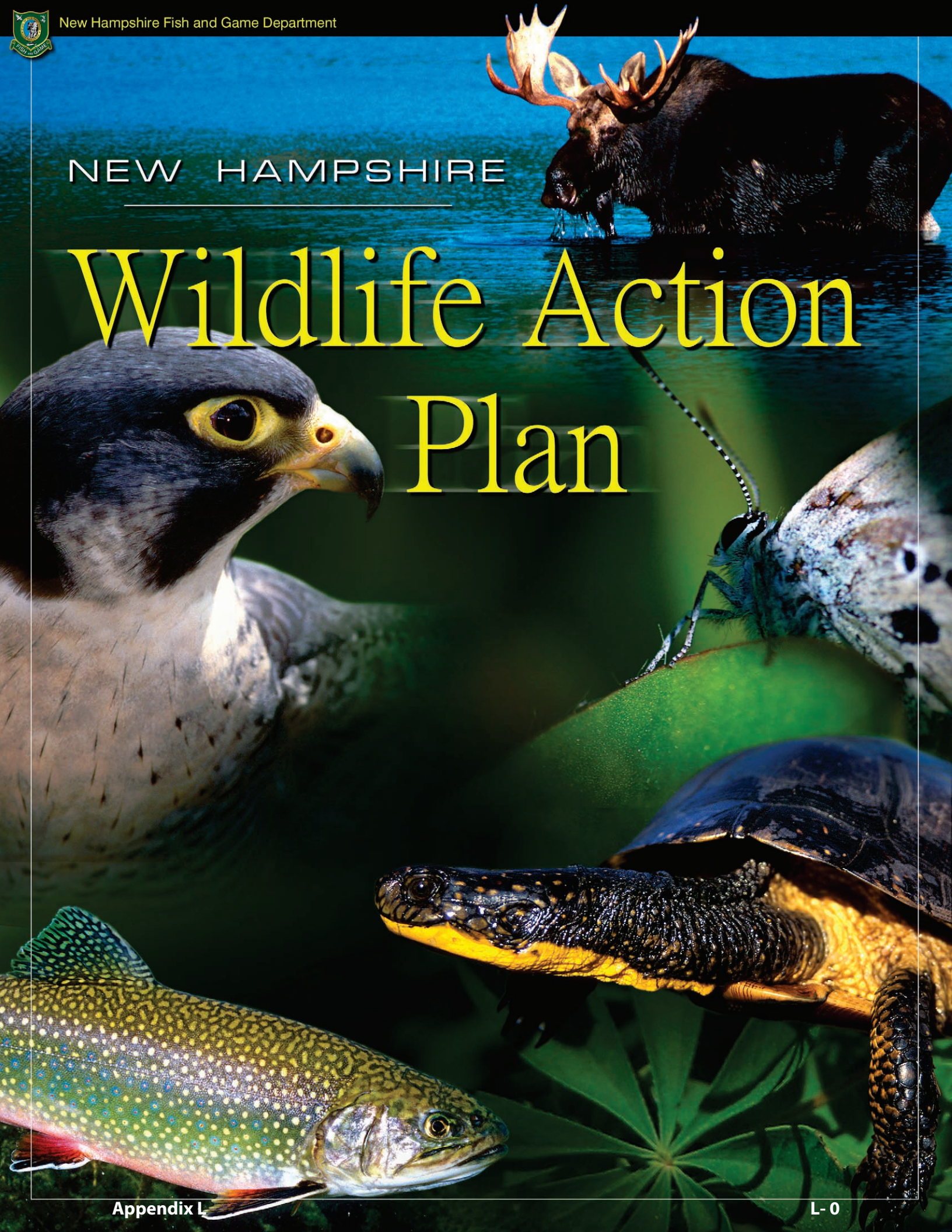

NEW HAMPSHIRE

Wildlife Action Plan

On the Cover

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Peregrine Falcon: © Alan Briere photo
Brook Trout: © Eric Engbretson photo
Blandings Turtle: © NHFG / Marquis Walsh photo
Karner Blue Butterfly: © NHFG / Victor Young photo

New Hampshire
Wildlife Action Plan

Submitted October 1, 2005

New Hampshire Fish and Game Department

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COMMONLY USED ACRONYMS

Many acronyms are used throughout the chapters and appendices. This list only includes the most commonly used acronyms. Those not listed here are spelled out the first time they are used in each chapter or appendix.

ACOE	United States Army Corps of Engineers
ATV	All Terrain Vehicle
DRED	Department of Resources and Economic Development
ESA	Endangered Species Act
FERC	Federal Energy Regulatory Commission
FLEP	Forestland Enhancement Program
GIS	Geographic Information System
GRANIT	Geographically Referenced Analysis and Information Transfer System
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
NAAT	National Advisory Acceptance Team
NHA	New Hampshire Audubon
NHBR	New Hampshire Bird Records
NHCP	New Hampshire Coastal Program
NHDES	New Hampshire Department of Environmental Services
NHDFL	New Hampshire Division of Forests and Lands
NHDOT	New Hampshire Department of Transportation
NHFG	New Hampshire Fish and Game
NHNHB	New Hampshire Natural Heritage Bureau
NHOSP	New Hampshire Office of State Planning
NRCS	Natural Resource Conservation Service
OHRV	Off Highway Recreational Vehicle
RAARP	Reptile and Amphibian Reporting Program
SPNHF	Society for the Protection of New Hampshire's Forests
TNC	The Nature Conservancy
UNH	University of New Hampshire
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geologic Survey
WAP	Wildlife Action Plan
WMNF	White Mountain National Forest

ACKNOWLEDGMENTS

PUBLIC LAW 107–63—NOV. 5, 2001

STATE WILDLIFE GRANTS

"... No State, territory, or other jurisdiction shall receive a grant unless it has developed, or committed to develop by October 1, 2005, a comprehensive wildlife conservation plan, consistent with criteria established by the Secretary of the Interior, that considers the broad range of the State, territory, or other jurisdiction's wildlife and associated habitats, with appropriate priority placed on those species with the greatest conservation need and taking into consideration the relative level of funding available for the conservation of those species."

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Executive Summary

New Hampshire's Wildlife Action Plan (WAP) completion comes at a crucial time in the state's history. *New Hampshire's Changing Landscape 2005*, a recent report from the Society for the Protection of New Hampshire Forests (SPNHF), chronicles the increasing human footprint on the state's natural habitats, and documents the immediate need for improved habitat conservation. In 1983, the reforestation that followed farming and logging of the 19th and 20th centuries reached its peak, with 87 percent of the state's lands forested. By 1997, the U.S. Forest Service (USFS) estimated that the state's forest cover dropped three percent, to 84 percent. Unlike the 18th and 19th century conversion of forests to fields, today's land conversion to roads, housing, and businesses permanently alters natural habitats and degrades their value to native wildlife. The WAP points to where the most vulnerable species and habitats are in relation to these rapid changes to the natural landscape.

New Hampshire's WAP is the result of a mammoth effort by hundreds of people and organizations committed to ensuring the future welfare of wildlife in New Hampshire and providing opportunities for people to enjoy use of these resources. The WAP is the most comprehensive wildlife assessment ever completed in New Hampshire. Thirty-four wildlife experts from 10 conservation agencies, organizations, and academic institutions served as contributing authors.

In a parallel effort, a 33-person citizen advisory group shaped the management framework for New Hampshire's big game species. Working with the New Hampshire Fish and Game Department (NHFG) wildlife biologists and program administrators, management policies and population objectives were synthesized into a Big Game Management Plan (Appendix E). Big game management objectives were integrated into the WAP's Chapter 5, Conservation Strategies.

At New Hampshire's Wildlife Summit in March of 2004, 110 individuals representing conservation, recreation, business, and community interests identified priority conservation issues. Via a web survey, 1,256 individuals provided additional input. Preventing habitat loss from development, educating citizens about wildlife management, and improving land-use planning were survey respondents' top priorities. During May of 2005, a sub-group of Wildlife Summit participants identified tools that could effectively be used to implement WAP strategies in the political and social climate of New Hampshire.

Using all available data, a core team of biologists identified 123 species and 27 habitats in greatest need of conservation. More than a half-million dollars of State Wildlife Grant federal funds were provided to contract with experts at partnering organizations, agencies, and academic institutions to complete assessments of these species and habitats. Each partner brought significant resources to match federal funds.

To ensure consistency and comparability of information, a wildlife species and habitat template was provided to all contracted experts. Four major elements—distribution and habitat, species and habitat condition, species and habitat risk assessment, and conservation actions—were addressed. In total, 131 species and habitat profiles were completed for all habitats and nearly all priority wildlife, including several invertebrate and fish species (nineteen "at risk" species were not profiled, either because there was a lack of information for those species, or because the conservation concerns facing those species were best addressed at the habitat level).

Following the development of species and habitat profiles, technical analyses were conducted to assess the condition of habitats and risks to wildlife. The results of these technical assessments were incorporated into each profile and are summarized in this document.

During the condition assessment phase, we compiled data that tripled the number of records in our wildlife occurrence database, and we used sophisticated science to develop the first maps ever to predict the location and compare the current condition of all matrix forests, terrestrial, wetland, and aquatic habitats over the entire state. Mapping was also completed for a subset of well-studied species.

In the risk assessment, we called on wildlife experts to conduct a structured assessment for 62 priority wildlife species and 27 habitats. Preliminary results identified 16 wildlife species that are highly at risk of extirpation from New Hampshire. Included in this list are Karner blue butterflies, piping plovers, and roseate terns. Eleven of the 27 priority habitats assessed ranked in the highest conservation risk category. Examples include Appalachian Oak Pine Forests, Pine Barrens, Salt Marshes, Lowland Spruce-Fir Forests, and Vernal Pools. Further review and analysis of species and habitats that appear to be in most jeopardy will be a first step in implementation.

After completing analysis of individual species and habitats, we identified risks that were common among species and habitats and developed strategies to address these risks. Rapid urban development in many parts of the state was identified as the most potent risk to our wildlife, devastating the health of many terrestrial, wetland, and aquatic populations and irreversibly fragmenting their habitats. Urban development is outpacing land protection. We need to respond by helping communities integrate wildlife habitat conservation into decisions about development. To meet this goal, we will:

- Provide public and private entities at all levels in the urban development and planning communities with information and assistance, including conservation science, maps, and mitigation guidelines to encourage sustainable development in sensitive wildlife areas
- Consider proactive strategies such as landowner incentives and voluntary land protection

Regional air and water quality issues scored among the most threatening problems for wildlife, both in terms of broad cumulative degradation and intense localized impacts. In response, we will:

- Promote the inclusion of wildlife in structured risk assessments by agencies engaged in energy, transportation, and industrial development projects
- Promote regional and national policies and funding that improve air and water quality for New Hampshire's wildlife and people

Some habitats have been degraded to the point that wildlife species associated with them will be lost without human intervention. To maintain our biodiversity and landscape integrity, we will:

- Guide management and restoration of rare and declining plants, animals, habitats, and natural communities
- Address human and ecological issues that threaten New Hampshire's biodiversity with strategies such as population management, habitat management and, when necessary, regulatory protection

There is a critical need to obtain, store, and manage data on the status and condition of New Hampshire's wildlife. Current information is essential to providing the best conservation science and monitoring. We will:

- Compile, manage, and analyze information about New Hampshire's wildlife; assess risks; and prioritize conservation actions
- Develop a system to monitor ecological health and management performance
- Adapt to changing conditions

Introduction

From Mount Washington to our Atlantic coastline, New Hampshire supports a wealth of wildlife species and habitats. Through the 1700s and 1800s, a majority of the state's forests were cleared for fields, pastures, and timber. Rivers and streams, dammed and degraded, became largely impassable for migratory fish. During this period, many fish and wildlife—already beleaguered by deforestation and diminished water quality—were nearly extirpated by market hunting and fishing.

New Hampshire, like other states, reacted to this "era of exploitation" with efforts to conserve fish, wildlife, and land. In 1865, the New Hampshire Fisheries Commission was established to restore sea-run fish to the Merrimack and Connecticut rivers, and to introduce other species into lakes, ponds, and streams for their food and recreational value. Later, New Hampshire conservationists helped pass the 1911 Weeks Act, which in 1912 led to the purchase of 72,000 acres of land by the federal government and the creation of the White Mountain National Forest. Since then, people have flocked to New Hampshire each year to enjoy our forests, water, and wildlife.

In the early decades of the 20th century, concerned hunters and anglers demanded an end to the over-exploitation of the nation's fish and wildlife resources. In response, the reorganized and renamed New Hampshire Fish and Game Department (NHFG) took steps to conserve them by setting and enforcing bag limits; creating wildlife refuges and sanctuaries; paying for game damage; operating a game farm; and issuing hunting and fishing licenses. The revenue generated from fishing and hunting license sales enabled the agency to expand its restoration, education, and law enforcement programs.

Additional funding for wildlife restoration started coming to NHFG from the Federal government after the passage of the Pittman-Robertson Act in 1937. In 1950, the Dingell-Johnson Act was established to support the states' restoration of sport fish. With this infusion of funds and support and the efforts of the Department, dozens of fish and wildlife species like moose, black bears, beaver, white-tailed deer, and wood ducks were able to rebuild their populations' health and numbers.

Beyond Sport Fish and Game Restoration

In 1979, during an era of public outcry over polluted air and water, New Hampshire formally recognized the need to contribute to conserving endangered wildlife and passed the state Endangered Species Conservation Act. In partnership with the U.S. Fish & Wildlife Service (USFWS), U.S. Forest Service (USFS), and New Hampshire Audubon (NHA), NHFG staff initiated activities that would ultimately lead to the recovery of some of the high-profile species that were hit hardest by environmental contaminants—bald eagles, peregrine falcons, ospreys, and loons. The success of these efforts proved that management could benefit a broad range of wildlife.

Formally acknowledging the breadth of wildlife that are affected by environmental issues, and also recognizing the diversity of ecological roles and habitat values that are necessary to support wildlife, the Nongame Species Management Act was passed by the New Hampshire Legislature in 1988. The act expanded the mission of NHFG to include the full array of wildlife—not just game and endangered species. This was the genesis of the mechanism that allows the State to spend $50,000 out of the General Fund to match private contributions to New Hampshire's Nongame and Endangered Wildlife Program. Over the years, the Nongame Program has leveraged

these funds to gain additional grants; thousands of people have contributed to the program.

The conservation of aquatic species in New Hampshire has focused on anadromous fish restoration, through the Atlantic salmon, American shad, and river herring restoration programs; and sport fish management, through population assessments and state and federal regulations. Lesser-known species of fish and aquatic invertebrates have received little direct attention. Some species, such as the bridle shiner, have been identified as species of concern in nearby states, while the status of other whole groups of species, such as crayfish and snails, is virtually unknown. The WAP provides the opportunity to assess the status and develop conservation priorities for all aquatic species and habitats.

In the 1980s, the waterfowl stamp, a new state lands management collaborative, and the Land Conservation Investment Program fueled NHFG's ability to manage land for all wildlife. Today, NHFG owns dozens of parcels and easements on parcels, enabling staff to manage for wildlife and habitat values. In cooperation with the N.H. Department of Resources and Economic Development's Division of Forest and Lands, many state forests and parks are managed for habitats that support diverse wildlife.

A partnership of concerned citizens and conservation organizations has spearheaded land, water, and wildlife conservation efforts in the 1990s and 2000s. The Society for the Protection of New Hampshire Forests (SPNHF), NHA, The Nature Conservancy (TNC), individual towns and many others have worked on their own and in partnership with NHFG and local land trusts to protect hundreds of thousands of acres in the last decade.

Despite this long history of successful projects and partnerships, NHFG has never had the resources necessary to comprehensively address the challenges facing all the state's wildlife and habitats. Certainly, decades of efforts to improve conditions for sport fish and game animals benefited more than just the focal species; nonetheless, not until now have we been able to take stock of a comprehensive range of species and habitat conditions, synthesize and analyze the information to identify risks to wildlife, and specifically target strategies to alleviate them.

State Wildlife Grants and the Wildlife Action Plan

In 2002, the United States Congress passed a law appropriating $80 million in State Wildlife Grants, which would go to state wildlife agencies to address the "species in greatest need of conservation," including those species not hunted or fished. To be eligible for these funds, New Hampshire was required to develop a comprehensive wildlife conservation plan—the New Hampshire Wildlife Action Plan—to be submitted to Congress by October 1, 2005. Congress mandated that the Plan address eight elements:

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

With the infusion of funds from the State Wildlife Grants and with the Congressional mandate, NHFG's Nongame and Endangered Wildlife Program has expanded over the last three years to cover more species and habitats in a broader context than ever before. Even with additional funding and staff, we continue to work closely with partners, recognizing that responsibility of protecting all wildlife and habitats is bigger than what we can accomplish on our own.

To assist in developing a comprehensive conservation plan, we called on broad expertise in the state to work as collaborators. Together, we developed an organizational structure (see Appendix F) and identified desirable outcomes to guide the development and future implementation of the Plan:

1. Citizens that are aware of New Hampshire's wildlife diversity and its contribution to the environmental, economic, and social fabric of the State and that actively support wildlife conservation.
2. An informed network of partners actively prepared to engage in implementing key conservation strategies and actions that protect the State's wildlife diversity.
3. A dynamic and adaptable GIS-based blueprint of New Hampshire's significant wildlife habitats that support species in greatest need for conservation and the full array of wildlife diversity.
4. A suite of conservation strategies that considers biological, social, and economic factors and opportunities to conserve the wildlife species in greatest need of conservation and all wildlife.
5. A dynamic and adaptable GIS-based wildlife data management system that contains all known wildlife occurrences and habitat polygons and that can be augmented continually with new data and queried by ecoregion, conservation land, habitat type, and species to monitor our progress in conserving wildlife.

The Planning Team developed the initial approach to completing the WAP. The Core Biologist Team served as a liaison between the biologists/researchers/writers and the Communications and Outreach Team, which worked on generating public input and releasing public information about the WAP. The three teams communicated frequently and most partner organizations were represented on more than one team, to keep technical/scientific and communications activities in sync.

Standards for the Wildlife Action Plan

In developing strategies to address challenging issues facing New Hampshire wildlife, we:

1. Identified Wildlife At Risk
2. Assessed Wildlife Habitat Conditions
3. Evaluated Risk Factors
4. Developed Strategies
5. Integrated Monitoring, Performance and Adaptive Management
6. Planned for Implementation

Throughout the process, we concentrated on developing a more systematic and transparent approach to wildlife planning. We invited public participation during plan development; efforts included the Northeastern Regional Survey, a Wildlife Summit, a Web Survey, Stakeholder Meetings, and a Strategy Forum.

Identifying Wildlife At Risk

In Chapter 2, we identify New Hampshire's low and declining wildlife populations and wildlife that are indicative of the diversity and health of the State's wildlife. This chapter corresponds primarily with the first of the Eight Required Elements, and builds on the many conservation initiatives that preceded the WAP in New Hampshire. Chapter 2 lays a foundation for Element 2 by describing the use of natural communities as surrogates for the diversity of poorly understood wildlife, the relationship between natural communities and wildlife habitats, and serves to organize both species and natural communities within the over-arching habitat types that occur in New Hampshire. These habitat types are the basis for our analyses and planning work described in later chapters.

Information Gathering (Data Templates)

One of the early and integral steps in the creation of this WAP was the development of an accurate, up-to-date, geographically referenced database system containing information on wildlife species. In cooperation with the New Hampshire Natural Heritage Bureau, we solicited data from experts on the highest

priority wildlife and improved the quality of existing records, tripling the initial amount of information. This database provides us with an efficient, web-based mechanism for reporting known fish and wildlife occurrences, and has been instrumental in determining distribution and abundance of species and habitats as required in the first and second of the Eight Required Elements.

Chapters 3-6 form the core of the WAP, with specific information about wildlife in New Hampshire, the problems they face, the solutions we propose, and how we will monitor them. To ensure that our work was comprehensive and based on the best available information, we developed standardized templates to gather technical information and data from contracted experts. All of the information collected on these forms is organized and linked in a database format, and has been applied throughout the document.

The first template, a Species and Habitat Profile Template (Appendix L), was completed for all wildlife and habitats. The fields in this template were designed to meet the first 5 of the Eight Required Elements, and their completion or lack thereof provide a clear indication of our knowledge gaps. Corresponding to each Profile Template, we completed a Risk Factor Ranking Form (Appendix M). Next, experts on each challenging issue evaluated ranks for the associated risk factors and summarized them in a Risk Assessment Template (Appendix N). This worked formed the body of Chapter 4.

To address all of the risks identified, we enlisted experts to complete a Strategy Template (Appendix O), with detailed information about implementation and feasibility for each objective. For each Strategy Template, a corresponding Feasibility Ranking Form (Appendix P) was completed. These data forms will help guide implementation.

Assessing Wildlife Habitat Condition

The location and relative condition of key wildlife habitats, the second of the Eight Required Elements, is the topic of Chapter 3. Describing the locations and condition of wildlife habitats is a complex process. In the predictive phase, we used computer analyses and GIS to predict where each kind of wildlife habitat is located. In the analytical phase, we compiled many different kinds of data about each location and used these data to analyze the local status of predicted habitats across the landscape. Information about local conditions will be compared and "filtered" to create maps showing areas of high potential and high risk for wildlife. A preliminary assessment of the condition of New Hampshire's wildlife habitats is reported in Chapter 3.

In New Hampshire, considerable public effort and money is being invested in the preservation of properties that may not be the most critical to wildlife. The goal of our investment in sophisticated mapping technology and conservation science is to provide tools for local and regional planners to ensure that time and money are spent in the most critical locations. Developing a complete map of wildlife habitats in New Hampshire and compiling information about them for the WAP was a major scientific undertaking. The coordinated work of all our partners will make conservation technology much more accessible to the entire planning community.

Evaluating Risk Factors

Although we were able to use quantitative data (Chapter 3) to gain insight about some of the challenging issues that threaten wildlife, for many issues, data are nonexistent. Chapter 4 addresses problems that may adversely affect wildlife and their habitats based on the expert opinions of wildlife professionals and the published literature. We used a structured process to organize and focus the attention of our science team on the most challenging issues.

From a scientific perspective, we recognize that all of the challenging issues, or "threats," that wildlife face can be viewed as having two aspects in common. First, each has certain "risk factors" that potentially have negative impacts on wildlife; and second, each has a series of events or an "exposure pathway" that brings a risk factor to fruition. A simplified description of the risk assessment process follows—this process was completed for all priority habitats and most priority wildlife species.

In the initial phase of the process, a panel of experts on a given species or habitat was supplied with a list of potentially challenging issues. The panel identified all of the risk factors associated with each issue and described the exposure pathway for their target species or habitat. During the ranking phase of the process, the panel completed a Risk Factor Ranking Form (Appendix M) to provide numeric ranks about

key aspects of each risk factor. To the extent that expertise and information were available, the values given for each risk factor were peer-reviewed and cross-referenced to scientific literature. A summary score was calculated for each risk factor, and the highest scoring ones were described in detail in the Species or Habitat Profile.

In the comparative phase of the process, all of the scores from all of the Risk Factor Ranking Forms were compiled in a database. The scores were grouped based on the list of general challenging issues that was originally provided to the species/habitat expert panels. Next, an expert on each issue screened the scores for all of the wildlife affected by it. The scores from the forms and descriptions from the Species/Habitat Profiles were written up in a Risk Assessment Template. Finally, scores were analyzed to compare the levels of risk among species/habitats and also among the broader issues. This approach enabled us to summarize challenging issues in a consistent, standardized format that will be used to help prioritize actions for implementation.

Developing an Action Plan

In response to the fourth of the Eight Required Elements, Chapter 5 describes actions necessary to conserve wildlife and provides information about prioritizing and implementing such actions. As part of the preceding chapters, we completed in-depth analyses to obtain a "diagnosis" of the issues that threaten New Hampshire's wildlife most. During the earlier steps in our planning process, we completed some preliminary work—the public participation process and the Species and Habitat Profiles—to prescribe actions to resolve the biggest issues. Based on this work, we generated an exhaustive list of potential actions. To ensure that the list properly assigned the right solutions to the right problems, we surveyed our expert team to help cross-reference wildlife, habitats, risks, and solutions in a linked database.

We utilized this cross-referenced information to analyze the breadth and depth of the actions necessary to conserve the full array of New Hampshire's wildlife. Within strategic program areas, wildlife management experts completed a ranking process to assess the operational feasibility of each action. For each strategy, experts gathered information about implementation potential and completed a detailed Strategy Template that far exceeds the scope of this document.

To simplify the WAP, we organized our strategies under four focus areas. The goal of the Regional Air and Water Quality Action Plan is to reduce harmful air and water pollutants by promoting sustainable energy, transportation, and industrial development practices. The Local Land and Water Conservation Action Plan contains approaches for promoting sustainable development and resource use to support wildlife health and diversity through a combination of coordinated working groups, technical assistance, and the production of targeted information and education materials. The actions under the Statewide Biodiversity Stewardship Program will help maintain New Hampshire's biodiversity and habitats by coordinating management, restoration, and land and regulatory protection. The Conservation Science and Information Management Action Plan will ensure that the best available science is used to adapt management and monitor those species and habitats of greatest conservation concern.

Integrating Monitoring, Performance, and Adaptive Management

To meet the fifth of the Eight Required Elements, Chapter 6 describes New Hampshire's plan for monitoring species identified in Element 1 and their habitats, for monitoring the effectiveness of the conservation actions proposed in Element 4, and for adapting these conservation actions to respond appropriately to new information or changing conditions. The three categories of variables we need to monitor are levels of risk factors, management effects, and ecological responses. Finding the right combination of measurements and variables within a reasonable budget—and still having the ability to respond to changes on the ground—is a critical challenge.

Our approach is to find the most efficient variables. By "efficient," we mean variables that fit into more than one of the categories described above and also represent many fish and wildlife species. Efficient also means that we can measure a variable and detect changes with minimal effort. When a variable meets these criteria, we consider it a useful "indicator" because it indicates changes that are happening for many variables. Our goal is to select useful indicators for each priority habitat and high priority species, and

to monitor them rigorously.

Guiding Implementation

In accordance with elements 6-8 of the Eight Required Elements, Chapter 7 describes our plans for coordinating, reviewing, and revising the WAP during the implementation phase in concert with our partners, stakeholders, and public. Several of the objectives described in Chapter 5 require immediate implementation and will serve as a transition between plan development and implementation. For example, information that we gathered about risks to wildlife and the feasibility of our objectives will be used to prioritize implementation of the WAP. We recognize that our priorities may differ from those of our partners, stakeholders, and the public, and therefore will provide guidance to match action items with the best organization for implementation.

Planning for the Future

Now, with the completion of the WAP, the process of funding and proceeding with its implementation begins. The benefits of investing in the WAP's strategies—or any wildlife conservation activities—go well beyond "saving" rare species. The economic benefits are clear. In a situation common to all states, wildlife associated recreation is a significant economic engine for New Hampshire. The U.S. Fish and Wildlife Service's 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation determined expenditures for these activities to be nearly $579 million in New Hampshire. Fishing brought in an estimated $165 million in 2001; hunting, $71 million; and wildlife watching, $343 million. Southwick Associates calculated that hunting and fishing alone provide more than 4,500 jobs in the state. Any downturn in participation in these activities would have a negative impact on the state's economy; whereas efforts to improve wildlife and habitat in New Hampshire would likely have the benefit of bringing more money into the system from hunters, anglers, and wildlife watchers.

The economic issue goes well beyond wildlife-associated recreation. New Hampshire's ecological framework is itself a hidden economy, untranslatable into dollars and cents. People live in and visit New Hampshire, and spend money in the state, in large part because it is a place of great natural beauty. The downside is this: New Hampshire's structures and services have boomed. When people move to New Hampshire from out of state, the amount of space developed per person has risen to more than two acres. Some 18,000 acres of land in New Hampshire are lost each year to development. This conversion of forest and other wildlife habitat into roads, houses, and businesses degrades the land's value to New Hampshire's wildlife. New Hampshire can support new people, and it can offer them places to live and drive and work and recreate; the WAP helps accomplish this by pointing to where the most vulnerable species and habitats are in relationship to the rapidly transforming landscape.

It starts with smart planning, which is at the heart of this Plan's strategies. When people are able to clearly see the connections between good wildlife management, clean air and water, sustainable economic growth, and our quality of life, wildlife habitat conservation actions will naturally be brought to the forefront of planning decisions.

Through existing and new partnerships, NHFG is moving forward with implementing the WAP. Prompt action is crucial—not only for the health and diversity of wildlife and habitats in the state, but also to ensure that future generations will have the opportunity to experience and enjoy the Wild New Hampshire we love and appreciate today.

Roadmap to Eight Required Elements

We used the eight required elements as the building blocks for New Hampshire's Wildlife Action Plan. Each element is an important piece of the wildlife puzzle. You will find these elements interwoven throughout the text, figures, and forms. We provide this guide to help you find the eight elements.

Element 1	Chapter and Appendix	Templates and Forms	Tables
Information on the distribution and abundance of species of wildlife, including low and declining populations as the State fish and wildlife agency deems appropriate, that are indicative of the diversity and health of the State's wildlife.	Chapter 2 Appendix A: Species Profiles	Species Profiles • 1.2 Justification • 1.4 Population and Habitat Distribution • 1.7 Sources of Information • 2.2 Relative Health of Populations	

Element 2	Chapter and Appendix	Templates and Forms	Tables
Descriptions of locations and relative condition of key habitats and community types essential to conservation of species identified in (1).	Chapter 3 Appendix B: Habitat Profiles	Habitat Profiles • 1.6 Habitat Map • 2.1 Scale • 2.2 Relative Health of Populations • 2.4 Relative Quality of Habitat Patches	Table 3-1 Table 3-2

Element 3	Chapter and Appendix	Templates and Forms	Tables
Descriptions of problems that may adversely affect species identified in (1) or their habitats, and **priority research and survey efforts** needed to identify factors which may assist in restoration and improved conservation of these species and habitats.	Chapter 4	Species and Habitat Profiles • 1.8 Extent and Quality of Data • 3.1 (A) Exposure Pathway • 3.1 (B) Evidence • 3.2 Sources of Information • 3.3 Extent and Quality of Data • 3.4 Threat Assessment Research Risk Exposure (Form 1) Risk Factor Assessment (Form 2)	Table 4-1 Table 4-2 Table 4-3

Element 4	Chapter and Appendix	Templates and Forms	Tables
Descriptions of conservation actions proposed to conserve the identified species and habitats and priorities for implementing such actions.	Chapter 5	Species and Habitat Profiles Existing Protection • 1.3 Protection and Regulatory Status • 2.3 Population Management Status Proposed Actions • 4.1 (A) Affected Threat • 4.1 (B) Justification • 4.1 (C) Conservation Performance Objective • 4.1 (D) Performance Monitoring • 4.1 (E) Ecological Response Objective • 4.1 (F) Response Monitoring • 4.1 (G) Implementation • 4.1 (H) Feasibility • Feasibility Ranking Form • 4.2 Conservation Action research Conservation Strategy Template	

Element 5	Chapter and Appendix	Templates and Forms	Tables
Proposed plans for monitoring species identified in (1) and their habitats, for monitoring the effectiveness of the conservation actions proposed in (4), and for adapting these conservation actions to respond appropriately to new information or changing conditions.	Chapter 6	Species Profiles • 1.9 Distribution Research • 4.1 (C) Conservation Performance Objective • 4.1 (F) Response Monitoring	Table 6.1

Element 6	Chapter and Appendix	Templates and Forms	Tables
Descriptions of procedures to review the strategy at intervals not to exceed ten years.	Chapter 7		

Element 7	Chapter and Appendix	Templates and Forms	Tables
Plans for coordinating the development, implementation, review, and revision of the plan with Federal, State, and local agencies and Indian tribes that manage significant land and water areas within the State or administer programs that significantly affect the conservation of identified species and habitats.	Chapter 7	Conservation Strategy Template (E): Organization	

Element 8	Chapter and Appendix	Templates and Forms	Tables
Broad public participation is an essential element of developing and implementing these plans, the projects that are carried out while these plans are developed, and the Species in Greatest Need of Conservation that Congress has indicated such programs and projects are intended to emphasize.	Chapter 1 Appendix H: Wildlife Summit results Appendix I: Web Survey Appendix K: Wildlife Strategy Forum results Appendix J: Public participation record		