# State Wildlife Action Plans in the Northeast: A Regional Synthesis

Michelle Aldridge
Michael Jastremski
Nicole Lewis
Sarah Levy
Ashley Lowe
Edalin Michael
Lauren Pidot
Christopher Theriot
Joel Visser

Steve Yaffee, Advisor

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# Introduction

## *Purpose*

This analysis explores the development, contents, and implementation of nine Comprehensive Wildlife Conservation Strategies (CWCS), also known also known as State Wildlife Action Plans (SWAP).[1] Each state fish and wildlife agency completed a plan in 2005 in order to remain eligible for federal State Wildlife Grant funds.

From January 2007 to April 2008, a team of nine interdisciplinary graduate students at University of Michigan's School of Natural Resources and Environment investigated CWCS development and early implementation in Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Pennsylvania. The effort was part of a larger study funded by the National Council for Science and the Environment's Wildlife Habitat Policy Research Program engaging eight universities around the county to explore plans in all states and territories.

From a regional perspective, we analyze plan development processes, elements of various plans, and developments in the two and a half years since the plans' completion. We uncover the impact of the plans on fish and wildlife agencies and conservation organizations across the region, and we examine both factors that have facilitated progress and challenges to promoting wildlife strategies. Finally, we provide recommendations for improving the next iteration of plans and expanding the impact of the plans in implementation.

## *Background on the Northeast Region*

The U.S. Census Bureau defines the Northeast region as the New England states of Maine, New Hampshire, Vermont, Massachusetts, Connecticut, and Rhode Island, and the Middle Atlantic states of New York, New Jersey and Pennsylvania.[2] In 2006, the region's urban, suburban and rural communities supported 54.6 million people.[3] The dense band of urban and suburban communities from Boston south to Washington D.C. is the nation's largest megapolitan region, and also continues to experience faster than average growth.[4] Migrations between urban centers cause population shifts in the region. New Hampshire, the fastest growing state in the Northeast, has experienced a population increase of 6.7% since 2000, largely as the commuteshed around Boston expands beyond Massachusetts' borders.[5] The total percentage of development in the Northeast is far greater than the national average. In 1997, the top four U.S. states with the greatest percent of developed non-federal land, were New Jersey (39.1%), Rhode Island (30.5%)

[1] SWAPs and CWCSs will be referred to from hereon out as 'the plans'.
[2] U.S. Census Bureau, "Census Regions and Divisions of the United States," U.S. Department of Commerce Economics and Statistics Administration, http://www.census.gov/geo/www/us_regdiv.pdf.
[3] U.S. Census Bureau, "Annual Estimates of the Population for the United States, Regions, States, and Puerto Rico: April 1, 2000 to July 1, 2007 (NST-EST2007-01)," Population Division, http://www.census.gov/popest/states/NST-ann-est.html.
[4] Eric D Kelly, *Managing Community Growth* (Westport, CT: Praeger, 2004), p. 5.
[5] Ibid.

Massachusetts (30.4%), and Connecticut (28.6%).[6] The Northeast has the least federally owned land of any region and the most privately held property.[7]

The Northeast is the most densely populated region of the country.[8] New Jersey and Rhode Island, the first and second most densely populated states, each support more than 1,025 residents per square mile – more than three times the average population density of India.[9,10] Six of the region's nine states are among the ten most densely populated in the nation.[11] The region's population density drops off in the most-northern stretches of the region, such as northern Maine, where many areas of the state remain unincorporated county land.[12,13] Despite a history of compact development in the region, recent development trends are leading to increases in per capita acreage development. For example, from 1950 to 2000, Massachusetts' population increased 28%, but the area of developed land increased 200%.[14] While human impacts on wildlife are traditionally associated with urban development, suburban and exurban sprawl has increasingly become a conservation concern.

The Northeast United States is home to diverse natural landscapes, including thousands of miles of rivers and rugged coastline and millions of acres of mountains, forests, and grasslands. More than 1,300 vertebrate species depend on ecosystems across the region for their survival.[15] As forests, wetlands, and agricultural lands are developed with roads and buildings, wildlife species face shrinking and fragmented habitat. This loss of open space escalates the impact of other wildlife threats such as nonpoint source pollution and climate change. Not surprisingly, all nine Northeastern fish and wildlife agencies report that many of their most significant conservation challenges stem from habitat loss, fragmentation from development and transportation infrastructure, and direct and indirect destruction of wildlife habitat.[16]

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[6] Natural Resources Conservation Service, "Acreage and Percentage of Non-Federal Land Developed," *1997 National Resources Inventory*, Department of Agriculture, http://www.nrcs.usda.gov/Technical/NRI/maps/meta/t5846.html.

[7] Natural Resources Conservation Service, "Percent of Land in Federal Ownership," 1997 *National Resources Inventory*, Department of Agriculture, http://www.nrcs.usda.gov/Technical/NRI/maps/meta/m5554.html.

[8] U.S. Census Bureau, "Census 2000 Summary File 1 GCT-PH1. Population, Housing Units, Area, and Density: 2000," American Fact Finder, http://factfinder.census.gov/servlet/GCTTable?_bm=y&-ds_name=DEC_2000_SF1_U&-CONTEXT=gct&-mt_name=DEC_2000_SF1_U_GCTPH1_US9&-redoLog=false&-_caller=geoselect&-geo_id=&-format=US-9|US-9S&-_lang=en.

[9] Ibid.

[10] Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, "World Population Prospects: The 2006 Revision and World Urbanization Prospects: The 2005 Revision," http://esa.un.org/unpp/p2k0data.asp.

[11] U.S. Census Bureau, "Census 2000 Summary File 1 GCT-PH1. Population, Housing Units, Area, and Density: 2000."

[12] Ibid.

[13] Maine Department of Inland Fisheries and Wildlife representative, telephone interview with Michelle Aldridge, October 10, 2007, Ann Arbor, MI.

[14] Massachusetts Division of Fish & Wildlife Department of Fish and Game (MDFW), *Commonwealth of Massachusetts 2005 Comprehensive Wildlife Conservation Strategy* (Boston, MA: 2005), p. 11.

[15] Teaming With Wildlife, "New York Wildlife Action Plan Summary," State Wildlife Action Plans, http://www.wildlifeactionplans.org/pdfs/action_plan_summaries/newyork.pdf.

[16] Connecticut Department of Environmental Protection (CTDEP), *Connecticut's Comprehensive Wildlife Conservation Strategy* (Hartford, CT: 2005), p. xiii; Maine Department of Inland Fisheries and Wildlife, (MDIFW), *Maine's Comprehensive Wildlife Conservation Strategy* (Augusta: ME: 2005), p. 2-4; MDFW, p. 11; New Hampshire Fish and Game Department Nongame and Endangered Wildlife Program (NHFG), *New Hampshire Wildlife Action Plan* (Concord, NH: 2005), p. 4-5; New Jersey Division of Fish & Wildlife Endangered and Nongame Species Program (NJDFW), *New Jersey Wildlife Action Plan* (Trenton, NJ: 2005), p. 2; New York

Finally, it is important to recognize the long history of conservation action in the Northeast. The land trust movement began in Massachusetts in the late 1800s. Today, the region is home to 581 land trusts, and has the highest density of land trusts in the nation.[17]

## *Origins of the Comprehensive Wildlife Conservation Strategies*

Wildlife management in the United States originally focused on the protection of food fisheries, agricultural pests and game species.[18] In 1973, Congress passed the Endangered Species Act to protect endangered plants and animals.[19] Between 85 and 90 percent of wildlife species, however, remained outside the focus of state fish and wildlife agencies. To meet the management gap, Congress passed the Fish and Wildlife Conservation Act in 1980, helping states, territories, and the District of Columbia protect species that were not hunted, fished, or listed as threatened or endangered. Funding for this program, however, was never sufficient to meet its goals. Instead, states relied on alternative conservation funds, including income tax donations and checkoffs, wildlife license plates, and lotteries to grow "nongame" and "wildlife diversity" programs.[20]

In 2000, Congress created two additional funding mechanisms for wildlife conservation: the Wildlife Conservation and Restoration program and the State and Tribal Wildlife Grants program. By 2002, the two programs had merged into one program, the State Wildlife Grants (SWG) program.[21] Funds allocations are now determined by a formula based 1/3 on land size and 2/3 on population size, with no state receiving more than 5% or less than 1% of available funding.[22] In its first five years, the SWG program appropriated $340 million dollars across all states, or approximately $56 million annually.[23]

In 2001, Congress required states and territories to submit a comprehensive wildlife conservation strategy to a U.S. Fish and Wildlife National Advisory Acceptance Team by October 1, 2005, in order to continue qualifying for SWG funds. Each plan was required to include the following eight common elements, abbreviated here:

(1) Distribution and abundance of wildlife species,
(2) Locations and condition of key habitats and community types,
(3) Wildlife and habitat threats,
(4) Conservation actions to address these threats,

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Department of Environmental Conservation (NYDEC), *New York Comprehensive Wildlife Conservation Strategy* (Albany, NY: 2005), p. 57; Pennsylvania Game Commission (PGC) and Pennsylvania Game and Boat Commission (PGBC), *Pennsylvania Comprehensive Wildlife Conservation Strategy* (Harrisburg, PA: 2005), p. 11-3; Rhode Island Department of Environmental Management Division of Fish and Wildlife, (RIDEM), *Rhode Island's Comprehensive Wildlife Conservation Strategy* (Wakefield, RI: 2005), p. 93; Vermont Fish and Wildlife Department, (VFW), *Vermont's Wildlife Action Plan* (Waterbury, VT: 2005), p. 2-8.

[17] Robert Aldrich and James Wyerman, *2005 National Land Trust Census Report* (Washington, D.C.: The Land Trust Alliance, 2006).

[18] National Conservation Training Center, "Origins of the USFWS," U.S. Fish and Wildlife Service, http://training.fws.gov/history/origins.html.

[19] Ibid.

[20] Jeff Lerner, Bobby Cochran, and Julia Michalak, *Conservation Across the Landscape: A Review of the State Wildlife Action Plans* (Washington, D.C.: Defenders of Wildlife, 2006), p. 4.

[21] Ibid.

[22] *The Department of the Interior, Environment, and Related Agencies Appropriations Act 2006*, P.L.09-54.

[23] Rebecca Brooke et al., *State Wildlife Grants: Five-Year Accomplishment Report* (Washington, DC: Association of Fish and Wildlife Agencies and the U.S. Fish and Wildlife Service, 2006), p. 16.

(5) Plans for monitoring species, habitats and the effectiveness of conservation actions,
(6) Plans for review and adaptive management of the strategy,
(7) Plans to coordinate strategy development, implementation, and review with Federal, state, local agencies and Indian tribes, and
(8) Opportunities for broad public participation in plan development and implementation.

While all state plans shared a common framework around these required elements, each state varied in its approach and scope. States received guidance about plan development, format, and contents from several sources, including U.S. Fish and Wildlife federal and regional offices, and the Association of Fish and Wildlife Agencies (AFWA), a non-profit organization that represents the state agencies.

All Northeast states submitted their strategies to U.S. Fish and Wildlife Association Northeast Regional National Advisory Acceptance Team (NAAT) by the deadline of October 1, 2005. The NAAT, composed of thirteen wildlife professional representing the USFWS and the regional association of state fish and wildlife agencies, reviewed each strategy's approach to the eight required elements. On February 16, 2007, the final strategy from all fifty states, the District of Columbia, and five U.S. territories was accepted by the Department of Interior.[24]

## *Plans or Strategies?*

Over the course of plan development, states adopted a variety of synonyms to refer to their strategy, depending on which title best resonated with the state approach and public understanding of plan goals. Nationally, the most commonly used plan titles are Comprehensive Wildlife Conservation Strategy and State Wildlife Action Plan. Northeast states remain split in their official reference to the strategy. Six states (Connecticut, Massachusetts, Maine, New York, Pennsylvania, Rhode Island) maintained the Comprehensive Wildlife Conservation Strategy title, while three states (New Hampshire, New Jersey, Vermont) elected to call their strategies Wildlife Action Plans. To maintain clarity throughout this paper, all strategies and plans are referred to here as “plans.” Official plan titles will only be used in the context of specific state plans.

The ongoing debate about how best to title the plans reflects the lack of consensus about the role of these documents themselves. Some states approached plan development as an exercise in articulating broad goals and objectives for protecting state species and habitats. Others developed clearer action plans with prioritized short-term and long-term actions.

## *Research Methods*

The foundation for this study was laid during the winter of 2007, when the participating Michigan students conducted a review of relevant conservation planning literature and first became acquainted with Northeast region’s nine plans. After developing a questionnaire designed to systemically draw information from the lengthy documents, students wrote summaries describing the contents and development process for each plan (State Characterizations).

[24] U.S. Fish and Wildlife Service, “Interior Department Approves Plans by 56 U.S. States and Territories to Keep Species from Becoming Endangered,” February 16, 2007, http://www.fws.gov/news/NewsReleases/.

In the fall of 2007, the nine students, in conjunction with other members of the national study, developed a set of standardized, open-ended questions for use in interviews with stakeholders and fish and wildlife agency employees. These interview questions were designed to gather information and impressions on the development of the plans and the steps taken towards their implementation between 2005 and 2007. Interviews were conducted with at least two knowledgeable stakeholders and one agency employee from each of the nine states. Data for the regional synthesis below were drawn from analysis of the plans and these interviews. In order to ensure the candor of interviewees and protect stakeholder-agency partnerships, all interviewees were granted anonymity.

# Plan Development and Content

## *Participation in Plan Development*

In the creation of the plans, Northeast state wildlife agencies devised an array of approaches of varied breadth, robustness, and duration to satisfy the Congressional requirements for participation in plan development. The last two of the eight plan elements required by Congress call both for the coordination of plan development with federal, state, local, and tribal agencies and the incorporation of broad public participation in the development process.

This section begins with an overview of the extent and timing of partner engagement and the satisfaction of partners with the engagement processes. It should be noted that the term "partner" is used here to denote all involved non-lead agency entities, including governmental and non-governmental organizations at all scales. The succeeding section describes the array of mechanisms employed by states to engage partners in the development process. Each partner category (federal, local, non-governmental, etc.) is then discussed, and the major involved entities and engagement mechanisms are described. The chapter concludes with a brief discussion of the potential implications of partner engagement for plan implementation.

The extent of partner engagement in the plan development process varied significantly among the Northeastern states. At one extreme, Vermont and New Hampshire included a broad array of agency and non-agency partners in almost all aspects of plan development. At the other end, Massachusetts and New Jersey limited engagement to partner review of draft plans and the use of information gleaned from partner databases and reports. New Jersey and Massachusetts were both required to extend their public review periods prior to receiving final approval by the U.S. Fish and Wildlife Service (U.S. FWS).[25]

New Jersey's plan underwent numerous iterations, reflecting the comments and review of an array of partners. This review and comment process included the convening of a wildlife summit that brought together representatives of over fifty partner organizations.[26] Massachusetts defended its limited engagement with partners by arguing that since their plan is primarily composed of pre-existing programs which had been developed collaboratively, the priorities on

[25] Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 19, 2007, Ann Arbor, MI.; Endangered and Nongame Species Program, "New Jersey Wildlife Action Plan: Background (2006)," Division of Fish and Wildlife, New Jersey Department of Environmental Protection, http://www.state.nj.us/dep/fgw/ensp/waphome.htm.
[26] NJDFW, pp. 624–629.

which it is based are "shared priorities."[27] That Massachusetts received a total of only 12 comments on their plan may provide support for the agency's assertion.[28] The comments received were primarily either supportive of the plan or suggested the inclusion of additional species to the state species of greatest conservation need (SGCN) list.[29]

Partners were brought into the plan development process at various points in time. In some states, partners were engaged in devising the approach to plan development, while in others engagement other than information sharing was postponed until after a draft plan had been completed by the lead agency. The wildlife agencies of New Hampshire, Pennsylvania, Vermont, Connecticut, and Rhode Island all engaged other agencies and non-governmental organization (NGO) partners in the development of strategies and goals for approaching plan development.[30] As noted above, the Massachusetts and New Jersey agencies did not engage partners beyond information sharing until draft plans had been completed in-house. Maine and New York engaged partners after their development process was underway, but prior to the completion of a draft plan, and additionally held comment periods for the drafts.[31]

Non-agency partners interviewed for this study expressed widely differing levels of satisfaction with their state's engagement process, sometimes even within a single state. At least one interviewed partner in New Hampshire, Maine, Rhode Island, and Vermont expressed satisfaction with the level of collaboration employed by their state agency in developing its plan (while other partners may have been satisfied, they did not specifically mention this in their interviews).[32] Most praise was directed at the level of inclusiveness that was achieved or attempted by the given state wildlife agency.

At least one interviewed partner in Maine, New York, and New Jersey specifically expressed some level of disappointment in their state's engagement process.[33] The Maine and New Jersey partners suggested that earlier and more diverse opportunities for engagement would have been beneficial. The New York partners expressed perhaps the greatest level of dissatisfaction, although the criticisms of the two interviewees were markedly different. One felt that the engagement process was "just a complete farce," and that information and perspectives

[27] Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, April 26, 2007, Ann Arbor, MI.
[28] Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 19, 2007, Ann Arbor, MI.
[29] MDFW, p. 7.
[30] NHFG, p. 1-1; PGC and PGBC , p. 8-6; VFW, p. 3-8; CTDEP, p. 7- 1; Rhode Island Department of Environmental Management Division of Fish and Wildlife representative, telephone interview with Joel Visser, September 27, 2007, Ann Arbor, MI.
[31] Maine Conservation NGO representative, telephone interview with Lauren Pidot, September 28, 2007, Ann Arbor, MI.; NYDEC, pp. 569–572.
[32] Maine Conservation NGO representative, telephone interview with Lauren Pidot, October 24, 2007, Ann Arbor, MI.; Rhode Island Conservation NGO representative, telephone interview with Joel Visser, October 23, 2007, Ann Arbor, MI.; New Hampshire Conservation NGO representative, telephone interview with Michelle Aldridge, October 10, 2007, Ann Arbor, MI.; Vermont Conservation NGO representative, telephone interview with Nicole Lewis, November 14, 2007, Ann Arbor, MI.
[33] Maine Conservation NGO representative, telephone interview with Lauren Pidot, April 19, 2007, Ann Arbor, MI.; New York Conservation NGO representative, telephone interview with Michael Jastremski, October 10, 2007, Ann Arbor, MI New York Conservation NGO representative, telephone interview with Michael Jastremski, October 24, 2007, Ann Arbor, MI.; New Jersey Conservation NGO representative, telephone interview with Sarah Levy, September 24, 2007, Ann Arbor, MI.

collected from partners were not incorporated into the plan.[34] The other, however, criticized the decentralized method of plan development, asserting it led to "almost too much opportunity [for engagement]," thereby preventing his group from being "efficient in our contribution."[35]

## Overview of Engagement Mechanisms

States used a wide variety of formal mechanism to engage non-lead agency partners in the development of the plans. These mechanisms are distilled into the following five categories: contracting with partners, inclusion of partners on steering or technical committees, convening of partner meetings, organization of review and comment periods, and conducting of surveys. While approaches varied from state to state, the most frequently used mechanisms were partner meetings of varying levels of formality, engagement of partners on technical committees, and public review and comment periods. Information and data sharing also occurred at some level in every state.

It is undoubtedly the case that significant information was shared and ideas generated through informal conversations between agency and non-agency partners, but this type of informal collaboration is more difficult to capture and is addressed here only as it pertains to interstate collaboration. Also, most states conducted some level of outreach to inform the general public and partners about the development of the plans. These mechanisms, however, are not described below since they do not involve the collection of input but only the dissemination of information.

### *Contracting with Partners*

Wildlife agencies in several Northeast states, including Pennsylvania and New Hampshire, contracted the research and writing of sections of their plans to other state agencies, non-profit organizations, and research and academic institutions.[36] The New Hampshire wildlife agency made use of this tactic to a greater extent than any other state agency in the Northeast, spending more than $500,000 to contract with thirty-four experts from ten conservation organizations, agencies, and academic institutions. [37] When asked if collaboration in the development of the plan exceeded levels for previous planning projects, a representative from the New Hampshire agency responded, "Yes, definitely."[38] The representative went on to suggest that the contracting process had encouraged robust engagement, "[The relevant entities] were all involved. And many of them were involved in a contractual arrangement; they had to produce a project that went into the plan and they were funded for doing so."[39] Contracting also allowed the New Hampshire agency to "farm out [sections of the plan] to where they thought the expertise was."[40]

When funding was allocated to certain partners to perform tasks or complete sections of the plans, it was, not surprisingly, generally these partners who were most engaged in the process.

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[34] New Jersey Conservation NGO representative, telephone interview with Sarah Levy, September 24, 2007, Ann Arbor, MI.
[35] New York Conservation NGO representative, telephone interview with Michael Jastremski, October 24, 2007, Ann Arbor, MI.
[36] PGC and PGBC, p. 8-3; NHFG, p. 1-1.
[37] New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.
[38] Ibid.
[39] Ibid.
[40] New Hampshire Conservation NGO representative, telephone interview with Michelle Aldridge, October 10, 2007, Ann Arbor, MI.

This was particularly true in Rhode Island, where a grant from the Doris Duke Charitable Foundation enabled The Nature Conservancy to become the most engaged non-agency partner.[41]

### *Inclusion of Partners on Development and Taxonomic Committees*

Connecticut, New Hampshire, Pennsylvania, New York, Rhode Island, Vermont, and, to a lesser extent, Maine all included non-lead agency representatives as members of at least some of their plan development and technical committees.[42] It should be noted that committee names are different between states and development committees are intended to distinguish coordination, development, steering and strategic committees, while the term 'technical committees' encompasses taxonomic and GIS teams associated with the plans. In Maine, committee membership extended only to federal and state agency partners, with the great majority of members being lead agency employees.[43] Vermont included agency and non-agency partners on its technical committees and some of its development committees, going so far as to populate the committees partially in accordance with nominations from partner organizations.[44]

### *Partner Meetings*

Partner meetings were held by most states during the development of their plans, though the size, content, and focus of these meetings varied significantly. Several states brought together large groups of partners to both inform them about the plan and offer an opportunity for input. New Hampshire and Vermont both convened large partner summits of up to 112 individuals at which priorities and strategies were discussed.[45] Pennsylvania's All-Bird Conservation Workshop convened more than 130 individuals to discuss bird related habitat and conservation issues in the context of the plan.[46] Pennsylvania also held a more general meeting of partners, attended by representatives of thirteen organizations, to discuss the vision and goals for the plan.[47]

Another strategy was to bring together smaller groups of partners on a repeated basis. Maine convened a partner working group which met three times during the development of the strategy to review and brainstorm SGCN lists and strategies, though the specific individuals participating in the meetings varied to some extent.[48] Similarly, Rhode Island held a series of workshops at which partners were asked to assist in identifying key species, habitats, threats, and actions.[49] New York also convened a partnership group which met twice during the development process, though these meetings were seen as an opportunity to inform partners about the process as much as to actively engage them.[50] Sections of New York's plan were also reviewed and revised by local watershed teams in nine regions throughout the state.[51]

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[41] Rhode Island Department of Environmental Management Division of Fish and Wildlife representative, telephone interview with Joel Visser, September 27, 2007, Ann Arbor, MI.
[42] RIDEM, pp. 283–284; NHFG, Appendix F; NYDEC, p. 570; VFW, p. 3-4; MDIFW, p. 8-2; PGC and PGBC, p. 8-3; CTDEP, p. iv-v.
[43] MDIFW, p. 8-2.
[44] VFW, p. 3-3.
[45] NHFG, p. 1-3; VFW, p. 3-8.
[46] PGC and PGBC, p. 8-6.
[47] PGC and PGBC, p. 8-5.
[48] Maine Department of Inland Fisheries and Wildlife, telephone interview with Lauren Pidot, September 27, 2007, Ann Arbor, MI.
[49] RIDEM, p. 309.
[50] NYDEC, p. 571; New York Conservation NGO representative, telephone interview with Michael Jastremski, October 10, 2007, Ann Arbor, MI.
[51] NYDEC, p. 570.

Finally, representatives from several state agencies also met with numerous smaller groups of partners, and in some cases specific individuals or organizations, to both provide information on the plans and gather input and priorities. New Hampshire, Vermont, Connecticut, and Rhode Island all made use of this strategy.[52]

While New Jersey held both a large partner summit and smaller partner meetings, these were all convened after the completion of one or more draft of their plans.[53]

### *Review and Comment Periods*

Most states held public review periods during which the draft plans were posted on websites and comments were solicited from partners and the general public. Vermont held two review periods, an earlier and longer session for conservation partners, and a somewhat later one that was open to the general public.[54] New Jersey and Massachusetts, both of which, as noted above, were required by the U.S. FWS to extend their public review periods, presented their draft plans at public meetings and committees.[55] New Jersey's plan was taken through several iterations, each one involving an extensive review period that included partner participation and review.[56]

While most states held full-scale review periods only after the completion of a draft plan, the New York wildlife agency also held a two-stage review of its SGCN list towards the beginning of its development process. The draft list was both posted on the agency website and distributed to experts. More than three hundred comments were received.[57] Connecticut, Rhode Island, and Pennsylvania did not have formal comment periods, but their draft plans were posted on their websites with email addresses provided for submitting comments.[58] In New Hampshire, their "wildlife summits served as [the] public input process," and no open review period was held.[59]

### *Surveys*

Surveys were used by three states to assess priorities and gather input from both targeted partner groups and the general public. Connecticut used questionnaires and surveyed attendees at informational presentations to solicit priorities and ideas from both local decision-makers and the general public.[60] Pennsylvania distributed surveys and comment forms at conferences and meetings to gather priorities and ideas from conservation partners and the public.[61] New Hampshire assessed the priorities of the general public through a widely advertised web survey, to which 1,256 responses were received.[62]

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[52] NHFG, p. 1-4; VFW, p. 3-8; CTDEP, p. 7-1, p. 8-1; RIDEM, p. 309.
[53] NJDEP, pp. 624–629.
[54] VFW, p. 3-8.
[55] Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 19, 2007, Ann Arbor, MI.; Endangered and Nongame Species Program, Division of Fish and Wildlife, New Jersey Department of Environmental Protection, "*New Jersey Wildlife Action Plan," Background* (2006), http://www.state.nj.us/dep/fgw/ensp/waphome.htm.
[56] NJDEP, pp. 624–629.
[57] NYDEC, p. 569.
[58] CTDEP, p. 8-2; PGC and PGBC, p. 7-4.
[59] New Hampshire Fish and Game representative. E-mail correspondence with Lauren Pidot, November 20, 2007, Ann Arbor, MI.
[60] CTDEP, p. 7-2, p. 8-7.
[61] Pennsylvania Game Commission and Pennsylvania Game and Boat Commission representatives, telephone interview with Ashley Lowe, October 1, 2007, Ann Arbor, MI; PGC and PGBC, p. 7-3.
[62] NHFG, p. 1-3.

In addition, a random telephone survey of four hundred residents from each of thirteen northeastern states was conducted in 2004 to assess the best channels through which to improve agency reputation and public support for wildlife conservation.[63] The results of this survey were used by the New Hampshire wildlife agency to develop outreach and education strategies for their plan, but were not mentioned by any other state agency.[64]

## Engagement of the General Public

Aside from public comment periods, engagement of the general public in the plan development process was generally confined to informational materials and presentations. All states used web sites, e-mails, press releases, newsletters, and presentations at public events to keep the interested public abreast of developments. A few states, notably Pennsylvania and New Hampshire, also surveyed the general public using, respectively, widely distributed questionnaires and a web survey.[65]

As noted above, nearly all states also had formal or informal public review periods during which draft plans were posted on websites and public comments were solicited. In several states with formal public review periods, the number of comments received was quite low, with twenty or fewer comments received in Maine, Massachusetts, and New York (this excludes comments made during the early review period for New York's SGCN).[66] A representative of the Maine wildlife agency, which received comments from only "2 to 3" members of the general public, speculated that the limited interest of the general public stemmed from the breadth of the plans. "[Members of the general public] are going to go in and look for their little pet critter and if its on the list fine and if its not, those are the ones we heard from…," the representative said, "We didn't expect a lot of comments, and we didn't get many."[67]

## Involvement of Non-Governmental Organizations in Plan Development

The NGO partners most commonly engaged in plan development include the Nature Conservancy (TNC), National Audubon and independent state Audubon offices, academic institutions and extension offices, and large state-based conservation organizations and coalitions such as the Pennsylvania Biodiversity Partnership and the Society for the Protection of New Hampshire Forests.[68] TNC was identified as a top collaborator by a representative of five state agencies (Maine, New Hampshire, Vermont, Rhode Island, and New Jersey), while independent

[63] NHFG, p. 1-1.
[64] NHFG, p. 1-1.
[65] PGC and PGBC, p. 7-3; NHFG, p. 1-3.
[66] Maine Department of Inland Fisheries and Wildlife representative, telephone interview with Lauren Pidot, April 11, 2007, Ann Arbor, MI.; NYDEC, p. 572.; NDFW, p. 98.
[67] Maine Department of Inland Fisheries and Wildlife representative, telephone interview with Lauren Pidot, April 11, 2007, Ann Arbor, MI.
[68] Pennsylvania Game Commission and Pennsylvania Game and Boat Commission representatives, telephone interview with Ashley Lowe, October 1, 2007, Ann Arbor, MI; New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.; New Jersey Division of Fish & Wildlife Endangered and Nongame Species Program representative, telephone interview with Sarah Levy, September 19, 2007, Ann Arbor, MI.; New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, October 9, 2007, Ann Arbor, MI.; Maine Department of Inland Fisheries and Wildlife representative, telephone interview with Lauren Pidot, April 11, 2007, Ann Arbor, MI.; Vermont Fish and Wildlife representative, telephone interview with Nicole Lewis, November 8, 2007, Ann Arbor, MI.; Rhode Island Department of Environmental Management Division of Fish and Wildlife representative, telephone interview with Joel Visser, September 27, 2007, Ann Arbor, MI.

state or national chapters of the Audubon Society were identified as such by four state agencies (Maine, New Hampshire, Vermont, and New Jersey).[69] The role of TNC seemed particularly significant in several states. This organization was described by one New Hampshire partner as having played a "mighty role" in that state's plan development, while a representative of the Rhode Island Division of Fish and Wildlife noted that "the meat and potatoes [of collaboration on the plan] was largely other state divisions and TNC."[70,71] As mentioned above, a grant from the Doris Duke Charitable Foundation enabled TNC to become the most active non-agency participant in Rhode Island's development process.[72]

All states engaged NGOs through some level of data sharing, either through the use of previously developed plans or reports (as in Massachusetts) or by making use of available data in identifying SGCN species or habitats. With the exception of New Jersey and Massachusetts, both of which engaged partners only after the development of draft strategies, all Northeastern states also engaged partners in interactive meetings, workshops, or working groups focused on developing priorities and strategies. These meetings ranged from large, broadly focused gatherings such as the 112-person New Hampshire Wildlife Summit that addressed general strategies for developing the plan, to large, species-focused meetings such as the 130-person Pennsylvania All-Bird Conservation workshop, to individual partner meetings, such as those held in Vermont.[73,74,75]

Several states, including Vermont, New York, and Rhode Island, included non-governmental partners on taxonomic or development committees.[76] New Hampshire contracted the development of significant portions of its plan to NGO partners.[77]

## Interagency Involvement in Plan Development

Interagency collaboration most often occurred between the lead agency and other agencies with jurisdiction over parks and recreation, environmental regulation, natural area and heritage conservation, and planning. As discussed below, New Hampshire, Vermont, and New York also engaged the Department of Transportation (DOT) in their respective plan development processes.[78]

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[69] New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI; New Jersey Division of Fish & Wildlife Endangered and Nongame Species Program representative, telephone interview with Sarah Levy, September 19, 2007, Ann Arbor, MI.; Maine Department of Inland Fisheries and Wildlife representative, telephone interview with Lauren Pidot, April 11, 2007, Ann Arbor, MI.; Vermont Fish and Wildlife representative, telephone interview with Nicole Lewis, November 8, 2007, Ann Arbor, MI.; Rhode Island Department of Environmental Management Division of Fish and Wildlife representative, telephone interview with Joel Visser, September 27, 2007, Ann Arbor, MI.

[70] New Hampshire Conservation NGO representative, telephone interview with Michelle Aldridge, October 10, 2007, Ann Arbor, MI.

[71] Rhode Island Department of Environmental Management Division of Fish and Wildlife representative, telephone interview with Joel Visser, September 27, 2007, Ann Arbor, MI.

[72] Ibid.

[73] NHFG, p. 1-3.

[74] PGC and PGBC, p. 7-13.

[75] NHFG, p. 3-8.

[76] RIDEM, pp. 283–284; NYDEC, p. 570; VFW, p. 3-4.

[77] New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.

[78] New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.; Vermont Fish and Wildlife representative, telephone interview with Nicole Lewis, November 8,

Representatives of non-lead state agencies engaged in the process as partners in both large group meetings and technical committees and in one-on-one meetings to coordinate plans and strategies. In New Hampshire and Maine, significant responsibility for portions of the strategies was delegated to the New Hampshire Natural Heritage Bureau and the Maine Department of Marine Resources respectively.[79] While responsibility for all sections of Rhode Island's plan remained with the Division of Fish and Wildlife, an agency employee felt that a representative of the Rhode Island Heritage Program "was a huge help and almost a coauthor on the strategy because it is a logical extension of Heritage Program work as well." [80]

As noted above, the state Department of Transportation was substantively engaged in at least three states' plan development processes. In New Hampshire, members of the plan-development core team held meetings with representatives of DOT, which was developing its ten-year plan contemporaneously, to discuss "strategies addressing transportation and wildlife."[81] In Vermont, the lead-agency deemed DOT the most important state agency to engage, "in that we really want them to help us implement this and it's further from the center of their mission than it is for Forest and Parks Department or Environmental Conservation."[82]

At least one state felt that plan development broke new ground for interagency collaboration. A representative of the Rhode Island Division of Fish and Wildlife noted that the Division "is not really used to dealing with other agencies…and I would like to think that [plan development] was helpful."[83] Some interagency collaborations, however, were decried. While the Maine plan was the first comprehensive plan to cover the management of both marine species and inland fish and wildlife, collaboration between the Maine Department of Inland Fisheries and Wildlife (which held primary responsibility for the plan) was not considered robust by either an agency representative or partners.[84] Involvement from the Division of Marine Resources was described by one partner as "token."[85]

## Involvement of Federal Agencies in Plan Development

Given its congressionally mandated role as the reviewer of all plans, the U.S. FWS proved to be the most frequently cited federal partner in the development of the Northeastern strategies. Other agencies that were mentioned as active partners included the U.S Forest Service (USFS) (New Hampshire, Vermont), the National Resource Conservation Service Conservation Resource (Vermont), U.S. Department of Transportation (New York), and the U.S. Geological Survey

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2007, Ann Arbor, MI.; New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, October 9, 2007, Ann Arbor, MI.

[79] New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.; Maine Department of Inland Fisheries and Wildlife representative, telephone interview with Lauren Pidot, April 11, 2007, Ann Arbor, MI.

[80] Rhode Island Department of Environmental Management Division of Fish and Wildlife representative, telephone interview with Joel Visser, September 27, 2007, Ann Arbor, MI.

[81] New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.

[82] Vermont Fish and Wildlife representative, telephone interview with Nicole Lewis, November 8, 2007, Ann Arbor, MI.

[83] Rhode Island Department of Environmental Management Division of Fish and Wildlife representative, telephone interview with Joel Visser, September 27, 2007, Ann Arbor, MI.

[84] Maine Department of Inland Fisheries and Wildlife representative, telephone interview with Lauren Pidot, April 11, 2007, Ann Arbor, MI.; Maine Conservation NGO representative, telephone interview with Lauren Pidot, April 19, 2007, Ann Arbor, MI.

[85] Maine Conservation NGO representative, telephone interview with Lauren Pidot, April 19, 2007, Ann Arbor, MI.

(USGS) (New York).[86] A representative of the New York Department of Environmental Conservation expressed disappointment with the difficulty of engaging both the Environmental Protection Agency (EPA) and the National Oceanic and Atmospheric Administration (NOAA) in the plan development process. The representative felt that NOAA's lack of engagement was a particular problem given that the agency's Marine Fisheries Division has jurisdiction over certain relevant fish species.[87]

In addition to providing guidance and reviewing sections of the plans, representatives of the U.S. FWS—and, occasionally, the other agencies mentioned above—participated in partner meetings in some states including Maine, Vermont, Pennsylvania, New Jersey, and New Hampshire.[88] Representatives of federal agencies also participated as members of technical committees in Maine and Vermont.[89] In addition, employees of the USFS' Northeast Forest Experiment Station were contracted to write part of New Hampshire's plan.[90]

Connecticut appears to have had a particularly strong, or at least appreciative, relationship with the Region 5 U.S. FWS office. A Connecticut agency representative reported that "the staff at FWS Region 5 gave the state incredible support throughout the planning, and made sure that we had the necessary resources available to write the plan."[91]

## Involvement of Local Agencies in Plan Development

The majority of Northeastern states either did not engage municipal and county governments in the development of their plans, or engaged them only through the participation of broader organizations representing the interests of local governments (as in Maine and Vermont).[92]

In New Hampshire and New Jersey, representatives of local agencies participated in large partner meetings.[93] A representative of the New Hampshire wildlife agency noted that representatives of local agencies did attend the New Hampshire Wildlife Summit but added that "it's been after the production of the plan that there's been a ton of outreach work and a lot of community input and planner input."[94] Connecticut did perhaps the most to engage local actors during the plan development process. As described by agency representatives, "early on in the

[86] New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.; Vermont Fish and Wildlife representative, telephone interview with Nicole Lewis, November 8, 2007, Ann Arbor, MI.; New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, October 9, 2007, Ann Arbor, MI.

[87] New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, October 9, 2007, Ann Arbor, MI.

[88] MDIFW, p. 8-2; NHFG, p. 1-2; PGC and PGBC, p. 8-5; VFW, p. 3-4.

[89] MDIFW, p. 8-2; Vermont Fish and Wildlife representative, telephone interview with Nicole Lewis, November 8, 2007, Ann Arbor, MI.

[90] New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.

[91] Connecticut Department of Environmental Protection representative, telephone interview with Christopher Theriot, October 22, 2007, Ann Arbor, MI.

[92] Maine Department of Inland Fisheries and Wildlife, telephone interview with Lauren Pidot, September 27, 2007, Ann Arbor, MI.; Vermont Fish and Wildlife representative, telephone interview with Nicole Lewis, November 8, 2007, Ann Arbor, MI.

[93] New Jersey Division of Fish & Wildlife representative, telephone interview with Sarah Levy, September 19, 2007, Ann Arbor, MI.; New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.

[94] New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.

process we passed out a questionnaire at local planning workshops that gave us input and feedback from local government bodies."[95]

In states where local governments were not significantly engaged in preparing the plan, some partners and agency representatives expressed a sense that this was a shortcoming of the development process. In Vermont, at least one partner felt that the limited engagement of local governments might significantly impede plan implementation. According to this partner, the Vermont plan "didn't have that real classic, crisp connection to the people... I think a way to have done that would have been to engage towns and local governing and planning entities in the development process because that's how this is going to get implemented at the local level."[96] In Rhode Island, a representative of the wildlife agency reported that local governments had not been engaged in plan development, but felt that "linkages [to towns] need to be fostered" for implementation to succeed.[97] In some states, the challenges of interacting with the local level may impede such linkages. In New York, for instance, municipalities were described as simply too numerous to engage in plan development.[98]

## Interstate Involvement in Plan Development

Coordinators in the Northeast region engaged in varying levels of informal consultation amongst themselves. Such consultations took place primarily through conversations at regional meetings held by the U.S.FWS Region 5 office and national meetings held by Association of Fish and Wildlife Agencies (AFWA), as well as through both a coordinators' listserve organized by AFWA and one-on-one discussions between coordinators in adjacent states.[99] Where it took place, interstate consultation seems to have usually involved sharing strategies for plan development and data and classifications related to common landscape features, such as the Susquehanna River which runs through both Pennsylvania and New York.[100] It should be noted that two of the Northeastern states, Rhode Island and Connecticut, contracted with the same individual to write their plans. A representative of the Rhode Island wildlife agency felt that this bolstered agency awareness of what was going on in the other state.[101]

Occasionally, interstate consultation extended even beyond the bounds of the Northeast. After stakeholders asked him how they were meant to navigate his state's thousand-page plan, the Vermont coordinator turned to AFWA's coordinator listserve for advice. The Wisconsin

[95] Connecticut Department of Environmental Protection representative, telephone interview with Christopher Theriot, October 22, 2007, Ann Arbor, MI.
[96] Vermont Conservation NGO representative, telephone interview with Nicole Lewis, October 29, 2007, Ann Arbor, MI.
[97] Rhode Island Department of Environmental Management Division of Fish and Wildlife representative, telephone interview with Joel Visser, September 27, 2007, Ann Arbor, MI.
[98] New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, October 9, 2007, Ann Arbor, MI.
[99] Pennsylvania Game Commission and Pennsylvania Game and Boat Commission representatives, telephone interview with Ashley Lowe, October 1, 2007, Ann Arbor, MI.; New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, October 9, 2007, Ann Arbor, MI.; Vermont Fish and Wildlife representative, telephone interview with Nicole Lewis, November 8, 2007, Ann Arbor, MI.; New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.
[100] New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, October 9, 2007, Ann Arbor, MI.
[101] Rhode Island Department of Environmental Management Division of Fish and Wildlife representative, telephone interview with Joel Visser, September 27, 2007, Ann Arbor, MI.

coordinator shared that state's strategy of opening the plan with a user's guide directing different types of stakeholders to different sections of the document. The Vermont plan now features a similar user's guide.[102]

More formal collaboration between states has been initiated during the first two years of plan implementation. These joint efforts are described below under the section on regional collaboration.

## Implications for Implementation

The majority of state agency representatives did not report that the development of the plans prompted the engagement of significant new partnerships. Representatives from the Rhode Island and New York agencies, however, did report the forging of important new ties with agencies and non-governmental organizations.[103] As described above, the Rhode Island representative particularly felt plan development had pushed the agency to interact with certain agencies and groups in new ways.[104] The New York representative described connections made during the plan development process as a first step towards mending the tense relationship between the state government and the New York Native American tribes.[105] These new partnerships may have a lasting influence on plan implementation and other agency activities.

In other states, however, those most engaged in the development process were primarily long-standing partners. While New Hampshire had one of the most robust partner engagement processes in the Northeast, a representative from its wildlife agency reported being disappointed that no truly new or non-traditional partnerships were forged. "We got a lot of good feedback from a variety of stakeholders and increased public awareness through the summits," the representative said, "but there wasn't something brand new like a partnership with representatives from land development interests that could lead to far-reaching changes in development practices that impact wildlife."[106]

A robust partner-engagement process has not always translated into satisfaction with engagement as states have moved into the plan implementation phase. While the interviewed Maine partners expressed moderate to enthusiastic praise for the engagement of partners in their state's plan development, both expressed frustration with the limited engagement of partners in the two years since publication.[107] In Vermont, which had a broad and multi-faceted engagement process, at least one partner believes that partner engagement in implementation has "happened to some degree but think[s] that in implementation we are still waiting to see how that plays out."[108] In New Hampshire, however, some of the most highly involved partners have become

[102] Vermont Fish and Wildlife representative, telephone interview by Lauren Pidot, October 4, 2007, Ann Arbor, MI.
[103] New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, October 9, 2007, Ann Arbor, MI.; Rhode Island Department of Environmental Management Division of Fish and Wildlife representative, telephone interview with Joel Visser, September 27, 2007, Ann Arbor, MI.
[104] Rhode Island Department of Environmental Management Division of Fish and Wildlife representative, telephone interview with Joel Visser, September 27, 2007, Ann Arbor, MI.
[105] New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, October 9, 2007, Ann Arbor, MI.
[106] New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.
[107] Maine Conservation NGO representative, telephone interview with Lauren Pidot, September 28, 2007, Ann Arbor, MI.; Maine Conservation NGO representative, telephone interview with Lauren Pidot, October 24, 2007, Ann Arbor, MI.
[108] Vermont Conservation NGO representative, telephone interview with Nicole Lewis, November 14, 2007, Ann Arbor, MI.

even more committed to the process by stepping into paid positions designed explicitly to facilitate implementation. According to a representative of the New Hampshire wildlife agency: "If you're the person writing for the future of conservation action and it's really the first thing that you've done in your job, you're going to follow it very closely. I think that's what's been so powerful."[109]

## *Assessment of Conservation Needs*

Elements 1–4 of the plan components mandated by Congress direct states to conduct an assessment of their wildlife conservation needs. States were required to investigate the distribution and abundance of wildlife species, locations and condition of their key habitats and community types, threats to those species and habitats, and conservation actions to address those threats. While there was little oversight of the methods used to conduct these assessments by the federal government, the International Association of Fish and Wildlife Agencies (IAFWA) issued a set of guiding principles designed to help states achieve compliance with all eight of the required elements, and it distributed more detailed documents containing recommendations for the selection of SGCN and habitat classification systems.[110] The states ultimately used a variety of methods to conduct the mandated assessments, which are described in more detail below.

### Species of Greatest Conservation Need and Their Habitats

Historically, wildlife conservation in the United States has been addressed on a species-by-species basis both in the management of game species, traditionally a major focus of many state wildlife agencies, and in response to imminent extinction through the Endangered Species Act of 1973.[111] One limitation to this approach is the lack of time or resources for addressing species of concern individually. More recently, single-species management approaches have been developed that attempt to conserve many species through management of a few. Rationale for choosing these "surrogate" species include their value as an indicator of ecosystem health ("indicator" species); characteristics of their life history, such as large home ranges or the use of diverse habitats that mean the habitats necessary for their survival overlap with habitats important to many other species ("umbrella" species); or their disproportionate impact on the welfare of other species in a given ecosystem ("keystone" species).[112]

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[109] New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.

[110] Teaming With Wildlife Working Group, *Guiding Principles for States to Consider in Developing Comprehensive Wildlife Conservation Plans and Wildlife Conservation Strategies (Plans-Strategies) for the State Wildlife Grant and Wildlife Conservation and Restoration Programs* (International Association of Fish and Wildlife Agencies, 2002), http://www.fws.gov/r5fedaid/swg/Planning%20Resources/default.htm; Teaming With Wildlife Working Group (TWWWG 2003-1), *Memorandum: Identifying Species in Greatest Need of Conservation* (Wilmington, DE, International Association of Fish and Wildlife Agencies, 2003), http://www.fws.gov/r5fedaid/swg/Planning%20Resources/default.htm; Teaming With Wildlife Working Group (IAFWA 2003-2), *Memorandum: Ecological Frameworks Sub-workgroup (SWG Workgroup)* (Lincoln, NE, International Association of Fish and Wildlife Agencies, 2003), http://www.fws.gov/r5fedaid/swg/Planning%20Resources/default.htm.

[111] Daniel Simberloff, "Flagships, umbrellas, and keystones: Is single-species management passé in the landscape era?" *Biological Conservation* 83:3 (1997), pp. 247–257.

[112] Ibid.

Another solution to the problem of limited resources for species conservation is the classification of key habitats and ecological communities, which can then be managed as units, hopefully encompassing all of their resident species.[113] The IAFWA guiding principles advised the states to organize their conservation needs through a combination of coarse-grained, habitat-based approaches and finer-grained approaches, such as surrogate species and species of special concern.[114]

### *SGCN Selection and Organization*

In September, 2003, the IAFWA issued a memorandum to all state wildlife coordinators containing criteria to consider when developing lists of SGCN and for identifying species that meet those criteria. The IAFWA suggested criteria are listed below.

Criteria for defining the overall focus and scope of species to be included in state plans:

- Full array of wildlife species,
- Species of greatest conservation need,
- Species with low or declining populations,
- Species indicative of the diversity and health of the state's wildlife,
- Species whose needs are not being met through other funding sources.

Criteria for defining species with greatest conservation need:

- Endangered, threatened, or candidate species (federal or state),
- Imperiled species (globally rare),
- Declining species,
- Endemic species,
- Disjunct species,
- Vulnerable species,
- Species with small, localized, "at-risk" populations,
- Species with limited dispersal,
- Species with fragmented or isolated populations,
- Species of special, or conservation, concern,
- Focal species (keystone species, wide-ranging species, species with specific needs),
- Indicator species,
- "Responsibility" species (i.e. species that have the center of their range within a state).[115]

As discussed in the previous section, the level of engagement during the species selection process varied between states. Seven states assembled teams composed of experts from both state wildlife agencies and external organizations and institutions to select species of concern from particular taxonomic groups.[116]

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[113] Zen Naveh, "Biodiversity and Landscape Management," in Ke Chung Kim, Robert D. Weaver, eds. *Biodiversity and Landscapes: A Paradox of Humanity.* (New York, NY: Cambridge University Press, 1994), 187–209.
[114] IAFWA, 2002, Section B: Focus and Scope.
[115] IAFWA, 2003-1, p. 1.
[116] CTDEP, p. 1-24; NHFG, p. 2; NYDEC, p. 31; MDIFW, p. 8-3; RIDEM, p. 42; PGC and PGBC, p. 10-2; Vermont Fish and Wildlife representative, telephone interview with Nicole Lewis, November 8, 2007, Ann Arbor, MI.

In New Hampshire, the state wildlife agency used SWG funds to involve other state wildlife experts in the development of the plan. Taxonomic experts from The Nature Conservancy, New Hampshire Audubon, the University of New Hampshire, and several other organizations and universities were contracted to write the species and habitat profiles and to provide external review.[117]

SGCN were selected using a variety of criteria in different states. Many of the plans list criteria very similar to those listed in the IAFWA memorandum, although only Rhode Island explicitly mentions using all of the guidelines issued by IAFWA.[118] All states consulted existing national and regional species of concern lists when choosing SGCN.[119] New Jersey also used species lists specific to their existing Landscape Project and State Wildlife Grants Working Plan.[120] The national and regional lists used by the states included federal threatened/endangered/special concern lists, species of regional conservation concern as identified by Therres (1999), and the Audubon Christmas Bird Count.[121] Five states used lists from internal Natural Heritage Programs.[122]

The most commonly mentioned criteria from the IAFWA list used by states (besides those described above) include:

- Declining species,
- Species vulnerable due to life history traits,
- Species vulnerable due to risk to critical habitat.

Several states mentioned lack of information on species status and population trends as being an important consideration for inclusion in the plan. This is the only criterion used by the states that was not part of IAFWA's list.

Three states explicitly mentioned state endemic species or species with large portions of their populations within their borders as being of special concern, regardless of population trends.[123] Two states mentioned the inclusion of indicator species on SGCN lists.[124]

Four states evaluated potential SGCN in five general taxonomic categories: mammals, birds, reptiles/amphibians, fish, and invertebrates.[125] Maine used this breakdown, but with the addition of marine wildlife (including marine fish) as a separate category.[126] Vermont also used the same categories, but with the addition of plants.[127] Vermont was the only state in the Northeast to consider plants as potential SGCN. Other states probably did not take this step because plants are outside of the funding scope of the State Wildlife Grants program. A representative from the Massachusetts Division of Fisheries and Wildlife noted that one way to

[117] NHFG, p. XI.
[118] RIDEM, p. 41.
[119] CTDEP, p. iv; MDFW, p. 2; NJDFW, p. x; NHFG, p. 2-1; NYDEC, p. 6; MDIFW, p. 3-9; RIDEM, P. 41; PGC and PGBC, p. 10-2; VFW, p. 4-1.
[120] NJDEP, Attachment "A".
[121] US Fish and Wildlife Service Threatened and Endangered Species Database, 2008, http://ecos.fws.gov/tess_public/StartTESS.do. Accessed 3/1/2008; Therres, G.D, "Wildlife Species of Conservation Concern in the Northeastern United States," *Northeast Wildlife* 54 (1999): 93-100; Audubon Christmas Bird Count Historical Results, 2008, http://www.audubon.org/bird/cbc/hr/index.html (accessed 4/1/2008).
[122] MDIFW, p.1-76; NHFG, p. 2-1; NJDEP, p. 4; NYDEC, p. 6; VFW, p. 4-1.
[123] PGC and PGBC, p.10-5; RIDEM, p. 41, MDIFW, p. 1-76.
[124] PGC and PGB, p. 10-5; RIDEM, p. 41.
[125] CTDEP, p. iv; NHFG, p. 14-3; RIDEM, p. 157; PGC and PGBC, p. 10-5.
[126] MDIFW, p. 4-31.
[127] VFW, p. 3-10.

circumvent this limitation was to focus on habitats rather than species when planning for conservation.[128]

New York used the most detailed taxonomic breakdown of the Northeast states for evaluating potential SGCN, including sections in their plan on mammals, birds, freshwater fish, diadramous fish, marine fish, herpetofauna, marine mollusks, freshwater and terrestrial mollusks, crustacea and meristomata, dragonflies and damselflies, mayflies and stoneflies, lepidopterans, and other terrestrial insects.[129] Each of these groups had its own independent selection process and team of taxonomic experts. These species were assembled into a new database for plan development.

New Jersey was the only state to ignore taxonomic breakdowns in organizing potential SGCN species. Instead the state organized species by geographic distribution and conservation status. This is how New Jersey's Landscape Project, which pre-dates their plan, is organized.[130] Species are introduced by landscape region, then further broken down by conservation zones. Within each conservation zone species are then divided into federally listed species, state listed species, nongame species of concern, game species of regional priority, and fish species.

Final counts of SGCN varied widely between states. The distribution of the sizes of SGCN lists shows that there is not a strong relationship either between state size or habitat diversity and final SGCN totals, beyond the two largest states (New York, 537 species; and Pennsylvania, 572 species) having the longest lists of SGCN. For example, Connecticut, which is about a tenth the area of New York, has an SGCN total that approaches ninety percent of that state's listing (475 species).[131]

States that likely share similar species and habitats derived quite different final SGCN totals. New Hampshire and Vermont, which share a border, consist of a similar size, and feature similar terrain, ended up with very different SGCN totals, with Vermont (334 species, not including plants) having more than double the SGCN of New Hampshire (123 species).[132] Differences in SGCN lists across the region demonstrate differences in planning methods, which could make a regional or national synthesis difficult in the future.

Three states prioritized SGCN by conservation need after their selection. Maine used a triage process, based on a priority rating assigned to species during the initial SGCN selection process, and ratings for "knowledge" and "readiness", or how well the status, distribution, threats, and conservation needs for a particular species are understood.[133] Species for which significant funding was already allocated from other sources were considered a lower priority.[134] New Hampshire ranked SGCN by considering threat severity, threat timing, likelihood of extirpation, and available information on a species and produced categories of "critical concern", "serious

[128] Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with M.S. Jastremski, November 20, 2007, Ann Arbor, MI.
[129] NYDEC, p. 31-51.
[130] NJDEP, Attachment "A".
[131] NYDEC, Appendix 2, PGC and PGBC p. 10-64; Wikipedia, "Connecticut," http://en.wikipedia.org/wiki/Connecticut; Wikipedia, "New York," http://en.wikipedia.org/wiki/New_York; CTDEP, p. 1-1.
[132] VFW, p. 4-1; John Kanter, "Prioritization: What's next for New Hampshire? 72 strategies, 123 species, and $600,000," *State Wildlife Action Plans One Year Later Meeting, PowerPoint Presentation*, July 31, 2006.
[133] MDIFW, p. 3-108.
[134] Ibid.

concern", "moderate concern", and "low concern".[135] Vermont included species prioritization for conservation action in its detailed species assessments.[136]

### *Habitat Classification and Selection*

The IAFWA Ecological Frameworks sub-workgroup issued a memorandum in September, 2003 providing guidance to all state wildlife plan coordinators on selecting a habitat framework for use during the planning process. The stated goals of the memorandum were to provide "a) information on habitat/natural community classification systems available; b) insight into what classification systems states are planning to use; and c) to make a recommendation as to the best ecological platform to use in a national synopsis."[137] The memorandum suggests that states use the Bailey/USFS Ecological Units classification system as the ecological platform for plan organization, and that states provide a section-level summary of their plan to IAFWA upon completion. The recommendation is intended to facilitate regional and national aggregations of the plans.[138] No Northeastern state relied solely on the Baileys/USFS Ecological Frameworks, although several states consulted multiple frameworks including Bailey's/USFS when creating their classification systems. States employed a variety of classification systems for describing different habitat types. Most states used adaptations of existing regional and state systems.

New York was the only state that did not adopt some type of habitat-based rationale for organizing the area within its borders. It used New York Natural Heritage Program's Ecological Communities of New York State to assign SGCN to communities, but used U.S. Geological Survey Level 4 Hydrologic Units to break up the state into management units.[139] Level 4 is the smallest sub-unit of the USGS national watershed classification system.[140]

New Jersey and Massachusetts included detailed sections devoted to specific habitats or geographic areas. When combined with the states' existing computer-based critical-habitat mapping programs these sections could constitute "mini-plans."[141] These sections provided enough detail to allow users to consult the plan and quickly assess whether there are relevant species or habitats occurring in a particular area. The plans also provide guidance on accessing each state's computer-based program to create customized maps and access specific information pertaining to an area of interest.

In the Massachusetts plan, each of twenty-two habitat types is described in detail. For each the plan includes a list of SGCN associated with the habitat, a state map showing the occurrence of that habitat type, a description of relevant threats and appropriate conservation actions, and strategies for monitoring the success of conservation actions.[142] The maps included with each habitat section include sufficient detail to indicate whether the habitat is located in a user's general vicinity. Users could then consult Massachusetts's Biomap or Living Waters

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[135] Kanter, *State Wildlife Action Plans One Year Later Meeting, PowerPoint Presentation.*
[136] VFG, Appendix A.
[137] IAFWA 2003-2, p. 1.
[138] IAFWA 2003-2, p. 2.
[139] NYDEC, p. 87.
[140] NYDEC, p. 90; United States Geological Survey, "What are Hydrologic Units?" http://water.usgs.gov/GIS/huc.html (accessed 3/1/2008), July 31, 2006.
[141] MDFW, *The Biomap Project (Terrestrial Habitats)*, http://www.mass.gov/dfwele/dfw/nhesp/nhbiomap.htm, 2008; MDFW, *Living Waters Project (Aquatic Habitats)*, http://www.mass.gov/dfwele/dfw/nhesp_temp/land_protection/living_waters/living_waters_home.htm, 2008; MDFW, p. 197; NJDEP, *The Landscape Project*, http://www.nj.gov/dep/fgw/ensp/landscape/, 2008; NJDEP, p. 299.
[142] MDFW, p. 197.

databases for a more detailed map of their area showing the precise locations of habitats of concern.[143] In addition, the detailed species entries in the Massachusetts plan indicate which towns a particular species occurs in or near. This will enable local land-use planners to recognize when planning decisions might be affected by the presence of species or habitats of concern.[144]

For its plan, New Jersey's was broken up into several different landscape zones, which were further broken into conservation zones. For each conservation zone, the plan includes a list of prioritized SGCN, relevant threats to wildlife and habitats, conservation goals, conservation actions, potential partnerships to deliver conservation goals, and strategies for monitoring success.[145] Maps provided with each conservation zone are relatively easy to read, but are probably only useful to indicate whether a habitat of concern is in close proximity to an area of interest to a particular user. .In combination with a more detailed map from the Landscape Project database, the information embedded in the plan could be a powerful conservation-planning tool.

Three states rated habitats based on their quality as compared to similar habitats in the state. In New Hampshire, habitats were assigned a relative condition on the basis of landscape context, wildlife diversity, recreational factors, development/land use factors, and air and water quality factors.[146] Rhode Island assigned each habitat a relative threat level (“high”, “medium”, or “low") and a condition rank (“excellent”, “good”, “fair”, “poor”).[147] Connecticut also rated habitats as “excellent”, “good”, “fair”, and “poor”.[148]

All states except New York included spatial representations of the occurrence of SGCN and their habitats. New York included watershed maps of EPA Multi-Resolution Land Characteristics land use/land cover data, which do not correspond with the habitat classification used in the rest of New York’s plan.[149] For other states, maps varied widely in content, complexity, and usefulness. Maine included large-scale ecoregional maps displaying key habitats, which are unlikely to be useful for practical purposes.[150] Connecticut included maps of key habitats and species distributions, but the maps were over ten years old at the time of plan publication.[151] For the plan New Hampshire created new habitat maps, which are continually updated and available to the public.[152] Pennsylvania included maps displaying habitat types and patch sizes and was the only state to feature maps of land use patterns and trends.[153] As discussed earlier, New Jersey and Massachusetts included maps created from pre-existing mapping programs.[154]

### *Development of New Conservation Tools during Species/Habitat Selection Process*

In four states the selection of species and habitats of greatest conservation need resulted in either the creation of new conservation tools or the revision of existing ones. New York assembled a

[143] Ibid.
[144] Ibid.
[145] NJDEP, p. 299.
[146] NHFG, p. 3-5.
[147] RIDEM, p. 71.
[148] CTDEP, p. 4-7.
[149] NYDEC, p. 8.
[150] MDIFW, p. 4-10.
[151] CTDEP, p. 4-6.
[152] NHFG, Wildlife Action Plan Habitat Maps CD, 2007.
[153] PGC and PGBC, p. 19-3.
[154] NJDEP, p. 299, Attachment “A”; MDFW, p. 197.

new SGCN database including information on critical habitats, threats,conservation actions, and means of monitoring the success of those actions. The database was used to assign species to groups based on similar taxonomy, habitat use, and threats ('Odonates of bogs/fens/ponds' and 'Wintering waterbirds' are examples). This database was also used during the rest of plan development.[155]

In New Hampshire, the SGCN selection process initiated a complete review and revision of the state's threatened and endangered species list.[156] New Hampshire also contracted with The Nature Conservancy for the creation of the state's first aquatic habitat classification system..[157]

Vermont and Rhode Island also created new habitat-classification systems.. In Vermont, technical teams characterized twenty-four community types using over one hundred different communities, cultural habitats, and landscapes drawn from five different classification systems and scholarly publications focused on the Vermont landscape.[158] Citing the lack of data on distribution and abundance of many SGCN,the Rhode Island state wildlife agency chose to use several existing habitat-classification schemes to create a new one .[159] Rhode Island based its classification on a wide variety of existing vegetation and ecosystem classification models, distilling them into six primary and sixty-four key habitat types.[160]

Five states did not develop new tools during the planning process. For three of these states, the plan was based almost entirely on existing programs. The Massachusetts wildlife agency felt it already possessed all of the proper tools to conduct comprehensive wildlife conservation, and perceived the plan as a way to bring all of those tools "under one umbrella" in the words of a representative of the Maine wildlife agency. [161] That same representative said, "we felt like we were kind of ahead, we didn't need to really go out and create a lot of new programs to implement this."[162]

In Maine, management plans were in place for many SGCN prior to the development of the plan.[163] In the words of a Maine wildlife agency representative, the state's pre-existing landscape-level conservation program, Beginning with Habitat, is "the foundation conservation action" in Maine's plan.[164]

In New Jersey, selection of species and habitats was based on their pre-existing Landscape Project, State Wildlife Grants Working Plan, and Endangered and Nongame Advisory Committee. New Jersey officials also consulted other existing species lists and habitat classification systems.[165]

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[155] NYDEC, p. 6-7.
[156] New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.
[157] NHFG, p. 3-2.
[158] VFW, p. 3-15.
[159] RIDEM, p. 52.
[160] Ibid.
[161] Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.
[162] Ibid.
[163] Maine Department of Inland Fisheries and Wildlife representative, telephone interview with Lauren Pidot, April 11, 2007, Ann Arbor, MI.
[164] Maine Department of Inland Fisheries and Wildlife, telephone interview with Lauren Pidot, September 27, 2007, Ann Arbor, MI.
[165] NJDEP, p. 4, Attachment "A".

## Northeast Regional Threats

While IAFWA provided detailed guidance on selecting SGNC and habitats, it did not provide the same level of advice for the identification of threats. In the guiding principles memorandum sent to the state wildlife coordinators, IAFWA advises states to use "threats analyses, risk and stressor assessments, and other techniques to help set priorities for goals, objectives, strategies, and activities."[166] The memorandum also explicitly advises states to consider invasive species management.[167] There was no other mention of either specific threats or methods of assessing them.

Wildlife in the Northeast is exposed to threats that are globally ubiquitous, such as climate change, and also those that have more localized drivers and impacts,such as habitat loss from commercial and residential development. The magnitude and character of threats to Northeast wildlife vary throughout the region. For instance, the threats facing SGCN in the more remote north woods of New York, Vermont, New Hampshire, and Maine are different in character and/or degree from those facing SGCN living closer to major metropolitan areas.

All of the nine Northeast states list habitat loss, degradation, and fragmentation as major threats to species of greatest conservation need within their borders.[168] Such listing is consistent with previous studies finding that in the United States habitat loss is the most widespread threat to terrestrial species, followed by invasive species.[169] For many aquatic species, pollution (including sedimentation) is the second most prominent threat after habitat loss.[170] Wilcove et al. list fourteen major categories of anthropogenic activity that result in habitat loss and degradation in the United States.[171] These are (in no particular order of magnitude):

- agriculture
- livestock grazing
- mining, oil, gas, and geothermal exploration and development
- logging
- infrastructure development
- road construction and maintenance (specific to infrastructure development)
- military activities
- outdoor recreation
- off-road vehicles (specific to outdoor recreation)
- water development
- dams and other impoundments (specific to water development)
- pollution and sedimentation
- land conversion for residential and commercial development
- disruption of fire ecology

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[166] IAFWA 2002, p. 3.
[167] Ibid.
[168] NYDEC, p. 57; CTDEP, p. 3-4; NJDEP, p. 17; NHFG, p. 4-5; RIDEM, p. 77-86; VFW, p. C:1; PGC and PGBC, p. 11-3; MDIFW, p .5:242-246; MDFW, p. 11.
[169] Edward O. Wilson, *The Diversity of Life*, (Cambridge, MA: Belknap Press, 1992); C.H. Flather, and M.S. Joyce, "Threatened and endangered species geography," *BioScience* 48 (1998): 365-376; David S. Wilcove, David Rothstein, Jason Dubow, Ali Phillips, and Elizabeth Losos, "Quantifying threats to imperiled species in the United States," *BioScience* 48 (1998): 607-615.
[170] Wilcove et. al:, p. 607-615.
[171] Ibid.

While all of the threats listed above have either occurred or are occurring in the Northeast, a few are more frequently listed by the states as being threats to SGCN in their plans.

### *Habitat Loss, Degradation, and Fragmentation from Development*

The Northeastern United States is the most densely populated region of the country.[172] It is home to a significant portion of the nation's largest contiguous urban landscape, the Boston to Washington, D.C. megalopolis, which stretches along the Atlantic coast. The region has a large amount of rural agricultural land and open space in relatively close proximity to large population centers. This proximity inevitably leads to heavy development pressure on areas important to many of the region's SGCN.

All of the nine Northeast states listed habitat loss, degradation, and fragmentation due to land conversion for commercial and residential development, as well as the maintenance and construction of infrastructure to serve those developments, as major threats to SGCN within their borders.[173] Given the development pressure in the Northeast, addressing the potential for the destruction, degradation, and fragmentation of habitat is clearly essential to the conservation of SGCN in the region.

### *Other Anthropogenic Influences Leading to Habitat Loss and Degradation*

States also listed other kinds of direct human influences as important causes of habitat destruction and degradation. Pollution and sedimentation is a particular problem in aquatic systems. As mentioned above, Wilcove et al. found that, after habitat loss, pollution and sedimentation are the most significant threats to several aquatic species groups. Six states listed pollution and sedimentation of aquatic systems as threats to species of concern.[174]

Five states listed incompatible land use practices such as unsustainable agriculture and forestry as threats to species of concern.[175] Maine and New York list incompatible silvicultural practices explicitly. Both of these states have extensive forestlands where logging occurs. Three states mention direct contact between humans and wildlife as a phenomenon that decreases habitat quality.[176] Other threats mentioned by at least one state include outdoor recreation, dams and impoundments, and disruption of natural fire regimes.[177]

### *Invasive Species*

Previous studies have found that competition with invasive species poses the most significant threat to imperiled terrestrial species after habitat loss from anthropogenic activities.[178] Invasive species are also a threat in aquatic systems in the Northeast. Competitive exclusion of native

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[172] US Census Bureau, "Geographic Comparison Tables, 2000," http://factfinder.census.gov/servlet/GCTTable?_bm=y&-context=gct&-ds_name=DEC_2000_SF1_U&-mt_name=DEC_2000_SF1_U_GCTP1_RE1&-CONTEXT=gct&-tree_id=4001&-geo_id=02000US1&-format=RE-1&-_lang=en.
accessed 2/27/08.

[173] MDIFW, p. 242-246; NYDEC, p. 57-56; CTDEP, p. 3-4; NJDEP, p. 17; RIDEM, p. 77-86; NHFG, p. 42; VFW, p. C:1; PGC and PGBC, p. 11-3; MDFW, p. 11.

[174] MDIFW, p. 242-246; NYDEC, p. 57-5; NHFG, p. 42; VFW, p. C:1; PGC and PGBC, p. 11-3; MDFW, p. 11.

[175] NYDEC, p. 57-56; MDIFW, p. 242-246; NJDEP, p. 17; MDFW, p. 11; NHFG, p. 42.

[176] NYDEC, p. 57-56; MDIFW, p. 242-246; NHFG, p. 42.

[177] NJDEP, p. 17; MDFW, p. 11.

[178] Wilson, p. 244; Flather and Joyce, p. 365-376; Wilcove, et. al., p. 607-615.

species by invasive exotic species was mentioned explicitly by all plans.[179] This is the only threat besides habitat loss and fragmentation that was mentioned across all states. The problem is pervasive and is certainly not unique to the Northeast, although the region has characteristics that make it particularly vulnerable to invasion. Many invasive plant species thrive in disturbed habitats. Land cleared for residential, commercial, and infrastructure development in the Northeast often affords invasive plants a foothold from which they can colonize more pristine areas.[180] Given the amount of new development occurring in the northeast, this is a common problem.

The aquatic habitats of the Northeast are also vulnerable to invasive species. The zebra mussel (Dreissena polymorpha) has spread rapidly across parts of the region, generally transported from watershed to watershed on trailered boats.[181] More recently a new invasive aquatic species, the algae didymo (Didymosphenia geminata), also known as "rock snot", has been found in streams in New York and Vermont.[182] According to a representative of the New York wildlife agency, "There's constantly the next invasive coming along."[183] The growing number of invasive species suggests that this threat will become more significant in the future.

### *Climate Change*

Climate change was mentioned as a threat by six states.[184] The states that mentioned climate change generally noted that the scale of this threat necessitates regional and global, rather than state level, approaches. One contributor to the New Hampshire plan cautioned against placing too much emphasis on climate change mitigation and adaptation strategies. "The biggest threat we face" he argued, "is the … paving of New Hampshire, and that's going to happen far faster than climate change. To the extent that climate change will have an effect on things, the more we pave, the less room there is for things to adapt to climate change." [185] A representative of the New York wildlife agency agreed that the problem is huge, but recognized that it needs to be addressed on multiple scales, including the state level: "We have to address the species we think are the most vulnerable to climate change: boreal species, high altitude species. Cold water fisheries, trout, lobster, winter flounder are very temperature sensitive and are at the edge of their natural range. So we're trying to devise strategies for resilience."[186]

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[179] NYDEC, p. 57; CTDEP, p. 3-4; NJDEP, p. 17; NHFG, p. 4-5; RIDEM, p. 77-86; VFW, p. C:1; PGC and PGBC, p. 11-3; MDIFW, p. 5, 242-246; MDFW, p. 11.

[180] Ann K. Sakai, Fred W. Allendorf, Jodie S. Holt, David M. Lodge, Jane Molofsky, Kimberly A. With, Syndallas Baughman, Robert J. Cabin, Joel E. Cohen, Norman C. Ellstrand, David E. McCauley, Pamela O'Neil, Ingrid M. Parker, John N. Thompson, and Stephen G. Weller, "The Population Biology of Invasive Species," *Annual Review of Ecology and Systematics*, 32 (2001): 305-332.

[181] A. J. Benson, "Zebra mussel sightings distribution", 2008, http://nas.er.usgs.gov/taxgroup/mollusks/zebramussel/zebramusseldistribution.htm.

[182] New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, October 9, 2007, Ann Arbor, MI; Vermont Fish and Wildlife representative,telephone interview with Nicole Lewis, November 8, 2007, Ann Arbor, MI.

[183] New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, October 9, 2007, Ann Arbor, MI.

[184] MDIFW, p. 242-246; NYDEC, p. 57-5; NHFG, p. 42; VFW, p. C:1; RIDEM, p. 77-86; NJDEP, p. 17.

[185] New Hampshire Conservation NGO representative, telephone interview with Michelle Aldridge, October 10, 2007, Ann Arbor, MI.

[186] New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, October 9, 2007, Ann Arbor, MI.

*Lack of Resources*

Lack of financial, organizational, or informational resources to perform conservation work was mentioned by all of the states in some manner, either in the plan itself or in conversations with state representatives.[187] The inability to hire or allocate staff to work on protecting SGCN or to acquire properties important to those species certainly has an impact on their conservation. In reference to building capacity with local municipalities, a representative of the Rhode Island Agency told us: "We believe the best way to integrate with municipalities is to physically build relationships and actively participate in either local planning processes, or at least to provide technical assistance for local planning/wildlife needs. Without additional staff, I see no way to do this."[188]

Rhode Island and Vermont explicitly mentioned lack of resources in their plans. Rhode Island listed the organizational limitations of management agencies, including lack of strategies and information for comprehensive planning, as a threat to SGCN.[189] Vermont mentioned information gaps as a threat to species and habitats of concern.[190] A representative of the New York wildlife agency agreed that information gaps presented a problem, hindering the agency's ability to target particular areas for conservation.[191]

## Identifying Threats

States obtained their threat data through a variety of different methods, including in-house experts, external experts from non-governmental organizations and academia, existing local and regional conservation plans, and state natural heritage programs. At least one state, Connecticut, conducted its first formal statewide threat analysis for creation of its plan, compiling information from over one hundred existing local and regional conservation programs and plans developed by state agencies and stakeholder organizations.[192]

New Hampshire used the novel method of threat evaluation to understand the root causes of particular threats rather than just address the symptoms.[193] By focusing on the underlying series of events that creates threats, rather than the symptoms or results of the threats themselves, experts aimed to undermine the "exposure pathways" that bring threats to fruition. New Hampshire asserts that this focus can be a more effective and less expensive way to manage threats.

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[187] Connecticut Department of Environmental Protection representative, telephone interview with Christopher Theriot, October 22, 2007, Ann Arbor, MI.; Maine Department of Inland Fisheries and Wildlife representative, telephone interview with Lauren Pidot, April 11, 2007, Ann Arbor, MI.; Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.; New Jersey Division of Fish & Wildlife representative, telephone interview with Sarah Levy, September 19, 2007, Ann Arbor, MI.; New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.; New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, October 9, 2007, Ann Arbor, MI; RIDEM, p. 77-86; VFW, p. C:1; Pennsylvania Game Commission and Pennsylvania Game and Boat Commission representatives, telephone interview with Ashley Lowe, October 1, 2007, Ann Arbor, MI.

[188] Rhode Island Department of Environmental Management Division of Fish and Wildlife, telephone interview with Joel Visser, September 27, 2007, Ann Arbor, MI.

[189] RIDEM, p. 77-86.

[190] VFW, p. C:1.

[191] New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, September 12, 2007, Ann Arbor, MI.

[192] CTDEP, p. 3-4.

[193]NHFG, p. 4-2.

## Prioritizing Threats

States did not prioritize threats at the state level, but three states did so at smaller scales. In New York, threats were listed in broad categories at the state level, but were linked to SGCN at the watershed level and ranked on the basis of how many species a particular threat affected in the watershed.[194] In Connecticut, threats to species in each of twelve designated key habitats were prioritized by agency staff on the basis of their potential to harm populations of SGCN in a particular habitat.[195] In New Jersey, threats were broken down by conservation zone and ranked according to the magnitude of their threat to species that inhabit a particular zone.[196] Other states identified lists of general threat categories of concern at the state level, but did not prioritize these threats at any sub-state level.[197] For all states, the unwillingness to prioritize threats at the state level could be due to a desire to be comprehensive in the inclusion of state-wide threats.

# *Conservation Action*

The ability of the plans to help translate knowledge and resources into organized action is in many ways defined by the conservation strategies they propose. The following section provides an overview of each state plan's conservation strategies, describing how states organizes their discussion of conservation actions and the level of specificity provided in the plans.

## Characterizing Conservation Action at the State Level

Every state's plan presents a series of conservation meta-strategies identified as most appropriate to address common threats to wildlife across the state. In Maine, the Department of Inland Fisheries and Wildlife refers to these meta-strategies as "super strategies."[198] In Connecticut, they are referred to as "Conservation Actions."[199] In some cases, these lists represent taxonomies, or ways of categorizing action to communicate the more discrete conservation strategies recommended in response to specific threats to wildlife. In some states, these meta-strategies resemble state-wide conservation goals.

The conservation taxonomies and goals of the Northeastern states reveal strikingly similar conservation needs and approaches to wildlife conservation. Such similarities are appropriate given the similar threats and implementation challenges to which each state must respond.

Both New Jersey and Pennsylvania provide short lists of conservation strategies that broadly define the nature of activities they recommend or plan to implement. Both states' lists summarize an ambitious range of conservation action. As an example, New Jersey's recommended conservation actions are as follows:

- Full recovery of rare species populations through habitat restoration, land acquisition, and landowner incentives,
- Public education and outreach programs regarding wildlife, critical habitats, and the deleterious effects of invasive species and other threats,

[194] NYDEC, p. 90.
[195] CTDEP, p. 3-4.
[196] NJDEP, p. 61.
[197] MDIFW, p. 242-246; RIDEM, p. 77-86; NHFG, p. 42; VFW, p. C:1; PGC and PGBC, p. 11-3; MDFW, p. 11.
[198] MDIFW, p. 6-2.
[199] CTDEP, p.4-3.

- Development of effective conservation partnerships among organizations representing diverse interests in wildlife conservation,
- Continued research and monitoring of SGCN to inform biological databases and NJ's Landscape critical habitat mapping, and direct local and statewide conservation efforts.[200]

To compare, Pennsylvania's plan presents the following five goals:

- Improve the scientific basis for making conservation decisions for wildlife, with special emphasis on species of greatest concern,
- Plan, prioritize, and implement actions that will conserve the state's diversity of wildlife and its habitat,
- Develop a knowledgeable citizenry that supports and participates in wildlife conservation,
- Ensure that the necessary resources are available to conserve Pennsylvania's wildlife,
- Expand and improve coordination of the public agencies and other partners in wildlife conservation planning and implementation.[201]

Both New Jersey and Pennsylvania stress as pillars of their state strategies continued SGCN research and monitoring, the development and expansion of conservation partnerships, and improved public education and opportunities for citizen participation in conservation. Unlike New Jersey, Pennsylvania lists its conservation goals in order of priority and provides succinct strategic and operational objectives necessary to reach each goal, which can be found in Chapter nine of Pennsylvania's plan.

Five of the nine Northeast states present a taxonomy of statewide strategies to organize the plan's discussion of conservation actions, including existing state conservation programs. These states include Maine, Massachusetts, New Hampshire, New York, and Vermont. As an example, Massachusetts' plan presents the following seven strategies which, "taken as a whole … provide the overarching framework for the conservation, management and restoration of the species in greatest need of conservation":

- Proactive habitat protection,
- Collection of biological information,
- Conservation planning,
- Environmental regulation,
- Habitat restoration and management,
- Coordination and partnerships,
- Conservation/environmental education.[202]

Similarly, Maine's plan identifies five main program components, or "super strategies." These strategies represent major categories of need "based on the hundreds of potential conservation actions and opportunities."[203] Vermont is the only state that chose to adopt a classification of conservation actions developed by an outside conservation group as a means of standardizing their plan's discussion of state-wide strategies. Vermont used a slight variation of

[200] NJDFW, p. 13.
[201] PGC and PGBC, p. 9-1.
[202] MDFW, p. 132.
[203] MDIFW, p. 6-2.

the World Conservation Partnership's Proposed Taxonomy of Conservation Actions, developed by Salafsky (2005) and adopted by the World Conservation Union (IUCN).[204] New Hampshire's conservation objectives are clearly and hierarchically organized into eight strategy categories that are meant to be mutually exclusive. Chapter 5 of New Hampshire' plan provides a summary description of each strategy and the conservation objectives underlying them.[205]

In contrast to this use of taxonomic organization, Connecticut and Rhode Island provided lists of their high priority statewide actions. Connecticut's plan presents a list of thirteen conservation actions, while Rhode Island's includes nineteen overarching statewide conservation actions. These actions address threats to SCGN and key habitats across the states and vary greatly in scale and specificity. For example, Rhode Island's actions range from "augment [the] ability of the [Rhode Island wildlife agency] to implement the [plan]" to "Geo-reference existing taxonomic data sets and create new GIS coverages on the status, location, and distribution of GCN species."[206] Some of the more specific strategies identified in Connecticut's plan include continuing participation in regional efforts to protect key species; developing statewide guidelines to minimize impacts of development on species of greatest conservation need; and mapping key habitats at the landscape level.[207] While different from the lists of summary strategies and the conservation taxonomies presented in other plans, these sets of broad strategies clearly communicate the states' highest priority conservation needs.

For a complete list of each plan's statewide strategies or action taxonomies, including overarching state conservation priorities, see Appendix 1.

## Conservation at Multiple Scales

Most conservation work proposed in the plans will support protection of wildlife at the habitat level, rather than target protection of individual species. Plans differ, however, with respect to how thoroughly they addressed the need for action at different scales. With the exception of New York's plan, which identifies actions at the watershed level, all state plans directly associate conservation actions with habitats. Six of the nine plans also consistently identify conservation actions appropriate for the management or protection of individual species.[208] In choosing not to propose specific conservation actions to protect each of its individual species of greatest conservation need, Massachusetts, Pennsylvania, and Rhode Island stray from this pattern.

Pennsylvania, Rhode Island, Vermont, and New Hampshire provide examples of states whose plans explicitly discuss the need for conservation at multiple scales and provide guidance for implementation of such a strategy. Pennsylvania's plan emphasizes a multi-species, multi-level approach to strategy implementation. The plan defines comprehensive planning for wildlife as a process that identifies or creates conservation opportunities at multiple levels while focusing action at the habitat level:

> "… partners are encouraged to identify common issues or habitats among suites of high-priority species. This enables a more practical approach for implementing conservation actions at the habitat level, which will simultaneously benefit many species. For this reason, the [plan] strategies and priorities are presented at the

[204] VFW, p. 4:11.
[205] Maine, Connecticut, New York, New Jersey, New Hampshire, Vermont, and Rhode Island.
[206] RIDEM, p. 102.
[207] CTDEP, p. 4-1.
[208] CTDEP Ch. 4, Appendix 1d; NJDFW Ch. V1; NHFG Appendix A; NYDEP Appendix A; MDIFW Ch 5-6; VFW Appendix A

> species, habitat, and species suite levels so that the diverse stakeholders of the [plan] can find meaningful recommendations regardless of their scale and scope of interest."[209]

Pennsylvania's plan recommends targeted actions to protect both suites of species associated with its eleven broad habitat categories and individual SGCN.

Rhode Island's plan also recommends conservation action at multiple scales. This plan discusses statewide actions of highest priority to address state-wide, overarching threats to wildlife, actions appropriate to address threats to each of sixty-four listed habitat types and their associated suites of species, and species-specific actions.[210] Similarly, Vermont's plan proposes action at five levels: the species level, the taxonomic level, the habitat level, the landscape level, and the regional level.[211]

Recommended actions in the New Hampshire plan were also targeted at varying scales and levels of detail. In addition to recommending actions for specific species and habitats, this plan presents strategies to address regional air and water quality, local land and water conservation, statewide biodiversity stewardship, and conservation science and informatFion management.[212] Organization of strategies under these focus areas constitutes an attempt to simplify the action plan and to define clear conservation goals for the state.[213] At the time of the plan's publication, the New Hampshire wildlife agency had not identified lead agencies or partners to drive action related to each.[214]

Appendix II provides a comparative look at the scales at which each state proposes action.

## Key Conservation Strategies

A review of the nine statewide strategies and the thousands of detailed actions proposed in the plans reveals some clear trends. Habitat protection, surveying and assessment, conservation education, and continued conservation planning are the most commonly recommended conservation strategies among the Northeast states. Addressing inadequate knowledge of species biology and habitat requirements, as well as of the geographic distribution of species and habitats, figures prominently in the region's conservation needs.

New York's discussion of actions in the Upper Hudson watershed clearly expresses this reality: "Before other conservation actions can be taken to combat the harmful effects of habitat loss and fragmentation, data need to be collected on specific habitat requirements of SGCN, population processes, and how, when, and where habitat management and/or restoration should occur."[215] New Jersey and Connecticut provide additional illustrations. In New Jersey's assessment of its Atlantic Coastal ecoregion, 'planning', 'surveying', 'monitoring', 'mapping', 'investigating', and 'assessing' comprise much of the language describing needed conservation action.[216] The conservation actions described for this region are representative of conservation needs for New Jersey as a whole.

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[209] PGC and PGBC, p. 5-4.
[210] RIDEM, p. 99.
[211] VFWD, p. 4:35.
[212] NHFG, p. 5-3.
[213] NHFG, p. xv.
[214] NHFG, p. 7-3.
[215] NYDEC, p. 523.
[216] NJDFW, p. 75.

Connecticut's list of statewide conservation actions provides further evidence of the common need for more information—specifically regarding species needs and habitat distribution.. The first statewide action listed in this plan is to "determine the distribution, abundance, condition and limiting factors (threats) for all [SGCN] and key habitats." [217] Connecticut's list of conservation priorities also highlights the need to improve data collection and data-management systems to track the status of species and key habitats.[218]

While nearly all states recommend conservation actions to protect particular habitat types, few plans make these actions geographically specific. Only Massachusetts, New Jersey, and Vermont propose action to protect geographically defined natural communities. Among these states, only New Jersey's plan proposes conservation actions based on detailed spatial analysis of the entire state. New Jersey's plan identifies the need for investments in conservation to support wildlife in geographically defined conservation zones, reflecting the greater spatial specificity of New Jersey's plan relative to others. At the same time, conservation goals and actions vary only slightly between conservation zones identified in the plan. Thus, these conservation actions effectively relate to the broader ecoregions.[219]

The Massachusetts and Vermont plans use habitat classifications that highlight specific ecological systems in need of protection. The Massachusetts plan identifies the Connecticut River and Merrimack River main stems among its six large-scale SGCN habitats.[220] Similarly, Vermont's eighteen community and cultural habitat groups include Lake Champlain, Lake Champlain tributaries, and the Lower Connecticut River.[221] Unlike Massachusetts' habitat categorization, which defines the Connecticut and Merrimack rivers as one general habitat type, Vermont considers these three systems individually. Proposed conservation actions to protect the Connecticut River in Massachusetts include expanding water quality assessment techniques, increasing monitoring of fecal coliform bacteria, and reviewing the effects of dams on water quality and aquatic life.[222] Priority conservation strategies for the Lower Connecticut in Vermont include monitoring, protecting, and restoring riparian and in-stream habitats affected by development; monitoring the river and its tributaries for invasive species; and providing technical outreach and financial assistance to private landowners, towns, and other partners to increase their awareness of threats to SGCN.[223]

While New York's plan is organized by watershed, in theory denoting a degree of spatial specificity, these watersheds encompass a wide diversity of habitat types. Furthermore, New York's watershed-based strategies are not yet developed to the point of providing useful recommendations to guide conservation activity in determined areas of the state.

Most Northeast plans articulate, or at least allude to, the connection between proposed conservation actions and the threats they seek to combat. In some cases, such as in Maine and New York's plans, discussion of conservation actions clearly illustrates the threats to which they respond without systematically linking actions to threats. However, five of the Northeast states do not systematically link actions with the threats they are designed to address.[224] In the case of

[217] CTDEP, p. 4-3.
[218] Ibid.
[219] This conclusion is based on an analysis of the Atlantic Coastal ecoregion and its designated conservation zones.
[220] MDFW, p. 131.
[221] VFWD, Appendix B.
[222] MDFW, p. 197, 211.
[223] VFWD, p. B: 60-61.
[224] Connecticut, Pennsylvania, New York, Vermont, and Rhode Island.

Pennsylvania, this has resulted in a disconnect between the threats of most immediate concern and the actions designated as high priorities for plan implementation..[225]

New Hampshire and Rhode Island are two of four states that explicitly draw the connection between threats and actions. New Hampshire's habitat profiles list the direct threats addressed by each recommended conservation action.[226] Doing so links each profile's detailed discussion of proposed actions with the species and habitat threat assessments that precedes it, helping to provide a useful reference for conservationists. Rhode Island's plan clearly illustrates the connection between observed threats and proposed conservation actions at the state-wide, taxa, and habitat levels.[227]

Despite the acknowledgement by many states that partnership and collaboration is critical to the successful implementation of conservation actions, six of the nine states under study do not consistently identify potential lead or partner agencies responsible for implementing specific actions. Only New Hampshire, Vermont, and Pennsylvania identify lead agencies or potential partners with the mandate or capacity to implement proposed conservation actions.

Similarly, few state conservation strategies adequately address the costs or feasibility of implementing proposed conservation actions.[228] Vermont and New Hampshire acknowledge the significance of such considerations, but do not provide details in their plans. Vermont's plan includes a short list of potential funding sources for each conservation strategy identified for individual species and habitat types, but does not discuss cost or feasibility outright.[229] The New Hampshire plan's species and habitat profiles include brief discussion of the feasibility of proposed conservation actions, but do not discuss potential costs.[230] According to the New Hampshire plan, the feasibility of implementing strategies was taken into account during the plan development process and in continuing planning. This information was not, however, included in the plan.[231]

## Prioritization and Time Frame for Implementation

The majority of plans for the Northeast states apply some degree of prioritization to their assessment of plan actions or strategies.[232] In at least two of the plans, implementation priorities are defined in broad terms. Massachusetts' plan, for example, identifies proactive habitat protection as the state's priority conservation strategy.[233] Similarly, Maine prioritizes its six super strategies and assigns highest priority to habitat conservation and surveys and monitoring for many SGCN.[234]

Maine's plan also identifies the two highest priority conservation super strategies for each SGCN within the primary habitat in which they occur. According to Maine, "[t]his level of

[225] Lowe, Ashley. Pennsylvania state characterization, unpublished.
[226] NHFG, Appendix B.
[227] RIDEM, Chapter 4; RIDEM, Appendix 3.
[228] New Hampshire and Massachusetts are the only states identified to have explicitly addressed cost associated with conservation actions or feasibility of action implementation.
[229] VFW, Appendices A and B.
[230] NHFG, Appendices A and B.
[231] NHFG, p. xiv.
[232] Connecticut, New Hampshire, and New York do not prioritize conservation actions in their wildlife action plans.
[233] MDFW, p. 132.
[234] MDIFW, p. 6-12, Table 39.

organization represents a broader-scale approach to synthesizing needs that will address the most species and threats and yield the highest conservation return."[235]

Other states, such as New Jersey and Vermont, make an effort to prioritize among more discrete actions or conservation approaches, applying their prioritization schemes at different levels. For example, Vermont prioritizes conservation actions for individual species, while New Jersey prioritizes actions for species and habitat within each of its twenty-six conservation zones.[236,237] In both cases, the majority of recommended actions are identified as high priority. Assigning high priority to multiple conservation actions may provide useful guidance to organizations with a narrow, strategic focus. This approach, however, may not facilitate efficient conservation either at the state level or in the context of limited resources.

In some cases, state prioritization of conservation strategies is implicit rather than explicit. By prioritizing certain threats over others, Rhode Island's plan implies the need to implement strategies identified to address those threats.[238] Thus, actions are implicitly prioritized based on their association with specific, ranked conservation challenges.

Few states provide a time frame for implementation of conservation actions. Maine's process for developing species conservation plans, upon which their plan is partially based, is designed according to a 15-year implementation time frame.[239] In Pennsylvania, prioritized actions are scheduled for implementation within five to ten years from adoption of the plan, and all high priority actions are set for implementation within five years.[240] States such as New Hampshire developed a time frame for implementation after the plan was published.[241]

## *Spatial Data and Geographic Information Systems*

Congress required all plans to identify and describe SGCN habitat requirements, threats, research needs, and conservation actions. States in the Northeast met these directives spatially, non-spatially, or through a mix of organizational methods. This section will outline and assess the different approaches of the use of Geographic Information Systems (GIS) in meeting these requirements.

Plan GIS were assessed according to five criteria:

- *How well-developed is the GIS?* This criterion includes considerations such as scale, complexity, attention to detail, and comprehensiveness.
- *How integrated is the GIS into the plan?* While many states make use of spatial data, some states chose not to incorporate this data into the plan itself. This lack of integration disconnects plan species, threats, and actions from their respective spatial locations, weakening the overall effectiveness of both the plan and the GIS.
- *How dynamic is the system?* This includes pace and scope of updates and addition of new or changing information.

[235] MDIFW, p. 6-3.
[236] VFWD, Appendix A.
[237] NJDFW, Section VI: Landscape Assessments and Conservation Strategies.
[238] DIDEM, p. 84.
[239] Lauren Pidot, Maine State Characterization. Unpublished.
[240] PGC and PGBC, p. 10-1.
[241] NHFG, Chapter 7.

- *How accessible is the system?* Do stakeholders have access to data? How easy is the system to use?
- *What kind of reaction has the GIS generated from stakeholders?*

These five criteria were used as guides in holistically evaluating plan's GIS. After evaluation, plans were assigned one of three statuses: exemplar, developing, or GIS not used. It should be noted that because many states are in the process of updating or changing their systems, this assessment should be considered a brief "picture in time" of the current state of GIS in the Northeastern region.

## Exemplar Plans

The New Jersey and New Hampshire plans were both given the "exemplar" status. In addition to having the most well-developed GIS embedded in their plans, the programs are continually evolving, have received praise from stakeholders, and are accessible to the public. Perhaps most importantly, the strength of their geographic information systems has made New Jersey's and New Hampshire's plans relevant and useable in the eyes of state conservation communities.

The GIS component of the New Jersey plan is called the New Jersey Landscape Project (see Figure 1), which the New Jersey Department of Environmental Protection (DEP) developed in 1994 to create a "landscape level approach to imperiled species conservation.[243] The purpose of the Landscape Project is to provide its users with scientific information that can be integrated with planning and land management programs at multiple scales in government, as well as for non-governmental organizations and private landowners.[244]

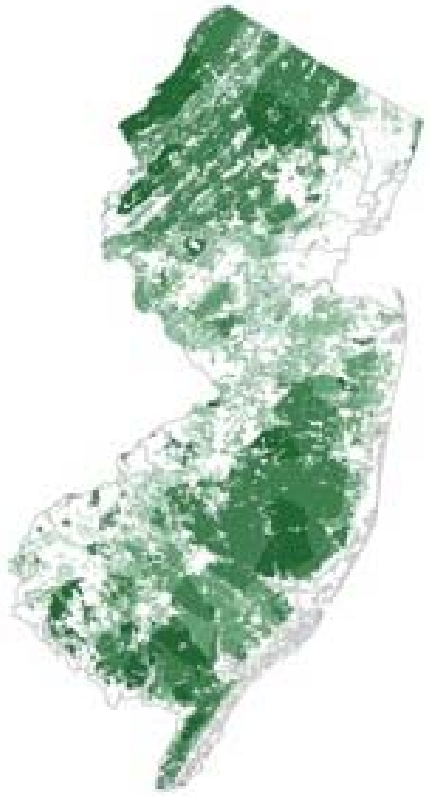

**Figure 1:** The New Jersey Landscape Project is a landscape level approach to imperiled species conservation. Above is an image of the New Jersey forests habitat.[242]

According to a representative of the New Jersey agency, the driving force behind the creation of the Landscape Project was the preexisting regulatory protection for endangered and threatened species dictated in the Endangered Species Act.[245] Because the protection of these species often caused complications in state planning, the Endangered Species Program (ENSP) created the Landscape Project to offer pro-active information on where potential conflicts with species habitat may occur. The project also serves a secondary purpose of making information on

[242] New Jersey Division of Fish and Wildlife, "New Jersey Landscape Project: Download Landscape Project Data (v.2), Forest Metadata," http://www.nj.gov/dep/fgw/ensp/landscape (accessed March 3, 2008).
[243] NJDFW, Attachment A.
[244] Ibid.
[245] New Jersey Division of Fish & Wildlife representative, telephone interview with Sarah Levy, May 11, 2007, Ann Arbor, MI.

the characteristics of threatened and endangered species available to the public without putting the species in danger of public collection.[246] In addition to being the basis of the plan and the regulatory standard for all New Jersey Department of Environmental Protection permits, the Landscape Project is used by the New Jersey Office of Smart Growth, municipal and county planners, environmental commissions, non-governmental conservation organizations, the New Jersey Pinelands Commission, and the New Jersey Highlands Council for regulatory and planning efforts.[247]

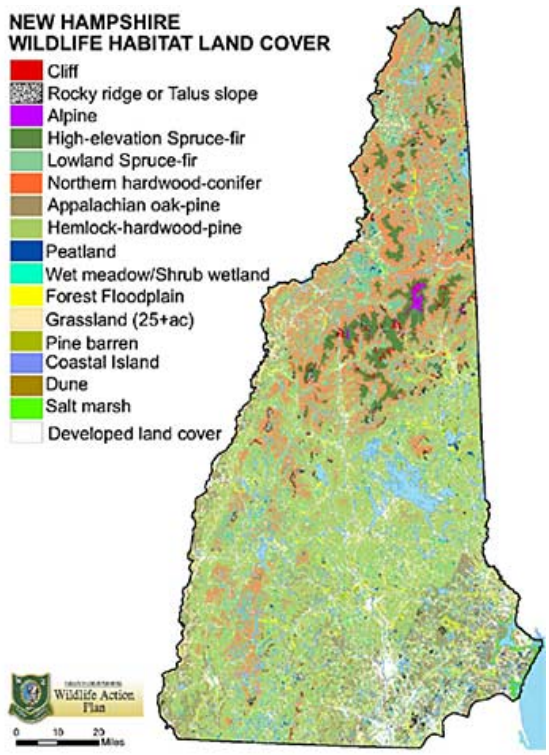


**Figure 2:** New Hampshire created detailed habitat profile mapping after the plan was formally release. Above is the New Hampshire Wildlife Habitat Land Cover Map.[248]

Though the Landscape Project is used by multiple agencies, its use as the foundation for New Jersey's plan creates the potential for further collaboration with participating agencies and NGO's. As a result, the plan is highly spatial and well-integrated, and it possesses a detailed orientation to spatial and ecological nuances otherwise unlikely without the existence of the Landscape Project. The Landscape Project also appears to be one of the most valuable aspects of the plan for stakeholders. A representative from a large New Jersey conservation NGO, said that the Landscape Project possesses "the best data far and away of just about everyone around."[249]

In contrast, New Hampshire's GIS tools were significantly enhanced during the creation of its plan and were formally released in October 2006 (see Figure 2). Because some of the data on the quantity and distribution of habitats was incomplete, New Hampshire Fish and Game (NHFG)—with the help of The Nature Conservancy and The Society for Protection of NH Forests—created both detailed habitat profiles and a few species location maps through multiple methods. It is important to note that these basic habitat location maps were not available for public distribution prior to the plan publication. Habitat locations were analyzed for known risk factors, and threats and patterns of biodiversity were compared across scales for prioritization of species of greatest conservation need. Habitat types were prioritized based on where biological and landscape impacts are highest and human impacts are lowest, thereby isolating and identifying

[246] The Landscape Project accomplishes this by including a "species lookup table" that accompanies each habitat shapefile. For more information on species location, see the NJDFW, Attachment A.
[247] New Jersey Division of Fish & Wildlife representative, telephone interview with Sarah Levy, May 11, 2007, Ann Arbor, MI.
[248] New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, April 16, 2007, Ann Arbor, MI.
[249] New Jersey Conservation NGO representative, telephone interview with Sarah Levy, September 27, 2007, Ann Arbor, MI.

habitats that are most likely to maintain biological integrity over time. This prioritization scheme places greater map emphasis on preserving relatively untouched landscapes, such as contiguous forest tracts, as opposed to areas under greater development pressures but with fewer natural resources.[250]

New Hampshire NGOs and municipalities frequently utilize the GIS component of the plan. A representative from a conservation NGO suggested that the GIS component is potentially the most useful part of the plan. According to this representative: "The plan itself, the written plan of 1400 pages is too much for anybody to really wrap their mind around. But we use GIS constantly here in our planning work and our land conservation work. When the data became available, we were very pleased that it was essential information, particularly the habitat conditioning model."[251] The representative specifically discussed the usefulness of the mapped habitat features and statewide condition-and-habitat ranking to his organization.[252]

## Developing Plans

The plans in Maine, Rhode Island, and Massachusetts also include GIS. In these states, however, the systems are either still in development or not fully integrated into the plans.

One pillar of Maine's plan is its Beginning with Habitat program, which has provided detailed GIS maps and other planning materials to local governments for nearly a decade. This program includes the identification and mapping of spatially specified species-at-risk habitat areas, which are designated based on a variety of criteria, including the locations of rare flora and fauna, significant wildlife habitat, and the overlap of these features with large blocks of undeveloped land. Beyond a description of this program and the inclusion of a small map of focus areas, Maine's plan did not use spatially specific habitat areas or actions for prioritization but organized its SGCN into generic primary and secondary habitats (such as coastal wetlands).[253] While Beginning with Habitat was previously restricted to Southern Maine, coordinators are working on extending focus-area identification and mapping to Northern Maine, where land is primarily owned by a relatively small number of large landowners, including timber companies. Maine hopes to have a statewide map of focus areas in place by the end of 2007.[254]

The lack of spatial specificity in Maine's plan has proven to be a point of frustration for participating stakeholders. A representative from a large Maine NGO said, "What we have are long tables and lists of species and generic habitats and geographic regions of the state, which … don't have the same power as, I think, a map would have.… I imagine, though I haven't actually been to these states, that [the maps are] galvanizing and lead to more cooperation, better synergy, and therefore more effective use of everyone's money."[255]

In comparison to Maine, which already had a GIS program in existence before the plan was developed, Rhode Island created a GIS component with help from The Nature Conservancy and Doris Duke Conservation Fund grant money for the plan. A representative at a large Rhode Island NGO said the maps were "good" but that Rhode Island still needed to create focus areas,

[250] New Hampshire Conservation NGO representative, telephone interview with Michelle Aldridge, October 10, 2007, Ann Arbor, MI.
[251] Ibid.
[252] Ibid.
[253] MDFW, Chapter 4 and Appendices 5, 6, 7, 8, 9.
[254] Maine Department of Inland Fisheries and Wildlife representative, telephone interview with Lauren Pidot, April 11, 2007, Ann Arbor, MI.
[255] Maine Conservation NGO representative, telephone interview with Lauren Pidot, April 19, 2007, Ann Arbor, MI.

boundaries, and a better overall analysis of ecological areas.[256] According to a Rhode Island agency representative, creating the maps proved "an exercise, because it was required of the plan.… We just overlaid a bunch of stuff and came up with some mumbo-jumbo about priority areas, because the plan wanted that in there."[257] This individual acknowledges that the state will need to develop new GIS products because existing coverages are not sufficient.[258]

## GIS Not Used

New York, Pennsylvania, Vermont, and Connecticut either do not have GIS projects related to their plan or projects with minimal output. Representatives of Pennsylvania's state agencies say that they decided not to create maps or priority conservation areas in part because of the difficulty in distinguishing one priority area from another. In a recent interview, representatives said, "You could almost cover the entire state with priority areas, depending on which species you include."[259] Instead, Pennsylvania identifies a new priority habitat every year and calls for projects in and around those sites. The priority habitat for 2006, for example, was "Wet Thickets." Pennsylvania relies on the mapping expertise of partners like the Nature Conservancy for spatial data.[260]

In New York, the state plan was divided into eleven Huc-4 level watersheds.[261] These watersheds are intended to capture the ecological variation in New York State, and they are used to organize species and delineate threats and conservation actions. However, there are a few major GIS-related drawbacks with New York's current organizational method. First, New York is the only state in the Northeast region that chose to use watersheds. This makes working with other state SWAP GIS projects nearly impossible because the habitat-and-species classification is so different. One person who participated in plan development called the idea to organize the plan by watershed "harebrained" and said that it "didn't make sense biologically, climactically, demographically, or from an implementation standpoint."[262] At one point, the former coordinator of New York's Natural Heritage Program attempted to incorporate data from the NHP program into the plan, which would have enhanced the usability and overall strength of the plan by augmenting its spatial dataset.

## Discussion

Challenges to developing Geographic Information Systems can be clustered into three general areas. The first is the difficulty in spatially defining priority species and habitats, as described by agency representatives from Pennsylvania in the above section. In part, this struggle stems from the desire to characterize the entire state as a priority habitat, particularly in smaller states. A Massachusetts agency representative said, "We have such a small state that [all areas are]

[256] Rhode Island Conservation NGO representative, telephone interview with Joel Visser, October 23, 2007, Ann Arbor, MI.
[257] Rhode Island Department of Environmental Management Division of Fish and Wildlife representative, telephone interview with Joel Visser, September 27, 2007, Ann Arbor, MI.
[258] Ibid.
[259] Pennsylvania Game Commission and Pennsylvania Game and Boat Commission representatives, telephone interview with Ashley Lowe, October 1, 2007, Ann Arbor, MI.
[260] Ibid.
[261] The Huc-4 watershed level represents the "subregional" level of the United States Geological Survey's 4-digit Hydrologic Units boundaries. For more information, visit http://water.usgs.gov/GIS/huc.html.
[262] New York Conservation NGO representative, telephone interview with Michael Jastremski, October 10, 2007, Ann Arbor, MI.

important to someone, to some set of species somewhere. And that's my way of telling you that we don't have a list of priorities."[263] The individual continued to say that Massachusetts stresses conservation of biological diversity as a goal as opposed to management of individual species and habitats.[264] New Jersey, on the other hand, prioritized species and habitats while facing many of the same challenges—high density, pervasive urban expansion, and inadequate funding for conservation—as Massachusetts. New Jersey prioritized by mapping habitat at a 1m x 1m scale, hand-digitizing all species locations, and consulting local NGO's and scientific experts. Massachusetts is currently working on a similar project.[265]

Prioritization is also inhibited by the difficulty in narrowing focus areas, due to both a desire to retain flexibility and a fear of excluding potential partners. An agency representative said of Rhode Island's plan:

> "We have not defined focal areas to this point. I don't know that there's any reason to do that. I mean, in some ways I don't want to formalize drawing rings around areas. You know part of my approach in writing the plan was to put enough stuff in there that we have enough flexibility to do anything that was important as the need came up, so in one way that is why we did not prioritize. And realistically, in terms of expenditures and funding, we're only going to be able to spend State Wildlife Grant funding with people who have match[ing funds]. So there's almost no point in prioritizing right now because our ability to do something is going to be dictated by circumstances that are not biological. So that's why it was very soft, I mean, a laundry list, but no prioritization. That was done intentionally."[266]

This "laundry list" comment was repeated often in interviews with both coordinators and stakeholders in the Northeast. Stakeholders seemed to both appreciate and resent the lack of prioritization—saying that it made implementation more difficult—while coordinators seemed to believe that creating an all-encompassing plan would improve conservation in their state.[267] Though New Jersey may have had a strong GIS component, the plan follows this same "laundry list" strategy.

Another oft-cited barrier to developing GIS projects is the strength of property rights groups. In Maine, the northern two-thirds of the state is predominantly owned by large land holders, particularly timber companies. Companies or individuals owning large portions of land fear that mapping efforts might result in seizures of private property, exposure of their land use practices, or simply invasion of privacy. Spatially specific priority maps, therefore, fall under a high level of suspicion, though focus areas are currently being identified and mapped for this

[263] Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.
[264] Biomaps and Living Waters, the geographic databases associated with the Massachusetts plan, do prioritize by "core habitat" and "supporting habitat." However, the Massachusetts plan itself does not have a list of priorities.
[265] Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.
[266] Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.
[267] New Jersey Division of Fish & Wildlife representative, telephone interview with Sarah Levy, September 19, 2007, Ann Arbor, MI.; New Jersey Conservation NGO representative, telephone interview with Sarah Levy, September 24, 2007, Ann Arbor, MI.

region. A Maine NGO representative described the reasons it has taken Maine nearly a decade to expand this program to the northern reaches of the state,

> "[I]t's such a different landscape, different ownership, different land use, different pressures and threats.… In the southern part of the state you can have a generic blob that may cover parts of three towns and say this is an important area [and]… it's not threatening. But you put the same size blob in northern Maine and it may end up being all in one forest company's ownership. So it's a very different thing. That's very threatening."[268]

Property-rights concerns were also mentioned by people associated with the plans in New York and Vermont. One stakeholder in Vermont said that the plan development process was extremely productive until the discussion moved to the development of spatial data. This individual claimed that the more conservative elements of state government and wildlife stakeholder groups thought that maps would be inappropriate, thus the conservation and momentum that had built up around plan development subsequently broke down.[269]

A representative of a national NGO said that opposition to mapping because of property rights concerns may be a less significant issue if a more "personal" approach is taken in data gathering. The representative cited an experience working for the Natural Heritage Program in northern Michigan, noting that though the Upper Peninsula constitutes a "stronghold" of property rights activists, "a really high percentage" of property owners gave consent when asked permission to conduct surveys on their land.. The representative said that the property owners almost never placed a restriction on how the data could be used, and were curious about the results of the survey. The representative also said that an active property-rights movement in a state could pose more barriers but that, ultimately, gathering data is about "how it's handled, it's how it's presented, and how you talk about it."[270]

GIS is gaining traction as the preeminent method of identification, analysis, and communication of location and characteristics of species and wildlife habitat, and it may soon be an expected part of the plans. Other states should consider looking to New Hampshire and New Jersey as examples of how spatial data could be incorporated into plans. These states may also serve as a model for the Northeast regional GIS effort currently underway and plans in other geographic regions around the country.

## *Monitoring and Review*

Coordinators in the Northeast assess plan success by monitoring individual elements within the plans, and tracking overall plan success.

### Monitoring Species and Habitats

The first approach relies on monitoring individual species, habitats, and programs within the plans. The monitoring for these programs ranges from specific directives, resembling step-by-

[268] Maine Conservation NGO representative, telephone interview with Lauren Pidot, April 19, 2007, Ann Arbor, MI.
[269] Vermont Conservation NGO representative, telephone interview with Nicole Lewis, October 29, 2007, Ann Arbor, MI.
[270] National Conservation NGO representative, telephone interview with Sarah Levy, October 23, 2007, Ann Arbor, MI.

step instructions, to relatively abstract goals with similarly abstract keys to success. Generally, monitoring actions for states includes the following five items:

- monitoring habitat change over time,
- monitoring abundance, productivity, and trends of species over time,
- monitoring effectiveness of adaptive management techniques,
- monitoring communication with stakeholders, increasing as necessary, and
- monitoring educational efforts.

The states that included broad monitoring strategies lack the rigor of enumerated institutional controls that could provide a more effective structure to assess success. For example, New Jersey outlines monitoring strategies on a state-wide level and for each conservation zone. Statewide monitoring objectives can be as broad as "compar[ing] new survey results to previous surveys to assess trends in abundance, distribution, and habitat use."[271] Monitoring objectives in each conservation section are no more detailed. Monitoring activities in the Maurice River Watershed Conservation Zone direct the New Jersey Department of Environmental Protection to "monitor contaminant levels that might impact bald eagle and osprey populations[,]… employ adaptive management techniques for the goal and conservation actions established for SGCN[, and r]eview effectiveness of research and management and improve techniques as necessary."[272]

New Hampshire and Massachusetts specified their monitoring strategies in greater detail. New Hampshire developed a fairly comprehensive monitoring strategy that includes seven expansive statewide objectives, each listing expected benefits, threats, resources, critical inputs, and necessary "organization".[273] For example, the second objective listed in the plan is to "detect changes in the condition of wildlife and wildlife habitats." The associated benefits of this objective include early detection in habitat condition, preemption of costly intervention, and understanding of habitat distribution and abundance. The "Existing Resources" section lists programs already involved in wildlife and habitat monitoring, including the Society for Protection of New Hampshire Forests, the New Hampshire Department of Environmental Services, and the North American Bird Conservation Initiative. The "organization" section states that species monitored under existing programs ought to be catalogued to determine further monitoring needs.[274] This information provides plans readers with a better understanding of how success will be measured.

While the Massachusetts plan offers very little guidance for measuring statewide performance of conservation actions, the plan provides more specific directions for assessing conservation-action effectiveness for each habitat section.[275] For example, effectiveness of conservation actions in the "Coastal Plain Ponds" region will include measures such as:

- Number of surveys completed for under-surveyed coastal-plain pond animals;
- Number of proposed coastal plain pond alterations reviewed and regulated by DFW each year;
- Number of educational materials produced and disseminated about coastal-plain ponds;

[271] NJDFW, p. 44.
[272] NJDFW, p. 198.
[273] NHFG, p. 6-1.
[274] NHFG, p. 6-8.
[275] MDFW, p. 181.

- Number of research projects completed on coastal-plain pond animal life histories;
- Number of conservation actions modified and adapted, using the results of monitoring.[276]

Note that this monitoring scheme does not quantify the effectiveness of conservation actions, but simply provides a tangible count for evaluating success.

State coordinators offered few insights into the development of monitoring strategies in interviews. Pennsylvania agency representatives did say that achieving monitoring goals was not feasible for a single state because many goals, such as eradication of invasive species, are dependent on multi-state efforts.[277] A multi-state monitoring strategy is currently being developed by the Regional Conservation Needs Program (see Building on the Plans: Regional Collaboration).

## Tracking Success of the Plans

Despite the enumeration of these strategies in the plans, only New Hampshire and Connecticut have implemented the second type of monitoring: tracking plan-based actions and outcomes to assess plan progress. New Hampshire coordinators developed a comprehensive spreadsheet which lists priorities, proposed timelines, and completed projects.[278] Pennsylvania is currently developing a similar excel database to track progress.[279] The New Jersey coordinator intends to develop a formal implementation tracking mechanism serving as an interactive spatial database where users can enter information, learn about other projects, and adapt to other successes and failures.[280]

## Plan Review

States were required by Congress to update their plans at intervals of no more than ten years. A few states in the Northeast have elected to update their plans once every five years, while the rest follow the ten-year federal guideline. Some plans have more complex review procedures with additional opportunities for adjustment.

New Hampshire, for example, has a three-part process. In the first three years, the state plans to develop specific targets to measure the success of plan goals. In years two through ten the state will measure progress of goals and use adaptive management techniques to alter conservation approaches.[281] In 2015, New Hampshire has scheduled a major plan review that will incorporate feedback from members of the public and other stakeholders.[282] Connecticut adopted a slightly different, yet similarly complex process. Connecticut will review performance every year, conduct a more comprehensive review process every two years, perform a five-year

[276] MDFW, p. 336.
[277] Pennsylvania Game Commission and Pennsylvania Game and Boat Commission representatives, telephone interview with Ashley Lowe, October 1, 2007, Ann Arbor, MI.
[278] New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.
[279] Pennsylvania Game Commission and Pennsylvania Game and Boat Commission representatives, telephone interview with Ashley Lowe, October 1, 2007, Ann Arbor, MI.
[280] New Jersey Division of Fish & Wildlife representative, telephone interview with Sarah Levy, September 19, 2007, Ann Arbor, MI.
[281] NHFG, Sections 5 and 6.
[282] Ibid.

review to coincide with the state's mandatory update of its Endangered Species Act, and update the plan every ten years.[283]

# Developments between 2005 - 2007

## *Overview*

The material above offers a description of the content of the plans and the processes by which they were developed. Attention is now turned to the impact and implementation of the plans in the two years after their publication. While more details are offered in later sections, the overview immediately below provides a sense of changes in Northeast wildlife management, challenges facing implementation, and external changes shaping the context in which conservation actions are carried out.

### Transformation of state wildlife management in the Northeast

Only two years after plan submission, a full assessment of the transformative effect of the plans is not possible. The full effect of the plans will not be known for many years to come, but signs of transformation in agency approaches and in external partners can already be seen.

Since the plans were developed, all nine Northeast states have seen a shift in their conservation approach. However, the extent of this shift varied across states. State agencies that saw the most significant change used plan development as a catalyst to cultivate new resources, approaches, or partnerships. States such as Maine, Massachusetts, and New Jersey, with existing habitat-focused statewide conservation management, were less likely to embark on new approaches as result of the plan development process, and they were less likely to attribute changing approaches directly to plan development.[284]

For each Northeast state, the plan serves as the first agency-created, statewide, comprehensive wildlife plan that incorporates game, nongame, terrestrial, wetland, freshwater, marine, listed, and unlisted species and their habitats. In Connecticut, New Hampshire, New York, Pennsylvania, Rhode Island and Vermont, the plan was the first statewide nongame species plan conducted.[285] While, Maine, Massachusetts and New Jersey had habitat-based plans already, existing plans did not cover all the diversity of state species. Maine had never incorporated marine species into planning efforts along with terrestrial, freshwater and wetland

[283] CTDEP, p. 6-1. Connecticut Department of Environmental Protection representative, telephone interview with Christopher Theriot, October 12, 2007, Ann Arbor, MI.

[284] Maine Department of Inland Fisheries and Wildlife, telephone interview with Lauren Pidot, September 27, 2007, Ann Arbor, MI.; Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.; New Jersey Division of Fish & Wildlife representative, telephone interview with Sarah Levy, September 19, 2007, Ann Arbor, MI.

[285] Connecticut Department of Environmental Protection representative, telephone interview with Christopher Theriot, October 22, 2007, Ann Arbor, MI.; New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.; New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, October 9, 2007, Ann Arbor, MI.; Pennsylvania Game Commission and Pennsylvania Game and Boat Commission representatives, telephone interview with Ashley Lowe, October 1, 2007, Ann Arbor, MI.; Rhode Island Department of Environmental Management Division of Fish and Wildlife representative, telephone interview with Joel Visser, September 27, 2007, Ann Arbor, MI.; Vermont Fish and Wildlife representative, telephone interview with Nicole Lewis, November 8, 2007, Ann Arbor, MI.

wildlife. [286] Previous Massachusetts plans were primarily based on endangered species. [287] In New Jersey, existing habitat-based wildlife plans targeted only specific species or species groups.[288] In New Hampshire, an agency representative found that the plan helped push managers to more seriously consider the conservation of species that are not listed as threatened or endangered.[289] Therefore, to some extent, the plans necessarily broadened the scope of wildlife conservation across all Northeast states.

In addition to being comprehensive, the plans were designed to encourage wildlife agencies to manage species by a more habitat focused approach. There is some indication that this shift was realized in states where a habitat focus was not already integrated into the approach. "The action plan has gotten us all on the same page, broadly identifying habitat concerns," said an agency representative in Vermont. [290] The representative added, "Our fish and wildlife department, like many, are kind of at the transition stage from the single-species game management and a broader focus on habitat. The action plan has done a lot to bring us all on the same page of acknowledging that habitat is key."[291]

In Connecticut, New York, Pennsylvania, and Vermont, New Hampshire, plan development, beyond expanding the scope of state wildlife conservation, stimulated the cultivation of new resources, partnerships, and approaches. As a result of its plan development, Connecticut is enhancing their GIS system of tracking species occurrences.[292] New York is moving toward a more decentralized wildlife approach, hiring a biologist for each of the state's ten major watersheds to coordinate plan implementation.[293] Vermont created a new municipal collaboration program, the Community Wildlife Program, to share state wildlife goals with municipalities and organizations.[294] New Hampshire, arguably the Northeast state with the most transformed wildlife-conservation approach, compiled data that tripled the total number of records in the wildlife-occurrence database, developed new metrics for classifying aquatic habitat, updated wildlife database software, and created the first publicly available statewide habitat location maps during the plan development process.[295]

Although the plans somewhat expanded the scope of wildlife conservation in each Northeast state, plan development in states with existing statewide wildlife plans was less transformative. In New Jersey, Maine and Massachusetts, the plans were devised around established programs. New Jersey's plan drew from existing data sources, including the spatially-based Landscape Project that was already being used to guide planning and land

[286] Maine Department of Inland Fisheries and Wildlife, telephone interview with Lauren Pidot, September 27, 2007, Ann Arbor, MI.
[287] Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, April 26, 2007, Ann Arbor, MI.
[288] New Jersey Division of Fish & Wildlife representative, telephone interview with Sarah Levy, September 19, 2007, Ann Arbor, MI.
[289] New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.
[290] Vermont Fish and Wildlife representative, telephone interview with Michelle Aldridge, October 4, 2007.
[291] Vermont Fish and Wildlife representative, telephone interview with Michelle Aldridge, October 4, 2007.
[292] Connecticut Department of Environmental Protection representative, telephone interview with Christopher Theriot, October 12, 2007, Ann Arbor, MI.
[293] New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, October 9, 2007, Ann Arbor, MI.
[294] Vermont Fish and Wildlife representative, telephone interview with Michelle Aldridge, October 4, 2007.
[295] New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.

management programs at multiple scales of state government.[296] Maine's plan drew on the Beginning with Habitat program, relying on existing information as the cornerstone of their approach.[297] Similarly, Massachusetts's plan was based primarily on two existing programs, BioMap and Living Waters, both of which have been historically plagued by inadequate funding. [298] A Massachusetts representative said that the plan's most transformative effect came not from the compilation of habitat and species data but from the increased funding leverage for comprehensive wildlife planning already underway.[299]

In the long term, the plans will likely impact not only state approaches to wildlife conservation but regional approaches as well. Many of the actions to protect wildlife and habitats are best conducted at a landscape scale. The Northeastern Association of Fish and Wildlife Agencies (NEAFWA) created the Regional Conservation Needs Grants program to identify and fund projects that agencies identify as priorities for interstate collaboration. The Regional projects are funded through third-party grants, partner matches, and a four-percent contribution of each state's SWG funds. "To my knowledge, we're the only part of the country that's started to do that," said a Massachusetts representative. "It's just in the infancy of it, but as time goes by, they'll have hundreds of thousands of dollars to put on projects … and it absolutely wouldn't have happened without the Fish & Wildlife grant and completing these plan," said a Massachusetts's representative.[300] In 2008, the regional program, using a single habitat classification system, began production of a comprehensive, integrated map of all regional habitats and began development of a regional monitoring framework to measure the success of management activities.[301]

## Challenges to Plan Implementation

As described above, the plans have transformed some aspects of state wildlife management, though to varying degrees in different states. In the two years since the plans were published, however, challenges inhibiting the speed and extent of plan implementation have been identified. Agencies in all states in the Northeast region acknowledged lack of adequate funding as a major challenge to carrying out the actions within the plans.[302]

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[296] New Jersey Division of Fish & Wildlife representative, telephone interview with Sarah Levy, September 19, 2007, Ann Arbor, MI.

[297] Maine Department of Inland Fisheries and Wildlife, telephone interview with Lauren Pidot, September 27, 2007, Ann Arbor, MI.

[298] Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, April 26, 2007, Ann Arbor, MI.

[299] Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.

[300] Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.

[301] Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.

[302] Connecticut Department of Environmental Protection representative, telephone interview with Christopher Theriot, October 12, 2007, Ann Arbor, MI.; Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, April 26, 2007, Ann Arbor, MI.; New Jersey Division of Fish & Wildlife representative, telephone interview with Sarah Levy, September 19, 2007, Ann Arbor, MI.; New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, April 16, 2007, Ann Arbor, MI.; New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, October 9, 2007, Ann Arbor, MI.; Maine Department of Inland Fisheries and Wildlife representative, telephone interview with Lauren Pidot, April 11, 2007, Ann Arbor, MI.; Rhode Island Department of Environmental Management Division of Fish and Wildlife representative, telephone interview with Joel Visser,

The challenge of limited funding has been compounded by a recent change in match requirements for SWG funds. Before the change, SWG funds could be used by the states for either planning or implementation projects, the former of which required only a 1:3 state/federal match while the latter required a 1:1 match. As of January 2007, the definition of "planning projects" has been significantly narrowed, resulting in states having to generate a fifty percent match for nearly all SWG funded projects.[303] According to state agencies, realizing this matching amount for all projects has made implementation more complicated and difficult to sustain. In Maine, the agency may not be able to generate the match necessary to access all of their state's SWG funds in the future.[304]

Limited staffing and the difficulty of hiring new employees were also described as a significant challenge. In Rhode Island, a state financial crisis has also led to a freeze in agency hires, as has also been the case in several other Northeast states. [305] In New Hampshire, a hiring freeze has resulted from an agency deficit, and the state faces the prospect of losing up to twenty-five percent of the department's funding due to a slump in hunting and fishing license sales.[306] As a Rhode Island agency employee remarked, "We're really inhibited or constrained by what we can do because of our inability to hire and our inability to generate match."[307]

Limited capacity and funds has left several state agencies overextended in the face of plan implementation. As one Maine agency employee described the difficulty in devoting sufficient time to the SWG allocation and plan implementation processes: "I don't think it gets the time that it needs, that it deserves. That's simply because I'm stretched so thin…. I barely have enough time to administer the program, let alone coordinate meetings to move our plan forward, to review our plan in upcoming years, and that kind of thing."[308]

In addition to funding and staffing challenges, state agencies and NGOs face difficulties in communicating and coordinating activities with stakeholders and communities. New Jersey, for instance, has over five hundred municipalities and one hundred land trusts with which the state agency must try to coordinate work.[309] As a representative of a New Jersey conservation NGO recalled, "We have these examples where one town owns a large property east of the boundary, and the other town owns property west of the boundary and they're completely contiguous, but they're not communicating or planning in any way."[310] Agency representatives

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September 27, 2007, Ann Arbor, MI.;[302] Pennsylvania Game Commission and Pennsylvania Game and Boat Commission representatives, telephone interview with Ashley Lowe, October 1, 2007, Ann Arbor, MI.; Vermont Fish and Wildlife representative, telephone interview with Nicole Lewis, November 8, 2007, Ann Arbor, MI.

[303] U.S. Fish and Wildlife Service, "2007 Administrative Guidelines for State Wildlife Grants," January 1, 2007.

[304] Maine Department of Inland Fisheries and Wildlife, telephone interview with Lauren Pidot, September 27, 2007, Ann Arbor, MI.

[305] Rhode Island Department of Environmental Management Division of Fish and Wildlife representative, telephone interview with Joel Visser, September 27, 2007, Ann Arbor, MI.

[306] New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.

[307] Rhode Island Department of Environmental Management Division of Fish and Wildlife representative, telephone interview with Joel Visser, September 27, 2007, Ann Arbor, MI.

[308] Maine Department of Inland Fisheries and Wildlife, telephone interview with Lauren Pidot, September 27, 2007, Ann Arbor, MI.

[309] NJDFW, Attachment C, p. 4.

[310] New Jersey Conservation NGO representative, telephone interview with Sarah Levy, September 24, 2007, Ann Arbor, MI.

from both Pennsylvania and Maine cited difficulty in communicating the importance of the plan to stakeholders and deemed it a significant challenge. [311]

A related obstacle to plan implementation is in the physical nature of the plans themselves. Many stakeholders find the extensive and dense nature of the plans—several being over one thousand pages long—to be intimidating. As an NGO representative in New Hampshire explained, "The written plan [at] 1,400 pages is too much for anybody to really wrap their mind around."[312]

## External Changes

In addition to the challenges described above, changes external to the agency can serve to substantially hinder or facilitate plan implementation. This section will explore ecological and sociopolitical changes that have taken place in the two years since plan publication and that have the potential to impact the management of nongame wildlife.

### *Ecological Changes*

When asked about changes that have taken place since 2005, interviewees from only two states mentioned changes that were purely ecological in nature. This limited response may reflect either a focus on past rather than incipient changes (such as climate change) or a reluctance to mention small scale changes. An agency representative from Connecticut, for instance, asserted that "nothing catastrophic has occurred ecologically."[313] This does not preclude the existence of smaller scale ecological changes which may be outside of the interviewee's purview.

The only purely ecological change identified by interviewees was the expanding presence of invasive species. It is notable that presence of the Didymo (*Didymosphenia geminate),* a microscopic freshwater diatom, was mentioned as a potentially problematic change in both New York and Vermont.[314] This invasive species is likely a problem in virtually all of the Northeast states and was simply not mentioned in other interviews. Thus the lack of ecological changes identified in this study should not be taken as evidence of a lack of ecological change. It is quite likely that many similar changes are occurring, but none rise to a catastrophic level.

Despite the lack of interview responses directly related to climate change, there is indication that concern over climate change is having ecological effects in the Northeast. Agency representatives in both New York and Pennsylvania cited a concern that an increased political focus on wind power could have negative impacts on birds and bats.[315] Rhode Island also mentioned wind power as a future concern.[316] This issue illustrates the conundrum that a

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[311] Maine Department of Inland Fisheries and Wildlife, telephone interview with Lauren Pidot, September 27, 2007, Ann Arbor, MI.; Pennsylvania Game Commission and Pennsylvania Game and Boat Commission representatives, telephone interview with Ashley Lowe, October 1, 2007, Ann Arbor, MI.

[312] New Hampshire Conservation NGO representative, telephone interview with Michelle Aldridge, October 10, 2007, Ann Arbor, MI.

[313] Connecticut Department of Environmental Protection representative, telephone interview with Christopher Theriot, October 22, 2007, Ann Arbor, MI.

[314] New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, October 9, 2007, Ann Arbor, MI.; Vermont Fish and Wildlife representative, telephone interview with Nicole Lewis, November 8, 2007, Ann Arbor, MI.

[315] New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, October 9, 2007, Ann Arbor, MI.; Pennsylvania Game Commission and Pennsylvania Game and Boat Commission representatives, telephone interview with Ashley Lowe, October 1, 2007, Ann Arbor, MI.

[316] Rhode Island Department of Environmental Management Division of Fish and Wildlife representative, telephone interview with Joel Visser, September 27, 2007, Ann Arbor, MI.

program instituted to protect the environment can have environmentally negative side effects.

**Political and Social Changes**

A number of interviewees identified political and social changes that have taken place since the publication of the plans. These changes tended to be specific to the state rather than applicable to the region generally.

Changes in state administrations have had significant impacts for several states in the region. In New York, the election of Eliot Spitzer as governor has resulted in a number of changes with significant environmental consequences. First, the change in party leadership has resulted in new political appointees within the wildlife management agency and, thus, a resulting shift in agency focus.[317] In addition, Spitzer has emphasized wind energy as a key policy in the state—a positive note for climate change mitigation, but one with potentially negative side effects for migratory bird and bats.[318] Similarly, the election of Deval Patrick in Massachusetts has resulted in an increased focus on land acquisition and support for environmental bonds.[319] On a negative note, a recent fraud scandal involving Connecticut's governor has made it harder to hire contract employees in the state, causing staffing problems for wildlife management agencies.[320] All of these issues are specific to particular states, but they demonstrate how political issues can impact nongame wildlife management.

Changes in public attitudes within the state, sometimes unrelated to wildlife management, can also have an impact on successful implementation. In Pennsylvania, the wildlife agency is hopeful that an increased interest in climate change will result in an increase in grassroots support for actions related to the plan.[321] Similarly, Connecticut's grasslands project, undertaken as part of plan implementation, has resulted in significant public support for nongame wildlife management.[322]

There have also been several negative grassroots responses that threaten plan implementation. Both Vermont and New Hampshire conducted significant mapping projects with the intent of enhancing the effectiveness of the management efforts. In both states there has been a negative response from landowner-rights organizations that view mapping as a threat.[323] While the impact of these organizations remains to be seen, they may succeed in diminishing certain aspects of plan implementation.

State and national economic trends may also exert a profound influence on plan implementation. As described above, most Northeast agencies are constrained by limited resources due to struggling state economies. While this problem is not unique to wildlife

[317] New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, October 9, 2007, Ann Arbor, MI.
[318] New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, October 9, 2007, Ann Arbor, MI.
[319] Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, April 26, 2007, Ann Arbor, MI.
[320] Connecticut Department of Environmental Protection representative, telephone interview with Christopher Theriot, October 12, 2007, Ann Arbor, MI.
[321] Pennsylvania Game Commission and Pennsylvania Game and Boat Commission representatives, telephone interview with Ashley Lowe, October 1, 2007, Ann Arbor, MI.
[322] Connecticut Department of Environmental Protection representative, telephone interview with Christopher Theriot, October 22, 2007, Ann Arbor, MI.
[323] Vermont Fish and Wildlife representative, telephone interview with Nicole Lewis, November 8, 2007, Ann Arbor, MI.; New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, April 16, 2007, Ann Arbor, MI.

agencies, it may be the most dominant factor in the success of implementation efforts. As a result, it is important to consider this factor when analyzing the relative success of plan implementation across states.

## *Impact of the Plans*

One of the messages behind the Congressional call for the creation of the plans was the need for an increased emphasis on nongame management across the country. In both developing and implementing the plans many Northeastern wildlife agencies, and a few NGOS, have recognized the need to expand their staff, re-think their funding allocation, and extend their organizational goals. The section below offers a description of the extent to which the plans have reshaped the institutions responsible for wildlife conservation in the Northeast region.

It is important to note that, while some level of change is occurring in all states, it is often difficult to trace these changes directly to the plans. However, even when important positive changes have occurred independent of the plans process, they can still benefit the plan goals and objectives.

### Changes within Agencies

Despite the short time that has passed since the plans were published, they have driven considerable change within several Northeast wildlife agencies. The nature of these changes indicates that the plans are succeeding in pushing agencies towards more comprehensive wildlife management. Some of the significant themes in agency change that have emerged are the increased emphasis on collaboration and cooperation within the agencies and the recognition that additional staff dedicated to nongame management will be required for successful plan implementation.

Several barriers to successful agency implementation of the plans have also been identified. Resource constraints, both to provide additional staffing and to meet SWG matching requirements, were identified as a major challenge in many states. A second barrier is a lack of inclusion of NGOs in implementation. While some states have increased transparency and included NGOs in SWG distributions, many NGOs feel left out. Increased collaboration has the potential to improve management efficiency and leverage funds, and continued movement toward this collaboration may increase the effectiveness of current implementation efforts.

#### *Organizational Changes*

Despite the impact of the plans in many Northeast states, there was no indication of a large-scale restructuring of any of the primary management agencies. This observation, however, does not indicate a lack of organizational change or commitment to implementation within the agencies. Given the short time since publication, significant restructuring may not have been possible. In addition, agencies may already have a structure in place that can meet implementation needs, or the agencies may be constrained from making changes due to other existing management responsibilities. Many of the individuals who were interviewed identified aspects of increased collaboration and coordination within agencies and increased transparency and coordination with the public. These process-based changes can also create significant benefits for nongame management.

The comprehensive nature of the plans was perhaps the greatest driver of agency change. The large scope of the topic required agencies to reach outside of traditional species or habitat

niches and take a collaborative approach to assessing wildlife needs. As an example of this broader perspective, one agency employee described "the fisheries people learning that the Louisiana Thrush depends on streams, too, and not just brook trout."[324] Of the nine states included in this study, four states (Connecticut, Massachusetts, New Hampshire, and Rhode Island) identified increased collaboration and coordination within the agency as a significant organizational change.[325] In Connecticut's case, the agency saw "a real breakthrough with respect to intra-agency collaboration."[326]

In interviews of representatives of the remaining states, four agency employees did not mention intra-agency collaboration and coordination at all, and one interviewee seemed to indicate that traditional boundaries were still entrenched. In that case, an agency employee from New Jersey stated "I want to clarify that the [Endangered and Nongame Species Program] is not the Division of Fish and Wildlife. There's a Game Bureau, there's a Land Management Bureau. Those folks may be doing things differently. But when it comes to rare species and SGCN, we're doing the things in the plan."[327] Given both the complex nature of many ecological issues and the need to efficiently use limited resources in management, the general trend toward increased collaboration and coordination within state agencies is encouraging.

Issues surrounding outreach and agency transparency were also often mentioned by both agency and non-agency interviewers. Three of the nine states reported increased agency transparency and outreach as a significant positive change.[328] One notable example is New York, which hired ten watershed-based biologists whose jobs include a significant focus on community outreach.[329] In the case of New Hampshire, a state NGO representative stated that agency transparency is "much better than it used to be.... I can—to use a bad analogy—see how the sausage is being made....Sausage is scary, but in this case the sausage isn't scary."[330]

Although this trend toward increased transparency was only noted in three states, its importance was underscored by NGO representatives in three other states that were frustrated by the lack of transparency in their management agencies.[331] Given the scope of the challenges to

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[324] Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, April 26, 2007, Ann Arbor, MI.

[325] Connecticut Department of Environmental Protection representative, telephone interview with Christopher Theriot, October 22, 2007, Ann Arbor, MI.; Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.; New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.; Rhode Island Department of Environmental Management Division of Fish and Wildlife representative, telephone interview with Joel Visser, September 27, 2007, Ann Arbor, MI.

[326] Connecticut Department of Environmental Protection representative, telephone interview with Christopher Theriot, October 22, 2007, Ann Arbor, MI.

[327] New Jersey Division of Fish & Wildlife representative, telephone interview with Sarah Levy, September 19, 2007, Ann Arbor, MI.

[328] New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.; New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, October 9, 2007, Ann Arbor, MI.; Rhode Island Department of Environmental Management Division of Fish and Wildlife representative, telephone interview with Joel Visser, September 27, 2007, Ann Arbor, MI.

[329] New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, October 9, 2007, Ann Arbor, MI.

[330] New Hampshire Conservation NGO representative, telephone interview with Michelle Aldridge, October 10, 2007, Ann Arbor, MI.

[331] Maine Conservation NGO representative, telephone interview with Lauren Pidot, September 28, 2007, Ann Arbor, MI.; New York Conservation NGO representative, telephone interview with Michael Jastremski, October 10,

nongame wildlife conservation, agencies and NGOs must work together, and agency transparency is an important aspect of building collaborative relationships. One NGO representative in Vermont stated that the agency needs to "understand that it's our plan and not just their plan and reaching out and trying to help them understand that … it can't all be done by them."[332] Fortunately, agencies in Vermont and many other states have made significant progress in this area, due in part to the creation of the plans.

### *Agency Staffing Changes*

In many states, the plans identified a host of new activities that will be required for effective management of SGCN. As these plans are implemented, additional staff, or at least staff time, will be needed to undertake these activities. Seven of the states identified the need for additional staff as an important issue for implementation.[333] In many cases, the states were able to successfully meet these staffing needs, although other states faced outside constraints that prevented them from adding needed staff.

A total of five states have added staff related to nongame management since the plans were published, and in four of these cases the staffing increase was a direct result of the plans. The additional staff cover a wide range of specialties, and it includes technicians and GIS specialists in Connecticut; a plan coordinator, grants specialist, and ten biologists in New York; a plan coordinator and Community Wildlife Program Coordinator in Vermont; and nongame biologists in Pennsylvania.[334,335,336,337]

### *Funding*

Despite a desire to hire additional staff, several state agencies have been unable to do so due to budget constraints. In some cases, these agencies' states are experiencing wide scale economic problems that have resulted in statewide budget cuts and hiring freezes. Despite these constraints, both Vermont and New Hampshire have been able to meet some staffing needs by reassigning

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2007, Ann Arbor, MI..; Vermont Conservation NGO representative, telephone interview with Nicole Lewis, November 14, 2007, Ann Arbor, MI.

[332] Vermont Conservation NGO representative, telephone interview with Nicole Lewis, November 14, 2007, Ann Arbor, MI.

[333] Connecticut Department of Environmental Protection representative, telephone interview with Christopher Theriot, October 22, 2007, Ann Arbor, MI.; Maine Department of Inland Fisheries and Wildlife representative, telephone interview with Lauren Pidot, April 11, 2007, Ann Arbor, MI.; New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, April 16, 2007, Ann Arbor, MI.; New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, October 9, 2007, Ann Arbor, MI.; Rhode Island Department of Environmental Management Division of Fish and Wildlife representative, telephone interview with Joel Visser, September 27, 2007, Ann Arbor, MI.; Pennsylvania Game Commission and Pennsylvania Game and Boat Commission representatives, telephone interview with Ashley Lowe, October 1, 2007, Ann Arbor, MI.; Vermont Fish and Wildlife representative, telephone interview with Nicole Lewis, November 8, 2007, Ann Arbor, MI.

[334] Connecticut Department of Environmental Protection representative, telephone interview with Christopher Theriot, October 22, 2007, Ann Arbor, MI.

[335] New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, October 9, 2007, Ann Arbor, MI.

[336] Vermont Fish and Wildlife representative, telephone interview with Nicole Lewis, November 8, 2007, Ann Arbor, MI.

[337] Pennsylvania Game Commission and Pennsylvania Game and Boat Commission representatives, telephone interview with Ashley Lowe, October 1, 2007, Ann Arbor, MI.

staff to work more closely with plan projects.[338] In other states, however, more extreme budget cuts have resulted in a loss of staff and personnel and have limited reassignment due to other existing responsibilities. Frustrated agency personnel in Rhode Island, New Hampshire, and Maine have all stated that their inability to hire additional staff has prevented some implementation actions from taking place.[339] In expressing frustration in this inability to hire additional staff, a Rhode Island agency employee stated, "I'm not saying that a huge expansion of personnel would be desirable right now.... But it would be helpful to have somebody whose activities were focused entirely, or at least in large part, on the plan itself."[340]

Despite the staffing challenges faced in several states, there is a clear recognition among agencies that the plans are important and that successful implementation will require additional help. It is encouraging that so many states have successfully added the staff necessary for the implementation of the plans and that other states have recognized the need for additional staffing and may remedy the problem when outside constraints are lifted.

### *Change in Use of SWG Funds*

Perhaps due to the large quantity and wide range of actions identified in the plans, there is little consistency in the use of SWG funds between states. Eight of the states use the funds directly to implement actions ranging from biological monitoring to land acquisition to focal area projects with a multi-scale and multi-species focus. [341, 342, 343] SWG-funded projects also represent a mix of existing programs that meet plan needs and new projects identified in the plans. The only exception is Pennsylvania, which is using SWG funds for internal capacity building within the agency.[344] Despite this diversity in projects, however, there are still a number of important themes in SWG allocation that can be discerned.

One of the most important themes relates to the SWG recipients. In Connecticut, Maine, Massachusetts, New Jersey, and Pennsylvania, the funds are used exclusively by the wildlife management agency. Given the expertise of these agencies in wildlife management, it is not surprising that they are able to identify worthwhile projects to fund with these grants. However, some NGOs are frustrated by their inability to access these funds. While asserting that the agency was spending SWG funds in a worthwhile manner, an NGO representative from Maine suggested that a program that was more transparent and inclusive of NGOs would provide

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[338] Vermont Fish and Wildlife representative, telephone interview with Nicole Lewis, November 8, 2007, Ann Arbor, MI.; New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, April 16, 2007, Ann Arbor, MI.

[339] Maine Department of Inland Fisheries and Wildlife representative, telephone interview with Lauren Pidot, April 11, 2007, Ann Arbor, MI.; New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, April 16, 2007, Ann Arbor, MI.; Rhode Island Department of Environmental Management Division of Fish and Wildlife representative, telephone interview with Joel Visser, September 27, 2007, Ann Arbor, MI.

[340] Rhode Island Department of Environmental Management Division of Fish and Wildlife representative, telephone interview with Joel Visser, September 27, 2007, Ann Arbor, MI.

[341] Connecticut Department of Environmental Protection representative, telephone interview with Christopher Theriot, October 22, 2007, Ann Arbor, MI.; Connecticut Department of Environmental Protection representative, telephone interview with Christopher Theriot, October 12, 2007, Ann Arbor, MI.

[342] Rhode Island Department of Environmental Management Division of Fish and Wildlife representative, telephone Interview with Joel Visser, September 27, 2007, Ann Arbor, MI.

[343] New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, April 16, 2007, Ann Arbor, MI.

[344] Pennsylvania Game Commission and Pennsylvania Game and Boat Commission representatives, telephone interview with Ashley Lowe, October 1, 2007, Ann Arbor, MI.

additional benefits through collaboration and leveraging of funds.[345] New York has addressed these concerns by instituting a competitive grant program for the use of SWG funds. All interested recipients, including the agency itself, must relate their proposed project to the plan in an application to the management agency.[346] Vermont and New Hampshire are also currently distributing SWG funds outside of the agency, while Rhode Island and Maine are both considering a competitive grant process for distribution of SWG funds.[347,348,349,350]

The recent increase to a fifty-percent match requirement for many uses of SWG funds is also beginning to cause changes in the allocation of these funds The difficulty in generating a match is most evident in Rhode Island, which has been unable to generate any matching funds internally and has become the only state which distributes all of its funds to outside organizations.[351] Other states, including Maine, New Hampshire, and Vermont, have begun seeking matching funds from outside NGOs and agencies in order to use the SWG funds.[352] Given the financial difficulties faced by many states in the Northeast, the increased match requirement may result in increased NGO access to SWG funds as states become unable to generate the matching funds on their own.

### *Additional Funding Issues*

Ultimately, the changes in funding associated with plans may have the most transformative effect for on-the-ground conservation. In addition to ensuring continued eligibility for SWG allocations, Connecticut, New Hampshire, and Massachusetts have used plan goals to redefine priorities for existing conservation grant programs, including Natural Resource Conservation Services (NRCS) grants, the Landowner Incentive Program (LIP), the Wildlife Habitat Incentives Program (WHIP), and the Environmental Quality Incentives Program (EQIP).[353] [354] [355] The New Hampshire Land and Community Heritage Investment Program (LCHIP) which revised its requirements to ensure that projects fall within a plan-defined conservation focus area, was

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[345] Maine Conservation NGO representative, telephone interview with Lauren Pidot, September 28, 2007, Ann Arbor, MI.
[346] New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, October 9, 2007, Ann Arbor, MI.
[347] Vermont Fish and Wildlife representative, written communication, Nicole Lewis, January 22, 2007, Ann Arbor, MI.
[348] New Hampshire Conservation NGO representative, telephone interview with Michelle Aldridge, October 10, 2007, Ann Arbor, MI.
[349] Rhode Island Department of Environmental Management Division of Fish and Wildlife representative, telephone interview with Joel Visser, September 27, 2007, Ann Arbor, MI.
[350] Maine Department of Inland Fisheries and Wildlife, telephone interview with Lauren Pidot, September 27, 2007, Ann Arbor, MI.
[351] Rhode Island Department of Environmental Management Division of Fish and Wildlife representative, telephone interview with Joel Visser, September 27, 2007, Ann Arbor, MI.
[352]Maine Department of Inland Fisheries and Wildlife, telephone interview with Lauren Pidot, April 11, 2007, Ann Arbor, MI.; New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, April 16, 2007, Ann Arbor, MI.; Vermont Fish and Wildlife representative, telephone interview with Nicole Lewis, November 8, 2007, Ann Arbor, MI.
[353] Connecticut Department of Environmental Protection representative, telephone interview with Christopher Theriot, October 22, 2007, Ann Arbor, MI.
[354] New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.
[355] Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.

funded for $12 million for FY 2008/FY2009, significantly advancing the pace of conservation in the state.[356] One Massachusetts agency representative explained the power of putting the plan priorities to work through existing programs:

> "It's as if we're spending their money. Groups who are going out looking for money from outside funding sources are coming to us so that they can check off that they're coordinating with the state on implementing the [plan] and then they can get points or extra points or whatever in their ranking from their funding source. So other people are beginning to use the plan, and so it's having its intended purpose, and it's being implemented not only through us but through these other entities as well."[357]

In certain states, in addition to realigning existing conservation programs to meet plan goals, agency access to state general funds has improved as a result of the plans. The New Hampshire wildlife agency was appropriated $87,000 of state general-fund money as a match for SWG funds in FY 2008.[358]

Just as continued SWG fund allocations served as the incentive for states to embark on this planning process, private donations are motivating the states to clearly communicate their strategic approach. The Doris Duke Charitable Foundation is offering competitive plan-implementation grants for which eligibility is contingent upon the publication of a statewide priority area map.[359] While Maine did not complete such a statewide map for plan publication, the prospect of eligibility for these grants induced the state to undertake the process, which was completed in 2007.[360]

## Changes in Partner Organizations

Some state wildlife agencies invested up to two years in creating their plans and, as described above, enlisted many different non-agency organizations and experts in the planning process. Staff from these contributing organizations frequently served on working groups or committees that assisted in the research process and in developing action items and priorities. Collaboration in the planning process appears to have led to notable shifts in organizational focus within some non-agency groups in the Northeast.

### *Organizational Changes*

Several interviewed non-agency representatives described how the plans have shifted the focus of their organization. One New Hampshire stakeholder noted that her organization was feeling the impact of the transition, at both the state and national levels, toward more habitat focused conservation approaches. "There's going to be less money for some of the things we traditionally

[356] New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.
[357] Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, April 26, 2007, Ann Arbor, MI.
[358] New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.
[359] Maine Department of Inland Fisheries and Wildlife, telephone interview with Lauren Pidot, September 27, 2007, Ann Arbor, MI.
[360] Maine Department of Inland Fisheries and Wildlife, telephone interview with Lauren Pidot, September 27, 2007, Ann Arbor, MI.

have done," the stakeholder said. "We have to reprioritize, given both the plan's recommendations and the reality of available funding in terms of what we can accomplish."[361] Another New Hampshire stakeholder stated: "As we develop new projects, more and more places are acknowledging the role of the plan. Integrating the strategies to the extent feasible is a good thing. Some parts of our organization are using it more than others, so it varies quite a bit."[362]

A Vermont stakeholder partially attributed his organization's sharpened focus on wildlife conservation to the priorities detailed in the plan. "In some ways," he said, "there was a big change in our work here before the plan came out, but it does go along with the kind of thinking that went into the plan.… The [plan] helped us think about some of the strategies we need to implement. I think it's also got us to think about how to partner with other groups and to find groups that are doing things similar to our work or achieving the same end but that are maybe not [similarly] focused."[363] This stakeholder also noted both a shift in conservation focus among land trusts in Vermont and greater emphasis in his organizations efforts to reach out to private landowners in the state.[364]

A Massachusetts stakeholder also reported that the completion of the plan has led to increased communication between the some NGOs in this state and the state agency. The stakeholder cited as an example the Environmental League of Massachusetts' efforts to develop a relationship with the state to help implement the actions identified in the plan.[365] This suggests that, in some states, the agency and NGOs may be more closely coordinating their actions, even if the organizational focus of the organizations has not shifted.

### *Staffing Changes*

Very few of the non-agency organizations interviewed reported making staffing changes directly on account of the plan. While significant new staff may not have been taken on due to the plan, this is not to say that the plan is not guiding the work of existing staff. A Vermont observer noted, "I haven't seen any changes in staffing because of the plan … but it seems like every organization is definitely using the action plan now. You definitely see that in all the partner publications, and the plan is definitely part of the talking points for everybody now."[366] A New Hampshire organization staffer concurred with this sentiment: "Everybody who can make use of this information is now schooled in it and uses it. We use it in outreach functions and internal planning functions. It is totally integrated in what we do now. We have not dedicated any staff for any special purposes around here."[367]

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[361] New Hampshire Conservation NGO representative, telephone interview with Michelle Aldridge, October 10, 2007, Ann Arbor, MI.
[362] New Hampshire Conservation NGO representative, telephone interview with Michelle Aldridge, October 10, 2007, Ann Arbor, MI.
[363] Vermont Conservation NGO representative, telephone interview with Nicole Lewis, November 14, 2007, Ann Arbor, MI.
[364] Vermont Conservation NGO representative, telephone interview with Nicole Lewis, November 14, 2007, Ann Arbor, MI.
[365] Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 19, 2007, Ann Arbor, MI.
[366] Vermont Fish and Wildlife representative, telephone interview with Nicole Lewis, October 12, 2007, Ann Arbor, MI.
[367] New Hampshire Conservation NGO representative, telephone interview with Michelle Aldridge, October 10, 2007, Ann Arbor, MI.

*Changes in Funding*

A number of non-agency environmental organizations reported using the plans as a basis for grant proposals, but none of the interviewed organizations reported outright changes in their budgets on account of the plans. In New York, for example, two NGOs heavily involved in the planning process have used the goals of the plan as a basis for grant applications and for applying for SWG funds, but they do not otherwise use the plan to guide their work.[368]

A representative from a Massachusetts NGO said that the plan has served as a useful tool to seek both state and federal funds. Specifically, this organization has used the plan to justify the need for a large environmental bond from the state legislature.[369]

Other groups, including one Connecticut NGO, report that they have been successful in using the plan as a basis for private grant funding.[370] As a representative of a New Hampshire NGO described, "Every proposal that we put out for funding talks about the [plan], talks about the info we've found there, and makes that case. It's a very powerful foundation."[371]

## *How the Plan is Being Used*

The previous section described how the plans have reshaped the institutions engaged in wildlife conservation in the Northeast states. The extent to which actual implementation of the plans has been carried out is described below.

### Implementation of the Plan by Agencies

Agency implementation of the plans varied considerably among the Northeast states, with significant new initiatives in some cases and few observed changes in others. Implementation, however, is hard to quantify, and different understandings of this term, as well as different agency emphases prior to the planning process, affect the amount of change observed as a result of the plan.

States such as Connecticut, New Hampshire, and Pennsylvania have seen significant changes as a result of plan implementation, including new initiatives geared towards maps, priority habitats, and priority species.[372] New Hampshire has successfully met its two-year implementation goals on schedule.[373] Other states, most notably Massachusetts and Maine, had strong preexisting programs that were incorporated into their plan. While there have been few changes as a result of the plan in these states, the continued and expanding work under these

[368] New York Conservation NGO representative, telephone interview with Michael Jastremski, October 10, 2007, Ann Arbor, MI.
[369] New Hampshire Conservation NGO representative, telephone interview with Michelle Aldridge, October 10, 2007, Ann Arbor, MI.
[370] Connecticut Conservation NGO representative, telephone interview with Christopher Theriot, October 19, 2007, Ann Arbor, MI.
[371] New Hampshire Conservation NGO representative, telephone interview with Michelle Aldridge, October 10, 2007, Ann Arbor, MI.
[372] Connecticut Department of Environmental Protection representative, telephone interview with Christopher Theriot, October 22, 2007, Ann Arbor, MI.; New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.; Pennsylvania Game Commission and Pennsylvania Game and Boat Commission representatives, telephone interview with Ashley Lowe, October 1, 2007, Ann Arbor, MI.
[373] New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.

incorporated programs constitutes another form of agency implementation.[374] In other states, agencies have had less success in on-the-ground implementation but have been developing the internal capacity needed for plan implementation. New York, for example, has hired watershed biologists who are actively developing watershed-level plans, as required by the state plan, which will serve as the basis for on-the-ground action.[375] As described above, funding and staffing have been a challenge in many states and has hampered the many agencies' ability to fully implement the plans.

There are several themes which can be discerned from a survey of agency implementation initiatives. Most significant is the emphasis on mapping and GIS. Among the Northeast states, Connecticut, Massachusetts, Maine, New Hampshire, and Vermont have all implemented a spatial analysis initiative as a part of plan implementation. These projects have ranged from the development of focal area maps to the incorporation of existing maps into electronic format for GIS, to the creation of new GIS mapping initiatives. 376 In addition, nearly all of the Northeast states emphasized an increased agency focus on outreach as a critical component of plan implementation. This has included the hiring of new staff—with a focus on outreach—and the initiation of programs designed to aid private parties and organizations in plan implementation. [377,378]

In addition to spatial analysis and outreach programs, states have also implemented programs focused on (a) managing priority habitats, such as Connecticut's Grasslands Habitat Conservation Initiative, (b) managing priority species, such as New Hampshire's amphibian and reptile protection program, (c) encouraging land acquisition, and (d) building agency capacity through training.

As described above, new monitoring programs prioritized in the plans have not been implemented by any Northeast agencies.

Despite the short period since the plans were published, the state agencies in the Northeast have demonstrated significant progress toward implementation. The work of these agencies, both in developing new initiatives and in progressing on preexisting programs, demonstrate that they have incorporated plan goals into current management practices.

## Implementation of the Plan by Stakeholders

The degree to which non-agency groups utilize the plan seems somewhat part influenced by the extent of outreach and engagement from the state agency. The New Hampshire wildlife agency, for example, hosted a summit where they convened stakeholders from around the state to help prioritize and rank implementation strategies. Through the process, the agency and its partners

[374] Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.; Maine Department of Inland Fisheries and Wildlife, telephone interview with Lauren Pidot, September 27, 2007, Ann Arbor, MI.

[375] New York Conservation NGO representative, telephone interview with Michael Jastremski, October 24, 2007, Ann Arbor, MI.

[376] New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.; Connecticut Department of Environmental Protection representative, telephone interview with Christopher Theriot, October 22, 2007, Ann Arbor, MI.; Vermont Conservation NGO representative, telephone interview with Nicole Lewis, November 14, 2007, Ann Arbor, MI.

[377] New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, October 9, 2007, Ann Arbor, MI.; Pennsylvania Game Commission and Pennsylvania Game and Boat Commission representatives, telephone interview with Ashley Lowe, October 1, 2007, Ann Arbor, MI.

[378] Vermont Fish and Wildlife representative, telephone interview with Nicole Lewis, November 8, 2007, Ann Arbor, MI.

identified top implementation strategies, including expected year of initiation and overall project duration. New Hampshire directly engaged organizations like TNC, the Audubon Society of New Hampshire, and other partners to lead projects identified in the plan.[379]

On the other end of the spectrum are Massachusetts and Rhode Island. In Massachusetts, there was little outreach or engagement by the state agency during the planning process, yet non-agency groups have seemingly embraced the plan for both grants and for program/project guidance and implementation.[380] With the exception of its work with TNC, Rhode Island also engaged only minimally with non-agency organizations during planning. Unlike Massachusetts, however, there seems to be little evidence of non-agency groups using the plan.[381]

The clarity and accessibility of the documents appears to be another determinant of how non-agency groups utilize the plans. In New Jersey, for instance, one NGO representative observed that the plan does not tell people how to participate or show them how they fit into the "big picture" of conservation in the state.[382] While the New Jersey plan lists potential partners, steps have not always been taken to engage them.[383]

In Vermont, more subtle changes are underway amongst the non-agency groups. Here, the plan facilitated the creation of a common dialect for discussing wildlife conservation. Conservationists throughout the state have begun to adopt terms such as "species of greatest conservation need" and "habitat fragmentation".[384] A NRCS biologist used Vermont's plan to develop the state's WHIP management plan, folding significant portions directly into WHIP's statewide strategy.[385]

This last example suggests that the plans can, and do provide strategic guidance to non-agency partners, but this outcome is certainly not universal based on interviews with eighteen organizations. It is important to note, however, that at the time of these interviews only two and a half years had passed since publication of the plans, and more changes may still be forthcoming.

## Progress on the Ground: Example Programs and Projects

To illustrate in more detail how the plans are shaping wildlife conservation in the Northeast states, three exemplar cases are described below. These examples highlight different options, including building on past accomplishments, reaching out to local decision-makers, leveraging funds, and encouraging collaboration. While the extent and speed of implementation has frustrated some stakeholders, these examples serve as a reminder that, project by project, progress is being made.

### *Building on Past Successes: Massachusetts' GIS Cross-walk*

[379] New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.
[380] Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.
[381] Rhode Island Department of Environmental Management Division of Fish and Wildlife, telephone interview with Joel Visser, September 27, 2007, Ann Arbor, MI.
[382] New Jersey Conservation NGO representative, telephone interview with Sarah Levy, September 24, 2007, Ann Arbor, MI.
[383] New Jersey Division of Fish & Wildlife Endangered and Nongame Species Program representative, telephone interview with Sarah Levy, September 19, 2007, Ann Arbor, MI.
[384] Vermont Conservation NGO representative, telephone interview with Nicole Lewis, November 14, 2007, Ann Arbor, MI.
[385] Vermont State Agency representative, telephone interview with Nicole Lewis, October 12, 2007, Ann Arbor, MI.

GIS-based tools have been integral assets in the Massachusetts' wildlife agency's land-acquisition process. Two important places to find information regarding conservation planning in Massachusetts are the agency's BioMap and Living Waters programs. These two programs are invaluable to the planning processes of the many land trusts and non-profits in the state, and to other state government agencies.[386]

Massachusetts identified expanding the GIS in BioMaps and Living Waters as an important plan implementation goal.[387] While funding constricts the agency's ability to expand its GIS programs, the Massachusetts' agency decided not to let these constraints halt the advancement of their GIS programs benefiting wildlife conservation within the state. With this goal in mind, agency staff headed into the field to both make certain that existing information in the GIS databases was still accurate, and ensure that the state's priority habitats were being recognized by the GIS-identified focus areas. The result was improved detail and accuracy of the state's GIS programs.[388]

As one agency representative explains, "We might have had an area that looks like a square. Now going back with the mapping information [we're] seeing that there's certain types of habitat that are just off to the left or near the southeast or whatever, [and we're] going back and redrawing those focus areas to try to capture that new information to make those focus areas more functionally correct."[389] These actions will help agency staff see what's happening on the ground, and will gather valuable information for habitat protection and management.

### *Innovative Local Outreach: Vermont's Community Wildlife Program*

As part of its plan, the Vermont wildlife agency created the Community Wildlife Program. The goal of this project is to help towns and regional planning agencies better identify and conserve habitat within their local communities. Through the program, the agency has hired a biologist whose to visit Vermont towns, discuss the plan, and provide technical support to implement it. The biologist's duties include everything from conducting on-the-ground surveys of species occurrence and critical habitat areas to helping town planners develop zoning language for stronger wildlife protection.[390] One Vermont NGO representative acknowledged the project, saying: "I think that's a big success."[391]

Since its inception, Vermont's Community Wildlife Program has been hailed as a success by Vermont agency staff and numerous plan stakeholders.[392] As a result of the project, the agency has been able to educate and inform municipalities about the plan and the agency's priorities. Since the majority of land-use decisions occur at the local level, programs such as Vermont's Community Wildlife Program are critical in accelerating habitat conservation, particularly in the

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[386]Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.

[387] Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.

[388] Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.

[389] Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.

[390] Vermont Fish and Wildlife representative, telephone interview with Nicole Lewis, November 8, 2007, Ann Arbor, MI.

[391] Vermont Conservation NGO representative, telephone interview with Nicole Lewis, October 29, 2007, Ann Arbor, MI

[392] Vermont Fish and Wildlife representative, telephone interview with Nicole Lewis, November 8, 2007, Ann Arbor, MI.

Northeast where more land is privately held than any other region in the country[393]. By making the plan more accessible to the people that make decisions in the state, the Community Wildlife Program stands to have a major impact on the future of conservation in Vermont. Outreach under this program has also served as an important point of entry into local communities for other technical assistance programs and organizations, including Vermont Audubon and the state Landowner Incentive Program.[394]

### *Success in Collaboration and Leveraging Funds: Connecticut's Grassland Habitat Conservation Initiative*

Grassland habitats, which are typically located in areas subject to development pressure, are being lost at a more rapid rate than any of Connecticut's other eleven habitat types.[395] Under the Connecticut Grassland Habitat Conservation Initiative, the Connecticut wildlife agency is joining a variety of state agencies and conservation and agricultural groups to inventory existing grassland habitat and the array of related wildlife species.

The project has united a broad array of federal, state, and NGO partners. Among the federal partners involved on the project are U.S. FWS, the Department of Agriculture, and the NRCS. Connecticut's Departments of Economic and Community Development, Transportation, and the Office of Policy and Planning are also involved in the initiative. NGO collaborators include Connecticut Audubon, TNC, Connecticut Farmland Trust, Connecticut Farm Bureau, Working Lands Alliance, Trust for Public Land, and the Wildlife Management Institutes.[396,397,398,399] One NGO stakeholder called this level of collaboration "amazing" and added that "it certainly says that everybody from the governor's office on down recognized items that were in the [plan] and took delivery on that conservation message."[400]

In addition to the successful use of collaboration, the Grassland Initiative is an excellent example of how the plan has been used to leverage new funds for wildlife conservation. In a resounding success for conservation in the state, the Connecticut state legislature voted to allocate nearly $8 million to the initiative, for inventorying and acquisition.[401]

The initiative is providing tangible benefits for the state's conservation efforts. Approximately 150 sites have been studied so far, and a number of acquisitions are currently in

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[393] Natural Resources Conservation Service, "Percent of Land in Federal Ownership 1997 (from the *National Resources Inventory*)," Department of Agriculture, http://www.nrcs.usda.gov/Technical/NRI/maps/meta/m5554.html.

[394] Vermont State Agency representative, telephone interview with Nicole Lewis, October 12, 2007, Ann Arbor, MI.

[395] Connecticut Department of Environmental Protection representative, telephone interview with Christopher Theriot, October 12, 2007, Ann Arbor, MI.

[396] Connecticut Department of Environmental Protection representative, written communication to Christopher Theriot, December 2007.

[397] Vermont Conservation NGO representative, telephone interview with Nicole Lewis, October 29, 2007, Ann Arbor, MI

[398] Vermont Conservation NGO representative, telephone interview with Nicole Lewis, November 14, 2007, Ann Arbor, MI.

[399] Vermont State Agency representative, telephone interview with Nicole Lewis, October 12, 2007, Ann Arbor, MI.

[400] Connecticut Conservation NGO representative, telephone interview with Christopher Theriot, October 19, 2007, Ann Arbor, MI.

[401] Connecticut Department of Environmental Protection representative, telephone interview with Christopher Theriot, October 12, 2007, Ann Arbor, MI.

the discussion phase.[402] Several years ago, little data existed about grasslands in Connecticut, but each quadrant has now been defined by wildlife staff and volunteers.[403] In pursuing the grasslands initiative, Connecticut is developing a framework for preserving other types of habitats through the utilization of this successful research and collaboration methodology.

## *Building on the Plans: Regional Collaboration*

All of the Northeast states relied almost exclusively on intrastate information and resources, despite the fact that all of the states are working on joint projects with other states in the region. Only (Connecticut) mentioned engaging with other states to arrive at species lists and actions.[404] Massachusetts, New York, and Pennsylvania, however, reported informal interaction to discern whether or not the state had a regionally significant portion of a species' population.[405] Maine, New Hampshire, New Jersey, Vermont and Rhode Island reported that they refrained from collaborative efforts with other states during the development process.[406] Some plans, such as that prepared by Massachusetts, involved a limited regional inventory in which the state wildlife agency tried to establish whether the state had a "regionally significant portion of the population," in which case the species was added to the list.[407]

The plans reflect this intrastate focus in that they are, on the whole, rather insular strategies for in-state wildlife. This framework may have been the logical result of each state being required to submit its own individual strategy to the federal government. [408]

### Drivers of regional efforts

*Agency-based*

Despite the insular nature of the plans, states and regional agencies recognized that "many of the conservation needs identified in the plans are best addressed at a landscape-scale–a scale that

[402] Connecticut Department of Environmental Protection representative, telephone interview with Christopher Theriot, October 12, 2007, Ann Arbor, MI.
[403] Connecticut Department of Environmental Protection representative, telephone interview with Christopher Theriot, October 12, 2007, Ann Arbor, MI.
[404] Connecticut Department of Environmental Protection representative, telephone interview with Christopher Theriot, October 22, 2007, Ann Arbor, MI.
[405] Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI; representatives Pennsylvania Game Commission and Pennsylvania Game and Boat Commission, telephone interview with Ashley Lowe, October 1, 2007, Ann Arbor, MI.; New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, October 9, 2007, Ann Arbor, MI.
[406] Maine Department of Inland Fisheries and Wildlife, telephone interview with Lauren Pidot, September 27, 2007, Ann Arbor, MI.; New Jersey Division of Fish & Wildlife Endangered and Nongame Species Program representative, telephone interview with Sarah Levy, September 19, 2007, Ann Arbor, MI.; Rhode Island Department of Environmental Management Division of Fish and Wildlife, telephone interview with Joel Visser, September 27, 2007, Ann Arbor, MI.; New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, April 16, 2007, Ann Arbor, MI.; Vermont Fish and Wildlife representative, telephone interview with Nicole Lewis, November 8, 2007, Ann Arbor, MI.
[407] Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.
[408] Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.

does not conform to state boundaries."[409] A Massachusetts agency employee offered the following explanation for the emerging regional approach, stating, "All the states up in the Northeast are small, so they have bought into this idea of looking at things in a regional context."[410]

Representatives of the Northeast region's state wildlife agencies met in March, 2006 to discuss developing regional projects. Three representatives from each state agency met wjth representatives from the U.S. FWS and other federal partners to discuss ideas for these new projects. After an intense brainstorming session, six proposals emerged. The state agency representatives then received approval from the state directors to submit votes for two of these proposals.[411] The development of a regional monitoring framework and a community-habitat classification and mapping system received the most support among the states in the region.

At the 2006 meeting, participants recognized the difficulty of requesting or earmarking funds for cross-border collaborative projects from individual state governments. In order to avoid the bureaucratic challenge of allocating state funds for regional projects, the states agreed to use four percent of their SWG funds to support regional efforts.

The 2006 process resulted in the formation of a Regional Conservation Needs Grant Program intended to address regional, landscape-level issues identified in the plans through grants for regional projects. The program will be funded by financial contributions from each state in the Northeast region. A Massachusetts agency representative identified the NEAFWA as being one of the primary drivers in the push for regional collaboration.[412]

### *Non-agency-based*

Non-governmental organizations have driven regional efforts primarily through actions such as funding of specific Regional Conservation Needs programs. The Doris Duke Foundation, for example, is providing a significant amount of funding for the regional mapping component.[413] Similarly, the National Fish and Wildlife Foundation has allocated money for the development of collaborative multi-state projects around the country. An agency representative from Vermont sees organizations as the main non-agency driver of regional collaboration.[414]

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[409] NEAFWA, "NEAFWA Regional Conservation Needs," Northeast Regional Conservation Needs Grant Program, http://www.rcngrants.org/index.shtml.

[410] Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.

[411] Vermont Fish and Wildlife representative, telephone interview with Nicole Lewis, November 8, 2007, Ann Arbor, MI.

[412] Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.

[413] Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.; Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 19, 2007, Ann Arbor, MI.; Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 26, 2007, Ann Arbor, MI; NEAFWA, "Northeastern Wildlife Habitat Classification Project," Northeast Regional Conservation Needs Grant Program, http://www.rcngrants.org/habitat_classification.shtml.

[414] Vermont Fish and Wildlife representative, telephone interview with Nicole Lewis, November 8, 2007, Ann Arbor, MI.

At least some stakeholders are pleased to see the participation of state wildlife agencies in the regional process.[415] Many of the organizations applying for grants through the Regional Conservation Needs Program are groups that have previously worked with the Northeast state agencies. A number of these groups are also national or regional organizations with local offices in the individual states.

## The Regional Conservation Needs (RCN) Program

The Regional Conservation Needs Program is administered by the Wildlife Management Institute, through a contract with the NEAFWA. States participate in the program primarily through representation on state wildlife-diversity technical committees. These committees meet annually to generate topic areas for projects addressing regional conservation needs for each funding year.[416]

Some states seem to be more involved in the regional efforts than others. A Rhode Island agency employee knew the state was involved in some of the regional projects but did not know much about the programs beyond the four-percent funding initiative. He described participation as requiring "a significant commitment of time" due to reviewing a number of grant proposals for regional projects.[417] Other states cite funding and staff limitations as the reason for not being able to contribute more. A Vermont agency representative mentioned that a number of regional projects for which additional state staff had been requested but added that regional efforts are "not always easy given how thinly spread staff are."[418]

### *How Projects Are Chosen: Priority Topics*

The first step in the process of choosing grant recipients is to determine the priority areas that the grant proposals should focus on during each year. Each year, priority project topics are decided by agency staff involved with the development and implementation of the plans in a facilitated workshop. After the topics have been established, they are made available online at the RCN website and disseminated to organizations, universities, and other organizations through press releases.[419]

The priority RCN topics for 2007 were:

- Creation of Regional Habitat Cover Maps,
- Identify Invasive Species that Impact Species of Greatest Conservation Need in the Northeast,
- Development of Instream Flow Standards, Guidelines, and Policies,

[415] Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 19, 2007, Ann Arbor, MI.; Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 26, 2007, Ann Arbor, MI.

[416] Information about the structure, functioning, and processes of the Regional Conservation Needs Program such as this can be found at NEAFWA, "Frequently Asked Questions," Northeast Regional Conservation Needs Grant Program, http://www.rcngrants.org/faq.shtml.

[417] Rhode Island Department of Environmental Management Division of Fish and Wildlife, telephone interview with Joel Visser, September 27, 2007, Ann Arbor, MI.

[418] Vermont Fish and Wildlife representative, telephone interview with Nicole Lewis, November 8, 2007, Ann Arbor, MI.

[419] NEAFWA, "2007 Priority RCN Topic Areas," Northeast Regional Conservation Needs Grant Program, http://www.rcngrants.org/topics.shtml.

- Development of Model Guidelines for Assisting Local Planning Boards with Conservation of Species of Greatest Conservation Need and their Key Habitats through Local Land Use Planning,
- Identification of Regional Focal Areas and Corridors for the Conservation of Species of Great Conservation Need in the Northeast,
- Development of Regional Indicators and Measures, and
- Development of Habitat Conservation Initiatives at a Landscape Scale.[420]

Once priorities areas have been determined, grants are made for relevant projects. The grants encourage partnership and collaboration at both the funding and project level. Grant proposals are reviewed by a committee of representatives of the Northeast Wildlife Diversity Committee, Northeast Wildlife Administrators, and the Northeast Fisheries Administrators. Final grant awards are made by the Directors of the NEAFWA.[421]

### *Types of Projects*

A number of grant proposals covering the seven priority areas were submitted this past year. The process was open to "individuals, non-governmental organizations, state and federal agency employees, members of academia, and for-profit corporations."[422] At the regional meeting in October 2007, NEAFWA Directors approved the following eight RCN grants:

- Creation of Regional Habitat Cover Maps: Application of the Northeast Terrestrial Habitat Classification System
- Northeast Regional Connectivity Assessment Project
- Identifying Relationships between Invasive Species and Species of Greatest Conservation Need in the Northeast Region
- Development of Avian Indicators and Measures for Monitoring Threats and Effectiveness of Conservation Actions in the Northeast
- The Conservation Status of Key Habitats and Species of Greatest Conservation Need in the Eastern Region
- An Interactive, GIS-Based Application to Estimate Continuous, Unimpacted, Daily Streamflow at Ungaged Locations in the Connecticut River Basin
- Proposal to Establish a Regional Initiative for Biomass Energy Development for Early-Succession SGCN in the Northeast
- Implementing Bird Action Plans for Shrubland Dependents in the Northeast[423]

Priority RCN topics for 2008 are still under discussion, though they will be announced in early 2008. Grant proposals relating to these new topics will be accepted at that time.

Currently, both the Habitat Classification and Mapping Project and the Regional Monitoring and Performance Reporting Framework appear to be generating the most interest among stakeholders and agencies. These were the original two projects identified by the states in

[420] NEAFWA, *Press Release: Northeast Regional Conservation Needs Grant Program*, http://environment.cornell.edu/action.php?resource_id=1429.
[421] NEAFWA, "Frequently Asked Questions."
[422] NEAFWA, "Frequently Asked Questions."
[423] In-depth information about these projects including contact information and a proposal summary can be found online at NEAFWA, "2007 Conditionally Approved RCN Grants," Northeast Regional Conservation Needs Grant Program, http://www.rcngrants.org/projects.shtml.

2006. For each of these two projects, a staff person was assigned, from the states, and a steering committee was developed to provide coordination and leadership.

**Mapping**

The Habitat Classification and Mapping project will ultimately produce one comprehensive, integrated map of all of the habitats in the Northeast region from Maine to Virginia. It is being coordinated by an individual at the Virginia wildlife agency in partnership with NatureServe, TNC, and GAP. The first step undertaken for the project was development of a classification system to describe all habitat types included in the different Northeast plans. This step will be completed for both terrestrial landscapes (Northeastern Terrestrial Habitat Classification System, [NETHCS]) and aquatic habitats. The mapping will be based on the New Hampshire model, thus, New Hampshire will be the first state for which the classification and mapping system will be completed.[424]

As of October 2007, the group is almost done classifying the Northeast Region's habitats, but it has not yet begun to prioritize or map them.[425] The group intends to have the project completed by the spring of 2008. According to a Massachusetts agency staff member the project is of high importance because, "it's something up here in the Northeast that we all recognize that we need ... It's going to be the foundation for all of our regional work."[426]

**Monitoring**

The Regional Monitoring and Performance Reporting Framework is currently being developed collaboratively by federal, NGO, and academic partners with funding from the RNC program.[427] This objective of this project is to "develop a mechanism to meet monitoring and performance reporting requirements in an effective and cost-efficient manner."[428] The project will produce a regional framework for monitoring species and measuring the success, or effectiveness, of the management regimes currently in process. As part of this, those working on the project will define "success", and determine how that definition can be usefully applied across state boundaries. The framework produced will be used to inform federal-and-state-level funding sources and policy makers. The project is being headed by individuals at New York and Vermont wildlife agencies in conjunction with input from committees comprised of academics, non-governmental organization experts, and state and federal agency staff. The groups aim to complete the monitoring framework in January 2008.

### *Funding Mechanisms*

As mentioned previously, representatives of the Northeast wildlife agencies realized that dependence upon state legislatures for funding of regional, cross-boundary work would not

[424] New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.
[425] New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.
[426] Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.
[427] For more information on the process of creating the Regional Monitoring and Performance Reporting Framework, please see NEAFWA, The Northeast Monitoring and Reporting Framework Workshop Memo, http://www.rcngrants.org/downloads/PerformanceMeasuresWorkshop_I_Follow-Up.pdf.
[428] NEAFWA, "Regional Monitoring and Performance Reporting Framework," Northeast Regional Conservation Needs Grant Program, http://www.rcngrants.org/regional_monitoring.shtml.

prove expeditious or secure. Each of the state wildlife agencies will, therefore, allocate four percent of their annual SWG fund allocation to the regional effort, thus benefiting the entire region. A minimum of fifty percent of funds for each regional project must be from a non-federal and/or in-kind match. For example, the first year of the Habitat Classification and Mapping project was funded by the Doris Duke Charitable Foundation, while the second year will likely be funded through a RCN grant.

*Conclusions*

The creation of the plans has spurred regional collaboration to an extent unprecedented by the Northeast. The RCN partnership, with its cost-sharing and regionally inclusive frameworks for monitoring and mapping, is unique. No other region in the country has yet created such a group, nor have other areas been able to progress on any of these issues at a regional level. The Northeast region is in the position to truly begin approaching conservation at a level where political boundaries no longer constitute barriers to wildlife management. Through mechanisms such as the monitoring program, the wildlife agencies are also able to standardize their information across the region, making it much easier to share, compare and work together to adaptively manage their combined resources in a cost-effective manner. As a Massachusetts agency representative states, "It absolutely wouldn't have happened without the Fish and Wildlife grant and completing these plans."[429]

# Recommendations

Through analyzing the findings of our research, we have identified a number of recommendations that may improve the usefulness of future iterations of the State Wildlife Action Plans and may also improve success in current implementation of the plans. The following is a brief description of each of our recommendations. More information on each recommendation, including examples from various states, can be found in the Northeast Regional characterization document.

## *Part I: Recommendations for Future Plan Development*

### 1.) Create action-driven content

*Link actions to threats*

By articulating the connection between the most immediate threats and the actions recommended to respond to those threats, the plans can provide a more clear direction for potential NGO, private, and state actors in the implementation process. Many Northeast states, including New Hampshire, New Jersey, Massachusetts, and Rhode Island, clearly demonstrate the link between threats and actions.

In New Hampshire's plan, species and habitat threat assessments are linked to detailed discussions of proposed actions within the habitat profiles. This clear link provides a useful reference for various organizations—including NGOs, community groups, private landowners,

[429] Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.

municipalities, and agencies with limited expertise in wildlife biology—when planning future implementation actions.

### *Prioritize where feasible*

This strategy, in situations where it is feasible to prioritize actions in the plans, helps to guide the user, who likely has limited resources, towards the most pressing conservation actions. Prioritizing actions in the plan also demonstrates to potential funders that the state has a clear strategy and has taken steps to ensure that resources are dedicated most efficiently.

Actions were prioritized in a few Northeast states. Maine utilized a "proactive habitat protection" approach in its plan, prioritizing a number of broad conservation strategies for the protection of land already known as significant to wildlife.[430] Strategies include collecting of biological information, planning for conservation, and restoring habitats, among others[431]. According to the Maine plan, "This level of organization represents a broader-scale approach to synthesizing needs that will address the most species and threats and yield the highest conservation return."[432]

In Pennsylvania, the conservation actions were prioritized based on a two-level hierarchy of need that was tied to the time frame for implementation. Actions were divided into "high priority" actions, to be implemented within one to five years, and "priority" actions, to be implemented within five to ten years. Additionally, the allocation of SWG funds through the state competitive grant process is tied to habitat areas that are selected and emphasized as a priority each year. This organizational strategy gives implementation partners a precise temporal vision of wildlife conservation in the state, and it has helped to steer conservation actions.

Furthermore, prioritizing at multiple scales, including the landscape, habitat, and species levels, may be desirable. Prioritizing for action at the species level, for instance, provides clear guidance to groups or individuals with narrow conservation interests. In Vermont, species profiles included species level prioritization of actions. Pennsylvania also includes priority actions organized by each habitat discussed in the plan.

## 2.) Make stakeholder engagement meaningful

### *Incorporate partners early in the process and allow them to influence content*

A study conducted in association with this regional synthesis demonstrates the positive effects of early and meaningful partner engagement in plan development. The study, which compared various stakeholder engagement processes with perceptions of plan and implementation success in Maine and New Hampshire, found that the timing of partner engagement and the influence that participants had over the content in the plans were the two strongest factors associated with participants' satisfaction with the stakeholder-engagement process in plan development.[433]

In instances where the majority of stakeholders indicated dissatisfaction with the engagement process, the reasons given support this recommendation. Stakeholders interviewed from Maine and New Jersey suggested that earlier and more diverse opportunities for

[430] Maine Department of Inland Fisheries and Wildlife, (MDIFW), "Maine's Comprehensive Wildlife Conservation Strategy." (Augusta: ME: 2005), p. 132.
[431] Ibid.
[432] MDIFW, Ch 6, p. 3.
[433] Pidot, Lauren, "Looking Beyond the Agency: The Influence of Stakeholder Engagement on the Perceived Success of the Maine, New Hampshire, and Vermont State Wildlife Action Plans," unpublished.

engagement would have been beneficial.[434] One New York partner, who expressed perhaps the greatest level of dissatisfaction of any stakeholder interviewed, felt that the engagement process was "just a complete farce,"[435] and that information and perspectives collected from partners were not incorporated into the plan. [436] At an early stage in the development of future iterations of the plan, including partners—and giving them a say in plan content—can help to strengthen the relationship between the state and potential implementation partners, and it can provide potential partners with a sense of ownership in the plan.

### *Engage nontraditional partners*

Developing nontraditional partnerships can bring in new resources and fresh ideas to wildlife conservation in a state. In New Hampshire, which formed one of the most robust partner engagement processes in the Northeast, a representative from its wildlife agency reported being disappointed that no truly new or non traditional partnerships were forged in the development process, stating, "We got a lot of good feedback—from a variety of stakeholders—and increased public awareness through the summits, but there wasn't something brand new like a partnership with representatives from land development interests that could lead to far-reaching changes in development practices that impact wildlife."[437] Including partners from fields such as land development and planning has the potential to create a plan that is not only comprehensive, but also feasible by considering the views of players shaping the physical landscape on which conservation must take place.

As an example, while the Department of Defense (DOD) is a federal agency with a primary mandate for military readiness, it also maintains a number of secondary objectives that focus on conservation. Programs such as Compatible User Buffer Programs, Integrated Natural Resource Management Plans under the Sikes Act, and the Legacy Program all provide sources of funding and staffing dedicated to conservation on the 30 million acres of land under DOD management. Reaching out to military installations already engaged in these programs and ensuring that existing and developing DOD conservation actions incorporate SWAP priorities can both have significant benefits for implementation in the future and is encouraged.

### *Engage at the local level if you want to have local action*

Effective biodiversity protection in the United States is dependent on linking local land use planning with larger-scale conservation goals. According to a Defenders of Wildlife review of the plans, 46 state plans defined coordinating with land use planners as a conservation action, and 20 articulated a need for state technical assistance to planners.[438]

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[434] Maine Conservation NGO representative, telephone interview with Lauren Pidot, September 28, 2007, Ann Arbor, MI.; New Jersey Conservation NGO representative, telephone interview with Sarah Levy, September 24, 2007, Ann Arbor, MI.

[435] David Van Luven, TNC Hudson River Landscape Director. telephone interview with Michael Jastremski, October 10, 2007, Ann Arbor, MI.
(TNC)

[436] New York Conservation NGO representative, telephone interview with Michael Jastremski, October 10, 2007, Ann Arbor, MI.

[437] New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.

[438] Michalak, J., and J. Lerner, "Linking Conservation and Land Use Planning: Using the State Wildlife Action Plan to Protect Wildlife From Urbanization," (Washington, DC: Defenders of Wildlife, 2007).

Many states, however, did not collaborate with representatives from local governments during plan development. In Vermont, one partner commented that the plan "didn't have that real classic, crisp connection to the people." The partner added, "I think a way to have done that would have been to engage towns and local governing and planning entities in the development process because that's how this is going to get implemented at the local level."[439]

The Northeast region has a few examples of effective outreach at the local level. In New Hampshire and New Jersey, representatives of local agencies participated in large stakeholder meetings and helped to set guidance for technical work.[440] In Connecticut, which did perhaps the most to engage local representatives during the plan development process, the Department of Environmental Protection "passed out a questionnaire at local planning workshops that gave [them] input and feedback from local government bodies early on in the process."[441]

Where inviting specific local governments into the planning effort is impractical, working with associations of governments or planners, including the National Association of Counties and the state chapters of the American Planning Association, would prove an effective method to incorporate local scale interests in plan development.

### *Make plans truly habitat-oriented*

Managing wildlife conservation through a habitat-based approach has a number of benefits and it was utilized as a strategy by many states in the Northeast region while developing plans. Habitat management may help leverage limited resources for wildlife conservation by enabling states to simultaneously benefit several priority species through each habitat-based action.

Another important benefit of utilizing the habitat-based method in writing the plans is that it creates a truly comprehensive approach with the potential to conserve entire ecosystems rather than individual species. Though SWG funding has not been made available for plant conservation, utilizing a habitat-based approach allows for the protection of plants as a consequence of habitat-based, species-conservation efforts. In Massachusetts, where the habitat-based approach has been utilized, the state coordinator explains, "It was important that we organized our plan around key habitats rather than species. This enables us to incorporate plants into the CWCS."[442] Making the plans truly habitat oriented will enable more comprehensive and efficient conservation actions during the implementation phase. We encourage states to utilize this strategy in future iterations of the plan.

## 3.) Standardize the plans across states

### *Use a common language*

In 2003, the IAFWA Ecological Frameworks sub-work group issued a memorandum to all state wildlife plan coordinators suggesting that states use the Bailey/USFS Ecological Units classification system as the ecological platform for plan organization. The intent behind this

[439] Vermont Conservation NGO representative, telephone interview with Nicole Lewis, October 29, 2007. Ann Arbor, MI.
[440] New Jersey Division of Fish & Wildlife representative, telephone interview with Sarah Levy, September 19, 2007, Ann Arbor, MI.; New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.
[441] Connecticut Department of Environmental Protection representative, telephone interview with Christopher Theriot, October 22, 2007, Ann Arbor, MI.
[442] Massachusetts Division of Fish and Wildlife Department of Fish and Game representative, telephone interview with Michael Jastremski, November 20, 2007, Ann Arbor, MI.

recommendation was to facilitate regional and national aggregations of the plans. But, the actual result of plan development in the 50 states and six territories has been the use of nine different habitat classifications.

To date, the lack of standard classification language has complicated interstate collaboration. It has especially complicated collaborations for the creation of interstate spatial tools. As expressed by one Connecticut stakeholder, "GIS compatibility on a multi-state project has been really challenging."[443] By using a common classification among all plans, or at least at the regional level, desirable interstate collaborations for wildlife conservation may become more feasible. States from the Northeast region are leading the way by combining efforts to create a standardized classification system that will enable projects at the regional level to be realized. Similar discussions should be considered in other regions as well.

### *Standardize format and improve organization*

While some plans exhibit excellent organization and layout, others are more difficult to navigate, leading to confusion and wasted time. As one stakeholder explains, "I've used [the plans] a little bit. One of my frustrations with them is that they're so uneven in quality and usefulness…You think that they all follow the standard format but then when you look at the information within them…it's pretty different."[444] For future iterations of the plans, creating a standard format, including a somewhat standard organization and layout, may also lead to improved usability and ease of comparison between states. This could additionally lend the plans more easily to interstate collaborations.

## 4.) Design with users in mind

Although all the plans contain substantial information benefiting local planners, the documents are lengthy and cumbersome. Most plan users lack time to digest all of the details, and would they benefit from having important information presented in simplified forms. Discussed below are a few options that would make the information presented in the plans more accessible to those utilizing it for conservation.

### *Users' Guides: A Vermont Example*

A "User's Guide to Vermont's Wildlife Action Plan," included in Vermont's Wildlife Action Plan, serves two purposes for a reader of the plan. First, the guide conveys a series of broad suggestions that set the context for effective use of the plan. The guide encourages readers to "be mindful of the following"[445]:

- Use the Wildlife Action Plan to identify how your organization's mission and goals relate to and match up with the needs of wildlife.
- Be aware of groups of species with similar needs.
- Consider the problems or opportunities you wish to address and determine the scale at which you are comfortable working.
- Recognize the complexity of habitat management.

[443] Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, March 3, 2008, Ann Arbor, MI.
[444] Ibid.
[445] Vermont Fish and Wildlife Department, (VFW), "Vermont's Wildlife Action Plan," (Waterbury, VT: 2005), p. v.

- The Wildlife Action Plan is a guidance document intended to provide a menu of opportunities. Some portions may or may not be appropriate at any given place or point in time.

The user's guide also provides examples of ways to use the plan and it points users seeking specific information to the appropriate section(s) of the plan. The guide states, "If you are interested in management of a particular property or area…you might want to 'enter' the document at Chapter 4:35 and appendix B. There you'll find community descriptions, SGCN lists, information on the problems impacting those communities."[446]

### *Short fact sheets*

Short fact sheets that summarize the findings of each plan element are useful for plan users at other agencies or conservation NGOs that want to quickly understand the overall plan contents without sifting through hundreds of pages of text. These summaries essentially serve as white papers that make the most significant findings of the plan readily accessible readers.

New Hampshire, for example, has created an online fact sheet that focuses on plan contents, but without resorting to technical jargon. With headings such as "What is threatening their survival?" and "What can we do?" the fact sheet addresses the required elements of threats and actions while making itself more accessible to the general public and potential plan users.

### *Create mini-plans that are relevant to a variety of scales*

Dividing the plan into a series of mini-plans is another effective way to disperse plan information in a more user-friendly format. New Jersey's plan, for example is divided into major sections. The second section of the plan is further divided into five ecoregions and 26 conservation zones. Here, specific species, threatened habitats, goals and actions are identified. Each of these small sections can be considered a "mini plan"—similar in format to the others, but with location-specific threats and actions which interested parties can quickly find and utilize.

Mini-plans can be useful at the smaller habitat and species scales as well. States such as Vermont and New Hampshire have included habitat summaries and SGCN profiles as part of plan appendices. By organizing the plans in this manner, groups or individuals with a narrow conservation focus or interest are able to quickly find information related to their work or needs.

### *Hire a designer where resources allow*

A study of stakeholder engagement in Maine, New Hampshire, and Vermont found that those from New Hampshire were, on average, significantly more in agreement that their state's plan was "well laid out and easy to navigate."[447] New Hampshire is also the only one of the three states to have hired a professional designer for its plan.[448] Having a professional handle the design of the final plan document can ensure that the document is more accessible to the general reader and may lead to increased utilization of the information.

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[446] VFW, p. vi.

[447] Lauren Pidot, "Looking Beyond the Agency: The Influence of Stakeholder Engagement on the Perceived Success of the Maine, New Hampshire, and Vermont State Wildlife Action Plans," unpublished.

[448] New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.

## 5.) Put Wildlife Conservation "On the Map"

### *Utilize GIS for planning*

The use of Geographic Information Systems (GIS) has become a crucial element of landscape ecology and conservation planning. Furthermore, the "IAFWA Guiding Principles recommends that states "make the Plan-Strategy spatially explicit, to the extent feasible and appropriate, with a full complement of GIS and other maps, figures, and other graphics … so it can be used effectively by all partners."[449]

Northeast states that have put resources towards development of comprehensive mapping systems have benefited from visual communication of conservation goals to stakeholders, spatial analysis of landscape patterns, and improvement in monitoring and assessment. Coordinators who feel that their state is too small to spatially prioritize the landscape GIS may look to the New Jersey Landscape Project as an exemplar project (see example below). Some coordinators expressed concern that spatial databases might create opposition from property rights or political groups. Where additional state mapping is not feasible, we encourage coordinators to utilize existing national or state-based mapping projects, including Natural Heritage or Gap Analysis information.

### *An example: The Landscape Project*

The Department of Environmental Protection (DEP) developed New Jersey's Landscape Project in 1994 to create a "landscape level approach to imperiled species conservation".[450] Its purpose is to provide its users with scientific information that can be integrated with planning and land management programs at multiple scales in government, including non-governmental organizations and private landowners.[451]

Currently, the Landscape Project is used in New Jersey to:

- Prioritize conservation acquisitions through the development of critical areas maps;
- Guide regulators and planners to enhance wildlife protection throughout the planning process;
- Empower citizens to protect species habitats through publicizing the landscape information and,
- Guide stewardship of conservation areas and allow Endangered and Nongame Species Program (ENSP) biologists to develop best management practices for long-term conservation.[452]

More information on the Landscape Project can be found in Attachment A of the New Jersey Wildlife Action Plan.

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[449] Teaming With Wildlife Working Group, Guiding Principles for States to Consider in Developing Comprehensive Wildlife Conservation Plans and Wildlife Conservation Strategies (Plans-Strategies) for the State Wildlife Grant and Wildlife Conservation and Restoration Programs ( International Association of Fish and Wildlife Agencies, 2002), p. 2, http://www.fws.gov/r5fedaid/swg/Planning%20Resources/default.htm.
[450] NJDFW, Attachment A, p. 5.
[451] Ibid., p. 7.
[452] Ibid.

## 6.) Improve monitoring strategies

*Specify benchmarks for success and programs to monitor them*

Methods of monitoring individual species, habitats, and programs mentioned within the plans ranges from specific directives, resembling step-by-step instructions, to relatively abstract goals with similarly abstract keys to success. Most states included general monitoring strategies that lack the rigor of enumerated institutional controls. While it is too early to assess the implications of such far-reaching language, use of detailed and specific monitoring could provide a more effective structure for evaluating success, thus steering implementation resources towards the most beneficial projects in the future.

New Hampshire and Massachusetts specified their monitoring strategies in greater detail than other Northeast state. New Hampshire, for example, developed a fairly comprehensive monitoring strategy that includes seven expansive state-wide objectives, each with listing expected benefits, threats, resources, critical inputs, and needed "organization" for implementation. This information provides a more concrete understanding of how success will be measured.

New Hampshire and Connecticut have also implemented an approach for tracking plan-based actions and outcomes to assess plan progress. Connecticut, for example, has hired a full-time employee to maintain a database to track actions. We suggest that all states engage in this type of tracking, and we recommend investing in databases with dynamic spatial capabilities that stakeholders can access.

# *Part II: Recommendations for Implementation*

## 1.) Enhance partnerships

Partnerships can increase efficiency by pooling fiscal and staffing resources. The following are specific recommendations for enhancing partnerships for implementation of the plans.

*Collaborate with other state agencies and integrate plans where possible*

Many times, separate organizations are working towards similar goals without knowledge of the others' actions or progress. Without proper communication and collaboration, such strategies result in organizations implementing similar plans "working *near* each other, but not necessarily *with* each other."[453] Collaborating with other state agencies where appropriate can result in reduced workloads and better outcomes for both parties. An example can be found under the Legacy Program of the Department of Defense, where DOD has organized five SWAP and Integrated Natural Resource Management Plan workshops designed to increase knowledge about the compatibility and integration of these two plans. We also encourage state agencies to collaborate with appropriate land-use planning departments and departments of transportation.

*Engage private land owner constituencies*

Given that the Northeast has such high rates of private land ownership, it is important to engage and educate the private landowner in conservation efforts. The Landowner Incentive Program

[453] Department of Defense, *State Wildlife Action Plan and Integrated Natural Resource Management Plan Workshop: Workshop Summary*, (quoting Bruce Beard) (emphasis in original), http://www.swap-inrmpworkshops.net/events1_seswap1_summary.pdf.

(LIP) provides states with an important implementation tool to address SWAP priorities by working directly with the private landowner to protect at-risk species and improve habitat. The LIP program began in 2003 and was recently cut in the FY2008, budget though many states have funding to continue the program.

A recent survey of national LIP coordinators shows that the program enables states to engage with a diverse constituency of private landowners. Of the 33 states responding to the survey all had worked with traditional, individual landowners, and over half had worked with absentee landowners, hobby farmers, and land trusts. States are also building relationships with community associations, sportsmen's clubs, towns, and corporate landowners.[454] Authorizing programs such as LIP for future private land owner engagement would enhance partnership opportunities and should be encouraged.

### *Engage municipalities*

As the primary authority for local land use decisions, town, municipal, and county governments play a critical role in maintaining biodiversity, habitat, and wildlife resources.[455] Still, many local planners do not understand the relationship between biodiversity and sustainable human communities, are unaware of state wildlife priorities, or are unsure how to best integrate wildlife protection with local planning and development goals.[456] Programs such as the Vermont Community Wildlife Program and the New Hampshire Fish and Game technical-assistance workshops that distribute and interpret SWAP data and maps are instrumental in assuring that wildlife priorities reach the local municipality.

### *Education and outreach*

A majority of state agency staff identified misunderstandings of standard operating procedures, responsibilities, and limitations as a challenge when working with partners for implementation. By educating potential partners about agency limitations and procedures, confusion and frustration may be avoided further in the implementation process.

## 2.) Build on success — monitor what's being done and share successes

There are many examples of successful implementation projects, however, not all of these success stores are being documents or shared. State coordinator e-mail listservs have been noted as one outlet for the dissemination of information between agency staff. Implementation databases serve as another useful tool in sharing information.

### *Utilize implementation databases*

[454] Steven Riley, "National Survey of the Landowner Incentive Program," (AFWA LIP Working Group, Unpublished raw data, 2007).
[455] Environmental Law Institute and Defenders of Wildlife, *Planning for Biodiversity: Authorities in State Land Use Laws* (Washington DC: Environmental Law Institute and Defenders of Wildlife, 2003), p. vii.
[456] Vermont Fish and Wildlife representative, telephone interview with Michelle Aldridge, October 4, 2007, Ann Arbor, MI.

To guide implementation and prepare for updates to the plan, Connecticut has hired a full-time database manager who collects and manages the vast amount of field data related to implementation. The information is logged on an Access database. [457]

The database manager also assists with the development of GIS resources. Soon the wildlife division will launch, over the agency network, a user interface that will allow access to mapping resources for all staff.[458] This new resource addresses one of the key goals of the SWAP: to improve, expand, and update mapping resources and make these available to the staff and the public.

The Conservation Action Registry is another excellent example of using a database for monitoring project implementation and success within Oregon, Washington and Idaho. Here the information collected is accessible by the Internet.

## 3.) Leverage funding

### *Utilize a competitive SWG funding process*

Where internal resources are constrained, distributing SWG funds to external partners can increase the pace and scope of implementation. A competitive grant program offers states control over the final disbursement of SWG funds while also allowing the partners with the necessary technical, staffing, and resource capacities to further plan goals.

To date, in the Northeast region, only New York has implemented a competitive grant program requiring both agency and non-agency actors to apply for SWG funds.[459] But both Rhode Island and Maine are considering forms of competitive grants under SWG.[460] Maine's interest in this program demonstrates the benefits of a competitive grant program when agencies are fiscally constrained. Due to a lack of matching funds, Maine may be unable to spend all of the SWG funds that have been allocated from the federal government.[461] A competitive grants program may provide the exposure needed for states to meet their match requirements through partnerships. As one state coordinator put it, "Nothing brings in partners like money."[462]

In agencies possessing the capacity to implement actions with an internal SWG process, enacting a process that makes SWG funds available to external partners can help to stretch the usefulness of each SWG dollar by matching it with external partner funds.

### *Train staff in writing and identifying funding opportunities*

While extremely beneficial, SWG funds represent a small source of funding for many state wildlife management agencies in the Northeast. Due to their small sizes and populations, many states receive the minimum allocation of one percent ($600,000 in recent years). Significant

[457] Connecticut Department of Environmental Protection representative, telephone interview with Christopher Theriot, October 12, 2007, Ann Arbor, MI.
[458] Ibid.
[459] New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, October 9, 2007, Ann Arbor, MI.
[460] Rhode Island Department of Environmental Management Division of Fish and Wildlife, telephone interview with Joel Visser, September 27, 2007, Ann Arbor, MI. Maine Department of Inland Fisheries and Wildlife, telephone interview with Lauren Pidot, September 27, 2007, Ann Arbor, MI.
[461] Maine Department of Inland Fisheries and Wildlife, telephone interview with Lauren Pidot, September 27, 2007, Ann Arbor, MI.
[462] Washington Department of Fish & Wildlife representative, telephone interview with Ashley Lowe, September, 28, 2007, Ann Arbor, MI.

resources will be needed to successfully implement the plans, and agencies will need to identify other sources of funding.

While imposing an up front cost, hiring a staff member who can dedicate a significant portion of time to identifying and applying for other grants can be an effective method of leveraging additional funding. An agency representative in Rhode Island, noting that federal aid is often complex, regretted the retirement of the staff member who filed most of the federal aid paperwork, stating "Another person's going to fill that slot and there will be a learning curve."[463] But the representative added that the agency has restructured its staff and assigned a federal aid coordinator that would probably make it easier to identify and obtain federal aid from sources other than SWG.[464]

Dedicating a staff member coordinating federal-aid grants and may result in greater outcomes than overlooking federal aid, or addressing funding from an un-coordinated approach.

## 4.) Increase municipal community outreach

### *Hire or reassign an outreach staff member*

Municipal outreach programs that are most formally integrated into the state wildlife agencies employ at least one staff member whose primary duty is to share state wildlife priorities with localities, conservation organizations, and other state government agencies. "When you're working with a lot of partners, you really need to have somebody that's thinking about this in the shower every morning," said a local planner from New Jersey. "Otherwise life gets in the way. Everybody's busy."

State approaches to staffing vary. Maine's Beginning with Habitat program employs two full time biologists and a cartographer.[465] Although it has been facing a hiring freeze and have not been able to create new positions, the New Hampshire agency re-allocated the job description of one biologist position so that 80 percent of that biologist's time is devoted to technical assistance, including sharing state wildlife priorities with local communities.

## 5.) Contract out where not possible to hire

State agencies face many challenges in hiring full time employees, thus consultants sometimes more desirable and better able to execute important projects, especially when an agency lacks personnel in an area of expertise needed for a specific project. In Connecticut, for example, the state agency hired two GIS consultants to address data gaps on forest resources in their Forest Stand GIS database project. The agency is also working with the University of Connecticut Extension Service to digitize information that was available only on printed maps.[466] The creation of these temporary positions may circumvent hiring freezes and redirect permanent staff for other tasks.

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[463] Rhode Island Department of Environmental Management Division of Fish and Wildlife, telephone interview with Joel Visser, September 27, 2007, Ann Arbor, MI.

[464] Rhode Island Department of Environmental Management Division of Fish and Wildlife, telephone interview with Joel Visser, September 27, 2007, Ann Arbor, MI.

[465] Maine Department of Inland Fisheries and Wildlife representative, telephone interview with Michelle Aldridge, October 12, 2007, Ann Arbor, MI.

[466] Connecticut Department of Environmental Protection representative, telephone interview with Christopher Theriot, October 12, 2007, Ann Arbor, MI.

## 6.) Improve agency transparency

Six Northeast states identified clear communication of agency decisions as key to successful implementation of wildlife management strategies. Where state agencies share their decision-making and funding processes, partners better understand agency goals.

A New Hampshire NGO representative noted that by being involved at agency meetings, the NGO better understand state agency priorities.[467] Other NGOs have expressed concern over the lack of transparency in funding decisions, especially with relation to SWG funds.[468] When agencies become are clearer about their processes and goals, with respect to both management and funding, NGOs develop greater confidence in the agency and the potential for collaborative efforts. Therefore, we recommend that agencies disclose information about how SWG funding applies towards conservation and the grants selection process, where applicable.

## 7.) Integrate climate change into plan implementation

Due to the scope of the problem, climate change has not traditionally been addressed by state fish and wildlife agencies, but it must be addressed at multiple scales, including the local level. A New Hampshire planner in a highly developed coastal area saw climate change as the region's most pressing wildlife concern. Additionally, representatives from local planning organizations identified a need for spatial climate change data, as it may help them prioritize where to focus their efforts.

Opportunities may also exist to utilize the climate-change debate to leveraging funds for wildlife conservation. The Warner-Lieberman bill presents an opportunity to connect the Wildlife Action Plans to a major bill in Congress. Under the current Warner-Lieberman bill, America's Climate Security Act, a proposal exists to create an adaptation fund for conducting activities in accordance with comprehensive wildlife conservation strategies and, where appropriate, other fish and wildlife conservation strategies. Specifically, the bill calls for twenty percent of the adaptation fund to be applied toward conservation programs administered by FWS that protect endangered species, migratory bird, and other fish and wildlife programs administered by the FWS.[469] Gathering political support for these bills could result in increasing funds to wildlife conservation programs such as SWAP. One possible use for the newly formed Teaming with Wildlife Coalitions may be to mobilize around this issue.

## 8.) Continue the Regional Conservation Needs Program

By addressing regional conservation needs at the appropriate scale, NEAFWA is utilizing monetary resources in an efficient and comprehensive manner. The objectives of the regional program will help ensure that future interstate collaborations in the Northeast will be viable undertakings. As of October 2007, the group is almost done classifying the Northeast Region's habitats, but it has not yet begun to prioritize or map them.[470] The group aims to completed the

[467] New Hampshire Conservation NGO representative, telephone interview with Michelle Aldridge, October 10, 2007, Ann Arbor, MI.
[468] Maine Conservation NGO representative, telephone interview with Lauren Pidot, September 28, 2007, Ann Arbor, MI.
[469] America's Climate Security Act of 2007, SB 2191, SEC. 4702, "Adaptation fund," 110th Congress, 1st Session (introduced October 18, 2007).
[470] New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, October 1, 2007, Ann Arbor, MI.

project by the spring 2008. According to a Massachusetts agency staff member, the project is of high importance because, "It's going to be the foundation for all of our regional work."[471]

[471]Massachusetts Division of Fish & Wildlife Department of Fish and Game representative, telephone interview with Edalin Michael, September 24, 2007, Ann Arbor, MI.

# Appendix I

## *Statewide Conservation Actions and Priorities*

### Connecticut Conservation Actions[472]

1. Determine distribution, abundance, condition and limiting factors (threats) for all GCN and habitats.

2. Evaluate impact of invasive plant and animal species on GCN species and their habitats and develop/implement applicable management strategies.

3. Develop statewide guidelines to minimize impacts of residential/ industrial development on GCN species.

4. Continue to participate in regional conservation efforts for GCN species such as Indiana bat, Puritan tiger beetle, New England cottontail, timber rattlesnake, golden-winged warbler, cerulean warbler, Atlantic and shortnose sturgeon, American eel, and winter flounder.

5. Implement existing recovery plans for all GCN in Connecticut.

6. Develop and implement inventory, survey, and monitoring protocols to determine and track the status and condition of key habitats.

7. Develop improved data collection, management, and retrieval system to track the status of GCN species and key habitats.

8. Map key habitats at landscape level to determine and monitor their status and condition in Connecticut.

9. Enhance efforts to provide current information on GCN species and key habitats to land use planners, decision makers, public at the local, region and statewide scale.

10. Implement programs promoting conservation of GCN species and their habitats.

11. Work with conservation partners to conserve GCN and key habitats statewide.

12. Reduce impacts from human disturbance to GCN species.

13. Enhance conservation of collectible/poached species by improving monitoring of sites and law enforcement efforts.

[472] CTDEP, p. 4-3.

*Connecticut Statewide Conservation Actions*

> *Each of the above conservation actions is considered high priority.*[473]

**Maine Program Components ('Super Strategies')**[474]

1. Surveys and Monitoring
2. Research
3. Population Management
4. Habitat Conservation
5. Education and Outreach

*Maine Statewide Conservation Priorities*

> In order to assess priorities across taxa, MDIFW and MDMR staff, in consultation with species experts and stakeholders, identified the two highest priority conservation super strategies for each species of greatest conservation need by habitat. Surveys and monitoring and habitat conservation are listed most frequently as priority super strategies to protect SGC.[475]

**Massachusetts Conservation Strategies**[476]

1. Proactive habitat protection
2. Collection of biological information
3. Conservation planning
4. Environmental regulation
5. Habitat restoration and management
6. Coordination and partnerships
7. Conservation/environmental education

*Massachusetts Statewide Conservation Priorities*

"The foremost priority among these [conservation] strategies is the proactive protection of the habitats of the species in greatest need of conservation."[477]

To make and implement this prioritization for land protection, the following elements are necessary:

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[473] CTDEP, p. 4-1.
[474] MDIFW, p. 6-2.
[475] MDIFW, p. 6-12.
[476] MDFW, p. 132.
[477] Ibid.

- Knowledge of what land is protected in the Commonwealth, by whom, and for what purpose.

- Knowledge of the biological resources of the state, particularly of the species and habitats in greatest need of conservation.

- Knowledge of which species and habitats are already protected.

- Prioritization of protection efforts.

- Identification of land for protection, based on stated priorities.[478]

**New Jersey Recommended Conservation Actions[479]**

1. Full recovery of rare species populations through habitat restoration, land acquisition, and landowner incentives.

2. Public education and outreach programs regarding wildlife, critical habitats, and the deleterious effects of invasive species and other threats.

3. Development of effective conservation partnerships among organizations representing diverse interests in wildlife conservation.

4. Continued research and monitoring of SGCN to inform biological databases and NJ's Landscape critical habitat mapping, and direct local and statewide conservation effort.

[478] MDFW, pp. 133–135.
[479] NJDFW, p. 13.

*New Jersey's Statewide Conservation Priorities*[480]

The following goals are listed in order of priority assigned by stakeholders.

- Identify and protect breeding, migration, wintering habitats and landscapes essential for long-term viability of wildlife and fish populations of species of conservation concern.

- Restore populations of endangered and threatened wildlife to stable levels that allow their delisting by population management, protecting critical habitat, and habitat restoration and enhancement.

- Identify, restore, and protect unique ecosystem processes including the control and/or removal of invasive and exotic species, fire management, and delayed and alternate patch mowing.

- Identify, monitor and conserve, key migratory corridors and stopover locations for migratory birds.

- Improve communication between farmers foresters and land stewards of private, local, state and federal lands to develop habitat management plans that enhance habitats for species of conservation concern and maintain or improve the ecological integrity of the natural community.

- Reduce the adverse impacts of non-native invasive species, subsidized predators, and over-abundant native species on critical wildlife, natural communities, and habitat quality.

- Identify, protect and minimize human disturbance at sensitive locations (nests, hibernacula, breeding pools, critical concentration or feeding areas, etc.).

- Maintain connectivity of habitats at the landscape scale.

- Conduct long-term monitoring to evaluate population viability through statewide surveys, atlases, and effectiveness of protection and restoration efforts of both wildlife and their habitats.

- Identify, maintain, and restore natural vegetative communities through sustainable, area-specific deer densities.

**New York Statewide Priority Strategies/Actions**[481]

1. Data collection
2. Planning

[480] NJDFW, Appendix H.
[481] NYDEC, p. 71.

3. Land protection
4. Management and restoration
5. Information dissemination
6. Regulatory and legislative
7. Incentives

*New York Statewide Conservation Priorities*

All of the above recommendations are intended to be of high priority to implement in the coming 5 to 10 years for the benefit of the most critical SGCN in the state.[482]

> "Before other conservation actions can be taken to combat the harmful effects of habitat loss and fragmentation, data need to be collected on specific habitat requirements of SGCN, population processes, and how, when, and where habitat management and/or restoration should occur."[483]

**New Hampshire Conservation Strategies[484]**

1. Intra-agency coordination and policy
2. Conservation planning
3. Education and technical assistance
4. Environmental review
5. Habitat management
6. Interagency regulation and policy
7. Land protection
8. Landowner incentives
9. Monitoring
10. Population Management
11. Regional Coordination
12. Research
13. Local regulation and policy

*New Hampshire Statewide Conservation Priorities*

> According to the Wildlife Action Plan, New Hampshire's conservation strategies are not yet prioritized: "A principal need is the prioritization of [Wildlife Action Plan] strategies and objectives. This task will be aided by the risk assessment scores and feasibility ranking forms developed as part of the WAP. Priority strategies and objectives will be reviewed by partners and revised as appropriate."[485]

[482] NYDEC, p. 71.
[483] NYDEC, p. 523.
[484] NHFG, p. 5-2.
[485] NHFG, p. 7-1.

The following "desirable outcomes" were identified to guide plan "development and future implementation."[486]

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.

**Pennsylvania CWCS Goals[487]**

Goal 1: Improve the scientific basis for making conservation decisions for wildlife, with special emphasis on species of greatest conservation concern

Goal 2: Plan, prioritize, and implement actions that will conserve the state's diversity of wildlife and its habitat

Goal 3: Develop a knowledgeable citizenry that supports and participates in wildlife conservation

Goal 4: Ensure that the necessary resources are available to conserve Pennsylvania's wildlife

Goal 5: Expand and improve coordination of the public agencies and other partners in wildlife conservation planning and implementation

*Pennsylvania Statewide Conservation Priorities[488]*

- *Identify high-quality habitats (1-5 years)*
- *Support the protection of exemplary sites (1-5 years)*
- *Develop multi-species management guidance (1-5 years)*
- *Targeted attention to unique/isolated habitat types (1-5 years)*
- *Support habitat restoration efforts for immediate/high levels of concern species (5-10 years)*

[486] NHFG, p. XIII.
[487] PGC and PGBC, p. 9-1.
[488] PGC and PGBC, p. 11-23.

**Rhode Island Overarching Statewide Conservation Actions**[489]

1. Augment ability of the RI DEM DFW to implement the CWCS.
2. Facilitate acquisition or easement of key parcels and coordinate acquisitions with other state and regional programs.
3. Digitize all state parcel data in digital form and create an overlay of protected lands and waters.
4. Assemble all existing life history and known locality information.
5. Enhance GIS data - Geo-reference existing taxonomic data sets and
6. Create new GIS coverages (spatially explicit information) on the status, location and distribution of GCN species and location and condition of key habitats.
7. Assess threats to species and habitats.
8. Identify all critical habitats.
9. Develop and continue partnerships with private landowners and identify any other appropriate partners.
10. Outreach to appropriate partners, initiate landowner contact.
11. Promote existing programs to private landowners and provide technical assistance where required.
12. Compile, publish, and disseminate data and results.
13. Organize education/outreach programs, including workshops, technical support.
14. Develop focal area and focal species approaches in Rhode Island.
15. Identify focal areas or defensible populations and issues specific to all parcels in focal areas.
16. Identify and pursue the protection and conservation of unprotected parcels in focal areas through acquisition.
17. Conduct outreach to appropriate landowners in focal areas regarding chemical management.
18. Determine lethal and non-lethal effects of contaminants.
19. Develop process to facilitate research priorities.

[489] RIDEM, p. 102.

*Rhode Island Statewide Conservation Priorities*

> All actions presented in Rhode Island's Action Plan are considered priority actions. The statewide actions listed above have a greater conservation effect across taxa and habitats and are thus considered highest priority actions.[490]

**Vermont Conservation Strategies[491]**

1. Land/water protection
2. Land/water/species management
3. Law and policy
4. Research, education and awareness
5. Economic and other incentives
6. Capacity-building

*Vermont Statewide Conservation Priorities[492]*

Statewide priorities are not explicitly identified. Statewide "themes for action" include the following:

1. Through education, legislation, and policy improvements address issues such as sprawl, poorly planned development, and global warming that drive habitat conversion, degradation and fragmentation (The Wildlife Society).

2. Through education, incentives, legislation, and policy efforts address global warming and pollutants such as mercury and acid deposition.

3. Develop a collaborative, statewide and regional wildlife monitoring and adaptive management program to develop SGCN baselines, measure progress toward desired outcomes for SGCN, and to evaluate and improve the effectiveness of the conservation strategies proposed here and throughout this document.

4. Through policy and education support the enforcement of existing laws that protect species of greatest conservation need.

5. Work to develop and implement landowner incentives, technical assistance and education for sustainable management of species of greatest conservation need.

6. Provide regional coordination for conservation and management of species of greatest conservation need.

[490] RIDEM, p. 101.
[491] VFWD, Appendix C.
[492] VFWD, p. 1-9.

# Appendix II

| | State-wide conservation strategies | Habitat-specific (or "suites of species") actions | Species-specific conservation actions | Actions linked to particular threats | Actors associated with recommended actions | Performance measures associated with actions |
|---|---|---|---|---|---|---|
| **Connecticut** | 13 actions considered to have broad impacts across habitats and taxa. Each associated with broad measures to monitor effectiveness. | X | X | X | | X |
| **Massachusetts** | Seven broad strategy categories. No associated actions or objectives directly listed in plan. | X | | X | | X |
| **Maine** | Five major categories of threat and need under which countless conservation actions may be categorized. | X | X | X | | X |
| **New Hampshire** | Eight conservation strategies with associated objectives | X | X | X | X | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **New Jersey** | Four broad conservation strategies. | X | X | X | | |
| **New York** | Seven recommendation categories, all of high priority. A few to several specific actions associated with each. | X | X | X | X | |
| **Pennsylvania** | Five broad conservation goals listed in order of priority. Strategic and operational objectives associated with each. | X | | | X | X |
| **Rhode Island** | 19 actions listed under statewide threats to species and habitats. | X | X | X | | |
| **Vermont** | Six general categories under which 24 strategy classes are organized. Adapted from Salafsky's Proposed Taxonomy of Conservation Actions (2005) | X | X | | X | X |