grounding wells used for the satellite-tracking facilities (PES 1995).

No Federal Emergency Management Agency data is available for floodplains within NBAFS (PES 1995). However, major flood events (i.e., 100- to 500-year flood) would principally affect areas associated with Joe English Pond and Joe English Brook (PES 1995). Thus, it is not expected that the Operations Area would be adversely affected by flooding.

Permitted water pollution point sources include the station wastewater treatment plant and three storm water discharge points: two for the Building 141 parking lot and the third draining the sand borrow pit, salt/sand storage shed, and hazardous waste storage area. Discharges from the first two eventually drain into Bog Brook, which is located off-site, north of the Operations Area. The third eventually drains into Joe English Pond. Industrial and sanitary wastewater from the Operations Area is collected by a sewer system and routed to the station's wastewater treatment plant. The plant provides primary treatment and extended aeration treatment and disinfection. Discharges from the wastewater treatment plant are then discharged through a National Pollutant Discharge Elimination System (NPDES) permitted outfall to a hillside, where it eventually discharges into Beaver Pond No. 1.

## 3.5 Ecological Resources

The NBAFS has been identified as a Category I installation by both the New Hampshire Department of Fish and Game and the U.S. Fish and Wildlife Service. This classification indicates that the NBAFS has suitable habitat for conserving and managing fish and wildlife. An Integrated Natural Resource Management Plan has been prepared to guide management of the natural resources of NBAFS using an ecosystem approach. The relatively high biodiversity supported on NBAFS is attributable to the presence of generally undisturbed lands throughout much of the site and to the types of low-impact activities that occur on the station (ANL 1997).

Three ecological surveys have been conducted to determine the habitats and biotic composition of NBAFS, wetland delineation (PES 1996), biodiversity survey (ANL 1997) and a bat survey (ANL 2002). The following discussion of ecological resources emphasizes those resources that may be affected by the proposed and alternate action.

The project area habitat is primarily mature deciduous, coniferous and mixed forests. A 1996 installation wide inventory determined Northern red oak (*Quercus rubra*) is the dominant deciduous species in the forest with 22 percent of the basal area. Red maple (*Acer rubrum*) was dominant in overall number of stems with 24 percent compared to 20.7 percent for red oak. Other common species include black birch (*Betula lenta*), white birch (*Betula papyrifera*), black oak (*Quercus velutina*) American beech (*Fagus grandifolia*). Eastern white pine (*Pinus strobus*) and Eastern hemlock (*Tsuga canandensis*) are the two dominant coniferous species found on the installation. Eastern white pine accounts for 24 percent of the basal are of all trees and 13 percent of stems, hemlock accounts for 16 percent of basal area and 14 percent of the stems.

Wildlife species in and adjacent to the project area are typical for the station and region. Commonly encountered species include mourning dove, blue jay, hermit thrush, black-capped chickadee, American robin, rufous-sided towhee, dark-eyed junco, house finch, raccoon, coyote, Eastern chipmunk, woodchuck, red squirrel, red-backed vole, fisher, and white-tailed deer.

The threatened, endangered, and rare species known to occur on NBAFS are listed in Table A.1[3] (Appendix A). A discussion of these species and the eight rare natural communities that occur at NBAFS is provided in ANL (1997) and summarized in ANL (1999). None of the rare natural communities are located near the project area. Two state listed wildlife species have been documented near the proposed oak/pine shelterwood. The state listed (threatened) Eastern hognose snake (*Heterodon platyhinos*) has been well documented throughout the installation with one record occurring adjacent to the oak/pine shelterwood during the summer of 2002. The small-footed bat (*Myotis leibii*) was documented on the installation during a bat inventory conducted during summer 2002. Capture locations for the small-footed bat were within 1000 feet of the proposed oak/pine thinning.

## 3.6 Cultural Resources

Archaeological investigations within the Merrimack River system have documented prehistoric sites dating from the Early Archaic period (8,000 to 5,500 B.C.), with very limited evidence for sites dating from the earlier Paleo-Indian period (10,500 to 8,000 B.C.). The streams and wetlands present at NBAFS and its high natural resource potential made it a suitable location for both temporary single-purpose foraging locations and possible multi-component 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).

Twenty-eight historic sites occur on NBAFS (22 rural homesteads, 3 industrial complexes, and 3 civic sites [road, school, and trash dump]; Watford 1988; PAL 1993). These sites are distributed widely throughout NBAFS; although, 12 are clustered along the roads at the base of Joe English Hill. Twenty-six of these sites have been recommended as potentially eligible for listing on the *National Register of Historic Places* (PAL 1993) because of their potential to contain information important to the history of the area (Criterion D, as identified in 36 CFR 60.4). Further evaluation is required before a formal eligibility determination can be made (ANL 1999).

[3] The species listing status and ranking codes for these species are presented in Table A.2 (Appendix A).

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).

Because of the limited land area required to support satellite-tracking operations, most of NBAFS provides a natural setting (e.g., the forests, hills, wetlands, and ponds). Visual resources are therefore rated as excellent, with scenic vistas evident from the station's higher elevations.

## 3.8 Socioeconomics

About 150 people are employed by NBAFS (12 military and the remainder civilian or civilian contract employees). Although rural in character, the three communities that surround NBAFS have experienced population growth because of their location within one of the most rapidly expanding areas of New England. To accommodate this growth, residential development is expected to continue in the neighborhoods 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; PES 1995).

# 4 ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION AND ALTERNATIVES

## 4.1 Environmental Consequences of the Proposed Action

Potential impacts from the proposed alternative that were evaluated in this EA include: (1) air quality impacts; including noise increases; (2) disturbance of land, streams, and wetlands from, harvesting, and trucking; (3) land use alterations and limitations; (4) habitat modification; and (5) damage to subsurface archaeological resources. All contractors would have to comply with all Federal, State, and local regulations pertaining to the environment (e.g., air, noise, solid wastes, water;). Adherence to these regulations would mitigate the potential for adverse impacts. Nevertheless, some environmental impacts would be unavoidable. The following sections discuss these potential environmental impacts and their significance.

### 4.1.1 Air Quality and Noise

Localized, short-term air quality impacts that could occur during harvesting include the generation of fugitive dust and engine exhaust emissions. Averaged over the project period, the daily impact would be low. Also, only a small number of heavy equipment and vehicles would be involved, so total emissions would be rather small. Therefore, the potential impacts on ambient air quality in the vicinity of the NBAFS site would be minor and of short duration. No violations of applicable federal and state ambient air quality standards are expected.

Noise impacts would occur from the use of machinery and vehicles. 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 has been evaluated for the project described in this EA according to the requirements of 40 CFR 93, Subpart B. The requirements of this rule are not applicable to this action because total direct and indirect emissions from the action have been estimated at 1.4 tons of nitrogen oxides (NOx) and .7 tons volatile organic compounds (VOCs) and are below the conformity threshold value established at 40 CFR 93.153(b) of 5 Tons for ozone precursors.

### 4.1.2 Topography, Geology, and Soils

Erosion would be negligible due to the short-term exposure of open soils due to skidder trails before seeding. Mitigating measures include the use of erosion fences, hay bales, geotextile fabric, sediment basins, and revegetation, that would further reduce impacts to soils.

The harvest landing areas would be located adjacent to graveled surface. Refueling equipment would take place in landing areas, the potential for impacts from fuel-handling spills would be mitigated by use of spill kits. Vehicles and other equipment would be required to be clean and properly operating (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 Air Force and State regulations.

### 4.1.3 Water Resources

Localized minor to negligible increases in turbidity and sedimentation of surface waters in the harvests vicinity could occur during periods of soil disturbance. The major source for these impacts would be runoff from exposed soil, particularly during inclement weather, erosion control practices required for this project and seasonal timing would mitigate any potentially adverse impacts. No long-term degradation in water resources is expected to result from the implementation of the proposed action.

The project would not be expected to affect groundwater resources (e.g., change the depth to groundwater, alter groundwater flow direction, affect groundwater recharge, or impact groundwater quality). As discussed in Section 4.1.2, the potential for spills from fuel handling would be minimized through preventative actions and approved spill response procedures

### 4.1.4 Ecological Resources

Impacts to ecological resources would be limited primarily to the immediate harvest area. Dust and other particulates and noise associated with the project, which could affect adjacent vegetation, would be produced over a short period of time and would be confined to a narrow corridor near active harvesting.

#### *4.1.4.1 Vegetation*

Vegetation communities would be modified by the proposed harvest. Mature trees would be removed from patch clear-cut shelterwood and thinning areas. Forest regeneration would be expected to develop 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. Forested areas that receive a thinning treatment would continue to have the same species present. Residual trees would be expected to increase crown width and height as more growing space becomes available.

#### *4.1.4.2 Fish and Wildlife*

The proposed habitat improvement would have a positive impact on wildlife that utilizes under-story regeneration and small forest openings. Examples of these species include ruffed grouse, white-tailed deer, moose, rufus sided towhee and several bat species. Management practices 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 (examples: red squirrel, 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 in the immediate project vicinity would be disturbed during the project by noise and visual disturbances from equipment, and personnel. These disturbances could cause short distance movements of wildlife, scare birds off their nests, or otherwise disrupt normal wildlife activities. However, because of the temporary and localized nature of these disturbances, their impacts are expected to be negligible.

Rare wildlife species and neotropical migrant bird species (afforded protection under the Migratory Bird Treaty Act) are distributed widely across the station and could occur in the harvest area (ANL 1999). The whip-poor-will Eastern pipistrelle (both considered rare in the State, but neither listed by the Federal government or the State) are the only rare or listed species that have been identified near the harvest areas. Individuals of these species in the immediate project area could be disturbed during the project. Any impacts that would occur would be minor, and would not jeopardize the survival of these species at NBAFS.

Impacts to aquatic and wetland habitats and biota are expected to be temporary, minor, and indirect. No direct impacts (e.g., dredge or fill activities) to jurisdictional wetlands would occur.

#### *4.1.4.3 Threatened and Endangered Species*

No known federally or listed plant species or wildlife species are known to occur in any of the proposed harvest areas. Two state listed species have been identified near the proposed harvest areas. The small footed bat (*Myotis leibii*), state listed endangered and E. hognose snake (*Heterodon platirhinos*), state listed threatened were identified near the oak/pine shelterwood adjacent to Meadow Road during 2002.

Harvesting is not expected to have a negative effect on either species due to seasonal timing and protection of areas for bats. In summer they appear to roost beneath rocks and in rock crevices in cliff faces or talus slopes(BCI 2001). Suitable roosting areas are available on NBAFS within approximately 2000 feet of the oak/pine shelterwood. Small-footed bats would be most vulnerable to losses during the maternity season, nursing is complete by the second week in August(BCI 2001). Harvesting will not be allowed during the bat roosting season in the oak/pine shelterwood.

E. hognose snake would be unaffected by any winter harvesting activity. During summer months all contractor personnel would be briefed on the snakes appearance and asked to ensure avoidance. Individual snakes would be expected to move away from harvesting activities. No losses of hognose would be expected due to harvesting.

### 4.1.5 Cultural Resources

The proposed project would not impact known cultural resources. Earth-disturbing activities and the use of heavy equipment could potentially encounter previously undiscovered cultural resources. However, the potential to discover cultural resources is low as the project is planned for winter or dry summer conditions. Nevertheless, if cultural resource materials are unexpectedly encountered during the project, operations would cease in the immediate area of the discovery until permission to resume work is given by NBAFS.

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

The proposed project would result in a localized minor short-term loss followed by a long-term minor net gain in natural resources. This would not conflict with any plans or goals for natural resource management at NBAFS. The proposed project would have no effects on land use in the area surrounding NBAFS.

### 4.1.7 Socioeconomics

The proposed action would require about 3000 man-hours of labor over a period of about nine months distributed over two years. All activities would be confined to NBAFS. The nature and duration of the proposed project would not cause any significant adverse socioeconomic impacts to the local population, labor force, or economy. Because only a small work force would be required, impacts on the capacities of public services (e.g., schools, police, fire protection) would not occur. The project would provide negligible employment benefits and associated increase in cash flow to the local economy.

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" (February 11, 1994), 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, since the proposed project would have no impact on the population immediately surrounding NBAFS.

### 4.1.8 Health and Safety

Health and safety issues related to the project routinely center on the potential or perceived effects from exposure to hazardous materials or equipment related injuries. Contractors are not expected to need any hazardous material other than fuel and lubricating oils to complete this project. All contractors are required to follow OSHA guidelines while working on the installation.

## 4.2 Environmental Consequences of the Alternative Action

Impacts associated with implementation of the alternate action would be qualitatively similar to those previously addressed for the proposed action (Section 4.1). Therefore, the following sections refer back to the assessments for the proposed action for general impact characterizations; and then compare impacts between the action, as appropriate.

### 4.2.1 Air Quality and Noise

Impacts would be the same as the proposed action described in Section 4.1.1.

### 4.2.2 Topography, Geology, and Soils

Impacts to topography, geology, and soils would be similar to those that would result from the proposed action Section 4.1.2.

### 4.2.3 Water Resources

Impacts to water resources from the alternate action (clear cutting) would be similar to those for the proposed action described in Section 4.1.3.

### 4.2.4 Ecological Resources

Impacts to ecological resources would be approximately the same as the proposed action. Impacts to ecological resources from clear cutting and planting in the project area would include limiting the availability of overstory habitat by certain wildlife species (killdeer, woodchuck, northern flicker, etc.). Planting would also modify the tree species composition of regeneration and would introduce seedlings with non-local genetics.

Disturbance of wildlife would be approximately the same as the proposed action described in Section 4.1.4.

### 4.2.5 Cultural Resources

Potential impacts to cultural resource for the alternate would be similar to those for the proposed action described in Section 4.1.5; no impacts are anticipated.

4.2.6 Land Use, Recreation, and Visual Resources

Potential impacts on land use would be similar to those for the proposed action described in Section 4.1.6.

4.2.7 Socioeconomics

Socioeconomic impacts of alternate would be similar to those resulting from the proposed action (Section 4.1.7).

4.2.8 Health and Safety

Health and safety effects associated with the alternative would be similar to those of the proposed action desecribed in Section 4.1.8.

## 4.3 Environmental Consequences of the No-Action Alternative

Under the no-action alternative, the forest would continue to mature. Taking no action would be equivalent to maintaining the existing environment (as described in Section 3). The impacts associated with the forest harvest including patch clear cutting, and shelterwood cuts as described in Section 4.1 (proposed action) and Section 4.2 clear cutting and planting would not occur.

## 4.4 Adverse Effects that Cannot be Avoided if the Project Is Implemented

Implementation of the proposed alternative (Forest Harvesting) should not result in any long-term adverse environmental impacts.

Although no significant air quality impacts are anticipated if the project is implemented, fugitive dust and engine exhaust emissions would be released during project activities. All air quality impacts would be short-lived and limited to the immediate project surroundings.

Despite the implementation of control measures, some unavoidable increases in soil erosion could result from project activities, especially during heavy rains. Turbidity and suspended solids in nearby surface water bodies could temporarily increase.

The potential would exist, albeit small, for serious injuries or fatalities to workers during the project.

## 4.5 Irreversible and Irretrievable Commitment of Resources

Resources that would be committed irreversibly or irretrievably from forest harvesting 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, and other materials during project execution would constitute an irreversible and irretrievable commitment of those resources.

## 4.6 Relationship between Short-Term Uses and Long-Term Productivity

This section evaluates the effect of the proposed short-term use of the environment for the forest harvest on the long-term productivity of this same land and its resources. Forest harvesting will provide higher quality habitat for many wildlife species than the current forest condition. Most adverse impacts to the environment would be temporary (e.g. increased noise).

The only short-term socioeconomic impacts would be those associated with the employment of workers over a period of about nine months. Long-term socioeconomic impacts would be negligible.

## 4.7 Cumulative and Incremental 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 can result from individually minor but collectively significant actions taking place over a period of time (ANL 2000). No adverse cumulative effects are anticipated for either the proposed or alternative actions

The potential impact on ambient air quality from emissions (e.g., fugitive dust and engine exhaust emissions) would be a negligible short-term increase in emissions occurring from other activities at NBAFS and within Hillsborough County. However, emissions associated with the proposed action would be mostly confined to the immediate project area since most emissions would be released near ground level. Emission rates would be low, so potential impacts on

ambient air quality would be minor. Under the proposed and alternative actions, some equipment noise could be detectable. However, these activities would occur infrequently, so cumulative noise impacts would be localized and temporary in nature.

## 5 REFERENCES


Acoustical Society of America, 1983, *American National Standard Specification for Sound Level Meters*, ANSI S1.4-1983, New York, N.Y., Feb.

Acoustical Society of America, 1985, *American National Standard Specification for Sound Level Meters*, ANSI S1.4A-1985, Amendment to ANSI S1.4-1983, New York, N.Y., June.

ANL: see Argonne National Laboratory.

Argonne National Laboratory, 1990, *Environmental Assessment for the Conduct of Military Training, New Boston Air Force Station, New Hampshire*, prepared by Argonne National Laboratory, Environmental Assessment and Information Sciences Division, Argonne, Ill. for Department of the Air Force Headquarters, Air Force Space Command, Environmental Planning Division, Peterson Air Force Base, Colo., July.

Argonne National Laboratory, 1997, *Biodiversity Survey of New Boston Air Station, New Hampshire*, Final Report, Argonne National Laboratory, Environmental Assessment Division, Argonne, Ill., Sept.

Argonne National Laboratory, 1999, *Environmental Assessment of Military Training Activities at New Boston Air Station, New Hampshire*, prepared by Argonne National Laboratory, Environmental Assessment Division, Argonne, Ill. for U.S. Department of the Air Force, New Boston Air Station, NH, May.

Argonne National Laboratory, 2000, *Environmental Assessment for Construction of Phase II of an Underground Electrical and Communications Distribution System at New Boston Air Force Station New Hampshire*, prepared by Argonne National Laboratory, Environmental Assessment Division, Argonne, Ill. for U.S. Department of the Air Force, New Boston Air Station, NH, May 2000.

Bat Conservation International (BCI), 2001, *Bats in Eastern Woodlands*, Bat Conservation International.

Bond, R.W., and J.F. Handler, 1981, *Soil Survey of Hillsborough County, New Hampshire, Eastern Part*, U.S. Department of Agriculture, Soil Conservation Service, Oct.

DeGraaf, R.M., and D.D. Rudis, 1986, *New England Wildlife: Habitat, Natural History, and Distribution*, U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station, General Technical Report NE-108.

ENSR: see ENSR Consulting and Engineering.

ENSR Consulting and Engineering, 1993, *Natural Resources Management Plan for New Boston Air Force Station New Hampshire*, Prepared for U.S. Army Corps of Engineers, New England Division, July.

EPA: see U.S. Environmental Protection Agency.

Liebich, R.E., and M.P. Cristoforo, 1988, "The Use of Audibility Analysis to Minimize Community Noise Impact of Today's Smaller Generation Facilities: Located near Residential Areas," presented at American Power Conference 50th Annual Meeting, Chicago, Ill., Apr.

Loflin, B.G., and R.S. Grumet, 1996, *United States Air Force Cultural Resources Servicewide Overview Project: New Boston Air Station, Air Force Space Command, Hillsborough County, New Hampshire,* National Park Service Resource Stewardship and Partners Team, Northeast Field Area, Philadelphia, Penn., and Georgia Trust for Historic Preservation, Feb.

Muller, N.C., 1998, Letter from N.C. Muller (State Historic Preservation Officer, New Hampshire Division of Historical Resources) to S. Najjar (Natural Resources Planner, 23 SOPS/MAFCVN, New Boston Air Station), Aug. 28.

PAL: see Public Archaeology Laboratory Inc.

Parsons Engineering Science, Inc., 1995, *Preliminary Final Environmental Assessment for Unexploded Ordnance Clearance at Joe English Pond New Boston Air Force Station, New Hampshire*, prepared for New Boston Air Force Station, N.H., and 50th Space Wing (AFSPC), Falcon AFB, Colo., by Parsons Engineering Science, Inc., Boston, Mass, June.

Parsons Engineering Science, Inc., 1996, *Wetlands Delineation Report*, prepared for New Boston Air Force Station, N.H., and 50th Space Wing (AFSPC), Falcon AFB, Colo., by Parsons Engineering Science, Inc., Mass., Sept.

Parsons Engineering Science, Inc., 1998, *Survey and Evaluation of Cold War Resources, New Boston Air Station, New Boston, New Hampshire (Draft)*, prepared for 50th Space Wing (AFSPC), Falcon AFB, Colo., by Parsons Engineering Science, Inc., Mass, March.

PES: see Parsons Engineering Science, Inc.

Public Archaeology Laboratory, Inc., 1993, *Historic and Archaeological Reconnaissance/Inventory Survey, Cultural Resources Management Plan, New Boston Air Force Station, New Boston, Mont Vernon, Amherst, New Hampshire*, prepared for U.S. Army Corps of Engineers, New England Division, Waltham, Mass., June.

Ramsdell, J.V., and G.L. Andrews, 1986, *Tornado Climatology of the Contiguous United States*, NUREG/CR-4461 and PNL-5697, Pacific Northwest Laboratory, prepared for U.S. Nuclear Regulatory Commission, May.

Ruffner, J.A. (editor), 1985, *Climates of the States: National Oceanic and Atmospheric Administration Narrative Summaries*, 3rd edition, Gale Research Company, Detroit, Mich.

Sanborn, P., 1998, personal communication from P. Sanborn (Department of Environmental Services, Air Resources Division, Concord, N.H.) to Y.-S. Chang (Argonne National Laboratory, Argonne, Ill.), Nov. 19.

USAF: see U.S. Air Force.

U.S. Environmental Protection Agency, 1974, *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*, EPA-550/9-74-004, Office of Noise Abatement and Control, Washington, D.C., March.

Watford, R., 1988, *Preservation Plan, New Boston Air Force Station, New Hampshire*, prepared by Department of Anthropology, Northern Arizona University, Flagstaff, Ariz., Aug.

# 6 LIST OF PREPARERS

| Name | Education/Experience | Contribution |
|---|---|---|
| Stephen Najjar | MS Natural Resources<br>7 Years Natural Resources Management | Responsible for all phases of EA preparation |

## 7 AGENCIES, ORGANIZATIONS, AND PERSONS CONTACTED

Candace Hunstiger, Capt, USAF
Staff Judge Advocate
50 SW/JA
608 Navstar Street Suite 18
Schriever Air Force Base, CO 8012

Mr. James McConaha
State Historic Preservation Officer
19 Pillsbury Street
PO Box 2043
Concord NH 03302-2043

New Hampshire Fish and Game Department
Mr. William S. Bartlett, Jr.
Executive Director
2 Hazen Drive
Concord NH 03301

US Department of Interior
Mr. Michael Bartlett
Field Supervisor
Fish and Wildlife Service
70 Commercial St
Concord NH 03301

## APPENDIX A
## LISTED AND RARE SPECIES ON NEW BOSTON AIR STATION

**Table A.1 Federally Listed, State Listed, and Rare Species of Plants and Animals Found on New Boston Air Station, New Hampshire.[a]**

| Common Name | Scientific Name | Federal Status | State Status | State Rank |
|---|---|---|---|---|
| ***Plants*** | | | | |
| Fern-leaved false foxglove | *Aureolaria pedicularia* var *intercedens* | -[b] | LE | S1 |
| ***Moths*** | | | | |
| No common name | *Aphareta purpurea* | - | - | S2 |
| Orange-spotted idia | *Idia diminuendis* | - | - | S2S4 |
| ***Butterflies and Skippers*** | | | | |
| Appalachian brown | *Satyrodes appalachia* | - | - | S1? |
| Delaware skipper | *Atrytone logan* | - | - | S3S4 |
| Mulberry wing | *Poanes massasoit* | - | - | S1S3 |
| Little glassywing | *Pompeius verna* | - | - | SU |
| ***Reptiles*** | | | | |
| Blanding's turtle | *Emydoidea blandingii* | - | - | S3 |
| Eastern hognose snake | *Heterodon platirhinos* | - | LT | S2 |
| ***Birds*** | | | | |
| Pied-billed grebe | *Podilymbus podiceps* | - | LE | S1B/ZN |
| American bittern | *Botaurus lentiginosus* | - | - | S3B |
| Osprey | *Pandion haliaetus* | - | LT | S2B/ZN |
| Bald eagle | *Haliaeetus leucocephalus* | LT | LE | S1 |
| Northern harrier | *Circus cyaneus* | - | LT | S2B |
| Cooper's hawk | *Accipiter cooperi* | - | LT | S2B/ZN |
| Whip-poor-will | *Caprimulgus vociferus* | - | - | S3B |
| ***Mammals*** | | | | |
| Small footed bat | *Myotis leibii* | | LE | S1 |
| Eastern pipistrelle | *Pipistrellus subflavus* | | | S1N/SUB |

[a] Federal and state listing status codes and state ranks are defined in Table A.2 (Appendix A). State ranks do not confer any official or legal status to a species. These ranks are assigned by the New Hampshire Natural Heritage Inventory to provide information on the population status of species within the state.

[b] A dash (-) indicates that the status is not applicable to that species. A question mark (?) indicates that the status shown is expected, but not known with certainty.

Source: ANL (1997), modified Jan 03.

## Table A.2 Species Listing Status and Ranking Codes Used by the Federal Government and the State of New Hampshire.

---

**Federal Listing Status Codes**[1]

LE Listed as Endangered Species in the List of Endangered and Threatened Wildlife and Plants under the provisions of the Endangered Species Act. Defined as any species which is in danger of extinction throughout all or a significant portion of its range.

PE Proposed for addition to the List of Endangered and Threatened Wildlife and Plants as Endangered Species.

LT Listed as Threatened Species. Defined as any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

PT Proposed for listing as Threatened Species.

C Candidate Species for addition to the list of Endangered and Threatened Wildlife and Plants. Taxa for which the USFWS currently has substantial information on hand to support the biological appropriateness of proposing to list the species as endangered or threatened.

LTSA Threatened due to similarity of appearance.

NL Not currently listed, nor currently being considered for addition to the List of Endangered and Threatened Wildlife and Plants.

**State Listing Status Codes**[2]

LE Endangered; those native species whose prospects for survival in New Hampshire are in immediate danger because of a loss or change in habitat, over-exploitation, predation, competition, disease, disturbance or contamination. Assistance is needed to ensure continued existence as a viable component of the State's wildlife community.

LT Threatened; those species which may become endangered if conditions surrounding them begin, or continue to deteriorate.

SC Special concern; those species which do not meet the definition of threatened or endangered species but, because of their beauty, commercial value, excessive collecting, or other factors, require monitoring or regulation.

**State Rank Codes**[3]

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 quite rare in parts of its range, especially at the periphery.

## Table A.2 (continued).

**State Rank Codes[3] (continued)**

S5 Demonstrably secure, though it may be quite rare in parts of its range, especially at the periphery.

SU Possibly in peril, but status uncertain; more information needed.

SH Historically known; may be rediscovered.

### State Rank Modifiers

A Accidental in the state; including species (usually birds or butterflies) recorded very infrequently, hundreds or thousands of miles outside their usual range.

B Breeding status for a migratory species. Example: S1B, SZN - breeding occurrences for the species are ranked S1 (critically imperiled) in the state, nonbreeding occurrences are not ranked in the state.

E An exotic established in the state; may be native in nearby regions.

N Non-breeding status for a migratory species. Example: S1B,SZN - breeding occurrences for the species are ranked S1 (critically imperiled) in the state, non-breeding occurrences are not ranked in the state.

Z Ranking not applicable.

? Ranking suspected, but uncertain.

[1]List maintained by the U.S. Fish and Wildlife Service.

[2]List maintained by the New Hampshire Department of Fish and Game

[3] State species ranking codes do not confer any official or legal status to a species. These ranks are developed by the New Hampshire Natural Heritage Inventory to provide information on the population status of species within the state.

# APPENDIX B
# REQUEST FOR ENVIRONMENTAL IMPACT ANALYSIS (AF FORM 813) (WITH AIR CONFORMITY CALCULATIONS)

# REQUEST FOR ENVIRONMENTAL IMPACT ANALYSIS

Report Control Symbol 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).*

## SECTION I - PROPONENT INFORMATION

| 1. TO *(Environmental Planning Function)* | 2. FROM *(Proponent organization and functional address symbol)* | 2a. TELEPHONE NO. |
|---|---|---|
| MAFCVN | MAFCVN | 2426 |

3. TITLE OF PROPOSED ACTION
Conduct Forest Harvesting in New Boston Air Force Station Management Unit 2 and Unit 23 & 24

4. PURPOSE AND NEED FOR ACTION *(Identify decision to be made and need date)*
The proposed harvesting complies with habitat management goals set in the Integrated Natural Resources Management Plan for NBAFS. Harvesting will result in an increase in young age class class forest and will increase growth rates on residual trees.

5. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES *(DOPAA) (Provide sufficient details for evaluation of the total action.)*
The proposed action includes the use of patch-clearcutting and thinning to increase tree regeneration and growth rates of dominant desireable trees in units 2 (approx 20 acres)and 23 (approx. 50 acres). Alt 1. clearcut and plant, No action

| 6. PROPONENT APPROVAL *(Name and Grade)* | 6a. SIGNATURE | 6b. DATE |
|---|---|---|
| RAYMOND J. TRAMPOSCH, Capt, USAF<br>Support Officer | | 29 JUL 02 |

| SECTION II - PRELIMINARY ENVIRONMENTAL SURVEY. *(Check appropriate box and describe potential environmental effects including cumulative effects.) (+ = positive effect; 0 = no effect; - = adverse effect; U = unknown effect)* | + | 0 | - | U |
|---|---|---|---|---|
| 7. AIR INSTALLATION COMPATIBLE USE ZONE/LAND USE *(Noise, accident potential, encroachment, etc.)* | | SOW X | | |
| 8. AIR QUALITY *(Emissions, attainment status, state implementation plan, etc.)* | | SOW X | | |
| 9. WATER RESOURCES *(Quality, quantity, source, etc.)* Use of stormwater BMP's per contract. | | SOW X | | |
| 10. SAFETY AND OCCUPATIONAL HEALTH *(Asbestos/radiation/chemical exposure, explosives safety quantity-distance, bird/wildlife aircraft hazard, etc.)* | | 29 JUL 02 | | |
| 11. HAZARDOUS MATERIALS/WASTE *(Use/storage/generation, solid waste, etc.)* addressed in SOW | | SOW X | | |
| 12. BIOLOGICAL RESOURCES *(Wetlands/floodplains, threatened or endangered species, etc.)* | | X | | |
| 13. CULTURAL RESOURCES *(Native American burial sites, archaeological, historical, etc.)* | | X | | |
| 14. GEOLOGY AND SOILS *(Topography, minerals, geothermal, Installation Restoration Program, seismicity, etc.)* | | SOW X | | |
| 15. SOCIOECONOMIC *(Employment/population projections, school and local fiscal impacts, etc.)* | | SOW X | | |
| 16. OTHER *(Potential impacts not addressed above.)* | | | | |

## SECTION III - ENVIRONMENTAL ANALYSIS DETERMINATION

17.
- [ ] PROPOSED ACTION QUALIFIES FOR CATEGORICAL EXCLUSION (CATEX) # _____ ; OR
- [X] PROPOSED ACTION DOES NOT QUALIFY FOR A CATEX; FURTHER ENVIRONMENTAL ANALYSIS IS REQUIRED.

18. REMARKS
Environmental Assessment (EA) is needed due to the presense of the small footed bat (*Myotis leibii*), New Hampshire listed threatened.

General Conformity Determination Not Needed, Calc. show below threshold
Attached P.N.

| 19. ENVIRONMENTAL PLANNING FUNCTION CERTIFICATION *(Name and Grade)* | 19a. SIGNATURE | 19b. DATE |
|---|---|---|
| STEPHEN J. NAJJAR, GS-11<br>Natural Resources Planner | | 29 JUL 02 |

General Air Conformity Analysis for Proposed New Boston AFS Timber Harvest
Stephen J. Najjar, Natural Resources Planner

7-Jan-03

Chainsaws

| HC | Exhaust | | | HC | Evap | | | HC | Refuel | | | Nox | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N | 2 | | | N | 2 | | | N | 2 | | | N | 2 | |
| | Hp | 6.4 | | | Hp | 6.4 | | | Hp | 6.4 | | | Hp | 6.4 | |
| | LF | 0.5 | | | LF | 0.5 | | | LF | 0.5 | | | LF | 0.5 | |
| | Hour | 300 | | | Hour | 300 | | | Hour | 300 | | | Hour | 300 | |
| | EF | 152 | | | EF | 0.66 | | | EF | 10.22 | | | EF | 0.96 | |
| | Mass grams | 291840 | lbs | 644.2384106 | Mass grams | 1267.2 | lbs | 2.797351 | Mass gram | 19622.4 | lbs | 43.31656 | Mass gram | 1843.2 | lbs | 4.068874 |

Sum of chainsaw emissions in lbs 694.4211921

PickupTruck (Heavy duty gas powered)

| Per mile HC | Nox | Max Miles per day | Number of trucks | Total g/day | Total days | lbs |
|---|---|---|---|---|---|---|
| 4 | 3.4 | 100 | 2 | 2720 | 187 | 1122.826 |

Sum of pickup emissions in lbs 1122.825607

Log Truck

| Per mile HC | Nox | Max Miles per day | Number of trucks | Total g/day | Total days | lbs |
|---|---|---|---|---|---|---|
| 2 | 8.2 | 200 | 2 | 6560 | 187 | 2707.991 |

Sum of log truck emissions lbs 2707.99117

Skidder

| HC | Exhaust | | | HC | Crank | | | HC | Refule | | | Nox | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | N | 1 | | | N | 1 | | | N | 1 | | | N | 1 | |
| | Hp | 131 | | | Hp | 131 | | | Hp | 131 | | | Hp | 131 | |
| | LF | 0.49 | | | LF | 0.49 | | | LF | 0.49 | | | LF | 0.49 | |
| | Hour | 750 | | | Hour | 750 | | | Hour | 750 | | | Hour | 750 | |
| | EF | 0.54 | | | EF | 0.02 | | | EF | 0.003 | | | EF | 11.3 | |
| | Mass grams | 25996.95 | lbs | 57.3884106 | Mass grams | 962.85 | lbs | 2.125497 | Mass gram | 144.4275 | lbs | 0.318825 | Mass gram | 544010.3 | lbs | 1200.906 |

Sum of skidder emissions 1260.738361

Sum of all emissions lbs 5785.97633
Sum of all emissions Tons 2.892988165

Notes:
Formula and data for chainsaw and skidder from EPA 21a-2001 Nonroad vehicle emission study report
Truck data obtained from the 5th edition of EPA AP-42 Vol. II
Used model year 1995 for truck calculations

APPENDIX C
CORRESPONDENCE

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

DEC 31 2002

MEMORANDUM FOR NEW HAMPSHIRE DEPARTMENT OF FISH AND GAME
ATTN: MR. WILLIAM S. BARTLETT, JR.
EXECUTIVE DIRECTOR
2 HAZEN DRIVE
CONCORD NH 03301

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

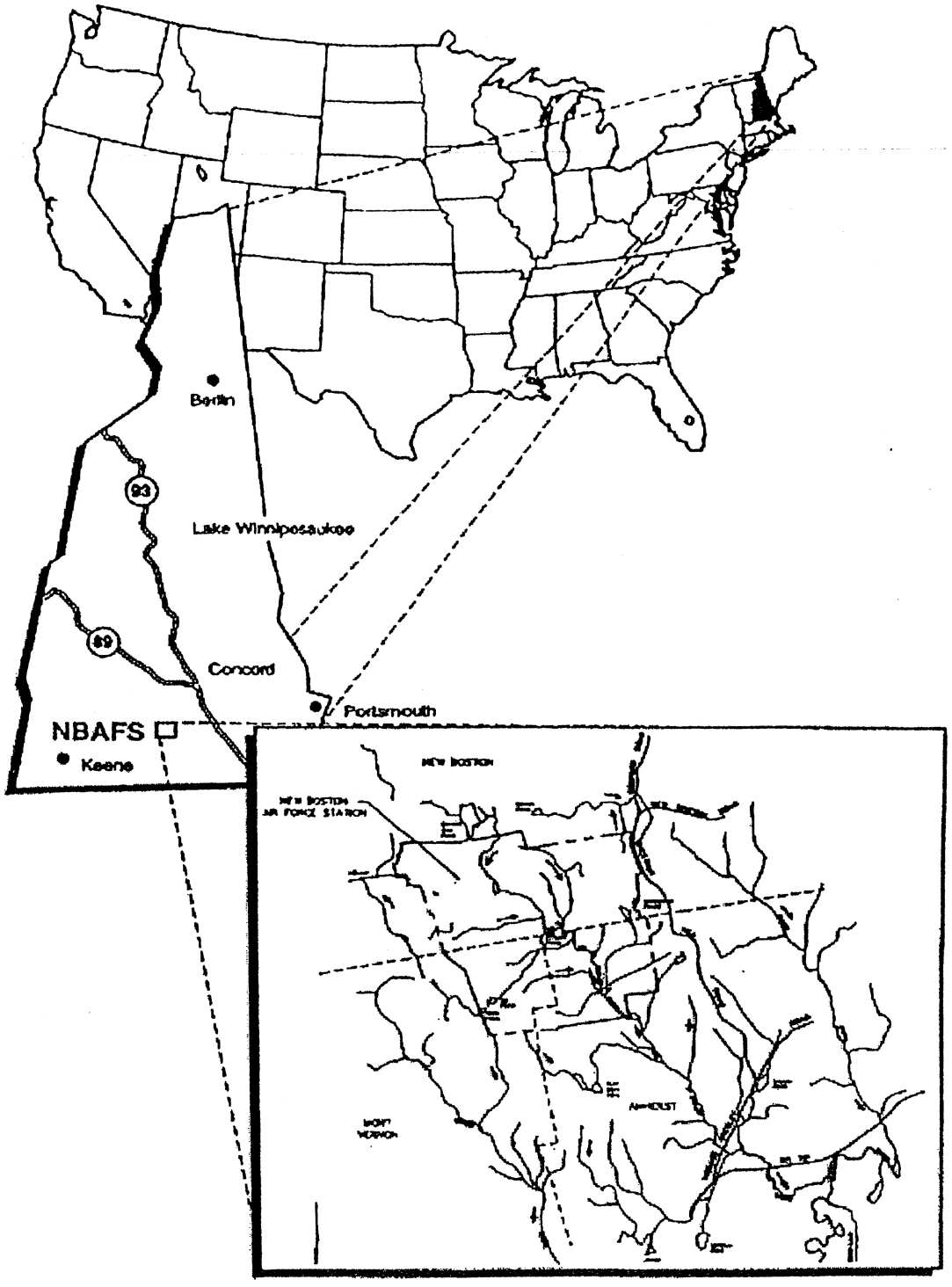
SUBJECT: Preparation of an Environmental Assessment (EA) for Forest Harvesting at New Boston Air Force Station (NBAFS), New Hampshire

1. I am requesting information from your office regarding state-listed threatened and endangered plant and animal species that may occur on or in the vicinity of NBAFS, NH (Atch 1).

2. The United States Air Force (USAF) plans to conduct forest harvesting in three locations (Atch 2) on approximately 150-200 acres over the next two-three years. Harvesting would occur primarily during fall and winter months (Sep-Mar). Forest management practices would include the application of several silvicultural techniques designed to improve forest and wildlife habitat quality including thinning, shelterwood and patch clear-cutting (1-2 acres).

3. NBAFS is a satellite-tracking station that occupies approximately 2,836 acres in Hillsborough county of south-central New Hampshire. The station is predominantly undeveloped forest with a mix of deciduous and coniferous trees that varies in species dominance and seral stage across the site. State-listed species found on NBAFS during a two-year biodiversity survey conducted from 1994–1996 included the fern-leaved false foxglove (*Aureolaria pedicularia* var *intercedens*), pied-billed grebe (*Podilymbus podiceps*), osprey (*Pandion haliaetus*), bald eagle (*Haliaeetus leucocephalus*), northern harrier (*Circus cyaneus*), Cooper's hawk (*Accipiter cooperi*), eastern hognose snake (*Heterodon platirhinos*) and small footed bat (*Myotis leibii*). The bald eagle and northern harrier were not observed to use station habitat, but were observed in flight over the site during fall migration. Recently, a bald eagle was observed during the winter feeding on a deer carcass at Joe English Pond in the central portion of the station. See Atch 3 for a complete list of protected and rare species and natural communities found on NBAFS. Bat data is not included in attached table; this data was collected during summer 2002 and is currently unpublished.

Location of New Boston Air Force Station (Source: ENSR, 1993)




Attachment 1

## Listed and Rare Communities and Species of NBAFS (continued)

| Common Name | Scientific Name | Federal Status[1] | State Status[1] | State Rank[1] | Number of Observations[2] |
|---|---|---|---|---|---|
| Birds (continued) | | | | | |
| Northern harrier | *Circus cyaneus* | -- | LT | S2B | 8 |
| Cooper's hawk | *Accipiter cooperi* | -- | LT | S2B/ZN | 9 |
| Whip-poor-will | *Caprimulgus vociferus* | -- | -- | S3B | 6 |

Source: *Biodiversity Survey of New Boston Air Station*, Argonne National Laboratory (1997).

[1] State ranks do not confer any official or legal status to a species. These ranks are assigned by the New Hampshire Natural Heritage Inventory to provide information on the population status of species within the State.

[2] Number of observations is the number of individuals encountered in surveys. For plants, this is the 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 was observed and it is possible that the same individual was seen and counted more than once.

[3] Some natural communities on NBAFS exhibited characteristics of more than one community type. Where this occurred, the name and rank of both communities are listed separately. Natural communities are not assigned a Federal or State status.

[4] NA = not applicable.

[5] 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.

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

DEC 3 1 2002

MEMORANDUM FOR UNITED STATES DEPARTMENT OF INTERIOR
ATTN: MR. MICHAEL BARTLETT
FIELD SUPERVISOR
FISH AND WILDLIFE SERVICE
70 COMMERCIAL STREET, SUITE 300
CONCORD NH 03301

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

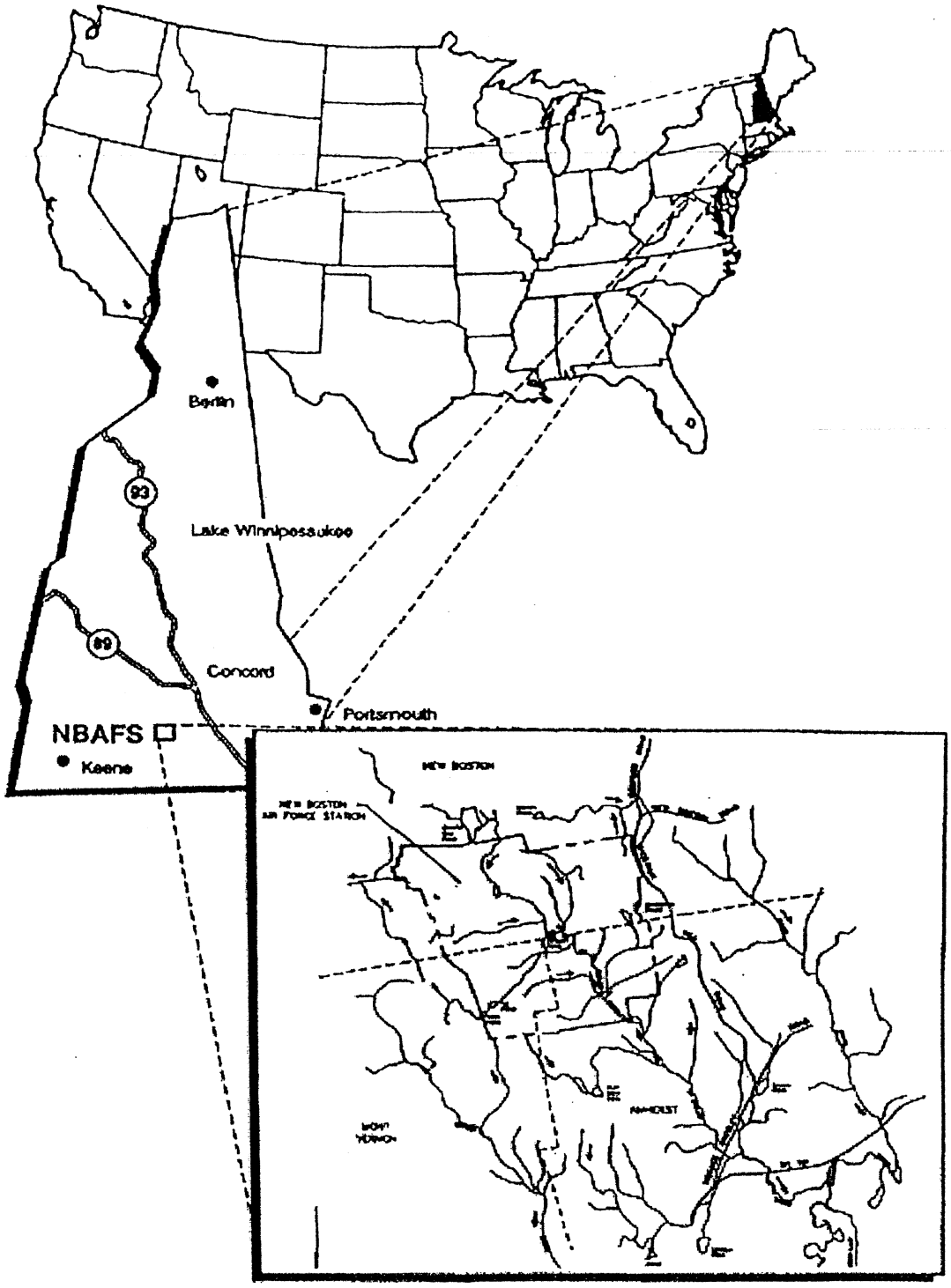
SUBJECT: Preparation of an Environmental Assessment (EA) for Forest Harvesting at New Boston Air Force Station (NBAFS), New Hampshire

1. I am requesting information from your office regarding federally-listed threatened and endangered plant and animal species that may occur on or in the vicinity of NBAFS, New Hampshire (Atch 1)

2. The United States Air Force (USAF) plans to conduct forest harvesting in three locations (Atch 2) on approximately 150-200 acres over the next two-three years. Harvesting would occur primarily during fall and winter months (Sep-Mar). Forest management practices would include the application of several silvicultural techniques designed to improve forest and wildlife habitat quality including thinning, shelterwood and patch clear-cutting (1-2 acres).

3. NBAFS is a satellite-tracking station that occupies approximately 2,836 acres in Hillsborough county of south-central New Hampshire. The station is predominantly undeveloped forest with a mix of deciduous and coniferous trees that varies in species dominance and seral stage across the site. State-listed species found on NBAFS during a two-year biodiversity survey conducted from 1994–1996 included the fern-leaved false foxglove (*Aureolaria pedicularia* var *intercedens*), pied-billed grebe (*Podilymbus podiceps*), osprey (*Pandion haliaetus*), bald eagle (*Haliaeetus leucocephalus*), northern harrier (*Circus cyaneus*), Cooper's hawk (*Accipiter cooperi*), eastern hognose snake (*Heterodon platirhinos*) and small footed bat (*Myotis leibii*). The bald eagle and northern harrier were not observed to use station habitat, but were observed in flight over the site during fall migration. Recently, a bald eagle was observed during the winter feeding on a deer carcass at Joe English Pond in the central portion of the station. See Atch 3 for a complete list of protected and rare species and natural communities found on NBAFS. Bat data is not included in attached table; this data was collected during summer 2002 and is currently unpublished.

Location of New Boston Air Force Station (Source: ENSR, 1993)




Attachment 1

## Federally Listed, State-Listed, and Rare Species of Plants and Animals and Rare Natural Communities Found on New Boston Air Force Station, New Hampshire, 1994 to 1996[1]

| Common Name | Scientific Name | Federal Status[1] | State Status[1] | State Rank[1] | Number of Observations[2] |
|---|---|---|---|---|---|
| Natural Communities[3] | | | | | |
| Black Gum - Red Maple Basin Swamp | NA[4] | -- | -- | S1S2 | 1 |
| Coastal/Southern Dwarf Shrub Bog and Acidic Fen | NA | -- | -- | S1/S2 | 1 |
| Hardwood-Conifer Basin Swamp and Coastal/Southern Dwarf Shrub Bog | NA | -- | -- | SU/S1 | 1 |
| Coastal/ Southern Acidic Fen | NA | -- | -- | S2 | 1 |
| Transitional/ Appalachian Acidic Talus Woodland | NA | -- | -- | S3 | 1 |
| Dry Transitional Oak-White Pine Forest | NA | -- | -- | S3S4 | 1 |
| Southern Acidic Rocky Summit Community | NA | -- | -- | S3S4 | 1 |
| Oak-Pine Rocky Summit Woodland Community | NA | -- | -- | SU | 1 |
| Plants | | | | | |
| Fern-leaved false foxglove | *Aureolaria pedicularia* var *intercedens* | -- | LE | S1 | >100 |
| Moths | | | | | |
| No common name | *Aphareta purpurea* | -- | -- | S2 | 1 |
| Orange-spotted idia | *Idia diminuendis* | -- | -- | S2S4 | 1 |
| Butterflies and Skippers | | | | | |
| Appalachian brown | *Satyrodes appalachia* | -- | -- | S1? | 7 |
| Delaware skipper | *Atrytone logan* | -- | -- | S3S4 | 1 |
| Mulberry wing | *Poanes massasoit* | -- | -- | S1S3 | 4 |
| Little glassywing | *Pompeius verna* | -- | -- | SU | 1 |
| Reptiles | | | | | |
| Blanding's turtle | *Emydoidea blandingii* | -- | -- | S3 | 4 |
| Eastern hognose snake | *Heterodon platirhinos* | -- | -- | S2 | 1 |
| Birds[5] | | | | | |
| Pied-billed grebe | *Podilymbus podiceps* | -- | LE | S1B/ZN | 10 |
| American bittern | *Botaurus lentiginosus* | -- | -- | S3B | 2 |
| Osprey | *Pandion haliaetus* | -- | LT | S2B/ZN | 57 |
| Bald eagle | *Haliaeetus leucocephalus* | LT | LE | S1 | 5 |

# United States Department of the Interior

**FISH AND WILDLIFE SERVICE**
New England Field Office
70 Commercial Street, Suite 300
Concord, New Hampshire 03301-5087

February 11, 2003

Stephan Najjar
New Boston Air Force Station
23 SOPS/MAFCVN
317 Chestnut Hill Road
New Boston AFS, NH 03070-5125

Dear Stephan:

This responds to Lt. Col. Stephen F. Sovaiko's December 31, 2002 letter requesting concurrence of no adverse effect on federally-listed and proposed endangered or threatened species in relation to proposed forest harvesting at the New Boston Air Force Station in New Boston, New Hampshire. Our comments are provided in accordance with Section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

Based on information currently available to us, no federally-listed or proposed threatened or endangered species under the jurisdiction of the U.S. Fish and Wildlife Service are known to occur in the project area, with the exception of occasional transient bald eagles (*Haliaeetus leucocephalus*), as stated in your letter. Therefore, we concur with your no effect determination. Preparation of a Biological Assessment or further consultation with us under Section 7 of the Endangered Species Act is not required. Should project plans change, or additional information on listed or proposed species becomes available, this determination may be reconsidered.

Thank you for your cooperation and please contact me at 603-223-2541 if we can be of further assistance.

Sincerely yours,

Susanna L. von Oettingen
Endangered Species Biologist
New England Field Office

NEW HAMPSHIRE DIVISION OF HISTORICAL RESOURCES
State of New Hampshire, Department of Cultural Resources 603-271-3483
19 Pillsbury Street, P. O. Box 2043, Concord NH 03302-2043 603-271-3558
Voice/TTY RELAY ACCESS 1-800-735-2964 FAX 603-271-3433
*http://www.state.nh.us/nhdhr* *preservation@nhdhr.state.nh.us*

January 15, 2003

Stephen F. Sovaiko, Lt. Col., USAF
Commander
50th Space Wing
Department of the Air Force
317 chestnut Hill Road
New Boston, NH 03070-5125

RE: Three Proposed Forest Harvests at New Boston Air Force Station, New Boston, NH

Dear Lt. Col. Sovaiko:

In accordance with the National Historic Preservation Act of 1966 (P.L. 89-655), as amended, and as implemented by regulations of the Federal Advisory Council on Historic Preservation ("36 CFR Part 800: Protection of Historic Properties"), the New Hampshire Division of Historical Resources/State Historic Preservation Office has reviewed the undertaking referenced above to identify potential effects on properties listed, or potentially eligible for listing, in the National Register of Historic Places.

Based upon the information currently available, it has been determined that there are no known properties of architectural, historical, archaeological, engineering, or cultural significance within the area of the undertaking's potential impact and no identification or evaluative studies are recommended.

If any other resources are discovered or affected as a result of project planning or implementation, the Division of Historical Resources is to be consulted on the need for appropriate evaluative studies, determinations of National Register eligibility, and mitigative measures (redesign, resource protection, or data recovery) as required by federal law and regulations.

For the purpose of compliance with the Advisory Council on Historic Preservation procedures (36 CFR 800), I request that this determination be construed as a finding of "No Historic Properties Affected".

Sincerely,

James McConaha

James McConaha
State Historic Preservation Officer

JM:EF:dg