Nash Stream Forest

MANAGEMENT PLAN

State of New Hampshire
Department of Resources and Economic Development
1995

FOREWORD

The Nash Stream Forest is a unique parcel of land in Northern New Hampshire. Its acquisition in 1988, through a collaborative effort between the state of New Hampshire Land Conservation Investment Program, the U.S. Forest Service, The Nature Conservancy, The Trust for New Hampshire Lands, and The Society for the Protection of New Hampshire Forests is equally unique, and serves as a milestone in state, private and federal cooperation.

The diversity of the groups represented in this effort is almost as great as the diversity of resources that exists within the Nash Stream Forest and the topography of the land itself. Yet over an eighteen-month period, representatives from each of these groups worked together, to negotiate an arrangement which all felt was in the best interest of the land and the people who use it.

All of the groups involved in the purchase and future management of the Nash Stream Forest recognized the importance of protecting the Forest from development, as well as the importance of continuing to use the land in a "multiple-use" manner – for education and research, as a key watershed area, for fish and wildlife, recreation, scenic qualities, and as a sustainable timber resource. These mutual concerns led to the successful purchase of the property, the formation of a Technical Team to assist in the development of a management plan, and to a gubernatorial-appointed Advisory Committee to focus public input and provide insightful advice (see page 9).

The Nash Stream Advisory Committee determined that the Nash Stream Management Plan serve as a model of public land stewardship realizing that the funding necessary to fully implement the Plan is not presently available in state government. Therefore, the Committee recommended that the Plan be implemented, to the extent possible, in order to achieve the Forest condition described in the Vision (see page 61) as soon as possible.

The Plan identifies more than 60 implementation requirements that range from basic boundary line and road maintenance to specially designed studies and scientific monitoring. These requirements will provide the basis for work plans to be carried out within the limits of available resources.

The Department of Resources and Economic Development and the Division of Forests and Lands is extremely grateful to the members of the Advisory Committee and Technical Team who collectively donated more than 1000 hours of time to this project. Without their dedication and interest this state-of-the-art plan would never have been completed.

John E. Sargent

John E. Sargent
NH State Forester

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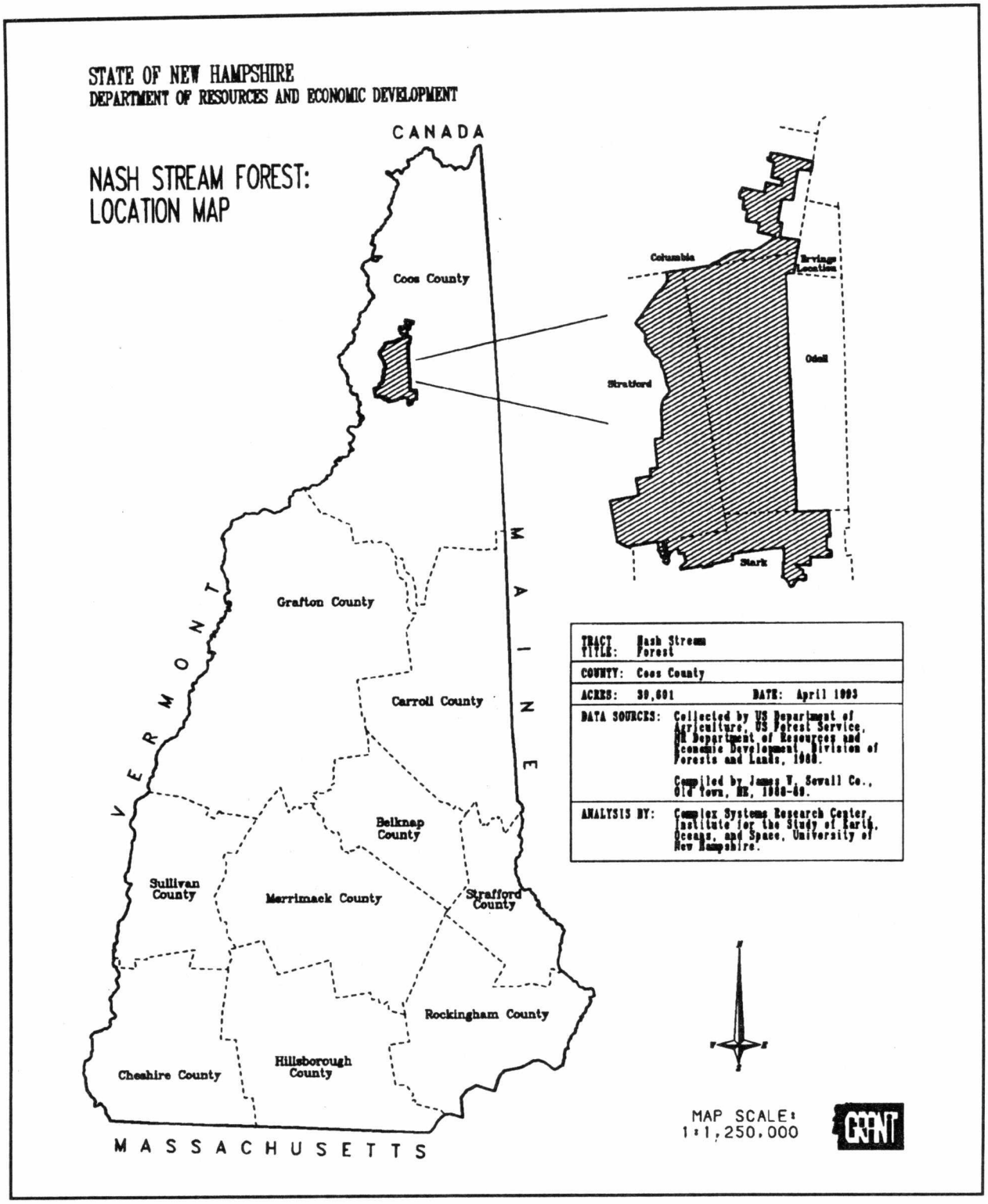

STATE OF NEW HAMPSHIRE
DEPARTMENT OF RESOURCES AND ECONOMIC DEVELOPMENT
NASH STREAM FOREST:
LOCATION MAP
CANADA
Coos County
Grafton County
Carroll County
Belknap County
Sullivan County
Merrimack County
Strafford County
Rockingham County
Cheshire County
Hillsborough County
VERMONT
MAINE
MASSACHUSETTS
Columbia
Errings Location
Odell
Stratford
Stark
TRACT TITLE: Nash Stream Forest
COUNTY: Coos County
ACRES: 30,601
DATE: April 1993
DATA SOURCES: Collected by US Department of Agriculture, US Forest Service, NH Department of Resources and Economic Development, Division of Forests and Lands, 1988.
Compiled by James V. Sewall Co., Old Town, ME, 1988-89.
ANALYSIS BY: Complex Systems Research Center, Institute for the Study of Earth, Oceans, and Space, University of New Hampshire.
MAP SCALE: 1:1,250,000

Reader's Note:

To help readers navigate through this hefty document, a detailed **Table of Contents** and the following **Highlights** section are provided. A companion document, **Nash Stream News,** which answers commonly asked questions is also available upon request.

If you have comments or questions, or would like a copy of the **Nash Stream News,** please call the Division of Forests and Lands in Concord, NH at (603)271-3456, or write to:

Department of Resources and Economic Development
ATTN: Nash Stream Forest
Box 1856
Concord, NH 03302-1856

Highlights

The following highlights are based on questions and comments from the public listening sessions (see **Appendix 3 – Summary of Common Themes,** page 159) held in the spring of 1990 *(page references in italics are suggested reading).*

Access

- Traditional public access into the Nash Stream Forest will be continued; the main gate will be opened each spring and closed in December each year *(pages 112 and 116).*
- No new permanent roads are planned; existing roads and trails will be maintained as multi-use corridors to minimize new construction and impacts *(pages 82, 112, 115 and 116).*

Easement

- The Conservation Easement allows certain uses of the Nash Stream property, places permanent restriction on certain uses, and establishes long-term enforcement for those restrictions *(page 5).*
- The U.S. Forest Service will be responsible for administering the Easement on behalf of the United States and will not become actively involved with management *(page 8).*

Information and Education

- Information and education will be provided primarily through existing state programs and will include interpretation of management activities *(page 85)*.
- Interpretive programming and signage will be low key and carefully applied *(page 116)*.

Law Enforcement

- Law enforcement is currently handled by nine law enforcement agencies under each agency's domain; present patrols have been able to handle enforcement situations that develop *(page 58)*.
- Mutual aid agreements for law enforcement between state and local communities are under consideration *(page 95)*.

Gravel

- Rights to extract gravel on about 936 acres of land area have been reserved until October 27, 1995 *(page 21)*.
- Gravel extraction will be permitted in accordance with DRED gravel excavation, reclamation and operational standards *(page 113)*.

Forest Health

- Management will strive to protect natural qualities and ecological processes *(page 61)*.
- Ecological land groups (ELGs) provide the basis for management decisions such as timber harvests, wildlife habitat improvements, and recreation designs *(page 51)*.
- Notwithstanding state law, chemical pesticides will not be used *(pages 58 and 62)*.
- Water quality will be the highest priority; best management practices (BMPs) will be used to protect quality *(pages 62, 105, 115, 117, 119 and 122)*.

Private Recreation Camps

- The Conservation Easement prohibits residential use of the Forest but allows continuation of the existing recreation camps *(pages 5 and 110)*.
- Ninety-four recreation camp lot leases will continue under 5-year renewable agreements for a period not to exceed 50 years; all camp lot agreements will terminate on June 30, 2039 *(pages 22 and 111)*.

Local Impact

- The towns of Columbia, Stark, Stratford, and the unincorporated place of Odell are entitled to payments from the state in lieu of taxes *(page 58)*.
- Private recreation camps are assessed local property taxes; camp owners also pay annual camp lot license fees to the state, a portion of which is returned to the local economy through forest management projects *(page 60)*.
- Forest fire suppression costs, including training and prevention *(page 59)* and fire and safety equipment purchases *(page 56)*, are shared equally between the state and towns.

Multiple Use

- The Conservation Easement provides for perpetual public use and protection of the Nash Stream Forest with emphasis on traditional uses of the land, including public access and the conservation of natural resource values *(page 5)*.
- The Nash Stream Forest "Vision" places a premium on forest stewardship, ecosystem management, public involvement, and traditional low-impact uses *(page 61)*.
- A Cooperative Land Management Committee and State Land Management Team will consider multiple resource values and user interests *(page 106)*.
- Comprehensive management guidelines are included in the Plan that will sustain ecological processes, provide resources for public use, and integrate management activities *(page 113)*.

Nash Bog Dam

- Although allowed by the Conservation Easement, there are no plans to rebuild the Nash Bog Dam *(page 85)*.

Natural Preserves and Other Protected Areas

- Five areas totaling an estimated 8,113 acres qualify as natural preserves *(page 77)*.
- About 46% (18,339 acres) of the Forest is considered ecologically significant and will be preserved or protected. Protection will be accomplished by several methods: natural preserve designation, natural preserve buffers, selected control areas, no-cut pond buffers, and steep, wet or otherwise fragile land designations *(page 76)*.
- Six exemplary and uncommon natural plant communities have been identified and four of five rare plant species located in the Forest are listed as threatened by the N.H. Native Plant Protection Act *(page 29)*.
- State law requires that all forest and brush fires be extinguished *(pages 93 and 182)* including wildfires in natural preserves *(page 127)*.

Management Plan

- A gubernatorial appointed Advisory Committee and a Technical Team worked on the Management Plan; public input was key to the process *(page 9)*.
- A 5-page Management Vision was developed by the Nash Stream Advisory Committee to guide all management and planning efforts *(page 61)*.
- State-of-the-art, geographic information system (GIS) computer technology was used to map and analyze data *(page 9)*.
- A Citizen Advisory Committee will be established to advise and work in partnership with DRED *(pages 67 and 110)*; a proposed monitoring and evaluation program provides for periodic reviews *(page 130)*.
- There will be public notification of significant proposed land management activities (pages 64, 67 and 118).

Preserve Raw Character

- Emphasis is on maintaining natural features and quality of the Forest with minimal development *(page 61)*.

Recreation

- Public access for traditional, low impact, dispersed recreation will be continued *(pages 61 and 81)*; camping is presently not available *(page 84)*.
- Traditional hunting, fishing and trapping will be permitted in accordance with state law *(page 89)*.
- No new trails are proposed. A Trails Advisory Group is recommended to help with current trail assessments and to make recommendations for improvements *(page 83)*.
- Thirty-seven miles of snowmobile trails will be maintained by local users with support for a statewide grant-in-aid program *(page 49)*.
- The Sugarloaf Mountain and N. Percy Peak hiking trails total more than 5 miles; where consistent with recreation purpose, interior woods roads will be maintained as multi-use recreation trail corridors *(page 83)*.

Staffing

- DRED is charged with management responsibility *(page 9)* with interagency assistance; license fees from camp lots help fund supplemental patrols *(page 60)*.
- Although allowed by the Conservation Easement, there are no plans to charge a fee for public entry and general use of the Forest; there are no plans to build a visitors' center or hire a gate attendant *(page 84)*.

Timber

- More than half (20,492 acres) of the Forest will be managed for timber *(page 100)*, which is about 80% of the total Forest area traditionally harvested *(page 26)*.
- Timber management practices will be modified to protect other resource values *(page 62)*. Public notification will be made of proposed timber harvests *(page 118)*, and harvest plans will be coordinated with an interdisciplinary team *(page 113)*.
- Uneven-aged timber management will be the method of choice; limited even-aged management, including clearcutting, is allowed but with restrictions *(pages 62, 98, 120, 139 and 147)*.
- The immediate potential for sawlog harvests is low, but there are widespread opportunities for commercial thinnings *(page 27)*.

Public Use

- The Management Plan includes guidelines for public use *(page 128)*.
- A carry in/carry out ethic will be promoted *(page 82)*.

Wildlife

- Management will integrate wildlife habitat concerns into long-term timber harvest and silviculture schedules *(pages 118 and 123)*.
- Management guidelines include softwood communities and their value to wildlife *(page 124)*.
- The Nash Stream Forest provides a wide variety of wildlife habitats for an estimated 180 different species of mammals, birds, reptiles and amphibians *(page 34)*.
- Fish and wildlife habitat management will strive to sustain populations that naturally occur on the property *(pages 64, 70, 71, 75 and 86)*.

Other

- Numerous reserved rights came with the property deed; some have long-term management implications *(page 21)*.
- The Mount Prospect fire tower in Lancaster has the best view of the Nash Stream Forest; 42 miles of gravel roads provide access to 60% or more of the property by conventional vehicles for fire suppression purposes *(page 56)*.
- Annual aerial detection flights will be carried out to check for potential insect and disease infestations as part of a statewide surveillance program *(page 94)*.

1. The Nash Stream Forest

Introduction

The Nash Stream Forest is a parcel of 39,601 acres located within the towns of Columbia, Stark, Stratford, and the unincorporated place of Odell in Coos County in northern New Hampshire (**Map 1**). Its remote location and many natural features, such as ponds, streams, mountain peaks, and forest land, contribute to its natural beauty and ecological value.

The area encompasses a variety of wildlife habitats, from ponds, streams and wetlands, to hardwood, softwood, and mixed forests of various ages. It is home to an estimated 180 different species of mammals, birds, reptiles and amphibians.

The Nash Stream Forest is also used for recreational activities, including fishing, hunting and hiking in the summer and fall, and snowmobiling, cross country skiing, dog sledding, and snowshoeing in the winter. It is served by a 66.5 mile network of roads, allowing access to some forty miles of rivers and streams and over 150 acres of ponds. Hiking trails to several mountain peaks have been maintained by local hikers. There are presently 94 camp lot licenses which are held by individuals, families, or associations.

The Nash Stream Forest is also important for its timber resources, since forest covers almost 98% of the property. As a result of past cutting, much of this forest is densely covered with a young regrowth of trees 30-40 years old. Based on a timber cruise of 29,348 acres surveyed in the fall of 1988, the majority of forest land surveyed was found to be hardwoods (56%); softwoods accounted for a much smaller area (7%); with mixed hardwoods/softwoods (28%) and mixed softwoods/hardwoods (9%).

The Nash Stream Forest is also an important watershed area. The property has five separate drainages which are all part of the Connecticut River watershed.

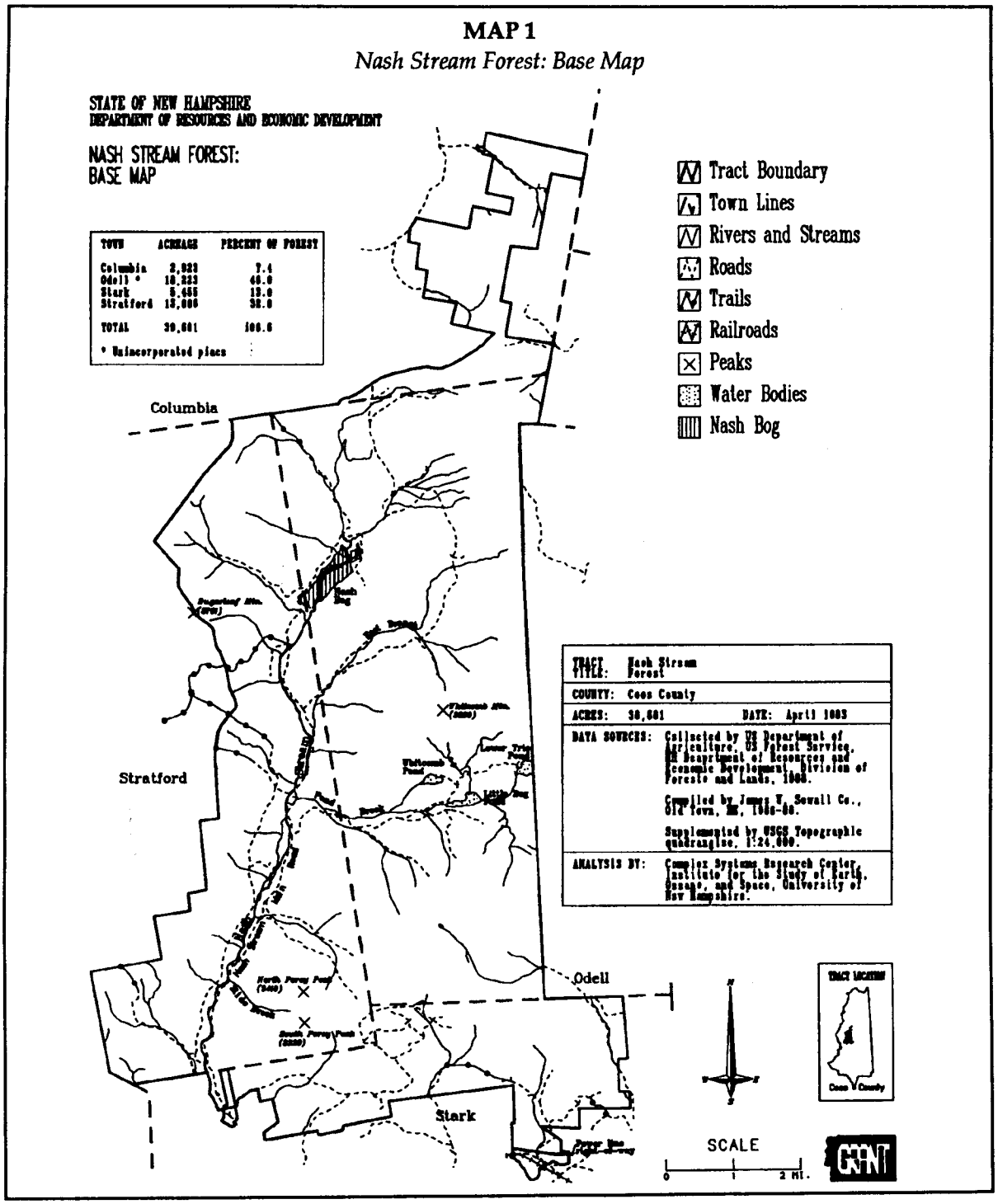
Through a unique collaborative effort between the state of New Hampshire, the U.S. Forest Service, The Nature Conservancy, The Trust for New Hampshire Lands, and The Society for the Protection of New Hampshire Forests, the state was able to purchase the Nash Stream Forest tract in October, 1988. It is presently managed by the N.H. Department of Resources and Economic Development (DRED) for natural resource purposes, in partnership with other state agencies and the U.S. Forest Service, which holds a Conservation Easement. This easement provides for multiple use management that includes education and research, watershed, fish and wildlife, recreation, scenic qualities, and timber.

In December, 1989, an Advisory Committee was appointed by Governor Judd Gregg to serve as a focused source of public comment and technical expertise. Since that time, the Committee has been working on this draft document, which is now presented for public review and comment. A final Management Plan will be produced after comments have been received and reviewed.

The Nash Stream Forest is important to the quality of life in New Hampshire and vicinity. As part of the northern forest region

MAP 1

Nash Stream Forest: Base Map



Acreage and forestland percentage figures used throughout this document were derived from the GRANIT system, a statewide geographic information system housed at the Complex Systems Research Center, University of New Hampshire, and are subject to field verification. As the Nash Stream Forest planning effort progressed, new data sets from various sources were introduced into the mapping and data analysis. While minor discrepancies existed between the data sources, they did not represent significant acreages in the context of the entire property. As field verification of the data analysis is carried out, these discrepancies will be addressed.

that extends from the Adirondacks of New York across northern portions of Vermont, New Hampshire, and Maine, the Nash Stream Forest has long contributed to the local forest-based economy, public recreation, fish and wildlife habitat, and scenic forest landscapes. The Nash Stream Forest has provided statewide, regional and local conservation and recreational value.

History/Acquisition

A series of events that began in 1988 alarmed conservationists, state officials, the public and Congress to the potential for large-scale subdivision of New England forests. The natural beauty, landscape, rural character, natural resources, and quality of life long associated with large blocks of undeveloped northern forest land was threatened when Diamond International Corporation, a subsidiary of the French timber company General Occidentale, placed its landholdings in New Hampshire, Vermont, New York and Maine on the market in the winter of 1988. A price of $19 million was set for 90,000 acres in Vermont and New Hampshire. Timberland investment analysts estimated a value of $100 per acre was justified and agreed that Diamond's asking price was more in line with the land's development potential.

In April, The Nature Conservancy (TNC) made an offer, planning to hold the land until a state or federal agency could buy them out. TNC's offer, based more on the timber values than development values, was rejected. In May, an offer by the New Hampshire Retirement System was also rejected. TNC and the Retirement System were working out details of a joint offer when on May 27, 1988, Rancourt Associates announced they had signed an agreement to pay the asking price of $19 million.

Almost immediately, negotiations began between TNC, The Society for the Protection of New Hampshire Forests (SPNHF), the Land Conservation Investment Program (LCIP) and Rancourt Associates to purchase 46,500 acres of the 67,000 acres in New Hampshire. This included approximately 40,000 acres in Nash Stream, 2,000 acres in four smaller pieces and 4,500 acres of inholdings within the White Mountain National Forest (WMNF). On July 5, TNC and SPNHF signed an agreement to buy the land from Rancourt as an addition to the WMNF. However, on July 13, the U.S. Senate passed an appropriation for the Department of the Interior, which included only $5.3 million for this land purchase and a scramble was underway in New Hampshire to raise the difference between this and a negotiated sale price of $12.75 million.

On August 23, 1988, the LCIP Board of Directors voted to approve the expenditure of $7.65 million of LCIP funds for the purchase of these lands. A purchase and sale agreement was executed the following day with TNC and SPNHF to provide a loan of $5.1 million to cover the balance of the purchase price until the federal funds were released.

The principal remaining problem was to allocate interests in the Nash Stream land between the state and federal governments. The state offered to sell a proportionate share in fee, at the price per acre it had agreed to pay to acquire the land from Rancourt. The Forest Service refused because the state's purchase price was higher than the Forest

Service's appraised value. The state then offered to sell a proportionate common and undivided interest. The U.S. Justice Department said "No". Finally, in October, 1988, the Forest Service agreed in principle to share the costs of the Nash Stream acquisition through purchase of a Conservation Easement on the property.

When a closing finally took place on October 27, 1988, the state of New Hampshire purchased 46,679 acres of Diamond (Rancourt) land for $12.75 million and reconveyed 4,496 to the Forest Service for $1.175 million. The state mortgaged the remaining property to TNC and SPNHF for $3.925 million to provide the balance of the purchase price pending negotiation of the terms and value of the Conservation Easement. The Nash Stream deal was finalized almost a year later, when on August 4, 1989, the Conservation Easement was sold to the United States of America for $3.95 million and the TNC/SPNHF loan (with interest) was paid.

Why the State Purchased the Nash Stream Forest

The Nash Stream Forest was purchased by the state through the Land Conservation Investment Program (LCIP) to preserve the property's natural beauty, landscape, rural character, natural resources, and the quality of life in New Hampshire, in cooperation with the United States Forest Service, The Nature Conservancy, Trust for New Hampshire Lands, and the Society for the Protection of New Hampshire Forests. It was purchased primarily to:

- **Ensure** that the property continues to contribute to forest economy through the sale of wood products;
- **Provide** continued public access for recreation; and
- **Protect** the area's natural beauty and ecological values.

The Land Conservation Investment Program was established in the spring of 1987 to acquire lands and interest in lands of statewide, regional, and local conservation and recreation importance to preserve the natural beauty, rural character, natural resources, and quality of life.

Acquisition through LCIP brought certain requirements and restrictions under the provisions of RSA 221-A which include:

(1) That the management of the Nash Stream property be assigned to a state agency to be managed in the public interest in accordance with the purposes of RSA 221-A;

(2) That the property shall not be posted to prohibit hunting or fishing, unless deemed appropriate by the LCIP Board, Fish and Game Department or Division of Forests and Lands; and

(3) The sale, transfer, conveyance, or release of the Nash Stream Forest or interest in the land from public trust is prohibited.

A Federal Conservation Easement Deed also places permanent restrictions on certain uses of the Nash Stream property that ensures public interests in the property will be forever protected.

From an historical perspective, the purchase of the Nash Stream Forest is consistent with the early foresight of the State Legislature. The original State Forestry Commission authorized by the General Court on July 29,

1881 determined in its early years that the purchase and management of state forests in New Hampshire would be justified by four benefits:

"1. *State-owned forests would serve as demonstrations of sound forestry principles.*

2. *Public ownership of sensitive mountain tops, cut conservatively, would retain greater value for their effects on soil erosion and stream flow than for timber production.*

3. *A few small tracts of rare natural beauty could be preserved.*

4. *State would derive revenue from the management of forests which serve the other three purposes."*

Conservation Easement

The state of New Hampshire sold a Conservation Easement on the Nash Stream Tract to the United States of America for $3.95 million on August 4, 1989. This followed over nine months of intensive negotiations between representatives of the Land Conservation Investment Program (LCIP), the Office of Attorney General and the United States Department of Agriculture (Forest Service) and its attorneys, relative to the terms of the easement. These negotiations also involved inputs from various state and federal agencies, state and national conservation organizations and numerous congressional leaders. A considerable education effort was required to convince Congress of the wisdom of the federal/state partnership in land protection that would result from purchase of the Nash Stream Conservation Easement. Will Abbott, Executive Director of the LCIP summarized the entire negotiation process when he said, "I've never seen state and federal government, the private sector, and the enormous number of people representing each, pull together more cooperatively to seize such an important opportunity."

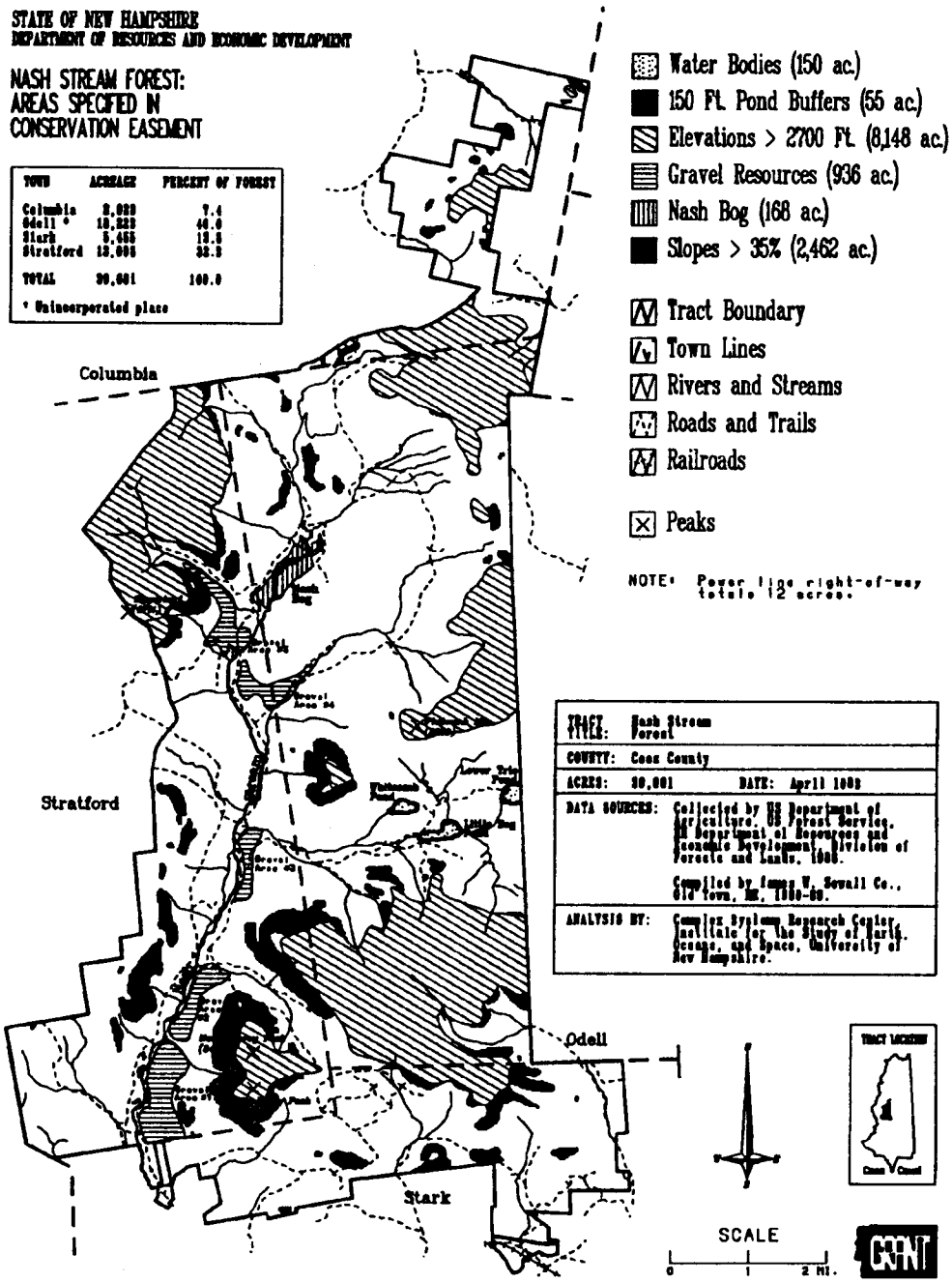
A Conservation Easement is a deed conveying a partial interest in property for the purpose of protecting the land from development. It allows certain uses of the land, places permanent restrictions on certain uses and establishes long-term enforcement for those restrictions. The Conservation Easement covers the entire Nash Stream Forest property (39,601 acres) located in Odell, Stark, Stratford and Columbia **(Map 2, page 6).**

General Provisions

- Public access shall be assured subject to reasonable restrictions and regulation by the state and a charge of reasonable fees.
- Easement is subject to all valid existing rights of record at the time of conveyance.
- Easement is enforceable in law or equity by parties. State is responsible for and bears the cost of enforcement action and restoration caused by violation of any term of easement.
- Easement area shall be administered and managed by state at state cost and liability. State shall receive all revenue derived from management.
- Forest Service shall administer easement on behalf of United States. The United States has an affirmative right to manage

MAP 2

Nash Stream Forest: Areas Specified in Conservation Easement



any resource or land use acquired under the easement which is not reserved by the state.

- Easement shall be construed so as to effect the conservation purposes for which it was acquired.
- State shall hold United States harmless from all liabilities relating to the property.
- United States has right of first refusal should state decide to sell.

Uses Allowed

- Public Recreation – Campsites, trails (including cross country ski and snowmobile), picnic areas, boat launches, trailhead parking areas, visitors center and ranger station;
- Public roads and utilities (with prior written approval of Forest Service);
- Internal access roads;
- Existing recreational residences (camps);
- Natural Resources Multiple Use Management – Including watershed, fish and wildlife, recreation, scenic, education and research, timber, and sand and gravel;

Uses Not Allowed

- Subdivision or disposal as smaller tracts;
- Leases or contracts exceeding five years, except for public roads and utilities;
- Residential uses of all forms, temporary or permanent;
- Ski areas, ski lodges, ski lifts, resorts, outfitting establishments;
- Landfills, dumps, storage areas;
- Garages and warehouses, except as necessary for management of the property;
- Mineral, oil, gas or related development (except gravel rights reserved to the state).

Timber Management Constraints

- Timber resources shall be managed on a sustained yield basis (except in the event of a natural catastrophe, fire, disease or insect infestation).
- No logging shall occur on slopes greater than 35% or above 2,700 feet in elevation.
- Clearcuts shall not exceed 30 acres in size. Larger areas may be clearcut only with the approval of the Forest Service and only as needed to harvest timber damaged by natural catastrophe. No clearcut harvest may be made adjacent to a previous clearcut regeneration harvest area until the average height of the regeneration from the previous cut is at least 15 feet. Within any ten year period, no more than 15 percent of the total easement area may be clearcut.
- Logging on those areas near streams, ponds, or public highways is subject to the provisions of RSA 224:44-a, except as further defined or restricted as follows:

  1. Timber harvesting on areas near streams, ponds and public highways are subject to the provisions of RSA 224:44-a (recodified to RSA 227-G:2) and shall be no less restrictive than the terms of this statute as of January 1,1989. (Nash Stream from the breached dam downstream to the southern boundary of the easement

area, and Pond Brook from Trio Pond to the confluence with Nash Stream, shall be considered "navigable rivers.")

2. No timber harvesting shall occur within 150 feet of Whitcomb Pond, Trio Pond, and Little Bog Pond (except as necessary for recreation development and timber salvage purposes with approval of the Forest Service).
3. Timber harvesting shall be conducted in conformance with current applicable federal and state laws and regulations, including the use of "Best Management Practices" (BMPs) prescribed for given activities.

Role of State and Federal Governments

The unique and innovative relationship between the state of New Hampshire, as fee owner of the Nash Stream Forest, and the United States of America, as holder of a Conservation Easement Deed (CED) on the property, raised questions about how this partnership will work.

The Forest Supervisor, White Mountain National Forest (WMNF) is responsible for administering the CED on behalf of the United States. The role of the Forest Service is to ensure that the terms and conditions of the CED are satisfied and not to become actively involved with management. The WMNF staff serve as advisors to the state and provide technical assistance and management support when needed.

The state assumes full responsibility of ownership, operation (management), upkeep and maintenance of the property. Allowed uses of the property, however, are subject to the terms and conditions of the CED.

Laws Affecting the Nash Stream Forest

The following laws govern acquisition, conveyance and management responsibility of the Nash Stream Forest:

RSA 221-A	**Land Conservation Investment Program**
RSA 477:45	**Conveyances and Interests**
RSA 482:48	**Acquisition of Dams and Water Rights**
PL 102 Stat. 1805	**NH Forest Management Initiatives Act**

RSA 221-A established the authority for the purchase of the Nash Stream Forest for the state of New Hampshire by the Land Conservation Investment Program as well as the authority to assign management responsibility to the Department of Resources and Economic Development. **RSA 482:48** established the authority for acquisition of the dams on Trio Ponds and Little Bog Pond by the Land Conservation Investment Program as well as the authority to assign management responsibility for the dams to the New Hampshire Fish and Game Department (see *Ponds*, page 31).

Certain lands, including the Nash Stream Tract, are the subject of the Federal **"New Hampshire Forest Management Initiatives Act of 1988", 102 Stat. 1805** which authorized and directed the United States Secretary of Agriculture to acquire certain lands and interests in land located in the state of New Hampshire. Under the laws of

the state of New Hampshire, **RSA 477:45, et seq.**, a conservation easement constitutes an interest in land.

Chronology/Planning Process

Once the purchase of the Nash Stream Forest was completed, the New Hampshire Division of Forests and Lands immediately formed a Technical Committee in **August, 1989,** to assist in the development of a Management Plan.

The **Technical Committee** was comprised of representatives from a broad range of resource areas: NH Fish and Game; NH Division of Forests and Lands; NH Division of Water Resources; NH Division of Parks and Recreation; USDA Forest Service; NH Historical Preservation Office; NH Natural Heritage Inventory; and the NH Audubon Society. This working group's main jobs were to assess and evaluate current information available about the Nash Stream Forest, and to assist in the development of the final Management Plan for the area. The Technical Committee was not a policy team.

In **November, 1989,** DRED entered into an agreement with the Office of State Planning and University of New Hampshire (UNH) Complex Systems Research Center (CSRC) for assistance with the preparation of a Management Plan for the Nash Stream Forest using the GRANIT[1] computer system. GRANIT, a state-of-the-art geographic information system, was used throughout the planning process to map and analyze information about the Nash Stream Forest.

In **December, 1989,** Governor Judd Gregg appointed an **Advisory Committee** to serve as a focused source of public input and technical expertise. Members of this group represented Nash Stream Lease Holders Association; The Society for the Protection of New Hampshire Forests; The Nature Conservancy; Coos County Advisory Board; NH Timberland Owners Association; The Wilderness Society; USDA Forest Service White Mountain National Forest; Appalachian Mountain Club; Audubon Society; White Mountain Lumber Company; Ammonoosuc Watershed Study Committee; Trout Unlimited; Groveton Trailblazers; and the White Mountain National Forest Advisory Committee. The Advisory Committee's main jobs were to gather public input and to work with the **NH Department of Resources and Economic Development (DRED)** to achieve consensus on policy and management direction **(Appendix 1)**.

DRED was charged with establishing policy and management direction, and implementing the Management Plan for Nash Stream, based on the input received from the Technical and Advisory Committees.

A work plan was developed to guide the Committees and DRED in the development of the Management Plan for Nash Stream (page 11).

In **March, 1990,** a public information package about the Nash Stream Forest was developed to provide the public with basic information about the acquisition of the Nash Stream property, its history, and its resources.

This document served as the basis for discussion at two public listening sessions held on **April 11, 1990** in Groveton, and on **April 17** in Concord. These sessions gave the public the opportunity to present their ideas

about how the Nash Stream property should be used. At these sessions, participants were broken down into small, informal groups to discuss and summarize their ideas and present them to the entire group. Over 120 people attended the sessions and provided valuable input **(Appendix 2** and **Appendix 3)**.

The key points which emerged from these public sessions were:

- Maintaining local influence;
- Keeping the Nash Stream Forest undeveloped;
- Eliminating the gravel mining rights of Rancourt Associates;
- Providing for multiple recreation uses;
- Restoring tax yield to local towns; and
- Stressing sound forestry management practices.

In **July, 1990**, the Advisory Committee's sub-groups presented reports on timber, wildlife, natural areas, recreation, and management principles and vision. Meetings were held to discuss these areas and incorporate suggestions and changes into the draft Management Plan and Vision statement (page 61).

The Advisory Committee approved and adopted the Vision statement at a meeting in **January, 1991.**

In **July, 1991**, the first draft of the goals, objectives and strategies were presented to the Advisory Committee for review and comment.

The sub-groups continued their work, developing and reviewing additional information provided by the Technical Team.

In **December, 1991**, DRED and the Advisory Committee agreed upon the goals, objectives and strategies and adopted them. In **January, 1992**, the draft Management Plan, incorporating the completed material, was begun. Multiple agencies were involved in the preparation of the draft plan, which was begun even as additional data and information was still being compiled.

After approximately one year in the development stages, the first draft of the Management Plan was presented to the Advisory Committee for review in **January, 1993.** Throughout 1993 and 1994, modifications and additions to the Plan were made. In **February, 1995** an open house and public meeting was held in Lancaster, New Hampshire to hear public comments on the draft Plan. The final Management Plan was approved and adopted by the Advisory Committee and DRED in **December, 1995.**

WORK PLAN

STEPS	PARTICIPANTS
1. Inventory and assess the Nash Stream Forest tract	A,TT,AC
2. Develop a Public Information Package	A,TT,AC
3. Identify issues, opportunities and public values	A,TT,AC,P
4. Establish management goals and objectives	A,AC
5. Develop management strategies	A,TT
6. Develop draft Plan for public review	A,TT,AC
7. Review draft Plan	A,TT,AC,P
8. Develop final Management Plan	A,TT,AC
9. Implement and monitor final Plan	A,AC

CODE: A = Agency (DRED)
TT = Technical Team
AC = Advisory Committee
P = Public

AGENCY: refers to state of New Hampshire, Department of Resources and Economic Development (DRED), Division of Forests and Lands and Division of Parks and Recreation. Their role is to establish policy and management direction, and implement the Management Plan for Nash Stream.

TECHNICAL TEAM: a working group, not a policy team. Their role is to assist in the development and evaluation of assessment information. Members represent a broad range of resource areas: NH Fish and Game, NH Division of Forests and Lands, NH Division of Water Resources, NH Division of Parks and Recreation, USDA Forest Service, NH Historical Preservation Office, NH Natural Heritage Inventory, and NH Audubon Society.

ADVISORY COMMITTEE: a broadly representative committee to serve as a focused source of public input and strive for consensus with DRED on policy and management direction. Members represent: Nash Stream Lease Holders Assoc., The Society for the Protection of New Hampshire Forests, The Nature Conservancy, Coos County Advisory Board, NH Timberland Owners Assoc., The Wilderness Society, USDA Forest Service White Mountain National Forest, Appalachian Mountain Club, Audubon Society, White Mountain Lumber Company, Ammonoosuc Watershed Study Committee, White Mountain National Forest Advisory Committee, Trout Unlimited, and the Groveton Trailblazers Snowmobile Club.

PUBLIC: interested citizens, local communities, special interest groups, and all others. Symbol indicates where provision has been made for formal public input. However, the Advisory Committee and DRED will seek and respond to public comment throughout the planning process.

2. The Resource History of the Nash Stream

Soil and Vegetation

The climax vegetation patterns (or forest associations) existing today on Nash Stream are part of landscape, soil, and vegetation combinations called Ecological Land Groups (ELGs) – **Chapter 3 – Soils, Landscapes and Ecological Land Groups.** The character and distribution of ELGs have been formed through more than 11,000 years of post-glacial development.

Soil Development

Although the overall topography of the Nash Stream area represents much older geologic processes, the soil properties present on the property can be traced directly to glacial movement. The Wisconsin Glacier began advancing about 50,000 years ago and continued to accumulate to an estimated two miles thick over the Nash Stream area. Much like a bulldozer, the advancing glacier scraped, ground, and eroded the previous soils and bedrock into a massive mix of ice, water, and soil and rock debris. More importantly, the glacier acted as a means to deposit material on the land. Glacial deposition took two forms: glacial till and glacial outwash.

Glacial till occurs where debris was deposited at the base of the glacier (basal till) or where debris settled out as the glacier receded (ablation till). Due to the overlying pressure under which it was formed, basal till is typically dense and compact, forming a characteristic layer called a hardpan. Ablation till, on the other hand, precipitated under the force of gravity and generally does not contain a hardpan.

Glacial outwash is material deposited by the meltwaters of the glacier. Rivers and streams flowed on, through, under, and adjacent to the glacial ice as it melted. The water carried, sorted, and deposited vast quantities of gravel and sand in the valleys. These deposits are now composed of multiple layers of gravel and sand which accumulate in places to several feet thick.

After the glaciers receded and the parent material for the soils was distributed, environmental factors (e.g., climate, topography, plant and animal life) acted on these parent materials to form the soils that occur today. The climactic influence relates directly to elevation — higher elevation soils (above approximately 2,300 feet) do not warm above 59° F during the summer and are in the cryic temperature zone. Lower elevation soils are somewhat warmer and are in the frigid temperature zone.

Vegetation

The distribution of exemplary natural communities and rare plants can be traced directly to the last glaciation. Once the glaciers began to recede, native vegetation slowly returned to the landscape through a process known as primary succession. Due to the arctic climate near the glacier's receding front, the first species to colonize the barren earth were hardy, boreal bryophytes (mosses), herbs, and shrubs. Many of these arctic/boreal species are rare today and remain only in higher elevation habitats where harsh winds, cold temperatures, and

shallow soils restrict competition from less hardy species.

Soon after this primary succession, cold-hardy spruce forests returned to much of the New England landscape. These spruce-fir forests remain today in higher elevations and lower elevation pockets where frigid, hard-pan soils exist. As the landscape continued to warm, pine and then hardwood species returned to occupy suitable lower elevation sites. Thus, the current mosaic of natural communities on the Nash Stream property represents both current soil characteristics and over 11,000 years of adaptations to a changing climate.

Post-glacial events can also explain the rarity of some lower elevation species. Evidence of pollen deposition indicates that plants of calcareous, mineral soils were once more common than they are today. With the warming of the climate and subsequent colonization of numerous southerly species, these "calcicoles" gradually disappeared from the landscape. Rare plants such as broad-lipped twayblade, millet-grass, and marsh horsetail relict are examples of relict calcicoles that remain today in the Nash Stream area.

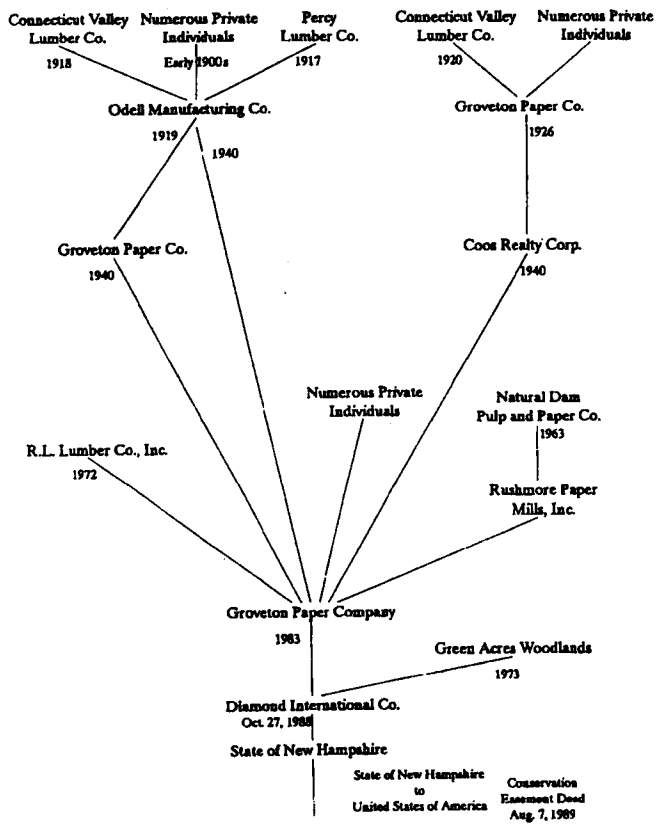
Cultural

The Nash Stream Forest is located in an area of the state which has received only minimal research concerning prehistoric peoples who lived there. No investigations have been conducted within the Nash Stream drainage, thus there is no documented evidence for archaeological sites. However, given the size of the Forest, the rich natural resources present within it, and the documented archaeological sites to the west on the Connecticut River, and to the east on the Androscoggin River drainage, it is certain that sites were located in the Nash Stream drainage.

The record of human occupation in the North Country begins immediately after the retreat of the glacier approximately 10,000 years ago with the arrival of hunters who stalked game such as caribou. Their numbers were small and lifestyle mobile to the extent that sites of that culture are extremely rare. In subsequent millennia, prehistoric peoples shifted toward hunting and gathering food resources which are to be found in the contemporary environment. Their sites are more numerous and tend to be preserved in settings where soils are stable and less prone to be removed by erosion. Along stream banks and on raised land near wetlands appear to be settings with high potential for site preservation and discovery. These sites typically will contain stone artifacts (principally the debris from tool manufacture along with a few spear points/arrow points) and charred food bone fragments. Prehistoric pottery, the earliest of which dates to 3,000 years ago, may also be present but only in rare circumstances.

The cultural history of Nash Stream is one reflective of a hunting and gathering way of life which would have left behind relatively small sites, occupied on a short term/non-permanent basis and situated on landforms conveniently close to prime hunting and food collecting resources. Evidence of agriculture and more permanent settlements, as has been documented in other areas of New England, is not anticipated. It is interesting to note that the probable prehistoric use of Nash Stream in many ways anticipates the contemporary usage.

CHART 1
Nash Stream Ownership History



Land Use and Ownership

Nash Stream Forest has a long history of use as a source of raw materials for the forest products industry. The ownership history chart[2] **(Chart 1)** above represents the ownership pattern and changes from the turn of the century.

As evidenced by the owners' names and dates of property conveyance, the majority of the land has been owned by lumber or paper companies, primarily Groveton Paper Company, during this time. Six paper companies, five lumber companies, one land holding company, one land management company, and numerous private individuals have owned and conveyed land that today makes up the Nash Stream Forest.

Forest Protection

Forest Fire Protection

The NH Division of Forests and Lands has no record of any significant forest fires in the Nash Stream area. In 1910, the NH Timberland Owners Association funded the construction and operation of the Sugarloaf Mountain fire tower, located in Stratford, New Hampshire. In the state of New Hampshire 1913-1914 Biennial Report, the Sugarloaf tower is listed as a state tower as of 1914. This structure was removed in 1982 by the state of New Hampshire. The tower had not been regularly manned since 1976. The watchman's cabin associated with the fire tower was destroyed by fire in 1994.

The Sugarloaf Mountain tower was one tower in a system of fifty-two towers (both state and federally owned) when the system was at its peak in the late 1940s and early 1950s.

Insect and Disease

There are unconfirmed reports of a spruce budworm outbreak in the Phillips Brook area (abutting property east of the Nash Stream Forest) in the 1930s. No documentation has been found to substantiate this information.

Law Enforcement

In the early stages of the Nash Stream planning process, the NH Division of Forests and

Lands met with law enforcement agencies in the area of Nash Stream to discuss potential areas of concern and items of mutual interest. Agencies represented were Stark Police Department, Groveton Police Department, Coos County Sheriff, NH State Police, NH Fish and Game Department, NH Division of Parks and Recreation Bureau of Trails, and NH Division of Forests and Lands Forest Protection Bureau.

Verbal agreements were made that the respective agencies would handle law enforcement matters in their domain. Fish and Game Department, Bureau of Trails, and the Forest Protection Bureau would schedule routine patrols, with the Division of Forests and Lands Forest Protection Bureau taking the lead role. The other agencies would respond in an emergency situation or when requested.

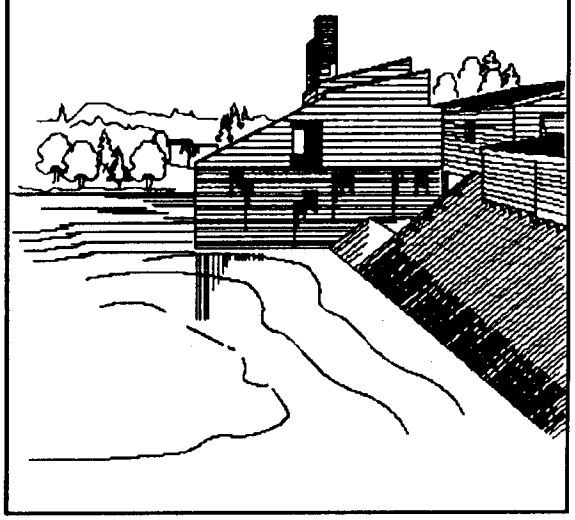
Logging

Logging did not become a major industry until the Grand Trunk Railroad came through in 1852. At that time valuable trees were "culled" from woodlands and driven downstream to meet the very specific demands of the lumber trade. Later, a developing market for wood fibre changed early "culling" to wholesale "clean cutting" even the smallest trees for pulp. The combination of culling and clean cutting probably contributed to what was referred to as the "secondary forest" in much of Coos County and in the Nash Stream Forest in 1894 (**Figure 2**, page 16).

Nash Stream was a significant log driving stream along with the Connecticut and Androscoggin Rivers. In 1870, Gilbert Soule incorporated the Nash Stream Improvement Company to construct dams and blast rocks to improve the river for log drives at a cost of $30,000. Three dams were constructed on the main Nash Stream. The first was the Big Bog dam (at Nash Bog) which was begun in 1896 and began holding water in 1900. **Figure 1** is a sketch of Big Bog dam prior to its loss when the dam breached in 1969. The East Branch dam, just below its confluence with Nash Stream, was built soon after the Big Bog dam. Soule's dam, constructed just south of Long Mountain Brook, completed dam construction on the main stream.

Smaller dams on feeder streams, sometimes referred to as "squirt" dams, were constructed coincidentally with dams on the main stream. One of these was at the upper reaches of the East Branch where the present road crosses over a six-foot culvert, approximately 4,200 feet (road distance) from the Main

FIGURE 1
Big Bog Dam Prior to 1969



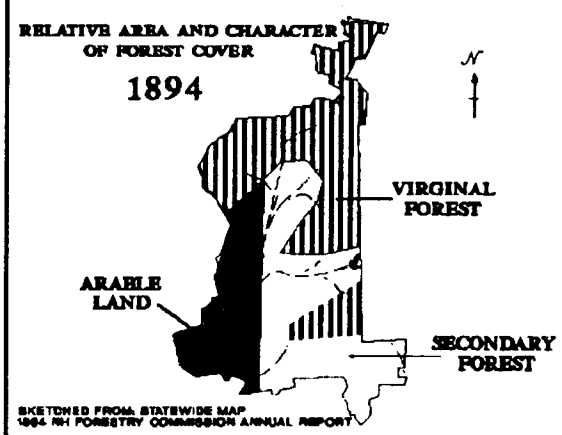
Nash Stream Road. This dam was also referred to as Nineteen Valley dam. At the head of the watershed, Trio Pond dam was constructed sometime around 1896, rebuilt in 1943, and again by the Fish and Game Department in 1981. Little Bog dam, also called Fourteen and a Half as the logging camp was numbered, was constructed sometime around 1896 to 1900 when the other dams were being built. Log drives stopped in the 1930s when the use of trucks became more economical to haul logs in any season. There has been a road into Nash Stream valley for probably a century or more.

Early logging crews also made use of gravity and horses to move wood. Horses pulled wood-filled sleds and guided "bunched" wood downslope to access roads. "Sluices" constructed on mountain slopes used gravity to feed wood to concentration areas for more efficient handling.

Since the turn of the century, a network of twenty four or more logging camps in and around the Nash Stream property provided food, lodging, supplies, and maintenance support for logging crews working the woods. Camps included office, horse hovel, bunkhouse, clerks' office, cookshack, and blacksmith shop, and ranged from a few men and horses to camps consisting of 50 men and 8 to 10 horses. Logging camps went out when the use of cars and trucks became more common. Camps were either taken over as sporting camps or rotted away.

The 1894 New Hampshire Forestry Commission Report presents evidence that the southwest portion of the Nash Stream property was cleared for "arable land" (suitable for farming) use prior to 1819 (**Figure 2**). Cut logs were probably worked downstream to a local sawmill. Limited markets existed at that time for pine, oak and hemlock logs. However, most land clearing yielded raw material that, once processed, became pot or pearl ashes. These crude chemicals provided welcome income in the form of credit at local country stores. Pot or pearl ashes were shipped by the thousands of bushels to Boston from local merchants.

FIGURE 2
Early Nash Stream Forest Cover



Except for the very steepest and highest areas, all of the property has been cut over at least once. Evidence of softwood pulp cutting in the early 1900s is seen at the 3,000 foot elevation and higher in sheltered spots. Yellow birch and sugar maple logs were cut from accessible areas beginning in the 1940s. Hardwood pulp removals started in the 1950s. In recent years, many wood product markets existed, including chips for fuel. As a result, most accessible and productive areas have been repeatedly cut.

Recreation

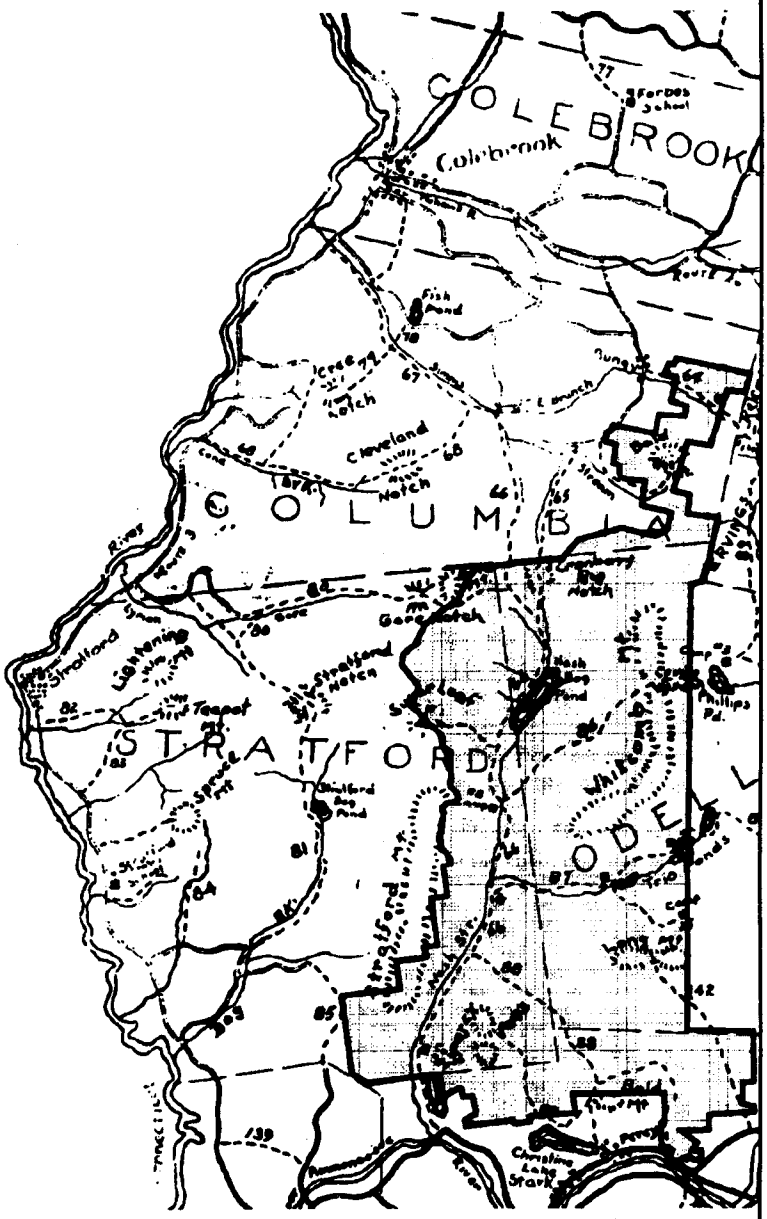
Recreational history of the Nash Stream Forest mirrors, to a large degree, the history of recreation on large industrial landholdings of the North Country. Public access for hunting, fishing, trapping, hiking, and berry picking have long been traditional activities in the Nash Stream Forest, and throughout the North Country. Today, snowmobiling is also a major activity.

Hiking

The Nash Stream property has never been the hikers' destination that the White Mountains have been since the late 1800s. Nevertheless, mountain peaks, ponds, and other natural features of the property have provided destinations to some recreational hikers for many years. Berry pickers climbed South Percy Peak as early as 1876. Within four years after the foundation of the Percy Summer Club on Christine Lake, a path had been cut from their camps to the summit of North Percy[3].

Mr. Earl Roberts of Lancaster published a trails map (**Figure 3**) for Coos County in 1940 that identifies a dozen trails on the Nash Stream property. The current condition and use of many of these historic trails is unknown.

FIGURE 3
Partial Earl Roberts 1940 Map with Nash Stream Forest Overlay



Until the late 1920s, the usual hiking route up Sugarloaf Mountain was a bushwhacked trail from Stratford Bog, although the fire-tower, built in 1910, was always reached from the Nash Stream side. By the early 1930s the Nash Stream side became the preferred route when the Nash Stream Road became passable to the fire warden's trail.

Fishing, Hunting and Trapping
Since the turn of the century, Nash Stream was considered a very good trout fishing stream until the dam at Nash Bog Pond breached in 1969. Although records are sketchy, Nash Bog Pond and Trio Ponds were stocked as early as 1900. Sporting clubs built camps in the early 1900s. Members of the clubs who owned these early camps also trapped and hunted. In recent years, nuisance control trapping was allowed by Diamond International. Remoteness of trapping sites discourages much interest today.

Snowmobiling
The development of snowmobiles after World War II made winter travel faster and easier for camp owners. With camps already in the valley, weekend and longer trips became common. Snowmobiles could easily follow the network of logging trails, opening up access to and from Columbia and Dixville, Phillips Brook, and the Stratford Bog area. This network provided the foundation for the present snowmobile trail system largely developed in the late 1960s.

Diamond International, owner of the property in 1987, requested public funds to help support and improve snowmobile use on their property. The Division of Parks and Recreation Trails Bureau negotiated a trail lease with the company, and Diamond received funds from the Bureau for the two years prior to state acquisition. A local snowmobile club, the Groveton Trail Blazers, has been receiving grant-in-aid to maintain snowmobile trails in the Nash Stream Forest (page 60).

Sharing the winter trails with snowmobiles have been cross-country skiers, and, to a lesser extent, dog sleds. The state has continued a policy of restricting motorized wheeled recreational vehicles set by Diamond International. See Public Use Guideline #11, page 129 regarding the use of motorized, wheeled recreational vehicles.

Camping and Camp Lot Leases
Diamond International had a longstanding recreational camp lot leasing program on the Nash Stream property. The program originated as a fringe benefit for company employees, but was expanded to include the general public in recent years. There are 94 recreation lot leases remaining on the property **(Chapter 3 – Recreation Camp Lots)**. All the leases will be phased out over the next fifty years. The cabins built on these leased properties are generally simple structures, and primarily have functioned as hunting and fishing camps.

Approximately 25 or 30 years ago there was a campground near the Nash Bog Pond dam, supervised by the dam operator. The campground apparently ceased operations before the dam failed in 1969. Details of its operation are sketchy.

Fisheries

The first fisheries management in the Nash Stream area probably occurred in 1896. That year was the first recorded instance of hatchery brook trout being delivered to the town

of Groveton (NH Fish and Game Commission 1897). It is likely these fish were stocked in the Trio Ponds or Nash Stream itself. In 1898, 10,000 brook trout fry from the Colebrook Hatchery were delivered to E. E. Tibbetts of Groveton. These fish were also likely destined for the Trio Ponds.

Camp journals have indicated that the Trio Ponds have been stocked on an annual basis since 1900. The construction of Nash Bog dam was initiated in 1896 and completed in 1900 and although created for log driving purposes, the pond most likely received plantings of brook trout fry at this time.

The stocking records for Nash Stream and surrounding ponds are very sketchy from the turn of the century until about 1940. These early stockings did not mention which waterbodies received fish. Only numbers of fish delivered to a particular person in a town was recorded. The Trio Ponds were stocked with brook trout fry transported in milk cans by horse and buggy or backpack in the early part of this century and later by an all-terrain vehicle called a "jigaboo." Aerial stocking of the ponds began in the late 1950s and early 1960s.

The first biological survey of Nash Stream and the area ponds was conducted by the Fish and Game Department in 1939 **(Table 1)**. Fish collections were made from Nash Bog Pond, Silver Brook, East Branch and Nash Stream. Fisheries habitat was measured in Nash Stream and stocking recommendations were made based on the quality of the habitat present. This was the first attempt at quantifying fish habitat and determining stocking rates based on scientific data.

TABLE 1

Fish Species Collected in 1939 Survey

COMMON NAME	SCIENTIFIC NAME
brook trout	Salvelinus fontinalis
white sucker	Catostomus commersoni
longnose sucker	Catostomus catostomus
blacknose dace	Rhinichthys atratulus
longnose dace	Rhinichthys cataractae
fallfish	Semotilus corporalis
common shiner	Notropis cornutus
slimy sculpin	Cottus cognatus

Nash Bog Pond was reclaimed in 1947 and again in 1955 using the fish toxicant rotenone. This was the principal trout management technique employed by the Fish and Game Department during this time as a method of controlling unwanted species such as suckers and bullheads. Members of the Groveton Fish and Game Club assisted the Department with both reclamations. The other ponds in the watershed were never reclaimed.

Brook trout were the principal species in Nash Stream. Wild and stocked populations existed. However, in 1967, at the request of the Groveton Fish and Game Club, a few thousand rainbow trout were stocked in the Nash Bog Pond. Some of the rainbows grew to large size as evidenced by a few 5 pound specimens being collected following the failure of the Nash Bog dam in 1969. These large rainbows were found dead on the bank of the stream after the flood waters receded.

Nash Stream was stocked with rainbow trout beginning in 1970 as the stream lost most of its good pool habitat and in-stream and overhead cover during the 1969 flood. Stream habitat following the flood was suitable for

rainbows, being more riffly (page 33) and open to the warming rays of the sun. Rainbow stocking was terminated in 1991 in an effort to return to native species.

Wildlife

Information on the historical abundance and diversity of wildlife specific to the Nash Stream Forest is scant. However, it is possible to generalize about the species that may have been present there prior to the occurrence of large-scale timber harvesting.

Early accounts of New England colonists attest to plentiful game at the time of European settlement. Abundant wild pigeons, grouse, ducks, geese, turkeys, deer, and rabbits provided ample food for humans and native predators such as wolves, bobcats, lynx, and possibly panthers. Grouse, snowshoe hares, deer, and moose probably were abundant species in the Nash Stream valley. Wild turkeys and rabbits are unlikely to have occurred that far north. No historical records exist of non-game species, but birds of prey, songbirds, small mammals, reptiles, and amphibians presumably were abundant as well.

From 1867 to around 1900 extensive logging occurred in northern New Hampshire. Logging and forest fires during this period undoubtedly affected wildlife populations, including those in the Nash Stream valley.

Old camp journals documented consumptive use of wildlife in the Nash Stream area in the early 1900s. It is interesting to note that two species mentioned as being shot or trapped were loons and sable, more commonly referred to as pine marten today. The journals clearly document the occurrence of these now protected species in the Nash Stream Forest in the early part of this century.

Long-time camp owner Phil Oakes asserts that hunting and trapping were considered to be "good" during the 1940s and 1950s on the Nash Stream property. Snowshoe hare and ruffed grouse were abundant in the Nash Bog area. Deer yarded up in the softwood cover adjacent to the old Nash Bog Pond and sightings of deer commonly occurred along roads and trails.

According to local residents, the first recent signs of the return of moose began in the 1940s, as much of the deer wintering areas were cut. Coyotes invaded the valley around 1950. The deer population and resulting harvest declined significantly following the winter of 1969-70 when record snowfalls decimated deer populations throughout the North Country.

Recent hunter surveys conducted by the Fish and Game Department indicate that harvests of large and small game species such as deer, bear, grouse, and snowshoe hare remain fairly low in the Nash Stream Forest compared to the rest of Coos County. This is likely due to a combination of low numbers of these species and low hunter pressure.

3. Inventory And Situation

Reserved Rights

The deed from Diamond International Corporation contained numerous reserved rights. Most of these reservations are relatively insignificant. However, several have long-term implications relative to the use and management of the Nash Stream Forest.

Power Line Easement – Public Service Company of New Hampshire
Public Service Company of NH owns a power line easement across the southerly end of Nash Stream Forest in Stark. This is a permanent right to erect, maintain, rebuild and operate electric transmission and distribution lines and to cut, trim and remove all trees and underbrush on a strip of land 150 feet wide and 4,300 feet in length. The easement parallels North Road approximately 600 feet to the north.

Canadian National Railroad
The Canadian National Railroad owns a strip of land 2,600 feet long and 88 feet wide across Nash Stream Forest in Stark. This railroad line runs just south of and parallel to North Road.

Public Highways
Public highways and rights of way together with appurtenant slope and embankment easements were reserved. These would include North Road and Nash Stream Road up to the existing location of the snowmobile parking lot.

Miscellaneous Reservations
The Nash Stream deed contains two generic or boilerplate types of reservations typical of any large property conveyance that involved multiple smaller tracts that make up the whole. The first of these reserves "all easements, rights of way and other encumbrances as set forth in the various deeds." The second is "all rights of the public in and to use any hiking trails and bodies of water situated on said land." A review of the individual deeds reveals at least two private rights of way to private camp "in-holdings" in Columbia. Also, there is a private camp on state land in Stark where a private individual may have some claim based on adverse use or possession. A reservation of "existing timber harvesting and purchase wood agreements" has become ineffective as the rights granted thereunder have lapsed.

Gravel
Rancourt Associates of New Hampshire reserved gravel rights on five different pit areas along Nash Stream Road in Stratford between the Stark/Stratford town line and Nash Bog. Based on a sketched map of the approximate (potential) operation area of each of the five pits included as part of the gravel rights agreement, GRANIT data analysis estimates 936 acres of land area is involved. Excavation would begin at pit #1 at the Stark/Stratford Town line and move northward sequentially to pit #5. Rancourt has seven years from the date of state acquisition (October 27, 1988) to remove five million cubic yards of "earth and granular materials." If the excavation results in a State Business Profits Tax or other state tax liability, the quantity to be excavated increases to six million cubic yards.

In addition to the gravel, Rancourt Associates has the right to use, maintain, repair and replace existing and future roads and to construct, repair and replace a railroad line(s) to all pit sites. All maintenance and construction of roads and railroads shall be at Rancourt's expense. At the expiration of the gravel rights, any improvements become the property of the state.

At the termination of the seven year excavation period or upon completion of excavation of 5 (or 6) million cubic yards of material, at Rancourt's option, Rancourt may enter into a joint venture with the state to continue to excavate. The state would be entitled to 50% of the profits from the joint venture. The issuance of any permits and approvals required shall not be unreasonably withheld.

Excavated areas "shall be reclaimed so as not to be inconsistent with the use of the properties as a State Park" and shall be performed by Rancourt or the joint venture at their expense. "Reclamation and Operation Standards for Gravel Excavation on DRED Properties" adopted by DRED will guide any excavation and restoration at Nash Stream.

Camp Lot Leases

Diamond International Corporation had maintained a long-term camp lot leasing program at certain locations in the Nash Stream Forest. Rights of existing lessees were reserved in the deed to the state. The lease period was one year (June 1 to June 1) and could be cancelled with 30 days notice.

The Conservation Easement granted to the United States of America permitted the camp use to continue, subject to the rights of the state to regulate or terminate them. Because of the immediate need to address the camp lot situation, the Department of Resources and Economic Development developed a camp lot license policy and program. This policy may be found in **Appendix 4.**

Recreation Camp Lots

Diamond International Corporation had a longstanding recreational camp lot leasing program for their Nash Stream property. The camp lot lease was a legal right for individuals or a private association to occupy and maintain a camp for recreational purposes at a specified site for a period of time on the Nash Stream property. The program originated as a fringe benefit for company employees, but expanded to include the general public in recent years. With the purchase of Nash Stream on October 27, 1988, the state became the owner of existing leased camp sites.

One hundred and four camp lots existed at the date of state acquisition of Nash Stream. Ten of the original have since been cancelled (no camps, non-payment of fees, wishes of camp owner, etc.) Eighty-nine are individual or family camps, four are association camps, and one is state-owned but privately licensed. Eighty-four of the individual or family camps are located in the unincorporated town of Odell; nine are in the town of Stratford. The four association camps are located at Lower Trio Pond, Fourteen and a Half Pond, and two miscellaneous locations. The state-owned camp is located in the unincorporated town of Odell on Nash Bog. **Table 2** lists the number of existing recreation camp lots by location.

The 94 existing recreation camp lot leases will be continued under licenses issued by the Department of Resources and Economic

TABLE 2
Camp Lot Locations

GENERAL LOCATION	NUMBER OF CAMPS
Fourteen and a Half Pond	6
Nash Bog	62
Lower Trio Pond	9
Whitcomb Pond	1
Misc. Locations	16
Total Camps	**94**

Development. Overall license term shall not exceed 50 years in duration and all licenses will terminate on June 30, 2039. **Chapter 5 – Camp Lot License Management** details how the licenses will be managed, including license renewals, transfers, and termination.

Roads and Access

The Nash Stream Forest is well served by a 66.5 mile network of roads (see **Appendix 5 – Road List by Class**). Gravel roads total just under 42 miles (63%).

The road network begins from a paved town highway (Emerson Road), about 2 miles north and east of N.H. Route 110, or about 4 miles from U.S. Route 3 at Groveton Village.

The first side road encountered, Jimmy Cole Brook Road, **#17**, **(Map 3**, page 24) departs to the right (east) about 0.4 miles from the pavement. This road is gated at about 0.2 miles, and runs generally easterly, passing north of Jimmy Cole ledge and bog and north around Victor Head, then forks to various parts of Rowells Brook headwaters, south of Long Mountain. This road has 4.2 miles of gravel surface.

At 1.3 miles from Emerson Road, the next side road (West Side Road, **#52**) departs to the left across a gated, wooden-planked, steel stringer bridge over Nash Stream. This is a well graveled road that turns north up the west side of the valley for 5.3 miles.

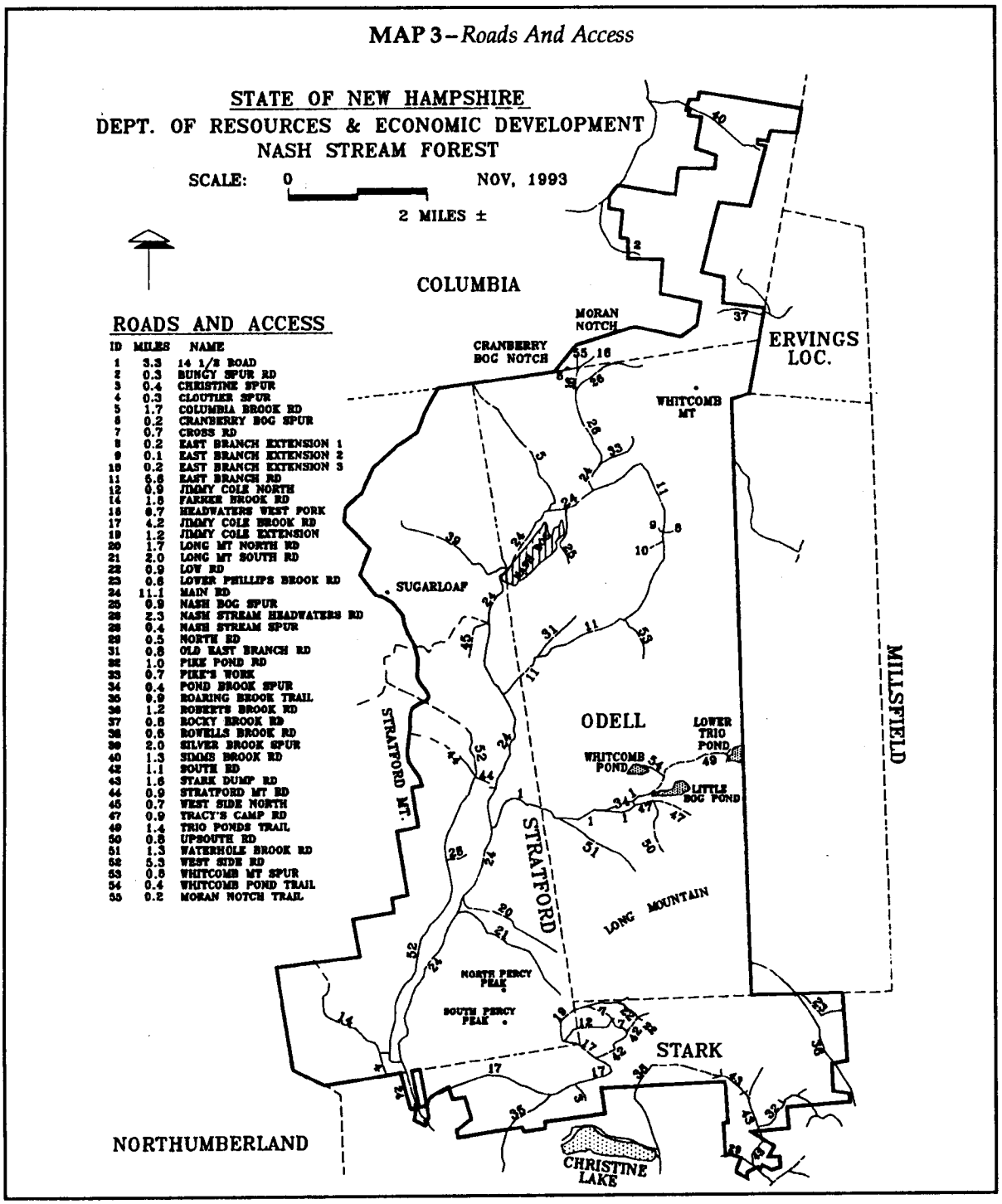
The next major road is Little Bog Pond Road (also called Fourteen and a Half Road, **#1**) which forks to the right at about 5.0 miles. This well graveled road runs east and north to Little Bog Pond, a distance of 3.3 miles. A short distance below the pond, a gated fork (Tracy's Camp Road, **#47**) departs to the right. Trio Ponds Trail **(#49)** departs from the small parking lot at Little Bog Pond, and runs northeasterly for 1.4 miles. This trail provides access to the private camps on Whitcomb and Trio Ponds and is not graveled.

The next side road (East Branch Road, **#11**) is about 7.2 miles from Emerson Road. This gated road is 5.6 miles long with a good gravel base but has numerous washouts. The road runs east, crosses the East Branch, then continues north where it connects back with the Main Road **(#24)** north of Nash Bog.

At about 8 miles from Emerson Road, the Main Road crosses to the west side of Nash Stream over a wooden-planked, steel stringer bridge. At about 9 miles, the site of the former Nash Bog dam is located just east of the road, but not visible. A cluster of private camps begins here and extends around the full length of the westerly and northerly sides of the former pond.

At about 10 miles, the road crosses Nash Stream, just above its entrance into the bog. Just beyond this bridge, the gated entrance to

MAP 3 – *Roads And Access*



ROADS AND ACCESS

ID	MILES	NAME
1	3.3	14 1/2 ROAD
2	0.3	BUNGY SPUR RD
3	0.4	CHRISTINE SPUR
4	0.3	CLOUTIER SPUR
5	1.7	COLUMBIA BROOK RD
6	0.2	CRANBERRY BOG SPUR
7	0.7	CROSS RD
8	0.2	EAST BRANCH EXTENSION 1
9	0.1	EAST BRANCH EXTENSION 2
10	0.2	EAST BRANCH EXTENSION 3
11	6.6	EAST BRANCH RD
12	0.9	JIMMY COLE NORTH
14	1.8	FARMER BROOK RD
16	0.7	HEADWATERS WEST FORK
17	4.2	JIMMY COLE BROOK RD
19	1.2	JIMMY COLE EXTENSION
20	1.7	LONG MT NORTH RD
21	2.0	LONG MT SOUTH RD
22	0.9	LOW RD
23	0.6	LOWER PHILLIPS BROOK RD
24	11.1	MAIN RD
25	0.9	NASH BOG SPUR
26	2.3	NASH STREAM HEADWATERS RD
28	0.4	NASH STREAM SPUR
29	0.5	NORTH RD
31	0.8	OLD EAST BRANCH RD
32	1.0	PIKE POND RD
33	0.7	PIKE'S WORK
34	0.4	POND BROOK SPUR
35	0.9	ROARING BROOK TRAIL
36	1.2	ROBERTS BROOK RD
37	0.8	ROCKY BROOK RD
38	0.6	ROWELLS BROOK RD
39	2.0	SILVER BROOK SPUR
40	1.3	SIMMS BROOK RD
42	1.1	SOUTH RD
43	1.6	STARK DUMP RD
44	0.9	STRATFORD MT RD
45	0.7	WEST SIDE NORTH
47	0.9	TRACY'S CAMP RD
49	1.4	TRIO PONDS TRAIL
50	0.8	UPSOUTH RD
51	1.3	WATERHOLE BROOK RD
52	5.3	WEST SIDE RD
53	0.8	WHITCOMB MT SPUR
54	0.4	WHITCOMB POND TRAIL
55	0.2	MORAN NOTCH TRAIL

Columbia Brook Road (#5) forks to the left. This gravel road runs north into Columbia Brook valley for 1.7 miles to the Columbia town line.

The Main Road continues easterly around the north end of the former pond and then turns north along Pike Brook to a fork. The right fork (known as Nineteen Valley) continues up Pike Brook and connects with the north end of the East Branch Road. Up the left fork, the Main Road ends at a gate about 11.1 miles from pavement.

The Nash Stream Headwaters Road (#26) begins beyond the gate. Steep in sections, this gravel road is waterbarred for erosion control. The road runs north about 1.0 mile where a left fork (Headwaters West, #16 and Cranberry Bog Spur, #6) swings northerly through Cranberry Bog Notch to the Columbia town line and property boundary. The right fork continues easterly for another 1.3 miles to an old log yard in Moran Notch about a mile northwest of the 3,610 foot high peak of the Whitcomb Mountain range.

The lands in Columbia are served by Simms Brook Road (1.3 miles, #40) (also called Kelsey Notch Road), Bungy Spur (0.3 miles, #2), and Rocky Brook Road (0.8 miles, #37). Simms Brook Road and Bungy Spur lead in from Bungy Road, a town highway. Both are low-grade, gravel roads and, to date, have been privately maintained by several landowners. Rocky Brook Road is also graveled, accessed by way of Phillips Brook Valley through private property to the east.

The lands in Stark, southeasterly of Long Mountain, are served by several good gravel roads. The Stark Dump Road (1.6 miles, #43) leaves North Road (0.5 miles, #29), a public highway, across from the old Stark landfill. At about 0.5 miles, the Pike Pond Road (1.0 miles, #32) forks right, runs northeasterly, then swings south to the property line and connects with Bell Hill Road, a public highway, off the property. Stark Dump Road continues north, west, and eventually connects with Rowells Brook Road (0.6 miles, #38) north of Bald Mountain. Rowells Brook Road runs southwest to the property line and a private road that connects with the entrance road to Christine Lake.

Roberts Brook Road (1.2 miles, #36) is accessible from Bell Hill Road, but arrangements must be made to cross over private lands. The bridge over Roberts Brook must be replaced in order for this road to become useable.

All roads except for the Main Road and Fourteen and a Half Road are presently closed to vehicular traffic (page 112). Since state acquisition, several roads have received significant maintenance work. Main, West Side, Jimmy Cole Brook, and Fourteen and a Half Roads have been graded, ditched, resurfaced, and in some cases restructured in order to be properly graded on a regular basis. The East Branch Road gate was replaced at the Main Road intersection. The Main Road bridge over Nash Stream just below the breached dam at the Bog was replanked. The bridge over the East Branch on the East Branch Road was replaced with a culvert.

Timber Resources

A timber cruise was done in the fall of 1988 to measure, map and evaluate the timber resources. The cruise was carried out through the combined efforts of the Division

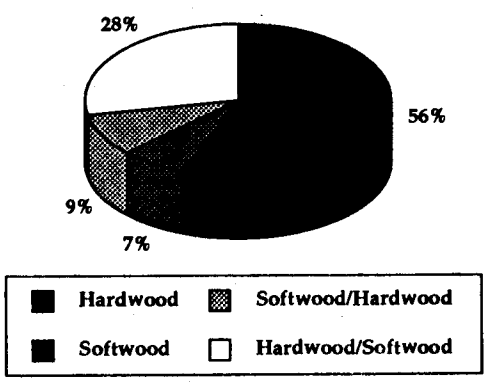
of Forests and Lands, U.S. Forest Service, The Society for the Protection of New Hampshire Forests, and The Trust for New Hampshire Lands, under the technical direction of the James W. Sewall Company of Old Town, Maine. Final cruise map and data computations were done by the James W. Sewall Company. Results were compiled by the use of the GRANIT computer system under a joint contract between the Office of State Planning, Division of Forests and Lands, and the University of New Hampshire Complex Systems Research Center.

The timber cruise area totaled 29,348 acres and included forest up to 2,700 feet elevation considered accessible for logging or showing evidence of previous access. The following is a summary of the timber cruise results.

Forest Composition

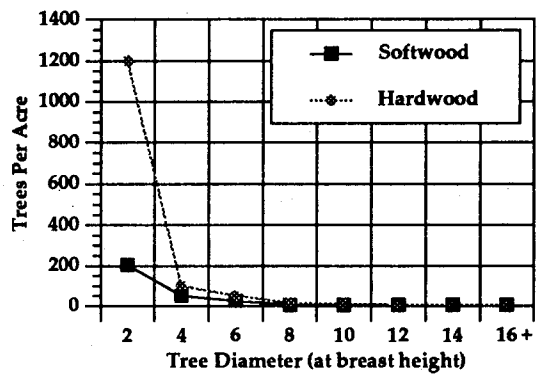
Pure hardwood forest (over 74% hardwood) in the timber cruise area[4] totaled 16,420 acres **(Figure 4)**. Hardwoods in mixed composition with softwoods totaled 10,840 acres. Pure softwood forest (over 74% softwood) occupied only 2,088 acres.

FIGURE 4
Forest Cover in the Timber Cruise Area



Yellow birch, sugar maple, white birch, red maple and beech are primary hardwoods. Other hardwoods include poplar and white ash. Dominant softwood species are balsam fir and red spruce.

FIGURE 5
Diameter Distribution



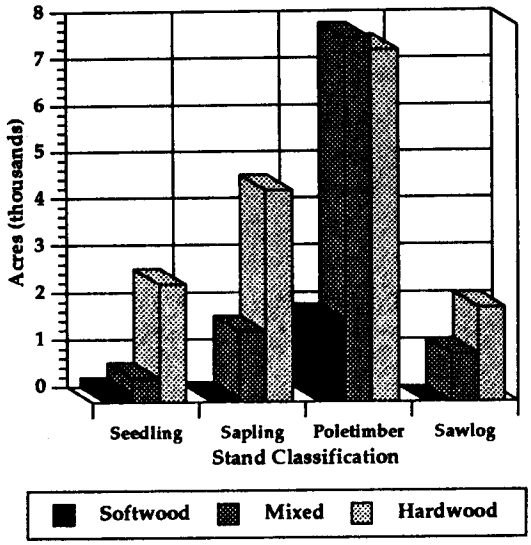
Forest Structure

Figure 5 shows the average per acre diameter distribution. This diameter distribution does not represent the natural cycling of a forest **(Chapter 5 – Timber Management – *Forest Structure Trend*)**. Almost 90 percent of the trees are 4 inches in diameter or smaller and fewer than four trees per acre are larger than 16 inches in diameter. About one-third of the 4-inch and smaller trees are short-lived species of pin cherry and striped maple which will die out as the forest matures.

Seedling and Sapling Size Classes

Seedlings are trees up to 2 inches in diameter. Saplings are 2 to 4.5 inches in diameter. Stands classified in the seedling and sapling size classes totaled 9,382 acres **(Figure 6)**. Almost 75 percent of the seedling and sapling stands are pure hardwood, heavily

FIGURE 6
Size Class Distribution



stocked with shade intolerant species such as paper birch, yellow birch, aspen and early successional species of pin cherry and striped maple. Mixedwood seedling and sapling stands are mostly composed of red maple, beech, red spruce and balsam fir. The few pure softwood stands in these size classes consist of spruce and fir and sometimes, on the lower elevations, include small quantities of white pine and tamarack. Seedling and sapling size class reflects the most recent cuttings within the last thirty years.

Poletimber Size Class
Poletimber ranges in size from 4.6 to 9.5 inches in diameter. Stands classified as poletimber size totaled 16,826 acres of the forest. The combination of hardwood and mixedwood poletimber stands totaled about 15,037 (about 50%); softwood poletimber occupied only 1,789 acres (less than 10%). Sugar maple, white ash, yellow birch and beech make up the hardwood poletimber stands on the fine textured upland soils. Red maple and/or beech poletimber often mixed with scattered patches of red spruce and balsam fir occupied the coarser and often wetter soils. Softwood poletimber stands are dominated by balsam fir with lesser amounts of red spruce.

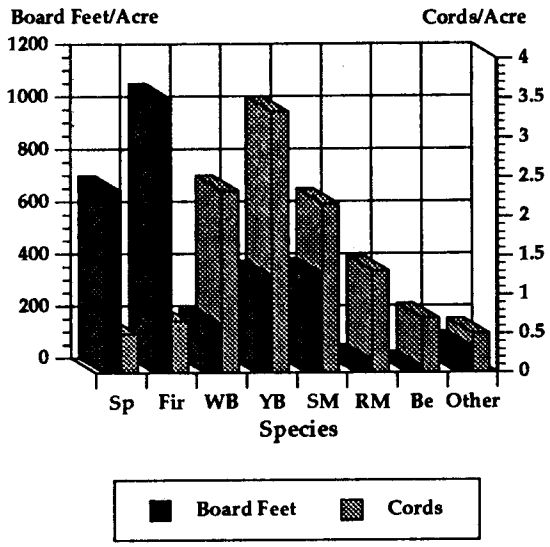
Sawtimber Size Class
Approximately 3,140 acres (11%) of the timber resource was in the sawtimber size class (9.6 inches+). About two-thirds of the sawtimber stands consisted of pure hardwoods; the balance was mixed with softwoods. There were no pure softwood stands in the sawtimber size class. Hardwood sawtimber was generally just above the poletimber size class with a mean diameter at breast height of 12 inches+/-.

Timber Volume and Quality
Sawlog volume was measured in average board feet per acre based on the International 1/4 Inch Rule from stands of all size classes. Spruce and fir sawlogs were measured from 5.6+ inches in diameter and hardwoods from 8.6+ inches in diameter.

Average softwood sawlog volume per acre was almost twice that of hardwoods (**Figure 7,** page 28). Softwoods averaged about 1,700 board feet per acre and hardwoods about 1,060 board feet per acre with total average volume of approximately 2,760 board feet per acre for all stands. Spruce and fir log volume was primarily scattered throughout stands of mixed hardwood and softwoods and was considered about average quality.

Hardwood log volume consists primarily of medium to low grade (Grade 2 and 3) white birch, yellow birch and sugar maple. High

FIGURE 7
Timber Volume



grade sawlogs (Grade 1) comprised less than 10 percent of the hardwood sawlog volume **(Figure 8)**.

Cord volume was measured in average cords per acre (standard 128 cubic foot cord) from stands of all size classes **(Figure 7)**. Average cord volume was estimated to be just under 12 cords per acre consisting primarily (86%) of hardwood species. More than half (52%) of the cord volume was pulp grade primarily of yellow birch, white birch and sugar maple.

Growth and Stocking

Average gross volume growth[5] was computed for all trees 4.6 inches in diameter and larger. Gross volume growth (to a 4.0 inch top) was estimated to be 65 cubic feet per acre per year. Hardwood growth was about 70 percent of this total with yellow birch,

FIGURE 8
Hardwood Log Quality

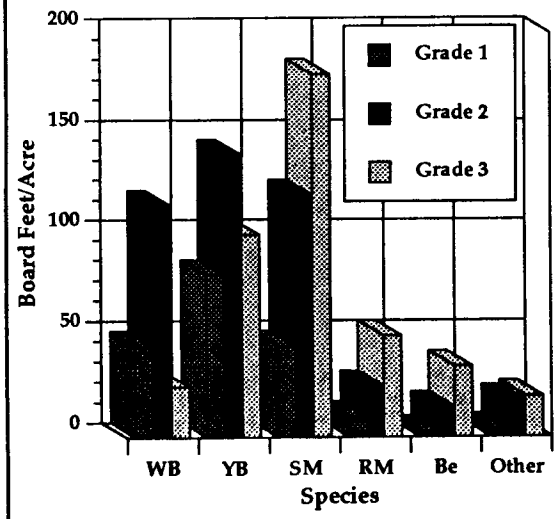


FIGURE 9
Average Annual Gross Growth Per Acre

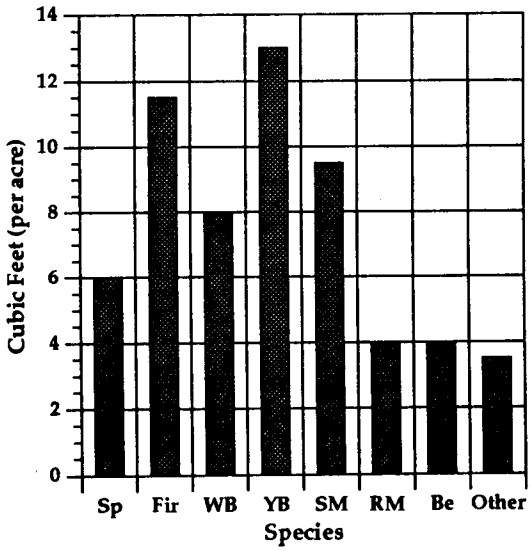
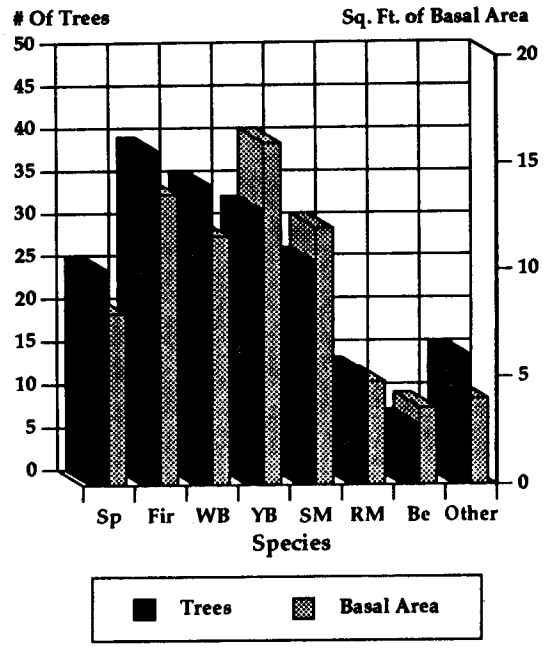


FIGURE 10
Average Per Acre Stocking



sugar maple and paper birch making up almost half of the total growth **(Figure 9)**. Balsam fir, one of two major softwood species, made up almost 20 percent of total growth.

Average basal area per acre for all trees 4.6 inches in diameter and larger was 74 square feet with yellow birch, sugar maple and paper birch making up more than half of the total **(Figure 10)**. Hardwoods made up 71 percent of the total basal area.

For trees 4.6 inches in diameter and larger, yellow birch, sugar maple and beech had the largest average tree diameter at just under 10 inches. Average diameter for all other species, including softwoods, ranged from 6 to 8 inches dbh with 8 inch most common.

Areas of Ecological Concern

In response to the vast Diamond International land sale in February 1988, The Nature Conservancy (a private, non-profit organization) funded an inventory to determine areas of ecological significance on all Diamond International lands. This inventory, of which the Nash Stream Forest was a significant component, was conducted in 1988 by the New Hampshire Natural Heritage Inventory (NHI). The inventory sought to identify rare plants, rare animals, and exemplary natural communities.

A natural community is an assemblage of plants and animals ecologically related to each other and to their physical environment. Exemplary natural communities are remnants of the undisturbed landscape that represent the best remaining intact examples of the state's flora and fauna. They are either good examples of rare natural community types or excellent (i.e., large, undisturbed, representative) examples of more common natural community types. Exemplary natural communities are mapped and documented by the NHI in a process similar to that for rare species.

Several exemplary natural communities, particularly uncommon high elevation natural communities, and rare species were identified on the Nash Stream property:

- A **Northern Acidic Cliff Community** occurs on Whitcomb Mountain. This sparsely vegetated community type typically occurs on steep or vertical rock outcrops such as granite or quartz monzonite. Characteristic species include hair-grass, rusty woodsia, tall rattlesnake root, and Rand's goldenrod.

- A **Northern Acidic Rocky Summit Community** occurs on Percy Peaks, Victor Head, and Bald Mountain. This is an open to partially forested community on ridgetops and summits where bedrock is exposed. Forest cover is typically patchy, alternating with areas of exposed bedrock dominated by low shrubs and bryophytes (mosses and lichens). Dry conditions prevail in this community much of the year. Summer drought is common and as a result, the community is susceptible to fire which may have been important historically in maintaining openings. Characteristic species are similar to the previous community; others include blueberry, lambkill, and three-toothed cinquefoil.
- A **Northern Acidic Talus Slope Forest Woodland** occurs on Long Mountain. This community occurs on slopes of loose rock which collect at the base of cliffs or ledges. Typically, open talus areas are interspersed with forest cover which varies from open woodland to dense thickets and woods. Characteristic species are red spruce, mountain maple and white birch.
- An exemplary **Northern Hardwood Forest** occurs on Fitch and No. 3 Mountains. This community is unique in that it may be old growth; further research is needed to make this determination. Characteristic species are sugar maple, beech, and yellow birch. On cooler slopes, hemlock and red spruce are frequent. Other common species are hobblebush, spinulose wood-fern, striped maple, and large-leaved goldenrod.
- A **Rich Mountain Streambottom Forest** occurs on the shoulders of Sugarloaf, Fitch, and No. 3 Mountains. This is a forest community of mountain ravines and headwaters. It occupies a narrow space along headwater stream seeps and stream ravines. Although this community includes streams and stream borders, it is not classified as a wetland. Wetland plants and hydric soils are present but occur in a mosaic with upland soils. Vegetation is typically dense and varied, in habitats ranging from running water to moist, cool forest. Characteristic species include yellow birch, paper birch, mountain ash, jewel-weed, twayblade orchids, and Braun's Holly Fern.
- An **Acidic Fen** is located on Long Mountain. Acidic fens are peatlands dominated by graminoid vegetation, primarily sedges and rushes, and are influenced by groundwater flow. Unlike bogs, fens receive spring water which provides mineral nutrients.

Rare plants found on the Nash Stream property are listed in **Table 3**. Four of the five species are listed as threatened by the NH Native Plant Protection Act. The other, three-forked rush, is relatively rare but is not state-listed.

Black crowberry and three-forked rush are sub-alpine species typically found on exposed soils. Broad-lipped twayblade is typically found in cedar swamps and in woods along wet, cold seeps and springs. Millet-grass thrives in the shade of a mature canopy in rich or calcareous forest. Marsh horsetail occurs in a variety of wetland habitats, often in calcareous areas.

TABLE 3
Rare Plants and Locations

PLANT	LOCATION
Empetrum nigrum (Black Crowberry)	Percy Peaks
Equisetum palustre[6] (Marsh Horsetail)	Nash Stream Bog
Juncus trifidus (Three-forked Rush)	Percy Peaks
Listera convallarioides (Broad-lipped Twayblade)	Fitch/No. 3 Mtns./ Gore Mtns.
Milium effusum (Millet-grass)	Sugarloaf/Fitch/ No. 3 Mtns.

Water Resources

The Nash Stream Forest property includes five separate drainages, all part of the Connecticut River watershed. Seventy percent of the property is drained by Nash Stream, ten percent by Phillips Brook, five percent by Rowells Brook, and five percent by Jimmy Cole Brook, all of which flow into the Upper Ammonoosuc River. The remaining ten percent of the property is drained by Simms Stream which flows directly into the Connecticut River.

Measuring stations in Berlin and Dixville Notch, New Hampshire show average annual precipitation at 44 inches, seventy-five percent in the form of rainfall and twenty-five percent as snow. At ten inches of snow to one inch of rain, the property receives about 100 inches (about 8.3 feet) of snow annually.

All surface waters are classified for use as "B" waters (fishable, swimmable) by the state. There are no known discharge sources such as sewers or dumps affecting water quality. There is some recorded data from acid rain studies done in 1980 for Lower Trio Pond.

Nash Stream, Phillips Brook, Rowells Brook, Jimmy Cole Brook and Simms Stream are major named flowages. Standing water bodies are Little Bog (Fourteen and a Half) Pond (37 acres), Lower Trio Pond (68 acres), Whitcomb Pond (19 acres), and Long Mountain Pond (2 acres). Nash Stream, a most outstanding feature, originates on the north slope of Whitcomb Mountain near the Columbia town line and flows south to the Upper Ammonoosuc River, a drop of about 2,100 feet in twelve miles.

Based on recorded stream flow data from the U.S. Geological Survey gauge on the Upper Ammonoosuc River near Groveton, New Hampshire, average water flow for Nash Stream is about 100 cubic feet per second where Nash Stream flows into the Upper Ammonoosuc River. Minimum flow is about 6 cubic feet per second; 100 year flood-flow is about 4,000 cubic feet per second.

Nash Bog Pond was an artificial pond, approximately 223 acres in size, located in a valley bottom on the upper stretch of Nash Stream. Built around the turn of the century, the pond was used to hold water for log drives and for downstream water use until 1969 when the dam breached. Today, the old pond site is a natural bog habitat with a water table located at or above the surface most of the year (see **Nash Bog Pond**, page 32).

Fisheries Resources

Ponds

Previously, there were six ponds in the Nash Stream Forest: Trio Pond #1, Trio Pond #2, Nash Bog Pond, Whitcomb Pond, Little Bog

Pond, and Long Mountain Pond. Today there are only four: Trio Pond #1 and #2 are now one body of water, and the dam on Nash Bog Pond breached, leaving an old stream bed. Operation and maintenance of the dams on Lower Trio and Little Bog (Fourteen and a Half) Pond are the responsibility of the Fish and Game Department. Chapter 151, Laws of 1992 amended RSA 482:48 III (a) transferred the dams from DRED to Fish and Game.

Lower Trio Pond (also called Big Trio Pond) was previously known as Trio #1 and #2. The ponds are now connected due to a rise in water level from the dam at the outlet of the former Trio Pond #1. The pond has a total surface area of 68 acres and is part of Pond Brook drainage which also drains Little Bog Pond. Based on GRANIT analysis, about 26 acres of Lower Trio Pond lies within the Forest boundary, about one-third of the shoreline of the entire pond. Maximum depth is reported to be 27 feet. The last fishery survey was conducted in 1989 when 18 brook trout were caught. The fish ranged in size from 4.1 to 14.3 inches and averaged 8.4 inches. Three, and possibly four, age classes of fish were present indicating good holdover capacity. Lower Trio is currently stocked with 17,000 brook trout fingerlings per year.

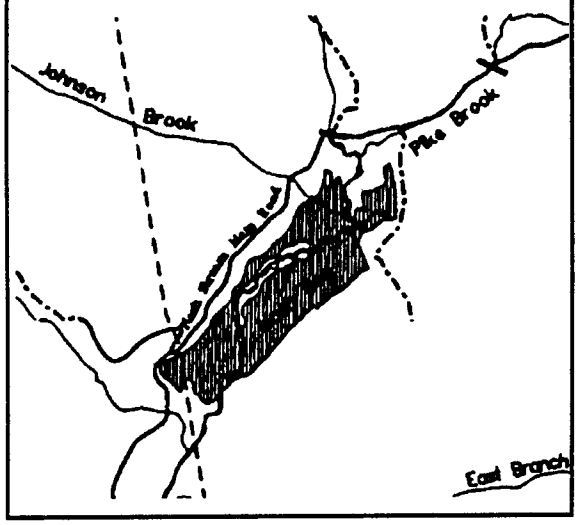
Little Bog Pond (locally known as Fourteen and a Half) is located on the Pond Brook drainage which flows into the Nash Stream. The pond has a surface area of 37 acres and has a maximum reported depth of 10 feet. The pond is artificial with an earthen and rock crib dam. The pond is accessible with conventional vehicles and has a wooden plank boat launch near the dam for small boats. The pond was last surveyed in 1989 when 15 brook trout were captured. They ranged in size from 4.4 to 15.4 inches with an average size of 8.2 inches. The pond is currently stocked with 500 yearling and 4,000 fingerling brook trout.

Whitcomb Pond is a natural pond located northwest of Little Bog Pond and accessible by a half-mile walk from the parking area at Little Bog Pond. The outlet flows into a small stream that enters Pond Brook about one mile downstream of Little Bog Pond. The pond is reported to be just under 19 acres in size, has a maximum depth of 7 feet and an average depth of 5.5 feet. The pond was last surveyed in 1990. This sampling procured 15 brook trout that ranged from 4.4 to 13.0 inches and averaged only 6.2 inches. This pond was classified in a 1955 survey as being best suited for warm-water fish. There is a heavy growth of aquatic vegetation in summer that supports this classification. Approximately 4,000 fingerling brook trout are aerially planted each year.

Nash Bog Pond is no longer a pond today. **Figure 11** illustrates the impoundment area of Nash Bog Pond as it currently appears. Currently, there is no fisheries management in place for Nash Bog although there are reports of several beaver ponds in the old stream bed that produce good fishing for wild brook trout.

Long Mountain Pond is a natural pond of about 2 acres. It is drained by Roberts Brook which flows out of the Nash Stream Forest and into Phillips Brook. To date, no fisheries surveys have ever been conducted and no stocking has occurred here. It is not known if there are any fish present in this pond.

FIGURE 11
Nash Bog Pond Impoundment Area Today



Streams

Nash Stream is the main stream in the Nash Stream Forest. It flows from north to south and is a major tributary to the Upper Ammonoosuc River. The stream is about 12.5 miles long in the Nash Stream Forest and is composed of mostly boulder and rubble bottom. The entire stream is easily accessible as the Main Road parallels the stream. Nash Stream has seven named tributaries, two of which have the potential of supporting fisheries, but have received little management (Pond Brook and East Branch).

A 1990-91 habitat survey of Nash Stream and several of its tributaries revealed a lack of pool habitat. Optimal trout habitat is characterized by a 1:1 pool to riffle ratio. Nash Stream and its tributaries were found to have an average 1:10 pool to riffle ratio **(Table 4)**.

TABLE 4
Results of Fisheries Habitat Survey, 1990-91

TRIBUTARY	DISTANCE SURVEYED (FT)	HABITAT TYPES (%) Pool	Glide	Riffle	Cascade
Nash Stream	47,981	4.6	32.3	55.3	7.8
Columbia Brook	5,820	5.5	47.1	39.1	8.3
Slide Brook	4,290	2.0	2.4	30.5	65.1
East Branch	2,997	5.6	40.0	54.4	0.0
Long Mtn. Brook	2,035	7.6	5.4	68.9	18.1

From the early 1940s to 1969 Nash Stream was stocked only with brook trout. The stream was stocked annually since 1970 with catchable size brook and rainbow trout. Recently, the decision was made to stock only brook trout in the watershed.

Stream fishery management is limited to Nash Stream. The stream is stocked with yearling brook trout. Regulations for the stream are a 5 fish or 5 pound creel limit, a January 1 to October 15 season, and no gear restrictions. No stocking occurs in any of the

Three of the four ponds in the Nash Stream Forest (Lower Trio, Little Bog, and Whitcomb) are being managed for the most part as put, grow, and take trout fisheries. Little Bog Pond is also stocked with catchable size fish. Regulations are currently a 5 fish or 5 pound creel limit, an open season from the fourth Saturday in April to October 15, and no gear restrictions. Long Mountain Pond is not stocked due to its small size and remoteness.

tributaries to Nash Stream. However, they are open to fishing and the above regulations apply. Anecdotal information suggests that these small tributaries contain populations of wild brook trout.

Wildlife Habitats and Species

The Nash Stream Forest encompasses a considerable variety of wildlife habitats, from ponds, streams, and wetlands to hardwood, softwood, and mixed forests of various ages and at elevations ranging from 1,020 feet to 3,680 feet.

Ponds, Streams, and Wetlands
Aquatic and wetland habitats on the Nash Stream Forest include three great ponds (water bodies exceeding 10 acres in surface area), about forty wetlands, and more than fifteen streams.

Ponds–The great ponds include Whitcomb Pond, Little Bog Pond, and Lower Trio Pond. Whitcomb Pond is a 19 acre natural pond at an elevation of 2,250 feet, with a rocky shoreline and a maximum sounded depth of 7 feet. Little Bog Pond, also known as Fourteen and a Half, is an artificial pond of 37 acres at 2,042 feet elevation, with a half-wooded and half-rocky shoreline and a maximum sounded depth of 10 feet. Trio Ponds, at 2,315 feet elevation, result from a dam which has connected two formerly natural ponds into a single water body with a current total surface area of 68 acres, about 26 acres of which lie within the Nash Stream Forest. The maximum depth is 27 feet. Long Mountain Pond, an additional small body of open water, is a 2 acre pond at an elevation of 3,400 feet[7]. Its shores are rocky, and its depth is unknown.

These ponds provide foraging habitat for aquatic species such as Otter, Mink, Raccoon, Moose, Common Loon, Common Merganser, American Black Duck, Mallard, Belted Kingfisher, Red-spotted Newt, Mink Frog, Pickerel Frog, Green Frog, and Bullfrog, and produce aquatic insects with airborne adults which are important prey for bats, swallows, Chimney Swifts, Cedar Waxwings, and flycatchers.

Streams–Nash Stream is the most significant stream on the property, and traverses the Nash Stream Forest for about 12.5 miles north to south. The reach above Nash Stream Bog has a gradient of 6 percent and runs through forest and a few small wetlands. The stream then meanders through Nash Bog for more than 1.5 miles, with swampy edges and areas of braided channel. Below the bog the stream runs nearly 8 miles with a 1 percent gradient to the property boundary. The shores of this reach are well scoured by the 1969 flood, and the substrate is primarily cobble and boulders. The Nash Stream Main Road follows much of this reach quite closely. Other major streams range in length from less than a mile to about 5 miles, and have gradients ranging from 3 to 28 percent. All but three of the significant streams are tributaries of Nash Stream; the others flow into Phillips Brook, Christine Lake, and the Upper Ammonoosuc River.

These streams and their edges provide potential habitat for Star-nosed Mole, Water Shrew, and Spring, Dusky, and Two-lined Salamanders, as well as Beaver, Otter, Mink, and Raccoon.

Wetlands–Nash Bog is the largest wetland with more than 200 acres, and is predominantly (77%) mixed emergent marsh and

shrub scrub, with smaller areas of emergent marsh (8%), shrub scrub (7%), and deciduous forested wetland (8%). Nash Stream meanders through the wetland from north to south.

Nash Bog provides breeding habitat for several wildlife species that are uncommon or absent elsewhere on the property. These include Common Snipe, Sora, Song Sparrow, and Red-winged Blackbird.

Most of the other wetlands occur in series along various streams, although a few are relatively isolated. They range in area from <1.0 to 34 acres, with twenty-five wetlands less than 2 acres and only five exceeding 10 acres. The majority are active or inactive beaver flowages. About half the wetlands include only a single wetland type; the others include various combinations of open water, emergent marsh, shrub scrub, and forested types. Significant numbers of standing dead trees occur in four wetlands. Softwoods dominate the forests along wetland shorelines.

Wildlife known or likely to utilize these wetlands include Moose, White-tailed Deer, Beaver, Raccoon, Water Shrew, Star-nosed Mole, Southern Bog Lemming, Mink, Otter, Fisher, Barn and Tree Swallows, Olive-sided Flycatcher, Wilson's and Yellow Warblers, Northern Waterthrush, Rusty Blackbird, Swamp Sparrow, Spring Peeper, Mink Frog, and Pickerel Frog.

Vernal pools–Vernal pools are temporary ponds, usually small and shallow, which occur annually in the same locations, gaining their water from snowmelt, spring rains, and/or elevated groundwater levels. They typically dry up largely or completely in late summer. Lack of water or extremely low oxygen levels during part of the year precludes the survival of fish populations in these ponds. The absence of fish provides a safe breeding environment for amphibians, and a number of species breed only in these fishless ponds.

To date there has been no specific survey for vernal pools on the Nash Stream Forest. The topography of the tract is largely unfavorable for vernal pools. A wetlands survey conducted in 1992 documented amphibian egg masses in thirteen wetlands, thus documenting them as vernal pools. These pools provide essential breeding habitat for wood frogs and spotted salamanders, as well as a variety of aquatic invertebrates. Red-spotted Newts, Gray Tree Frogs, Green Frogs, Spring Peepers and American Toads also may breed in vernal pools.

Upland Forest

Habitat in the Nash Stream Forest, as the name suggests, is primarily forested land, which covers 38,562 acres, 97.4% of the property[8]. This does not imply, however, that forest habitat conditions are uniform across the property. Forest types occurring can be grouped into three broad categories, softwood, hardwood, and mixed, but species composition within these groups varies from one location to another. Past harvesting has created a range of age classes as well. Pole-timber stands occur most extensively, covering 65% of the total Forest, followed by sapling stands at 17% and sawlog and seedling stands, each at slightly below 10%.

Hardwood Forest–Northern hardwood forest comprises the most extensive wildlife habitat in the Nash Stream Forest. This forest

type consists principally of mixed stands of sugar maple, beech and yellow birch. Black cherry, red maple and white ash occur as common associated species. Shade intolerant species, including trembling and bigtooth aspen, paper birch, pin cherry, and striped maple, are common in even-aged seedling and sapling stands regenerating after clearcutting. Hardwood stands occur on the best growing sites on mid to upper slopes below 2,700 feet elevation, and occupy more than 18,000 acres. Hardwood acreage is more evenly distributed among age classes than is the case for other forest types (**Table 5**).

TABLE 5
Current Age/Size Class Distribution of Hardwood Forest

AGE/SIZE CLASS	AREA (acres)	% OF TYPE	% OF FOREST
Seedling	2,533	14.0	6.6
Sapling	4,489	24.8	11.6
Poletimber	8,971	49.5	23.3
Sawlog	2,142	11.8	5.6
Total Hardwood	**18,135**		**47.0**

Poletimber is the most extensive at nearly 50% of the hardwood acreage, and the other age classes range between 12% and 24%. Studies in the White Mountain National Forest and elsewhere indicate that poletimber hardwoods support the lowest breeding bird species diversity of all the hardwood age classes. Overall breeding bird diversity on the tract can be expected to increase as the present poletimber stands age into older classes.

Northern hardwood forests support a wide diversity of wildlife species, including Red-bellied Snake, Downy and Hairy Woodpeckers, Least Flycatcher, White-breasted Nuthatch, Red-eyed Vireo, Ovenbird, Rose-breasted Grosbeak, Smoky Shrew, Northern and Southern Flying Squirrels, Woodland Jumping Mouse, Porcupine, and Fisher. Beechnuts provide an important food source for mast-consuming species, including Blue Jay, White-breasted Nuthatch, Flying Squirrels, Black Bear, and White-tailed Deer. Species using younger age classes include Chestnut-sided and Mourning Warblers, Common Yellowthroats, American Redstarts, and Alder Flycatchers.

Softwood Forest–Softwood habitat in the Nash Stream Forest consists principally of mixed stands of red spruce and balsam fir. Some white pine occurs at lower elevations, and black spruce, tamarack and cedar occur in a few boggy areas. Softwoods currently occupy about 12.5% (4,890 acres) of the Nash Stream Forest. Most of the softwood acreage is in poletimber (90%), with minor components in seedling (4%) and sapling (6%) age classes (**Table 6**).

TABLE 6
Current Acreage of Softwood Type

AGE/SIZE CLASS	AREA (acres)	% OF TYPE	% OF FOREST
Seedling	175	3.6	0.5
Sapling	294	6.0	0.8
Poletimber	4,415	90.4	11.4
Sawlog	0	0.0	0.0
Total Softwood	**4,884**		**12.7**

High Elevation Softwood Forest–More than 60% of the softwood acreage in the Nash Stream Forest exists in areas above 2,700 feet elevation, which are designated as natural

preserves. The property includes four areas of high elevation habitat: the northwest peaks, Whitcomb Mountain, Long Mountain, and the Percy Peaks. Together they comprise more than 8,000 acres above 2,700 feet.

Areas classified as mountain top and upper mountain slope constitute more than 13,000 acres. Long Mountain is the largest high elevation area on the property, with a summit elevation of 3,640 feet, and 3,100 acres above 2,700 feet, of which 1,346 acres is softwood. The northwest peaks encompass six separate named peaks within the Nash Stream Forest and several others beyond the boundaries, and is the most extensive contiguous high elevation area in the upper Connecticut River watershed. This area includes 1,887 acres above 2,700 feet within the Nash Stream Forest, of which 325 acres is in softwood and another 511 acres is in softwood-hardwood. The area includes Sugarloaf, the highest elevation on the property, with a summit of 3,701 feet. Whitcomb Mountain consists of two peaks which are separated by a notch at 2,340 feet. The northern peak rises to 3,610 feet and encompasses 1,700 acres above 2,700 feet; the southern peak rises to 3,360 feet and encompasses 1,061 acres above 2,700 feet. The Percy Peaks, with summits at 3,418 feet and 3,220 feet, cover the smallest high elevation area. They occupy 350 acres above 2,700 feet, most of which is on the North Peak.

Low Elevation Softwood Forest–There are four major softwood areas at low elevations. The largest, located between Nash Bog and East Branch, includes some 260 acres in eleven pure stands of up to 78 acres, interspersed with hardwoods and mixed stands. A number of old strip cuts exist in this area. About 190 acres of pure softwoods occur with mixed stands on a large flat northeast of Little Bog Pond, and two areas each with about 140 acres of pure softwoods exist north of Simms Stream and west of the Bordeau Trail. Several contiguous areas of 30-70 acres also occur, but most other scattered patches of low elevation softwoods cover less than 20 acres.

Since relatively little spruce-fir forest currently exists at lower elevations on the property, the extensive high elevation spruce-fir forests provide the primary habitat for boreal forest species such as Gray Jay, Boreal Chickadee, Spruce Grouse, Blackpoll Warbler, White-winged Crossbill, and Yellow-bellied Flycatcher. The Gray-cheeked Thrush inhabits areas above 3,000 feet. Marten and Lynx also are most likely to occur in these areas. Low elevation softwoods may provide important deer wintering habitat. Other mammals closely associated with spruce-fir include Snowshoe Hare, Red Squirrel, Northern Flying Squirrel, Deer Mouse, Southern Red-backed Vole, and Porcupine.

Mixed Forests–Mixed-wood stands in the Nash Stream Forest consist of various mixtures of sugar maple, yellow birch, beech, red maple, red spruce and balsam fir. The area of mixed forest is extensive, covering some 15,543 acres. Of the mixed forest acreage, 73% is predominantly hardwoods and 27% is predominantly softwoods. Age class distributions differ somewhat between these two sub-types, as shown in **Table 7**, page 38. Mixed types include beech/sugar maple/spruce; beech/red maple/spruce; sugar maple/birch/ash; spruce/fir/sugar

TABLE 7
Age/Size Class Distribution of Mixed Forest Type

AGE/SIZE CLASS	TOTAL AREA	% HS*	% SH**	% OF MIXED	% OF FOREST
Seedling	542	62	38	3.5	1.4
Sapling	1,822	82	18	11.7	4.7
Poletimber	11,813	71	29	76.0	30.6
Sawlog	1,366	80	20	8.8	3.5
Total Mixed	**15,543**	**73**	**27**		**40.3**

*HS = hardwood/softwood (50-74% hardwood)
**SH = softwood/hardwood (50-74% softwood)

maple; and spruce/fir/birch on lower mountain slopes; birch/spruce/fir on upper mountain slopes; and spruce/fir/birch on mountain tops.

Typical wildlife using mixed stands at lower elevations include White-tailed Deer, Fisher, Flying Squirrel, Red-backed Vole, Weasel, Moose, Bobcat, Black Bear, Barred Owl, Pileated Woodpecker, Black-capped Chickadee, Winter Wren, and various warblers, as well as many species typical of either hardwood or softwood stands. Mixed stands at high elevations support wildlife typical of high elevation softwoods.

Other Habitat Features

Upland Openings–Upland openings in the Nash Stream Forest include roadsides, logging roads, log yarding areas, and clearings around structures on leased lots. Vegetation in these openings includes grasses, sedges, and various forbs, often with low shrubs along the edges. Drainage swales along the edges of roads and log landings and ruts in old skid trails provide patches of moist, open habitat.

Openings with tall herbaceous vegetation provide habitat for a number of upland species that are unlikely to occur in forest interiors. These include Northern Brown Snake, Garter Snake, Song Sparrow, Meadow Vole, and Meadow Jumping Mouse. These openings also provide foraging areas for species such as American Robin, American Goldfinch, Song Sparrow, Snowshoe Hare, White-tailed Deer, Red Fox, Coyote, and bats. The swales provide habitat for American Woodcock, Common Snipe, Star-nosed Mole, and various amphibians.

Sand and Gravel Banks–Exposed banks exist along some stretches of Nash Stream, in several excavated pits, and in scattered road cuts. They range in height from a few feet to more than 100 feet. Sections with relatively loose but stable deposits provide potential nesting sites for Belted Kingfisher and Bank and Northern Rough-winged Swallows, which excavate nesting burrows in vertical banks. More level areas of sand deposits provide nesting sites for painted and snapping turtles.

Structures–The 94 camps existing on leased lots, with associated outbuildings, provide a unique habitat feature in the Nash Stream Forest. Door and window ledges and exposed rafters likely provide the only available nest sites for eastern phoebes and barn swallows, and are used by American robins as well. Loose boards and tarpaper, and attics accessible through cracks and knotholes provide roost and nursery sites for cavity-dwelling bat species (Little Brown Myotis, Long-eared Myotis, Small-footed Myotis, Silver-haired Bat, Eastern Pipistrel,

Big Brown Bat) in a forest where timber harvesting has eliminated many natural sites. Red Squirrels, White-tailed Deer and White-footed Mice also likely gain access to forage, take shelter in winter, and bear young.

Wildlife Present

Comprehensive wildlife inventory efforts began in May-July, 1992 with point count bird surveys on transects in previously managed areas of the Forest, in selected high elevation areas, and at the majority of wetlands. Wetland surveys also documented reptiles, amphibians, and mammals. Track surveys for mammals in February-April, 1993 and surveys for bats and stream salamanders in July, 1993 also expanded current inventory information.

Reptiles and Amphibians–Wetland surveys and chance encounters have documented four amphibian species and one reptile species in the Nash Stream Forest. **Table 8** provides a list of potentially resident species.

TABLE 8

Amphibian and Reptile Species **Known** *or Expected to Occur in Nash Stream Forest*

AMPHIBIANS	REPTILES
Bullfrog	Eastern Ribbon Snake
Eastern American Toad	**Garter Snake**
Gray Treefrog	Milk Snake
Green Frog	Northern Water Snake
Leopard Frog	Painted Turtle
Mink Frog	Redbelly Snake
Northern Dusky Salamander	Ringneck Snake
Pickerel Frog	Smooth Green Snake
Red-spotted Newt	Snapping Turtle
Redback Salamander	Wood Turtle
Spotted Salamander	
Spring Peeper	
Spring Salamander	
Two-lined Salamander	
Wood Frog	

TABLE 9

Birds Documented in Nash Stream Forest During Breeding Season

Common Loon	American Robin
Mallard	Wood Thrush
American Black Duck	Hermit Thrush
Common Merganser	Swainson's Thrush
Northern Goshawk	Gray-cheeked Thrush
Red-tailed Hawk	Veery
Red-shouldered Hawk	Golden-crowned Kinglet
Broad-winged Hawk	Ruby-crowned Kinglet
Northern Harrier	Cedar Waxwing
Spruce Grouse	Solitary Vireo
Ruffed Grouse	Red-eyed Vireo
Sora	Black-and-white Warbler
American Woodcock	Tennessee Warbler
Common Snipe	Nashville Warbler
Spotted Sandpiper	Northern Parula Warbler
Barred Owl	Yellow Warbler
Chimney Swift	Magnolia Warbler
Ruby-throated Hummingbird	Black-throated Blue Warbler
Belted Kingfisher	Yellow-rumped Warbler
Northern Flicker	Black-throated Green Warbler
Pileated Woodpecker	Blackburnian Warbler
Yellow-bellied Sapsucker	Chestnut-sided Warbler
Hairy Woodpecker	Bay-breasted Warbler
Downy Woodpecker	Blackpoll Warbler
Black-backed Woodpecker	Ovenbird
Great Crested Flycatcher	Northern Waterthrush
Yellow-bellied Flycatcher	Mourning Warbler
Alder Flycatcher	Common Yellowthroat
Least Flycatcher	Wilson's Warbler
Eastern Wood-Pewee	Canada Warbler
Olive-sided Flycatcher	American Redstart
Tree Swallow	Red-winged Blackbird
Bank Swallow	Rusty Blackbird
Barn Swallow	Common Grackle
Gray Jay	Scarlet Tanager
Blue Jay	Rose-breasted Grosbeak
Common Raven	Evening Grosbeak
American Crow	Purple Finch
Black-capped Chickadee	Pine Siskin
Boreal Chickadee	American Goldfinch
White-breasted Nuthatch	Dark-eyed Junco
Red-breasted Nuthatch	White-throated Sparrow
Brown Creeper	Lincoln's Sparrow
Winter Wren	Swamp Sparrow
Gray Catbird	Song Sparrow
Northern Saw-whet Owl	Philadelphia Vireo

Birds – Field surveys during the breeding season to date have documented ninety bird species potentially breeding in the Nash Stream Forest (**Table 9,** page 39). These include 21 resident species, 28 short-distance migrants, and 39 long-distance migrants. The most commonly detected species in the 1992 point count surveys include: Winter Wren, Swainson's Thrush, Red-eyed Vireo, Black-Throated Blue Warbler, Black-throated Green Warbler, Ovenbird, and White-throated Sparrow, each of which accounted for more than 5% of all the individuals observed. Hermit Thrush, Chestnut-sided Warbler, and Pine Siskin accounted for 3-5% of individuals observed. Fifteen species occurred on all eight transects surveyed. These species include the above, and Black-capped Chickadee, Hermit Thrush, Solitary Vireo, Nashville Warbler, Yellow-rumped Warbler, Blackburnian Warbler, Chestnut-sided Warbler, and American Redstart, which occurred in lower numbers. **Table 10** lists undocumented bird species which may occur, and **Table 11,** those which occur as migrants, transients, or winter visitors.

Mammals – Wetland surveys and incidental sightings have documented twelve mammal species on the Nash Stream Forest to date.

TABLE 10

Bird Species Not Yet Documented Which May Occur in the Nash Stream Forest During the Breeding Season

Hooded Merganser	Three-toed Woodpecker
Sharp-shinned Hawk	Eastern Phoebe
American Kestrel	Northern Rough-winged Swallow
Virginia Rail	Cape May Warbler
Great Horned Owl	Red Crossbill
Black-billed Cuckoo	

TABLE 11

Bird Species Which May Occur in the Nash Stream Forest as Migrants, Transients, or Winter Visitors

Ring-necked Duck	Killdeer
Common Goldeneye	Common Nighthawk
Rough-legged Hawk	Horned Lark
Snowy Owl	Northern Shrike
Bohemian Waxwing	Palm Warbler
Common Redpoll	Pine Grosbeak
Cooper's Hawk	American Tree Sparrow
Golden Eagle	White-crowned Sparrow
Osprey	Fox Sparrow
Peregrine Falcon	Lapland Longspur
Merlin	Snow Bunting

TABLE 12

Mammals Documented in the Nash Stream Forest

Beaver	Moose
Black Bear	Raccoon
Bobcat	Red Fox
Coyote	Red Squirrel
Eastern Chipmunk	River Otter
Fisher	Snowshoe Hare
Marten	White-tailed Deer

Other mammals likely to occur in the Nash Stream Forest

Big Brown Bat	Northern Short-tailed Shrew
Deer Mouse	Porcupine
Eastern Pipistrel	Pygmy Shrew
Ermine	Red-backed Vole
Gray Fox	Red Bat
Hairy-tailed Mole	Rock Vole
Hoary Bat	Silver-haired Bat
Indiana Myotis	Small-footed Myotis
Eastern Long-eared Myotis	Smoky Shrew
Little Brown Myotis	Southern Bog Lemming
Long-tailed Shrew	Southern Flying Squirrel
Long-tailed Weasel	Star-nosed Mole
Lynx	Striped Skunk
Masked Shrew	Water Shrew
Meadow Vole	White-footed Mouse
Mink	Woodchuck
Muskrat	Woodland Jumping Mouse
Northern Bog Lemming	
Northern Flying Squirrel	

Table 12, page 40, provides a list of documented and potential mammals.

Invertebrates–The native fauna of the Nash Stream Forest includes many more invertebrate species than all the vertebrates put together. No invertebrate surveys have been conducted to date. While the taxonomy of some macroinvertebrate orders is relatively accessible, identification of most invertebrates is highly technical and requires microscopic examination. Documentation of mollusks, dragonflies, butterflies, and some additional insects present on the property may be feasible within the foreseeable future. A complete inventory of invertebrate species is beyond current capabilities.

Threatened and Endangered Species and Other Species of Management Concern

No federally listed animal species are known to breed in the Nash Stream Forest at the present time. Peregrine Falcons nest within twenty miles of the Forest, and may forage within the boundaries of the tract. Bald Eagles nest and winter within 20 miles of the Forest, but eagle use of the relatively small water bodies at Nash Stream likely is limited to occasional migrants and transients. Indiana Bats may occur in the Nash Stream Forest, but confirmation of their presence will require examination of a specimen.

Several state listed animal species occur or potentially occur in the Nash Stream Forest. Common Loons nest regularly on Trio Ponds, and Northern Harriers have nested in Nash Bog at least in some years. Marten have been documented in the Forest in high elevation spruce-fir and have also been sighted in riparian zones along the Nash Stream. Lynx may also occur in high elevation spruce-fir, as transients if not residents, but documentation will be difficult to obtain. Small-footed Bats may occur in the forest during the summer months, as a small population hibernates at a site in Gorham, about 25 miles away. Little is known of this species' habitat preferences. In summer they have been found in buildings, under rock slabs, and under loose bark. Documentation would require examination of a specimen.

Biologists on the Technical Team have identified fifteen additional species of management concern, so considered because of rarity in the region, particular sensitivity to habitat alteration or human disturbance, and/or economic importance (**Table 13**).

Information summaries for these species, as well as those listed as threatened or endangered and expected to occur in the Nash Stream Forest, follow. Additional species may be added at a later date as changes occur in state and federal lists, and as more information becomes available regarding the status of other species in the Forest.

TABLE 13

Proposed Species of Management Concern

Amphibians	**Mammals**
Blue-spotted Salamander	Beaver
	Black Bear
Reptiles	Bobcat
Wood Turtle	Indiana Bat
	Lynx
Birds	Marten
American Black Duck	Moose
American Woodcock	Otter
Common Loon	Small-footed Bat
Common Merganser	White-tailed Deer
Northern Goshawk	
Northern Harrier	
Red-shouldered Hawk	
Rusty Blackbird	
Wilson's Warbler	
Three-toed Woodpecker	

Species of Management Concern

Species:	Scientific Name:	Justification:	Preferred Habitat:	Habitat Availability In Nash Stream Forest:	Status In Nash Stream Forest:	Management Recommendations:
Wood Turtle	*Clemmys insculpta*	Rare in region	Meandering streams with sandy bottoms and overhanging alders, and adjacent woodlands	Potentially Columbia Brook beaver pond, parts of Nash Bog	Unknown	Survey for presence of species; develop management plan as appropriate.
Common loon	*Gavia immer*	State listed as Threatened	Deep freshwater lakes; nests on ground at water's edge	Nesting habitat on Trio Ponds; foraging also on Whitcomb and Little Bog Ponds	Rare; nests on Trio Ponds	Work with Loon Preservation Committee to identify nest location(s); assess nest site fidelity; identify and protect critical nesting habitat from human activity and habitat alteration.
American Black Duck	*Anas rubripes*	Economic importance	Ponds and open water, wetlands with brushy edges	Little Bog, Long Mountain, Trio, and Whitcomb Ponds, and Columbia Brook beaver pond	Uncommon	Maintain buffers around water bodies; avoid recreational activity in areas of suitable shoreline nesting habitat.
Common Merganser	*Mergus merganser*	Rare in region	Lakes, ponds, large streams with abundant fish populations; nests near shoreline in large tree cavities or on the ground	Whitcomb, Little Bog, and Trio Ponds	Rare; nests on Little Bog Pond	Identify nesting areas and protect from human disturbance and habitat alteration; install nest boxes in suitable locations.
Northern Goshawk	*Accipiter gentilis*	Rare in region, especially vulnerable to habitat modification	Mature forest with large diameter trees and high canopy closure, in association with areas with ample grouse and Snowshoe Hare populations, often near wetlands	Assessment of potential habitat incomplete	Rare; known activity in Lower Nash Stream valley, vicinity of Nash Bog	Identify areas of activity and recent nest sites; define management areas for species; within these management areas, manage for large diameter hardwoods and high canopy closure (>85%); avoid harvesting activity during March - July; avoid harvesting adjacent to nesting sites; develop area specific management plans; maintain habitat for Ruffed Grouse, Snowshoe Hare through timber management activities.

Species:	Scientific Name:	Justification:	Preferred Habitat:	Habitat Availability In Nash Stream Forest:	Status In Nash Stream Forest:	Management Recommendations:
Red-shouldered Hawk	*Buteo lineatus*	Rare in region, especially vulnerable to habitat modification	Mature hardwood or mixed forest with large diameter trees and high canopy closure, in close proximity to wetlands and at elevations <2,500 ft.	Bag Hill area, Nash Stream valley, eastern ponds area, East Branch, Nash Bog vicinity, upper Nash Stream	Rare; known activity in vicinity of Little Bog Pond	Identify areas of activity and recent nest sites; define management areas for species; within these management areas, manage for large diameter hardwoods and high canopy closure (>85%); avoid harvesting activity during March - July; avoid harvesting adjacent to nesting sites; develop area specific management plans.
Northern Harrier	*Circus cyaneus*	State listed as threatened	Nests in large shrub-scrub wetlands and overgrown fields; forages in same, and hayfields, pastures, Christmas tree plantations, and young clearcuts.	Nash Bog provides the only suitable breeding habitat; young clearcuts provide additional foraging habitat.	Rare	Monitor Nash Bog for breeding season activity; identify approximate nest location; identify foraging areas.
American Woodcock	*Philohela minor*	Economic importance	Grassy openings of at least 0.5 acres, brushy areas and early successional hardwoods on loams and sandy loams, all within areas of 25 acres	Localized in valley bottoms and on lower slopes and upland plains	Moderately common; encountered on upper West Side Road of the Bordeau Trail. Point count technique does not adequately survey this species. Surveys targeting this species restricted by access limitations during mud season.	Identify areas with suitable soils and designate as Woodcock management areas. Inventory grassy openings, alder/ dogwood cover, and regenerating hardwoods on suitable soil types. Create and/or maintain grassy opening of 0.5 - 1.0 acres and maintain availability of regenerating hardwoods less than 20 years old within each 25 acre area of suitable soil type.

Species:	Scientific Name:	Justification:	Preferred Habitat:	Habitat Availability In Nash Stream Forest:	Status In Nash Stream Forest:	Management Recommendations:
Three-toed Woodpecker	*Picoides tridactylus*	Rare in region	Old stands of spruce-fir with abundant standing dead trees, especially stands damaged by fire or budworm	Unknown	Unknown	Examine aerial photographs of high elevation softwood stands for areas of potentially suitable habitat; survey any suitable habitat for presence of species; monitor spruce-fir habitat for future development of suitable conditions and presence of species.
Wilson's Warbler	*Wilsonia pusilla*	Rare in region	Shrubby areas adjacent to water and spruce-fir forest	Various beaver ponds	Rare	Identify, map, and monitor all occupied and potential habitat; avoid alteration of occupied habitat.
Rusty Blackbird	*Euphagus carolinus*	Rare in region	Northern swamps, bogs, and pond shores with spruce-fir forest and standing dead trees	Little Bog, Long Mountain, Trio, and Whitcomb Ponds; Columbia Brook, East Branch, and Bag Hill beaver ponds.	Rare	Map areas of occupied and potential habitat; identify nesting areas; avoid habitat alterations in occupied areas; avoid recreational activity in nesting areas; maintain beaver population.
Indiana Bat	*Myotis sodalis*	Federally endangered	Forests with cavity trees near water	Vicinity of eastern ponds, Nash Bog, Columbia Brook beaver pond	Unknown	Survey potential habitat for bat activity and check for presence of species; retain and encourage development of large cavity trees within 0.25 miles of ponds and major wetlands; assess opportunities for bat box installation and implement bat box program as appropriate.

Species:	Scientific Name:	Justification:	Preferred Habitat:	Habitat Availability In Nash Stream Forest:	Status In Nash Stream Forest:	Management Recommendations:
Small-footed Bat	*Myotis leibii*	State threatened	Forested areas near water; summer roosts and maternity colonies may occur in buildings	Vicinity of eastern ponds, Nash Bog, Columbia Brook beaver pond	Unknown	Survey potential habitat for bat activity and check for presence of species; survey existing buildings for evidence of bat use; work with affected camp owners to protect any indoor colonies located; assess opportunities for bat box installation and implement bat box program as appropriate.
Lynx	*Lynx canadensis*	State listed as endangered	Extensive softwoods with substantial Snowshoe Hare populations	High elevations of Long Mountain, Whitcomb Mountain, and northwest peaks	Unknown	Minimize human activity in high elevation softwoods; manage vegetation adjacent to high elevation areas as feasible to encourage Snowshoe Hare populations.
Marten	*Martes americana*	State threatened	Extensive coniferous and mixed forests in mountainous regions	The higher elevations of the Nash Stream Forest provide extensive suitable Marten habitat	Uncommon; species found at high elevation and sighted in riparian areas along Nash Stream	Increase softwood component and woody debris as appropriate.
Beaver	*Castor canadensis*	Economic importance	Low gradient streams	Columbia, Jimmy Cole, Pike, and Waterhole Brooks, East Branch, Nash Stream, and several small unnamed streams	Uncommon	To the extent possible, resolve Beaver/human conflicts with beaver pipes rather than destruction of dams or trapping.
Black Bear	*Ursus americanus*	Economic importance	Mixed forest with dense understory near water	The lower elevations of the Nash Stream Forest provide extensive bear habitat.	Moderately common	Locate, map and maintain areas of bear clawed beech; promote development of mature beech stands.

Species:	Scientific Name:	Justification:	Preferred Habitat:	Habitat Availability In Nash Stream Forest:	Status In Nash Stream Forest:	Management Recommendations:
Otter	*Lutra canadensis*	Economic importance	Lakes, rivers, ponds, streams, and wetlands in forested areas	All the ponds, streams, and wetlands in the Nash Stream Forest provide suitable habitat	Uncommon	Identify and map shoreline Otter scat; post locations and avoid habitat alteration in these high use areas; maintain water quality and healthy populations of aquatic organisms.
Bobcat	*Lynx rufus*	Economic importance	Mixed forest in rough terrain with rocky and brushy habitats	Most of the Nash Stream Forest provides suitable Bobcat habitat	Uncommon	Identify and map potential denning areas; avoid habitat alteration and human activity in vicinity of denning areas.
White-tailed Deer	*Odocoileus virginianus*	Economic importance	Mixture of forest and openings, with areas of coniferous forest for winter cover	Deer wintering habitat is extremely limited in the Nash Stream Forest at the present time, and winter deer activity occurs primarily in the southeast section of the property; relatively small size and number of forest openings and long distance from agricultural lands limits habitat suitability of Nash Stream Forest for deer	Uncommon	Restore and maintain low elevation softwoods; maintain hardwood regeneration; encourage mast production; seed log landings and woods roads to grasses and clovers.
Moose	*Alces alces*	Economic importance	Extensive forests with numerous aquatic habitats	Most of the Nash Stream Forest provides suitable Moose habitat	Common	Maintain regenerating hardwoods and promote understory development in older stands.

Neotropical Migrants
The 39 species of neotropical migrant birds currently breeding in the Nash Stream Forest include 17 warblers, 6 flycatchers, 4 thrushes, 2 vireos, 2 swallows, one hawk, one swift, one kinglet, one tanager, one grosbeak, and the ruby-throated hummingbird.

Table 14 lists neotropical migrant birds nesting in the Nash Stream Forest and their relative abundance based on preliminary surveys. Of the 39 species, 6 can be considered abundant, 15 can be considered common, and 19 are uncommon based on preliminary surveys. Several of the uncommon species (Ruby-crowned Kinglet, Tennessee Warbler, Wilson's warbler) are near the southern limits of their range at Nash Stream; several are generally less common north of the White Mountains than in southern New Hampshire (great crested flycatcher, wood thrush, yellow warbler, scarlet tanager) and several (chimney swift, ruby-throated hummingbird, bank and barn swallows, northern waterthrush) have limited habitat within the Nash Stream Forest.

Implications of Present Stand Composition and Age Structure
Some wildlife species occurring in the Nash Stream Forest are relatively unaffected by the species composition and age structure of the forest. Stream salamanders and wetlands birds respond to conditions within their particular aquatic habitats rather than to surrounding upland vegetation. Small mammal populations are highly cyclical, and population highs and lows within given habitats appear to be relatively independent of most changes in habitat conditions. Other species, however, are directly dependent on particular tree species and/or forest structures for particular needs. Population levels of these species will change as the forest changes.

TABLE 14
Neotropical Migrant Birds Nesting in the Nash Stream Forest

Common Species	Uncommon Species	
Yellow-bellied Flycatcher	Broad-winged Hawk	Yellow Warbler
Alder Flycatcher	Chimney Swift	Northern Waterthrush
Gray-cheeked Thrush	Ruby-throated Hummingbird	Wilson's Warbler
Veery	Great Crested Flycatcher	Scarlet Tanager
Solitary Vireo	Least Flycatcher	**Abundant Species**
Nashville Warbler	Eastern Wood-Pewee	Swainson's Thrush
Magnolia Warbler	Olive-sided Flycatcher	Red-eyed Vireo
Blackburnian Warbler	Bank Swallow	Black-throated Blue Warbler
Bay-breasted Warbler	Barn Swallow	Black-throated Green Warbler
Blackpoll Warbler	Wood Thrush	Chestnut-sided Warbler
Mourning Warbler	Ruby-crowned Kinglet	Ovenbird
Common Yellowthroat	Philadelphia Vireo	
Canada Warbler	Black-and-white Warbler	
American Redstart	Tennessee Warbler	
Rose-breasted Grosbeak	Northern Parula Warbler	

Past logging activity has reduced the incidence of spruce and fir at lower elevations in the Nash Stream Forest. As these species become more common in the future, birds and mammals associated with northern conifers, such as Bay-breasted Warbler, Northern Parula Warbler, Boreal Chickadee, Golden- and Ruby-crowned Kinglets, Red Squirrel, and Marten should increase.

Future management of the Nash Stream Forest will favor older forest and reduce the size of young forest patches in comparison to present conditions. Moose numbers may decline as the extensive browse available in large clearcuts ages to larger trees. Deer numbers may eventually increase when suitable wintering habitat becomes available in low elevation softwood stands.

Many forest bird species are particularly adapted to a specific range of forest structure (**Table 15**). Species which reach their highest abundance in seedling stands (Alder Flycatcher, American Redstart, Common Yellowthroat, Chestnut-sided Warbler, Mourning Warbler, and White-throated Sparrow) will decline in numbers as the forest ages. Alder Flycatchers and Yellow Warblers, which are essentially restricted to the youngest age class, will continue to find suitable habitat in shrub-scrub wetlands. Birds currently occurring at low densities which are likely to increase as the forest ages include Northern Goshawk, Barred Owl, Pileated Woodpecker, Purple Finch, and Scarlet Tanager. Some species, including Swainson's Thrush and Winter Wren, occur at similar densities in all age classes, and will be little affected by forest changes.

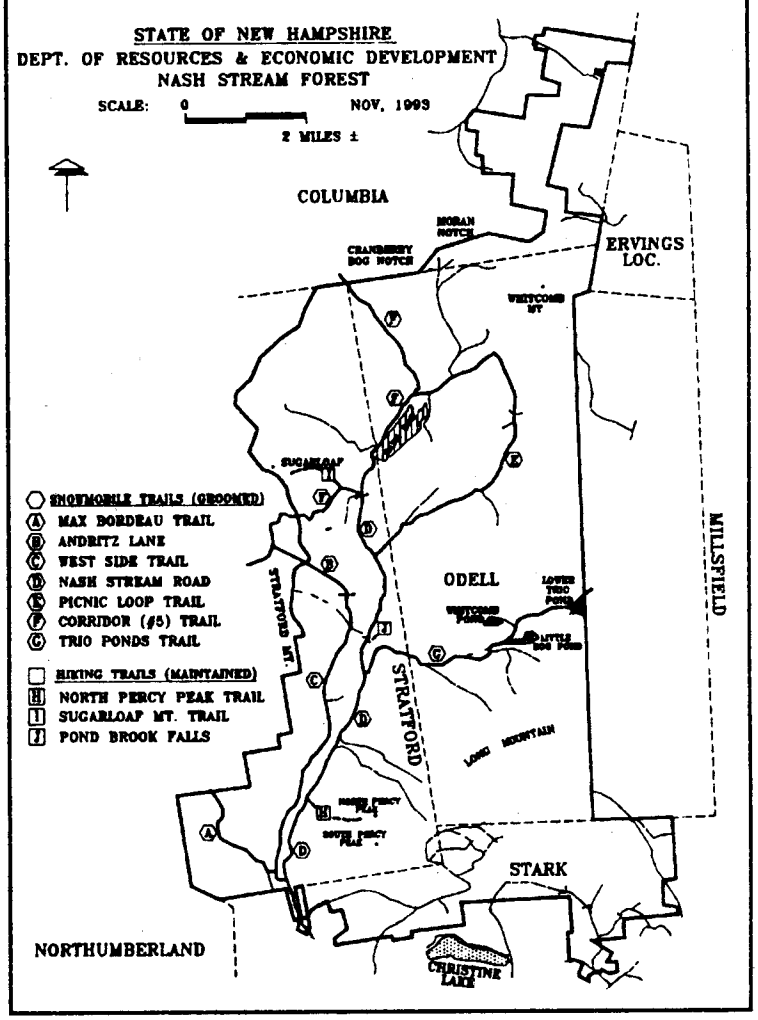
TABLE 15

Forest Age Class Associations of Common Breeding Birds in the Nash Stream

SEEDLING STANDS	SAPLING STANDS	POLETIMBER STANDS	SAWLOG STANDS
Highest Detection Rate	**Highest Detection Rate**	**Highest Detection Rate**	**Highest Detection Rate**
Alder Flycatcher	Black-capped Chickadee	Bay-breasted Warbler	Blackburnian Warbler
American Redstart	Blue Jay	Hermit Thrush	Black-throated Blue Warbler
Chestnut-sided Warbler	Canada Warbler	Golden-crowned Kinglet	Black-throated Green Warbler
Pine Siskin	Rose-breasted Grosbeak	Magnolia Warbler	Ovenbird
Common Yellowthroat	Red-eyed Vireo	Solitary Vireo	Red-breasted Nuthatch
Mourning Warbler		Yellow-rumped Warbler	
White-throated Sparrow	**Lowest (or no) Detection Rate**	**Lowest (or no) Detection Rate**	**Lowest (or no) Detection Rate**
Lowest (or no) Detection Rate	(Alder Flycatcher)	(Alder Flycatcher)	(Alder Flycatcher)
(Bay-breasted Warbler)	(Bay-breasted Warbler)	Black-capped Chickadee	Canada Warbler
Black-throated Green Warbler	(Blackburnian Warbler)	Blue Jay	Magnolia Warbler
Red-eyed Vireo	Black-throated Blue Warbler	Common Yellowthroat	Rose-breasted Grosbeak
Yellow-rumped Warbler	(Golden-crowned Kinglet)	Chestnut-sided Warbler	
	Hermit Thrush	Mourning Warbler	
	Ovenbird		
	Pine Siskin		
	(Red-breasted Nuthatch)		
	Solitary Vireo		
	White-throated Sparrow		

The 1992 bird surveys detected 26 species in all four age classes; 55 species in the seedling age class, ten of which occurred in that age class exclusively or nearly so; 33 species in the sapling age class; 48 species in the poletimber age class; and 57 species in the sawlog age class, five of which occurred in that age class exclusively or nearly so. **Table 15** summarizes forest age class associations of common breeding birds in the Nash Stream Forest based on the 1992 point count data.

MAP 4
Hiking and Snowmobile Trails



Recreation Resources

The natural features and intrinsic remoteness of the Nash Stream Forest are protected in a complete watershed with relatively limited access. It is the ponds, the mountain peaks, and the other natural features of the Nash Stream valley that create a landscape with a high aesthetic value and provide the primary recreational resource in the Forest.

In addition to these natural assets, a network of roads and trails and established recreation patterns exist on the property. There are 94 privately held recreational camp leases in the Nash Stream Forest, but the road and trail system and boat launch on Little Bog (Fourteen and a Half) Pond provide the only recreation developments available to the public.

Snowmobiling

Snowmobiling is the predominant winter recreation use in the Nash Stream Forest. Corridor trail #5, a major north-south snowmobile trail, passes through the property. A local snowmobile club, the Groveton Trail Blazers, maintains 37 miles of designated snowmobile trails on the property. About 90 percent of maintained trails are groomed **(Map 4)**. In addition to the maintained trail system, the remaining 29.5 miles of classified woods roads plus an undetermined number

of lessor trails are also accessible by snowmobile (see **Chapter 3– Roads and Access**). Parking for snowmobilers and other winter recreationists is available at the entrance of the Nash Stream Forest. Alternative parking to access the Forest is also available on adjacent private land.

Hiking

Hiking opportunities in the Nash Stream Forest include mountain trail hikes, challenging walks on multiple-use woods roads, and general bushwhacking and orienteering to remote areas. The AMC White Mountain Guide describes three mountain trails, totaling 5.2 miles, in the Nash Stream Forest. The West Side and Notch trails are routes to the 3,418-foot summit of North Percy Peak. The challenging upper reach of the West Side Trail climbs the steep ledges of the north peak and is currently closed for safety. The summit of North Percy provides an excellent 360 degree view of the surrounding region, and is a popular site for blueberry picking in August. The Sugarloaf Trail ascends to the 3,701-foot summit of Sugarloaf Mountain. The Percy Peak and Sugarloaf Trails are the only trails maintained for mountain hiking.

The Pond Brook Falls Trail is located about 5.7 miles from the property entrance. This trail is only a few hundred feet long and leads to Pond Brook from a small parking area on the Main Road. A series of falls on the brook is a scenic and popular area with easy access.

The 66.5 miles of woods roads on the property provide opportunities for recreational walking. More than 50 miles (76%) of these roads are currently gated to general vehicular traffic which provide excellent walking routes.

Other Trail Uses

Mountain biking is presently allowed on the gravel roads of the Forest, but is not a significant recreation use. Cross country ski use is also light. There are no trails that are signed specifically for cross country skiing, although much of the existing winter trail system is suitable for this use. Horseback riding is infrequent in the Forest, but the gravel roads are available for this use. The existing network of maintained roads, skid trails, and historic paths present a potential for further development of a well-marked, multiple-use trail system.

Hunting and Fishing

The Nash Stream Forest contains abundant forest and numerous water resources for recreation. There are more than 40 miles of streams on the property, including Nash Stream which has 69 acres of surface water; the four ponds in the Forest total 81 acres[9]. Several fishing experiences are available that include vehicle access sites such as Nash Stream and the boat launch on Little Bog (Fourteen and a Half) Pond, ponds and streams accessible by foot trails, and remote fishing sites not easily accessible by any means. Cold water fisheries are predominant. White-tailed deer and moose provide the most hunting potential. Black bear and game birds are also hunted. The fish and wildlife resources of the valley attract both local and out-of-state sportsmen, and the Forest has excellent potential for increased non-consumptive use of wildlife resources.

Recreation Access

Highway access to the Nash Stream Forest is good, and the tract is considered remote primarily by virtue of its distance from significant population centers. There is one public

automobile road that accesses the Nash Stream Forest. This single access point offers opportunities to provide visitor information efficiently and, if need be, control access. Winter recreation users currently utilize the plow turnaround, located on the public road at the boundary of the Forest, for parking.

There are approximately 15.8 miles of maintained gravel roads open to general vehicular travel. Most of the 66.5 miles of roads are not open to vehicles but are available for muscle-powered travel. Gravel roads parallel both sides of the Nash Stream, and these could be considered the main roads in the Forest. The road on the east side of the stream, the Nash Stream Main Road, is open for automobile travel. The West Side Road is not.

Approximately 1.5 miles up the Main Road from the entrance to the Forest is a small trailhead parking lot for the West Side Trail that climbs North Percy Peak. The parking lot is maintained for a limited number of cars. Public vehicle access terminates at the gate just north of the Nash Bog on the Main Road. Roads normally available for public vehicle access are open in the spring, after mud season, and are closed in the fall (see page 128).

The road system on the property was originally designed and built for logging access. Now, in addition to providing access for timber and wildlife management, the roads access the camps, trailhead parking, scenic vistas, and other natural features of the valley.

Soils, Landscapes, and Ecological Land Groups

A soils inventory in 1985 and 1986[10] identified and mapped over 150 separate soil units on the Nash Stream property (see partial list, **Appendix 6**). Each unit consists of one or more major soils with similar physical properties. An example soil unit is a steep and very stony Saddleback-Glebe-Ricker soil association designated as map unit #750E. Each soil unit has a detailed interpretation and suitability description.

Combining soil units located on similar landscapes with similar development histories and physical properties provides useful information about plant community development. For example, poorly drained glaciated tills on upland plains and drainages on the Nash Stream property predictably develop into softwood plant communities such as spruce, fir, and sometimes pine. Such combinations are called ecological land groups (ELGs) (**Map 5**, page 52). ELGs form the basis for determining the land's natural capability and suitability for land use planning and management purposes.

Three base features have been used to combine soil units and identify and map ELGs on the Nash Stream Forest: (1) landscape; (2) soil development history; and (3) forest association.

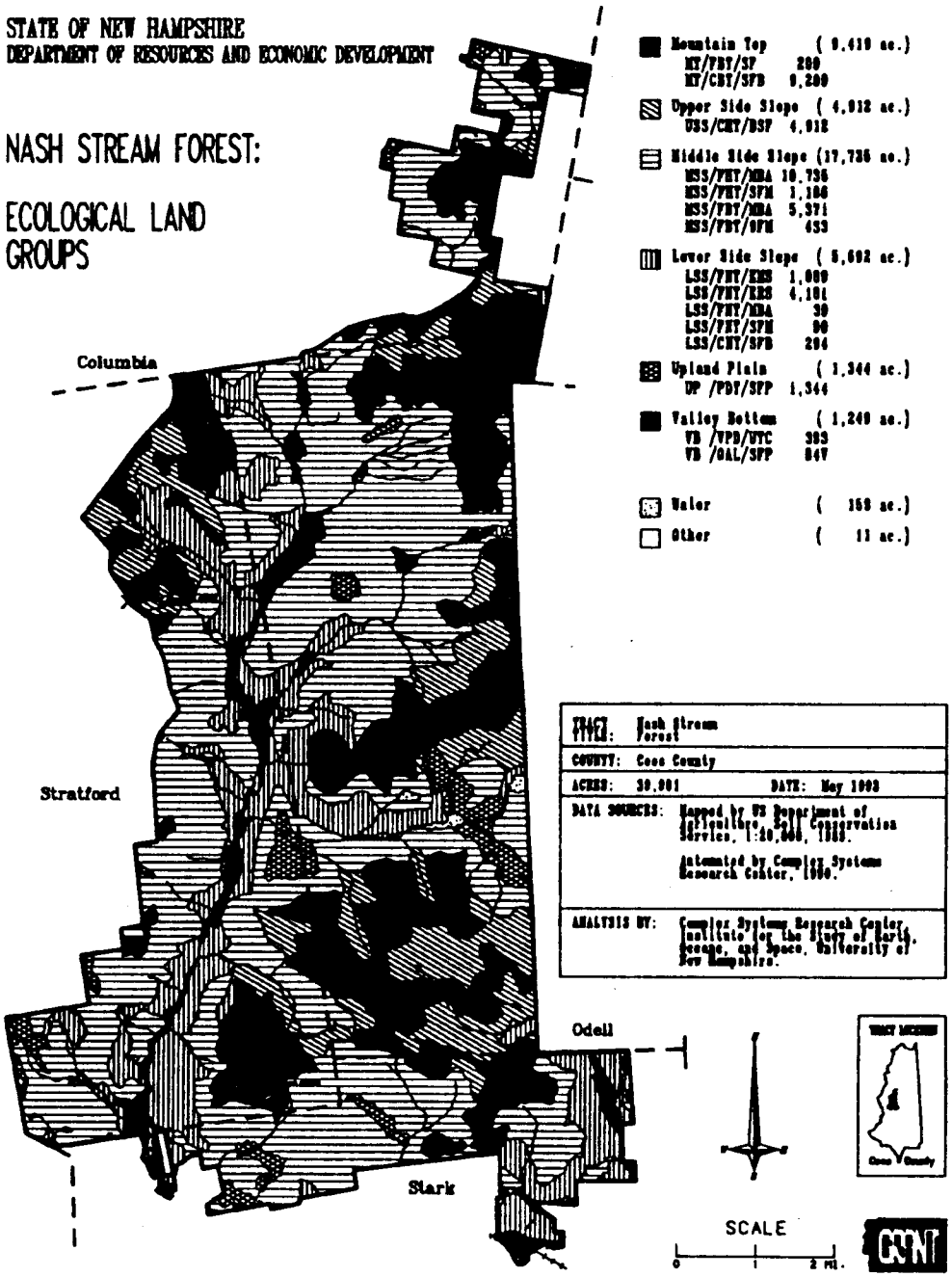
Landscape identifies general landform with associated physical characteristics and other conditions such as climate and related influences.

Soil history refers to the mineral or organic parent material and process from which soils develop.

Forest association refers to the tree species that tend to occupy a given area through time.

MAP 5

Nash Stream Forest: Ecological Land Groups



Fifteen ecological land groups have been identified and mapped on six major landforms that include mountain tops, upper, middle and lower mountain slopes, upland plains, and valley bottoms (**Table 16,** page 54). Lower and middle mountain side slope ELGs cover almost 60% of the property and support more than half of the natural forest associations on the property. The following is a summary of ELGs by major landforms (see **Appendix 7** for soil units and ELGs and **Appendix 8** for descriptions).

Mountain Tops – Two ecological land groups (#1 and 2) totaling 9,418 acres occupy mountain tops that range in elevation from 1,700 to 3,701 feet. Mountain tops typically are characterized by exposed bedrock, shallow soils and complex slopes that developed from glacial scraping and grinding. Soils are derived from cryic and frigid tills and organic matter. The dominant forest tendency on mountain tops includes combinations of red spruce, balsam fir, yellow birch, and mountain paper birch. Forest composition depends largely on soil depth, exposed bedrock and soil temperature. Mountain top ELGs cover 24% of the property and are probably the most conspicuous land form.

Upper Side Slopes – One ecological land group (#3) totaling 4,012 acres occupies upper (mountain) side slopes that range in elevation from 1,661 to 3,642 feet. Upper slopes are characterized by long, gently sloping, moderately steep slopes with loamy or silty soils shallow to hardpan that support mixedwood combinations of mountain paper birch, yellow birch, red spruce and balsam fir. Soils are derived from cryic hardpan tills and typically do not warm up above 59° F. Upper side slopes cover 10% of the property.

Middle Side Slopes – Four ecological land groups (#4,5,6,7) occur on middle side slopes consisting of a variety of land forms that range from flat, very poorly drained areas to steep and well-drained sites. The dominant characteristics of middle slopes are long, smooth, gently sloping to steep slopes over fine, sandy or loamy hardpan soils that support sugar maple, yellow birch and white ash. As soils become shallow, coarse, more exposed or wetter, the occurrence of red spruce and balsam fir tends to increase. Middle slopes range in elevation from 1,080 to 3,000 feet and cover almost half of the property.

Lower Side Slopes – Five ecological land groups (#8,9,10,11,12) occupy lower slopes of mountain sides dominated by complex patterns of hills and knolls with surface stones and boulders common over gravel and sandy soils with varying amounts of silt and clay. American beech and red maple are the most common species supported by coarse textured soils low in fertility. Occasional pockets of red spruce and balsam fir occur in combination with beech and red maple where soils become shallow. A small portion of lower slopes have fine textured, deep and fertile soils. On these infrequent sites, sugar maple and yellow birch tend to occur. One interesting lower side slope ELG occurs high in the Silver Brook drainage on Sugarloaf Mountain. Soils in this group are derived from cryic non-hardpan tills and support red spruce, balsam fir, yellow birch, and mountain paper birch. Lower side slopes range in elevation from 1,020 to 3,362 feet and occupy about 14% of the property.

Upland Plain – This unique landscape feature is occupied by one ecological land group

TABLE 16
Ecological Land Groups in the Nash Stream Forest
(Location + Soil History + Forest Association = Ecological Land Group)

LOCATION (Landscape feature)	SOIL HISTORY (parent material)	FOREST ASSOCIATION (natural succession)	ECOLOGICAL LAND GROUP
Valley Bottom (1,240 acres)	Very Poorly Drained Organic Matter & Till	B Spruce/Tamarack/Cedar	(15) VB/VPD UTC (393 acres)
	Outwash, Alluvial, Lacustrine	Spruce/Fir/Pine	(14) VB/OAL/SFP (847 acres)
Upland Plain (1,344 acres)	Poorly Drained Glacial Till	Spruce/Fir/Pine	(13) UP/PDT/SFP (1,344 acres)
Lower Slope Mountain Side (5,693 acres)	Frigid Non-Hardpan Glacial Till	Beech/S Maple/Spruce	(12) LSS/FNT/EMS (1,089 acres)
		Beech/R Maple/Spruce	(11) LSS/FNT/ERS 4,181 acres)
		S Maple/Birch/Ash	(10) LSS/FNT/MBA (39 acres)
		Spruce/Fir/S Maple	(9) LSS/FNT/SFM (90 acres)
	Cryic Non-Hardpan Glacial Till	Spruce/Fir/Maple	(8) LSS/CNT/SFB (294 acres)
Middle Slope Mountain Side (17,725 acres)	Frigid Hardpan Glacial Till	S Maple/Birch/Ash	(7) MSS/FHT/MBA (10,735 acres)
		Spruce/Fir/S Maple	(6) MSS/FHT/SFM (1,186 acres)
	Frigid Bedrock Glacial Till	S Maple/Birch/Ash	(5) MSS/FBT/MBA (5,371 acres)
		Spruce/Fir/S Maple	(4) MSS/FBT/SFM (433 acres)
Upper Slope Mtn. Side (4,012 acres)	Cryic Hardpan Glacial Till	Birch/Spruce/Fir	(3) USS/CHT/BSF (4,012 acres)
Mountain Top (9,418 acres)	Frigid Bedrock Glacial Till	Spruce/Fir	(2) MT/FBT/SF (209 acres)
	Cryic Bedrock Glacial Till	Spruce/Fir/Birch	(1) MT/CBT/SFB (9,209 acres)

(#13) that occurs at various locations on mountain side slopes characterized by poorly drained soils on glaciated upland plains and drainageways. Areas are generally long, narrow or irregular in shape, typically with a high water table most of the year. Natural forest tendency is pure softwood combinations of red spruce, balsam fir and sometimes white pine. Upland plains cover only about 3% of the property.

Valley Bottom – Two ecological land groups (#14 and 15) occupy valley bottoms characterized by nearly level to gently sloping terrain (very steep in some places). Generally deep, gravelly and sandy soils occur adjacent to Nash Stream, derived from glacial outwash and floodplain deposits that tend to support mixtures of red spruce, balsam fir, white pine and hemlock. Very poorly drained soils derived from a combination of organic matter and glacial tills are located in Nash Bog where the water table is located at or above the surface most of the year. Forest tendency of the Bog is toward a mixture of black spruce, tamarack and cedar. Valley bottoms range in elevation from 1,000 to 1,921 feet and occupy about 3% of the property.

Cultural Resources

To date there has been no effort to document the material remains of human presence in the Nash Stream Forest. There is anecdotal reference to the discovery of a prehistoric hide scraper at the former location of the Nash Bog dam, however, this has not been verified by a qualified archaeologist. The only formal visit to the Forest by an archaeologist took place in the winter months and was conducted on snowmobile. While this was helpful in obtaining a general perspective on the topography and scope of the area, it cannot be considered to be even a preliminary survey. An archaeological survey of the Forest is needed in order to achieve a fuller understanding of the area and to coordinate any development or management activities so that any important cultural resources would not be adversely affected. Such a survey would need to be carried out as the responsibility of the Department of Resources and Economic Development, with the coordination of the State Archaeologist in the Division of Historical Resources, as stipulated under RSA 227-C.

Forest Protection Resources

Forest Fire Prevention

Fire prevention and information posters are posted at major access roads leading to Nash Stream. The Division of Forests and Lands works with media outlets, local fire departments, forest fire wardens, and schools to increase public awareness about local forest fire conditions and fire safety. Staff have one-on-one interactions with camp owners and visitors to the area to meet people, answer questions, and offer information.

Presuppression

Four town fire wardens and 28 deputy wardens in the towns and unincorporated place that encompass the Nash Stream Forest have been appointed by the Director, Division of Forests and Lands. Town fire wardens and deputies have the responsibility to maintain equipment and resources to suppress all wildland fires in their area of responsibility (RSA 227-L:11). Town fire wardens and deputy wardens are also authorized to expend municipal dollars to suppress wildland fires.

In addition to town fire wardens and deputy wardens, 16 special deputy wardens have been appointed by the Director to serve within the fire districts that include the Nash Stream Forest. These special deputies are specially trained in preventing and/or suppressing wildfire and are empowered to act for a forest ranger and/or a forest fire warden or deputy warden in their absence. Special deputy skills include scouting, first aid, water pumping and pump mechanics, fire suppression techniques, and planning and logistics. While performing their duties, special deputies are employees of the state of New Hampshire.

The Division of Forests and Lands Forest Protection Bureau provides annual personnel training in all aspects of wildland fire fighting. A basic forest fire course is offered through the NH Fire Standards and Training Council with instructors that include appointed special deputy wardens and Division of Forests and Lands forest rangers.

Forest rangers receive special forest fire training; many have credentials in nationally certified wildfire courses. Forest rangers assist forest fire wardens in all forest fire activities. Rangers also assist local wardens with determining needs for maintaining sufficient wildfire equipment caches. RSA 227-L:5 authorizes the state of New Hampshire to enter cooperative agreements with the U.S. Forest Service and Northeastern Forest Fire Protection Commission for additional training and fire suppression assistance.

The state of New Hampshire cost shares in the forest fire training for wardens and deputy wardens on a 50/50 basis at state established rates (RSA 227-L). Training costs for special deputies and forest rangers are borne solely by the state of New Hampshire.

In cooperation with the U.S. Forest Service, the Division of Forests and Lands offers grant dollars on a 50/50 cost share basis to New Hampshire communities to assist them in acquiring forest fire suppression and safety equipment. In addition, through a federal/state agreement, surplus military vehicles and equipment are available to New Hampshire communities for retro-fitting for wildland fire suppression activities.

Detection

At present, Mt. Prospect fire tower has the best view into Nash Stream. Milan Hill tower also looks into the area supplemented by a northern, private contract air patrol. The Division also maintains ground surveillance through mobile patrol units, forest rangers and forestry staff that are scheduled in the area. These personnel are the first line of detection. They have communication equipment and fire plans readily available to report fires to fire departments and local fire wardens. In addition, the mobile patrol units are equipped with suppression equipment in their vehicles and can take immediate suppression action.

Suppression

In the event of a forest fire, both local and state suppression forces respond and act jointly to suppress a fire (see **Chapter 3 – Economic Considerations**). Suppression efforts may use local, state, compact[11] and federal fire suppression forces as necessary. In the organized towns of Stratford, Columbia, and Stark, it is the responsibility of local fire departments to take initial suppression action. The state of New Hampshire

has responsibility for initial suppression of forest fires in the unincorporated place of Odell. And, fire departments from the towns of Northumberland, Milan, and Colebrook are available to assist with suppression efforts upon request.

Forest fire plans provide information and guidance to effectively suppress forest fires. Fire plans are prepared by the Forest Protection Bureau for towns, districts, regions and for the entire state. Each plan lists available fire fighting equipment and personnel, local officials to contact, dispatch facilities, and other items including information about fire towers, forest rangers, and training resources. A fire plan is available for each community encompassing the Nash Stream Forest.

Town and district fire plans become elements of a regional and statewide plan. Forest fires that go beyond the capability of local resources and require assistance beyond the local area fall under a broader (regional or statewide) plan. Under the broader plans, for example, several caches of wildland fire equipment are maintained that are used to supplement or replace local fire department equipment on a fire. Forest rangers, special deputy wardens and other fire suppression specialists and resources are available through cooperative agreements and mutual aid systems. Equipment and personnel are also shared with the White Mountain National Forest. A private helicopter contractor is also available to assist with fire suppression, especially in remote and hazardous terrain.

Community resources for forest fire fighting in the Nash Stream Forest are adequate for initial attack and basic fire suppression. A sample of local fire plans and resource lists in **Appendix 9** indicate local, regional and statewide fire suppression equipment and key personnel currently available for use in the Nash Stream Forest.

The main road into the Nash Stream Forest begins from a paved town highway (Emerson Road), about 2 miles north and east of N.H. Route 110, or about 4 miles from U.S. Route 3 at Groveton Village. Limited access to portions of the property north of the Columbia town line is available by paved, gravel and unimproved roads from N.H. Route 26. And, limited access to the most southeasterly part of the property in the town of Stark is by gravel and unimproved roads from a paved town highway (North Road) and graveled town road (Bell Hill Road). This means that ground-based, fire suppression equipment and vehicles are restricted to a southerly access to most of the property, making fire suppression difficult and costly.

The Nash Stream property is well served by a 66.5 mile network of roads. An estimated 60%[12] or more of the property can be accessed by conventional fire suppression vehicles using about 42 miles of good gravel roads. Another 25 miles of non-gravel or winter roads provide restricted access to most of the remaining low-elevation areas by means of specialized or all-wheel drive vehicles. Only the most remote and highest elevations are limited to access by foot or by air (see **Chapter 5, Map 6 – *Natural Preserves and Other Protected Areas***).

The property is not considered to be a fire-prone environment. Fuel types are typically northern hardwood and mixedwood at lower elevations with spruce-fir on the upper elevations. These fuel types are not known to build up heavy fuel loads that increase the threat of wildfire under normal weather conditions in northern New Hampshire. However, considering other factors such as the remoteness of the property, single-point access (from the south) for vehicles and equipment, and rugged topography, there is a potential for large forest fires during prolonged dry spells.

Water for fire suppression purposes is readily available from numerous streams and water bodies on the property. Temporary water supply lines would need to be run from available water sources, and the use of helicopters to supply water may become necessary for remote areas.

Insect and Disease

The Forest Pest Advisory Group (FPAG)[13] has developed a management plan to be utilized should an aerial spray operation become necessary anywhere in the state. The NH Pesticide Control Board has very stringent restrictions regarding all applications of pest control measures. These (statewide) pest control measures may include highly selective biological insecticides such as Bacillus thuringiensis (BT). Notwithstanding state law, the Nash Stream Vision prohibits the use of chemical agents that would adversely impact natural ecosystems. State law (RSA 430:2) gives the Commissioner of the Department of Agriculture authority to take whatever measures deemed reasonable and proper to control damaging insect or plant disease infestations anywhere in the state.

Potential insect and disease problems range from saddled prominent, gypsy moth and spruce budworm to environmental stresses such as acid rain. Annual aerial surveillance and necessary follow-up ground checks are conducted by the Division of Forests and Lands for insect and disease situations. Forest health monitoring surveys are also conducted each year at thirty-seven different plots throughout the state. Two of these forest health plots are situated near Nash Stream, but none are in the Forest. These plots are used to determine baseline information of forest health in order to evaluate changes.

Law Enforcement

Nine law enforcement agencies handle law enforcement matters in the Nash Stream Forest under each agency's domain. The New Hampshire Fish and Game Department, Division of Parks and Recreation Trails Bureau, and the Division of Forests and Lands Forest Protection Bureau schedule routine patrols, with the Division of Forests and Lands taking the lead role. Other agencies, including Stark Police, Groveton Police, Stratford Police, Columbia Police, New Hampshire State Police, and the Coos County Sheriff, respond in an emergency situation or when requested. At this time, the present law enforcement patrols are able to handle enforcement situations that develop.

Economic Considerations

State and Federal Land Reimbursements

The towns of Columbia, Odell, Stark, and Stratford, which include parts of the Nash Stream Forest, are entitled to annual payments in lieu of taxes (PILOT) from the state and Federal governments. The state and

Federal land reimbursement is authorized by RSA 227-H:17 which states "...any town in which national forest land and land held by the state for operation and development as state forest land are situated... may apply... for the payment of an amount not exceeding the taxes for all purposes which such town might have received from taxes on said lands in such year had such land been taxable." The amount of "taxes on said lands" is determined annually by the Department of Revenue Administration. The formula for each town affected includes: (1) number of acres; (2) current use value; (3) equalization ratio; and (4) previous year's tax rate.

The amount of taxes determined by formula is then reduced by any payments towns receive from the national forest distribution. Only White Mountain National Forest towns (Stark) receive this distribution. The amount of the national forest distribution is based upon income generated from timber cuttings throughout the national forest system. This amount fluctuates yearly based upon both the volume of timber cut and sale price of the timber.

After subtracting the national forest reimbursement, the remaining balance represents the state's payment in lieu of taxes (PILOT) under RSA 227-H:17. For tax years 1990 and 1991, the state's payment, distributed to the four communities, totaled about $55,000 per year (**Table 17**).

TABLE 17
Nash Stream Forest Contributions–Local Cash Flow (Yearly Average)

PROGRAM	AMOUNT
State reimbursement (PILOT)[1]	$55,000
Grant-In-Aid	22,000
U.S. Forest Service Grants[2]	13,600
Operations	21,000
Total	$111,600

[1] Based on 1990 and 1991
[2] Based on 1991 – 1993

Forest Fire Suppression, Training and Prevention
If a fire occurs in the Nash Stream Forest, the fire bill will be paid in the same manner as bills for fires that occur on private lands, as provided for under RSA 227-L. Costs of fighting forest and brush fires in (incorporated) towns and other costs, including training and prevention activities, shall be shared equally by the town and the state, except in the case of unincorporated townships.

Fire bills for fires in unincorporated towns, such as Odell, are initially paid by the state. Coos County will reimburse the state 50% of the approved fire bill and thereafter bill Odell for its proportionate share of the fire expense. Up to one-half of said costs, but in no case to exceed 10% of the assessed valuation of Odell, shall be added to the tax assessed the following year against Odell.

Timber Harvests and Yield Taxes
Under RSA 79, the timber tax of 10% of the assessed value of stumpage at the time of cutting is paid directly to the town from which timber is cut. Under private ownership, historic levels of timber taxes paid to local communities from the Nash Stream property have been significant. However, because of the relatively young age and small size of the timber resource growing in

the Forest, timber harvest levels and yield taxes are not expected to be appreciable in the near future.

OHRV Grant-In-Aid Program

A statewide grant-in-aid program under the provisions of RSA 215-A:23 administered by the Trails Bureau in the Division of Parks and Recreation provides funding to organized non-profit OHRV clubs and political subdivisions for the construction and maintenance of OHRV trails and facilities. Funding for this program comes from OHRV registrations and un-refunded road taxes. All trails and facilities developed and maintained under this program are open to the general public. In the 1991-92 season, the Trails Bureau granted in excess of $22,000 to a local snowmobile club for maintenance of Nash Stream Forest trails. More than 5,600[14] snowmobiles are estimated to have used the Nash Stream Forest trails during the 1991-92 season.

Private Camp Lot Licenses

In addition to local property taxes assessed by each town on camp buildings, each licensee pays an annual $420* fee which totals $39,480 paid into the state's general fund. A portion of the income is budgeted to the Division of Forests and Lands operating budget for the maintenance of the Nash Stream Forest. In the 1992-93 biennium, $20,600 was budgeted each year for maintenance operations that included local equipment rental, supplies and materials (e.g. culverts, gravel, gates), and contracted services, including patrols.

U.S. Forest Service Grants

U.S. Forest Service, State and Private Forestry Branch funds have been available by application to support various activities in the Nash Stream Forest. For example, New Partnership Program funds have supported fisheries habitat inventory, breeding bird surveys, winter track surveys and other projects since the spring of 1991. These projects have provided temporary employment averaging approximately $13,600 per year.

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* *With Governor and Council approval, annual license fee increased from $350 to $420 for the 5-year period beginning July 1, 1994.*

4. The Management Vision

The Nash Stream Advisory Committee appointed by Governor Judd Gregg to assist with preparation of the Nash Stream Forest Plan developed the following "Vision" to help guide management and planning efforts. The Vision reflects the many and varied interests of people involved in the planning process, including public sentiment. Presented in its entirety, the Vision includes Principles and Goals of Management which together provide a timeless management focus plus a glimpse at what is hoped to be achieved through implementation of this Plan and those that follow.

Management Vision

The management of Nash Stream Forest will be a model of environmentally sound public land stewardship. While realizing that achieving the Vision will take time, we[15] will strive to:

- **Protect the natural qualities** and integrity of the land, natural communities, native species, and ecological processes. Use and build upon, rather than work in opposition to, ecological principles and natural tendencies. Manage the land with as little interference as possible with natural ecological functions.
- **Manage Nash Stream Forest** as a model of ecologically-based forestry, emphasizing the growth of long-rotation, high quality, solid wood forest products that contribute to the economy of northern New Hampshire.
- **Continue to offer public access** for traditional, low impact, dispersed recreation including hunting, fishing, hiking, and snowmobiling in designated areas.
- **Establish a process for ongoing public** involvement in the management process, and a periodic policy and technical review of the Vision and Management Plan.
- **Establish monitoring** of, scientific research on, and education about the management and ecological processes of the land, and continue to emphasize the cooperative approach to protecting and managing Nash Stream Forest.
- **Manage Nash Stream Forest** as an integral part of the ecology, landscape, and culture of the northern forests of New Hampshire and New England.

Management Principles

We envision that Nash Stream Forest will be managed as a blend of a relatively undisturbed forest ecosystem, and a working forest producing high quality forest products. Each of these will provide certain products, qualities and experiences.

A. All timber, road, recreation, habitat, and other management will be determined by land, soil, and ecological capabilities;

B. Vegetation, fish and wildlife management will promote, maintain, and where appropriate, restore natural communities of native vegetation, fish and wildlife. Planting of trees or other vegetation will not occur, except for ecologically beneficial ecosystem restoration using native species.

C. Management will provide for the continuity of natural areas through a system of core natural areas surrounded by buffers and linked by corridors. Major core natural areas will be linked by appropriate corridors of undisturbed or minimally disturbed lands.

D. Management area planning will minimize the fragmentation of the Forest by management activities, including for example, roads, developed recreation, and timber management.

E. Recreation management will feature the natural beauty of Nash Stream Forest and fit naturally, with minimal development, on the landscape.

F. Notwithstanding state law, chemical agents will not be applied to, or within, natural ecosystems in the Nash Stream Forest. Biological herbicides, insecticides, or other pesticides also will be prohibited.

G. Water quality protection will be of the highest priority throughout. Buffers along all wetlands, ponds, streams, and other bodies of water will be established to protect water quality, natural runoff patterns, water temperatures, bank and channel stability, biotic communities, and other natural values. Management activities and uses will be consistent with the Vision and the purposes for which the buffer is established.

Goals of Management

Timber

Timber management decisions will be determined primarily by ecological and land capabilities, natural site and soil tendencies, natural disturbance patterns, and ecological processes. The timber management zones of Nash Stream Forest will be managed on a long-term sustained yield basis to produce high quality, long rotation, solid wood products.

A. Uneven-aged management will be the method of choice for managing and regenerating timber stands.

B. Limited, judiciously applied, and environmentally-sound even-aged management (including clearcutting) may be appropriate to provide certain ecological conditions, products, and experiences associated with early successional forests. It will be used only when uneven-aged management will not achieve the Vision.

C. Timber harvesting and salvage will not occur in core natural areas. Natural area buffers and corridors may be managed cautiously for timber on an uneven-aged basis, and only when consistent with the Vision and the management goals of the natural areas and corridors.

D. Timber management roads, as well as other roads, will be laid out to minimize the fragmentation of the Forest; will be designed based on site and soil capabilities; and will be designed to the minimum standard needed for access.

E. Timber salvage may be permitted in timber management areas when consistent with the Vision.

F. Timber management may be carried out only after assessment of impact on historical, ecological, habitat, and recreational resources, and after appropriate modification to protect those resources.

Natural Areas

Nash Stream Forest will be managed to protect healthy representatives of all of the tract's known elements of natural diversity, identifying and working toward naturally functioning communities that are sustainable over the long term.

A. A system of core natural areas, buffers and corridors will be established to protect Nash Stream Forest's natural features. Core natural areas will be as large and contiguous as possible, within the constraints of the land and the Vision, to protect the habitat needs of rare, threatened, and endangered plant and animal species, natural communities, and unique or especially threatened features. Core natural areas will be subject to the minimum management necessary to achieve the Vision and then only consistent with the purposes for which the natural area was designated. Timber harvesting will not occur in these areas.

B. Buffer areas adequate to protect the purposes for which the natural area was designated will surround each core area. Low intensity management activity consistent with the purposes for which the buffer was established may occur in buffers.

C. Major core natural areas will be connected by corridors of undisturbed or minimally disturbed land, within the constraints of the land and the Vision, to meet the needs of the species and communities in the core. In some cases, waterways may serve as a corridor and in other cases as a core area and a corridor simultaneously.

D. The system of core natural areas will include representatives of the full range of ecological communities within the Nash Stream Forest, as well as natural preserve areas containing rare, threatened and endangered species.

E. Ephemeral ponds and streams are rare in the tract and need research and adequate buffering and protection.

Recreation

Recreation management of the Nash Stream Forest will provide low impact, dispersed, and traditional opportunities. Management decisions will be consistent with the guiding philosophy of protecting the environmental integrity of the land.

A. Recreational opportunities will include hunting, trapping, fishing, hiking, camping, and snowmobiling.

B. Management will strive for levels of recreational use that upholds the Vision and that are sensitive to and respectful of the natural values of the Nash Stream Forest.

C. Protection of the natural resources and environmental quality will be of primary concern in recreation management.

D. Recreation management will emphasize low impact use, carry in/carry out, and dispersed use.

E. Only low impact, relatively primitive tent sites and other recreation facilities will be permitted.

F. Promotion of recreation to the public will be consistent with the Vision and natural values of the Forest and will be designed

to provide information about those values and appropriate recreation opportunities.

Fish and Wildlife

Fish and wildlife habitat management will strive to sustain viable populations of all species occurring naturally in the Nash Stream Forest.

A. Critical habitat of fish, and wildlife species that are especially sensitive to intrusion will be identified, evaluated, and protected.

B. Throughout the tract, fish and wildlife habitat management will be integrated with other uses consistent with the Vision.

C. Traditional consumptive and non-consumptive wildlife uses on the tract will be allowed consistent with the Vision and goals of managing for native species and natural populations, and within the laws and regulations of the state.

D. Fisheries management will strive to develop self-sustaining natural populations of native species.

Public Participation

The public has a great interest and high stake in the management of Nash Stream Forest. It is important to encourage and foster continued public participation in the management of Nash Stream Forest. Several avenues for this, serving different levels of interest and concern, are needed.

A. A formal process will be used to adequately notify the public of significant proposed land management activities to provide an opportunity for public comment.

B. An ongoing Citizen Advisory Committee will be created to advise and work in partnership with the state to uphold the Vision. The committee should be composed of a range of individuals representing a variety of constituencies.

C. This committee will work with the state to review particularly sensitive and controversial management proposals and attempt to resolve management controversies.

D. Formal (legal) public appeal mechanisms are provided through the Uniform Procedures Act (RSA 541-A).

Monitoring, Research, and Interpretation

Much is still unknown about the ecology of the Nash Stream Forest which presents a unique research opportunity to the ecology, forestry, recreation and wildlife research communities. Monitoring and research should be a high priority to gather information for wise long-term planning.

A. Research should encourage projects to more thoroughly inventory the Nash Stream Forest and to assess the impacts of past intensive forest cutting and recreation on ecological conditions, forest regrowth, and wildlife populations.

B. A monitoring system should be established to determine and evaluate the impacts of present management actions.

C. Education and interpretation shall be offered to the public to inform them of the natural and management processes at work in the Nash Stream Forest.

5. Management Direction

Goals, Objectives and Strategies

STEWARDSHIP[16]

GOAL: MANAGE NASH STREAM FOREST AS AN INTEGRAL PART OF THE ECOLOGY, LANDSCAPE, AND CULTURE OF THE NORTHERN FOREST OF NEW HAMPSHIRE AND NEW ENGLAND.

OBJECTIVE 1: Carry out the provisions of the Conservation Easement Deed in cooperation with the United States Forest Service.

Strategy:

1. Establish a joint state and federal review procedure of land use policies and management practices.

OBJECTIVE 2: Strive to achieve and maintain an ecologically sustainable multiple use forest.

Strategies:

1. Manage under a concept of multiple use.
2. Establish an interdisciplinary team of resource and recreation management specialists to ensure consideration of multiple resource values and user interests.
3. Implement standards and guidelines that sustain ecological processes, provide resources that serve public needs, and integrate management activities.
4. Monitor and evaluate impacts of specific management and other human activities on ecological processes and forest health.

OBJECTIVE 3: Conserve native biodiversity.

Strategies:

1. Expand knowledge and understanding of biodiversity.
2. Establish guidelines for the protection and perpetuation of native species and the control of exotic species.
3. Ensure that the planning, layout and implementation of all management activities, including public use, provide for the conservation of native biodiversity.
4. Collect information to refine the Natural Heritage Inventory (NHI) classification of natural communities and relate classification to ecological land groups.
5. Identify the full range of natural communities and their locations represented on the Nash Stream property.
6. Implement a program to protect, manage, and monitor representative examples of the full range of identified natural communities.

OBJECTIVE 4: Protect air, soil, and water.

Strategies:

1. Use soil/site tendencies and ecological land capabilities to guide timber, road, recreation, habitat, and other management activities.
2. Stabilize soils and protect wetlands, associated biotic communities and natural run-off patterns.
3. Keep up-to-date on current research about effects of air pollution on the forest and apply appropriate findings to management of the Nash Stream Forest.

4. Monitor water chemistry of selected ponds and streams.

OBJECTIVE 5: Maintain the natural beauty of the landscape.

Strategy:

1. Minimize or avoid negative visual quality impacts during planning, layout and implementation of management activities, including public use.

OBJECTIVE 6: Maintain a cooperative management program.

Strategies:

1. Provide opportunities for state and federal agencies, local units of government, neighboring landowners, conservation groups, general public, and other potentially affected interests to be involved in addressing management issues.
2. Work closely with other units of government, conservation groups, neighboring landowners, volunteers, and others to establish and/or participate in programs and activities of mutual benefit.

OBJECTIVE 7: Provide opportunities for research and demonstration.

Strategies:

1. Conduct education programs concerning the management and ecological processes of the land.
2. Encourage and carry out scientific research activities.
3. Plan and execute management activities as potential demonstrations for public information, interpretation, and as opportunities for research.
4. Make use of technological capabilities such as geographic information systems (GIS), global positioning (GPS) and satellite imagery.

OBJECTIVE 8: Provide for property maintenance and protection.

Strategies:

1. Monitor and ensure proper regulation of reserved gravel rights.
2. Implement department restoration standards for sand and gravel excavation sites.
3. Establish a road and related infrastructure maintenance program.
4. Utilize existing roads to the maximum extent possible. Design any new roads based on soil/site capabilities to the minimum standard for access.
5. Establish a boundary line survey and maintenance program.
6. Acquire in-holdings and outstanding rights.
7. Implement a forest fire detection, prevention, suppression, and control program.
8. Implement a program for the detection, prevention, suppression, and control of destructive insect pests and plant diseases.
9. Develop and coordinate a law enforcement program for protection of persons and property.
10. Work toward consolidation of boundary lines.

OBJECTIVE 9: Strive for administrative, financial and public support.

Strategies:

1. Develop and stimulate public awareness and appreciation of the Nash Stream property and its contribution to the quality of life through proper management.
2. Prepare a long-range estimate of funding needs to implement the Management Plan, updated annually to reflect current situations.
3. Prepare an annual report of management activities for public distribution.
4. Work closely with federal, state and local units of government, conservation groups, and private interests for appropriate funding support.

OBJECTIVE 10: Maintain flexibility in management planning and land use.

Strategies:

1 Establish a Management Plan monitoring procedure to review accomplishments vs. goals and objectives.

2. Use the results of monitoring to modify management and other human activities.

3 Provide for periodic review of the Vision and Management Plan.

4 Establish work priorities.

5. Prepare long term work plans, updated annually to reflect available staff, equipment, and funds.

PUBLIC INVOLVEMENT

GOAL: INVOLVE THE PUBLIC IN THE MANAGEMENT PROCESS TO RESPOND TO THE DIVERSITY OF PUBLIC INTERESTS AND TO PROMOTE UNDERSTANDING BETWEEN THE PUBLIC AND THE MANAGING AGENCIES.

OBJECTIVE 1: Provide opportunities for public comment regarding ongoing management.

Strategies:

1. Adopt a formal process for adequate public notification and response to significant proposed management activities.
2. Create an ongoing Citizen Advisory Committee composed of a range of individuals representing a variety of interests.
3. Coordinate periodic review of the Vision and Management Plan with assistance of the Citizen Advisory Committee.
4. Prepare the annual accomplishment report for review by the Citizen Advisory Committee prior to public distribution.
5. Involve the Citizen Advisory Committee with ongoing Management Plan monitoring efforts.

OBJECTIVE 2: Provide information regarding public benefits to be derived from the Nash Stream Forest, and provide opportunities to foster better understanding of the reasons for management activities.

Strategies:

1. Make the area's resources, uses, and unique features known to the public through signage, published information, and public events.
2. Utilize ongoing information exchange vehicles and provide for continual public comment and inquiry.

3. Involve statewide organizations and groups in activities and publicize accomplishments.

CULTURAL RESOURCES

GOAL: IDENTIFY AND PRESERVE SIGNIFICANT CULTURAL RESOURCES FOR FUTURE RESEARCH AND PUBLIC INTERPRETATION.

OBJECTIVE 1: Identify and assess areas of probable cultural significance.

Strategies:

1. Conduct a short-range sensitivity survey of cultural resource areas threatened by immediate or potential impact.
2. Carry out an ecologically integrated long-range cultural resource survey of the entire Nash Stream Forest.

OBJECTIVE 2: Evaluate location, nature, extent and significance of identified cultural resource sites.

Strategies:

1. Interpret the cultural history and prehistory of specific sites to the extent possible.
2. Develop an archaeological baseline of integrated ecological and cultural resource data.
3. Establish research and education programs as a sufficient baseline of archaeological information is developed.

OBJECTIVE 3: Implement a monitoring and protection program for all identified cultural resource sites.

Strategies:

1. Provide suitable standards and guidelines for protection of known cultural resource sites for later research and/or interpretation.
2. Develop and coordinate monitoring and protection with other federal and state agencies.
3. Consider the location and preservation of cultural resources during the planning, layout and implementation of all management activities, including public use.

RECREATION RESOURCES

GOAL: PROVIDE FOR A RANGE OF QUALITY RECREATION OPPORTUNITIES THAT ARE CONSISTENT WITH PROTECTING ENVIRONMENTAL INTEGRITY AND FEATURE THE NATURAL VALUES OF THE LANDSCAPE.

OBJECTIVE 1: Manage public use so that it is sensitive to and respectful of natural and cultural values.

Strategies:

1. Assess current and potential recreational demands and opportunities including roads, trails and parking areas.
2. Establish a carry in/carry out policy for all recreational activities.
3. Determine and provide for appropriate parking.

OBJECTIVE 2: Establish recreational use standards and guidelines to ensure protection of natural resources and environmental quality.

Strategies:

1. Review existing department standards and guidelines for applicability; revise or develop new standards and guidelines where needed.

2. Work with other land-use activities to protect or enhance the visual quality of the landscape.

OBJECTIVE 3: Provide for and enhance recreational uses that are compatible with other management activities.

Strategies:

1. Continue public access for traditional, low impact, dispersed recreation including hunting, fishing, hiking, wildlife observation, and snowmobiling in designated areas.
2. Evaluate existing snowmobile trail corridors use areas.
3. Designate appropriate trail corridors and areas to be improved, maintained, or developed.
4. Consider opportunities for overnight backcountry experiences.
5. Assess nonmotorized recreation opportunities such as hiking, wildlife observations, cross country skiing, dog sledding, horseback riding and other uses, and consider enhancements including the extension and improvement of selected trails and roads.
6. Work with the N.H. Heritage Trail Committee to consider locating the trail through the Nash Stream Forest, compatible with other management activities.
7. Provide appropriate levels of handicapped access to meet the intent and spirit of current laws and regulations.

OBJECTIVE 4: Integrate interpretation of natural processes, biodiversity, and cultural resources into recreational visits.

Strategies:

1. Provide interpretive panels in areas likely to receive public use.
2. Develop interpretive programming utilizing state, federal, and private resources.
3. Develop appropriate interpretive literature, such as brochures, on the Nash Stream.
4. Consider opportunities for short educational loops near roads with different management histories, and self-guiding trails.

OBJECTIVE 5: Encourage volunteer participation in recreation development and management of the tract.

Strategies:

1. Maintain strong communications links between existing volunteer groups and managing agencies.
2. Adopt volunteer guidelines.
3. Provide opportunities for volunteer activities.

OBJECTIVE 6: Continue the use of existing private recreation camps for a period not to extend beyond the date of June 30, 2039.

Strategies:

1. Ensure full and proper execution of the department's existing camp lot license policy.
2. Prepare a plan for camp disposition, camp and site restoration for terminated camp licenses or abandoned camp lots.
3. Monitor and supervise the camp lot license for compliance with license terms.

4. Maintain close contact with the Camp Owners Association.
5. Implement policy to allow transfer and/or purchase by the state of private camps that become available.
6. Secure administrative and financial support for voluntary camp acquisitions.

AREAS OF ECOLOGICAL SIGNIFICANCE

GOAL: IDENTIFY AND PROTECT ALL ECOLOGICALLY SIGNIFICANT SITES.

OBJECTIVE 1: Identify known rare, threatened or endangered species and exemplary natural communities.

Strategies:
1. Use the Natural Heritage Inventory (NHI) methodology and other appropriate means.
2. Compile a list of said species and natural communities providing their rank, status and location.

OBJECTIVE 2: Evaluate the locations identified in Objective 1 and identify their management and protection needs.

Strategies:
1. Evaluate habitat and protection needs for rare, threatened or endangered species.
2. Identify management and protection needs for exemplary natural communities.
3. Identify and evaluate potential natural preserve areas for management and protection.

OBJECTIVE 3: Implement a protection, management and monitoring program for all ecologically significant sites.

Strategies:
1. Nominate and establish Natural Preserve Areas for those sites that qualify for designation.
2. Establish buffer areas and corridors to protect ecologically significant sites.
3. Initiate monitoring programs for selected species and natural communities.
4. Implement appropriate management strategies as feasible.

OBJECTIVE 4: Identify specific research needs and seek opportunities to address them.

WILDLIFE RESOURCES

GOAL: STRIVE TO SUSTAIN VIABLE POPULATIONS OF ALL NATURALLY OCCURRING NATIVE WILDLIFE SPECIES.

OBJECTIVE 1: Determine the current status of naturally occurring vertebrate and selected invertebrate populations in the Nash Stream Forest.

Strategies:
1. Select techniques and methodologies for inventorying vertebrate and invertebrate populations.
2. Establish priorities for inventory using existing information.
3. Implement wildlife inventory.

OBJECTIVE 2: Identify and map the distribution of habitat types currently existing in the Nash Stream Forest.

Strategies:
1. Select and define habitat types for mapping.

2. Prepare habitat distribution maps from remote sensing and other available data.
3. Monitor changes in habitat composition and distribution.
4. Assess status of habitat types and establish management priorities.

OBJECTIVE 3: Identify management needs critical to species of management concern and prescribe activities necessary for the protection and maintenance of these species.

Strategies:
1. Evaluate inventory and other available data to identify species of management concern.
2. Assess habitat and other needs, of identified species of management concern.
3. Identify management options and priorities.
4. Implement appropriate management strategies, as feasible.

OBJECTIVE 4: Identify significant wildlife travel corridors and the species that utilize them, and prescribe appropriate management and recreational activities.

Strategies:
1. Identify and define types of wildlife corridors likely to occur in the tract.
2. Establish criteria for designating and delineating travel corridors.
3. Map corridors meeting established criteria.
4. Recommend appropriate land uses and activities for wildlife corridors.

OBJECTIVE 5: Develop standards and guidelines for integrating wildlife management into forest and recreation management planning and operations.

Strategies:
1. Identify potential impacts and management opportunities associated with other land uses.
2. Draft standards and guidelines for technical review.

OBJECTIVE 6: Conduct long-term monitoring of selected wildlife populations, including species of management concern.

Strategies:
1. Select wildlife species for long-term monitoring.
2. Select techniques and methodologies for long-term monitoring of selected species.
3. Implement monitoring program.

OBJECTIVE 7: Identify specific wildlife research needs and seek opportunities for answering research questions.

FISHERIES RESOURCES

GOAL: MANAGE TOWARD SUSTAINABLE FISHERIES OF WILD POPULATIONS OF FISH INDIGENOUS TO THE NASH STREAM FOREST.

OBJECTIVE 1: Identify and evaluate fish habitat currently existing in the Nash Stream Forest.

Strategy:
1. Conduct pond and stream (functioning stream) surveys consistent with the New Hampshire Fish and Game Department's Fisheries Management Plan.

OBJECTIVE 2: Determine the current status of all wild fish populations in the Nash Stream Forest.

Strategy:

1. Conduct pond and stream (functioning stream) surveys consistent with the New Hampshire Fish and Game Department's Fisheries Management Plan.

OBJECTIVE 3: Determine the current use of the Nash Stream Forest Fisheries Resource by the public.

Strategy:

1. Conduct a creel and recreational fisheries use survey.

OBJECTIVE 4: Provide for a sustainable recreational wild fisheries accessible to all user groups.

Strategy:

1. Implement fisheries regulations that will conserve the fisheries resource and meet the objective.

OBJECTIVE 5: Implement a program for stream habitat protection and/or enhancement for indigenous wild fish populations.

Strategies:

1. Develop standards and guidelines for fish habitat enhancement in the Nash Stream Forest.
2. Implement regulations to protect riparian habitat.
3. Investigate stream (functioning stream) enhancement techniques that could be implemented in the Nash Stream Forest to restore habitat for indigenous self-sustaining fish populations.
4. Monitor fish populations and effects of habitat improvement structures on both stream (functioning stream) habitat and fish populations.

OBJECTIVE 6: Manage fish habitat and populations in concert with other uses of the Nash Stream Forest.

TIMBER RESOURCES

GOAL: MANAGE NASH STREAM FOREST AND ITS TIMBER RESOURCES TO ACHIEVE A CONTINUOUS YIELD OF WOOD PRODUCTS FROM AN ECOLOGICALLY SUSTAINABLE FOREST.

OBJECTIVE 1: Manage timber in concert with other uses of the Nash Stream Forest.

Strategies:

1. Emphasize sustained yield of forest products consistent with the traditional uses of the Nash Stream Forest, including public access, and the conservation of other resource values.
2. Coordinate timber management and harvests with other state, federal, and private natural resource specialists to ensure consideration of multiple resource values and user interests.
3. Use timber management, including harvest, as a vegetation management tool to maintain or enhance resource values and land uses.
4. Implement guidelines to integrate timber management with other resource values and land uses.

5. Carry out timber harvesting only after potential impacts and management opportunities associated with other resource values and land uses have been identified and appropriate modifications made.
6. Notify the public of each proposed timber harvesting operation for public information and response.
7. Provide interpretive opportunities for timber management practices and integration with other uses.

OBJECTIVE 2: Determine the commercial forest area suitable for timber management.

Strategies:

1. Identify and locate areas where other resource values or land uses take precedence over timber production.
2. Locate areas designated in the Conservation Easement Deed where timber cutting is prohibited or restricted.
3. Identify and evaluate areas where soil/site and ecological land capabilities are suitable for timber harvesting.

OBJECTIVE 3: Implement procedures to achieve and maintain a healthy and ecologically sustainable forest and timber resource.

Strategies:

1. Monitor and map changes in forest associations including composition and distribution of tree species, and growth characteristics.
2. Utilize silvicultural prescriptions which favor natural regeneration of native species, use and build upon soil/site capabilities and other ecological principles.
3. Emphasize the growth of long rotation, high quality forest products.
4. Use uneven-aged management as the preferred method for managing and regenerating timber stands.
5. Implement guidelines to protect the forest environment during timber management and harvesting.
6. Establish areas within the designated commercial forest area to study natural development and ecological processes of representative natural communities.

OBJECTIVE 4: Provide for an ecologically sustainable yield of forest products from the designated commercial forest area.

Strategies:

1. Evaluate available inventory data and determine the present distribution of tree species by age and size class.
2. Determine appropriate target ages for each species based on, but not limited to, soil/site capabilities, culmination of volume growth, stem quality, desired stand structure, and biotic needs.
3. Establish timber management criteria and silvicultural guidelines that support a sustainable timber resource.
4. Evaluate each planning unit within the area suitable for timber management to determine a sustainable allowable cut.
5. Develop a long-term timber management work plan, updated annually.
6. Anticipate and respond to forest product market opportunities.

7. Provide opportunities for all interested parties to bid on any timber sold in accordance with policies adopted by Governor and Council.

OBJECTIVE 5: Provide for long-term monitoring of forest conditions.

Strategies:

1. Inventory and map timber and other forest resources on a continuing basis to maintain up-to-date information for long-range planning.
2. Use regular inspections for insect and disease infestations and other damaging agents to supplement inventory and mapping as tools for long-term monitoring of forest and timber conditions.
3. Implement a forest operation tracking system.
4. Evaluate the effects of timber management practices on sustainable forest health and productive growth.
5. Use the results of monitoring to modify timber management and other human activities.

OBJECTIVE 6: Identify timber management research needs and seek opportunities for answering research questions.

Strategy:

1. Work closely with other units of government, educational institutions, and others to encourage, establish and/or participate in timber management and related subject research activities of mutual benefit.

Fisheries Management

Fisheries management will emphasize natural populations of indigenous species, primarily brook trout. Stocking will continue in areas where natural reproduction is limited or non-existent in order to maintain consumptive and non-consumptive angling opportunities, as expressed in the Vision. Special fishing regulations (e.g., catch-and-release, minimum fish lengths, fishing gear restrictions, etc.) may be implemented to protect the spawning stock (especially in Nash Stream and tributaries) in order to maintain a wild population of brook trout.

Nash Stream presents a unique opportunity to investigate the effectiveness of instream fish habitat improvement structures in New Hampshire waters. Instream and overhead cover are severely lacking in Nash Stream. This fact, combined with the naturally low fertility of the water, presents a serious challenge in maintaining a wild trout population. Until the status of the wild trout population can be determined, Nash Stream will continue to be stocked with hatchery brook trout. Currently, it is believed that Nash Stream would not support a recreational fishery without an annual stocking program due to the lack of pool habitat.

Native vs. Wild Trout

The term "native" is often mistakenly used when referring to "wild" or non-stocked trout. In reality, there is a subtle yet distinct difference between the two terms. Native generally refers to the original stock or strain of a species not influenced by hatchery fish. A wild trout is one that is the result of natural reproduction in a stream. A wild trout can be descended from hatchery fish that survive and reproduce in the wild.

While it is assumed that brook trout are native to the Nash Stream watershed, this cannot actually be proven. The first biological survey of Nash Stream occurred in 1939, roughly 40 years after domesticated, hatchery brook trout were first stocked in the region. Unfortunately, there is no way to determine if the brook trout captured by the survey crew in 1939 were original, native stock or descendants of hatchery fish. Therefore, it is unlikely there are any reproductively isolated native populations of brook trout left due to the genetic introgression of hatchery fish that has occurred over time. A genetic study[17] of wild trout populations in the upper reaches of Nash Stream's tributaries would be necessary in order to find out if any native strains of brook trout still exist.

Pond Management

Although recent fisheries surveys have been completed on the ponds, additional netting is necessary to determine an accurate picture of current trout populations. Small sample sizes of fish obtained in previous surveys and lack of scale samples and creel survey data do not allow for age and growth determination or angler success rates. This type of information is important in assessing the trout fisheries in these ponds. Additional netting combined with creel surveys will be conducted to obtain this information.

In order to maintain the current fishery, annual stocking of brook trout fingerlings will continue in Lower Trio and Little Bog Ponds due to the apparent lack of adequate

spawning habitat present. Continued stocking of Whitcomb Pond will depend on the return rate of trout to the angler. Historically, the pond has produced a few large trout on occasion, but the habitat is marginal at best for brook trout. From a recreational standpoint, however, Whitcomb Pond may be important in that it provides a semi-remote outdoor experience since it only has one camp on it and the access is by foot.

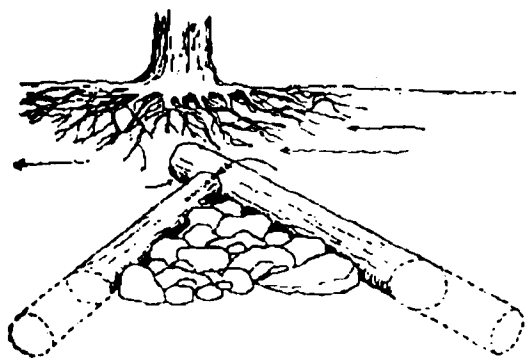
Stream Management

Fish habitat in streams will be surveyed using the basin-wide technique developed by Hankin and Reeves (1988) and modified for northeastern waters. To date, Nash Stream, Columbia Brook, and Slide Brook have been completely surveyed. Portions of East Branch and Long Mountain Brook have also been surveyed. Pond Brook has not yet been surveyed. As they have been in the past, tributaries to Nash Stream will be managed for wild trout and will not be stocked. These tributaries may serve as important refuge areas during hot weather for trout in Nash Stream.

Wild trout populations need to be inventoried in Nash Stream and its tributaries. This will be done by randomly selecting index sites for electrofishing. Population estimates will be determined using mark and recapture or removal techniques. A creel survey will also be conducted in order to determine angler pressure and catch rates.

Since management for wild populations of brook trout is desired, it may be necessary to implement a fish habitat enhancement program in order to compensate for the lack of cover and pool habitat (a critical component) in Nash Stream. Habitat enhancement guidelines will be established for the stream using state-of-the-art techniques applicable to northeastern waters. **Figure 12** illustrates a sample fish habitat structure used to divert stream flows so that stream meanders and pools are formed. Fish habitat structures, if constructed, will be monitored to determine their efficacy in maintaining trout populations at desired levels.

FIGURE 12
Single Wing Deflector Habitat Structure



In order to make the fisheries resource of Nash Stream accessible to all user groups, the possibility of constructing a fishing platform for disabled individuals along the stream will be explored. Preservation of historical cultural resources, however, will be given priority over construction of fishing platforms.

Management of Areas of Ecological Concern

The management goal for areas of ecological concern is to identify and protect all ecologically significant areas. Four components of this goal are: (1) identification and evaluation; (2) protection; (3) management; and, (4)

monitoring (see **Chapter 5 – Monitoring and Evaluation**). Each involves several steps.

(1) Identification and Evaluation

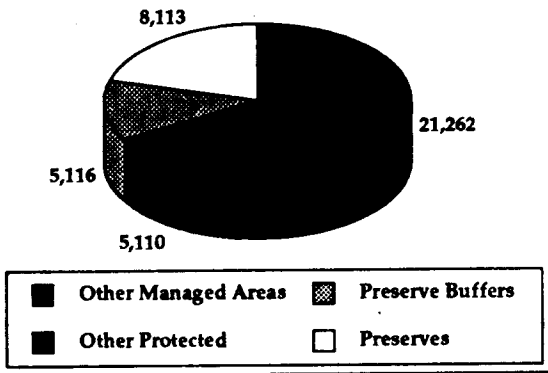
Identification of rare species and exemplary natural communities was completed in 1988 (**Chapter 3 – Areas of Ecological Concern**). Beyond this identification of rare "elements" of biodiversity, there is a need for more information on how the biological and physical components of the system interrelate, and how the larger landscape can contribute to providing biodiversity values. This information lies in the ecological characteristics of the entire Forest landscape. The Vision states that healthy representatives of all known elements of natural diversity should be protected. Consequently, further inventory work is needed to identify the full range of natural communities.

Additional inventory work will consist of three phases. The first phase will be the development of the survey design, based on existing physical and biological features. The second and third phases will be the collection of field data and the compilation and analysis of the data to define and describe natural community types. The inventory may reveal finer-scaled community types which are contained within the broader types currently defined by the Natural Heritage Inventory (NHI). In addition, classification of community types ongoing elsewhere in the state and regionally may provide additional context.

(2) Protection

Protection of significant ecological areas and other sensitive resources will be accomplished by several methods: **natural preserves**, selected **control areas** within natural community types, protective **buffers** and **corridors**, and management restrictions in other sensitive resource areas (**Map 6**, page 79). **Figure 13** illustrates the areas of protection and other managed areas[18] for the entire property. See **Table 18 – *Natural Preserves and Other Protected Areas***, page 78, for a detailed summary of protection categories.

FIGURE 13
Protection and Management Categories (in acres)



Natural Preserves

Although the Division of Forests and Lands (DFL) has established natural preserves on state lands, there are no formal rules governing natural preserve designation. Formal administrative rules for designation of natural preserves on state-owned lands are under consideration. Proposed criteria for such designations include:

A. Sites which provide habitat for rare or endangered species;

B. Sites that contain a rare natural community or high quality representative of a common natural community, or larger landscape units containing important combinations of communities and/or species;

C. Sites largely undisturbed by humans or largely recovered from human disturbance;

D. Sites which provide habitat for large numbers or uncommon associations of native plant and animal species;

E. Sites with special geological or paleontological significance.

Based on one or more of the above criteria, at least five general areas totaling 8,113 acres[19] within the Nash Stream Forest qualify as natural preserves:

1. Sugarloaf Mountain/Fitch Mountain/Number 3 Mountain (criteria A, B, C, E)
2. Percy Peaks (criteria A, B)
3. Long Mountain and Long Mountain Pond (criteria A, B)
4. Whitcomb Mountain (criterion B)
5. Victor Head and Bald Mountain (criterion B)

Designation of these five areas is consistent with the Conservation Easement Deed, which restricts management activities above 2,700 feet elevation and on excessively steep slopes. In addition, many of these areas contain Group II classified soils, which are physically not suitable for timber management. Determination of boundaries for these natural areas will be based chiefly on the protection needs of the rare species or natural communities they contain. It must be reiterated that the list above is a result of the 1988 inventory work and is by no means complete or final; future inventory work may result in modifications.

TABLE 18
Natural Preserves and Other Protected Areas

DESIGNATION	ACRES
Natural Preserves	8,113
Natural Preserve Buffers	5,116
Corridor	515
150 ft. Pond Buffers	55
Other High Elevation >2,700 ft.	49
Other Mountain Tops <2,700 ft.	516
Other Steep Slopes >35%	925
Other Group II Soils	3,050
TOTAL	**18,339**

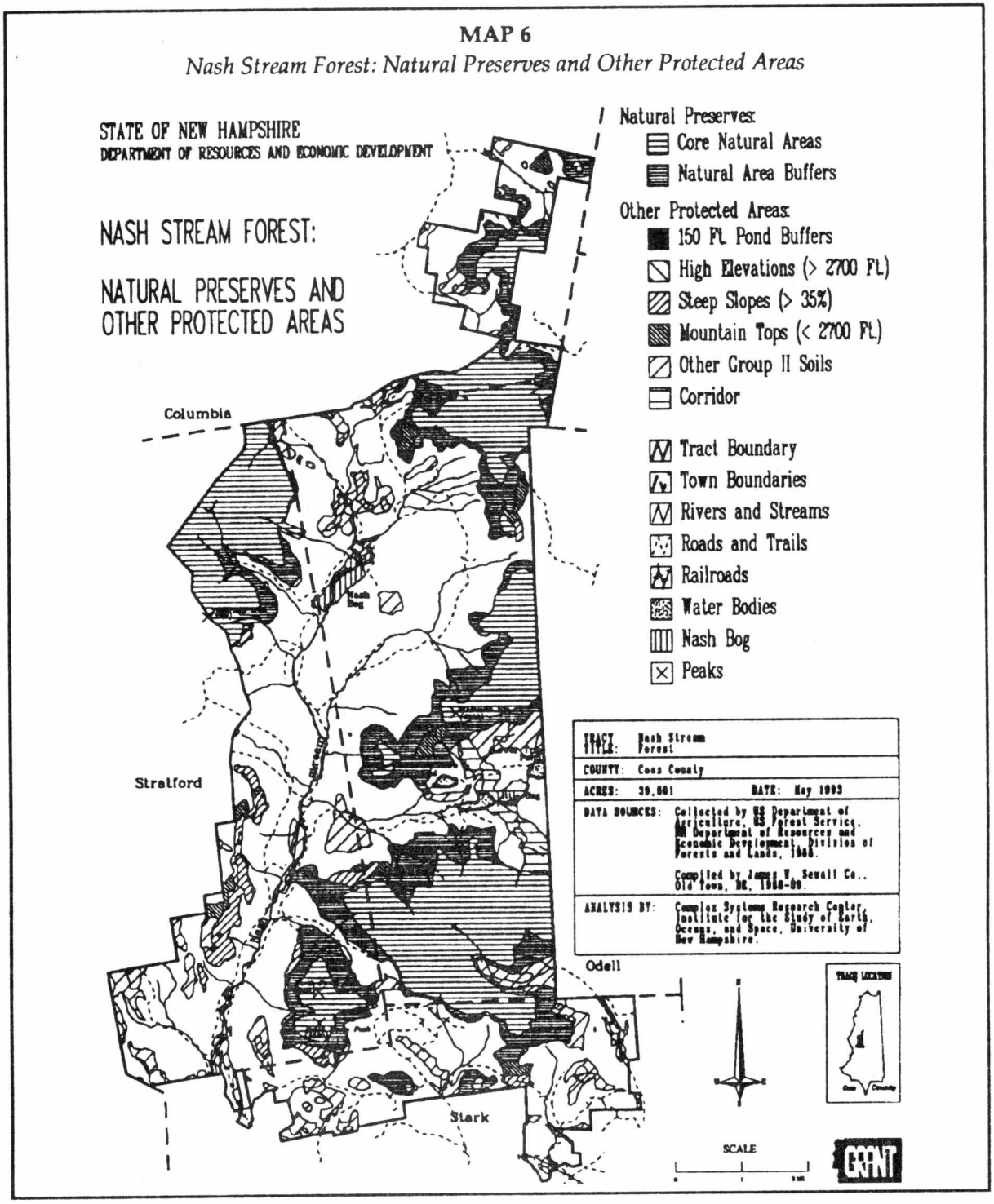
Field verification is necessary to accurately determine natural preserve boundaries.

Control Areas

Once the natural community classification is complete, a control area will be established within each identified natural community. These control areas will remain largely unaltered by human activity, with the exception of non-destructive vegetation sampling techniques. The primary purpose of control areas is to serve research and educational needs. For example, the areas can be used to contrast changes in vegetational composition and structure of control areas to areas in which active management is occurring. An additional purpose for establishing control areas is the preservation of plant and wildlife habitat, including examples of natural community types not represented in natural preserves due to the level of past human impacts. In this manner, control areas will contribute toward the goal of preserving examples of all community types, regardless

MAP 6

Nash Stream Forest: Natural Preserves and Other Protected Areas



of current condition, and in anticipation of a future condition where natural processes prevail.

The size and location of control areas will be based on factors relating to the vegetational structure of the natural community and the goals and design of the proposed monitoring. More specifically, Leak et al. (1993) proposed that at least five criteria should be considered in selecting natural areas:

1. Sufficient size to maintain or provide for natural disturbance cycles, stable population genetics, territorial requirements for native wildlife species, hydrologic integrity, and, in general, some degree of isolation from exterior influence;
2. Adequate representation of typical and important community/site combinations;
3. Known disturbance histories, to the extent possible, including natural events as well as historical agricultural/logging interactions;
4. Acceptable current condition in terms of age/size/successional stage including not only pristine climax forest but forested tracts in early successional stages; and
5. Administrative feasibility in terms of natural boundaries (e.g., watersheds), locatability, and accessibility.

Obviously, not all of these criteria are appropriate for the Nash Stream Forest. For instance, because nearly all of Nash Stream Forest has been previously harvested, it will likely be impossible to select control areas containing "pristine climax forest." However, attempts will be made to designate controls that contain some measure of age/size/successional stage diversity <u>within</u> each area as well as between areas.

Based on the criteria above, Leak suggested that a control (natural) area comprised largely of hardwood should be 100 to 200 acres, and a control (natural) area consisting largely of softwood should be approximately 1,500 acres. The size requirements relate to the dynamics and interactions that operate at both the site and landscape scales and the scale and pattern at which disturbance patches are generated. While these acreages are simply recommendations based on regional research, they do provide a starting point from which to designate control areas in the Nash Stream Forest.

Obviously the control areas cannot be designated until the natural community classification is complete. In the meantime, timber harvesting may be allowed only in locations not meeting the above criteria for natural community control areas. To accomplish this aim, the site of each proposed timber harvest will be thoroughly evaluated with regard to its potential as a natural community control area before detailed harvest plans are approved.

Buffer Areas and Corridors

To the extent allowable by the constraints of the Vision, buffer areas and corridors will be used to enhance the protection of the core natural preserves and control areas. Buffers and corridors can eliminate or greatly reduce indirect impacts to the core natural preserves. Corridors in particular can also allow for the movement of species between natural preserves. The intensity of forest manage-

ment will be significantly reduced in buffer areas and corridors; management generally will be limited to low- intensity activities that will not adversely affect the core areas. For example, vegetation management will be limited to salvage or single-tree selection harvesting and will be prohibited from steep, unstable, and poorly drained soils. In this regard buffers and corridors will serve as a vegetational gradient between more intensively managed areas and unaltered core areas; this gradient will eliminate the disjunct edge that would otherwise occur between harvested and core areas. In all cases, in buffers and corridors the primary goal of timber harvest will be to promote other resource values (e.g., wildlife habitat or endangered species habitat).

Similarly, the widths of buffer areas and corridors and the management intensity will be determined independently for each natural preserve. The primary factors to consider are the protection needs of the natural preserve and the soils, topography, and vegetation of the buffer or corridor. For example, to eliminate erosional impacts to core areas, buffers will typically be wider on fragile, wet soils and steep slopes.

Other Protected Areas

In addition to natural preserves, control areas, and buffers and corridors, other protected areas include mountain tops below 2,700 feet in elevation, and all other Group II classified soils[20]. These other protected areas will be subject to the same management restrictions as buffers and corridors.

(3) Management

While many of the rare species and natural communities will benefit simply from the exclusion of human activity, other natural communities may require limited management to perpetuate certain habitat conditions. One type of management may be the control or removal of exotic, invasive weed species that threaten native species and natural communities in the Forest. Other types of management may include such basic activities as signage of natural preserve boundaries, exclusion or limitation of recreational activity, or establishing guidelines for ecological research.

For other areas it may be necessary to examine the role of natural disturbance in perpetuating certain habitat conditions. Throughout northern New England natural disturbance plays an integral role in the dynamic condition of the forested landscape. Fires, insect outbreaks, storm damage, and other natural disturbance modes combine to create a patchwork of natural community types in different successional stages (seres) across the landscape. Because of the limited size of the Nash Stream Forest, some natural community successional stages that occur on the larger New England landscape may not occur within the Forest. It may be desirable to create these stages in the Nash Stream Forest by designing and implementing management that mimics natural disturbance. One example of such a technique is the use of prescribed fire to maintain vegetation in an early successional structure.

Recreation Management

Recreation management at Nash Stream will be consistent with recreation management on all other lands under the jurisdiction of the Department of Resources and Economic Development (DRED). Emphasis will be on quality and resource protection.

The Vision calls for traditional, low impact and dispersed recreation, with continued emphasis on cooperative management. Toward this end, early efforts will be to enhance the quality of on-going recreational activities consistent with the Vision and with other forest uses and resource values. For example, impacts to wildlife from recreational uses are possible, therefore, habitat concerns will be identified and integrated into recreation plans. The state's inter-disciplinary and multi-agency management programs, such as the Cooperative Land Management Committee and State Land Management Team (**Chapter 5 – Cooperative Management and Resource Integration**) provide a means to accomplish these efforts.

Recreation Management Guidelines
Public use and recreation management guidelines proposed for the Nash Stream Forest are consistent with those in place on other department lands. Nash Stream guidelines can be found in **Chapter 5 – Management Guidelines** and **Public Use Guidelines.**

The existing New Hampshire State Park "carry in/carry out" policy will be implemented in the Nash Stream Forest. The carry in/carry out policy will be applied through signage at strategic locations on the property and through public information.

Trails
Existing recreation trails are under assessment for maintenance needs, improvements, and environmental conflicts. The Statewide Trail Advisory Committee will be utilized to help with this assessment and advise the department and local volunteers on recreation trail matters. The Statewide Trail System Advisory Committee was created by RSA 216-F:5 for the purpose of advising the Director of Parks and Recreation on matters related to recreation trails. Committee members are appointed by the Commissioner of the Department of Resources and Economic Development and represent a wide range of trail interests.

Although some additions to the existing trail system are possible and under consideration, the present system of roads and trails provides an adequate base to meet anticipated recreation demands. Priority will be given to the proper maintenance and enhancement of existing trails before trail expansion work is done. To the degree possible, the road and trail system on the property will be maintained and utilized as multi-use trail corridors consistent with recreational purpose to minimize disruptions caused by additional trail construction and use. Selected roads and trails that have generally supported only winter recreation use will be considered for upgrading and maintenance to multi-use standards to facilitate four-season use. Existing recreation trails will be maintained to generally accepted trail maintenance standards for the highest standard of use on that trail (see #3, **Trail Construction and Maintenance,** page 115). For example, a gravel road that functions as a snowmobile trail in the winter will be maintained to gravel road standards.

Accepted hiking trail maintenance standards are those standards adopted by the Appalachian Trail Conference, Appalachian

Mountain Club, or the U.S. Forest Service. Accepted snowmobile trail maintenance standards are those standards, presently in draft form, adopted by the International Association of Snowmobile Administrators. Equestrian, mountain biking, and other trail uses will be evaluated to determine the degree to which additional standards need to be adopted to accommodate particular trail uses.

In addition, the department looks favorably on connecting the trail system in the Nash Stream Forest with trails on adjacent private lands, provided permission from the private landowners can be obtained. There are already agreements with adjacent landowners for snowmobile trails. In certain cases, it may be desirable to expand these agreements to include other trail uses.

Hiking

The Sugarloaf Mountain and North Percy Peak trails, totaling more than 5 miles in length, are the only maintained mountain hiking trails. The short trail to Pond Brook Falls from the Main Road is also worth mentioning as a hiking trail because of its recreational value even though it is only a few hundred feet in length.

Numerous walking opportunities exist on the Forest's 66.5 mile road and trail network. Most, if not all, of the network will be utilized as multi-use trail corridors and maintained to generally accepted trail maintenance standards as discussed under ***Trails*** above.

There are opportunities to improve hiking on the Nash Stream Forest including better marking and signing of trails, re-opening of selected historic hiking trails, addition of hiking loops from single destination trails, establishing a regular hiking trail monitoring and maintenance program, and possible construction of new mountain hiking trails.

Although funding and staff for hiking trails is limited, proper hiking trail maintenance and improvements can be accomplished with the aid of volunteers and the Statewide Trail System Advisory Committee. For example, the North Percy Trail has been well maintained by local interests for years prior to state purchase of the Forest. More recently, the Appalachian Mountain Club voluntarily performed an assessment of work needs for the West Side Trail on North Percy in the summer of 1991, and accomplished some of the trail work called for in the assessment.

Snowmobiling

The department has been performing road maintenance to bring selected gravel roads in the Nash Stream Forest up to standards. This work has benefited the snowmobile trail system that utilizes these roads. Additional snowmobile trail work has been accomplished by the Groveton Trail Blazers Snowmobile Club on an as-needed basis, with assistance from the OHRV grant-in-aid program (**Chapter 3 – Economic Considerations**).

A connecting snowmobile trail corridor that would connect trails on private lands in the Phillips Brook area to the 37 miles of designated snowmobile trails in the Nash Stream Forest has recently been leased from International Paper Company, the present owner of the Phillips Brook tract. This plan

does not anticipate an increase in snowmobile trail mileage. Existing trails will be improved where it is desirable and appropriate. For a map of snowmobile trails, see **Chapter 3 – Recreation Resources.**

Other Trail Uses
There is the potential in the Nash Stream Forest to increase and enhance the recreation opportunities for mountain bikes, equestrians, cross country skiers, and other trail users. The greatest opportunity lies in upgrading existing roads and trails to accommodate multiple trail uses, and the existing trail system will be reviewed with this in mind. Volunteer participation by the various user groups in upgrading selected trails will obviously facilitate an increase in opportunities for those user groups. Recreation management in the Nash Stream Forest will strive to identify and work closely with volunteer groups.

Visual Quality
Enhancing the recreational experience in the Nash Stream Forest involves more than trail improvements. Recreation management will be sensitive to the natural quality of the landscape. Visual quality will be taken into account in the planning and implementation of such landscape altering activities as trail building and timber harvesting (**Chapter 4 – Goals of Management – *Timber***). Sensitivity to visual quality goes beyond simply avoiding or mitigating impacts to the landscape. It seeks to feature the landscape through designing and providing views and viewing opportunities. Viewing opportunities will range in scale from small cleared or natural vista openings along trails, to graveled pullouts along public access roads.

Recreation Access
Providing and maintaining appropriate levels of public access is a means through which recreation opportunities will be managed. Although allowed by the Conservation Easement, there are no plans to charge a fee for public entry and general use of the Forest. There are no plans to build a visitors' center or hire a gate attendant for the main entrance.

Access for individuals with disabilities will be provided through the public road system, and through designing and maintaining access to selected natural features, such as the Nash Stream and Little Bog (Fourteen and a Half) Pond. Reasonable accommodation will be made to provide access for individuals with disabilities.

Camping and Non-traditional Recreation
This Management Plan recognizes that there are recreational activities that have not been traditional uses in the Nash Stream, but that may be appropriate within the context of the Vision. One such non-traditional use considered appropriate to the Nash Stream Forest is mountain biking. Mountain bikes are currently allowed on department lands, unless specifically prohibited for environmental or safety concerns. An initial management task at Nash Stream will be to assess the level and impact of mountain bike use.

Another non-traditional recreation use that may be appropriate is backcountry camping. Backcountry camping is not prohibited by the Vision, but research is needed to plan for this activity in the Nash Stream Forest. Backcountry camping is camping accessed by means other than automobile, and where no amenities are provided. Campsites may

be designated, or camping might be disbursed in a particular area. Camping can be a relatively high impact recreation use, and it requires active management. The decision to provide backcountry camping relates to other recreation uses, such as hiking.

A segment of the New Hampshire Heritage Trail is presently incorporated in the recreation planning for the Nash Stream Forest. A current proposal would utilize existing roads and trails in the Forest. The trail would enter the property from the South and follow the West Side Road northerly, leaving the property at Cranberry Bog Notch. The trail designation itself is not outside traditional use, but consideration is being given to providing backcountry camping along the trail. The appropriateness, location and management of backcountry campsites have yet to be determined. Should the interest in such camping materialize, then specific campsites will be identified. The sites will be located in appropriate management areas, with consideration given to soil and other site factors. Primitive toilet facilities would be developed for the sites as well. Management and maintenance of the campsites would be accomplished in a number of ways: additional department staffing; contracted services; volunteer assistance; or, a combination of these.

Education and Interpretation

Education and interpretation are means to enhance recreation experiences and protect the resource. Education and interpretation foster greater understanding, and therefore protection, of natural values. Education and interpretation can take place through passive means, such as interpretive panels, or through interactive forums, like guided walks. Both techniques may enrich a visitor's experience while providing information on timber harvests, cultural sites, or landscape features. Information and education will be provided through existing department staff and programs, and with assistance from other public and private resources.

Volunteerism

Management will encourage volunteer participation in developing and managing recreation in the Nash Stream Forest. Volunteer involvement has already been demonstrated in this planning process. Volunteer coordination may range in format from formal agreements with trail cooperators to simply facilitating public involvement in specific recreation projects.

Nash Bog Dam

After the Nash Bog dam breached in 1969, a new dam was proposed at a cost of just under $3.5 million in 1974 dollars. Lack of state and federal funding at the time shelved the proposal. The Conservation Easement allows the dam to be rebuilt for fish and wildlife and recreation purposes only. However, there are no current plans to rebuild the dam at Nash Bog (see **Figure 1**, page 15).

Wildlife Management

In accordance with the Vision, the wildlife resources of the Nash Stream Forest will be managed to sustain populations of naturally occurring native wildlife species. This will be accomplished by protecting and managing wildlife habitats, assessing and monitoring wildlife populations, and controlling the impacts of public use.

Wild animals depend on plants for food and cover, and each wildlife species has adapted to living in a particular mix of plant communities. The relationships between species and their habitats are very complex and, in many cases, only partially understood. Wildlife population levels naturally fluctuate due to many causes, but the long-term survival of populations ultimately depends on the continued availability of their required habitats. Some species have very specialized habitat requirements and occur only within a narrow range of habitat types. Others use a variety of different habitats during the course of a year, a season, or even a few days.

The suitability of any given area as habitat for a particular wildlife species is influenced by a wide array of biological and physical variables, including plant species composition, food availability, soil type and moisture, crown canopy closure, the density of ground level and understory vegetation, the presence of tree cavities or downed trees, and many others. These habitat components vary in distribution across the landscape, resulting in variations in the distribution of wildlife. Regional wildlife diversity may be sustained only if the mix of plant communities occurring across the landscape includes the full complement of required habitat types and components.

The wildlife habitats at Nash Stream are principally forest habitats. Forests are dynamic ecological systems that are continually changing. These changes occur at many different scales, ranging from point events such as the death or breakage of a single tree to large scale alterations such as the burning or blowdown of hundreds of acres. Changes result from many causes; including those induced by wildlife, such as beavers impounding a stream, and those induced by humans, such as timber harvesting.

All forest changes, whether natural or human caused, lead to changes in the vegetative composition and/or structural diversity of a forest stand, and create conditions different from those in neighboring stands. Research indicates that wildlife responds to changing vegetative conditions and patterns, and that these responses often can be predicted. Generally, as the availability of a species' required habitats declines, so will the numbers and density of that species.

With an understanding of species habitat relationships and vegetation responses to specific forest changes, we may assess and predict impacts of change on wildlife species. Further, with an identified set of wildlife goals and objectives, knowledge of present habitat conditions, and an understanding of site capabilities, we can design strategies to create and/or maintain a desirable mix of forest habitats. This habitat mix defines a future condition that provides a basis for management decisions.

The desired future condition of wildlife habitats in the Nash Stream Forest includes a variety of vegetative types and mix of age classes across the landscape. Large blocks of

spruce and fir will prevail at high elevations and, where site capabilities allow, along valley bottoms, drainageways and other appropriate sites. The Forest, however, will be dominated by uneven-aged stands of northern hardwoods. These stands will present a relatively continuous forest canopy with occasional breaks and gaps resulting from natural processes and forest management. Canopy breaks will vary in size, number and location over time. Habitats important to species of management concern will be protected from potentially harmful human activities by establishing buffer zones and other use restrictions. Forest management will focus on long rotation, uneven-aged techniques producing stands with big trees and many vegetative layers (high vertical stand diversity). A small percentage of the Forest will be managed to favor shorter-lived species with low shade tolerance, such as aspen and birch. The dynamic processes of nature will dictate future conditions in the many sections of the property not subject to forest management.

This management direction, established by the Vision, will produce changes in population densities of many naturally occurring wildlife species in the Nash Stream Forest. The extensive harvesting that Nash Stream has experienced in the past has created a landscape of high vegetative diversity, especially age class diversity. At present, stands less than thirty years old comprise 35% of the area suitable for timber management, and only 10% of this area is older than sixty years. As the Management Plan is implemented, this age structure will shift to a predominance of older, uneven-aged forest stands. As this occurs, many species that prefer younger aged forest stands will experience habitat declines. Birds such as the alder flycatcher, common yellowthroat, mourning warbler, and chestnut-sided warbler (all neotropical migrants) are among those expected to become less abundant across the Nash Stream valley as the acreage of young forest declines. Snowshoe hare densities are also likely to decline, resulting in reduced food availability for their avian and mammalian predators.

On the other hand, habitat for species common in uneven-aged hardwood forests, including neotropical migrants such as rose-breasted grosbeaks, ovenbirds, black-throated blue warblers, and red-eyed vireos will increase. The restoration of low elevation softwood stands will provide increased habitat for other species, including marten, red squirrel, blackburnian warblers and bay-breasted warblers.

Habitat Protection and Management

Land use activities, such as forest management operations and recreational developments, may present significant impacts to wildlife habitats within the Nash Stream Forest. Consideration of habitat protection and management needs will be integrated into these and other proposed land use activities through implementation of management guidelines **(Chapter 5–Management Guidelines)**. All proposed projects will be reviewed for consistency with, and application of, the wildlife habitat management guidelines.

The general approach to protecting and managing wildlife habitats is to:

1. Locate significant habitats, including those of species of management concern, and assess protection and management needs;
2. Protect high elevation spruce-fir habitats;
3. Promote restoration of softwoods on suitable low elevation sites;
4. Protect wetlands, ponds, streams, riparian zones and important wildlife travel corridors from degradation by inappropriate recreational developments, forestry operations or other land use activities.
5. Locate key mast (nut and fruit) producing stands and determine their management and protection needs;
6. Establish vegetative composition and age class goals by planning unit, integrating habitat management and protection needs with site capabilities.

The first priority in the protection and management of wildlife habitats at Nash Stream is the identification of significant areas. In general, these are habitats that are limited in distribution, support species of management concern, have special seasonal importance to wildlife, or support a highly diverse wildlife community. Significant habitats at Nash Stream include wetlands and riparian zones; spruce-fir stands at both high and low elevations; stands with concentrations of bear-clawed beech trees; known locations of endangered or threatened species; and wildlife travel corridors. Many of these areas at Nash Stream have been identified. Few threatened or endangered species occur in the Forest. Common loons nest on Little Bog Pond and Trio Pond, and northern harriers have nested in Nash Bog. Marten and lynx may occur, at least occasionally, at higher elevations. Key mast stands with bear-clawed beech need to be located and mapped. The standards and guidelines outline appropriate protection and management activities for significant habitats.

To ensure continued availability of habitats needed by all naturally occurring wildlife species, vegetative composition goals will be established for each planning unit. These will be based on site capabilities, ecological tendencies, and wildlife objectives for each unit. In conjunction with the area management concept and timber guidelines, management strategies will be designed to create or maintain a mix of stands reflecting desirable tree species compositions and age structure conditions.

The Nash Stream Vision calls for the identification of corridors connecting core natural areas. To properly identify them, we must understand their character and function. Generally, wildlife travel corridors are not distinct strips with well-defined edges and fixed widths. Rather, they are areas where wildlife movements tend to be concentrated. Different species use different kinds of travel corridors, and encounter different kinds of barriers to movement and dispersal. A geographic feature, such as Nash Stream, that constitutes a corridor for one species may be a barrier to another.

In general, significant travel corridors in the Nash Stream Forest include riparian zones and other shoreline and stream-side forests; softwood and mixed stands along contours near major slope changes; and along edges

between major cover types or age classes (such as the edge between regenerating and mature stands). Significant travel corridors need to be identified and, to the extent possible, indicated on maps. Information addressing this need is being gathered and will be updated as new information becomes available.

Land use activities will not be allowed to adversely impact wildlife travel corridors. Recreational development should avoid these areas. Existing recreational trails need to be evaluated and any proposed new trails will be laid out to minimize impacts to travel corridors. Forest cutting operations specifically designed to enhance wildlife habitat values of a travel corridor may be conducted.

Public Use of Wildlife

Public interest in wildlife inhabiting the Nash Stream Forest is high. Comments received at public meetings indicate a strong interest in maintaining traditional recreational activities. With respect to wildlife, the Vision specifically states traditional consumptive and non-consumptive wildlife uses will be allowed. Hunting and trapping are among these traditional wildlife uses and both are allowed within state law.

The Nash Stream Forest is open to any deer hunter, however, hunting pressure is relatively light. During the first five days of the 1991 firearms season, the Forest had fewer deer hunters than thirteen other restricted access areas checked by Fish and Game personnel. No deer were reported taken during this period. The Nash Stream Forest comprises approximately 18% of the Fish and Game Department's Wildlife Management Unit B. The firearms season for deer in this Unit has been restricted to antlered deer only since 1988. This regulation is reviewed annually based on the previous season's harvest and the severity of the recent winter.

Hunting for Moose, Black Bear, waterfowl and small game may also occur in the Nash Stream Forest. Baiting Black Bear for recreational hunting will not be permitted. The Fish and Game Department allows moose hunting only by permit selected by lottery and assigned by Management Unit. In the first five years of the moose hunt, 1988 through 1992, only two moose were taken on the property.

Trapping permits for the Nash Stream Forest, as for other state lands, are issued through a random selection process by the Fish and Game Department. For administrative purposes, the Forest has been divided into five trapping units. Only one permit is issued per unit for a two-year period. Each trapper is presently required to file an annual trapping report indicating the number and species of animals taken.

Non-consumptive wildlife uses include wildlife observation and photography. While these endeavors are generally encouraged, some related activities may need to be controlled. The use of blinds, spotlights, and attractants (such as food or vocalizations) will require approval by the state, and will comply with RSA's 207:3-d, 207:36-a, 208:8 and 208:8-a. Policies and guidelines related to the use of these items will be developed.

The state has a strong interest in promoting research to gain knowledge on wildlife occurrence and distribution at the Nash Stream Forest. Proposals for wildlife research projects should be submitted for review, comment, and approval.

Specific research to determine wildlife distribution may require the occasional capturing or taking of nongame species. RSA 214:29-33 provides for the regulation of this activity through special licenses for scientific research granted by the Executive Director of the Fish and Game Department. These are available to persons of known scientific attainment in ornithology or mammalogy, or to agents of public museums. Depending on the specific nature of the research, additional federal permits also may be required.

Recreational activities and developments may have significant impacts on wildlife habitats and populations even though the activity is not wildlife related. For example, development of public use areas, such as parking lots and camping areas, consume habitat directly. Snowmobile trails through softwood stands can adversely impact deer wintering in the area by increasing their metabolic energy consumption and allowing easier access to the area by predators. Therefore, the planning , development and maintenance of recreational sites will incorporate consideration of wildlife and wildlife habitat needs (page 115).

Population Assessment and Monitoring
Formal surveys and incidental observations have yielded significant information on the occurrence and distribution of wildlife in the Nash Stream Forest. In addition, knowledge of regional wildlife distributions, habitat relationships and population trends enables some inference about the status of various species at Nash Stream. However, much remains to be learned.

Wildlife inventory and monitoring require adequate personnel and funding. Both of these are limited within the state agencies involved in managing the Nash Stream Forest. As a result, the state's ability to implement a wildlife inventory and monitoring program is severely restricted (see **Chapter 5, Monitoring and Evaluation**). Fortunately, grants from the U.S. Forest Service, State and Private Forestry Branch, have been available to fund current inventory and monitoring projects (see **Chapter 3, Economic Considerations**). Additional partnerships and cooperative funding agreements need to be developed. Potential options must be identified and explored. Wildlife research by academic interests, such as the University of New Hampshire and Dartmouth College, should be promoted.

Biologists on the Technical Team (see **Chapter 1, Chronology/Planning Process**) have compiled a list of species of management concern (**Table 13**, page 41). This list is based on current information and may change over the years as our knowledge of wildlife distribution in the Forest increases or with regional changes in species status. Species are included on this list for a variety of reasons, including:

1. The species is listed as threatened or endangered at the state or federal level;
2. The species is rare in the state or region;
3. The species is economically important;
4. The species is especially vulnerable to disturbance from human activity or habitat modification.

Additional research designed to determine the status, distribution and habitat needs of these animals in the Nash Stream Forest will be a priority. For most species of management concern, appropriate habitat protection and management recommendations have been developed (see pages 42-46). These recommendations will be incorporated into management operations and recreational developments to avoid negative impacts to these species. In lieu of developed recommendations, Fish and Game Department biologists shall submit recommendations for appropriate modifications.

Information on species of concern and many other wildlife species is being collected through breeding bird and winter track surveys. These studies will establish an early baseline of information on the current status of selected wildlife. In conjunction with periodic monitoring, this data will be used to track changes and assess the results of management. These initial surveys should be conducted for at least three consecutive years to establish a solid data base. Thereafter, subject to available funds, fixed lines will be surveyed at intervals of three to five years. Habitat information will be collected at survey points to allow analysis of the influence of habitat change on species numbers and distribution.

Additional baseline information is needed for many wildlife groups, including amphibians, reptiles, small mammals and some species of management concern. Existing information will be analyzed to determine information needs and to establish inventory and monitoring priorities. Wildlife survey designs should be consistent with accepted scientific research methodologies and be comparable to other existing regional or national monitoring projects (**Chapter 5–Monitoring and Evaluation**).

Wildlife Reintroduction

No extirpated species are being considered for reintroduction to the Nash Stream Forest. The preferred approach to re-establishing extirpated species is to develop and maintain suitable habitat and allow the species to move in on its own. If this fails and an active reintroduction program is deemed feasible, it would be implemented under the direction of the Fish and Game Department and the regulations of RSA's 207:14 and 207:15.

The most likely candidate for re-establishment in the Forest is the Marten, a state-listed threatened species. These members of the weasel family are slowly expanding into their former range across northern New Hampshire. Marten are strongly associated with large blocks of softwood forest, which are presently limited to high elevation sites at Nash Stream. Management directed toward restoring softwoods to suitable sites at low elevation will develop Marten habitat and favor their re-establishment.

Forest Protection Management

Prevention

Forest fire prevention is the most cost effective forest fire program. Fire prevention and information posters will be posted at major access roads leading into the Nash Stream Forest. The Division of Forests and Lands, Forest Protection Bureau will work with media outlets, local fire departments, forest fire wardens, and schools to inform the public regarding forest fire conditions and

fire safety. Staff will maintain personal contacts with camp owners and visitors to the area in order to keep fire prevention and safety before the public.

Presuppression

A town forest fire warden and deputy wardens will be maintained in the towns of Stratford, Stark, Columbia, and in the unincorporated place of Odell under the authority of RSA 227-L:7. Town wardens and deputy wardens will maintain equipment and resources to be used for forest fire fighting in their towns and areas of jurisdiction. In addition, special deputy wardens in the fire districts that encompass Nash Stream will continue to be appointed and trained under the authority of RSA 227-L:8.

Training is critical to an effective forest fire protection program. Therefore, the Forest Protection Bureau will continue to provide annual training in wildland fire fighting. Special deputy wardens and forest rangers will continue to participate as instructors in the basic forest fire course offered through the New Hampshire Fire Standards and Training Council.

Forest Protection Bureau forest rangers will receive training in forest fire fighting on an ongoing basis to keep abreast of the latest techniques and equipment. Rangers will also continue to provide assistance to town fire wardens and deputy wardens with all forest fire activities, including maintenance of necessary wildfire equipment caches for use in their community.

Every opportunity to enter into cooperative agreements with the U.S. Forest Service and Northeastern Forest Fire Protection Commission for additional training and fire suppression assistance of benefit to New Hampshire will be pursued under the authority of RSA 227-L:5. This includes federal matching grant dollars to New Hampshire communities to help with purchasing fire fighting and safety equipment.

Forest rangers will continue to evaluate and acquire federal surplus equipment and vehicles suitable for use by New Hampshire communities for fire fighting activities. After communities are adequately supplied, a heavy duty off-road utility vehicle from federal surplus supplies is under consideration to be added to the region equipment cache in Lancaster, suitable for use throughout the North Region including the Nash Stream property.

The local fire plans and resource lists for the communities that encompass Nash Stream will be updated on a regular basis. These items includes an inventory of local fire equipment and key personnel available for fighting fire on the property (see **Appendix 9**).

Written mutual aid agreements are planned for local communities that may become involved with fire suppression in the Nash Stream Forest. Such agreements will be developed in cooperation with each community and will include but not be limited to: initial response, response equipment and personnel (including regional equipment cache), equipment backups and coverage, on-site responsibilities and chain-of-command, who reports to whom, who relieves whom, how fire bills are handled, training, and other items. Mutual aid agreements will serve to build upon the

ongoing coordination and cooperation between towns and the state of New Hampshire.

In addition to mutual aid agreements, a property fire (suppression) plan will be prepared. Local communities and fire fighting interests will be asked to assist with preparation of this fire plan. The plan will include information about equipment access, water sources, fuel and terrain descriptions, available equipment and personnel, training and orientation specific to the Nash Stream Forest, and fire suppression tactics. For example, because of the remoteness of Nash Stream it may be necessary to preposition caches of fire fighting equipment and use such combinations as air drops and pump and water lines to retard fires on high elevation sites.

Detection

The Division of Forests and Lands will maintain an early detection network of fire towers, two mobile patrols, and three fixed wing air patrols (private contractors). Out of this network, two fire towers, Milan Hill and Mount Prospect, one mobile patrol, and one fixed wing air patrol will cover the Nash Stream Forest, supplemented by other division staff. These resources will be maintained as the first line of fire detection to detect fires early and keep fire sizes as small as possible through rapid response with suppression equipment and personnel.

Fire Towers are Important to Early Detection

Two-way radio communications in the Nash Stream Forest are marginal at best, primarily due to the mountainous terrain. Good two-way radio communications are critical to timely fire suppression as well as safety, rescue and law enforcement. Efforts are underway to find the best combination of radio equipment and frequency use to either eliminate or improve upon so-called "dead spots" on the property where communication is very poor.

Suppression

RSA 227-L:11 mandates that town forest fire wardens and deputy wardens extinguish all brush and forest fires in their town. In all instances, the protection of life and property will be of top concern. Suppression efforts will use local, state, Compact[21] or federal fire suppression forces as necessary. Town, district, regional, and state fire plans will provide wardens with a list of resources available. Equipment and personnel will be shared with the White Mountain National Forest as needed.

Suppression actions will be dictated by the observed fire behavior, terrain, access, and available fire fighting resources. Hand tools, mechanized equipment and chemical (class

A foam) suppression techniques are some of the tactics available. In many situations in the Nash Stream Forest, heavy equipment may not be practical due to topography and soils. Class A foam is a chemical suppression tool that is environmentally friendly (U.S. Forest Service approved, non-toxic and biodegradable). The use of foam can minimize the impact of suppression activities as it makes water more efficient in wetting fuels and can be used to create a fire barrier instead of cutting a fire line. A private helicopter contractor will be available to assist with fire suppression activities especially in remote and hazardous terrain.

The state of New Hampshire will maintain caches of wildland fire equipment that could be used to supplement or replace local fire department equipment on a fire. Forest rangers, special deputy wardens and other fire suppression specialists and resources will be available through cooperative agreements and mutual aid systems.

Insect and Disease

RSA 430:2, 227-K:2 and 227-H:2 provide for the protection of forests from destructive insect and plant diseases. Forest insect and disease detection, evaluation and control plans will be consistent with the Vision for the Nash Stream Forest.

Aerial detection flights will be carried out annually over Nash Stream to identify abnormal changes in the forest canopy. When a change is detected, follow-up ground checks will be conducted to determine the cause of the change and evaluate its potential destructiveness. If a specific cause is determined to be abnormal and damaging to native populations, recommendations will be made for dealing with the situation that may involve control measures or monitoring and research. All action plans will be reviewed and evaluated by the Division of Forests and Lands staff to ensure consistency with the Vision. Follow-up inspections will be conducted to determine size, rate of spread and implications of the infestation to determine appropriate actions and need for future monitoring.

If additional funding is available for special studies, the Nash Stream Forest presents an opportunity to study the ecological role of forest insects and diseases. Consistent with a sound, ecologically-based forestry program, understanding and limiting exotic pests that may interfere with the natural forest processes is important.

New Hampshire utilizes different control options in trying to control insect populations. Control options would be reviewed by the State Forest Pest Advisory Group (FPAG)[22], White Mountain National Forest staff, State Land Management Team, and the proposed Nash Stream Citizen Advisory Committee.

The Bureau also participates in a Federal Forest Health Monitoring (FHM) program, annually measuring permanent plots to gather information about forest health changes. While none of these plots are in the Nash Stream management area , there are plots west of Stratford Bog and east in the Milan area. These plots would be representative of forest health conditions in Nash Stream.

Law Enforcement

The Division of Forests and Lands will take the lead in maintaining a high visibility of personnel on the property. Approximately

five days per week division personnel will be on-site when the main gate is open. Camp checks, road and trail inspections, forest fire mobile patrols, and personal contacts with visitors are priority activities.

The NH Fish and Game Department will also maintain high visibility on the property and vicinity for routine checks of fishing, hunting, snowmobiling, and other licensed recreational activities.

The Trails Bureau in the Department of Resources and Economic Development and Fish and Game Department will maintain the highest visibility when the ground is covered with snow. Trail grooming, trail inspections and maintenance, law enforcement, public safety, and quality recreation are of primary importance.

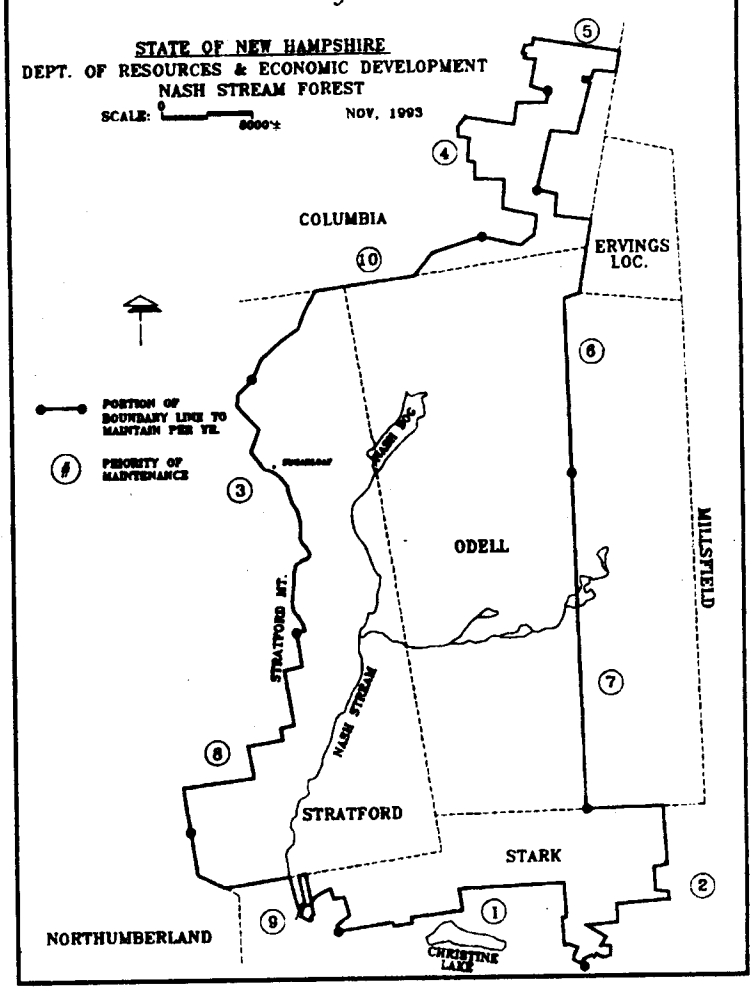
Motorized vehicles have limited access to the Nash Stream roads and trails due to gates. Gated access keeps law enforcement problems to a minimum and minimizes disturbances to wildlife, provides enjoyable low impact and remote recreation opportunities, and reduces road maintenance costs (**Chapter 5 – Roads and Access Management**).

Written mutual aid (law enforcement) agreements are planned for local communities that are involved with law enforcement in the Nash Stream Forest. Such agreements will be developed in cooperation with each community and will include but not be limited to: initial response, communication links, investigation and follow-up responsibilities, and other items. Written mutual aid agreements will build upon the ongoing coordination and cooperation between towns and the state of New Hampshire.

Boundary Maintenance

Of an approximate 56.25 miles of boundary line, about 38 miles have been blazed and

MAP 7
Boundary Maintenance



painted at various times as far back as the 1950s. Consequently, portions of the boundary line are in poor condition. Another 8 miles need to be defined, and the remaining 10.25 miles require close field inspection to determine condition and required work.

Procedure and Schedule

Consistent with other properties under the jurisdiction of the Department of Resources and Economic Development, monumentation and witness trees will be established at each corner and the lines in between will be blazed and painted with blue boundary paint. Property lines that are already clearly defined and painted in another color by abutting landowners may not need to be remarked in blue. However, state boundary signs will be placed along the line at reasonable intervals to identify ownership.

On a 10-year rotation, independent of boundary status, approximately 5.5 miles of line would need to be inspected and maintained, as necessary, each year. About 14 to 15 person-days per year will be required on the basis of accomplishing approximately 4,000 feet of boundary line per day for a two-person crew. Boundary maintenance cost savings will be pursued by working with abutting landowners to alternate maintenance of in-common lines. **Map 7,** page 95, is a boundary maintenance map showing annual designation and priority of boundary line sections to be maintained.

Cultural Resources Management

In order to manage the cultural resources in Nash Stream it will be necessary to establish a set of priorities in the absence of an existing inventory of resources. The first step should be to simultaneously: (1) identify those areas which are most likely to contain archaeological sites; and (2) identify those areas which are likely to undergo alteration of the land surface. In those instances where the two categories overlap, then a cultural resources survey should be executed and appropriate steps taken in accordance with state and federal regulations, including Section 106 of the National Historic Preservation Act of 1966, as amended.

The next step should be to develop a cultural resources management plan which would serve as a planning tool and provide a basis for public education and scholarly research. In addition, these inventory efforts should be undertaken in an interdisciplinary context, so as to take advantage of the other experts carrying out parallel inventory efforts regarding the natural resources.

Timber Management

Continued management of the Nash Stream Forest timber resource is important for many reasons. Forestry is a traditional, fundamental and accessory use of land in New Hampshire; the growth, harvest and utilization of timber has contributed to the social, cultural and economic definition of the North Country for almost two centuries. The importance of maintaining the Nash Stream watershed in the North Country timber base was emphasized repeatedly during negotiations to acquire the land, and is specifically referenced in the Conservation Easement Deed (CED). There was strong public support for this use at the two public listening sessions. Nash Stream Forest is capable of producing high quality timber of importance to local, regional and even global economies.

Proper forest management is compatible with other public values and potential uses of the property.

The Nash Stream Forest will be managed on a sustained yield basis for all forest products, including timber, wildlife, clean water, public recreation, and aesthetic enjoyment. Annual growth of timber will exceed annual removal within management zones for a period of several decades and probably long thereafter. All age classes will receive management, from regeneration to mature stands. Management options will be dictated primarily by soil/site capabilities based on ecological land groupings, with the long-term strategy of returning the forest to nearly its original (pre-19th century) species distribution; special efforts will be made to restore softwood stands to original distribution. Emphasis will be on long-rotation production of hardwood solid wood products, with pre-commercial and commercial improvement harvests to channel growth into quality.

As per the CED, timber management will not occur in areas above 2,700', on slopes exceeding 35%, and along streams, navigable rivers, and ponds and bogs as per buffer requirements of RSA 224:44 (recodified as 227-J:9). But, restrictions on cutting next to streams will be more restrictive than those set forth in the CED. Other areas, particularly those with special ecological features that might be disturbed by harvesting activity, will be set aside as well. Core natural areas will be prohibited from harvest, while natural area buffers and corridors may receive limited management; monitoring (control) areas **(Chapter 5– Management of Areas of Ecological Concern)** will be established below 2,700' to study natural forest developments in both managed and unmanaged sites. Timber harvesting activity will be limited, but not necessarily prohibited, in areas of high recreational use. Road construction and maintenance will be dictated by soil and site conditions and by access requirements, consistent with recreation and wildlife management plans.

Even-aged management will be an accepted silvicultural method, but restrictions on clearcutting will be more stringent than those set forth in the CED. Clearcutting will be used only when no other silvicultural method will accomplish the desired condition. Any clearcuts, if prescribed, will be located and designed to conform to topography and contour, consistent with visual quality guidelines, so as to have minimal aesthetic impact. Summer harvesting will be allowed, if necessary to accomplish silvicultural objectives. Artificial regeneration (planting) will be discouraged, except for educational and restoration purposes using native species.

Notwithstanding state law (RSA 430:2), chemical herbicides or pesticides will be prohibited from use. Timber salvage necessitated by natural catastrophe such as fire, blowdown or insect infestation shall be allowed. Because of liability to abutting landowners, forest fire suppression will be allowed. Control of non-native exotic plants, animals and insects will be emphasized.

At all times, timber management will be consistent with wildlife habitat objectives. All timber harvesting will be carried out only after assessment of its impact on historical

resources. The maintenance of water quality will be of utmost priority; established best management practices for controlling soil erosion will be required at all times.

A 20-year planning window concept will be used to implement the timber management plan. Within this planning window, 5-year implementation plans will be developed such that the entire acreage specified for timber management will receive attention or treatment within the 20-year period. Work units will be established to allow most efficient and economical management within specific areas, and to provide for in-depth pre-harvest inventory. Determination of sustainable yield and allowable cut will be on an area basis, rather than a volume basis.

Conservation Easement and Timber Management

Timber management is a primary emphasis of the Conservation Easement Deed (CED). The CED places constraints on the management and use of the timber resources as part of a multiple use natural resources management program (**Table 19**). The terms and conditions of the CED relating to timber management are listed in **Chapter 1 – Conservation Easement.**

No Harvest Areas

Areas specified by the CED where no timber harvesting shall occur[23] are described as follows:

(1) A 150-foot buffer around the three ponds drained by Pond Brook: Whitcomb Pond, Trio Pond, and Little Bog (Fourteen and a Half) Pond; the buffer totals an estimated 55 acres determined from the ordinary high water mark of the ponds.

TABLE 19
Estimated Area Impacted by CED Timber Management Constraints

CED CONSTRAINTS	ACRES
Area Above 2,700 ft. Elevation	8,148
Steep Slopes > 35% (below 2,700 ft.)	2,462
150 ft. Pond Buffers	
Whitcomb Pond	16
Lower Trio Pond	13
Little Bog Pond	26
TOTAL	**10,665**

(2) No logging shall occur on steep slopes greater than 35 percent or high elevations above 2,700 feet. Areas of steep slope and high elevation were identified for mapping purposes through GRANIT data analysis. Minimum map unit size for steep slope is 30 meters by 30 meters (about 1/4 acre). High elevation totals about 8,148 acres (just under 21% of the forest); steep slope, below 2,700 feet, totals about 2,462 acres (**Chapter 1 – Map 2 – *Areas Specified in the Conservation Easement***).

Restrictions on Clearcutting and Logging Near Streams

Restrictions on clearcutting and logging near streams shall be more stringent than those set forth in the CED outlined as follows (**Chapter 5 – Management Guidelines**):

(1) No more than 50% of the basal area of the trees shall be cut, or otherwise felled, leaving a well-distributed stand of healthy growing trees, within 150 feet of Nash Stream and Pond Brook as defined in the CED;

(2) Riparian zone guidelines which include best management practices will be followed when harvesting timber adjacent to all streams;

(3) Clearcuts shall not exceed 30 acres in size nor exceed more than 15% of the total easement area in any 10-year period. Any increase in these limits requires approval of the U.S. Forest Service.

Additional clearcutting restrictions are as follows:

a) Clearcutting will be used only when no other silvicultural method will accomplish the desired condition;

b) Clearcutting, when used, will be limited to sites with strong recuperative capacity;

c) Cutting will be done in the context of a larger watershed unit and in relation to all previous cuts in the unit (at a minimum, as per the CED, no new adjacent clearcuts shall be made until previous clearcut regeneration is at least 15 feet tall);

d) Cuts will be relatively small to ensure availability of seed sources and to minimize losses of dissolved substances and eroded material;

e) When possible, clearcutting will be limited to frozen ground periods to minimize damage to the forest floor;

f) Roads will consume an absolute minimum amount of area;

g) Riparian zones will be protected;

h) Proper ecological weight will be given to early successional plant species (these species play an important role in recovery processes by conserving nutrients and minimizing erosion and are also important wildlife foods);

i) Planned target ages (see ***Soil/Site Capabilities and Target Ages*** in this section) will be long enough for the ecosystem to regain, by natural processes, nutrients and organic matter equivalent both to that lost as a result of product removal and to losses accelerated by clearcutting;

j) Cutting will be consistent with wildlife and plant habitat goals.

Sustained Yield Management

The CED requires that the timber resources shall be managed on a sustained yield basis consistent with multiple use objectives without impairment of the productivity of the land and forest resources. This means that the flow of wood products will be part of the production of a mix of values, and other products (usually commodities, but may be other uses), while achieving a desired state (Vision) of the forest.

Management will strive to sustain the condition of ecosystems for all the benefits and values such systems offer. Thus, the condition of the Forest is the dominant focus, and the sustained yield of products will be provided within this context.

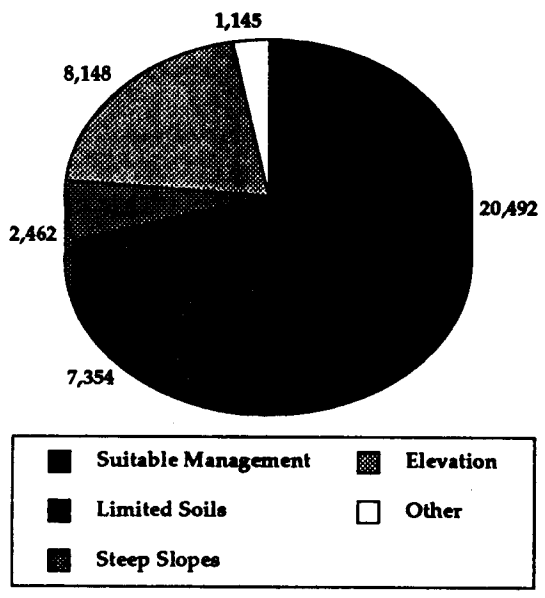
Sustained yield timber management will be guided by a simple and direct method called area management. The principle of area management is that an approximately equal area is regularly treated, or considered for treatment. Area management provides flexibility for modifications to cutting techniques and harvest volumes to protect or enhance

non-timber values. In this manner, the area treated for timber management will remain relatively constant but periodic harvest volumes may vary.

Available Forest Land
The Conservation Easement Deed places timber management constraints on an estimated 10,665 acres. Wetlands, ledge, powerline, unsurveyed lots, and other non-forest areas total 888 acres leaving 28,048 acres of available forest for potential timber management use. See **Appendix 7– Available Forest Land and Other Categories.**

Areas Suitable For Timber Management
Almost 75% (20,492 acres) of the available forest described above consists of stable and productive soils suitable for timber management[24] **(Figure 14) (Map 8)**. This represents more than half (52%) of the property. The remaining 48% consists of areas restricted by the Conservation Easement Deed (high elevation, steep slopes and pond buffers), limited (SCS Group II) soils[25], non forest and other areas. Timber cutting on limited (SCS Group II) soils will be restricted to the enhancement of non-timber values such as wildlife and endangered species habitat (**Chapter 5– Management of Areas of Ecological Concern**).

FIGURE 14
Protection and Management Categories (In Acres)



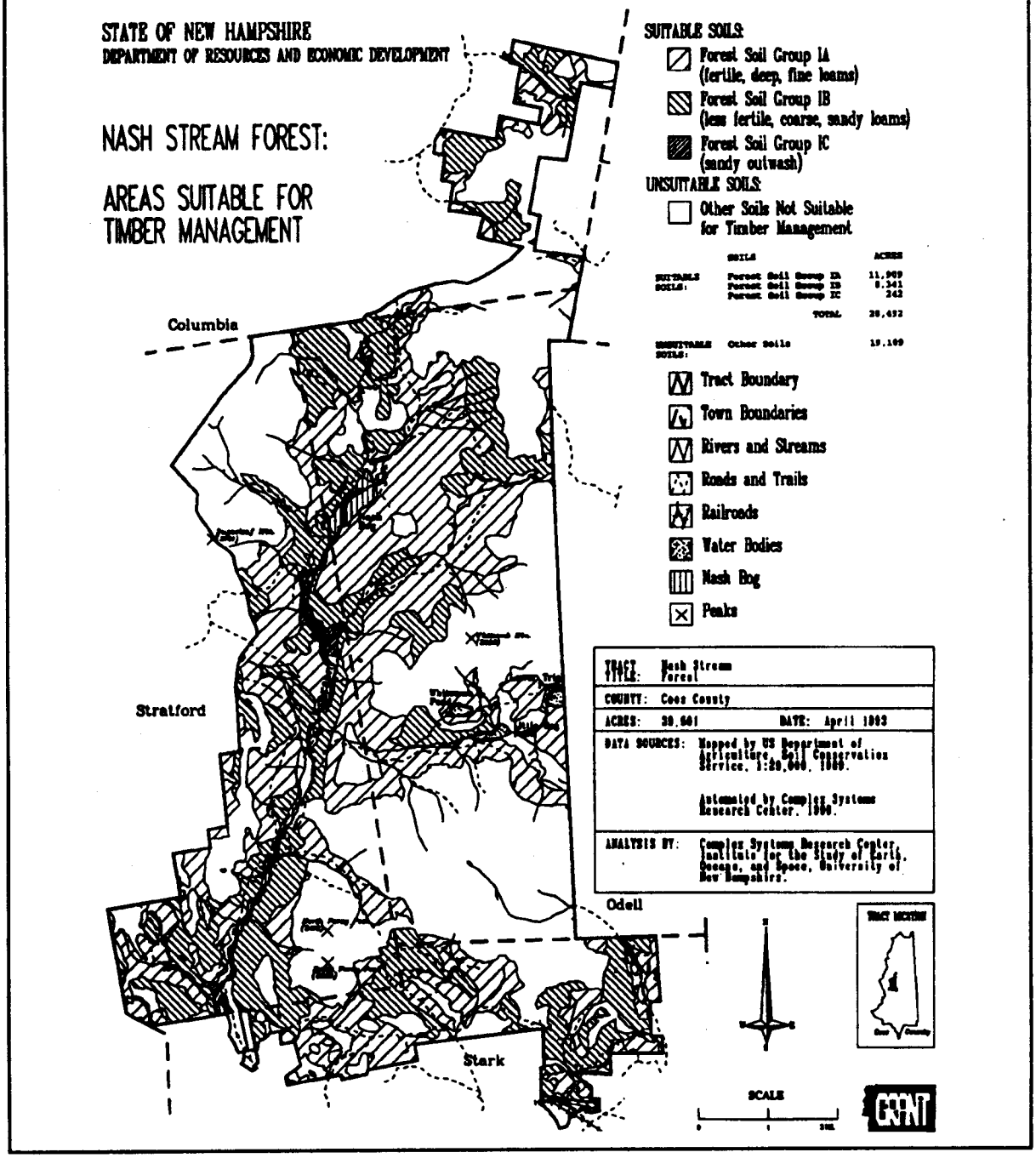
Ecological Land Capabilities
Eight ecological land groups (ELGs) have been identified within the area suitable for timber management (ASTM) to guide timber management. ELGs provide a basis for evaluating forest and land capability for timber management. Understanding ELGs and forest and land capabilities provides a means for determining timber management techniques that are consistent with natural stand dynamics and forest community development. Such management techniques include the ability to support the natural distribution and development of the forest.

Species Composition and Distribution
Timber management practices will be used that support the natural distribution and development of forest associations. The distribution and development of forest associations in the ASTM can be determined from Ecological Land Groups identified in **Table 20,** page 102.

Ecological Land Groups #5, 7 and 10 support pure hardwood forests on lower and middle mountain side slopes. These ELGs total just under 70% (14,089 acres) of the ASTM and are dominated by Group IA soils[26]. Group IA soils are deep, loamy, fine-textured and moderately well-drained soils that generally

MAP 8

Areas Suitable for Timber Management



support combinations of site demanding species such as sugar maple, yellow birch and white ash.

About 29% (6,029 acres) of the ASTM is made up of ELGs #6, 9, 11 and 12 that support mixedwood forests on lower and middle mountain sideslopes. These ELGs are dominated by SCS Group IB soils that are less fertile and coarser, sandy loams, moderately well and well-drained. These soils generally support combinations of less site demanding species such as beech, red maple, aspen, and paper birch. Scattered individual stems and small groups of red spruce and/or balsam fir often occur where soils are shallower.

TABLE 20
Ecological Land Groups in the Area Suitable for Timber Management (ASTM)
Location + Soil History + Forest Association = Ecological Land Group (ELG)

LOCATION (Landscape feature)	SOIL HISTORY (parent material)	FOREST ASSOCIATION (natural succesaion)	ECOLOGICAL LAND GROUP	SCS SOIL GROUP
Valley Bottom (374 acres)	Outwash, Alluvial (Lacustrine)	Spruce/Fir/Pine (pure softwood)	(14) VB/OAL/SFP	IA 132 acres
				IC 242 acres
Lower Slope Mountain Side (4,886 acres)	Frigid Non Hardpan (Glacial Till)	Beech/S Maple/Spruce (hardwood/softwood mix)	(12) LSS/FNT/EMS	IA 986 acres
		Beech/R Maple/Spruce (hardwood/softwood mix)	(11) LSS/FNT/ERS	IB 3,773acres
		S Maple/Birch/Ash (pure hardwood)	(10) LSS/FNT/MBA	IA 37 acres
		Spruce/Fir/S Maple (softwood/hardwood mix)	(9) LSS/FNT/SFM	IA 90 acres
Middle Slope Mountain Side (15,232 acres)	Frigid Hardpan (Glacial Till)	S Maple/Birch/Ash (pure hardwood)	(7) MSS/FHT/MBA	IA 10,010 acres
		Spruce/Fir/S Maple (softwood/hardwood mix)	(6) MSS/FHT/SFM	IA 432 acres
				IB 748 acres
	Frigid Bedrock (Glacial Till)	S Maple/Birch/Ash (pure hardwood)	(5) MSS/FBT/MBA	IA 222 acres
				IB 3,820 acres

NOTE: Superscript number ( ) preceding each ecological land group refers to group number in **Appendix 8–Ecological Land Group Descriptions.**

The remaining soils in the ASTM are in ELG #14. This ELG supports softwoods on outwash, alluvial (OAL) soils that are primarily sandy outwash soils on valley bottoms that support combinations of red spruce and balsam fir that may naturally cycle between softwood and hardwood compositions.

Soil/Site Capabilities and Target Ages

Soil/site capability is a measure of the soil productivity and associated habitats. Soil/site capabilities determine the ability of soil on a given habitat to support and grow naturally occurring trees to a desired age and condition. When a final crop tree reaches a desired age and condition(s) based on the soil/site capabilities, it has reached its target age.

Target ages are based on soil/site capabilities and generally correspond to the culmination of volume growth[27] and stem quality. Target age is used as a guide to determine the approximate age to harvest trees (and stimulate replacement through the process of natural regeneration), desired stand structure, or biotic contribution.

Three soil/site capability groups have been identified in the ASTM from which target ages (**Table 21**) have been determined. The three soil/site capabilities and associated ecological land groups are as follows: (1) hardwoods on mountain side slopes over fine till soils – includes ELGs #5, 7 and 10; (2) mixed hardwoods and softwoods on mountain side slopes over washed or compacted till soils – includes ELGs #6, 9, 11 and 12; and (3) softwoods on valley bottoms over outwash, alluvial or lacustrine (OAL) soils – ELG #14.

TABLE 21
Target Ages by Soil/Site Capability Group

SOIL/SITE GROUP	TARGET YEARS
Hardwood/Fine Tills	140
Mixedwood/Washed Tills	100
Softwood/OALs	80

Hardwood Fine Tills on Mountain Side Slopes – (includes ELGs #5, 7 and 10) is a very productive soil/site capability group with a natural tendency to grow combinations of pure hardwoods such as sugar maple, beech, yellow birch and white ash. This group is generally characterized by fine textured and fertile soils which provide opportunities for long target ages and growth of large, high quality trees. For example, research indicates that sugar maple generally matures at 20 to 24 inches in diameter at breast height (DBH) and culminates growth at approximately 140 years of age.

Mixedwood Washed Tills on Mountain Side Slopes – (includes ELGs #6, 9, 11 and 12) tend to support stands of mixed hardwood and softwood species that include beech, red maple, aspen, paper birch, red spruce and balsam fir. Stand compositions range from nearly pure beech and red maple on coarse loose sands and gravels to heavy concentrations of spruce and fir with hardwoods over soils with a water retentive layer. In general, soils in this capability group are coarser textured and less productive than fine tills. The growth of large diameter trees is less common. Stands in general tend to culminate growth in 80 to 90 years. However, beech and red maple may remain

commercially productive up to age 100 to 120 years. But balsam fir, aspen and paper birch experience extensive decay and mortality between 60 to 80 years of age.

Softwood Outwash Sites on Valley Bottoms – (ELG #14) have a strong tendency toward spruce and fir. Stands heavily stocked with red spruce may reach maturity in 80 to 100 years or more. However, some individual red spruce stems may remain vigorous for several hundred years. Stands heavily stocked with balsam fir tend to experience heavy decay in 70 to 80 years (sometimes earlier on some sites). Because of differences in longevity between spruce and fir, there may be several target ages in softwood stands based on the proportion of spruce and fir.

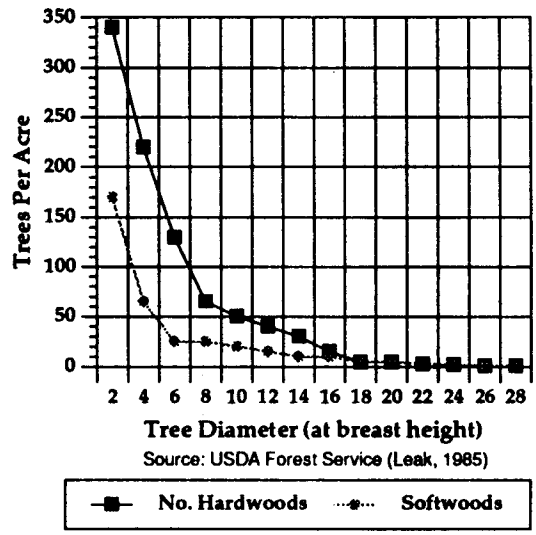
Forest Structure Trend

Forest structure refers to the proportion of age and size classes of trees. Unmanaged forest structures often follow somewhat of an inverse J-shape curve (**Figure 15**). In a forest the exact shape of the curve is determined by many variables such as soil/site capabilities, elevation, climate, and biotic factors such as insects and diseases.

Forest structure in the ASTM will be managed to provide a similar trend in the distribution of size classes consistent with soil/site capabilities (e.g. hardwood fine tills on mountain side slopes). Each soil/site capability (and consequent ecological process) is dissimilar and unique. There is ample information on the natural structure of hardwood forests on fine till soils, and to a lesser degree softwoods on outwash, alluvial or lacustrine soils. Unfortunately, there is limited information about mixedwoods on washed till soils.

FIGURE 15

Diameter Distribution Within "Old Growth" Stands in New Hampshire



Source: USDA Forest Service (Leak, 1985)

Stand Management and Natural Regeneration Patterns

Individual stem mortality and small group or patch disturbance (regeneration) patterns are the natural tendency on about 92% (18,848 acres) of the ASTM providing opportunities for uneven-aged management practices. These sites include ELGs #5, 7, 10, 11 and 12 that support combinations of sugar maple, beech, yellow birch and white ash on the fine textured till soils and red maple and beech with softwood on the coarser and sometimes shallower till soils.

ELGs #6 and 9 make up another 6% of the ASTM that support mixtures of red spruce, balsam fir, birch, and maple. Somewhat larger openings appear to naturally occur on these sites which are best suited to both uneven-aged and even-aged management techniques.

The remaining ELG #14 in the ASTM includes pure softwood sites that may naturally cycle between softwood and hardwood compositions and even and uneven-aged structures. A combination of even and uneven-aged management practices would come close to natural patterns on these sites.

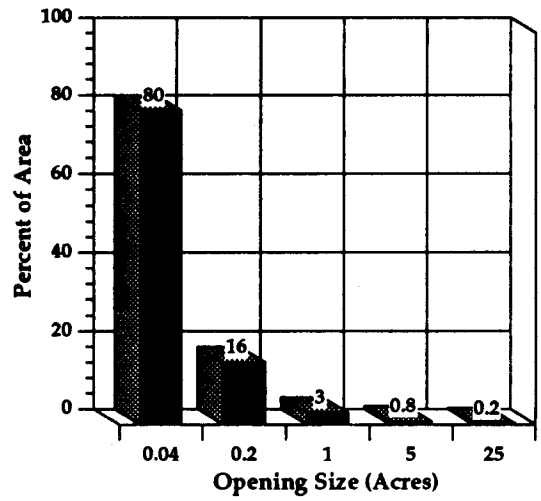
Silvicultural Practices

Silvicultural practices will be used to provide high quality commercial growing stock specified in the Vision. These practices will strive to emulate natural trends of forest structure. Natural trends and stand development do not often produce the best quality commercial growing stock. If this were true there would be no need for the use of silvicultural practices. Natural disturbance patterns will guide commonly accepted silvicultural practices to achieve long rotation, high quality forest products. The most common practice will be single tree selection emulating natural stand structures, but will lower the stand stocking (trees per acre) to a suitable managed density to promote good stem growth and development. Forest thinnings will also be applied in order to re-distribute radial stem growth to an optimum number of crop trees. Many different types of regeneration cuttings will be employed to replace harvested stems. Regeneration cuttings will range from single tree gaps which will be used often, to even-aged clearings of up to 30 acres, to be used less frequently. **Figure 16** shows the estimated distribution of openings that will probably result from management operations.

Attention will also be paid to within stand habitat features. Important non-commercial stem attributes such as large cavities, hard and soft mast producers, snags, and three-pronged stems and broken-topped trees for nesting will be encouraged. The ability of the forest to rebuild soil nutrients and organic matter after logging will also be considered.

FIGURE 16

Expected Distribution of Harvest Openings



Water Quality and Timber Harvesting

Filter strips are protective strips between disturbed areas (e.g. skid trails, truck roads, and log landings) and a water course (e.g. stream, pond, and wetlands) that provide an undisturbed zone to slow down runoff allowing sediment to settle and be filtered out before reaching a water course.

Filter strips will be maintained between all water courses and truck roads, major skid trails, and log landings where soil has been exposed and surface runoff will carry sediment. Filter strips will be protected to prevent exposure of mineral soil. Equipment operation will be limited. If mineral soil is exposed, it will be stabilized by seeding and/or mulching as soon as possible.

Unless otherwise designated by the Conservation Easement (**Chapter 1 – Conservation Easement**) or impacted by state law, filter strip widths will be designated as a function of slope (up to 35% slope[28]) according to best management practices[29] (BMPs) to protect water quality during forestry operations as shown in **Table 22**.

TABLE 22
Filter Strips

AVERAGE SLOPE (percent)	STRIP WIDTH (feet)
0-10	50
10-20	70
21-30	90
31-35	110

Harvesting practices which do not expose mineral soil, such as felling and winching of timber, may take place in filter strips (**Chapter 5 – Management Guidelines**) consistent with New Hampshire law which limits harvesting near surface waters (RSA 227-J:9). Log landings, new truck roads or major skid trails will not be permitted except when entering and leaving stream crossings according to BMP guidelines. Existing roads developed within filter strips and used prior to state ownership may continue to be used if continued use results in less site disturbance than relocation.

Visual Quality and Timber Harvesting
Visual quality objectives will be established for all timber harvesting projects using the guidelines in **Table 23**. For example, cutting practices will be modified adjacent to or within areas frequented by the public for recreation to protect or enhance recreation values (page 118). Limited cutting will be allowed for specific visual or management effects such as demonstration projects, vista cuttings, and wildlife habitat work that is consistent with the Vision and Conservation Easement. See **Map 9**, page 108, for areas of Visual Quality Management.

Cooperative Management and Resource Integration

Cooperative Land Management Committee
The purpose of the Cooperative Land Management Program (CLMP) is to provide coordinated land use policies and management of the state's natural resources agencies. The basic objective of the program is to identify, apply, and evaluate land use policies and management practices which offer the best opportunity for combining resource conservation or improvement for public use and benefit.

As presently constituted, the CLMP embraces the following agencies:

Fish and Game
Forests and Lands
Parks and Recreation
Water Resources

Under current state government organizations, there is no single natural resources agency. The Division of Forests and Lands and the Division of Parks and Recreation are units of the Department of Resources and Economic Development whose Commissioner is appointed by Governor and Council. The Fish and Game Department is a separate agency whose Director is appointed by, and serves under the direction of, a 10-member Fish and Game Commission. The Water Resources Division is a unit of the Department of Environmental Services.

An executive committee, composed of the four Directors of the member agencies, and a

TABLE 23
Visual Quality and Timber Harvesting Guidelines

OBJECTIVES	MANAGEMENT GUIDELINES	EXAMPLE AREAS
PRESERVE	Ecological change only.	(1) Natural preserves
PROTECT	Management activities restricted.	(1) Above 2,700' (2) Steep slopes (35% plus) (3) 150' pond buffers (4) Corridors (5) Natural preserve buffers (6) Mountain Tops (< 2,700') (7) Other Group II Soils
RETAIN	Management not evident or subordinate to landscape maintaining original landscape character.	(1) Foreground Zones
PARTIAL	Management may be evident maintaining most of original landscape character; naturally established vegetative patterns and landforms utilized including established lines, color, form, and texture.	(1) Middleground zones
MODIFY	Management evident often natural in appearance, toward a specific visual or management effect; site restoration work may be necessary for end result.	(1) Management areas where visual quality is not primary

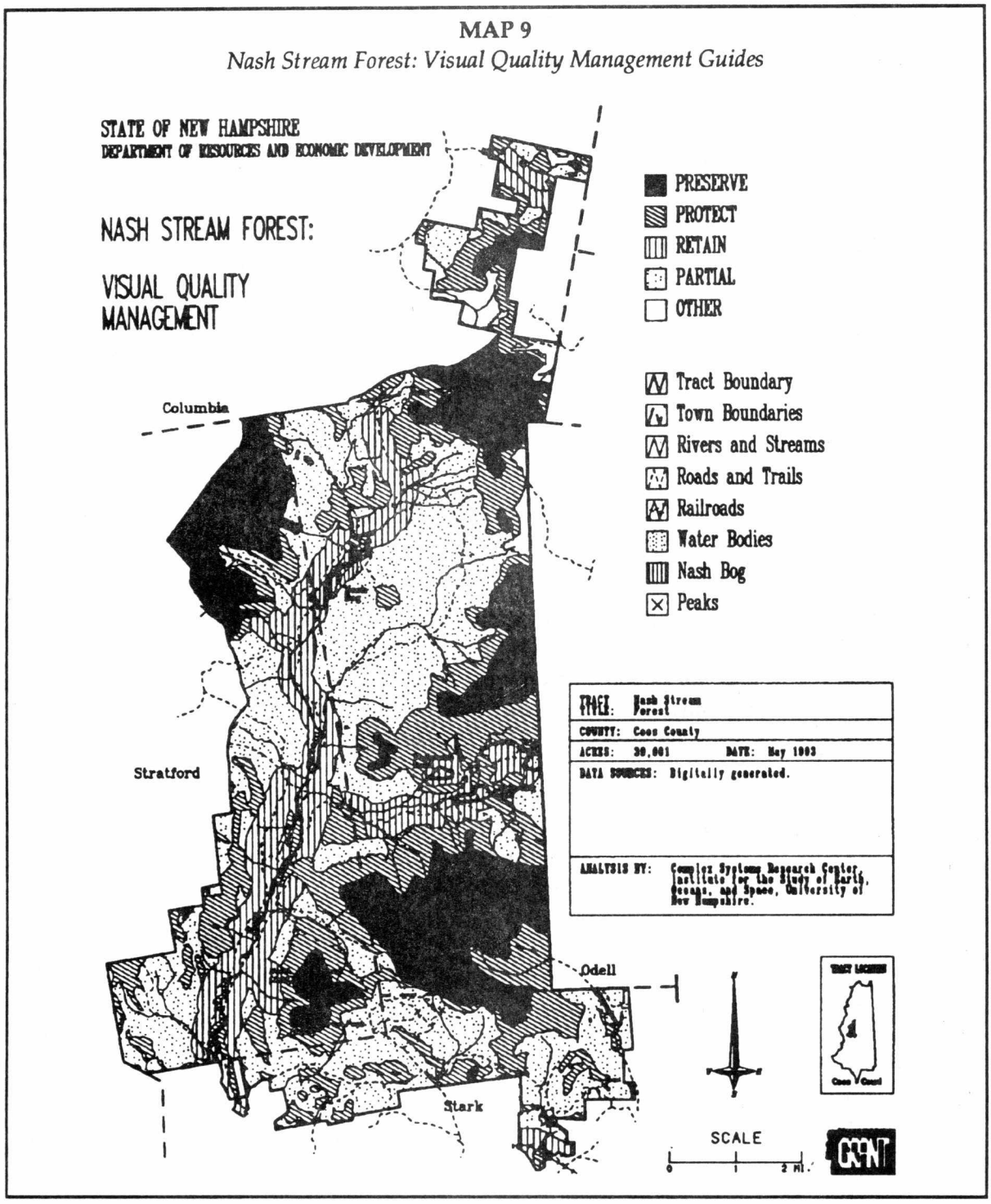
Where two areas overlap, for example, a "150-foot pond buffer" with a protect objective and foreground zone with a "retain" objective, the highest visual quality objective (protect) takes precedence.

Foreground Zone – up to 1/4 mile from the viewer along public high use areas such as Nash Stream Road, Trio Ponds Road, and Percy Peak trail.

Middleground Zone – from 1/4 to 3 miles from viewer along public high use areas and high vista points such as accessible mountain tops.

MAP 9

Nash Stream Forest: Visual Quality Management Guides



working committee appointed by the Directors, made up of key resource managers in each agency, constitute program members. To effectively administer the CLMP, member committees are instructed to:

(1) provide timely review of adherence to current policies and objectives;

(2) formulate specific recommendations regarding the nature, extent and timing of land use practices on specific sites;

(3) initiate management practices which the executive committee has approved, and;

(4) evaluate the execution and results of such practices.

The working committee of the CLMP meets regularly and reports to the executive committee on such program activities as: maintaining an inventory of each agency's properties, review and coordination of land acquisition and disposal, multi-disciplinary review of properties and ongoing programs, coordinated agency funding and utilization of agency personnel, development and implementation of interagency programs, and improvement of ongoing programs and multi-disciplinary management activities.

State Land Management Team

The purpose of the multi-agency State Land Management Team (SLMT) is to provide coordinated, inter-disciplinary resource planning and management assistance at the project level on state-owned forest lands, consistent with the mission and policies of participating agencies.

The inter-disciplinary approach is designed to ensure long-range, comprehensive and balanced consideration of multiple uses and resource values on public lands, since no single scientific discipline is sufficient to adequately identify opportunities and resolve issues and problems.

Core members of the SLMT consist of professional and technical resource management specialists from the following agencies (additional agencies participate on an as-needed basis):

Fish and Game Department

Division of Forests and Lands

Division of Parks and Recreation

Natural Heritage Inventory

Trails Bureau

Office of Historic Preservation

The members of the SLMT meet regularly to:

(1) review proposed land management activities and provide input in the development of operation plans;

(2) provide inter-disciplinary assistance to agencies in the development of long-range comprehensive property/area management plans;

(3) provide inter-agency communication on the status of land and resource management projects;

(4) coordinate field inspections of project proposals; and, if necessary,

(5) present operation plans or SLMT considerations to the Cooperative Land Management Committee.

Following SLMT review, each operation is placed on a "current projects" list for follow-up and monitoring.

Citizen Advisory Committee

It is recognized that the authority to manage the Nash Stream Forest rests with the state of New Hampshire and that this authority cannot be delegated or shared with outside individuals or organizations. It is also recognized that individuals, groups and organizations will be affected by the direction which policy and management take and that there should be a structured process for public input that is open, fair and balanced.

Therefore, in the interest of public involvement, a Citizen Advisory Committee will be established to work in partnership with DRED and other state agencies. A charter or agreement will be established that will identify: (1) the committee's objectives; (2) the scope of activity; (3) the agency or official to whom the committee reports; (4) the committee's duties; and (5) the term of committee members.

To ensure that the committee is in the public interest, committee membership will represent a fair balance of points of view and functions to be performed. Efforts will be made to ensure the Advisory Committee is not inappropriately influenced by any special interest.

Advisory Committee meetings will be open to the public and a notice of each meeting will be properly made. Interested individuals will be allowed to speak before, or submit statements to the committee. Records, reports, working papers, and other documents prepared and/or used by the committee will be made available to the public.

A designated state employee will also be appointed as the Advisory Committee management officer and will attend each meeting as well as ensure the above procedures are established and efficiently followed.

Camp Lot License Management

The Department of Resources and Economic Development (DRED) and its predecessor agencies have always had a policy of not granting private recreation leases (camp sites) on lands under their administrative jurisdiction. This is evidenced by the absence of private camps on our state forests and state park lands. The only exceptions to this policy were those private camps that were "grandfathered" by virtue of their existence at the time of acquisition of the particular land parcel.

In 1965, a decision was made to terminate these "grandfathered" camp sites which at that time numbered fourteen. The last such camp was removed from state land in July 1988 (Royce and Smith, Pisgah).

With state purchase of the Nash Stream Forest on October 27, 1988, the DRED became owner of camp lease sites that existed at the time of acquisition. Approximately 104 of these lease sites have camps that are owned or leased by private individuals under a lease lot program that was maintained by the state's predecessor, Diamond International Corporation.

Subsequent to purchase of the Nash Stream Forest, the state of New Hampshire granted a Conservation Easement Deed (CED) to the United States of America (August 4, 1989). This CED prohibits residential uses (including vacation homes, cabins and camps) of the Nash Stream Forest. However, existing recreation camps are allowed to continue subject

to the rights of the state to limit or terminate their use.

Private Camp Termination

The ultimate goal of the DRED is to remove the private recreation camps from state land and to return the lease sites to public use in their natural condition. This is consistent with past and present private camp lease policy and the overall purpose and intent of the state's acquisition of this property and of the CED. Recognizing the investment of time and money of the camp lot lessees in their camps, and to allow a reasonable period of time in which to recoup this investment, DRED's objective is to phase out the lease lots by allowing limited transfers of the privately owned camps for 15 years and life use (no transfers) by camp owners in year 15, for the remainder of a fifty-year term. The license for the state-owned camp (company camp) will not be transferred.

License Considerations

Camp lot leases with an existing camp building at the date of state acquisition of the Nash Stream Forest may continue under licenses that will be issued by the DRED. Undeveloped camp lot leases shall be cancelled.

Initial license term and renewals shall be in five-year increments. Overall license term, including all renewals, shall not exceed 50 years in duration and all Nash Stream camp licenses shall terminate on June 30, 2039. Transfers (sale, gift, etc.) of camps shall be allowed for 15 years. Individual or family camps shall not be transferred to or owned by more than two individuals at any one time. Association camps may be transferred, however, membership shall be limited to the total number of memberships existing at the date of state acquisition of the Nash Stream property. Camp lot licenses shall be transferred to new camp owners. The number (frequency) of camp transfers during the 15-year period shall not be limited. No camp transfers shall be allowed after June 30, 2004.

Camps on license lot shall be removed from the state land within one year of expiration, termination, cancellation or lapse of the license. Lot license fees shall be uniform for all lots within Nash Stream Forest. License fees for the first five-year term shall be sufficient to cover administrative costs associated with the lot license program and will reflect an appropriate share of the maintenance cost of Nash Stream Forest. License fees may be adjusted at each five-year renewal. However, any increases shall not exceed the accumulated yearly percentage change in the consumer price index for the previous five-year license period, as determined by the United States Department of Commerce and as adjusted regionally for the northeast.

Differences in the lot's natural amenities such as lot location, vehicle accessibility, or water body or stream proximity, and the size and quality of individual camps will not be considered in setting lot license fees. These items will be reflected in the lot and camp assessment and subsequent real estate tax bill received by the lot licensee/camp owner from local assessing officials.

License fees shall be set by the Commissioner, DRED, with approval of Governor and Council.

Acquisition of In-holdings and Outstanding Rights

Nash Stream has four in-holdings (private lands surrounded by state land), three of which have camp buildings. There are also 94 private camps on state land (**Chapter 3 – Recreation Camp Lots**) located along the Main Road, at Nash Bog and around Lower Trio Pond, Whitcomb Pond and Little Bog Pond. Lands associated with these camps are currently licensed to the camp owners under the private camp lot license policy (**Appendix 4**) and standard license form. There are also numerous intrusions into the Nash Stream Forest boundary where state land exists on three sides of a private ownership.

Private ownerships located within state forest and state park boundaries are problematic from the standpoint of comprehensive management, access control, and conflicts with the public, and are considered a high priority for acquisition.

The Department of Resources and Economic Development has always had a policy of not permitting private camp sites on land under department jurisdiction. Private camps that were "grandfathered" by virtue of their existence at the time of acquisition of a particular land parcel have been phased-out over time. Intrusions have also been a priority for acquisition in order to achieve management consolidation and decrease boundary line maintenance requirements.

Private in-holdings, camps and intrusions should be acquired over time as these properties become available for sale. Traditionally, department land acquisitions have been accomplished by: (1) capital budget appropriations; (2) special legislative acts; and (3) gifts in combination with federal monies under the Land and Water Conservation Fund. As there have been no state appropriations for land acquisition in the Department of Resources and Economic Development since 1979, and given the recently completed Land Conservation and Investment Program, funding from these traditional sources is highly unlikely.

To accomplish this land/camp acquisition objective, a non-lapsing opportunity acquisition fund would have to be established and acquisition priorities set. Nash Stream camp lot license fees provide an opportunity to allocate funds for this purpose. Legislative authority would need to be enacted to implement this program. General acquisition priority would be in the following order: (1) in-holdings; (2) intrusions; and (3) private camps. Within each category, specific priority properties could be established. However, if only friendly acquisitions (willing sellers) are to be used, property availability will, for the most part, set the priorities. An opportunity acquisition fund could also be used to pay for demolition and site restoration if acquired.

Roads and Access Management

No new permanent roads are planned. Parking areas and trailheads will be addressed as needed. No existing roads are planned for permanent closure; all roads will be maintained (**Chapter 3 – Roads and Access**).

Vehicle Access and Gates

Traditional vehicle access patterns will be continued[30]. The main gate will be opened each spring when road conditions allow[31]

and closed in December. The Main Road and Fourteen and a Half Road will be open to public vehicle access. All other interior gravel roads will be gated according to DRED standards. In this manner, motor vehicle traffic disturbances to wildlife and wildlife habitat will be minimized, low impact and remote recreational activities will be available, and road maintenance costs will be reduced. Vehicle travel on gated roads will be limited to management and forest protection activities.

Maintenance
All roads are classified into summer and winter roads for maintenance purposes (**Appendix 5 – Road List by Class**), and divided into three classes:

(1) Summer roads Class B gravel – all purpose;
(2) Summer Class C restricted use – light duty vehicles; and
(3) Winter roads Class D non-gravel – restricted use.

Class B, C and D descriptions are included in **Chapter 6 – Glossary** under **Roads**. Class A roads are public highways; Class U roads are unclassified.

Annual maintenance operations will focus on the Main Road and Fourteen and a Half Road and will include grading, resurfacing, raking, mowing or brushing, and upkeep of drainage structures and parking areas. All other interior roads will be regularly inspected and maintained as needed, including upkeep of gates, erosion control devices, drainage structures, mowing and brushing, reshaping, and graveling. Mowing and brushing operations will be avoided from May through July to avoid disturbing ground and shrub nesting birds.

Trio Ponds Trail will not be maintained for conventional motor vehicle use because of its location over rough terrain. However, it will be maintained as a snowmobile and walking trail. See Public Use Guideline #11, page 129 regarding motor vehicle use of Trio Ponds Trail.

Emphasis will be placed on resolving beaver flooding problems on roads and trails with beaver pipes (**Chapter 5 – Wildlife Management**). A beaver pipe is a 3-sided, box culvert with wire mesh on the bottom.

Gravel Use Policy
Gravel excavation may be permitted on the Nash Stream Forest in accordance with DRED gravel excavation, reclamation and operational standards[32] under the following criteria: (1) when material excavated would be used for improvements within DRED property boundaries; or (2) when material excavated would be used for state or municipal road improvements that would enhance public access specifically to a DRED property or properties; and (3) when the rights to excavate gravel or other earth materials on the property are not allowed or controlled by DRED.

Management Guidelines

The following are Management Guidelines for the Nash Stream Forest. These guidelines are subject to change by state law.* A complete list of state laws governing management activities at Nash Stream is listed in **Appendix 10.**

A. COOPERATIVE MANAGEMENT

1. Significant management activities will be coordinated with the Cooperative Land Management Committee and State Land

* The Commissioner of DRED has the statutory responsibility to adopt, amend, or repeal rules and regulations governing the management and use of all state reservations.

Management (interdisciplinary) Team, and other state and federal resource specialists as appropriate to ensure consideration of multiple resource values and user interests. Significant management activities include timber harvests, recreation developments, habitat enhancements, road and trail construction, and major maintenance projects.

2. **Conservation Easement**–Department of Resources and Economic Development staff will meet on a regular basis with White Mountain National Forest staff to review land use policies and management practices to ensure compliance with the Conservation Easement.

3. **Citizen Advisory Committee**–A Citizen Advisory Committee will be appointed and scheduled to meet regularly to serve as a focused source of public input and assistance.

4. **Public Notice**–Public notification will be made for significant proposed management activities such as timber harvests, major recreation developments, and emergency closures (see also G. #7).

5. In compliance with RSA 541-A:22, local municipalities will be notified of any actions within its boundaries that directly affect that municipality.

6. **Information Sharing**–Cooperative information and education activities will be encouraged and implemented when possible to reduce the number, intensity, and cost of conflict producing and resource damaging situations.

7. **Volunteers**–Opportunities in which individuals and volunteer organizations can assist with management of the property will be implemented when feasible.

B. CULTURAL RESOURCES

1. **Identification/Protection**–Areas likely to contain archaeological sites will be identified; areas likely to undergo alteration of the land surface will also be identified. Where these two categories overlap, a cultural resources survey will be executed and appropriate steps taken in accordance with state and federal regulations.

2. **Testing**–Archeological testing will be permitted by qualified archeologists who have obtained special use permits (see **Public Use Guidelines,** page 128).

C. PEST MANAGEMENT

1. **Detection**–Regular and systematic detection activities that include aerial flights and ground surveys will be employed to detect abnormal forest cover changes and abnormal plant disease populations.

2. **Evaluation**–Cause and effect of abnormal forest cover changes and abnormal natural plant disease populations will be identified and evaluated.

3. **Prevention/Control**–In compliance with RSA 430:2 and 227-H:2, the control of damaging insect and disease infestations will be a management strategy. Precautions will be taken to ensure that the management strategy does not adversely impact native plants or wildlife, especially threatened and endangered species.

4. Preference will be given to prevention and control of damaging pest problems through silvicultural means, including commercial salvage operations.

5. If non-native species are determined to interfere with native plants or natural pests, management strategies will be developed and implemented to monitor, control or eradicate the problem species.

6. Regional seed stock of native species will be used wherever feasible in the reseeding of log landings, roads, and other disturbed areas.

D. RECREATION

1. **Water/Soil** – Best management practices (BMPs) will be used for erosion control on trails in accordance with "Best Management Practices for Erosion Control on Trails, A Resource Manual," New Hampshire Trails Bureau, 1994. BMPs include such measures as turnpiking trails, log bridges, filter strips, stepping stones, stone waterbars, and treadway hardening.

2. **Multiple Use Trails** – Multiple-use trail corridors will be encouraged, where consistent with recreational purpose, to minimize disruptions caused by additional trail construction and use.

3. **Trail Construction and Maintenance** – Recreation trails will be developed and maintained for the highest standard of use on that trail following "Best Management Practices for Trail Construction and Maintenance," adopted by the Department of Resources and Economic Development, supplemented by the following for:

   A. Hiking trails – Appalachian Trail Conference Standards.

   B. Snowmobile trails – Inter. Assoc. of Snowmobile Administrators Trail Standards (draft).

   C. Mountain bike trails – established roadways unless otherwise posted; no off-road or cross country use permitted.

   D. Equestrian trails – (standards are under development).

   E. Other trail uses will be evaluated to determine the degree to which additional standards are required.

4. Whenever possible, permanent roads and trails with gates or blocking that are not actively used for logging or other management purposes will be maintained and available for low-impact and semi-remote recreational activities.

5. **Wildlife** – Planning, development and maintenance of recreational sites will incorporate consideration of wildlife and wildlife habitat needs. Snowmobile and cross-country ski trails should avoid stands that are presently dense softwood or are being managed to develop dense softwood (see also J. #11 through 16).

6. Beaver dams shall not be breached and impoundments shall not be drained for trail construction or maintenance without prior review by the State Land Management Team (see also J. #10).

7. **Visual Quality** – Recreation management activities will be sensitive to visual impacts.

8. **Camping Areas**–Should camping be considered appropriate for Nash Stream Forest, preference will be given to sustainable, backcountry camping accessed by means other than automobile, and where only primitive facilities are provided.

9. **Backcountry Campsites**–May be established when: there is identified need and desire; there are identified sites suitable and desirable for camping that do not conflict unreasonably with natural values of the site; and when appropriate management resources are available to monitor and maintain quality campsites.

10. **Disability Access**–Recreation management will comply with the American Disabilities Act (ADA). Reasonable accommodation will be used throughout the planning process to provide access to individuals with disabilities.

11. **Parking Areas**–Parking areas will be located and designed to meet minimum carrying capacity for trails and/or recreational area served.

12. **Health and Sanitation**–Consideration will be given to toilet facilities for parking areas and other developed sites that concentrate people. If septic disposal systems are considered necessary, they will be designed to accommodate anticipated use and comply with applicable state and federal law.

    A. Pit toilets are appropriate where public use is light to moderate and soils are suitable.

    B. Vault, mulching, and leach field systems are appropriate where public use is moderate to heavy.

13. A "carry in/carry out" policy will be promoted for all solid waste.

14. **Interpretation**–Interpretive programming and signage will be consistent with the interpretive standards of the National Association of Interpretation. Signage will be minimal, designed and placed so as not to interfere with visitor experiences of that which is being interpreted.

E. ROADS AND ACCESS

1. **Motor Vehicle Access**–Traditional public access by conventional motor vehicle will be continued on the Main Road and Fourteen and a Half Road. All other interior roads will be gated[33] and maintained for controlled access in order to provide for public safety and prudent resource utilization and protection.

2. Public access to roads and trails normally closed to conventional motor vehicular traffic may be granted on a case by case basis for specific purposes.

3. The gate on the Main Road at the south end of the property will be opened each spring when road conditions allow and closed in early December unless weather and road conditions require otherwise.

4. **Construction and Maintenance**–Road construction and maintenance will be dictated by soil and site conditions and by access requirements consistent with type and amount of use and management objectives. The Main Road and Fourteen and a Half Road will be maintained to Class B, gravel, all-purpose roads.

5. Construction and maintenance will be conducted in conformance with current applicable federal and state laws and regulations pertaining to the abatement of erosion and water pollution, including the use of best management practices prescribed for given activities.

6. Mowing and brush cutting for road maintenance purposes will be avoided from May through July to avoid disturbing ground and shrub nesting wildlife.

7. Sand, gravel, or other "borrow" excavation will be allowed in accordance with Department of Resources and Economic Development, "Reclamation and Operational Standards for Gravel Excavation on DRED Properties," adopted in 1991.

F. NATURAL PRESERVES

1. **Designation**–Natural preserve designation will be based on established DRED criteria. All lands above 2,700′ elevation satisfy one or more natural preserve criteria or are restricted from timber cutting by the Conservation Easement and therefore will be designated as natural preserves or otherwise restricted from timber harvesting.

2. Control areas will be established to complement natural preserves for research and education purposes to ensure that representatives of the full range of identified ecological communities that meet control area criteria remain largely unaltered by human activity. The size and location of control areas (**Chapter 5–Management of Areas of Ecological Concern**) will be based on factors which include but are not limited to community and hydrologic integrity, disturbance history, natural diversity, and isolation from outside influences (see also G. #14).

3. Mountaintop ecological land groups below 2,700′ and other land areas with limited (Group II) soils will be excluded from most management activities because of their fragile ecological characteristics. These areas will be subject to the same restrictions as buffers and corridors (see F. #8).

4. **Management**–Management practices and public uses will ensure preservation in accordance with the designation objective of natural preserves. To ensure that the biotic integrity of natural preserve areas and controls is maintained, all management actions proposed within these areas will be coordinated with the Natural Heritage Inventory and other members of the State Land Management Team.

5. There will be no physical manipulation of a natural preserve area that would alter natural processes or features.

6. Public use of natural preserve areas will be allowed to the extent that it does not alter natural features. Hunting, trapping, and fishing will be permitted in accordance with existing laws.

7. No structures or motorized traffic will be permitted in natural preserves. Trails, foot bridges and signs are permitted provided they are in compliance with #4 and #5 above.

8. **Buffers and Corridors** – Natural preserve buffers and corridors will be managed to reduce or eliminate impacts to the core natural preserves and control areas. The intensity of forest management will be reduced in buffer areas and corridors; management will be limited to low-intensity activities.

9. The widths of buffers and corridors will be determined independently for each area, depending on such factors as soils, topography, and vegetation.

G. TIMBER

1. **Multiple Use** – Timber management practices will be implemented so as to maintain or enhance other resource values.

2. Ecological conditions and resources that serve public needs such as special habitat for game and non-game fish and wildlife species, timber stands for wood products, and forest areas for recreation opportunities will be sustained.

3. Roads used for timber management purposes will be kept to a minimum number and standard considering safety, environmental impacts, and cost (see also E. #1 through 7).

4. **Sustained Yield** – Sustained yield refers to all forest products including timber, wildlife, clean water, public recreation, and aesthetic enjoyment.

5. The condition (i.e. Vision) of the Forest is the dominant focus, and the sustained yield of timber will be provided within this context. Sustained yield timber management will be guided by area management based on ecological land groups suited to timber management. Sustained yield area management will result in a relatively constant area treated for timber management but periodic harvest volumes may vary due to modifications to cutting techniques to protect or enhance non-timber values.

6. The land base for the determination of sustained yield of timber products will be the area considered suitable for timber management (**Chapter 5 – Timber Management**). This area consists of stable and productive soils exclusive of high elevations, steep slopes, sensitive and fragile soils, natural preserves (and buffers and corridors), non-forest areas, and other areas restricted by the Conservation Easement or administrative designation.

7. **Public Notice** – Public notification will be made for timber harvest proposals for public information and response.

8. **Recreation/Visual Quality** – Timber management practices adjacent to or within areas frequented by the public for recreation will be modified to protect or enhance recreation values. Roads and trails will be left unobstructed and special care will be taken in regard to slash within sight of roads and trails.

9. Visual quality objectives will be determined for each timber harvest operation. Areas of scenic value will be managed for the protection of aesthetic qualities. Limited timber cutting will be allowed to improve aesthetics or safety such as:

A. Removal of dead, diseased or high risk trees;

B. Single tree or group selection (uneven-aged cutting techniques) for variety in plant size and species; and

C. Small openings for vistas.

10. **Water/Soil** – Best management practices will be used during all timber harvesting operations to minimize erosion and reduce sediment and temperature changes in streams in accordance with "Best Management Practices for Erosion Control on Timber Harvesting Operations in New Hampshire, Resource Manual," Division of Forests and Lands, 1990. BMPs include such measures as water bars, temporary stream crossings, filter strips, hay bales, reverse grades, drainage devices, and seeding.

11. Temporary road, skid trail, and log landing design will include consideration for revegetation in order to stabilize soils, mitigate negative visual impacts, and provide for wildlife habitat.

12. **Special Areas** – Habitat of threatened or endangered species and areas of ecological significance including vernal pools, critical wildlife habitat, and natural preserve areas will be protected.

13. In both buffers and corridors, the primary goal of timber harvest will be to promote other resource values (e.g., wildlife habitat). If timber harvesting is prescribed in buffers and corridors, the intensity of management will follow a gradient, involving less disturbance as the core natural preserve areas are approached (see also F. #8).

14. Research control areas will be established in the area considered suitable for timber management and will be protected from logging disturbance (see also F. #2).

15. **Genetic and Species Diversity** – Management practices that support the natural distribution and development of forest associations will be emphasized; natural successional tendencies will be encouraged. Characteristics of older successional stages such as large old trees, dead standing trees, dead downed trees, rotting wood in shade, and healthy, vigorous trees will be encouraged where possible; proper consideration will also be given early successional species such as pin cherry, raspberry, aspen, and paper birch (see also G. #17 and #24, and J. #25 through 30).

16. **Ecosystem Diversity** – The integrity of natural communities and habitats of native species will be protected.

17. Timber management will support and promote a structurally diverse landscape and will strive to emulate natural disturbance and vegetative regeneration patterns and natural soil and site tendencies. Key indicators that will be used include the size and distribution of canopy gaps within stands, and the size and distribution of vegetative stand types within the landscape.

18. **Marketing/Utilization** – All interested parties will be provided the opportunity to bid on any proposed timber sale in accordance with procedures adopted by Governor and Council.

19. A timber sale contract will be required for each timber sale detailing timber included and price, method of payment, period of contract, scaling specifications, cutting and utilization standards, logging and skidding restrictions, trucking constraints, site restoration and sanitation requirements, safety and indemnification clauses, and statutory requirements.

20. Forest management staff will routinely inspect and supervise each timber sale while in operation.

21. A performance bond will be posted by the timber buyer and held by the state during the term of the contract to insure proper contract compliance and satisfactory completion of the sale. All timber is paid for in advance of cutting.

22. All trees designated for cutting and removal will be utilized according to specified utilization standards based on current markets, species, and where tree form and branching permit.

23. **Silvicultural Treatments**–Each timber harvesting operation will be based on a detailed management prescription.

24. Uneven-aged management will be the method of choice for managing and regenerating timber stands. Limited, judiciously applied, and environmentally sound even-aged management (including clearcutting) may be appropriate to provide certain ecological conditions, products, and experiences associated with early successional forests. Even-aged silviculture may be used to:

    A. Promote regeneration and growth that usually occurs naturally in scattered openings in the forest.

    B. Regenerate shade intolerant and intermediately intolerant species such as aspen and paper birch.

    C. Rehabilitate degraded or sparsely stocked areas.

    D. Meet wildlife habitat objectives.

    E. Protect forest health from damaging disease, insects, fire or other natural disaster.

    F. Make infrequent entries into management areas and minimize access road construction; and

    G. Open small vistas.

25. Uneven-aged silviculture will be used to:

    A. Regenerate shade tolerant species.

    B. Maintain continuous forest cover and shade in environmentally sensitive areas.

    C. Produce a variety in plant sizes and species along trails, roads and other visually sensitive areas; and

    D. Meet wildlife habitat objectives.

26. Each timber harvesting operation will be part of a regeneration system designed to create conditions favorable for the eventual replacement of the existing stand with naturally occurring tree species.

27. **Wildlife Habitat**–Management will strive to attain and maintain vegetative composition goals and patterns consistent with ecological land capabilities and

soil and site properties to integrate wildlife habitat concerns into long-term timber harvest and silviculture schedules.

28. Site specific wildlife habitat management practices will be considered with every timber harvesting operation and include: release of fruit producing trees; release of softwood understory trees; identification and retention of mast, cavity, snag, perch, raptor nest, and other critical wildlife trees; recruitment of woody debris adjacent to streams; encouragement of within-stand diversity; protection of wildlife travel corridors, water resources, and deer wintering areas; and management of logging roads and landings to benefit wildlife.

29. Whenever possible, existing truck roads, skid trails and log landings will be used for forest management operations. New road construction should be minimized and proposed locations evaluated to ensure protection of wildlife habitat. Roads will avoid riparian zones, and minimize stream crossings.

30. Whenever possible, log landings and roads will be stabilized and seeded with a mixture of grasses and clovers upon completion of operations (see also C. #6 and J. #9).

H. THREATENED AND ENDANGERED SPECIES

1. **Protection/Monitoring** – Timber, recreation and other management activities will avoid disturbance or deterioration of habitat of threatened, endangered, or rare plant and animal species. All management activities involving significant ground disturbance, including but not limited to timber harvest and road and trail construction, will be reviewed and coordinated with the State Land Management Team.

2. Rare or significantly declining plant and animal species and habitats known to occur in the Nash Stream Forest will be protected and monitored. The Fish and Game Department and Natural Heritage Inventory continuous statewide survey and monitoring programs of threatened and endangered flora and fauna will be the basis for determining if species or habitats are rare or significantly declining.

I. RIPARIAN ZONES

1. **Designation** – Riparian zones are aquatic-terrestrial transition zones without definitive boundaries that encompass wetlands, uplands or some combination of these two land forms; vegetated uplands adjacent to a natural water course or water body that directly affect or are affected by the adjacent water course or waterbody.

2. **Management** – Riparian zones will be managed for water quality, bank stability, structural habitat for fish and wildlife, shade, litter input, and other qualities where appropriate, including recreation values, wildlife corridors, and timber. Riparian values overlap and progressively decrease away from the stream or waterbody.

3. Resources that depend on riparian zones will be given preferential consideration over other resources or uses when there are conflicts between them.

4. No management practice which causes detrimental changes in water quality or fish habitat will be permitted. Such changes include adverse changes in water temperature or chemical composition, blockages of water courses, and deposits of sediment (see also I. #12 through 16 and K. #3).

5. No timber harvesting shall occur within 150 feet of Whitcomb Pond, Trio Pond, and Little Bog Pond (except as necessary for recreation development and timber salvage purposes with approval of the U.S. Forest Service) in accordance with the Conservation Easement.

6. At least 50% of the basal area of trees within 150 feet of Nash Stream from the breached dam downstream to the property boundary, and Pond Brook from Trio Pond to the confluence with Nash Stream will be retained in accordance with the Conservation Easement. At a minimum, at least 50% of the basal area of trees within 50 feet of all other perennial streams or waterbodies will be retained during timber harvesting operations unless site specific prescriptions warrant otherwise, such as management for beaver, aspen or waterfowl (see also I. #4 and #7).

7. Management practices in riparian zones will be implemented to ensure the sustained recruitment and accumulation of large woody debris adjacent to stable streams. During management operations, standing live trees within 100 feet of streambanks will be managed to maintain and/or recruit at least one tree of the following size per 100 lineal feet of adjacent stream per decade:

Stream Width	Minimum DBH
10-20 ft.	18"
20-30 ft.	24"
> 30 ft.	36"

8. Existing natural woody material will be left in streams as well as in the wet soil environment immediately adjacent to streams, waterbodies, and wetlands.

9. Trees with cavity holes or broken tops, standing dead trees, and downed trees not considered a safety hazard, will be retained during management operations in riparian zones (see also J. #25 through 30).

10. Special care will be given to softwood stands adjacent to streams during management operations (see also J. #16).

11. To avoid peak reptile and amphibian breeding periods and minimize soil compaction, logging operations in riparian zones will be restricted to frozen ground or late-summer harvests whenever practicable.

12. **Water/Soil**–Stream crossings will be minimized. All stream crossings will adhere to BMP guidelines and comply with applicable state law.

13. In order to prevent erosion and sedimentation, a BMP filter strip will be established between all water courses (streams, ponds, and wetlands) and disturbed areas (skid trails, truck roads, log landings, and recreation developments) where soil has been exposed and surface runoff will carry sediment. Filter strip widths will be established in accordance with BMP guidelines to protect water quality.

14. Filter strips will be protected to prevent exposure of mineral soil. Equipment use will be limited in filter strips to prevent exposure of mineral soil. Harvesting practices which do not expose mineral soil such as felling and winching of timber may take place. If mineral soil is exposed, it will be stabilized by seeding and/or mulching as soon as possible.

15. Log landings, new haul roads and heavily used skid trails will be located outside filter strips. Existing haul roads determined to be located within the distance prescribed for filter strips may be used if their use will result in less site disturbance than the development of new roads outside the prescribed filter strip width.

16. The development of main recreation trails will be avoided within prescribed filter strip widths while allowing for the occasional location of spur trails to wetland and stream vantage points. Existing recreational development within prescribed filter strip widths may continue to be used provided their use is compatible with the protection of water quality and other riparian functions.

J. WILDLIFE

1. **Vernal Pools** – A vernal pool is a temporary, isolated freshwater pond containing water for 2 months or more, that dries up during summer months and does not support fish. Vernal pool habitat includes the pool (or depression) and an area up to 200 feet wide surrounding the pool.

2. All vernal pools are considered significant unless determined not to be. Central to a determination of significance is the presence of species that only breed in or prefer vernal pool habitats and the absence of fish.

3. Forestry and recreational activities should not disturb the pool, its edges or adjoining soils. Log landings, haul roads and heavily used skid trails should not be located within the vernal pool habitat. Recreational trails should not be located in or immediately adjacent to pool depressions. Trees should not be intentionally felled into or across pool depressions. Tops and slash should be kept out of the pool. If an occasional top does fall into the pool depression, it should be left to avoid site disturbance.

4. Uneven-aged management practices will be used within vernal pool habitats. The pool depression and a surrounding 50-foot area should remain in a shaded and mostly undisturbed condition with minimal disturbance to the forest floor.

5. Within the vernal pool habitat, soil disturbance (rutting, compaction and disturbance of the mineral soil) will be minimized. Equipment will be operated when the ground is frozen and covered with snow, whenever possible. When opera-

tions must be scheduled during dry seasons, equipment will be kept out of the 50-foot shade area and logs will be winched out. Water diversion structures associated with skid trails and roads should be used to prevent sediment from entering the shaded 50-foot zone and pool depression.

6. **General Vegetation Management**– Identified wildlife objectives will provide a basis for establishing vegetative composition and age structure goals in association with site capabilities, management constraints, silvicultural objectives and present conditions. Vegetative goals will recognize that wildlife species richness requires a balance of vegetative types and age classes varying from regenerated to old forest stands distributed in time and space across the landscape.

7. The maintenance of large contiguous forested blocks through uneven-aged management will be emphasized. Forest operations planning will consider the understory structure (within-stand vertical diversity) and canopy closure requirements of wildlife groups targeted to benefit from the operation.

8. Horizontal diversity (between-stand variations) needs of targeted wildlife groups will be considered in establishing planning unit composition and age structure goals, and in the planning of both even-aged and uneven-aged management operations.

9. Few nonforested upland openings occur in the Nash Stream Forest. Most are former log landings. Where permanent openings are desired, they should be maintained in a mixture of grasses, forbs and brambles by mowing or burning at three to five-year intervals.

10. **Beaver Impoundments**–Beaver will be encouraged, except when their activity threatens established roadways. Emphasis will be placed on resolving beaver/human conflicts with beaver pipes rather than destruction of dams or trapping. Beaver dams shall not be breached without prior review by the State Lands Management Team.

11. **Spruce and Fir Forest**–Spruce and fir communities above 2,700 ft. or on slopes greater than 35% will not be actively managed. Most of these areas are designated as natural preserve areas.

12. Low elevation spruce and fir communities are limited in distribution and should be promoted on all suitable sites. Cutting in these stands should occur only when advanced softwood regeneration is present or the probability of regenerating softwood is high.

13. All spruce and fir communities subject to timber harvesting should be managed to sustain a dense softwood canopy across most of the stand while promoting softwood regeneration.

14. Softwood stands should be examined for evidence of winter use by deer tracks, established trails, winter pellet groups, bark scarring, and excessive browsing of hardwoods in and around softwood stands. Management in these areas, and adjoining stands, should be designed to maintain functional shelter, encourage softwood regeneration, and provide accessible browse.

15. Group selection is recommended for softwood stand management. Openings should remain small, 20 to 40 feet in diameter, to favor softwood regeneration. Openings should be distributed uniformly throughout the treatment area. No more than half the stand should be treated at each entry, unless it is too small for this to be practical. Openings created by natural mortality must be considered when determining the total area of allowable cuts.

16. To ensure uninterrupted winter wildlife mobility through wintering area, travel corridors of dense softwood cover should be maintained during all operations in softwood stands. The appropriate width and character of travel lanes will vary by location, however, these should generally be at least 200 feet wide and located in areas of frequent wildlife use, such as along streams and slope breaks.

17. **Northern Hardwood Forest Types**–Northern hardwood communities should be managed primarily on long rotations using a variety of uneven-aged techniques to maintain stands with varying degrees of vertical diversity and canopy closure.

18. Softwood inclusions within hardwood stands should be retained during cutting operations.

19. Promote tree species diversity in northern hardwood stands by managing to increase the abundance and distribution of less common species, such as white ash, black birch, white birch, black cherry, hemlock and aspen.

20. **Mixedwood Forest Types**–Where site conditions allow, operations in mixed stands should promote the development and regeneration of softwoods.

21. Large group or patch selection and even-aged management techniques shall be considered to manage aspen and birch where they occur in mixedwood stands.

22. **Key Mast Stands**–Stands with at least 20% of their basal area in American beech and showing extensive claw marks or broken branches from black bears are key mast stands.

23. Key mast stands should be managed by uneven-aged management techniques to promote the development of large crowned beech trees and to increase the proportion of beech in the stand.

24. Beech trees that have been repeatedly climbed by bears should be retained during cutting operations.

25. **Cavity Trees, Den Trees and Snags**–To maintain self-sustaining populations of all snag and cavity dependent wildlife, the following should be retained during forest management operations unless they present a clear safety hazard: live trees with excavated or natural cavities suitable for nests or dens; standing dead trees greater than 6" dbh and 15 feet tall; and live trees greater than 12" dbh with broken tops.

26. Cavity and/or snag trees will be retained in all upland habitats wherever feasible.

27. Cavity trees are particularly important in wetlands and riparian corridors. Trees flooded in beaver impoundments should not be harvested (see also I. #9).

28. In all managed stands, a minimum of one live tree per acre greater than 18" dbh should be retained as a deferment tree to remain uncut through its natural life span and period of decay. Preferably, trees designated as deferment trees have at least two major defects, such as cracks or large broken limbs.

29. **Dead and Down Trees**–Dead and down trees are important within stand habitat elements, providing cover and foraging substrates for small mammals, reptiles and amphibians. While top-wood and slash has value, large logs are more important due to the greater substrate they provide and longer period of time they last.

30. Harvest operations can increase the abundance and improve the distribution of dead and down logs. In stands where downed logs are not available, at least one cull per acre should be marked for felling and leaving. Encourage loggers to leave noncommercial sections of logs in the woods rather than piled at the landing.

31. **Raptor Nests**–Field staff will watch for and note the location of large stick nests. Hawks and owls frequently re-use nests or nest in the same stand over a period of many years.

32. No cutting should occur within 300 feet of active nests of most raptors from mid-March through July. At all times, an uncut buffer of at least 100 feet should surround large stick nests, and only light selection cutting should occur within 300 feet.

33. A 20-acre undisturbed area should be maintained adjacent to known nest sites of northern goshawks or red-shouldered hawks.

34. **Species Diversity**–Trends in species diversity should be monitored and evaluated. A master list of flora and fauna should be compiled and maintained from data derived from regularly scheduled and ongoing inventory and monitoring efforts, plus, as funding allows, specially designed studies such as breeding bird surveys, creel surveys, mammal tracking studies, fisheries habitat and aquatic species inventories.

K. FISH

1. **Management**–Fisheries management will strive to develop self-sustaining natural populations of native fish species and maintain consumptive and non-consumptive angling opportunities.

2. Special fishing regulations such as catch-and-release, minimum fish lengths, and fishing gear restrictions may be implemented to help protect the sustainability of fish populations and to maintain/enhance fishing opportunities.

3. Fish habitat will be protected during all management activities using best management practices to protect water quality during management operations.

4. **Habitat Enhancement** – Habitat enhancements will focus on areas which lack adequate in-stream cover and over-wintering habitat (i.e. pools) in order to encourage self-sustaining populations of fish.
5. Habitat restoration and enhancement projects will only be considered where stream channels are considered stable.
6. Emphasis will be on the use of native materials for habitat improvement structures.
7. Structural restoration and enhancement techniques will harmonize with surrounding visual setting.
8. Disturbances created during habitat enhancement projects will be kept to a minimum so as to maintain federal and state water quality standards.
9. All stream habitat improvements will be subject to approval by the State Wetlands Board in accordance with RSA 482-A.
10. **Stocking** – Stocking will be done primarily where natural reproduction is limited or non-existent to maintain consumptive and non-consumptive angling opportunities. Only species of fish native to the Nash Stream watershed will be used for stocking.
11. Fish used for stocking will be certified disease free and be of the highest quality possible.
12. Fish stocking rates will be based on stream and pond resource classification criteria in combination with angler use and harvest data.

L. FIRE

1. In compliance with RSA 224, any forest (wildland) fire not designated and managed as a prescribed fire will be extinguished, including wildfires in natural preserves.
2. The primary objective for the suppression of wildfires will be to confine, contain, or control, at minimum cost. All necessary steps will be taken to protect life and property.
3. Exclusive of natural preserves and high elevation areas (above 2,700 feet), existing woods roads and logging trails will be maintained for the passage of personnel and equipment for forest fire fighting purposes.
4. Slash and other logging debris will be cut or lopped to within four feet of the ground to promote decomposition and minimize the risk of forest fires (see also G. #8).

M. LANDS

1. **Acquisition/Disposal/Exchange** – The acquisition and disposal/exchange of real property will be done in compliance with the Conservation Easement and according to the Department of Resources and Economic Development policy and procedures.
2. **Boundary Lines** – All property lines will be painted and blazed regardless of other physical evidence denoting the line; monumentation and witness trees will be established at each corner and the lines in between will be painted and blazed with blue boundary paint[34].

3. Monuments, blazed trees, or other features denoting town boundary lines that cross the property will be protected during the layout and execution of management activities.

N. LAW ENFORCEMENT

1. Law enforcement will emphasize cooperation among state, federal, and local law enforcement agencies in the protection of persons and property.
2. Law enforcement will be commensurate with frequency, severity, and types of violations committed.

Public Use Guidelines

Public access to Nash Stream Forest is provided year round. Guidelines are necessary to ensure that experiences are pleasant and safe with minimal impact to the Forest and property. The following are guidelines covering general and special uses of the Nash Stream Forest.

A. GENERAL

1. **Access**–The only access to and from Nash Stream Forest by conventional vehicle is the gravel Main Road, about 2 miles north and east of N.H. Route 110 by way of the paved Emerson Road, or about 4 miles from U.S. Route 3 at Groveton Village.
2. **Open to Automobiles**–The main gate is closed in early December each year and opened each spring when road conditions allow. Some interior roads remain gated year round.
3. **Camping/Open Fires**–No overnight camping[35]. No open fires.
4. **Emergency Closure**–The Nash Stream Forest or any area within the Forest may be temporarily closed to the public during high fire danger periods and where it is determined to be hazardous for public use or detrimental to the resource or facility due to weather, pestilence, or other situation involving public health, safety, or welfare.
5. **Health and Sanitation**–The Nash Stream Forest is a carry in/carry out property where visitors and private camp lot owners are asked to bring out what they bring in. No person shall dump or dispose of any garbage, trash, debris, or any other refuse or waste material of any kind on the property.
6. **Removal or Disturbance of Forest Property**–No person shall cut, remove or damage any tree for any purpose, including firewood, or cut or damage any shrub or plant or pick any wildflowers, nor shall any person dig, excavate or remove sand, gravel, or other mineral from the Forest without written permission.
7. **Construction of Structures**–No person shall construct or erect any structure without written permission.
8. Portable deer stands that are temporarily installed without driving nails or inserting other devices permanently into a tree and that are removed without damage to any vegetation are permitted during legal deer hunting season. The stand shall have stamped into or attached a durable waterproof tag with the name and address of the user in legible form at all times; permanent tree stands or structures are not allowed.

9. **Human and Other Resources**–No person shall remove from, injure, disfigure, deface, destroy or disturb any object or feature of paleontological, archaeological, geological, or historical interest or value located in or upon the Forest.

10 **Vehicles**–All vehicles parked or stopped in any place that obstruct traffic or block any road or trail are subject to removal and impoundment at the owner's expense. No person shall park any vehicle within the forest during closure periods.

11. The use of all-terrain vehicles (ATVs) and trail bikes is prohibited. Snowmobiles are limited to areas or trails established for their use. Exceptions to the prohibition of ATVs and trailbikes and the use of snowmobiles are: 1)use by officials in the performance of their duties; 2) by persons with disabilities with written permission; and 3) the occasional legitimate use on a case-by-case basis with written permission. All provisions of RES-8500 trail use rules apply.

12. Mountain bicycles are allowed on established roadways unless otherwise posted; no off-road or cross country use permitted.

13. **Hunting/Fishing/Trapping** are allowed under N.H. Fish and Game Department regulations and enforcement. Baiting Black Bear for recreational hunting will not be permitted.

14. No discharge of firearms is allowed within 300 feet of any occupied building.

15. **Releasing of Animals and Plants**–No person shall release any wild or domestic animal, or abandon any such animal, or plant or culture any seed or vegetation of any type within the Forest without written permission.

B. RESEARCH AND SPECIAL USES

1. **Collection and Research**–All parties seeking permission for research or collection activities must apply to the Department of Resources and Economic Development for written permission.

2. **Threatened and Endangered Species**–State-listed threatened or endangered plant and wildlife species will not be collected or removed. Exemptions may be granted to remove protected species for scientific research in compliance with RSA 212-A and 217-A administrative rules.

3. **Special Use Permits**–Functions, sponsored events or other non-traditional activity such as military exercises, scout jamborees, sporting events, temporary right-of-way for removal of forest products, wedding ceremonies, and overnight activities require special use permits. Such permits are granted under conditions that protect state land. Any request for special use permits may be denied if the proposed use will have adverse impact on the land.

4. **Term Agreements**–Consistent with the Conservation Easement, no lease, contract or other right shall be granted or renewed for a term in excess of five years except for roads or utilities.

C. MINERALS

1. Prospecting (page 144) and mining are not allowed; mining operations and develop-

ments are prohibited by the Conservation Easement (page 7).

2. Reasonable "rock-hounding" (page 145) is an appropriate recreational use; the following restrictions apply:

   A. Only hand tools are permitted.

   B. Material removed from holes must be saved and used to immediately refill openings; every effort must be made to return each collection site to original condition.

   C. Digging holes, destruction of vegetation, or physical manipulation that alters natural features or processes is not allowed in natural preserves (page 117), above 2,700 ft. elevation, or above tree line; mapped locations of natural preserves are available from the Division of Forests and Lands, North Country Resource Center in Lancaster, N.H.

   D. Do not dig near recreation sites, roads, trails, camps, or other areas where such activity may impact other resources or activities.

   E. Avoid digging in or near streams to prevent adding silt to the water.

Monitoring and Evaluation

Webster defines monitoring as: *"to watch, observe, or check esp. for a special purpose; to keep track of, regulate, or control"*. Monitoring is a "check-in" process that can be carried out before, during, and after planned events in order to keep management on track.

A monitoring program for the Nash Stream Forest is presented with the hope that monitoring will be a flexible and continuously evolving process that will improve management. It is also important to point out that staff and funds for extensive monitoring are limited and that it is assumed that management practices recommended in this Plan will be effective in meeting management direction provided by the Vision. Therefore, it is expected that any lack of detailed monitoring data due to limited staff or funds will not deter or prevent management from taking place.

Within the limits of available resources, this monitoring program will assess achievements and adherence to guidelines, evaluate the effects of management, consider new information including changing conditions and trends, and identify and document the need to improve management practices.

Simple and cost effective monitoring will be stressed at all levels of planning and management. Monitoring will be integrated with regularly scheduled activities and procedures using available staff and qualified volunteers as much as possible. Management staff will regularly inspect management activities and conditions in the Forest. As resources become available, specially designed surveys and sampling programs will be done to complement regularly scheduled efforts. It is anticipated that an appointed Citizen Advisory Group and staff from other state and federal agencies will assist with monitoring efforts and that both traditional and non-traditional resources will be tapped to address monitoring needs.

A Complete Monitoring Program

A complete monitoring program has three levels:

1) Implementation monitoring;

2) Effectiveness monitoring; and,

3) Validation monitoring.

Implementation monitoring is the first or basic level of monitoring which ensures proper management direction by asking the question, "Are we doing the right things?". The next level looks at how effective management is at achieving desired results by asking "How are we doing?" And finally, a third level of monitoring looks at the desired future condition and asks "Is the long-term desired condition where we still want to go?"

Implementation Monitoring – "Are we doing the right things?"
"Are we doing the right things?" will be continuously asked when preparing work plans prior to implementation to ensure that management activities are: 1) in compliance with the conservation easement deed; and 2) implemented in the direction provided by the Vision.

Conservation Easement – The Forest Supervisor, White Mountain National Forest (WMNF) is responsible for administering the Conservation Easement on behalf of the United States. Since the Easement provides the basic framework for management, Nash Stream Forest management staff will meet on a regular basis with WMNF staff to review land use policies, management practices, and work plans to ensure compliance.

Management Vision – Monitoring the implementation of management activities to ensure consistency with the Vision will be a priority. Therefore, when preparing work plans, management staff will continuously ask the question, "Will this management activity move us toward the desired future condition?" or, "Are we doing the right thing?"

A monitoring element (or indicator) will be linked to each goal and principle of management in the Vision. These elements or indicators will be factored into work plans and monitored throughout the planning and implementation process. Work plans will be reviewed with the WMNF staff and Citizen Advisory Committee. Public notification of work plans will address consistency with the Vision.

A representation of monitoring elements for the timber management vision is shown in **Table 24** on page 132. A simple example to illustrate how monitoring at the implementation level will work is as follows. "Timber Management Zone" and "Ecological Land Capabilities" are components of the timber management vision. An indicator of this "zone" is the "area suitable for timber management" identified on the basis of ecological land capabilities in the Management Plan. In this example, timber harvest proposals would be monitored to ensure the proposed treatment area lies within the "area suitable for timber management" and follows recommended management procedures outlined in the Management Plan for ecological land capabilities.

Timber harvest proposals will be monitored (reviewed) by the State Land Management Team, approved by the Chief, State Forest Management, and be subject to public comment.

Effectiveness Monitoring – "How are we doing?"
Monitoring "how we are doing" will focus

TABLE 24

TIMBER VISION GOAL: Timber management decisions will be determined primarily by ecological and land capabilities, natural site and soil tendencies, natural disturbance patterns, and ecological processes. The timber management zones of Nash Stream Forest will be managed on a long-term sustained yield basis to produce high quality, long rotation, solid wood products.

VISION COMPONENTS	INDICATORS	MONITORING TECHNIQUES	FREQUENCY/TYPE
Ecological Processes and Land Capabilities	Tree species composition and distribution	Forest inventory	Annually
	Natural regeneration and regeneration patterns	Compare site plans and project results with ELGs	Routine project tracking and review
	Soil/site capabilities	Compare site plans and project results with ELGs	Routine project tracking and review
	Forest structure	Forest inventory	Annually
Timber Management Zone	Area suitable for timber management (ASTM)	Forest inventory	Annually
		Examine site plans	Routine project tracking and review
Sustained Yield	Treatment and harvest schedules	Area management control	Routine project tracking and review
Long Rotation, High Quality, Solid Wood Products	Target ages, species and stand prescriptions	Compare site plans and project results with ELGs	Routine project tracking and review
	Merchantability standards and forest product markets	Market surveys	Periodic
Economic Contribution	Competitive bidding	Market surveys and bid analysis	Routine project tracking and review
	Product utilization	Compare timber marking standards with market demand; on-site inspection of utilization	Routine project tracking and review
Harvesting Techniques	Silvicultural prescriptions	Examine site plans and project results with ELGs	Routine project tracking and review

on assessing achievements and adherence to management guidelines. Primary documentation will include annual work plans, forest operation planning reports, project summary reports, and annual accomplishment reports.

Monitoring efforts will include: on-site inspections by management specialists to monitor work projects and Forest conditions; forest inventory and mapping to monitor changes in forest cover; completed project summaries to investigate methods and results; public information and education activities to facilitate public understanding and comment; and formal management reviews (**Chapter 5 – Cooperative Management and Resource Integration**).

It is anticipated that the preparation of annual work plans and accomplishment reports will be coordinated with the Citizen Advisory Group. Work plans will be tied to goals and objectives and will reflect work priorities, available staff, equipment, and funds.

Forest operation planning reports will be prepared for major work efforts such as timber harvests. These plans will consist of a location map and project description and when combined with project summary reports will provide excellent documentation of management practices.

As resources become available specially designed surveys and sampling programs will be carried out, such as the recently completed fisheries habitat inventory and ongoing breeding bird and mammal surveys. Special surveys and sampling programs will include ecological monitoring (page 133); water quality testing; hunter and angler surveys; visitor satisfaction surveys; and fish population inventories. Research activities by qualified scientists, educators, and students will also be supported at Nash Stream, such as an ongoing study by a University of Maine graduate student using behavioral observations to monitor the productivity of forest birds.

Ecological Monitoring–There are two primary functions of ecological monitoring. One is to answer questions on the development of natural communities over time. How do successional trends differ in different natural communities? Is there really such a thing as a "climax" structure, or are natural communities continuously dynamic? How do different natural communities respond to natural disturbance? How long does it take for an even-aged stand to become all-aged, and what natural processes are at work in this conversion? Answers to these questions can be obtained by both studying plots through time and comparing plots which differ in the amount of time following disturbance.

Another function of monitoring is to assess the results of timber harvesting. This can be accomplished by comparing two areas similar in vegetation structure and composition–one area that will be subjected to forest management, and another that will be left as an unaltered control (**Chapter 5–Management of Areas of Ecological Concern–*Control Areas***). For example, does the species composition several years after a single-tree harvest compare to that of a similar unaltered stand? Although the dominant species may be similar, what about species in the shrub and herbaceous layers? The closer plots managed for timber and wildlife resemble control plots and other ecologically similar sites, the closer we are to achieving a central theme of the Vision, "...as little interference as possible with natural ecological functions."

Monitoring plots will be established for each rare species and exemplary natural community and in at least one control area for each natural community type. Monitoring plans for these plots will specify the goals, methods, frequency, and duration of monitoring.

Validation Monitoring–"Is the long-term desired condition where we still want to go?" Validation monitoring attempts to determine whether the desired future condition described by the Vision is still what we want to achieve. This is the broadest level of

monitoring, and by its nature must be conducted over long periods of time.

There are three significant components to the validation monitoring in the Nash Stream Forest. The first component involves studying the trends that emerge in the annual effectiveness monitoring. Are we accomplishing our annual work plan goals? Is our effectiveness increasing or decreasing over time? The second component involves the ongoing assimilation of new information into management activities. How does new information and knowledge about the natural world fit the Vision? The third component is the public review of the Vision. This is an ongoing process, achieved through public comment and input from the Citizen Advisory Group. As management moves toward the desired future condition described by the Vision, we can better determine if this is "where we still want to go".

It is anticipated that change is necessary and inevitable. Validation monitoring is an important and necessary tool to effect change by asking the question, "Should we continue what we are doing?"

Obviously, the Conservation Easement Deed provides permanent management obligations **(Chapter 1 – Conservation Easement)** and is not expected to change or be changed. But, management practices, the Management Plan, and the goals and principles of management in the Vision are subject to change, maybe in that order.

Validation monitoring will attempt to evaluate the effects of management, consider changing conditions and trends, and identify and document the need for changes in management practices.

Validation monitoring can take many forms and is expected to do so as we implement the Management Plan. Validation monitoring can be done sequentially or independently of implementation and effectiveness monitoring described above. It is anticipated that the cumulative results of implementation and effectiveness monitoring plus specially designed sampling efforts will fulfill validation monitoring needs such as the recently completed fish habitat survey and ongoing breeding bird surveys.

Monitoring efforts will include inspecting timber harvesting sites with the Citizen Advisory Committee, sampling water quality and changes in forest cover, hunter surveys, angler and creel surveys, and wildlife habitat and population studies.

Validation monitoring can be done as part of implementation monitoring and effectiveness monitoring by evaluating results as well as through independent monitoring efforts such as specially designed surveys or studies.

Validation monitoring will be integrated with regularly scheduled activities and procedures using available staff and qualified volunteers as much as possible. Funding for specially designed surveys and other costly efforts will be done as staff and funds become available. For example, water quality sampling, and inventory and mapping changes in forest cover can be done by existing staff. However, specially designed projects such as the recently completed fisheries habitat inventory and ongoing breeding bird surveys require specialized funding, staff and training.

Efforts will include assessing the results of timber harvesting; wildlife studies; recreation surveys; and researching ecological processes.

Validation monitoring will focus primarily on management practices prescribed in the Management Plan, and identify and document the need for change in management direction provided by the Vision and Management Plan.

The Management Vision is considered a timeless document but nonetheless a dynamic one, subject to change should the management direction it provides be considered inappropriate. However, since the Management Plan is based on the Vision it may be more appropriate to begin validation monitoring that can be used to help determine if management actions recommended in the Vision are achieving desired results.

The process of changing either the Vision or the Management Plan would be as involved as that which created them. It is anticipated that public comments and/or an advisory committee would be required to consider new information, including changing conditions and trends. Monitoring should provide the necessary means to help identify and document the need for change in management practices.

Validation monitoring can be used to determine if management actions are achieving desired results. Validation monitoring can take many forms and may be done sequentially or independent of implementation and effectiveness monitoring described above.

6. Glossary/ Footnotes/ References/ Acknowledgments

Glossary

ADA – Refers to the Americans With Disabilities Act (1990).

Allowable Cut – The amount of timber volume considered available for cutting from a given area during a specified period based on such factors as soil/site capability, timber growth, forest condition, silviculture and administrative objectives, markets, and other factors.

Aquatic Ecosystem – The stream channel, floodplain, lake, water, biotic communities and the habitat features that occur therein.

Area Control – A means of determining timber volume to be harvested based on a specified area allocated for cutting. (See **Volume Control.**)

Areas of Ecological Concern – Designated areas that require special management strategies to protect unique ecological values such as rare plants, rare animals, and exemplary natural communities. Areas of ecological concern include natural preserves, buffers, corridors, and control areas.

ATV – "All Terrain Vehicle" means any motor-driven vehicle with one or more tires designed to hold not more than 10 pounds per square inch of air pressure, having a capacity for passengers or other payloads, not to exceed 1,000 pounds net vehicle weight, and not to exceed 50 inches in width, which is designed or adapted for travel over surfaces other than maintained roads. (see **RSA 215-A.**)

Backcountry Camping – Remote camping with little to no developments, usually accessible only by trail or water.

Basal Area – The cross sectional area of a tree measured 4½ feet above the ground, usually expressed in square feet. Basal area per acre (ba/a) of live trees measures the density of tree stems in a forest stand. (See also **DBH.**)

Biological Agent – Defined in state law, RSA 430:29.

Biological Diversity (biodiversity) – The variety, abundance and distribution of plant and animal communities, species, genetic composition and habitats within a given area. It also refers to ecological structures, functions, and processes at all of these levels; the diversity of life in all its forms, and at all levels of organization.

BMPs (Best Management Practices) – Proper methods for control and dispersal of water from truck haul roads, skid trails, log landings, and recreation trails to minimize erosion and reduce sediment and temperature changes in streams.

Board Foot (BF) – A measure of wood by volume. One board foot is the volume of wood equal to a piece 12 inches long by 12 inches wide by one inch thick. Board feet per acre (bf/a) is a measure of density in a forest stand. (**See International 1/4 Inch Log Rule.**)

Buffer Area – An abutting or surrounding area of low intensity, or low impact human activity specifically designed to shield natu-

ral resource values within a designated area from negative influences, for example, a buffer area around a natural preserve.

Bushwhacking – term used to describe hiking through the forest where there is no defined trail.

Carry in/Carry out – A policy promoting the ethic that visitors should leave no trash behind them when they visit public or private lands. Litter, including biodegradable materials, should be responsibly disposed of off-site.

Cascade – Habitat type characterized by swift current, exposed rocks and boulders, high gradient and considerable turbulence and surface agitation, and consisting of a stepped series of drops. (See also **Glide, Riffle** and **Pool.**)

Chemical Agent – Referred to in the Vision as any substance, mixture of substances, pesticide (defined in RSA 430:29), or biological agent that, through application or use, may damage or pose a threat to natural ecosystems.

Clearcutting Method – (See **Even-aged Management.**)

Climax Forest – A term ecologists and others use to describe a forest's mature successional stage. Although all forests are dynamic, climax forests have relatively stable species composition and low or negligible overall growth rates. (See **Old Forest.**)

Commercial Forest – Forest land that produces or is capable of producing timber products on a regular basis and that has not been withdrawn from production for administrative, technological, physical, or environmental reasons.

Control Areas – Designated areas that will remain largely unaltered by human activity. Control areas will serve research and educational needs and will preserve plant and animal habitat.

Cord – A standard cord of wood is an imaginary rick, or stack of wood, measuring 4 feet by 4 feet by 8 feet and containing 128 cubic feet of wood, bark and voids. Cords per acre (cds/a) is a measure of density in a forest stand. (See **RSA 438:3 – Definition of Special Units of Measure.**)

Core Natural Area – (See **Natural Preserve Area.**)

Corridor – An area or strip of land, such as a forest or waterway of low intensity or low-impact human activity, that functions as a passageway for living organisms from one area to another; a travel route followed by animals along a belt or band of suitable cover or habitat.

Critical Habitat – Specific areas, within the geographical area occupied by a species, essential to the conservation of the species and which may require special management considerations or protection.

Crop Tree – A tree which enjoys maximum longevity in a stand due to desired characteristic such as commercial quality or biotic contribution.

Cultural Resources – The physical remains of past ways of life. They include historic and prehistoric sites and the artifacts and features associated with these sites.

DBH (diameter at breast height) – The average diameter of a standing tree, measured outside the bark, at a point 4½ feet above the ground.

Developed Recreation–Recreation characterized by concentrated public use generally featuring supportive facilities for such uses as campgrounds, picnic areas, and swimming areas.

Dispersed Recreation–Generally distributed, low density recreational activities where facilities, if provided, are designed primarily to minimize environmental impacts rather than comfort or convenience to the user.

Ecological Processes–Related actions contributing toward the natural interrelationships between living organisms and their environment; actions include predation, mutualism, successional development, nutrient cycling, carbon sequestration, primary productivity, and decay.

Ecological Land Capabilities–Based upon distinct combinations of natural, physical, chemical, and biological properties, the capabilities of a given area of land to respond in a predictable and relatively uniform manner to specified actions or stimuli applied to the landscape by natural or non-natural means. (See **Ecological Land Group**.)

Ecological Land Group–A category of land with similar soil development histories and soil combinations, landscape features, climate, and differing from other ecological land groups that in a relatively undisturbed state and/or at a given stage of plant succession is usually occupied by a predictable and relatively uniform plant community. (See **Ecological Land Capabilities.**)

Ecologically Sustainable Forest–(See **Sustainable Working Forest.**)

Ecologically Significant Sites–Those sites identified and ranked through the Natural Heritage Inventory (NHI) classification system. (See **Natural Heritage Inventory.**)

Ecologically-based Forestry–The application of forestry principles guided by the interrelationships between living organisms and their environment for the purpose of attaining or maintaining a sustainable working forest. (See **Sustainable Working Forest.**)

Ecosystem Sustainability–The ability to sustain natural diversity, productivity, resilience to stress, health, renewability, and/or yields of desired values, resource uses, products, or services from an ecosystem, while maintaining the integrity of the ecosystem over time.

Ecosystem Management–The careful and skillful use of ecological, economic, social, and managerial principles in managing ecosystems to produce, restore, or sustain ecosystem integrity and desired conditions, uses, products, and services over the long-term.

Ecosystem–A geographic area where it is meaningful to address the interaction of plants, animals, ecological processes, human social systems, soils, waters, sources of energy, and the forces that guide change over time.

Endangered Species Act–Refers to the federal Endangered Species Act of 1973, Public Law 93-205, as amended.

Endangered Species–Any species which is in danger of extinction throughout all or a significant portion of its range within the state pursuant to RSA 212-A:2 and 217-A:3, or any species determined to be an endangered species pursuant to the federal Endangered Species Act.

Ephemeral Stream – A stream which flows only in direct response to precipitation, receives no water from springs, and no long-continued supply from melting snow or other surface source. The channel may or may not be well-defined but at all times is above the water table. (See **Vernal Pool.**)

Even-aged Management – A timber management system that results in the creation of stands in which trees of essentially the same age grow together. Regeneration in a particular stand is obtained during a short period at or near the time that a stand has reached the desired age or size for regeneration and is harvested. Cutting methods producing even-aged stands are: (1) clearcutting; (2) shelterwood; or (3) seed tree.

(1) **Clearcutting method** – an even-aged cutting method that lays bare the area treated in one cutting which leads to the establishment of an even-aged high forest or stand. Reproduction of the new forest is secured after cutting either artificially or naturally. Modifications of the clearcutting method include: (a) clearcutting in patches; and (b) clearcutting in strips.

(a) **Clearcutting in patches** – a modification of the clearcutting method where the area being treated is removed in a series of clearcuts made in patches. Often employed to regenerate even-aged stands which cannot be reproduced by natural seeding if all trees are removed in a single cutting. Minimum patch size could be considered as the size of the largest opening entirely under the influence of adjacent mature trees. (See **Even-aged Stand.**)

(b) **Clearcutting in strips** – a modification of the clearcutting method where the area being treated is removed in a series of clearcuts made in strips. Trees on the uncut strips furnish all or part of the seed for stocking the cut strips, and protects the cutover area and new crop. The width of cut strips depends on the distance of effective seed dispersal, usually not exceeding 5 times tree height.

(2) **Shelterwood method** – an even-aged cutting method that removes the mature timber in a series of cuttings, which extend over a relatively short portion of the rotation, by encouraging the establishment of essentially even-aged reproduction under the partial shelter of seed trees.

(3) **Seed-tree method** – an even-aged cutting method that removes the mature timber in one cutting except for a small number of seed trees left singly or in small groups to serve as a seed source for the establishment of regeneration.

Even-aged Stand – All trees are the same age or at least of the same age class; a stand is considered even-aged if the difference in age between the oldest and youngest trees does not exceed 20 percent of the length of the rotation. From an ecological viewpoint, the minimum size of an even-aged stand could be considered as the size of the largest opening entirely under the influence of adjacent mature timber. The opening of critical size might be that which, at the very center, exhibited the same temperature regime as any larger opening. Such an opening is probably about twice as wide as the height of the mature trees.

Exemplary Natural Community – Remnants of New Hampshire's undisturbed landscape that represent the best remaining intact examples known of the state's flora and fauna. (See **Natural Community.**)

Exotic Species – A living organism artificially or otherwise established far from its natural habitat.

Filterstrip – A special management zone of largely undisturbed forest floor, maintained between a water body and any activity that disturbs the vegetative cover and exposes mineral soil.

Fire-Adapted Ecosystem – An ecosystem with the ability to survive and regenerate in a fire prone environment.

Fishery – A complex of interactions within and between the population(s) of fish being harvested, the population(s) of fishermen, and the environments of each.

Forbs – Herbaceous, fleshy-leaved plants.

Forest Cover Type – A category of forest defined by its vegetative composition.

Forest Fire – An unenclosed and freely spreading combustion which consumes the natural fuels of a forest, i.e., duff, grass, weeds, brush, and trees.

Forest Fire Suppression – Any deliberate, planned action to stop, confine, or control a forest fire by breaking or weakening, directly or indirectly one or more sides of the combustion (fire) triangle consisting of fuel, oxygen, and temperature.

Forest Health – A measure of forest health is the degree of harmony between potential resource diversity that could be produced and resource productivity that can be sustained.

Fragmentation – The separation of a unit of land and its ecosystem with its various plants and animals from other, similar ecosystems by the intrusion of a barrier.

Functioning Stream Channel – A well-defined streambed that clears itself at least once a year of small debris and litter, exhibits channel bank formation, and may often contain alluvial deposits of sand, gravel and/or rubble in the channel bed. (See **Intermittent Stream.**)

GIS (Geographic Information System) – A computer-based mapping system used to automate, manipulate, analyze, and display geographic data in digital form.

Glide – A slow moving, relatively shallow portion of a stream with little or no surface turbulence. (See also **Riffle, Cascade and Pool.**)

Goal – A broad, unquantified, general statement of a desired state or process that operating programs strive to achieve. A goal is the principal statement from which objectives must be developed.

GRANIT – The New Hampshire GRANIT (Geographically Referenced Analysis and Information Transfer) system is a statewide geographic information system funded by the New Hampshire Office of State Planning and housed at the Complex Systems Research Center, University of New Hampshire. The system is being developed to provide a range of data and analytical tools to assist in resource management and planning issues at the state, regional and local levels.

Grant-in-aid Program – State administered program funded by OHRV license registra-

tions. Provides assistance to organized non-profit OHRV clubs and political subdivisions for the purpose of encouraging development, construction, grooming, and safety on trails in New Hampshire.

Grooming (trail) – Process of leveling and conditioning winter trails for the enjoyment and safety of snowmobilers and skiers.

Group II Soils – Soils classified by the USDA Soil Conservation Service with physical limitations influencing forest management, i.e. steep slopes, erosive textures, surface boulders, excessive surface stones, and bedrock outcrops; good productivity but generally difficult and costly for forest management. On the Nash Stream Forest, soils in this group are considered unsuitable for timber management.

Group Selection Method – (See **Uneven-aged Management.**)

Habitat – A place where the physical and biological elements of ecosystems provide food, cover, and space resources needed for the livelihood of a particular species of plant or animal.

Heritage Trail – A multi-use recreational trail project stretching the length of New Hampshire from Massachusetts to Canada.

High Quality Forest Products – Forest products of distinct and superior character grown under the highest merchantability standards inherent in the product, species and growing site.

HMU (Habitat Management Unit) – A given area where vegetative composition goals are determined and managed, consistent with ecological land capabilities and soil/site properties, that provide appropriate vegetative communities, patterns, and age-class structures required by wildlife species. (See **Habitat.**)

Integrated Resource Management – The simultaneous consideration of ecological, physical, economic, and social aspects of lands, waters, and resources in developing and carrying out multiple-use, sustained-yield management. (See **Multiple Use Management.**)

Interdisciplinary Team – A group of individuals with skills from different resources assembled to provide necessary insight to multiple stages of a process. An interdisciplinary team is assembled because no single scientific discipline is sufficient to adequately identify and resolve issues and problems.

Intermittent Stream – A watercourse that flows in a well-defined channel generally during wet periods of the year, that may receive water from springs, long-continued melting snow, or other surface source. (See **Ephemeral Stream** and **Functioning Stream Channel.**)

International 1/4 Inch Log Rule – Log rule used to inventory and measure estimated board foot (sawlog) volume in the Nash Stream Forest. Board foot measurements with this rule are consistent and accurate for sawmills producing mainly 1-inch boards with a 1/4-inch saw thickness. It is the standard log rule for reporting board foot volumes for timber tax purposes (RSA 79) in New Hampshire.

Interpretation – An educational and recreational activity that links the visitor to the resource. A means of expanding appreciation, knowledge, enjoyment, and protection of the resource.

Land Capability – (See **Ecological Land Capabilities.**)

Landscape – An area composed of interacting and inter-connected patterns of habitats (ecosystems) that are repeated because of the geology, landform, soils, climate, biota, and human influences throughout the area. Landscape structure is formed by patches (stands or sites), connections (corridors and linkages), and the matrix. Landscape function is based on disturbance events, successional development of landscape structure, and flows of energy and nutrients through the structure of the landscape. A landscape is composed of watersheds and smaller ecosystems; the building block of biotic provinces and regions.

Long Rotation Forestry – The application of forestry practices that emphasize the growth of timber crops for the maximum period of years required to yield a specified economic or natural maturity condition.

Management Practice – A specific activity, measure, course of action, treatment or non-treatment.

Mast – The fruits and seeds of trees and other woody shrubs. Mast is an important wildlife food source for migrating and resident birds and mammals.

MBF – Thousand board feet. (See **Board Feet.**)

Monitoring – A check-in process that can be carried out before, during, and after a planned event or management activity in order to facilitate awareness, acceptability and, if necessary, adjustment; to watch, observe, or check, especially for a specific purpose, such as to keep track of, regulate, or control. Successful monitoring and evaluation is dependent on the use of appropriate, predetermined indicators.

Multiple Use Management – The management of all the various forest resources, including amenities and services, so that they are utilized in the combination that will best meet the needs of forest landowners and society; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; that some land will be used for less than all of the resources; and the harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of the land, with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit of output. (See **Integrated Resource Management.**)

Native Trout – Original stock or strain of trout of which the genetic integrity has not been influenced by hatchery fish. (See **Wild Trout.**)

Natural Community – An assemblage of plants ecologically related to each other and their physical environment. The unit that is classified, mapped, and described in a plant community classification system used by the New Hampshire Natural Heritage Inventory Program (NHI), coordinated regionally and nationally by The Nature Conservancy (TNC).

Natural Disturbance–Disturbances that occur from natural causes, such as the toppling of a single tree from age or disease, wind or ice storms that take down groups or patches of trees, and forest fires that destroy large areas of forest. The pattern, or location, frequency, and degree of natural disturbances, along with soils and topography, provide inherent diversity in forest lands.

Natural Heritage Inventory (NHI)–A program administered within the Department of Resources and Economic Development which collects and analyzes data on the status, location, and distribution of rare or declining native plant and animal species and exemplary natural communities in the state. NHI works cooperatively with federal, state, and private organizations to develop and implement measures for the protection, conservation, enhancement and management of native New Hampshire plants and animals.

Natural Preserve Area–A designated area which has retained its natural character, although not necessarily completely undisturbed, and/or which contains floral, faunal, ecological or geological features of global, national, regional, and/or statewide significance of scientific and/or educational interest.

Neotropical Migrants–Birds that breed in North America and migrate to Central and South America and the Caribbean for the winter.

Non-commercial Forest–Forest land not producing, or not suitable or capable of producing, timber crops on a regular basis, such as areas of steep slope, thin soil, and wetlands.

Northern Hardwoods–A forest type of northern New England consisting primarily of sugar maple, American beech, yellow birch and associated species including red maple, hemlock, white ash, basswood, white birch, red oak, spruce, and fir.

Objective–A concise, time-specific statement of measurable planned results designed to achieve a desired state or process represented by the goal.

OHRV–"Off Highway Recreational Vehicle" means any mechanically propelled vehicle used for pleasure or recreational purposes running on rubber tires, belts, cleats, tracks, skis or cushion of air and dependent on the ground or surface for travel, or other unimproved terrain whether covered by ice or snow or not, where the operator sits in or on the vehicle. (See **RSA 215-A.**)

Old (growth) Forest–A forest that has reached an age where the species composition is relatively stable and/or the average net annual growth is close to zero, and the natural species composition has not been altered by human activity. Sometimes referred to as "old growth" where the characteristics are unique to each forest type in the latter stages of forest succession.

Orienteering–Recreational use of a compass (and map) to navigate to specific points in the forest.

Overmature Stand–A condition where a stand of trees is older than normal rotation age for the type (species) and growing site. Overmature stands often provide important wildlife and other habitat conditions not found in younger stands. (See **Rotation.**)

Patch Selection Method – (See **Uneven-aged Management.**)

Perennial Stream – A watercourse that flows throughout the year or nearly so (90 percent) in a well-defined channel; same as a live stream.

Permanent Wildlife Opening – An area of land that is managed to provide and maintain low shrub and/or herbaceous cover for wildlife habitat.

Pesticide – Defined in state law, RSA 430:29.

Planning Unit – A mapped landscape unit based on natural and physical features designed to meet management objectives. There can be and generally is some degree of interaction between adjacent planning units.

Pole – A live tree which measures between 4.6 inches and 9.5 inches in diameter 4½ feet above the ground.

Pool – A portion of a stream with reduced current velocity, often with water deeper than surrounding areas and which is frequently usable by fish for resting and cover. (See also **Glide, Riffle** and **Cascade.**)

Potentially Affected Interests (PAI) – Includes all those interests who "will" be affected by an action (project) either directly or indirectly; all those interests who "think" that they will be affected; and those interests who for some "other" reason — need to, or want to, be involved. PAI and public are used interchangeably in this document.

Presalvage – Removal of merchantable trees highly vulnerable to loss or damage, in a stand which cannot be scheduled for early replacement. The objective of presalvage is to anticipate the loss of economic value in otherwise healthy trees threatened by a damaging agency.

Prescribed Fire – The application of fire under specified conditions to achieve specific land management objectives.

Prospecting – Exploration for minerals with mechanized equipment which will result in disturbance of land which could pose a danger to the public or cause environmental harm. Prospecting operations or developments are prohibited by the Conservation Easement (page 7).

Public – (See **Potentially Affected Interests.**)

Public Land Stewardship – The government's responsibility to manage itself and land under government jurisdiction with proper regard to the rights of all for clean air, water, and a healthy forest environment, to maximize the contribution of public forests to the enhancement of our living environment.

Public Way – Means any public highway, street, sidewalk, avenue, alley, park or parkway; or any way that is funded by state, city, town, county, or federal government, or laid out by statute; or any parking lots open for use by the public or vehicular traffic; or any frozen surface of a public body of water; provided, however, the off highway portion of any trail established specifically for OHRVs shall not be a public way (see RSA 215-A).

Public Involvement – Process designed to foster public understanding and comment in order to broaden the information base upon which management decisions are made.

Pulpwood – Wood or trees used to make pulp, from which paper products are manufactured. Trees of poor form or quality (rough and rotten), and generally of small size, that

will not likely grow into sawlog quality, are commonly tallied as pulpwood during a timber cruise.

Put to Bed – The practice of temporarily closing roads between periods of use. This may involve removing all drainage structures, revegetating the roadbed and drainage ditches, and closing the area to vehicular traffic.

Residual Basal Area – The sum of the basal area of trees remaining on a harvested site.

Riffle – A shallow rapids where water flows swiftly over completely or partially submerged obstructions to produce surface agitation, but standing waves are absent. (See also **Glide, Cascade** and **Pool.**)

Riparian Zone – Aquatic-terrestrial transition zones without definitive boundaries that encompass wetlands, uplands or some combination of these two land forms; vegetated uplands adjacent to a natural waterbody directly affect, or are affected by the adjacent waterbody.

Roads – Vehicular passage ways needed for the management and public use of Nash Stream Forest. Roads are classified into summer and winter roads divided into three classes: (1) Summer Roads Class B Gravel – all purpose; (2) Summer Class C Restricted Use – light duty vehicles; (3) Winter Roads Class D Non Gravel – restricted use.

(1) **Summer, Class B Gravel** – Roads used for frequent or continuous use for hauling and travel, except during winter and spring breakups when closures are required. Added fill and aggregate surfacing are required. Drainage structures are permanent. These roads are maintained for truck traffic, and if open to the public, for public travel.

(2) **Summer, Class C Restricted Use** – Roads used for short periods, then waterbarred and usually seeded between use periods. There is little or no aggregate surfacing. Drainage structures are usually temporary and are removed at the end of each use period. Use may be limited to dry ground and frozen ground periods. These roads are closed between use periods to vehicular traffic.

(3) **Winter, Class D Non Gravel, Restricted Use** – Roads used for intermittent and short periods, then waterbarred and seeded between use periods. There is little to no surfacing and usually no added fill. Use is limited to frozen ground conditions. Drainage structures are usually temporary and are removed at the end of each use period. These roads are closed to vehicular traffic between use periods.

Rock-hounding – The recreational pursuit and collection of rocks and minerals (as distinct from prospecting) using hand tools. Collecting involves removal of rocks and minerals from the ground surface, or panning of present-day stream gravels. Collecting is accomplished by only minor digging and loosening of soil material. There is no significant vegetation removal, and no explosives or power equipment are used for excavation. Typically, the activity is conducted infrequently, and disturbance to the environment is minimal.

Rotation – The period of years required to grow a crop of timber to a specified economic or natural maturity condition.

Salvage – Removal of trees that have been or are in imminent danger of being killed or

damaged by injurious agents other than competition between trees. The objective of salvage cutting is to utilize the injured, damaged or dead trees and recover timber values, not reserved for wildlife, that might otherwise be lost.

Sanitation – Removal of trees that have been attacked or are in imminent danger of attack by a damaging organism in order to reduce the spread of the damaging organism to the residual stand. Sanitation cutting is usually combined with a presalvage or salvage cutting. Sanitation cutting is conducted only if the character of the stands and the organism are such that the removal of susceptible trees will actually interrupt the life cycle of the organism sufficiently to reduce the spread to other trees.

Sapling – A live tree which measures between 2 inches and 4.5 inches in diameter 4½ feet from the ground.

Sawlog – The portion of wood, generally measured in board feet, cut from a tree which will yield timbers, lumber, railroad ties and other products which can be sawn with conventional sawmill equipment.

Sawtimber – A live tree greater than 9.5 inches in diameter measured 4½ feet above the ground.

Seedling – A live tree less than 4½ feet tall or less than 2 inches in diameter measured 4½ feet above the ground.

Sediment – Soil material that has been detached, transported, suspended, or settled in water.

Seed-tree Method – (See **Even-aged Management.**)

Shelterwood Method – (See **Even-aged Management.**)

Single-tree Selection Method – (See **Uneven-aged Management.**)

Skid Trail – The route used by forwarding machinery or animals to haul or drag forest products from the stump to the yard or landing.

Slash – Bark, branches, tops, chunks, cull logs, uprooted stumps and broken or uprooted trees and shrubs left on the ground as a result of a timber harvesting operation, right-of-way construction or maintenance and land clearance.

Soil/Site Capabilities – The productivity of soil and associated habitat based on combinations of land forms, vegetation and soil materials. (See **Ecological Land Capabilities.**)

Species of Management Concern – Any plant or animal species that is threatened, endangered, or otherwise determined to be of particular management concern for any significant reason.

Stand – A group of trees reasonably similar in age structure and species composition as to be distinguishable from adjacent areas. For administrative and mapping purposes, minimum stand size is considered to be five acres unless special characteristics require attention to smaller areas. (See **Even-aged Stand** and **Uneven-aged Stand.**)

Standards and Guidelines – Bounds or rules within which all management practices will be carried out in achieving planned goals and objectives.

Succession (ecological) – The gradual and predictable process of progressive community change and replacement, leading toward a

stable climax community; the process of continuous colonization and extinction of species populations at a particular site; sere.

Suitability – The appropriateness of applying certain resource management practices to a particular area of land, as determined by an analysis of economic and environmental consequences, and alternative or combined uses.

Sustainability – The ability to maintain a desired condition or flow of benefits over time.

Sustainable Forestry – Forest management practices for which the outcome will be sustained yield.

Sustainable Working Forest – A forest managed to maintain or achieve a healthy and productive forest together with human aspirations; a multi-dimensional managed forest that optimizes a sustained yield of wood products, soil and water quality, biological diversity, and human activity. (See **Integrated Resource Management.**)

Sustained Yield – The achievement and maintenance in perpetuity of an approximately even amount of annual or regular periodic wood yield consistent with multiple use objectives, without impairment of the productivity of the land and forest resources.

Target Age – When a final crop tree reaches a desired age and condition(s) based on the soil/site capabilities for that particular tree species and other factors such as desired commercial quality or biotic contribution.

Threatened Species – Any plant or animal species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range within the state pursuant to RSA 212-A:2 and 217-A:3, or any species determined to be a threatened species pursuant to the federal Endangered Species Act.

Timber Harvesting – The felling, skidding, loading, and transporting of primary timber products.

Traditional Uses – Those kinds of uses in the Nash Stream Forest and "north country" of New Hampshire that have characterized the Forest and general area in the past and present, including: an integrated mix of timber and forest products harvesting; low intensity outdoor recreation; and a limited number of recreation camps or residences.

Uneven-aged Management – The application of a combination of actions needed to maintain continuous high-forest cover, recurring regeneration of desirable species, and the orderly growth and development of trees through a range of diameter or age classes to provide a sustained yield of forest products. Cutting is usually regulated by specifying the number or proportion of trees of particular sizes to retain within each area, thereby maintaining a planned distribution of size classes. Cutting methods that develop and maintain uneven-aged stands are: (1) single tree selection; (2) group selection; and (3) patch selection.

(1) **Single-tree selection method** – removal of the mature timber, usually the oldest or largest trees, either as single, scattered individuals or in exceedingly small groups at relatively short intervals, repeated indefinitely, by encouraging the continuous establishment of reproduction and maintaining an uneven-aged stand.

(2) **Group selection method**–periodic removal of trees in small groups producing openings smaller than the minimum feasible acreage for a single stand under even-aged management (see **Even-aged Stand**) leading to the formation of an uneven-aged stand with a mosaic of small and variable sized age-class groups. Differing from single-tree selection in that the predominant characteristics of the group rather than individual stems, are evaluated for treatment .

(3) **Patch selection method**–removal of all trees down to a fixed limit (commonly 2 inches) on areas from a fraction of an acre up to the minimum feasible acreage for a single stand under even-aged management (see **Even-aged Stand**). Differing from group selection method in that all trees within the boundary, rather than a few adjacent, individually selected stems, are cut.

Uneven-aged Stand–A stand of trees that contains at least three well-defined age classes intermingled on the same area.

Vernal Pool–A temporary pool that fills up with water in the spring as a result of snowmelt, spring rains, and/or elevated groundwater table that provides crucial habitat to some species of wildlife. Some vernal pools fill again by autumn rains and may persist throughout the winter.

Viable Populations–A wildlife population of sufficient size to maintain its existence over time in spite of normal fluctuations in population levels.

Viewshed–All the surface areas visible from the observer's viewpoint.

Volume Control–A means of determining timber volume to be harvested based on the volume, distribution, and growth of timber growing stock. (See **Area Control.**)

Watershed–The entire area that contributes water to a drainage or stream.

Wetland–An area that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, river overflows, natural ponds, and similar areas.

Wild Trout–A trout that is the result of natural reproduction in a stream. A wild trout can be descended from hatchery fish that holdover and reproduce in the wild. (See **Native Trout.**)

Wildfire–Any wildland fire not designated and managed as a prescribed fire.

Wildlife–Any member of any nondomesticated species of the animal kingdom, whether reared in captivity or not, including, without exception, any mammal, fish, bird, amphibian, reptile, mollusk, arthropod or other invertebrate, and includes any part, product, egg or offspring thereof, or the dead body or parts thereof pursuant to RSA 212-A:2.

Working Forest–(See **Sustainable Working Forest.**)

Yarding–The transport of logs or whole trees from the stump to a yard, where wood is sorted. Yarding is usually done with rubber-tired skidders, with tractors, or with horses or oxen.

Footnotes

1 GRANIT (Geographically Referenced Analysis and Information Transfer) system; a statewide geographic information system housed at the Complex Systems Research Center, University of New Hampshire.

2 Based on deed tract references in the conveyance from Diamond International Company to the state of New Hampshire.

3 Baird, 1990.

4 The entire property was cover-typed during the timber cruise; see **Chapter 3– Wildlife Habitats and Species** for discussion of total forest cover (38,562 acres).

5 Less deductions such as mortality.

6 Historic record not reverified during 1988 inventory.

7 Based on GRANIT analysis.

8 Forest type and size class data based on GRANIT analysis of James W. Sewall Company forest type maps prepared in 1988.

9 Nash Stream and pond estimates based on GRANIT data analysis.

10 Completed by soil scientists from the Lancaster, NH USDA Soil Conservation Service office as part of the Coos County soil survey and National Cooperative Soil Survey of the United States.

11 Northeastern Forest Fire Protection Commission, 6 New England states, New York, provinces of New Brunswick and Quebec.

12 Based on an estimate of 600 acres of forest accessed by each mile of road.

13 Consists of NH Department of Agriculture, Cooperative Extension, U.S. Forest Service State and Private Forestry, The Society for the Protection of New Hampshire Forests, Audubon Society of New Hampshire, and NH Division of Forests and Lands.

14 Based on a count of snowmobiles observed by trail grooming machine operators and reported to the Trails Bureau by cooperative agreement.

15 Department of Resources and Economic Development in partnership with other state agencies, the U.S. Forest Service, and the public.

16 At Nash Stream, stewardship refers to government's responsibility to manage itself and land under its jurisdiction with proper regard to the rights of all for clean air, water, and a healthy forest environment and economy.

17 Using starch gel electrophoresis (a biochemical technique that deciphers protein genotypes).

18 Multiple use timber management (20,492 acres) and other non-forest and water areas (totaling 770 acres) not otherwise designated as protected.

19 Estimate based on GRANIT data analysis.

20 U.S. Department of Agriculture, Soil Conservation Service Group II soils that include steep slopes, erosive textures, surface boulders, bedrock outcrops, and poorly drained or seasonally wet sites.

21 Ibid, Northeastern Forest Fire Protection Commission, #11.

22 Ibid, #13.

23 Exceptions in the CED may allow harvesting with prior approval from the U.S. Forest Service.

24 Subject to field verification.

25 Ibid, #20; subject to field verification (see **Appendix 6 – Important Forest Soil Groups).**

26 Classified by the U.S. Dept. of Agriculture, Soil Conservation Service.

27 Usually when periodic annual growth is equal to volume lost through decay, or when the periodic annual growth becomes less than the average annual growth.

28 Maximum slope for logging operations.

29 From resource manual "Best Management Practices for Erosion Control on Timber Harvesting Operations in New Hampshire", compiled by J.B. Cullen et al, 1990.

30 Traditional public access by vehicle includes the Main Road and Fourteen and a Half Road.

31 Gate opening has usually been on or near Memorial Day weekend.

32 Department of Resources and Economic Development, "Reclamation and Operational Standards for Gravel Excavation on DRED Properties," February, 1991.

33 The trail to Trio Ponds will not be gated and will be maintained for management access and winter trail use only.

34 Property lines already clearly and properly defined and painted in another color by abutting landowners may not require re-marking in blue paint.

35 There are, at present, no designated camping areas; camping is not permitted on any state forest or park except in designated areas. Backcountry camping is being considered for Nash Stream's future.

References

Anon. 1888. History of Coos County, NH. W.A. Fergussen & Company, Syracuse, N.Y. 956pp.

Baird, I.W. 1990. Nash Stream An auto tour of the true north country with an account of the Sugarloaf fire lookout. Magnetic North 8(2): 23,29-34.

Burkholder, R., C. Feral, F. Clark, and B. Windmiller. 1989. A citizen's step-by-step guide to protecting vernal pools. Massachusetts Audubon Society, Lincoln, MA. (Reissued as: Colburn, E.A., ed. 1991. A citizen's step-by-step guide to protecting vernal pools. Massachusetts Audubon Society, Lincoln, MA. 107pp.)

Bormann, F.H., G.E. Likens, T.G. Siccama, R.S. Pierce and J.S. Eaton. 1974. The export of nutrients and recovery of stable conditions following deforestation at Hubbard Brook. Ecol. Monogr. 44:255-277.

Brouha, P., and M. G. Parsons. 1986. Foresters are fish habitat managers. Pp. 12-15 in Soc. American Foresters, Forester's future: leaders or followers? Soc. American Foresters, Bethesda, MD. 51pp.

Cullen, J.B., comp. 1990. Best management practices for erosion control on timber harvesting operations in New Hampshire. Coop. State Agency Resource Manual, Concord, NH.

DeGraaf, R. M. and D. D. Rudis. 1986. New England wildlife: habitat, natural history, and distribution. USDA For. Serv. Gen. Tech. Rep. NE-108. NEFES, Broomall, PA. 491pp.

DeGraaf, R. M., M. Yamasaki, W.B. Leak, and J.W. Lanier. 1992. New England wildlife: management of forested habitats. USDA For. Serv. Gen. Tech. Rep. NE-144. NEFES, Radnor, PA. 271pp.

Elliott, C.A., ed. 1988. Forester's guide to managing wildlife habitats in Maine. U. Maine Coop. Ext. Serv. and Maine Chapter of The Wildl. Soc., Inc. 58pp.

Foss, C.R. 1992. Wildlife in a changing landscape. Pages 15-22 in R. Ober, ed. Shaping the Land We Call New Hampshire. N.H. Historical Society and Soc. for the Protection of N.H. Forests, Concord, N.H. 96pp.

Frank, R.M., and J. Bjorkbom. 1973. A silvicultural guide for spruce - fir in the Northeast. USDA For. Serv. Gen. Tech. Rep. NE-6. NEFES, Broomall, PA. 29pp.

Hankin, D.G. and G.H. Reeves. 1988. Estimating total fish abundance and total habitat area in small streams based on visual estimation methods. Can. J. Aquatic Sci. 45: 834-844.

Hunter, M.L., Jr. 1990. Wildlife, forests and forestry – principles of managing forests for biological diversity. Prentice Hall. 370pp.

Johnston, W.F. 1986. Manager's handbook for balsam fir in the north central states. USDA For. Serv. Gen. Tech. Rep. NC-111. NCFES, St. Paul, MN. 27pp.

Leak, W.B. 1982. Habitat mapping and interpretation in New England. USDA For. Ser. Res. Pap. NE-496. 28pp.

Leak, W.B., D.S. Solomon, and P.S. DeBald. 1987. Silvicultural guide for northern hardwood types in the Northeast (revised). USDA For. Serv. Res. Pap. NE-603. NEFES, Broomall, PA. 36pp.

Leak, W.B. 1989. Relation of site to silvicultural alternatives. Pages. 31-37. in C.W. Martin, C.T. Smith, and L.M. Tritton, eds. New perspectives on silvicultural management of northenr hardwoods. USDA For. Serv. Gen. Tech. Rep. NE-124. 107pp.

Leak, W.B., M. Yamasaki, M.L. Smith and D.T. Funk. 1993. Selection criteria for forested natural areas in New England. U. S. For. Serv., Durham, N. H. 21pp.

Maine Critical Areas Program. 1983. Natural old-growth stands in Maine. Maine State Planning Office, Planning Report 77, Augusta, ME. 248pp.

Missouri, State of. 1986. Forest land management guidelines. Dept. of Conservation. 81pp.

New Hampshire, State of. 1991. Official list of public waters in New Hampshire. Dept. of Environmental Services, Concord, N. H.

Pastor, J. 1990. Nutrient cycling in aspen ecosystems. Pages 21-38 in R.D. Adams, ed. Aspen Symposium '89 Proceedings, USDA For. Serv. Gen. Tech. Rep. NC-140. NCFES, St. Paul, MN. 348pp.

Pennsylvania Game Commission. 1991. Wildlife habitat management manual.

Pike, R. E. 1967. Tall trees, tough men. W.W. Norton & Co., Inc., New York. 288pp.

Reay, R.S., D.W. Blodgett, B.S. Burns, S.J. Weber, and T. Frey. 1990. Management guide for deer wintering areas in Vermont. VT Dept. of Forests., Parks, & Recreation and VT Dept. of Fish & Wildlife. 35pp.

Robbins, C.R. 1979. Effect of forest fragmentation on bird populations. Page 198-212 in R.M. DeGraaf and K.E. Evans, comps. Management of North Central and Northeastern Forests for Nongame Birds. USDA For. Serv. Tech. Rep., NC-51. NCFES, St. Paul, MN. 268pp.

Runkle, James R. 1991. Gap dynamics of old growth eastern hardwood forests: management implications. Nat. Areas J. 11:19-25.

Salmon, G.F. 1992. Impacts of intensive timber utilization on neo-tropical songbird populations in Vermont. VT Dept. of Forests, Parks, & Recreation. 12pp.

Seehorn, M.E. 1985. Fish habitat improvement handbook. USDA Forest Service, Southern Region, Tech. Pub. R8-TP 7. 21pp.

Silver, H. 1957. A history of New Hampshire game and furbearers. N.H. Fish and Game Dept., Concord, N.H. 466pp.

Smith, D.M. 1962. The practice of silviculture. John Wiley & Sons, Inc. Seventh ed. 578pp.

Solomon, D.S., R.A. Hosmer, and H.T. Hayslett Jr. 1987. FIBER handbook: a growth model for spruce-fir and northern hardwood forest types. USDA For. Serv. NE-RP-602. NEFES, Broomall, PA. 19pp.

Tubbs, C.H., R.M. DeGraaf, M. Yamasaki, and W.M. Healy. 1987. Guide to wildlife tree management in New England northern hardwoods. USDA For. Serv. Gen. Tech. Rep. NE-118, NEFES, 30pp.

USDA Forest Service. 1986. Land and resource management plan. USDA Forest Service, Green Mountain National Forest, Rutland, VT.

USDA Forest Service. 1986. Land and resource management plan. USDA Forest Service, White Mountain National Forest, Laconia, N.H.

USDA Forest Service. 1989. Wildlife chapter service forester's handbook. NE Area, NA-FR-38. 43pp.

USDA Forest Service. 1992. Taking an ecological approach to management. Proc. Natl. Workshop, Salt Lake City, Utah. USDA Forest Service, WO-WSA-3, Washington, D.C. 241pp.

Vermont, State of. Undated. Wildlife management area operational procedures manual. Vermont Dept. of Fish and Wildlife. 154pp.

Wiley, J.E. III. 1988. Wildlife guidelines for the public reserve lands of Maine. Maine Bureau of Public Lands, Department of Conservation. 69pp.

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7. Appendix

APPENDIX 1
Newspaper Clippings

Nash Stream plan will stress harmony with forest

View of Nash Stream with Percy Peaks in the distance.

Nash Stream Plan Ready for Advisory Board

By BARBARA TETREAULT
Sunday News Correspondent

STARK — The Nash Stream Advisory Board, charged with developing a management plan for the 30,000-acre tract, will itself get back on track Tuesday when it meets for the first time in about a year.

The board was established in late 1989 after the state purchased the former Diamond International woodlands from a group of Nashua developers. As part of the transaction, the state sold a conservation easement on the property to the federal government.

The board, made up of representatives of timber interests, environmental groups, state agencies, recreational organizations and local communities, will review a draft management plan prepared by its technical team.

Division of Forest and Lands administrator Tom Miner, who heads the technical team, said the draft is very preliminary and was established to gather comments from committee members.

He said once the board has a chance to review the document and make changes, he hopes to distribute it to the public. He estimated a draft management plan might be ready to go out for public comment by early summer.

Miner said the draft follows the vision statement and goals, objectives, and strategies developed by the board.

The vision statement calls for the tract to be managed as a model of environmentally sound public land stewardship. Timber management will emphasize rotation and high quality wood products.

At the same time, a system of core natural areas surrounded by buffers and linked by corridors will be established to protect the habitat of rare, threatened and endangered plant and animal life.

Public access will continue as will traditional recreation such as hunting, fishing, hiking and snowmobiling.

While the committee has not meet for a year, Miner said the project hasn't been forgotten. He said field studies have continued as the technical team gathers baseline information on resources. Last summer, a wildlife inventory focusing primarily on bird life was conducted. Currently, a survey of mammals is underway.

"Everything is falling into place nicely," Miner said.

Still, both he and board chairman Steve Blackmer of the Appalachian Mountain Club, said it is time for the board to get back into action.

"I'm glad we're getting together," Blackmer said.

In the absence of a management plan, the Division of Resources and Economic Development has overseen the Nash Stream property. Since acquisition by the state, no timber harvesting has occurred in the tract.

The board will meet at 3 p.m. Tuesday at the DRED building in Concord. The meeting is open to the public but copies of the draft will not be available.

Nash Stream Advisory Group Sensitive to Citizen Input

By PETER RIVIERE

LANCASTER — Good progress is being made by the Nash Stream Watershed advisory committee on drawing up extensive plans for the management of the 40,000-acre tract acquired by the state in October of 1988.

Meeting here for the first time and since listening sessions were convened in early April, committee reports indicated just how sensitive the planners have been to citizen input.

Chairman of the group, Steve Blackmer of the Appalachian Mountain Club, summed up the meeting afterward saying the "discussion illustrates that we're far from finished but encouraged that we've found more consistency than inconsistency" in the subcommittees' work.

Working committees on timber, recreation and natural areas reported with another, informal group on wildlife, submitting a draft as those concerns spill into all other committees' work.

Providing a framework for the committees is Ecological Land Type mapping (ELTs for short) that seeks to correlate soil types, with slope gradients, vegetative cover and wildlife habitat to come to some decision point about areas off limits to road or trail building or foresting or overt management at all.

The mapping is providing a new basis for approaching land management and provides a hint of how seriously and sensitively the state is taking its role in planning for managing the Nash Stream Watershed area.

Forming the basis of many decisions is the conscious agreement that the property, as nearly as possible, be allowed to revert to its pre-Colonial vegetative cover and wildlife mix. Natural philosophical questions arise when pondering that thesis: does man intercede to manipulate the environment as an antidote to previous manipulations.

In some cases the management plan will include "no management at all" with dispersed, "unfettered and unconstrained, traditional recreation" uses favored with "an overriding ethic of protecting natural resources."

This is far removed from the feared Disney-like modus operandi and acknowledges the diamond-in-the-rough qualities of the property highly sought in the North Country by visitors from afar.

Timber management, one of the driving forces behind acquisition of the property and the basis of the conservation easement with the U.S. Forest Service, reflects this model planning posture.

Starting from the position that a long-term goal is to return the forest to "nearly its original (pre-19th century) species distribution" timber management will focus on long rotation harvests leading to more quality production of hardwoods and solid-wood supply.

"Nash Stream will not for all intents and purposes be a fiber supply for the paper industry," said Charlie Niebling of the Timberland Owners Association and a committee spokesperson.

He added that solitude and scenery were to be considered forestry products; that growth is expected to exceed harvest for decades to come; that natural areas would be linked, with sensitive forestry management planning along with appropriate buffers; clearcutting used only when no other silvicultural method will accomplish desired forest condition; summer harvesting allowed under some conditions (a reflection that winter recreationists may outnumber summer users); replanting, especially of exotics would be shunned; chemical treatments (herbicides, pesticides) banned but biological agents allowed when appropriate.

Other guiding principles for the timber management plan include making timber harvest subservient to wildlife needs, sustenance of water quality standards and annual yields based on management plans for a specific area rather than on a set volume basis (a practice followed by the USFS).

More work will be done to define buzzwords such as clearcutting, etc. and to describe the five-year planning cycles that would see the entire tract addressed within each 20-year block.

Niebling guessed that in the final analysis "probably half of NSW will be off limits to timber management."

John Twitchell, a recreation planner with the Division of Parks and Recreation, said that subcommittee has outlined low-impact, back country recreational opportunities with traditional uses favored (excepting camp leases which expire some 50 years hence).

A vision statement from the group expressed that recreation consists of a "limited range of outdoor experiences requiring minimal minimal management." In other words; there will be no recreation vehicle hookups, skeet ranges, mega parking areas or party boat launch areas. All-terrain vehicle use has not yet been addressed by the committee which meets again in Laconia on June 13.

Krista Helmboldt of The Nature Conservancy, reporting for the natural areas subcommittee, said the group was still assessing data in order to establish core natural preserve areas (NPAs) that would be linked and buffered from other activities in order to protect sensitive species or rare and endangered plants and species.

One concern expressed and the dilemma to be resolved is "what are we protecting the NPAs from?" One policy statement in the committee's draft speaks to preserving "representatives of all elements of biological diversity culminating in a sustainable dynamic."

Wildlife management, though not part of the formal subcommittee structure but recognized as a necessary adjunct to them, was discussed by a number of Fish and Game biologists led by Charlie Bridges of Concord.

Traditional uses of the tract will be favored along with promotion of "positive interactions between people and wildlife," many of which would be non-consumptive.

Producing this favored condition would require "maintaining a high level of diversity in natural biological communities which can be assured through time with a program of habitat protection, maintenance and enhancement," read the subgroup's position paper.

While it sounds as though everyone is on the same wavelength, the Fish and Game biologists were sharpest in their criticism of assumptions by laypeople influencing the management plan, at one point challenging a contention about setting minimum 500-foot buffers around NPAs and asking for documentation of research data to support such recommendations.

With many areas of discussion raised the committee is far from completed in its tasks. "We've got our work cut out for us," said Blackmer, noting that the next meeting is set for Concord on July 12.

Unfortunately, for local concerns, none of the four area representatives to the advisory committee made the meeting in their own back yard.

APPENDIX 2
Group Summaries

The following are based on verbal presentations by group spokespersons to the general assembly at the end of the small group work sessions. The comments are listed as presented and represent each group's consensus.

Group 1

1. Advisory Committee should be responsive to local input
2. Keep property open to timber cutting
3. Keep leases as they are
4. No wilderness
5. Self-supporting
6. Stewardship, etc.
7. More clarification of Federal rights

Group 2

1. Preserve raw character
   - status quo – limit pond access
   - no new roads or trails
2. Maintain tract health - viable forest
3. NO herbicides/chemicals
4. Multiple uses
5. Provide for natural preserves below 2,700 feet
6. Informational signs at harvesting sites
7. Extend leases
8. Improve logging practices done in the past

Group 3

1. Multiple use management
   - watershed, recreation, silviculture, etc.
2. Concern for environmental damage from gravel excavation
3. Interpretive and educational tours
4. Maintenance of biodiversity

Group 4

1. All recreation should be passive
2. Keep camps in place as they are
3. Keep snowmobile trails open above 2,700 feet
4. No clearcuts - leave oaks and beech for food
5. Keep trails away from deer yards
6. Control use of roads (speed limits?)

Group 5 & 6

1. No gravel mining
2. Responsible timber management with multiple uses
3. Local control
4. Keep access to a minimum
5. User fees
6. Important to compensate towns
7. Enforcement of hunting and fishing laws

Group 7

1. Leave property as is
2. Keep property open to snowmobiling, fishing, hunting, etc.
3. Local control of management
4. Little state and Federal control
5. Concern for effect on local tax base
6. Proper timber management
7. Bog should be a natural area
8. Develop cross country ski trails
9. Property should be self-sustaining
10. Review Plan every five years with local input

Group 8

1. No developments or facilities
2. Camp lease fees and restrictions should be kept reasonable
3. Active timber management plan promoting sustained yield and wildlife management

Group 9 & 10

1. Restore deer yards
2. Review lease program and loss of tax revenue
3. Restoration of gravel should be done and properly monitored
4. Local management

APPENDIX 3
Summary of Common Themes

There were many valuable comments made at both the Groveton and Concord Nash Stream public meetings. Those comments from both meetings (listed alphabetically by subject category) that appear to have a common theme are summarized below:

ACCESS (Roads and trails)
- Maintain and protect existing roads
- No new roads or trails
- Concern with impact of access on wildlife

EASEMENT
- Need clarification of Federal rights

EDUCATION
- Public education be a part of management and use of property

ENFORCEMENT
- Ensure enforcement of reasonable regulations

GRAVEL
- No gravel mining (i.e. Rancourt)
- If gravel mining must occur it should be properly controlled
- Need clarification of Rancourt's gravel rights

HEALTH
- Concern for tract (ecological) health–
  healthy trees/water/wildlife(native), no chemicals, stewardship

LEASES
- Keep the camp leases the way they are with reasonable fees and terms
- Extend leases beyond 50-year term

LOCAL IMPACT
- More local input into tract management
- Concern with financial impact to towns–
  Clarify yield tax, loss of property taxes, cost of added services such as roads, law enforcement and trash disposal
- Use property revenue to offset town costs

MULTIPLE USE
- Manage under principle of multiple use with consideration for protection, recreation and timber

NASH BOG DAM
- Mixed views on whether to rebuild dam or not

NATURAL PRESERVE
- Survey and identify areas suitable for natural preserves

PLAN
- Base plan on thorough study and review
- Periodic review of plan (every 3-5 years suggested)
- More public (and local) involvement in Plan

PRESERVE
- Leave property as it is
- Minimum development

RECREATION
- Keep property open to traditional recreational uses
- Concern about trail development and who maintains existing trails
- Any recreational development should be low impact

STAFFING
- Hire a manager and on-site staff

TIMBER
- Continue timber management consistent with traditional use
- Good forest management should be used
- Concerned about clearcuts

USE
- Keep property open to public use
- Property should be self-supporting
- Control use to prevent over-use (fisheries, wildlife and trail resources)
- Minimum impact uses
- Respect for property – ethical conduct by users

WILDLIFE
- Link wildlife habitat treatments with timber management
- Softwood management for wildlife

APPENDIX 4
Private Camp Lot License Policy

INTRODUCTION

The Department of Resources and Economic Development and its predecessor agencies have always had a policy of not granting private recreation leases (camp sites) on lands under their administrative jurisdiction. This is evidenced by the absence of private camps on our State Forests and State Park lands. The only exceptions to this policy were those private camps that were "grandfathered" by virtue of their existence at the time of acquisition of the particular land parcel.

In 1965, a decision was made to terminate these "grandfathered" camp sites which at that time numbered fourteen. The last such camp was removed from state land in July, 1988 (Royce and Smith, Pisgah).

With the state purchase of the Nash Stream Forest on October 27, 1988, the Department of Resources and Economic Development has become the owner of camp lease sites that were existing on this land at the time of acquisition. Approximately 104 of these lease sites have camps that are owned or leased by private individuals under a lease lot program that was maintained by the state's predecessor, Diamond International Corporation.

Subsequent to purchase of the Nash Stream Forest, the state of New Hampshire granted a Conservation Easement Deed to the United States of America (August 4, 1989). This Conservation Easement prohibits residential uses (including vacation homes, cabins and camps) of the Nash Stream Forest. However, existing recreation camps are allowed to continue subject to the rights of the state to limit or terminate their use.

This document will set forth the Department of Resources and Economic Development policy with regard to these recreation camps.

GOAL/OBJECTIVE

The ultimate goal of the Department of Resources and Economic Development is to remove the private recreation camps from state land and to return the lease sites to public use in their natural condition. This is consistent with past and present private camp lease policy and the overall purpose and intent of the state's acquisition of this property and of the Conservation Easement Deed. Recognizing the investment of time and money of the camp lot lessees in their camps and to allow a reasonable period of time in which to recoup this investment, our objective is to phase out the lease lots by allowing limited transfers of the privately owned camps for 15 years and life use (no transfers) by camp owners in year 15, for the remainder of a fifty-year term. Licenses for state-owned camps (company camps) shall not be transferred.

GUIDELINES/CONSIDERATION

Camp lot leases with an existing camp building at the date of state acquisition of the Nash Stream Forest may continue under licenses that will be issued by the Department of Resources and Economic Development. Undeveloped camp lot leases shall be cancelled.

Initial license term and renewals shall be in five-year increments.

Overall license term, including all renewals, shall not exceed 50 years in duration and all Nash Stream camp licenses shall terminate on June 30, 2039. Transfers (sale, gift, etc.) of camps shall be allowed for 15 years. Individual or family camps shall not be transferred to or owned by more than two individuals at any one time. Association camps may be transferred, however, membership shall be limited to the total number of memberships existing at the date of state acquisition of the Nash Stream property. Camp lot licenses shall be transferred to new camp owners. The number (frequency) of camp transfers during the 15 year period shall not be limited. No camp transfers shall be allowed after June 30, 2004.

Camps on license lot shall be removed from the state land within one year of expiration, termination, cancellation or lapse of the license.

Lot license fees shall be uniform for all lots within Nash Stream State Forest. License fees for the first five-year term shall be sufficient to cover administrative costs associated with the lot license program and will reflect an appropriate share of the maintenance cost of Nash Stream State Forest. License fees may be adjusted at each five-year renewal. However, any increases shall not exceed the accumulated yearly percentage change in the Consumer Price Index for the previous five-year license period, as determined by the United States Department of Commerce and as adjusted regionally for the northeast.

Differences in the lot's natural amenities such as lot location, vehicle accessibility or water body or stream proximity and the size and quality of individual camps will not be considered in setting lot license fees. These items will be reflected in the lot and camp assessment and subsequent real estate tax bill received by the lot licensee/camp owner from local assessing officials.

License fees shall be set by the Commissioner, Department of Resources and Economic Development, with approval of Governor and Council.

For other guidelines see the Standard License Form.

APPENDIX 5
Road List by Class

Roads are classified for maintenance and use purposes. Class A roads are public highways; Class U roads are unclassified. Class B, C and D descriptions are included in the Glossary under **Roads.**

	MILES BY CLASS					TOTAL
ROAD	A	B	C	D	U	MILES
Fourteen and a Half		3.3				3.3
Bungy Spur				0.3		0.3
Christine Spur			0.4			0.4
Cloutier Spur				0.3		0.3
Columbia Brook			1.7			1.7
Cranberry Bog Spur				0.2		0.2
Cross				0.7		0.7
East Branch Extensions 1, 2 & 3				0.5		0.5
East Branch		1.0	2.6	1.9		5.6
Farrer Brook			0.3	1.3		1.6
Headwaters West Fork				0.7		0.7
Jimmy Cole Extension				1.2		1.2
Jimmy Cole North				0.9		0.9
Jimmy Cole Brook		2.5	1.6			4.2
Long Mountain North			1.7			1.7
Long Mountain South			2.0			2.0
Low				0.9		0.9
Lower Phillips Brook					0.6	0.6
Main		11.1				11.1
Nash Bog Spur				0.9		0.9
Nash Stream Headwaters			1.2	1.2		2.3
Nash Stream Spur				0.4		0.4
North	0.5					0.5
Old East Branch				0.8		0.8
Pike Pond			1.0			1.0

Road List by Class (continued)

ROAD	MILES BY CLASS A	B	C	D	U	TOTAL MILES
Pike's Works			0.7			0.7
Pond Brook				0.4		0.4
Roaring Brook			0.6	0.9		1.5
Roberts Brook		0.6				0.6
Rocky Brook			0.8			0.8
Rowells Brook		0.6				0.6
Silver Brook				2.0		2.0
Simms Brook (Kelsey Notch)			0.3	1.0		1.3
South				1.1		1.1
Stark Dump			1.6			1.6
Stratford Mountain				0.9		0.9
Tracy's Camp		0.4	0.5			0.9
Trio Pond				1.4		1.4
Upsouth				0.8		0.8
Waterhole Brook				1.3		1.3
West Side		5.3				5.3
Whitcomb Mountain Spur				0.7		0.7
Whitcomb Pond				0.2		0.2
Totals	**0.5**	**24.2**	**17.7**	**23.5**	**0.6**	**66.5**

APPENDIX 6
Important Forest Soil Groups

GROUP IA — Fertile, deep, loamy texture; moderately well and well-drained; succession toward site demanding and shade tolerant hardwoods (Sm,Yb,Wa); hardwood competition severe; few limitations for forest management. [LOAMY/DEEP SIDE SLOPE–HIGH QUALITY HARDWOODS]

GROUP IB — Less fertile, coarser sandy loam; sandy and loamy over sandy textures; moderately well and well-drained; succession toward less site demanding hardwoods (Rm,Pb,Be,Ro); hardwood competition less severe; few limitations for forest management. [COARSE/SANDY/LOAM SIDE SLOPE–LOW QUALITY HARDWOODS]

GROUP IC — Somewhat droughty, less fertile; sands and gravel derived from glacial outwash; excessively well-drained; succession toward shade tolerant softwoods especially Rs,Bf, (Wp); hardwood competition low; ideally suited for forest management. [VALLEY BOTTOM OUTWASH– SOFTWOODS]

GROUP IIA — Diverse group similar to Groups IA and IB with physical limitations influencing forest management, i.e. steep slopes, erosive textures, surface boulders, excessive surface stones, and bedrock outcrops; good productivity but generally difficult and costly for forest management; includes shallow and deep (hardpan) to ledge; succession toward softwoods greater than or equal to hardwoods (Rm,Pb,Yb). [SHALLOW AND DEEP UPPER SLOPES]

GROUP IIB — Poorly drained, generally gray to mottled mineral soil; seasonal high water; lesser productivity; seasonal and other operating restrictions; suited to Rs and Bf; succession toward softwood more than hardwoods. [POORLY/VERY POORLY DRAINED VALLEY BOTTOM]

NC — Not classified for forest soil purposes; includes muck and peat, borofibrists, dumps, organic material, gravel pits (existing), rock outcrops, steep rubble, etc.

ESTIMATE OF AREA BY IMPORTANT FOREST SOIL GROUP:

	Total Forest	Multiple Use Timber Mgt Area
IA	12,210.0 Acres	11,909.0 Acres
IB	8,720.0	8,341.0
IC	391.0	242.0
IIA	15,318.0	0.0
IIB	2,192.0	0.0
NC	770.0	0.0

Soil Units and Ecological Land Groups

UNIT	SOIL	IFSG*	ELG	ACRES
738E	Glebe-Saddleback-Sisk association, steep, very stony	IIA	#01 - MT/CBT/SFB	1,811
750E	Saddleback-Glebe-Ricker association, steep, very stony	IIA	#01 - MT/CBT/SFB	3,004
750B	Saddleback-Glebe-Ricker association, gently sloping, very stony	IIA	#01 - MT/CBT/SFB	752
738B	Glebe-Saddleback-Sisk association, gently sloping, very stony	IIA	#01 - MT/CBT/SFB	368
738D	Glebe-Saddleback-Sisk association, moderately steep, very stony	IIA	#01 -MT/CBT/SFB	2,319
750D	Saddleback-Glebe-Ricker association, moderately steep, very stony	IIA	#01 - MT/CBT/SFB	955
726F	Rock outcrop-Lyman complex, very steep	IIB	#02 - MT/FBT/SF	209
834D	Sisk-Surplus association, moderately steep, very stony	IIA	#03 - USS/CHT/BSF	1,266
834B	Sisk-Surplus association, gently sloping, very stony	IIA	#03 - USS/CHT/BSF	81
734D	Surplus-Sisk association, moderately steep, very stony	IIA	#03 - USS/CHT/BSF	791
736E	Sisk-Glebe association, steep, very stony	IIA	#03 - USS/CHT/BSF	1,236
737B	Surplus-Sisk-Monarda variant association, gently sloping, very stony	IIB	#03 - USS/CHT/BSF	454
865B	Monarda variant-Surplus association, gently sloping, very stony	IIB	#03 - USS/CHT/BSF	184
820	ELyman-Tunbridge-Rock outcrop complex, steep	IIA	#04 - MSS/FBT/SFM	212
562E	Winnecook-Thorndike-Rock outcrop complex, 25-35% slopes	IIA	#04 - MSS/FBT/SFM	5
820B	Lyman-Tunbridge-Rock outcrop complex, gently sloping	IIA	#04 - MSS/FBT/SFM	106
71E	Lyman-Berkshire-Rock outcrop complex, 25-35% slopes	IIA	#04 - MSS/FBT/SFM	59
71C	Lyman-Berkshire-Rock outcrop complex, 8-15% slopes	IIA	#04 - MSS/FBT/SFM	18
71D	Lyman-Berkshire-Rock outcrop complex, 15-25% slopes	IIA	#04 - MSS/FBT/SFM	20
71B	Lyman-Berkshire-Rock outcrop complex, 3-8% slopes	IIA	#04 - MSS/FBT/SFM	13
560E	Winnecook-Plaisted-Thorndike complex, 25-35% slopes	IB	#05 - MSS/FBT/MBA	169
560D	Winnecook-Plaisted-Thorndike complex, 15-25% slopes	IB	#05 - MSS/FBT/MBA	196
919B	Tunbridge-Lyman-Marlow association, undulating, very stony	IB	#05 - MSS/FBT/MBA	976
919D	Tunbridge-Lyman-Marlow association, hilly, very stony	IB	#05 - MSS/FBT/MBA	2,561

* *IFSG refers to Important Forest Soil Groups.*

UNIT	SOIL	IFSG	ELG	ACRES
860E	Winnecook-Thorndike-Rock outcrop complex, steep	IIA	#05 - MSS/FBT/MBA	16
760D	Winnecook-Plaisted bedrk substratum-Plaisted assoc, mod stp,v stony	IA	#05 - MSS/FBT/MBA	68
70C	Tunbridge-Berkshire complex, 8-15% slopes	IA	#05 - MSS/FBT/MBA	64
70D	Tunbridge-Berkshire complex, 15-25% slopes	IA	#05 - MSS/FBT/MBA	93
70B	Tunbridge-Berkshire complex, 3-8% slopes	IA	#05 - MSS/FBT/MBA	2
919E	Tunbridge-Lyman-Marlow association, steep, very stony	IIA	#05 - MSS/FBT/MBA	1,179
560C	Winnecook-Plaisted-Thorndike complex, 8-15% slopes	IB	#05 - MSS/FBT/MBA	31
560B	Winnecook-Plaisted-Thorndike complex, 3-8% slopes	IB	#05 - MSS/FBT/MBA	16
864D	Howland-Plaisted association, moderately steep, very stony	IB	#06 - MSS/FHT/SFM	748
566B	Howland silt loam, 3-8% slopes	IA	#06 - MSS/FHT/SFM	5
764B	Howland-Plaisted-Monarda assoc, gently sloping, very stony	IA	#06 - MSS/FHT/SFM	343
567C	Howland silt loam, 8-15% slopes, very stony	IA	#06 - MSS/FHT/SFM	11
566D	Howland silt loam, 15-25% slopes	IA	#06 - MSS/FHT/SFM	4
567B	Howland silt loam, 3-8% slopes, very stony	IA	#06 - MSS/FHT/SFM	9
567D	Howland silt loam, 15-25% slopes, very stony	IA	#06 - MSS/FHT/SFM	66
79C	Peru fine sandy loam, 8-15% slopes, very stony	IA	#07 - MSS/FHT/MBA	97
79D	Peru fine sandy loam, 15-25% slopes, very stony	IA	#07 - MSS/FHT/MBA	34
762B	Plaisted-Howland association, gently sloping, very stony	IA	#07 - MSS/FHT/MBA	38
721D	Peru-Marlow association, moderately steep, very stony	IA	#07 - MSS/FHT/MBA	597
762D	Plaisted-Howland association, moderately steep, very stony	IA	#07 - MSS/FHT/MBA	433
77C	Marlow fine sandy loam, 8-15% slopes, very stony	IA	#07 - MSS/FHT/MBA	67
77E	Marlow fine sandy loam, 25-35% slopes, very stony	IA	#07 - MSS/FHT/MBA	5
77D	Marlow fine sandy loam, 15-25% slopes, very stony	IA	#07 - MSS/FHT/MBA	95
79B	Peru fine sandy loam, 3-8% slopes, very stony	IA	#07 - MSS/FHT/MBA	10
719E	Marlow-Tunbridge association, steep, very stony	IIA	#07 - MSS/FHT/MBA	49
862E	Plaisted-Winnecook association, steep, very stony	IIA	#07 - MSS/FHT/MBA	3

UNIT	SOIL	IFSG	ELG	ACRES
922E	Marlow-Tunbridge association, steep, extremely bouldery	IIA	#07 - MSS/FHT/MBA	403
923B	Marlow-Peru association, gently sloping, extremely bouldery	IA	#07 - MSS/FHT/MBA	540
828D	Skerry-Peru association, moderately steep, very stony	IA	#07 - MSS/FHT/MBA	151
828B	Skerry-Peru association, gently sloping, very stony	IA	#07 - MSS/FHT/MBA	1,061
821B	Marlow-Peru association, gently sloping, very stony	IA	#07 - MSS/FHT/MBA	254
821D	Marlow-Peru association, moderately steep, very stony	IA	#07 - MSS/FHT/MBA	2,385
823B	Peru-Marlow-Pillsbury association, gently sloping, very stony	IA	#07 - MSS/FHT/MBA	2,067
801E	Becket-Marlow association, steep, very stony	IIA	#07 - MSS/FHT/MBA	34
923D	Marlow-Peru association, moderately steep, extremely bouldery	IA	#07 - MSS/FHT/MBA	726
563C	Plaisted silt loam, 8-15% slopes	IA	#07 - MSS/FHT/MBA	6
563B	Plaisted silt loam, 3-8% slopes	IA	#07 - MSS/FHT/MBA	5
701D	Beckett-Skerry association, moderately steep, very stony	IA	#07 - MSS/FHT/MBA	1,373
559C	Skerry fine sandy loam, 8-15% slopes, very stony	IA	#07 - MSS/FHT/MBA	15
563D	Plaisted silt loam, 15-25% slopes	IA	#07 - MSS/FHT/MBA	20
559D	Skerry fine sandy loam, 15-25% slopes, very stony	IA	#07 - MSS/FHT/MBA	14
701B	Beckett-Skerry association, gently sloping, very stony	IA	#07 - MSS/FHT/MBA	187
57E	Becket fine sandy loam, 25-35% slopes, very stony	IA	#07 - MSS/FHT/MBA	1
57C	Becket fine sandy loam, 8-15% slopes, very stony	IA	#07 - MSS/FHT/MBA	4
564D	Plaisted silt loam, 15-25% slopes, very stony	IA	#07 - MSS/FHT/MBA	28
564E	Plaisted silt loam, 25-35% slopes, very stony	IA	#07 - MSS/FHT/MBA	36
812D	Monadnock-Herman association, hilly, extremely bouldery	IIA	#08 - LSS/CNT/SFB	118
803E	Berkshire-Monadnock association, hilly, very stony	IIA	#08 - LSS/CNT/SFB	176
579B	Dixmont silt loam, 3-8% slopes, very stony	IA	#09 - LSS/FNT/SFM	10
579D	Dixmont silt loam, 15-25% slopes, very stony	IA	#09 - LSS/FNT/SFM	64
579C	Dixmont silt loam, 8-15% slopes, very stony	IA	#09 - LSS/FNT/SFM	16
573B	Bangor silt loam, 3-8% slopes, very stony	IA	#10 - LSS/FNT/MBA	4

UNIT	SOIL	IFSG	ELG	ACRES
773D	Bangor-Dixmont association, hilly, very stony	IA	#10 - LSS/FNT/MBA	21
573E	Bangor silt loam, 25-35% slopes, very stony	IA	#10 - LSS/FNT/MBA	14
143E	Monadnock fine sandy loam, 25-35% slopes, very stony	IB	#11 - LSS/FNT/ERS	76
145C	Monadnock fine sandy loam, 8-15% slopes, extremely bouldery	IB	#11 - LSS/FNT/ERS	46
143D	Monadnock fine sandy loam, 15-25% slopes, very stony	IB	#11 - LSS/FNT/ERS	171
59C	Waumbek sandy loam, 8-15% slopes, very stony	IB	#11 - LSS/FNT/ERS	20
711B	Monadnock-Hermon association, undulating, very stony	IB	#11 - LSS/FNT/ERS	472
59B	Waumbek sandy loam, 3-8% slopes, very stony	IB	#11 - LSS/FNT/ERS	26
55E	Hermon sandy loam, 25-35% slopes, very stony	IB	#11 - LSS/FNT/ERS	0
273E	Berkshire, Monadnock, & Hermon soils, 15-35% slope, extr bouldery	IB	#11 - LSS/FNT/ERS	49
55D	Hermon sandy loam, 15-25% slopes, very stony	IB	#11 - LSS/FNT/ERS	0
155E	Success gravelly loamy coarse sand, 25-35% slopes, very stony	IB	#11 - LSS/FNT/ERS	25
711D	Monadnock-Hermon association, hilly, very stony	IB	#11 - LSS/FNT/ERS	1,768
812D	Monadnock-Hermon association, hilly, extremely bouldery	IB	#11 - LSS/FNT/ERS	750
812E	Monadnock-Hermon association, steep, extremely bouldery	IIA	#11 - LSS/FNT/ERS	108
829B	Waumbek-Hermon association, undulating, very stony	IB	#11 - LSS/FNT/ERS	352
143C	Monadnock fine sandy loam, 8-15% slopes, very stony	IB	#11 - LSS/FNT/ERS	110
812B	Monadnock-Hermon association, undulating, extremely bouldery	IB	#11 - LSS/FNT/ERS	179
711E	Monadnock-Hermon association, steep, very stony	IIA	#11 - LSS/FNT/ERS	131
143B	Monadnock fine sandy loam, 3-8% slopes, very stony	IB	#11 - LSS/FNT/ERS	7
142C	Monadnock fine sandy loam, 8-15% slopes	IB	#11 - LSS/FNT/ERS	7
169C	Sunapee fine sandy loam, 8-15% slopes, very stony	IA	#12 - LSS/FNT/EMS	91
169B	Sunapee fine sandy loam, 3-8% slopes, very stony	IA	#12 - LSS/FNT/EMS	99
169D	Sunapee fine sandy loam,15-25% slopes, very stony	IA	#12 - LSS/FNT/EMS	3
804B	Berkshire-Monadnock association, undulating, extremely bouldery	IA	#12 - LSS/FNT/EMS	0
804D	Berkshire-Monadnock association, hilly, extremely bouldery	IA	#12 - LSS/FNT/EMS	533

UNIT	SOIL	IFSG	ELG	ACRES
73D	Berkshire fine sandy loam, 15-25% slopes, very stony	IA	#12 - LSS/FNT/EMS	7
803E	Berkshire-Monadnock association, steep, very stony	IIA	#12 - LSS/FNT/EMS	232
803D	Berkshire-Monadnock association, hilly, very stony	IA	#12 - LSS/FNT/EMS	238
803B	Berkshire-Monadnock association, undulating, very stony	IA	#12 - LSS/FNT/EMS	61
569A	Monarda silt loam, 0-3% slopes	IIB	#13 - UP/PDT/SFP	10
415C	Moosilauke loam, 8-15% slopes, very stony	IIB	#13 - UP/PDT/SFP	10
647C	Pillsbury sandy loam, 8-15% slopes, very stony	IIB	#13 - UP/PDT/SFP	64
817A	Moosilauke-Waumbek association, nearly level, very stony	IIB	#13 - UP/PDT/SFP	21
647B	Pillsbury sandy loam, 3-8% slopes, very stony	IIB	#13 - UP/PDT/SFP	24
570C	Monarda silt loam, 8-15% slopes, very stony	IIB	#13 - UP/PDT/SFP	17
569C	Monarda silt loam, 8-15% slopes	IIB	#13 - UP/PDT/SFP	22
570B	Monarda silt loam, 3-8% slopes, very stony	IIB	#13 - UP/PDT/SFP	26
569B	Monarda silt loam, 3-8% slopes	IIB	#13 - UP/PDT/SFP	4
825B	Pillsbury-Peacham-Peru association, gently sloping, very stony	IIB	#13 - UP/PDT/SFP	1,113
415B	Moosilauke loam, 3-8% slopes, very stony	IIB	#13 - UP/PDT/SFP	18
415A	Moosilauke loam, 0-3% slopes, very stony	IIB	#13 - UP/PDT/SFP	15
36A	Adams loamy sand, 0-3% slopes	IC	#14 - VB/OAL/SFP	23
433A	Grange silt loam, 0-5% slopes	IIB	#14 - VB/OAL/SFP	9
36B	Adams loamy sand, 3-8% slopes	IC	#14 - VB/OAL/SFP	1
28B	Madawaska very fine sandy loam, 3-8% slopes	IA	#14 - VB/OAL/SFP	13
36E	Adams loamy sand, 15-60% slopes	IIA	#14 - VB/OAL/SFP	2
413B	Duane fine sandy loam, 3-8% slopes	IC	#14 - VB/OAL/SFP	54
413A	Duane fine sandy loam, 0-3% slopes	IC	#14 - VB/OAL/SFP	178
36C	Adams loamy sand, 8-15% slopes	IC	#14 - VB/OAL/SFP	14
28A	Madawaska very fine sandy loam, 0-3% slopes	IA	#14 - VB/OAL/SFP	55
630C	Salmon very fine sandy loam, 8-15% slopes	IA	#14 - VB/OAL/SFP	29

UNIT	SOIL	IFSG	ELG	ACRES
630D	Salmon very fine sandy loam, 15-35% slopes	IIA	#14 - VB/OAL/SFP	22
632B	Nicholville very fine sandy loam, 3-8% slopes	IA	#14 - VB/OAL/SFP	9
613B	Croghan loamy fine sand, 1-8% slopes	IC	#14 - VB/OAL/SFP	1
520B	Machias fine sandy loam, 1-8% slopes	IC	#14 - VB/OAL/SFP	1
504	Metallak very fine sandy loam	IA	#14 - VB/OAL/SFP	18
505	Cohas loam	IIB	#14 - VB/OAL/SFP	96
501	Abenaki very fine sandy loam	IA	#14 - VB/OAL/SFP	6
633A	Pemi silt loam, 0-5% slopes	IIB	#14 - VB/OAL/SFP	85
214A	Naumburg fine sandy loam, 0-3% slopes	IIB	#14 - VB/OAL/SFP	17
209	Charles silt loam	IA	#14 - VB/OAL/SFP	0
27B	Groveton very fine sandy loam, 3-8% slopes	IA	#14 - VB/OAL/SFP	9
102	Sunday loamy sand	IB	#14 - VB/OAL/SFP	12
214B	Naumburg fine sandy loam, 3-8% slopes	IIB	#14 - VB/OAL/SFP	2
208	Fryeburg very fine sandy loam	IA	#14 - VB/OAL/SFP	0
22A	Colton fine sandy loam, 0-3% slopes	IC	#14 - VB/OAL/SFP	15
22E	Colton gravelly fine sandy loam, 15-60% slopes	IIA	#14 - VB/OAL/SFP	75
22C	Colton fine sandy loam, 8-15% slopes	IC	#14 - VB/OAL/SFP	85
22B	Colton fine sandy loam, 3-8% slopes	IC	#14 - VB/OAL/SFP	18
298	Pits, gravel	NC	#15 - VB/UPD/UTC	11
295	Greenwood mucky peak	NC	#15 - VB/UPD/UTC	20
395	Chocorua mucky peak	NC	#15 - VB/UPD/UTC	17
15	Searsport fine sandy loam	NC	#15 - VB/UPD/UTC	11
697	Peacham, Greenwood, and Rumney soils, ponded	NC	#15 - VB/UPD/UTC	307
6G	Medomak Variant silt loam	NC	#15 - VB/UPD/UTC	23
549	Peacham muck, very stony	NC	#15 - VB/UPD/UTC	13
406	Medomak silt loam	NC	#15 - VB/UPD/UTC	2

APPENDIX 7
AVAILABLE FOREST LAND AND OTHER CATEGORIES
(IN ACRES)

I. AVAILABLE FOREST LAND (AFL)[1]

	GROUP I SOILS[2]			GROUP II SOILS[3]			
	IA	IB	IC	IIA	IIB	UNC.	TOTAL
HARDWOOD							
FBT/MBA[4]	222	3,820		822			4,864
FHT/MBA	10,010			238			10,248
FNT/MBA	37						37
TOTAL	**10,269**	**3,820**		**1,060**			**15,150**
MIXED SPECIES							
FNT/SFM	90						90
FNT/ERS		3,773		202			3,975
FNT/EMS	986			49			1,035
CHT/SFB				1,161	349		1,510
FHT/SFM	432	748					1,180
FBT/SFM				329			329
VPD/UTC						153	153
CNT/SFB				57			57
TOTAL	**1,508**	**4,521**		**1,798**	**349**	**153**	**8,330**
SOFTWOOD							
OAL/SFP	132		242	73	130		577
CBT/SFB				2,664			2,664
PDT/SFP					1,278		1,278
FBT/SF						49	49
TOTAL	**132**		**242**	**2,738**	**1,408**	**49**	**4,568**
UNCLASSIFIED						1	1
TOTAL AFL	**11,909**	**8,341**	**242**	**5,595**	**1,757**	**203**	**28,048**

[1] Forest land without timber harvesting restrictions in the Conservation Easement.

[2] US Soil Conservation Service (SCS) Group I soils considered suitable for sustainable timber management. Group I soils in the AFL management category total 20,492 acres.

[3] SCS Group II soils with physical limitations influencing timber management. These soils buffer natural areas and serve as connective corridors between natural communities at various elevations. Group II soils in the AFL management category total 7,352 acres.

[4] See Successional Group/Parent Material code descriptions on page 173.

APPENDIX 9
Community Forest Fire Resources

YEAR: 1994 DISTRICT: 7

TOWN: Colebrook EMERG PHONE: 237-5555 FS PHONE: 237-5798
M.A. SYSTEM: None FREQUENCY: FIREGROUND:

WARDEN: Ronald Hughes	HOME: 237-4991	WORK:	RADIO:
DEPUTY: David Robidas	HOME: (802) 962-3486	WORK: 237-4400	RADIO:
DEPUTY: Brad Sheltry	HOME: 237-4285	WORK: 237-5533	RADIO:
DEPUTY: Philip Sheltry	HOME: 237-4206	WORK: 237-4400	RADIO:

B.P. PUMPS: 16	RATTAN BROOMS: 1	VOL. PORT. PUMPS:
FIRE SHOVELS: 16	KINNEY RAKES:	FORESTRY HOSE: 1½"
COUNCIL TOOLS: 45	HAZEL HOES: 6	CHAIN SAWS:
MAINE AXE/PULASKI: 10	HARD HATS: 24	
FORESTRY AXES: 12	HEAD LAMPS: 4	

SELECTMEN OFFICE PHONE: 237-4070 DAYS: Mon-Fri HOURS: 8-5 pm
POLICE CHIEF: Wayne Cross DISPATCH #: 237-5555

FORESTRY TRUCKS: (Vehicle Description)

YEAR: 1994 DISTRICT: 7

TOWN: Columbia/144 EMERG FIRE PHONE: 237-5555

M.A. SYSTEM: None RADIO FREQ. PRIM.: — F. G.: —

WARDEN Peter Dion	HOME: 237-4924	WORK: 237-5533	RADIO:
DEPUTY Norman Cloutier	HOME: 922-5516	WORK: 922-5527	RADIO:
DEPUTY Wally Adaire	HOME: 237-8610	WORK: 237-5571	RADIO:
DEPUTY Eric Stohl	HOME: 237-4206	WORK: 788-4157	RADIO: F&G 211
DEPUTY Brenden Prusik	HOME: 237-4822	WORK: 246-3331	RADIO:

B.P. PUMPS: 6	RATTAN BROOMS	FIRE SHOVELS: 2
KINNEY RAKES	HIGH PRESS. PUMPS	
COUNCIL TOOLS: 2	HAZEL HOES	FORESTRY HOSE 1½" 1000'
MAINE AXE/PULASKI	HARD HATS	
FORESTRY AXES	HEAD LAMPS	

SELECTMEN OFFICE PHONE: 237-5255 DAYS: Mon. & Wed. HOURS: 3-5 pm
POLICE CHIEF: Danny Lyons DISPATCH #: 237-5555

FORESTRY TRUCKS: (Vehicle Description)

YEAR: 1994	DISTRICT: 7		
TOWN: Milan	EMERG FIRE PHONE: 449-2001	FS PHONE:	
M.A. SYSTEM: Norpac	RADIO FREQ. PRIM.: None	F. G.:	
WARDEN Russell Doucette	HOME: 449-6735	WORK: 449-3321	RADIO: 36K2
FIRE CHIEF Elmer Lang	HOME: 449-3487	WORK: 636-1154	RADIO: 36K1
DEPUTY Walter Mullins	HOME: 449-3445	WORK: 449-6675	RADIO: 36K3
DEPUTY Norman Frechette	HOME: 449-2007	WORK: 752-4600	RADIO: 36K4
B.P. PUMPS: 18	RATTAN BROOMS	VOL. PORT. PUMPS	
FIRE SHOVELS: 6	KINNEY RAKES: 6	HIGH PRESS. PUMPS	
COUNCIL TOOLS: 6	HAZEL HOES	FORESTRY HOSE: 1½" 200'	
MAINE AXE/PULASKI	HARD HATS	CHAIN SAWS	
FORESTRY AXES: 6	HEAD LAMPS		
SELECTMEN OFFICE PHONE: 449-3461		DAYS:	HOURS:
		Mon	9-4/6-8
		Tues	9-4
		Thurs	1-4/6-8
POLICE CHIEF: Greg Bisson	DISPATCH #: 449-2001		

FORESTRY TRUCKS: (VEHICLE DESCRIPTION)

D177 Forestry trailer with 225 gal. water tank

YEAR: 1994	DISTRICT: 7		
TOWN: Northumberland	EMERG FIRE PHONE: 636-1224	FS PHONE:	
M.A. SYSTEM: Norpac	RADIO FREQ. PRIM.:	F. G.:	
WARDEN: James Sanborn	HOME: 636-1384	WORK: 636-1154	RADIO: 32K1
DEPUTY: Dean Sanborn	HOME: 636-1563	WORK:	RADIO: 28
DEPUTY: H. Lee Rice, Sr.	HOME: 636-2240	WORK: 788-4641	RADIO: Coos 9
DEPUTY: James Kinney	HOME: 636-2150	WORK: 636-1154	RADIO: 32K2
DEPUTY: Stephen Currier	HOME: 636-2874	WORK: 636-1154	RADIO:
B.P. PUMPS: 6	RATTAN BROOMS	VOL. PORT. PUMPS	
FIRE SHOVELS: 11	KINNEY RAKES	HIGH PRESS. PUMPS	
COUNCIL TOOLS: 2	HAZEL HOES: 5	FORESTRY HOSE: 1½"	
MAINE AXE/PULASKI: 1	HARD HATS: 6	CHAIN SAWS	
FORESTRY AXES	HEAD LAMPS: 2		
SELECTMEN OFFICE PHONE: 636-1430		DAYS: Mon-Fri	HOURS: 8-4
POLICE CHIEF: Lee Rice, Jr.	DISPATCH #: 788-4641		

FORESTRY TRUCKS: All tools are State tools.

YEAR: 1994	DISTRICT: 7		
TOWN: Odell/346	EMERG PHONE # 788-4641	FS PHONE:	
M.A. SYSTEM: None	RADIO FREQ. PRIM.: F24	F. G.: —	
WARDEN: Phillip Oakes	HOME: 636-1566	WORK:	RADIO: 24
DEPUTY: Kenneth Oakes	HOME: 636-2901	WORK: 636-1154	RADIO:
DEPUTY: Bruce Oakes	HOME: 636-1542	WORK: 636-1154	RADIO:
DEPUTY: H. Lee Rice, Jr.	HOME: 636-1320	WORK: 636-2181	RADIO: 1658A
DEPUTY: John Normand	HOME: 636-1033	WORK: 636-1154	RADIO:
DEPUTY: Cecil Tisdale	HOME: 636-2452	WORK: 636-1154	RADIO:
B.P. PUMPS	RATTAN BROOMS	VOL. PORT. PUMPS	
FIRE SHOVELS	KINNEY RAKES	HIGH PRESS PUMPS	
COUNCIL TOOLS	HAZEL HOES	FORESTRY HOSE: 1½" 500'	
MAINE AXE/PULASKI	HARD HATS	CHAIN SAWS	
FORESTRY AXES	HEAD LAMPS		
SELECTMEN OFFICE PHONE: N/A		DAYS:	HOURS:
POLICE CHIEF: Francis Hopps	DISPATCH #: 788-4641		

FORESTRY TRUCKS: (Vehicle Description)

Regional Plan State Equipment

NORTH REGION

LANCASTER	Storage	1	BB-4 pump
		2	Mark 3 pumps
		1	Gorham Rupp pump
		2000'	weeping 1½"
		4000'	nonweeping 1½"
		1	1000 gal. Fold-Tank
		20	headlamps
			hand tools, BP pumps
LANCASTER	Bust Truck	3	Mark 3 pumps
		1	Gorham Rupp pump
		1	Floto pump
		2000'	weeping 1½"
		5000'	nonweeping 1½"
		75	hand tools, etc.
DIST. 7/8	(2) Patrol Trucks		75 gal. slip on pump

IN DISTRICTS

RANGER CACHE	On Vehicle	1	Gorham Rupp pump
		800'	weeping 1½"
		800'	nonweeping 1½"
		1	drip torch
		6	headlamps
	In District	1	Three Wheeler ATV

APPENDIX 10

Management and Protection Laws

The following state laws govern the management of state-owned reservations including the Nash Stream Forest: (This listing is not intended to be complete. For full reading of State laws consult the New Hampshire Revised Statutes Annotated.)

1.	RSA 79:1	Timber Tax and Stumpage Owner
2.	RSA 206:10	Fish and Wildlife Management
3.	RSA 206:23	Cooperative Fish and Wildlife Programs
4.	RSA 212-A	Endangered Species
5.	RSA 212-B:5	Conservation Programs
6.	RSA 216-A:2	Cooperative Management and Use
7.	RSA 217-A	Native Plant Protection
8.	RSA 227-C:9	Protection of Historic Resources
9.	RSA 227-G:3	Forest Management Responsibility
10.	RSA 227-H:1	Declaration of Purpose
11.	RSA 227-H:2	Protection; Improvement
12.	RSA 227-H:3	Purchase and Provision for Management
13.	RSA 227-H:6	Gifts of Land for Forestry Purposes
14.	RSA 227-H:8	Use of Land for Recreation Purposes
15.	RSA 227-J:6	Operations in Wetlands
16.	RSA 227-J:7	Alteration of Terrain
17.	RSA 227-J:9	Cutting Near Water and Highways
18.	RSA 227-J:10	Care of Slash
19.	RSA 227-L:11	Fire Fighting
20.	RSA 482:48	Acquisition of Dams and Water Rights
21.	RSA 483-B	Shoreland Protection
22.	RSA 541:A:22	Notice to Municipalities

The purpose of ownership of state-owned forests and reservations is declared in **RSA 227-H:1**. Responsibility for management of state-owned forests is provided under **RSA 227-G:3** and **227-H:3**. **RSA 227-H:2** provides for multiple-use management of reservations guided by the principles of sustained yield including planting and harvesting trees. **RSA 227-H:8** provides for the use of reservations for recreational purposes and **RSA 216-A:2** authorizes cooperative recreational and forestry use. The management of fish and wildlife resources are carried out under the authority of **RSA 206:10** and **212-B:5**. **RSA 206:23** provides for cooperative fish and wildlife management programs. Management, operation and minor maintenance of the dams at Trio Ponds and Little Bog Pond are carried out under the authority of **RSA 482:48**.

RSA 227-H:2 provides for the protection of reservations from fire, pests and other damaging agents. **RSA 227-L:11** directs forest fire wardens to extinguish all forest fires occurring in their towns and provide for the upkeep of woods roads and trails for the passage of men and equipment in case of forest fires. The protection of threatened or endangered wildlife is provided for by **RSA 212-A**, and threatened or endangered plants by **RSA 217-A**. Activities that may impact on historic resources are regulated by **RSA 227-C:9**.

Cutting of trees near water and public highways for forest management purposes is governed by **RSA 227-J:9** and the treatment of logging debris and slash under **RSA 227-J:10**. Permits for and notification of operating in and adjacent to wetlands is required by **RSA 227-J:6**, and any alteration of terrain or transportation of forest products in or on the border of surface waters is covered under **RSA 227-J:7**. The removal of vegetation along streams and water frontage for purposes other than forest management is regulated by **RSA 483-B**.

RSA 541-A:22 requires State agencies notify municipalities of any actions within its boundaries that directly affects that municipality, and **RSA 79:1** defines that the purchaser of timber from public lands is responsible for the timber tax to municipalities.

II. EASEMENT RESTRICTIONS

	GROUP I SOILS			GROUP II SOILS			
	IA	IB	IC	IIA	IIB	UNC.	TOTAL
ABOVE 2,700 FEET	8,148						
>35% SLOPE (below 2,700')		2,462					
POND BUFFERS		55					
WHITCOMB	16						
TRIO	13						
LITTLE BOG	26						
TOTAL EASEMENT RESTRICTION							**10,665**

III. OTHER NON-FOREST LAND

ABANDONED FIELD	3	
ALDERS	235	
BOG	15	
CLEARED LAND	2	
FLOWAGE	275	
GRAVEL PIT	14	
LEDGE	1	
POWER LINE	12	
WATER	148	
LOG YARD	22	
TOTAL OTHER NON-FOREST LAND		**727**

IV. NOT-TYPED **160**

V. TOTAL ACRES ALL LAND **39,601**

CODE DESCRIPTIONS

SUCCESSIONAL GROUP

S = red spruce, softwoods
F = fir
P = pine
E = beech
M = sugar maple
R = red maple
B = birch
A = ash
U = black spruce
T = tamarack
C = white cedar

PARENT MATERIAL

O = outwash
A= alluvium
L = lacustrine
T = till
F = frigid, friable
H = hardpan
C = cryic
B = bedrock
N = non-hardpan
VPD = very poorly drained

APPENDIX 8
Ecological Land Group Descriptions

#1. MT/CBT/SFB (Mountain Top/Cryic Bedrock Till/Spruce-Fir-Birch)–this mountain top ELG occurs at 1,700 to 3,622 feet elevation characterized by rock outcrops and complex slopes that correspond with underlying ledge within five feet of the surface. Seasonal high water is generally more than 72 inches, although water may perch on ledges for brief periods. Soils formed from cryic bedrock till and generally do not warm up above 59° F. Forest tendency is red spruce, yellow birch, and mountain paper birch. Total area is approximately 9,209 acres.

#2. MT/FBT/SF (Mountain Top/Frigid Bedrock Till/Spruce-Fir)–this ELG occurs on mountain top landforms that range from 2,161 to 3,342 feet elevation with strong to extremely steep slopes. Rock outcrops are common with well-drained soils shallow to bedrock derived from frigid bedrock till. Available water for vegetation is low to moderate. On available soil, forest tendency is toward red spruce and balsam fir. Total area is approximately 209 acres.

#3. USS/CHT/BSF (Upper Side Slope/Cryic Hardpan Till/Birch- Spruce-Fir)–this ELG is on upper slopes that include long, gently sloping, and smooth to moderately steep slopes. Elevation ranges from 1,661 to 3,642 feet. Soils formed from cryic hardpan tills, generally do not warm up above 59° F. and are loamy or silty with a shallow hardpan and ledge usually more than five feet in depth. This ELG supports yellow birch, mountain paper birch, red spruce, and balsam fir. Total area is approximately 4,012 acres.

#4. MSS/FBT/SFM (Middle Side Slope/Frigid Bedrock Till/Spruce-Fir- SMaple)–this ELG occurs on middle mountain side slope from 1,260 feet to 2,321 feet in elevation characterized by excessive slope, surface boulders, and ledge within five feet of the surface. Forest tendency is red spruce, balsam fir and sugar maple. Total area is approximately 433 acres.

#5. MSS/FBT/MBA (Middle Side Slope/Frigid Bedrock Till/SMaple- Birch-Ash)–this ELG occurs on middle mountain slopes that range from 1,080 feet to 2,800 feet in elevation with soils derived from frigid bedrock till. Ledge is generally within five feet of the soil surface. Sugar maple, yellow birch and white ash tend to grow on the finer, deeper soils in this group. Pockets of red spruce and balsam fir are scattered among the hardwoods where the soil material is coarse and shallow. Total area is approximately 5,371 acres.

#6. MSS/FHT/SFM (Middle Side Slope/Frigid Hardpan Till/Spruce-Fir- SMaple)–this group occupies exposed middle mountain slopes with higher moisture capabilities than other mountain side slopes. Elevations range from 1,400 to 2,681 feet. Soils formed from frigid hardpan till and support combinations of red spruce, balsam fir and sugar maple. Total area is approximately 1,186 acres.

#7. MSS/FHT/MBA (Middle Side Slope/Frigid Hardpan Till/SMaple-Birch-Ash) – this ELG is on middle mountain slopes that are smooth and gently sloping to steep at elevations from 1,100 to 3,000 feet. Soils formed from frigid bedrock till and have a sandy or loamy hardpan at about two feet. Surface stones are common and depth to ledge is generally greater than five feet. Pure hardwood occupies this land group in combinations of sugar maple, yellow birch, and white ash. This ELG covers about 27% of the property totaling approximately 10,735 acres.

#8. LSS/CNT/SFB (Lower Side Slope/Cryic Nonhardpan Till/Spruce-Fir-Birch) – this group occupies lower mountain side slopes from 2,241 to 3,362 feet in elevation characterized by steep slopes or a complex pattern of hills and knolls 1/2 to 10 acres in size and 5 to 30 feet higher than the valleys between. Soils in this group derived from cryic nonhardpan tills generally do not warm up above 59° F. Surface stones and boulders are common in gravelly, sandy, and loamy deposits that settled out of the melting glacial ice by the pull of gravity. Varying amounts of silt and clay are mixed with the sand and gravel. Natural forest tendency is mixed-wood communities of red spruce, balsam fir, yellow birch, and mountain paper birch. Two SCS soil units are classified as Group IIA soils. Total area is approximately 294 acres.

#9. LSS/FNT/SFM (Lower Side Slope/Frigid Nonhardpan Till/Spruce-Fir-SMaple) – this ELG occupies similar lower mountain side slopes (1,320 to 2,281 feet in elevation) as land groups #10, 11 and 12 described below. Natural forest tendency is toward mixedwood combinations of red spruce, balsam fir, and sugar maple. All three SCS soil units in this ELG are classified as Group IA soils. Total area occupied by this ELG is approximately 90 acres.

#10. LSS/FNT/MBA (Lower Side Slope/Frigid Nonhardpan Till/SMaple-Birch-Ash) – this ELG occupies lower mountain side slopes at elevations ranging from 1,440 to 2,661 feet. The fine, loamy and fertile soils in this land group are derived from frigid nonhardpan tills and tend to support combinations of sugar maple, yellow birch, and white ash. The three SCS soil units in this group are classified as Group IA soils. Total area is approximately 39 acres.

#11. LSS/FNT/ERS (Lower Side Slope/Frigid Nonhardpan Till/Beech- RMaple-Spruce) – this ELG occupies lower mountain side slopes from 1,020 to 2,841 feet in elevation. Soils formed from frigid nonhardpan till parent materials but are coarser in texture and less fertile and tend to support mixedwood combinations of less site demanding species consisting of American beech, red maple, and occasional red spruce and balsam fir. Of nineteen SCS soil units in this ELG, seventeen are classified as Group IB soils and two are classified as Group IIA soils. Total area occupied by this ELG is approximately 4,181 acres.

#12. LSS/FNT/EMS (Lower Side Slope/Frigid Nonhardpan Till/Beech- SMaple-Spruce)–this ELG occupies lower mountain side slopes from 1,120 to 2,281 feet in elevation characterized by a complex pattern of hills and knolls 1/2 to 10 acres in size and 5 to 30 feet higher than the valleys between. Surface stone and boulders are common in gravel and sandy soils derived from frigid nonhardpan till parent materials deposited by the pull of gravity from melting glacial snow. Varying amounts of silt and clay are mixed with the sand and gravel. Natural forest tendency is mixedwood combinations of American beech, sugar maple, and red spruce. Of nine SCS soil units in this ELG, eight are classified as Group IA soils and one is classified as a Group IB soil. Total area is approximately 1,089 acres.

#13. UP/PDT/SFP (Upland Plains/Poorly Drained Till/Spruce-Fir-Pine)–this ELG occurs at various locations on mountain side slopes, ranging in elevation from 1,180 to 2,421 feet, characterized by poorly drained soil on glaciated upland plains and drainageways. Areas are generally long and narrow or irregular in shape. A high water table most of the year, stoniness, and severe frost action usually result in high seedling mortality and blowdowns during windstorms. Natural forest tendency is pure softwood combinations of red spruce, balsam fir and sometimes white pine. Twelve SCS soil units are classified as Group IIB soils. Total area is approximately 1,344 acres.

#14. VB/OAL/SFP (Valley Bottom/Outwash, Alluvial, Lacustrine/Spruce-Fir-Pine)–this ELG is located adjacent to the Nash Stream in the valley bottoms and is characterized by nearly level to gently sloping terrain (very steep in few places). Soils are generally deep, gravelly and sandy and are derived from glacial outwash and floodplain deposits. Lacustrine soils, a normal associate, do not occur. Forest tendency is pure softwood communities of red spruce, balsam fir, white pine, and hemlock. Total area is about 847 acres.

#15. VB/UPD/UTC (Valley Bottom/Very Poorly Drained/Black Spruce-Tamarack-Cedar)–this ELG includes the Nash Bog and other flat, very poorly drained sites (1,000 to 1,921 feet elevation) totaling 393 acres. Water is typically at or above the surface most of the year. Soils are derived from various combinations of organic matter (muck and peat), floodplain, and glacial tills. Soil characteristics are variable including hardpan under a foot of organic matter, organic layers 52 inches deep and deeper, and poorly drained fine sandy loams. Forest tendency is toward black spruce, tamarack and cedar. (Note: a chunk of white cedar found under the old Nash Bog dam has been carbon dated to be **several thousands of years old.**) Total area is about 393 acres.