

**Protecting New Hampshire's Living Legacy:  
a blueprint for biodiversity conservation  
in the Granite State**

*"The Council believes that maintaining the region's biodiversity is important in and of itself, but also as a component of stable forest-related economies, forest health, land stewardship, and public understanding."*

*Finding Common Ground*  
Northern Forest Lands Council  
September 1994

*A report to*  
Philip Bryce  
State Forester and Director, Division of Forests and Lands,  
Department of Resources and Economic Development  
*and*  
Wayne Vetter  
Executive Director, Fish and Game Department  
*by*  
the Steering Committee  
of the New Hampshire Ecological Reserve System Project

July 1998

**Ecological Reserve System Project  
Steering Committee**

Will Abbott	Science Center of New Hampshire
Michael Amaral	U.S. Fish & Wildlife Service
Meade Cadot	Harris Center for Conservation Education
William Chapin	Landowner
Bob Eckert	University of New Hampshire
Carol Foss	Audubon Society of New Hampshire
Susan Francher	NH Division of Forests & Lands
Peter Helm	New Hampshire Office of State Planning
John Kanter	NH Fish & Game Dept., Nongame & Endangered Wildlife Program
Jim Kennedy	New Hampshire Wildlife Federation
Eric Kingsley	NH Timberland Owners Association
John Lanier	NH Fish & Game Department
Tom Lee	University of New Hampshire
Brian Mattson	City of Keene
Charlie Moreno	Consulting Forester
Jamie Sayen	Northern Forest Forum
Ellen Snyder	University of New Hampshire Cooperative Extension
Stephen Fay	White Mountain National Forest
Peter Stein	Lyme Timber
Mike Stevens	The Nature Conservancy
Dan Sundquist	Society for the Protection of New Hampshire Forests
Marjory Swope	NH Association of Conservation Commissions
Donald Tase	Champion International
Jim Taylor	University of New Hampshire
Tom Thomson	Tree Farmer/Landowner
David Van Luven	New Hampshire Natural Heritage Inventory
Scot Williamson	Wildlife Management Institute, Northeast Region

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New Hampshire Fish and Game Department  
New Hampshire Natural Heritage Inventory, Division of Forests and Lands  
Society for the Protection of New Hampshire Forests  
U. S. Fish and Wildlife Service, Division of Federal Aid, Partnerships for Wildlife  
William Wharton Trust

The project has also relied extensively on volunteer contributions by the members of the Steering Committee and the Scientific Advisory Group and their respective organizations.

**New Hampshire Ecological Reserve System  
Steering Committee**

2 1/2 Beacon Street, Suite 6, Concord, New Hampshire 03301  
(603) 224-5853 fax (603)228-2459 e-mail [mstevens@tnc.org](mailto:mstevens@tnc.org)

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To: Members of the Steering Committee and the Scientific Advisory Group  
From: Mike Stevens  
Date: July 13, 1998  
Re: Final reports and next steps

Greetings. It is with great pleasure (and relief) that I enclose copies of the final Scientific Advisory Group report and the Steering Committee's report to Phil Bryce and Wayne Vetter. These reports are truly the result of a group effort and I hope they represent the diversity of and consensus among the Steering Committee and the Scientific Advisory Group.

The Core Team presented the Steering Committee's recommendations to Phil Bryce, Wayne Vetter, and representatives from The Nature Conservancy, the Audubon Society, and the Forest Society on June 26. Bryce and Vetter agreed to meet with their staffs to discuss the reports and to respond back to the Steering Committee in as short a time as possible. This will enable us to then begin the work of presenting information to the Land and Community Heritage Commission, which will have its first meeting during the last week of July.

We have received coverage from New Hampshire Public Radio and the Valley News. I have enclosed the Valley News article and the NHPR piece is available on the station's home page.

The Core Team's focus over the next several months, leading to the September 22 meeting of the Steering Committee, will be to work with the Heritage Commission and to raise funds for an expanded educational program and continued scientific work, notably the development of a centralized database and web page that will facilitate access to information about biodiversity and our project.

I am also pleased to report that the Henry P. Kendall Foundation has made a two-year grant to The Nature Conservancy for continued support of the coordinator position.

Please contact me if you have questions, and have a good summer.

## Executive Summary

The people of New Hampshire have a long and distinguished history of conservation. Roughly twenty percent of the Granite State is in some form of conservation management or ownership, there is a strong tradition of stewardship of private lands, and the state is known for the collaborative spirit which marks its conservation and resource management communities.

*Despite the protected status of one-fifth of the state, an alarming proportion of species, natural community types, and ecosystems are not sufficiently protected to endure over the long term.* For example, close to 60% of classified rare natural communities and nearly three-quarters of known rare plants have 2 or fewer known occurrences on existing conservation lands.

Based upon the recommendations of the Northern Forest Lands Council, the Division of Forests and Lands and the Fish and Game Department established the New Hampshire Ecological Reserve System Project in late 1995 and charged a 27-person public-private Steering Committee with designing a blueprint for a system of ecological reserves within three years.

This report contains the Steering Committee's proposed blueprint for establishment of an Ecological Reserve System. The blueprint emphasizes the following themes:

- There is an urgent and scientifically-established need for concerted conservation of species, natural communities, and ecosystems throughout the state. Our recommended strategy is the establishment of a well-coordinated, comprehensive system of ecological reserves that, in conjunction with good management of commercial timberlands, wildlife populations, and watersheds, will protect the full spectrum of biological diversity in the state over the long term.
- The Ecological Reserve System will be based on existing programs, agencies, and conservation lands to the greatest extent possible. Many of the resources and programs needed to implement an ecological reserve system are already in place.
- The Ecological Reserve System Project will continue to be characterized by the extensive and productive cooperation among public agencies, private conservation organizations, and individual landowners.
- Participation by private landowners will be on a voluntary and willing basis only.
- New Hampshire should increase its investment in land conservation. Therefore, the Steering Committee will strive to support the work of the Land and Community Heritage Commission and ensure that protection of ecologically-significant lands will be a fundamental component of the Commission's recommendations to the Legislature.
- We still have much to learn about the status and distribution of biological diversity in the state. Our knowledge of aquatic ecosystems is especially poor. We must continue to support the inventory efforts of public agencies and private organizations.

## **I. Introduction: the need for an ecological reserve system in New Hampshire**

New Hampshire is home to more than 15,000 species of plants and animals, 100 types of natural communities, and ecosystems as diverse as the Great Bay estuary, the spruce-fir forests of the North Country, the summits of the White Mountains, and the floodplains of the Merrimack and Connecticut Rivers. This rich biological diversity, which includes not only plants and animals but also the habitats and ecological processes that sustain them, is a living legacy that helps keep our air clean, our water pure, our economy strong, and our quality of life high.<sup>1</sup>

The biodiversity of New Hampshire, however, is vulnerable to ongoing development and degradation. For example:

- **New Hampshire has already lost important aspects of its biodiversity at the species, natural community, and ecosystem level.** 11 species of animals and 13 species of plants have been extirpated from the state. Some types of unusual natural communities have declined, notably pine barrens. Of four pine barrens that were found in the state, only one remains. Despite extensive reforestation since the mid-1800s, there is a lack of undisturbed habitats including grasslands, waterbodies, and riparian corridors, and mature forest types such as northern hardwoods, oak-pine, and spruce-fir.
- **New Hampshire is losing at least 10,000 acres of open space to development each year.** Based on estimates from the state's Forest Resources Plan, approximately 189,600 acres of forests (3% of the state's total area) were developed between 1982 and 1997.<sup>2</sup>
- **Of the top 10 environmental risks ranked by the New Hampshire Comparative Risk Project, 6 risks are related to loss, degradation, or alteration of land or water habitats.** The predominance of habitat-related threats is especially alarming because the Comparative Risk Project examined a broad spectrum of environmental risks, including those with direct impacts on human health, and did not start with a focus on biodiversity or land and water conservation.<sup>3</sup>
- **There are 22 plant species, 30 animal species, and 25 natural community types in New Hampshire that are considered globally rare or imperiled.**<sup>4</sup>
- **We know of exemplary occurrences for fewer than 50% of the natural communities in the state, including common and widespread natural communities.**
- **There are few, if any, undisturbed aquatic ecosystems in the state.** Aquatic ecosystems are under particular pressure due to ongoing hydrologic alteration and shoreline development.

<sup>1</sup> For a primer on the biodiversity of New Hampshire, refer to *New Hampshire's Living Legacy*, published in 1996 by the Fish and Game Department's Nongame and Endangered Wildlife Program.

<sup>2</sup> This estimate assumes the following rates of forestland lost to development: 13,000 acres/year from 1982-1992 and 10,000 acres/year from 1992-1997.

<sup>3</sup> NH Comparative Risk Project. 1997. *Report of Ranked Environmental Risks in New Hampshire*.

<sup>4</sup> Data on the biodiversity of New Hampshire are taken from *An Assessment of the Biodiversity of New Hampshire with Recommendations for Conservation Action* completed in June 1998 by the Scientific Advisory Group of the Ecological Reserve System Project.

The intensity and nature of threats to biodiversity vary widely across the state and for different features of biodiversity, with some features relatively secure and others severely and immediately imperiled. Reflecting a pattern common throughout the United States, many of the areas in New Hampshire that contain the greatest concentrations of rare species and natural communities are also the most vulnerable to development and habitat alteration (See the attached Figures 5 and 9 from the Scientific Advisory Group assessment).

**Though conservation lands compose approximately 20% of the land area in New Hampshire, the current system of conservation lands in New Hampshire does not appear to provide comprehensive, long term protection of biodiversity at the species, natural community, or landscape levels.** As a way to evaluate the effectiveness of the current system of conservation lands, we used existing databases housed at the Natural Heritage Inventory and the Fish and Game Department to determine what portion of known occurrences of rare species and natural communities occur on conservation lands. We utilized the conservation lands layer developed by the Society for the Protection of New Hampshire Forests.

There are 2 or fewer known occurrences on conservation lands for:

- **close to 60% percent of classified rare natural communities.**
- **nearly three-quarters of known rare plants.**
- **over three-quarters of known rare vertebrate species.**
- **over 90% of known rare invertebrate species.**

There is consensus among the Scientific Advisory Group that 2 protected occurrences will not safeguard most plants, animals, or natural communities over the long term. While not all conservation lands or groups of species have been completely surveyed and the databases do not contain all existing information, these results suggest a serious and immediate need to enhance biodiversity conservation practices in the state.

Many species, natural communities, and landscape types are known to be well represented on current conservation lands or are protected through private lands management. In addition, there are significant portions of the state that are extensively forested and are experiencing low population growth levels (See the attached Figure 4 from the Scientific Advisory Group assessment). Therefore, we still have a remarkable opportunity to safeguard the species and places that form the ecological fabric of the Granite State. But how do we do it? **The establishment of a system of ecological reserves, in concert with good management of commercial timberlands, wildlife populations, and watersheds, is a vital step in protecting the biological diversity of New Hampshire over the long term.**

## **II. Background and goals of the Ecological Reserve System Project**

In September 1994, the Northern Forest Lands Council submitted to the Governors of New Hampshire, Maine, Vermont, and New York its report *Finding Common Ground*, which outlined the Council's recommendations for reinforcing the traditional patterns of land ownership and uses of large forest areas in the Northern Forest. The Northern Forest Lands Council consisted of representatives of local communities, the forest products industry, environmental

organizations, and state land and resource management agencies. The Council's recommendations reflected six years of research and public input, the comments of over 1,500 citizens, and were rooted in and advanced a broadly shared vision of the region.

As part of its findings, the Council highlighted the importance of biodiversity conservation:

*"The Council believes that maintaining the region's biodiversity is important in and of itself, but also as a component of stable forest-related economies, forest health, land stewardship, and public understanding."*<sup>5</sup>

To that end, the Council recommended that states "develop a process to conserve and enhance biodiversity across the landscape."

In late 1995, as a direct response to the recommendations of the Northern Forest Lands Council, the New Hampshire State Forester, who directs the Division of Forests and Lands, and the Director of the New Hampshire Fish and Game Department established the Ecological Reserves System Project and appointed a 27-person Steering Committee. The Steering Committee, composed of representatives of a broad range of interests, was charged with coordinating all aspects of an Ecological Reserve System planning process that would include all of New Hampshire, not just the Northern Forest portion of the state.

The New Hampshire Forest Resources Plan, issued in April 1996, reinforces the recommendations of the Northern Forest Lands Council by calling for the following actions:

- "develop a statewide, interagency strategy to maintain and enhance biological diversity using the best available information."
- "support the Ecological Reserve System Steering Committee process to design a science-based system of ecological reserves...to be established through the participation of public landowners and the voluntary cooperation of private landowners."
- "provide financial and other incentives to landowners to encourage conservation of biological diversity and other ecological values on private lands."<sup>6</sup>

The mission of the Ecological Reserve System Steering Committee is:

- *Assess the status of biodiversity in New Hampshire and the extent to which it is protected under the current system of public and private conservation lands.*
- *Provide a science-based blueprint for selection, design, establishment and management of a system of ecological reserves whose primary aim is biodiversity conservation.*

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<sup>5</sup> Northern Forest Lands Council. 1994. *Finding Common Ground: the recommendations of the Northern Forest Lands Council.*

<sup>6</sup> See pages 39-44 in Forest Resources Plan Steering Committee and Division of Forests and Lands, NH Department of Resources and Economic Development. 1996. *New Hampshire Forest Resources Plan.*

- *Assure a broad range of interests is represented and involved in the planning process through a series of public education and comment sessions.*
- *Disseminate the findings of the NH Scientific Committee on Biodiversity through existing education systems and the development of new outreach programs.*
- *Develop a proposal for presentation to the state legislature and the people of New Hampshire for voluntary designation and funding of ecological reserves.*

The Steering Committee was also charged with avoiding duplication of previous efforts to assess and conserve the natural resources of New Hampshire.

The Steering Committee began its work by drafting a definition of the goals for the Ecological Reserve System:

- *Perpetuate all elements of native biodiversity at all levels - - genetic, species, community, and ecosystem - - including different stages of succession.*
- *Maintain ecological and evolutionary processes at their natural frequency and spatial scale.*
- *Provide comprehensive representation of physical elements.*
- *Educate people about the benefits of biodiversity conservation*

Based on these goals, the Steering Committee defined an ecological reserve system in the following way:

*An ecological reserve system is a collection of lands managed and monitored to protect biodiversity in all its forms. Ecological reserves within the system will vary in size, location, ownership, and protection strategy. The system will be a mix of large and small parcels, some privately owned, others owned by private conservation organizations, and others publicly owned. Private lands will become part of the system only through voluntary landowners.*

An individual ecological reserve is defined by the Steering Committee as an area of land or water that contributes to one or more of the following system goals:

- *sustain or restore certain species, natural communities, physical elements, or ecological processes that are necessary to maintain native biodiversity.*
- *provide areas that serve as benchmarks to assess the impacts of human activities and natural global changes, and to demonstrate the benefits of having healthy and functioning ecosystems.*



- *contribute to the functioning of adjacent ecological reserves.*

Ecological reserves would also provide the people of New Hampshire the opportunity to experience and learn from representative examples of the state's natural ecosystems.

Finally, human uses of ecological reserves would be encouraged, as long as those uses are consistent with the goals of the ecological reserve system and the protection of the features of biodiversity supported by the individual reserve.

In early 1996, the Steering Committee commissioned a Scientific Advisory Group to conduct the biodiversity assessment, evaluate the current system of conservation lands, and outline the scientific principles that should be incorporated into a blueprint for an ecological reserve system. This report was completed in June 1998. The Scientific Advisory Group concluded that portions of the biodiversity of New Hampshire, at the species, natural community, and landscape level, are threatened by incompatible uses and development, and that the current system of conservation lands is not sufficient to safeguard biodiversity at its current known levels.

### **III. A blueprint for an ecological reserve system**

Based on the conclusions of the Scientific Advisory Group, the Steering Committee believes that it is essential that we work to improve biodiversity conservation practices in the state. In order to achieve more effective conservation of biodiversity, we must strive for a conceptual change in the way protected lands are established and managed. We must begin thinking in terms of an integrated system of lands that, when taken as a whole, will protect as many viable rare species and natural communities as possible and will provide outstanding examples of the state's common natural communities and landscape types.

Fortunately, we do not have to reinvent land conservation to achieve this goal. New Hampshire already has a collection of lands, both in public and private ownership, that capture a broad sampling of the state's biodiversity. But we need to do more. And due to the limitations of funding opportunities, we need to do our work in an organized, systematic manner that maximizes both our efficiency and effectiveness.

#### **A. Establishment and administration of reserve system**

Establishing a system of ecological reserves that meets our conservation goals would require:

- identifying priority conservation sites throughout the state using scientific criteria for reserve selection and design. Encouraging interested and willing landowners to collaborate on protection initiatives with either public agencies or private organizations.
- working closely with the Land and Community Heritage Commission to nominate and encourage selection of ecological reserves projects for state funding.

- reviewing management of existing public and private conservation lands and non-conservation public lands. Working with managers of these lands to enroll appropriate lands in the ecological reserves system.
- working with interested and willing private landowners to improve or formalize biodiversity conservation practices.
- cooperatively monitoring management activities of enrolled properties with participating landowners to maintain ecological reserves standards.
- collaborating with the Natural Heritage Inventory, the Fish and Game Department, Society for the Protection of New Hampshire Forests, Audubon Society of New Hampshire, U.S. Fish and Wildlife Service, and GRANIT (the state's official computerized geographic information database) to maintain and expand a centralized biodiversity and conservation lands database.
- ensuring little-known parts of the state and little-known species and communities receive further field inventory through expanded work by the Natural Heritage Inventory, the Fish and Game Department, private conservation organizations, and universities and colleges.
- raising funds from a combination of public and private sources
- cooperating with existing and future private and public educational agencies and programs to educate the public about the important features of biodiversity in New Hampshire, opportunities for protecting them, and the Ecological Reserve System.
- coordinating the Ecological Reserves Steering Committee.

The central idea behind our proposed administrative structure for an Ecological Reserve System is to establish a small, core set of staff that would work closely with the staff and programs of existing public agencies, private conservation organizations, and private land owners.

The ecological reserves staff would be comprised of a full-time, permanent coordinator who is provided with at least part-time administrative support. The coordinator would also hire either full-time or seasonal biologists and land stewards to assist with inventory and monitoring of reserves. In addition, the coordinator would collaborate with existing state or private organizations to assist with specific tasks. Depending on the sources of available funding, the coordinator and staff could be housed either in a state agency or within a private conservation organization.

Much work, especially in the arenas of land protection, research, and monitoring would be done in collaboration with private organizations or public agencies that do this work already. Funding for implementation projects would be secured via existing private and public programs and by collaborating with private conservation organizations.

If public funding became available, the ecological reserves staff would work to apply those funds directly towards land protection. Recommendations from the ecological reserves staff would be reviewed by a public-private board (varying in size depending on the level of funding and varying in composition depending on the level of public versus private funding).

## **B. Design and selection of ecological reserves**

The Scientific Advisory Group has developed scientific principles for the design of an ecological reserve system. The guiding principle behind reserve design is to ensure the long term viability of the species, natural community, or ecosystem we seek to protect. In almost all cases, this involves protecting not only the immediate location of the feature but also the system and processes that sustain it. Another fundamental design concept is that of a integrated *system* of reserves that, when managed as a whole, provides comprehensive representation of New Hampshire's biodiversity.

Specific criteria by which to assess the significance of areas proposed for inclusion in a system of ecological reserves include:

- Are there globally-rare or state-rare species or natural communities?
- Does the area have high physiographic or natural community diversity?
- Does the area support exemplary examples of common natural community types?
- Does the area support critical wildlife habitat?
- Are rare features likely to be viable over the long term?
- Is the area within or adjacent to a core forest area that has the size and shape needed to effectively buffer the area against incompatible human disturbances?
- Does the area expand or connect existing conservation lands (riparian corridors are especially important)?
- Does the area contain features of biodiversity and ecosystem types that are under-represented in the current system of conservation lands?

## **C. Management and monitoring of reserves system**

The level of management and monitoring of lands within an ecological reserves system would be determined by the funds available and the land's present use, management, and level of protection. A piece of land could become part of the Ecological Reserve System in a number of ways including fee simple acquisition or donation, donation or sale of a conservation easement, or cooperative management agreements.

Management of reserves would be conducted by the landowner in accordance with standards set by the staff and Steering Committee of the reserve system. Final decisions on exactly what uses would be allowed would be made on a case-by-case basis.

Both scientific monitoring of the status of features of biodiversity and monitoring of landowners' compliance with ecological reserve standards are essential components of an ecological reserve system. We present a brief discussion of how these types of monitoring could be accomplished.

Interest-holder refers to the organization which holds the less-than-fee interest (e.g. development rights), in the protected parcel. The interest-holder ultimately would be responsible for the protection of the parcel and the biodiversity features in the parcel. Parcels enrolled in the Ecological Reserve System could continue to be privately owned lands, with a private organization, town, or the state being the interest-holder. When the private organization, town, or state is the fee-simple owner, it is the interest-holder and landowner.

Compliance monitoring involves the periodic (often annual) inspection/documentation of a site, and communication with the landowner, to ensure that the terms of the conservation easement deed, use restrictions, or management plan are being followed. Specific review of the reserve area would be conducted to determine any adverse man-made or natural impacts have occurred or were likely to occur. Compliance monitoring and enforcement would be the responsibility of the interest holder, though the actual monitoring could be contracted to state agencies or a private organization. Ecological reserves staff would have the responsibility of ensuring monitoring is conducted according to reserve system standards.

Scientific monitoring is the inspection and documentation of an Ecological Reserve System feature or area, on an as needed basis (depending on feature or area), to determine the status, condition, viability, and extent of the feature or area as compared to conditions previously documented or at acquisition. Scientific monitoring would be conducted either by ecological reserves staff, existing state agencies, or contracted biologists.

#### **D. Gathering more information and public education**



Although we have access to excellent sources of information through the databases maintained by the Natural Heritage Inventory and the Fish and Game Department, there has been no complete ecological inventory of the state and some conservation lands have never been accurately surveyed. Our understanding of what areas of the state and what features should be priorities for inclusion in an Ecological Reserve System is based on our present knowledge of the status and distribution of biodiversity in the state. The more we are able to expand our knowledge of the state's biodiversity, the better able we will be to protect it.

The Natural Heritage Inventory and the Fish and Game Department's Nongame and Endangered Wildlife Program are a critical component of biodiversity conservation. These programs should be funded so they are able to conduct systematic inventories in areas of the state about which we know very little. Also, these agencies should be funded to continue incorporating existing information into their databases and developing their Geographic Information Systems, so that New Hampshire has an accurate, up-to-date centralized source of biodiversity information.

Education is another critical component of biodiversity conservation in the state. The Ecological Reserve System Project has already embarked upon an education program that includes presentations to foresters, landowners, local conservation commissions, and the general public. This program should be continued and expanded to ensure the concepts of biodiversity conservation become an integral part of land and natural resource management in New

Hampshire. One mechanism for beginning this process would be to establish a biodiversity educator within the Cooperative Extension Program who would educate foresters, landowners, regional and local planning commissions, and state agencies about the importance of biodiversity and the steps needed to implement good biodiversity management practices.

Figure 5. Known locations of rare species and exemplary natural communities in New Hampshire that are either ON or OFF existing conservation lands.

Locations OFF	Number of Known Locations: OFF	
△ Animals		315
○ Plants		673
□ Communities		291
Locations ON	ON Private	ON Public
▲ Animals	8	111
● Plants	43	535
■ Communities	27	318
 Conservation Lands		
 Municipal Boundary		

The location of a rare species is an area that supports a breeding population, while a location of an exemplary community is an area with either an undisturbed example of a common community (e.g. an old-growth spruce-fir forest) or any example of a rare community (e.g. a calcareous seep). The approximate center of each known location was scored as ON a conservation land if it fell within the boundaries of any area dedicated to conservation either permanently or for the foreseeable future.

Rarities may be protected whether they are ON or OFF conservation lands depending on how the lands are managed. Those ON conservation lands, however, probably have larger habitat areas protected for the long term.

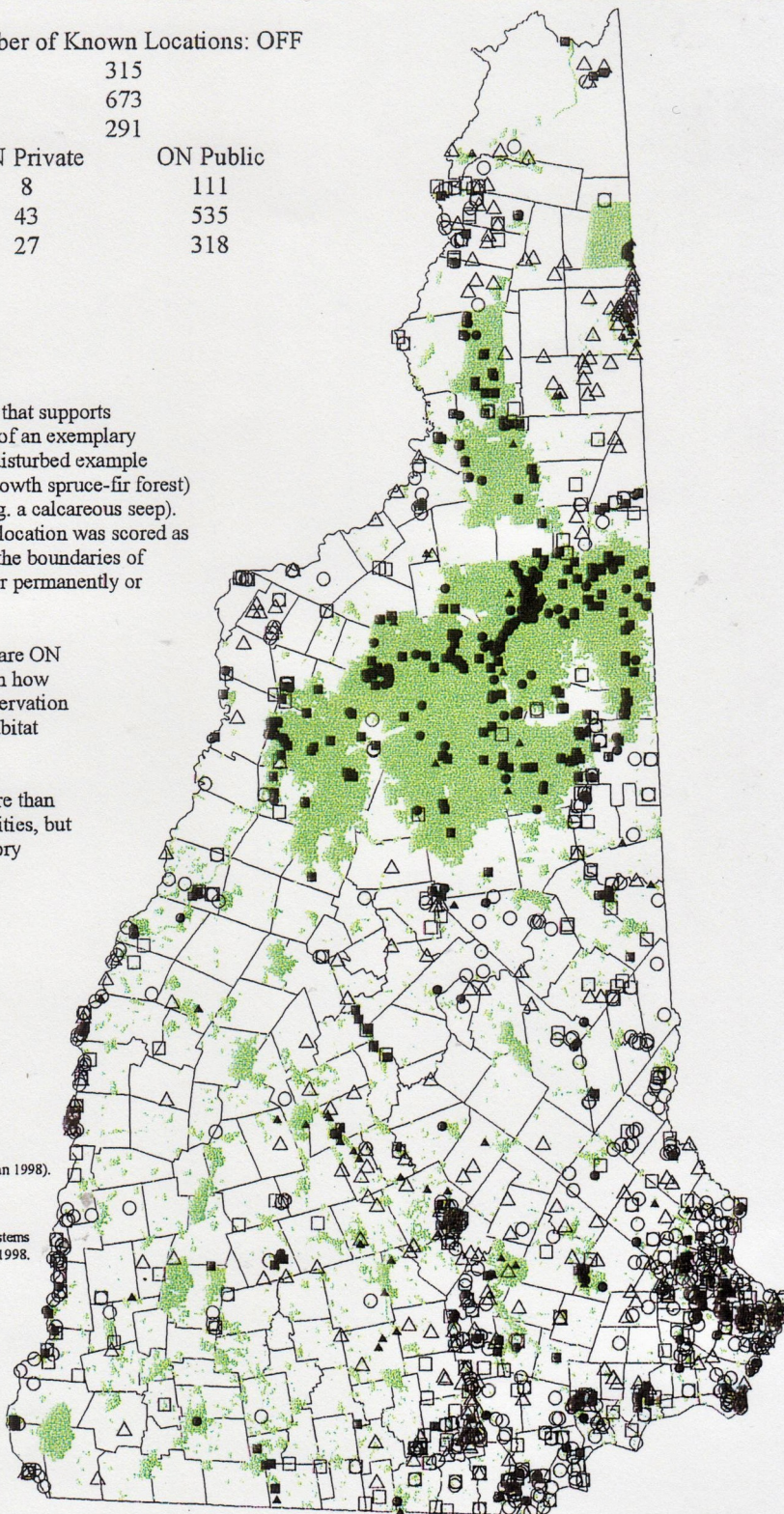
The NH Heritage database includes more than 2,400 recently observed locations of rarities, but there has never been a statewide inventory for rare species or communities. Many undiscovered (or unreported) locations certainly exist both on and off current conservation lands.

**Data Sources:**

Political boundaries derived from the US Geological Survey Digital Line Graphs, 1:24,000-1:25,000 as archived in the NH GRANIT database.

Locations of rare species and natural communities from the New Hampshire Natural Heritage Inventory, Department of Resources and Economic Development (Jan 1998).

Conservation lands mapped at 1:24,000 by the Society for the Protection of NH Forests and the NH Office of State Planning. The data were automated by Complex Systems Research Center (CSRC), and were last updated January 1998.



Map generated for the New Hampshire Ecological Reserve System Project, 1998

For more information contact the project coordinator at: The Nature Conservancy, 2-1/2 Beacon Street, Suite 6, Concord NH 03301. (603) 224-5853

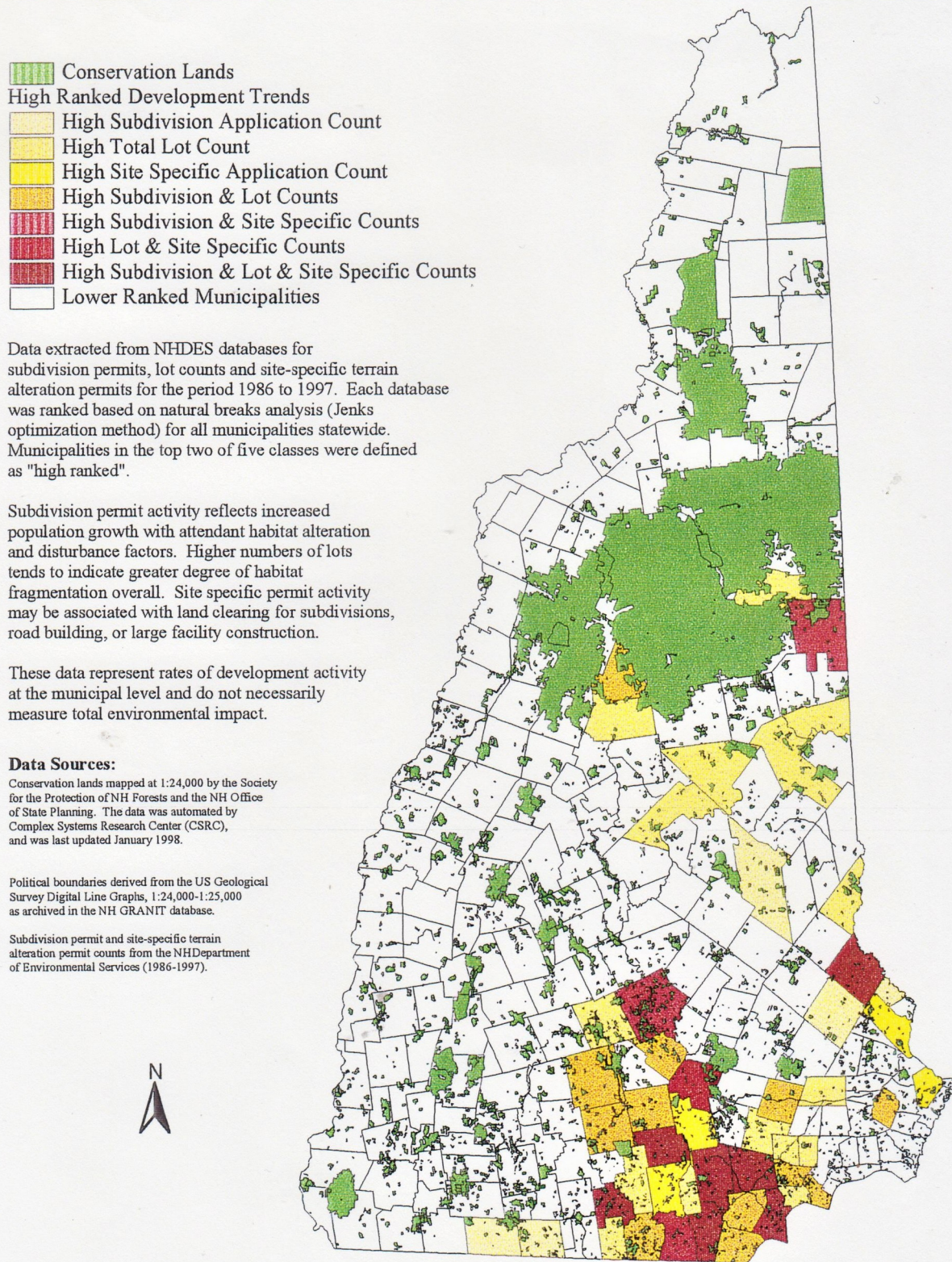
Figure 4. Core forest areas relative to conservation lands in New Hampshire.



Map generated for the New Hampshire Ecological Reserve System Project, 1998

For more information contact the project coordinator at: The Nature Conservancy, 2-1/2 Beacon Street, Suite 6, Concord NH 03301. (603) 224-5853

Figure 9. Rate of development activity in New Hampshire towns between 1986 and 1997 based on permits administered by the New Hampshire Department of Environmental Services.



Map generated for the New Hampshire Ecological Reserve System Project, 1998

For more information contact the project coordinator at: The Nature Conservancy, 2-1/2 Beacon Street, Suite 6, Concord NH 03301. (603) 224-5853



# Inventory Of Nature

## Study Suggests New Resource On Rare Plants And Animals

By RICH BARILOW

Valley News Staff Writer

In an area awash in stunning geography, the Connecticut River is the defining geographical fact. Without it, there would be no Valley in Upper Valley. The river is many things, depending on your lens. Boaters see it as recreation, fishermen a source of bounty, swimmers a refreshing cover against summer's heat.

Ecologists see it as a treasure trove that's best summed up by Jesup's milk-vetch.

The plant grows in three places on the planet, says David VanLoven, coordinator of the Natural Heritage Inventory, a state program in New Hampshire. "All three are on a 16-mile stretch of the Connecticut River" between Lebanon and Claremont — "and that's it."

As in other parts of the state, towns along the river are home to plants and animals listed on state environmental rolls as either endangered, meaning they face extinction in New Hampshire, or threatened, which means they face endangered status (see accompanying box). A recent report, now awaiting approval from the state forester and the head of the Fish and Game Department, proposes an "ecological reserve," a new term that essentially means bringing more of the state under existing conservation protections, "and doing it better," says VanLoven.

The product of three years' work by a state-appointed, 27-member committee, the report declares "an urgent and scientifically established need for concerted conservation of species, natural communities" — unusual forests, wetlands, etc. — "and ecosystems throughout the state." Although one-fifth of New Hampshire is currently under some sort of conservation protection, the unprotected rest also hosts numerous endangered species and land types, the report says.

Meanwhile, 24 plant and animal species once found in the state are gone, and development is eating up at least 10,000 open acres a year.

For a conservation report, this one's notably short on proposals for costly state land purchases, and not just because the state's own inventory of rare species says some species have higher priority for preservation than others. One person's conservation is another's land grab, and the committee was fearful that its program might founder on the sharp-edged strife that has erupted elsewhere between environmentalists, industry and landowners.

So it took a page from a 1904 project to protect the great Northern Forest of New England and New York. Figuring a committee on biodiversity ought to be diverse, the state put environmentalists, private landowners, industry representatives and academics on the panel. The report says land should remain under private ownership, and should be enrolled in any ecological reserve

See Study — Page A6

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# SUNDAY Valley NEWS

The Newspaper Of The Upper Valley

Prouty Ride/Walk Raises \$76,000 For Cancer Research — Page B1

# Study Urges New Resource On Rare Plants, Animals

Continued from page A1

“I think the point is it's going to be up to everybody to make it happen.”

Phil Bryce  
State Treasurer

voluntarily.  
“That was a concern of mine,” says Tom Thomson, an Oxford tree farmer who sat on the committee and invited the state to inspect his 2,400 acres for possible protection. Landowners not only want to maintain control of their property, some may be wary of walking into their town hall and seeing a public map of their land as part of some reserve. “They're going to think it's a Big Brother grab,” says Thomson.

But creating a reserve and keeping it secret likely wouldn't fly in New Hampshire, either. Thomson thinks landowners who demand under privacy won't volunteer for this effort.

But he is convinced that many would be open to sustainably managing their land if they were educated to the environmental risks. They possessed that he successfully argued for such education to be included among the report's recommendations. Van Luven takes pains to stress that it would be wrong to envision a reserve as a place “where we put up these big wire fences and say no people inside.... Nothing could be further from the truth.”  
Thomson even volunteered “to show other

landowners what it's about and how it's going to work.” He has talked to a few in the Valley, and “I sensed some excitement.... My prediction is the phone's going to be ringing off the hook, because private landowners want to know more about it.”

Thomson's property shows how a reserve might work. Among his vast holdings are four acres of a natural bog, carved out by glaciers and irrigated only by rainfall and seeps, which make the bog unusually acidic and hospitable to just a few plants like cottongrass and some bug-eaters. Thomson doesn't log the bog now, but if he did, an ecological reserve would have him voluntarily creating a protective buffer. “We would not cut trees or disturb the area around the bog. That would be left in its natural state.” Elsewhere, “I would continue to have a working, sustainable forest.”  
State Forester Phil Bryce says he hopes to

## Rare Species In The Upper Valley

The New Hampshire Natural Heritage Inventory tracks and protects rare plant and animal species and land types in the state. Here are some species listed by the inventory in a sample of towns in the Connecticut River Valley.

An asterisk by the species means it is threatened with extinction in the state, or on the verge of being so. The list does not include species that haven't been reported to the inventory in the last 20 years, although it's possible they may still survive in some towns.

- Champron**
- Plants: Ambiguous Sedge, Bladderfruit, Charming Junitory, Dwarf Ragwort, Glasswort, Golden-Fruited Sedge, Goldie's Fern, Great St. John's Wort, Green Drag-

- on, Gregarious Black Snakeroot, Hackberry, Hair-Fruited Sedge, Jeany's Milk Yell, Kain's Lobelia, Large-Flowered Bellwort, Loesel's Twayblade, Marsh Horsetail, Meadow Horsetail, Musk-flower, Northern Waterleaf, Shining Lady's-Tresses, Showy Orchis, Siberian Chives, Slender Cliff-Brake, Squirrel-Corn, Three-Leaved Black Snakeroot, Woodchuck

- Hamover**
- Plants: Barren Strawberry, Mossy-Cup Oak, Northern Waterleaf, Squinnet-Corn, Haverhill

- Rutberly, Tawny Emperor.
- Lebanon**
- Plants: Barren Strawberry, Black Maple, Variegated Horsetail, Woodland Hound's-Tongue, Animals: Bald Eagle, Lynx

- Plants:** Creeping Juniper, Ebony Sedge, Gauseig, Large Yellow Lady's Slipper, Milk-Grass, Scirpus-Like Sedge, Showy Lady's-Slipper, Slender Cliff-Brake, Smooth Woodstar, Snowy Aster, Squirrel-Corn, Walking Fern, Spikenard, Animals: Peregrine Falcon, Rich Barlow

meet with the Fish and Game director to decide on the report's recommendations later in the summer. It's not clear whether the recommendations would require significant state expense, although the report says that

“many of the resources and programs need to be implemented an ecological reserve system are already in place.” For example, Bryce says the legislature just created a commission on land and historical heritage

conservation. He also notes the report stresses the importance of private owners rather than the state. “I think the point is it's going to be up to everybody to make it happen.”