

State Wildlife Agency Conservation Priorities and Community Planning in the Northeast U.S.

Michelle Aldridge & Michael Jastremski

School of Natural Resources and Environment

University of Michigan

April 2008

State Wildlife Agency Conservation Priorities and Community Planning in the Northeast U.S.

I. Abstract.....	4
II. Introduction	5
State conservation priorities and local planning	6
Methods	6
Study Limitations.....	7
III. How are state wildlife agencies communicating priorities to localities?	8
Maine’s Beginning with Habitat Program	8
Massachusetts’ BioMap and Living Waters Programs	10
New Jersey’s Landscape Project.....	12
New York’s Hudson River Estuary Program.....	14
Vermont’s Community Wildlife Program	17
New Hampshire’s new outreach and technical assistance program.....	19
IV. What are the challenges to collaborative state-local wildlife planning?	21
State Challenges.....	23
Overwhelming number of diverse municipalities	23
Insistence on local autonomy/resistance to state level planning	23
High turnover of local land-use decision makers	24
Lack of regulatory mandates to plan for biodiversity conservation	24
Lack of data on biodiversity distribution	25
Property rights advocate backlash against spatial prioritization.....	25
Lack of wildlife agency resources.....	25
Unclear point of contact at state wildlife agency	26
State-scale priorities not applicable to local level planning	26
Lack of local planning expertise on wildlife conservation.....	27
Competing priorities, especially where development threats are not pressing.....	27
Lack of financial incentives	28
V. What important techniques are wildlife agencies using to facilitate collaboration?.....	28
Strategies for bridging the gap between state and localities	29
Dedicating agency staff to collaboration.....	29
Working with intermediary partners	30
Targeting local champions	31
Strategies for facilitating local conservation planning	32
Distribution of natural resource inventory maps	32
Technical assistance programs	33
Collaborative asset mapping	34
Direct review of local plans, codes and ordinances	35
Strategies for encouraging the prioritization of conservation planning	35
The Carrot: Financial Incentives	35
The Stick: Regulatory Opportunities.....	36
VII. How can State Wildlife Action Plans be used to encourage collaboration?.....	37
Case study: SWAP sparks new community outreach (New Hampshire).....	38
Case Study: The Raritan-Piedmont Wildlife Habitat Partnership (New Jersey).....	39
VIII. Recommendations	40
Bridge contact between state wildlife agencies and localities	40
Provide clear spatial priorities and technical assistance to facilitate local conservation planning.....	41
Provide incentives for prioritizing conservation planning	41
Build on success	42

About this Study42
Endnotes:43



I. Abstract

While the adoption of State Wildlife Action Plans suggests significant progress for wildlife conservation at the state and federal levels, to achieve their full potential, the plans must influence land use planning decisions on local scales. As the primary authority for land use decisions, municipal and county governments play a critical role in maintaining biodiversity, habitat and wildlife resources. Still, many local planners are unaware of state wildlife priorities or are unsure how to best integrate wildlife protection with their planning and development goals.

In this paper, we explore the relationship between state wildlife agency priorities and local land use planning in eight Northeast states. We discuss how agency-organized collaboration with local planners was occurring in Fall 2007, drawing primarily on conversations with individuals involved with land use and conservation planning at both the state and local levels. Next we identify common challenges to state-local collaboration, as identified by interviewees, and techniques for overcoming those challenges. We then discuss the emerging potential of the SWAPs as a tool for land use decision makers, and share two case studies where implementation of the plans has encouraged local wildlife protection. Finally, we offer recommendations for encouraging state-local collaborative conservation planning.

II. Introduction

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.¹ In 2006, the region was home to 54.6 million people.² The Northeast is the most densely populated region of the country, with six of its states among the top ten densest in the nation.^{3 4} The dense band of urban and suburban communities southeast from Boston to New York City, Newark, Philadelphia, and eventually Baltimore and Washington, D.C., is one of the nation's largest metropolitan regions.⁵ The region's density drops off in its most-northern stretches, such as in northern Maine, where many areas of the state remain unincorporated land.⁶

Despite a history of compact development in the Northeast, recent development trends are leading to more developed acreage per capita. For example, from 1950 to 2000, Massachusetts' population increased 28%, but the area of developed land increased 200%.⁷ Overall, the region is the most developed in the U.S. The top four U.S. states with the greatest percent of developed non-federal land in 1997 were New Jersey (39.1%), Rhode Island (30.5%) Massachusetts (30.4%), and Connecticut (28.6%).⁸ Looking beyond the human environment, the Northeast is comprised of a rich tapestry of natural landscapes upon which more than 1,300 vertebrate species rely.⁹ The region includes millions of acres of mountains, forests and grasslands, and thousand of miles of rivers and coastline.

As the human environment grows, forests, wetlands and agricultural lands are covered with roads and buildings, and wildlife species face shrinking and fragmented habitat. The loss of open space escalates the impact of other wildlife threats, by altering hydrologic regimes and natural fire patterns, decreasing species adaptability to global climate change, and increasing pollution, the spread of invasive species, recreation activity, road density, noise pollution, urban and edge predators, and the risk of stress-related diseases.¹⁰

Not surprisingly, all fish and wildlife agencies in the region¹¹ report that their most significant conservation challenges stem from direct and indirect destruction of habitat, and fragmentation resulting from development and transportation infrastructure.¹² Because most Northeast land-use and development pattern decisions are made at the local level, local land use planning is an extremely important platform for addressing wildlife conservation challenges.

State conservation priorities and local planning

In 2005, fifty states and six territories adopted comprehensive wildlife conservation strategies to ensure continued eligibility for federal conservation dollars.¹³ The strategies, collectively known as State Wildlife Action Plans (SWAPs), required state wildlife agencies to prioritize species and habitats of greatest conservation need, identify threats to those habitats and species, and recommended actions to address these threats.¹⁴ Collectively, the plans identified the importance of incorporating conservation goals in local planning. Forty-six plans defined coordinating with land use planners as a conservation action, and twenty articulated a need for state technical assistance to planners.¹⁵ Northeast states agencies articulated multiple strategic actions for collaboration with localities, including providing (a) community scale wildlife inventories, (b) technical assistance to local planners, (c) direct input for local planning processes, and (d) financial incentives for encourage local conservation planning. These strategies show that wildlife managers across the Northeast identify a need for more collaboration with local planners

Methods

In the following pages, we explore where agency-organized collaboration with local planners was occurring in the Northeast in Fall 2007, how it was being done, and the challenges, opportunities and successes associated with these efforts.

It is important to note that although State Wildlife Action Plan priorities were the starting point of our research, it was not our goal to determine whether these documents created opportunities for collaborative efforts with planners. Emerging research has shown that the SWAPs are collectively more inclusive than other state fish and wildlife plans at identifying state species, habitats, threats and actions across the region.¹⁶ The plans are considered the most comprehensive wildlife conservation plans by the state agencies themselves.¹⁷ Therefore, by using SWAPs as a proxy for state conservation priorities, we were simply trying to determine where agency-organized collaboration with local planners was occurring, how it was being done, and the challenges, opportunities and successes associated with these efforts.

Our study was designed to answer four key research questions:

- What actions have the state fish and wildlife agencies taken to communicate state conservation priorities to city, county, municipal, non-profit and other land-use decision makers?
- What are the challenges associated with collaborative state-local wildlife planning?
- What do people involved in state wildlife conservation and local planning feel are the most important techniques to facilitate collaboration?
- How can the State Wildlife Action Plans be used to encourage collaboration?

To explore how state wildlife agencies are sharing their priorities with local land-use decision makers, we first conducted phone and e-mail interviews with State Wildlife Action Plan coordinators in eight states – Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island and Vermont. Where communication of state conservation priorities to local land-use decision makers was occurring in a formal way, we spoke further with state agency professionals and local and regional planners and conservation non-governmental organization (NGO) representatives directly involved in these efforts. Local, regional, and NGO interviewees were selected because of their engagement in land use planning activities that incorporate state wildlife priorities. A total of 26 interviews were conducted across eight states. We attempted to reach staff at the Connecticut Wildlife Division, but without success.

We asked each interviewee a series of open-ended questions designed to explore existing collaborative conservation planning between states and localities. We defined collaborative conservation planning as the development of land use strategies to facilitate wildlife protection, created jointly between state wildlife agencies and local land use decision makers (elected or appointed officials, members of conservation, environmental or planning commissions, and planning staff at municipal, county or regional levels).

Study Limitations

It was beyond the scope of our study to determine whether state collaboration with localities is impacting wildlife populations or habitat integrity.

III. How are state wildlife agencies communicating priorities to localities?

Northeast state fish and wildlife agencies vary considerably in method and degree of engagement with local planners.

- Maine, Massachusetts and New Jersey wildlife agencies have been sharing state priorities with local planners for years through well-known programs: Beginning with Habitat,¹⁸ BioMap,¹⁹ and the Landscape Project,²⁰ respectively.
- New York’s wildlife agency is engaged in collaboration with localities in the Hudson River Valley region through the Hudson River Estuary Program, but not statewide.²¹
- Vermont’s wildlife agency launched the Community Wildlife Program in 2006 to help provide wildlife planning assistance to localities.²²
- New Hampshire’s SWAP development and improved spatial priorities directly spawned a wildlife agency program designed to target local planners and GIS professionals.²³
- Pennsylvania²⁴ and Rhode Island²⁵ wildlife agencies do not currently engage local planners in a formal way.

Characteristics of each of the above formal state programs including impetus, goals, structure, and recent successes are described in this section.

Maine’s Beginning with Habitat Program

Impetus: In 2000, after nearly two decades of identifying conservation actions through a habitat approach, Maine researchers concluded that 80 to 95 percent of the state’s terrestrial vertebrate species would be protected if the state’s riparian habitats, high value animal habitats, and large habitat blocks were managed for

Maine: Vital Statistics	
Population ²⁶	1,321,574
Density (per square mile) ²⁷	41.3
Rate of Growth (2000-2005) ²⁸	3.4%
Total Land Area (square miles) ²⁹	30,861.55
# of Species in Need of Conservation ³⁰ : # of Endangered Species	213 : 34
Major Wildlife Threats ³¹	Land conversion, fire management, abandonment of agricultural land, timber harvesting, insect defoliation of forests, aquatic invasive species, dams, water pollution, pesticide use, excessive aquatic nutrients.

conservation.³² That year, the Maine Department of Inland Fisheries and Wildlife launched Beginning with Habitat (BwH), establishing a goal to maintain enough habitat to support all of the native plants and animals breeding in the state.³³

Program Goal: Beginning with Habitat was originally designed to provide spatial information to land trusts protecting habitats in Maine’s most developed areas. Deciding that land acquisition funds could only take conservation so far, the program shifted its focus in 2003 to town level planning, expanding to serve the a greater areas of the state.³⁴ “If we can influence how those decisions can be made and how growth can be done, then we felt that we may be able to have a broader impact than just influencing where acquisition dollars are spent,” a Maine agency representative explained.³⁵

Program Structure: Today, BwH staff includes two biologists and a cartographer, who communicate landscape-based conservation goals with local and regional planners.³⁶ They provide each Maine town with three primary localized maps describing local habitats of statewide and national significance and five supplemental maps.³⁷

Since its inception, BwH staff has directly advised about 190 of Maine’s municipalities, roughly 50 percent.³⁸ In addition to providing maps, the staff review local comprehensive plans and sit on regional planning committees.³⁹ Overall, BwH encourages towns to work toward biodiversity conservation through multiple approaches, including local conservation planning, local regulations, land protection measures, community outreach and education, and regional coordination, allowing communities to select the strategies that best meet their unique needs.⁴⁰

Primary Maps
<ul style="list-style-type: none"> • Water resources and riparian habitats • High value plant and animal habitats • Undeveloped habitat blocks
Supplemental Maps
<ul style="list-style-type: none"> • Focus areas • Public and conservation lands • Watersheds • State planning office wetlands characterization • USFWS Gulf of Maine habitat map

Eventually, BwH staff hopes to move away from hard copy maps to an online map service, so that municipal officials can go online, zoom in on their town and see all the locally-specific information in front of them.⁴¹ In January 2008, the program launched an online toolbox with information on principles of open space planning, examples ordinance language and

analysis of common tools.⁴² Over time, staff hopes to integrate that toolbox with online maps to create narrative pop-ups for particular polygons, highlighting relevant species information and state regulations.⁴³

Recent Success: Until recently, the incorporation of BwH data in comprehensive plan revisions was voluntary, with about an 85% success rate.⁴⁴ However, effective October 2007, Maine’s comprehensive planning law now requires towns to incorporate BwH data points and polygon data into all comprehensive plan revisions.⁴⁵ BwH staff will review the comprehensive plans to ensure that the data and information has been effectively incorporated.⁴⁶ It is important to note that the agency has the authority to enforce inclusion of the information, but not to enforce implementation of the plans.

Those interested in learning more about this program should contact:
 Beginning with Habitat
 Steve Walker, Program Manager
 Maine Department of Inland Fisheries & Wildlife
 41 State House Station
 284 State Street
 Augusta, Maine 04333-0041
 Tel: (207) 287-5254
 Email: steve.walker@maine.gov
 Website: <http://www.beginningwithhabitat.org/>

Massachusetts’ BioMap and Living Waters Programs

Impetus: The BioMap and Living Waters programs were developed to identify areas that are important habitat for the 178 species of vertebrate and invertebrate animals and 264 species of plants that are officially listed as Endangered, Threatened or of Special Concern under the

Massachusetts: Vital Statistics	
Population ⁴⁷	6,016,425
Density (per square mile) ⁴⁸	570
Rate of Growth (2000-2006) ⁴⁹	2.6%
Total Land Area (square miles) ⁵⁰	10,555
# of Species in Need of Conservation ⁵¹ : # of Endangered Species	253 : 176
Major Wildlife Threats ⁵²	Habitat destruction from development, habitat fragmentation from development, suppression of fire and other ecological processes, exotic invasive species.

Massachusetts Endangered Species Act, with the intention of safeguarding the native biodiversity of the state of Massachusetts in perpetuity. BioMap addresses terrestrial ecosystems, and Living Waters addresses freshwater aquatic ecosystems.

Program Goal: The goal of the BioMap and Living Waters projects is to prioritize areas that are most important to the conservation of rare species and natural communities in Massachusetts, and provide that information to entities involved in wildlife conservation and land use planning in the state in order to enable them to act in a strategic manner to protect biodiversity.⁵³ This information is targeted primarily at the state's very active local land trust network, statewide conservation organizations, and local conservation commissions.⁵⁴ The intent is to make the information accessible, easy to understand, and easy to use for conservation planning.⁵⁵

Program Structure: The initial actions taken in the creation of the BioMap and Living Waters projects were a comprehensive evaluation of existing data on species and natural communities of concern in the state, biodiversity assays to fill gaps in that data, and the creation of a GIS layer of BioMap and Living Waters polygons that indicate priority areas for conservation.⁵⁶ Once this state-wide layer was created, people involved in local land-use decision making in each township were mailed a map of the town showing areas of concern within their borders, as well as a report to help interpret the map and to guide its use in planning. These maps are also available online in an interactive format, or as downloadable GIS data. The reports written for each town are available online as well.⁵⁷ All of this information is available in a hard copy form upon request from the Natural Heritage and Endangered Species Program.⁵⁸ The BioMap and Living Waters projects do not include all of the species of greatest conservation need listed in the Massachusetts SWAP, but rather focus on "the rarest of the rare." According to a representative of the Massachusetts wildlife agency, ultimately the maps will be updated to include species recognized by the more comprehensive SWAPs, but given the expense of creating the original maps, this is not a shorter-term goal.⁵⁹

New Jersey's Landscape Project

Impetus: In 1994, the New Jersey Division of Fish and Wildlife's (NJDFW) Endangered and Nongame Species Program (ENSP) adopted a landscape level approach to endangered, threatened and other rare species conservation by developing the Landscape Project.⁶⁶ The Landscape Project produces maps of critical wildlife habitat through geographically referenced data of rare species locations, land use, land cover, and species life history information.⁶⁷

New Jersey: Vital Statistics	
Population ⁶⁰	8,724,560
Density (per square mile) ⁶¹	999
Rate of Growth (2000-2006) ⁶²	3.9%
Total Land Area (square miles) ⁶³	8729
# of Species in Need of Conservation ⁶⁴ : # of Endangered Species	289 : 73
Major Wildlife Threats ⁶⁵	Invasive species, habitat destruction and fragmentation from development, climate change, reduced air and water quality, unsustainable land and water management practices.

New Jersey is the nation's most densely populated state, while at the same time encompassing a diversity of wildlife habitat and associated dependent species.⁶⁸ NJ habitats are important to over 70 species that are listed on state and federal threatened and endangered species lists.⁶⁹ Despite the state's protection efforts, which include strict land use regulations and an aggressive open space acquisition program (Green Acres), it continues to lose critical wildlife habitat at an alarming rate.⁷⁰

Program Goal: The state sought to make maps of state wildlife conservation priorities accessible to those involved in land-use planning, with the ultimate goal of maintaining and enhancing wildlife populations despite development threats.

Program Structure: The Landscape Project identifies critical areas for imperiled species based on land-use/land-cover classifications and imperiled species locations. These maps are then made available to the public over the internet, either in downloadable ArcView shapefile format or through the NJDEP's interactive mapping application.⁷¹

According to a representative of the ENSP, the Landscape Project is an important collaboration and technical tool for regulators, planners and conservation professionals at all scales.⁷² The availability of Landscape Project data has allowed a wide variety of people involved with land use planning to incorporate this information into their planning process.⁷³ The difficulty of discussing conservation priorities will all of New Jersey's 566 municipalities has been a challenge, given the limited resources at the ENSP.⁷⁴ According to a program representative, the Landscape Project's accessibility to computer users has helped to overcome this problem to a certain extent.⁷⁵ Even municipalities without GIS capabilities can consult Landscape Project maps through the NJDEP's interactive mapping application, which allows users to view and overlay pre-made map layers. With the NJDEP's interactive mapping interface, a land-use planner from a municipality has the ability to look at a map of their jurisdiction and see where the critical habitat areas are in relation to other landscape features, and consider that information, even without further spatial analysis. The availability of the NJDEP's interactive mapping interface has been particularly important to volunteer members of Environmental Commissions in the state, many of whom do not have proficiency with complicated GIS software, or the funds to purchase it.⁷⁶

Municipalities with GIS professionals on staff can go beyond viewing habitat maps. GIS users who download Landscape Project data as ArcView shapefiles can overlay critical habitat maps with any other spatial data they're concerned with, and take their analysis of the relationship between critical habitat conservation and other land-use planning priorities further, according to their specific local concerns. ENSP staff hopes to build a more targeted, more comprehensive outreach program to local municipalities. A future goal calls for developing planning expertise on staff, in order to figure out where common ground lies between conservation professionals and land use planners, and further facilitate the incorporation of Landscape Project priorities in land-use planning.⁷⁷

Recent Success: To encourage public use of the Landscape Project, ENSP developed a training program.⁷⁸ Training sessions are open to the public, free of charge and are typically held in computer labs of willing community colleges.⁷⁹ The sessions serve as an outreach tool, and as means of teaching participants how they can incorporate that data into their community's planning process. Participants learn how the Landscape Project was developed and utilize GIS hands-on in order to access critical habitat maps for threatened and endangered species

protection. The trainings have been attended by environmental commission members, planning board members, planners, educators, environmental consultants and representatives of nonprofit groups working in the field of conservation.⁸⁰

ENSP has worked with the Association of New Jersey Environmental Commissions (ANJEC) to conduct Landscape Project training sessions specifically targeted to environmental commission members.⁸¹ The sessions covered examples of incorporating Landscape Project priorities into local ordinances and planning activities.⁸² Although training sessions are limited to available community college computer labs, ANJEC has helped ENSP engage members of Environmental Commissions across the state.⁸³

Those interested in learning more about this program should contact:

Patrick Woerner, GIS Specialist
 NJ Department of Environmental Protection
 Endangered and Nongame Species Program
 P.O. Box 400
 Trenton, NJ 08625-0400
 Tel:(609)-292-1244
 Fax:(609)-984-1414
 Email: patrick.woerner@dep.state.nj.us
 Website: <http://www.state.nj.us/dep/fgw/ensp/landscape/>

New York's Hudson River Estuary Program

Impetus: There were 22 biodiversity hotspots identified in and around the Hudson River Estuary in a 2006 New York Cooperative Fish and Wildlife Research Unit/New York State Department of Environmental Conservation (NYSDEC) report.⁹⁰

New York: Vital Statistics	
Population ⁸⁴	19,306,183
Density (per square mile) ⁸⁵	354
Rate of Growth (2000-2006) ⁸⁶	1.4%
Total Land Area (square miles) ⁸⁷	54556
# of Species in Need of Conservation ⁸⁸ : # of Endangered Species	537 : 32 federal/127 state
Major Wildlife Threats ⁸⁹	Invasive species, habitat destruction and fragmentation from development, climate change, incompatible land use practices.

The estuary's natural resources serve many functions, including providing habitat in the life cycle of many species, supplying water to communities along its banks, creating extensive recreation opportunities. The Hudson River Estuary Program (Estuary Program) was established in 1987 in response to passage of the Hudson River Estuary Management Act, which directed NYSDEC to develop a management program for the Hudson River Estuarine District and its associated shorelands.⁹¹ Since its inception, Estuary Program activities have spread beyond the

estuary itself and into the estuary watershed that includes most of the 10 counties that border the river.⁹²

Program Goals: Founded on the principles of ecosystem management and implemented to support the quality of life valued by Hudson Valley residents, the program aims to conserve the natural resources for which the Hudson is legendary, promote full public use and enjoyment of the river, and clean up the pollution that affects the ability of people to use and enjoy it. The program implements the Hudson River Action Agenda and establishes 12 goals that address the issues outlined above.⁹³

Goal 3 addresses terrestrial plants and animals, and includes outreach to land-use decision makers.⁹⁴ The goal of the outreach portion of the Estuary Program is to synthesize conservation information from disparate sources, package it in a useable form, and distribute it to local governments, as well as build capacity for community conservation planning through training, funding, and technical assistance.⁹⁵

Program Structure: While the Estuary Program is administered by New York's state wildlife agency, it only covers about 17% of the state.⁹⁶ The Estuary Program employs 1.6 staff in community outreach who guide community's through identification of natural resources, resource prioritization and strategy development.⁹⁷ The Estuary Program also partners with other organizations, such as non-governmental organizations and academic institutions to provide technical assistance and training in biodiversity assessment, land-use law, and strategies for linking the two for people involved in land-use planning and decision making.⁹⁸ The Estuary Program also administers grants that help communities inventory their natural resources, conduct outreach and education related to conservation, draft open space conservation plans, and fund projects that implement those plans.⁹⁹

The program does not generally conduct targeted outreach, but instead works with communities that request assistance, as well as trying to ensure that their efforts are evenly distributed across the Hudson River estuary.¹⁰⁰ One of the Estuary Program's biodiversity outreach coordinators told us that a major goal over the next five years is building capacity to conduct more targeted outreach, through specific projects that more accurately map biodiversity resources and fill information gaps.¹⁰¹ This same individual attributes the success that they've

experienced to having dedicated staff with the time to understand local governments and their needs and to build relationships, as well as to being able to work with the partners that they do.¹⁰²

Recent Successes: Through a partnership with Hudsonia, Ltd, a local non-profit science and research organization, the NYSDEC published the Biodiversity Assessment Manual for the Hudson River Estuary Corridor.¹⁰³ Through a contract with NYSDEC, Hudsonia delivers Biodiversity Assessment Trainings (BATs) based on the manual. In this situation, the Estuary Program provides the funding, while the partner organization actually conducts the training.¹⁰⁴ Members of the Town of Gardiner's Environmental Conservation Commission (ECC) participated in Hudsonia's BAT in 2004, and as a result completed a 5,000-acre map of habitats east of the Wallkill River. This relatively understudied area is a mosaic of agricultural land, old fields and meadows, forests and streams, with increasingly intense development pressure. The draft habitat map was digitized and incorporated into Gardiner's Open Space Plan, to help inform priority areas for conservation, and there are plans to formally present the group's findings to the planning board and town board. Gardiner's new zoning law requires conservation assessments on certain subdivision applications before the planning board. The ECC will be involved in these assessments, and using the skills developed during the BAT, will be able to present the planning board with a habitat map of the property in question.¹⁰⁵

Those interested in learning more about this program should contact:

Karen L. Strong
Biodiversity Outreach Coordinator
Hudson River Estuary Program
NYS Department of Environmental Conservation/Cornell University
625 Broadway
Albany, NY 12233-4757
Tel: (518)-402-8860
Tel: (518)-423-0656
Fax:(518)-402-8925

Or

Laura T. Heady
Biodiversity Outreach Coordinator
Hudson River Estuary Program
NYS Department of Environmental Conservation / Cornell University
21 South Putt Corners Road
New Paltz, NY 12561-1620
Tel:(845)-256-3061
Fax: (845)-255-3649

Vermont's Community Wildlife Program

Impetus: In 2000, Vermont Fish and Wildlife (VFW) embarked on a study to understand local level wildlife planning in the state. The agency reviewed all existing municipal comprehensive plans and zoning codes and found that while a majority of communities incorporated wildlife information from state sources, few communities recognized high quality habitat. Study focus groups revealed that town planners and volunteer conservation commissioners often had difficulty interpreting the natural resource data, or applying the information into land use strategies.

Vermont: Vital Stats	
Population ¹⁰⁶	623,908
Density (per square mile)	65.8
Rate of Growth (2000-2005)	2.5%
Total Land Area (square miles)	9,249.56
# of Species in Need of Conservation : Endangered Species ¹⁰⁷	323 : 6
Wildlife Threats	Development, fragmentation, transportation infrastructure, pollution, sedimentation, invasive species, climate change.

Program Goal: In response to the state's need to build local conservation planning capacity, Vermont Fish and Wildlife (VFW) created the Community Wildlife Program in October 2006. The program centers on four main objectives: (1) establish local goals and a long-term vision for wildlife conservation, (2) gather and interpret local wildlife data applied in a regional context, (3) develop conservation strategies, and (4) implement these strategies.¹⁰⁸

Program structure: VFW hired a full-time biologist with a teaching background to spearhead the program. The coordinator serves as the liaison between the agency and Vermont towns, regional planning commissions, watershed associations and other non-government organizations with an interest in land planning.¹⁰⁹ The coordinator varies his approach depending on community needs.¹¹⁰ He provides extensive natural resource maps, attends planning and conservation commission meetings, reviews planning and zoning documents and provides direct advice on how to encourage conservation planning in local processes.¹¹¹ In his first year, the Wildlife Community Plan Coordinator directly advised more than 25 towns.¹¹²

The coordinator provides each town with a set of localized natural resource maps that include wildlife habitat suitability, conserved lands, hydrology, core forests, prime agricultural soils, bedrock geology and surficial geology.¹¹³ After natural resource inventory maps are completed, he focuses on helping the towns to understand the inventory to prioritize areas and develop conservation goals for implementation.¹¹⁴ In his words, once he's figured out what resources the town has, "I get out of the inventory business and into the implementation business."¹¹⁵

Even towns that have natural resource inventories must consider their community goals for wildlife before developing conservation strategies. The program coordinator encourages towns to have frank discussions about their values.¹¹⁶ In his experience, towns that have articulated a community vision for conservation, through existing planning efforts or public participatory processes are less likely to face opposition implementing their plan.¹¹⁷ Merging community values with ecological function is the core of Community Wildlife Program planning efforts.¹¹⁸

Recent success: Although the program has been active for less than a year, it is already having impact at the local level. In one example, eleven towns on the Vermont-New Hampshire border are identifying wildlife habitat connectivity between their towns.¹¹⁹ They are mapping and prioritizing habitat blocks and corridors, and will begin considering town-appropriate conservation strategies next, including the possible of wildlife corridor overlay zones.¹²⁰ The Community Wildlife Program liaison has made community presentations in each of the towns, and all will engage in charrette-style visioning sessions in over the course of the next year to encourage public participation.¹²¹

Those interested in learning more about this program should contact:
Vermont Community Wildlife Program
Jens Hilke, Program Coordinator
Vermont Fish & Wildlife Department
5 Perry St Suite 40
Barre, VT. 05641
Tel:(802)-476-0126
Email: jens.hilke@state.vt.us
Website: http://www.vtfishandwildlife.com/cwp_home.cfm

New Hampshire's new outreach and technical assistance program

Impetus: While historically characterized by its dominant forest cover and granite mountains, New Hampshire is now distinguished as the fastest growing state in the Northeast. The state's population grew at twice the rate of the rest of New England between 1990 and 2004, and is expected to grow more than 28% between 2000 and 2025.¹²⁴

New Hampshire: Vital Stats	
Population ¹²²	1,314,895
Density (per square mile)	137.8
Rate of Growth (2000-2005)	6.4%; fastest growing state in the NE
Total Land Area (square miles)	8,968.10
# of Species in Need of Conservation : Endangered Species ¹²³	84 : 39
Major Wildlife Threats	Habitat fragmentation and destruction from development.

Program Goal: In response to the growing threat of development, one of the principal goals of the New Hampshire Wildlife Action Plan is to consider conservation in local and landscape level decisions. In particular, the plan aims to “provide public and private entities at all levels in the urban development and planning communities with information and assistance, including conservation science, maps, and mitigation guidelines to encourage sustainable development in sensitive wildlife areas.”¹²⁵

Program Structure: In New Hampshire, communication centers around the distribution of spatial priority maps and building capacity to use maps locally. As part of their SWAP development, New Hampshire Fish and Game (NHFG) released habitat location maps to the public for the first time. Habitat land cover maps show the location of 16 habitat types statewide. These habitats are assessed by ecological condition using a series of available GIS data that informs habitat quality. A map was created that depicts the highest quality habitat areas in the state. Additional maps identify conservation focus areas: locations of high habitat integrity and diversity, known rare species locations and low human impacts.

Since the publication of the maps, one of the agency's three wildlife biologists spends 80 percent of her time collaborating with other state agencies, nonprofit organizations, regional planning commissions and local towns, explaining the purpose of the SWAP and sharing conservation area focus maps.¹²⁶ Distributing these conservation maps to planners and GIS users is one of the state's highest priorities.¹²⁷

In the program's first year, wildlife maps have been distributed through 22 mapping workshops and 5 workshops targeting GIS professionals, including participants from 133 towns.¹²⁸ These day-long workshops introduce participants to the SWAP, including its habitat types and wildlife species of greatest conservation need, basic concepts of conservation biology and land conservation, and the benefits of using GIS as a conservation planning tool.¹²⁹ Although the workshop varies based on the target audience, these learning experiences typically include PowerPoint presentations, a mapping exercise where participants use maps to make mock decisions about potential sites for conservation, and a field component where participants have the opportunity to experience significant habitats – and sometimes wildlife – firsthand.¹³⁰ A separate workshop series is also ongoing that more specifically targets GIS users in local planning roles.¹³¹ These maps are being distributed on CD in PDF form and in GIS file formats that can be directly incorporated to local projects.¹³² Soon regional biologists at NHFG's four state regional offices are expected to become more involved in community collaboration as well.¹³³

Recent successes: Although the outreach program began only in Fall 2006, the priority maps have already been useful for local planning and zoning projects. As the I-93 interstate corridor connecting most of New Hampshire down to Boston is expanded, the impact on adjacent towns will be dramatic. The Jordan Institute, a New Hampshire non-profit that provides research for municipalities, is mapping natural resources to better gauge the wildlife habitat and water quality impact of this planned highway expansion. They have incorporated SWAP priority maps in the development of their maps, and are communicating land use recommendations to the municipalities most likely to be affected by the expansion.¹³⁴

Those interested in learning more about this program should contact:

New Hampshire Fish and Game

Emily Brunkhurst, Conservation Biologist

Nongame and Endangered Wildlife Program

New Hampshire Fish and Game Department

11 Hazen Dr.

Concord, NH 03301-6500

Tel:(603)-271-5860

Email: emily.p.brunkhurst@wildlife.nh.gov

Website: http://www.wildlife.state.nh.us/Wildlife/nongame_and_endangered_wildlife.htm

IV. What are the challenges to collaborative state-local wildlife planning?

Through our conversations with interviewees at state wildlife agencies and involved in local planning, we identified two corresponding sets of challenges to collaborative conservation planning. In the next few pages, we describe the challenges in detail. In the next section, we identify techniques that state agencies are using to overcome these challenges.

The following table shows the common challenges, aligned with techniques that agencies and communities are using to overcome the challenges. We have coded each challenge with a colored shape. In the next section, where we describe techniques in detail, these colored shapes identify which challenges each technique can be used to overcome.

Table 1: Linking challenges to solutions

<u>Challenges</u>	<u>Techniques to overcome challenge</u>
State level challenges:	
 Overwhelming number of diverse municipalities	<ul style="list-style-type: none"> • Dedicate staff to directly address collaboration with local land-use decision makers • Work with intermediaries to share the effort of outreach • Create widely available, easy to understand outreach materials
 Insistence on local autonomy and resistance to state level planning	<ul style="list-style-type: none"> • Work with communities to map assets collaboratively and be attentive to their priorities • Dedicate agency staff to collaboration with communities, and work to explain the benefits of conservation planning • Target local champions • Provide financial incentives for conservation planning
 High turnover of local land-use decision makers	<ul style="list-style-type: none"> • Target local champions • Dedicate staff to maintaining relationships • Work with intermediary organizations that have a consistent local presence
 Lack of regulatory mandate for communities to plan for biodiversity conservation	<ul style="list-style-type: none"> • Develop incentives to encourage communities to plan voluntarily • Dedicate staff to working closely with communities to communicate the benefits of conservation planning • Change state enabling laws to create regulatory mandates for conservation planning

	Lack of data on distribution of biodiversity	<ul style="list-style-type: none"> • Empower communities to conduct biodiversity inventories through technical assistance programs • Work with partner organizations to provide technical assistance to communities and to coordinate conservation information
	Property rights advocate backlash against spatial prioritization	<ul style="list-style-type: none"> • Work with communities to map assets collaboratively • Dedicate staff to working closely with communities to communicate the benefits of conservation planning
	Lack of wildlife agency resources	<ul style="list-style-type: none"> • Work with intermediary organizations to leverage existing resources • Create widely available, easy to understand outreach materials
Local level challenges:		
	Unclear point of contact at state wildlife agency	<ul style="list-style-type: none"> • Dedicate agency staff to collaboration with communities • Work with intermediary organizations to improve community outreach • Create widely available, easy to understand outreach materials
	State-scale priorities not applicable to local level planning	<ul style="list-style-type: none"> • Work with communities to map assets collaboratively • Empower communities to conduct biodiversity inventories through technical assistance programs
	Lack of local planning expertise on wildlife conservation	<ul style="list-style-type: none"> • Dedicate staff to assisting local land use decision makers with conservation planning • Create easy to access, easy to understand outreach materials • Provide technical assistance programs • Conduct direct reviews of local plans, codes and ordinances
	Competing priorities, especially where development threats are not pressing	<ul style="list-style-type: none"> • Provide financial incentives for conservation planning • Create regulatory mandates to conduct conservation planning • Dedicate staff for outreach to communities with important biodiversity assets
	Lack of financial incentives	<ul style="list-style-type: none"> • Provide financial incentives for conservation planning • Work with intermediary organizations that may have more resources • Create regulatory mandates to conduct conservation planning

State Challenges

Across states, interviewees told us that in order to encourage state-local collaboration, state conservation priorities must be clearly articulated and made available to land use decision makers in a form that is understandable and easy to use. Of particular value to planners are scalable maps of conservation priorities. Dedicating state agency staff and providing technical assistance greatly improves local understanding of state conservation priorities, their larger scale importance, and the benefits of considering them in community planning.

Overwhelming number of diverse municipalities

Sharing state conservation goals with municipalities and translating that information into local conservation strategies is an ambitious undertaking if for no other reason than the number of players involved. The Northeast is home to more municipalities than any other region of the country. According to the 2002 U.S. Census of Governments, there are more than 1600 county, municipal and township governments in the New England states alone.¹³⁵ Land-use decision making powers are dispersed across these municipalities and townships. A New Hampshire conservation NGO representative explained:

*There are 232 municipalities and it's just like having 232 little countries. Just think of a New England state with 232 different planning boards and conservation commissions and master plans and community visions and all the rest, all volunteer boards, principally, and you can see what an outreach challenge that would be.*¹³⁶

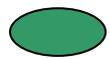
A New Hampshire planner agreed, noting that communities varied significantly in the number of planning resources available. “Many of these towns, they don’t have GIS resources. They don’t even have planning staff. Some towns might not even have zoning.”¹³⁷

Finding methods to tailor wildlife collaboration to many diverse municipalities was identified as a challenge by all eight state agencies.

Insistence on local autonomy/resistance to state level planning

In a region historically rooted in town hall meeting democracy and libertarian ideology, municipalities vary widely in their attitudes towards all types of planning overall, and conservation planning in particular. One New England state agency representative explained:

*[Towns] are in such different places. I've got towns where you mention the word 'zoning' and you said a very bad word. A hush comes over the crowd and you are no longer a friend. And then I've got towns that are so gung-ho progressive on ecological mapping that they don't even want people to be in the habitat blocks that they'd identified as prioritized. So literally the towns run the full gamut.*¹³⁸



High turnover of local land-use decision makers

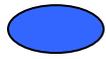
Even in areas with more effective outreach and training programs where community members have been strongly involved in conservation initiatives the past, efforts to inform local land-use decision makers about the benefits of biodiversity conservation are complicated by the relatively high turnover rate of local officials. A representative of the NYSDEC explained that working with local governments requires “an incredible amount of one-on-one time... and the other fun thing about that... is that if there's an election and everyone goes away, you've got to start all over again.”¹³⁹



Lack of regulatory mandates to plan for biodiversity conservation

Requirements for the inclusion of natural resource information in local planning documents vary significantly between states. In most northeast states, municipalities are not required by the state to conduct natural resource inventories or create comprehensive land use plans. This can create a situation in which state representatives must convince local governments to allocate limited resources to conservation planning. This becomes an extra step that consumes agency outreach capacity. As a representative of New York's Hudson River Estuary Program told us:

*“We have to depend on our... skills to convince local governments that [conservation planning] is in their best interest. In reality it depends on the entire community thinking that this is a good idea.”*¹⁴⁰



Lack of data on biodiversity distribution

Lack of background information on important areas of wildlife diversity is an impediment to targeting outreach to the places where it is most needed. Without having complete information on the locations of species and habitats of concern, it is difficult to understand how best to channel limited state resources to areas where they will have the most impact.



Property rights advocate backlash against spatial prioritization

While maps were the most universally recommended planning tool by interviewees, map publication can bring its own set of challenges. Maps can create resistance from landowners, explained a New York wildlife agency representative. “People who see their property on a map of potential parcels to acquire tend to get concerned about eminent domain.”¹⁴¹ Another concern about publishing maps is that, when property owners catch wind of the fact that the state is interested in a particular parcel, it can drive the price up, particularly in metropolitan areas.¹⁴²



Lack of wildlife agency resources

Although the SWAPs have leveraged some funding for nongame programs, state wildlife agencies face financial strain as a result of declining of hunting and fishing license sales. Without stable funding agency-wide, hiring new staff to engage communities is not likely. Financial strain also limits funds available for other important work, such as providing incentives for municipalities to conduct biodiversity assays and conservation planning. As a representative of the Rhode Island Division of Fish and Wildlife told one author:

*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 [and] wildlife needs. Without additional staff, I see no way to do this.*¹⁴³

Local Challenges:

Planners told us that they need locally specific information on species and habitats, detailed instructions how to plan for wildlife while meeting other planning goals, and financial incentives to prioritize wildlife conservation. Further, communities need committed local decision makers or leaders to push for conservation in the face of competing priorities.



Unclear point of contact at state wildlife agency

The difficulty states have in addressing each community is mirrored by the difficulty that local land-use decision makers experience in trying to understand state conservation priorities. Many planners and members of municipal boards find the complexity of state bureaucracy difficult to penetrate, and are overwhelmed by the time required to decipher state conservation priorities. Unless there is a means of clearly articulating the conservation concerns of the state to people at the local level, either a state representative “at the table” or easily accessible during the planning process, or outreach materials that are easy to understand, it is unlikely that state conservation priorities will be considered. A planner from a township in New Jersey put it this way:

The state doesn't really articulate to us very well what their priorities are. While the conservation of open space and protection of natural resources is always a high priority, it is not always clear on the process of how to "get there from here." You can go hunt them down, but we don't have the staff or the time for that, to wade through the mind-boggling plans. When you talk to them there are layers of bureaucracy, it's hard to find the person to talk to. I wouldn't even know who to talk to begin discussing what the state's priorities [for wildlife conservation] are.¹⁴⁴



State-scale priorities not applicable to local level planning

Often locally important biodiversity resources can slip through the cracks of a large scale approach. This is a particular problem in areas that are more developed, which may not be seen by the state wildlife agency to have resources important to state-wide conservation reserve systems. Remnant habitat patches, while small, are often viewed as important assets to local

communities. An environmental planner from New Hampshire found that state and regional plans for natural resources mapping is often at too large a scale to be effective for communities, especially when it highlights large areas of contiguous habitat. Of recent regional natural resource plan maps, he said, “In our part of the state, there’s so much development that it was hard to really gain a lot from it. We felt like we needed to get a little more intensive mapping.”¹⁴⁵



Lack of local planning expertise on wildlife conservation

The challenge of collaboration is complicated by the fact that many individual municipalities do not have professional planning staff, GIS resources or enough knowledge about wildlife issues to consider conservation goals in planning efforts.¹⁴⁶ A study conducted by Vermont Fish and Wildlife in 2000 to understand local level wildlife planning in the state illustrates this fact. The agency reviewed all existing municipal comprehensive plans and zoning codes, finding that for the state's 251 towns, 223 have town plans, and 91 percent identified "wildlife and/or fish habitat as an important public resource."¹⁴⁷ Three-quarters of the plans included wildlife habitat inventory data, and 96 percent of inventory data was derived from state sources.¹⁴⁸ However, the extent of the natural resource inventory significantly varied from town to town. Many inventories included locations of wetlands, but few of the towns had natural community maps or recognized high quality habitat at a local scale. Vermont Fish and Wildlife focus group discussions revealed that town planners and volunteer conservation commissioners, who serve on advisory boards in 35 towns, often did not have sufficient biology training to interpret state wildlife inventory information.¹⁴⁹ Even those that understood state inventories had trouble translating that data into effective zoning bylaws, land acquisition funds, and other conservation strategies.¹⁵⁰



Competing priorities, especially where development threats are not pressing

Other priorities besides conservation compete for the attention local land-use decision makers. Given limited time and resources, wildlife conservation must compete with things like planning for provision of infrastructure and services. A New Jersey planner told one author:

The conservation of wildlife, [as separate from open space conservation], is not one of my top priorities. It's something I do because it's important, but it's not in the top two or

three things. To sit here and say ‘I’m going to call the state and create some conservation plan that meshes with theirs,’ I can’t justify that given my time constraints.¹⁵¹

Communities that are not facing development pressure are less likely to see the immediate value of planning for conservation. However, state wildlife planners prefer that localities address wildlife planning before the most significant habitats and ecological areas are developed. A Maine state wildlife agency representative explained that getting ahead of the development curve is the toughest part:

Our biggest frustration at this point is encouraging towns to see the need to implement ahead of the game and to realize that it’s not an impediment to local economic development or properties.¹⁵²

Lack of financial incentives

At the local level, a lack of financial incentives makes considering state conservation priorities difficult in the face of a host of other competing priorities, even for those communities who would like to plan for wildlife conservation. A Maine state wildlife agency explained:

Budgets are stretched thin. Its usually the case that habitat conservation and open space don’t get very high on the priority ladder without some sort of mechanism to make it happen . . . like small grants to help them do an open space plan, or some cost-sharing program with the state, or something. That’s really the biggest issue now – we are competing with a lot of other priorities.¹⁵³

V. What important techniques are wildlife agencies using to facilitate collaboration?

While approaches differ among states, clear commonalities between programs emerge. The most successful programs are those that are able to effectively communicate state conservation priorities with local land-use decision makers, provide technical expertise in biodiversity assessments and conservation planning, and compel communities to take conservation planning seriously through financial incentives or regulatory mandates. More information about these state trends, including examples of state techniques to engage in cross-scale planning appear in

following sections. Each technique is accompanied by colored symbols that indicate which challenges it can be used to overcome.

Strategies for bridging the gap between state and localities

Dedicating agency staff to collaboration



State-local collaboration programs that are most formally integrated into the state wildlife agencies employ at least one full-time staff member whose primary duty is to share state wildlife priorities with localities, conservation organizations and other state government agencies. Ensuring that at least one person’s responsibilities involve collaboration helps commit an agency to cross-scale planning.

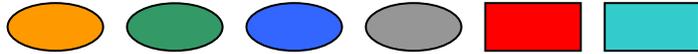
“When you’re working with a lot of partners, you really need to have somebody that’s thinking about this in the shower every morning,” said a representative from a New Jersey conservation NGO. “Otherwise life gets in the way; everybody’s busy.”

State approaches to staffing vary. Maine’s Beginning with Habitat program has two full time biologists and a cartographer on staff.¹⁵⁴ In Massachusetts, the Endangered Species Program has at least one full time staff member who spends a considerable amount of time coordinating with local land trusts, and to a lesser extent local planners.¹⁵⁵ In 2006, Vermont Fish and Wildlife hired a wildlife biologist with a background in education to lead the Community Wildlife Program. Although they have been facing a hiring freeze and have not been able to create new positions, New Hampshire re-allocated the job description of one biologist position so that 80 percent of that biologist’s time is devoted to technical assistance and sharing state wildlife priorities. New York’s Hudson River Estuary Program, which works in one region of the state, employs 1.6 staff positions dedicated to outreach to local land-use planners and decision-makers. A representative of that program believed the dedicated staff was the key to the program’s success,

*We have staff dedicated to it, it’s not just a local government asking us for info, it’s about us understanding local governments and their needs, their processes, and how conservation information can fit into their plans.*¹⁵⁶

Although New Jersey provides maps and technical assistance to localities, there is no single staff member devoted to outreach with municipalities.¹⁵⁷

Working with intermediary partners



Where resources are too strained to devote a full-time staff member to collaboration, some state agencies work with other state or regional conservation or planning organizations. Such partners essentially serve as intermediary collaborators, helping communicate state wildlife priorities with localities. States in the Northeast have partnered with regional planning commissions, Cooperative Extension offices, association of governments and conservation NGOs to help integrate state wildlife priorities into local level plans.

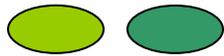
Regional planning commissions, quasi-government agencies that serve in an advisory capacity, can serve as effective intermediary organizations between states and localities. Regional planning commissions help towns, villages and communities with limited planning capacity to complete day-to-day land use projects, such as subdivision plan applications or longer range projects, such conservation inventories. When New Hampshire's Rockingham Planning Commission completed a Coastal Land Conservation Plan in 2006, the commission integrated the wildlife agency's newest wildlife spatial priorities to develop local tools and ordinances. "Some towns are starting to include [Coastal Land Conservation Plan guidance] in their master plan chapters," said a representative from the planning commission, explaining that some towns have even adopted modified versions of the wildlife corridor overlay zone language included in the plan.¹⁵⁸ In addition to helping with regional plans and local projects, the Rockingham Planning Commission has a staff member who attends conservation commission meetings throughout the region. Therefore, when the state is involved with the regional planning commission, an indirect connection to localities is strengthened.

New Hampshire's wildlife agency collaborated with wildlife personnel at the University of New Hampshire Cooperative Extension Service to develop workshops for local planners and GIS users that showcase the new SWAP maps and data. Both the wildlife agency and UNH provide slightly different versions of these workshops around the state. "We're doing basically the same thing. They [UNH Cooperative Extension] tend to run all-day workshops and include a habitat management component. I have done a lot more evening presentations, which you can't really do the habitat management component because it's too dark to go outside," explained an agency representative.¹⁵⁹ Because the New Hampshire wildlife agency contracts UNH Cooperative Extension staff through State Wildlife Grant funds, both partners have an

investment in the success of the project. While the agency does have one staff member whose primary role is outreach, this technique of partnering with state Cooperative Extension would be possible for other agencies that cannot commit full-time staff.

Although Pennsylvania does not have a formal mechanism for collaborating with local planners, the state has used State Wildlife Grants to fund The Nature Conservancy (TNC) county wide natural resource inventories. After all biological assets have been inventoried in the county, TNC staff present their findings to the county planners. In addition to providing an informational resource to the counties, these assessments are used by the state to identify existing wildlife resources. “It’s an indirect overture, but it is something that we’re trying to keep moving and stay involved in,” said a Pennsylvania Wildlife Action Plan co-coordinator. “Additionally, we are working with partners to evaluate potential land use patterns through the use of various models. In combination with county floral and faunal inventories, these models and associated predicted land uses can serve as valuable tools for local planners across the Commonwealth.”¹⁶⁰

Targeting local champions



Interviews with agency representatives and local and regional planners revealed that change is more likely to occur with the involvement of a local champion pushing for change. In some cases, the local champion has a scientific background, but in other cases, the champion is simply someone with local political power who is passionate about wildlife conservation and has the desire to apply state conservation priorities to their community. According to a representative of the Hudson River Estuary Program in New York, “If there’s a local person that’s dedicated to doing it, that’s huge.”¹⁶¹

Working with local leaders and passionate citizens also helps to ensure that the state is not forcing its priorities on the localities. “Changing local culture is a pretty tough sell, and you just have to keep at it until you can identify local champions who can be your foot soldiers,” said a Maine wildlife agency representative.¹⁶²

Where communities have conservation or environmental commissions, or planning staff that advise the planning board or community about important conservation issues, these individuals can often act as leaders in pursuing local wildlife goals.

Strategies for facilitating local conservation planning

Distribution of natural resource inventory maps



Before planning for wildlife, communities must first have a basic understanding of their local natural resources. All localities engaged in conservation planning identified maps as indispensable tools for understanding the wildlife species and habitats in their communities. Maine, Massachusetts, New Hampshire and New Jersey programs rely most heavily on the use of maps. “Maps are essential,” explained a representative from New Hampshire Fish and Game. “They are an essential scientific process to create, first the habitat, land cover, and then to assess condition, and then to come up with conservation focus areas.”

Local planners identified the most useful maps as those that are at the appropriate scale for planning. While maps of state priorities are important on a large scale, they may not appropriately address local priorities. For example, state maps that only prioritize large areas of contiguous open space as priorities were seen as frustrating by communities that were mostly developed, where smaller parcels of undeveloped land were considered major local resources, but less significant to the state habitat picture overall.¹⁶³ While state priorities must be considered for landscape scale effective actions, localities that are not recognized by state spatial priorities may feel a disincentive to engage in cross-scale collaboration.

In addition, it is important that maps are available in multiple formats, so that they can be used by communities with varying levels of resources. A conservation commissioner in Vermont found that having hard copies of the maps made reviewing the information easier. She took large printed maps to her conservation commission meeting and asked the other commissioners to add any missing details. The maps were then returned to the Vermont Community Wildlife Coordinator, who made edits. While some communities might work well with hard copies of maps, other communities appreciate digital files that could be easily scaled, and integrated into other planning documents.

Maine, Massachusetts, New Hampshire and New Jersey have outreach programs that make scalable maps of priority conservation areas available over the Internet for free.¹⁶⁴ Making state conservation priorities available in this way makes it very easy for anyone with access to a

computer to make a map that applies to their particular area. This is an effective means of dealing with the large number and diversity of municipalities in those states. A representative of the Massachusetts wildlife agency agreed, noting that Massachusetts' computer-based mapping program saved valuable agency resources. "They can do it themselves, they don't even need to talk to us," he explained. "They can get the town report and maps online. So you can actually make yourself a map. This is the cost effective means of getting the info out."¹⁶⁵

Maine's Beginning with Habitat program has identified online mapping as a future goal. In addition to accessibility, online technology will help maintain up to date spatial information. BwH has just developed an online interactive encyclopedia. In time, this will be linked to maps, so that when a user's mouse hovers over map polygon, links appear to relevant state regulations, species information, and best management practices. "We're going to try and integrate all the narrative information we now provide towns with the online map service."¹⁶⁶

In addition to spatially explicit wildlife priorities, both states and localities identified a need for spatial climate change data, as it may help them prioritize where to focus their efforts. Climate change has not traditionally been addressed by state fish and wildlife agencies. Due to the magnitude of the problem, it must be addressed at multiple scales, including the local. A New Hampshire planner in a highly developed coastal area saw climate change as a more pressing concern than continued development, and expressed interest in mitigation recommendations.¹⁶⁷

Technical assistance programs



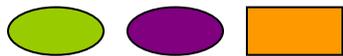
Vermont's new Community Wildlife Program was designed specifically to help build conservation planning capacity at the local level. In addition to providing natural resource inventory maps, the program coordinator helps local decision makers interpret natural resource inventory data and priorities. Then he works with them to develop strategies that protect wildlife. "Towns are thrilled to have access to experts that can translate hard core science into language they can understand."¹⁶⁸ A local planner who has worked with the Vermont program called the approach a "much needed infusion" of enthusiasm and momentum.¹⁶⁹

In New York, the Hudson River Estuary Program has partnered with a non-profit conservation organization called Hudsonia to conduct Biodiversity Assessment Trainings (BATs) for local land-use decision makers.¹⁷⁰ During these trainings, participants learn to

identify and map important habitats in their communities. Once trained, these individuals have been able to provide information about the occurrence of species and habitats of concern to their local planning boards, for incorporation into the planning process. A consultant to a township in New York, who participated in the BAT training, summed up the importance of building this kind of capacity, “The best way to protect habitat is to train people who are either local land use decision makers or are somehow involved with local land use [to recognize important habitats]”¹⁷¹

In New Jersey, the state wildlife agency has partnered with the Association of New Jersey Environmental Commissions to provide trainings for the state’s Landscape Project. According to a representative of the agency, the Landscape Project is an important collaboration and technical tool for regulators, planners and conservation professionals at all scales.¹⁷² Participants in the trainings learn how the Landscape Project was developed and utilize GIS hands-on in order to access critical habitat maps for threatened and endangered species protection. The trainings have been attended by environmental commission members, planning board members, planners, educators, environmental consultants and representatives of nonprofit groups working in the field of conservation.¹⁷³

Collaborative asset mapping



While making state conservation priorities clear to local land use decision makers is important, the priorities of localities must be included in planning and mapping to best serve local needs. In the Northeast, where town hall meetings are still common and political autonomy is culturally engrained, delivering top-down state priorities can be a recipe for failure.

One pillar of the Vermont Community Wildlife Program is ensuring the incorporation of local input into the planning process. In an ongoing project involving corridor protection between eleven towns along the Vermont-New Hampshire border, the program coordinator hosted public meetings in each town to introduce the planning process. Future charettes will be planned when the public is given blank maps and allowed to identify their own priorities of importance. “As the state, I’m not coming in telling them what to do; I’m just trying to support their decisions,” explained the program coordinator.¹⁷⁴

Direct review of local plans, codes and ordinances



Where states have the opportunity and regulatory authority to provide comprehensive plan reviews, they can ensure that conservation priorities are being directly integrated into local plans.

Until recently, the incorporation of Beginning with Habitat (BwH) data in comprehensive plan revisions was voluntary, with about an 85% success rate.¹⁷⁵ However, effective October 2007, Maine's comprehensive planning law now requires towns to incorporate BwH data points and polygon data into all comprehensive plan revisions.¹⁷⁶ BwH staff will review the comprehensive plans to ensure that the data and information has been effectively incorporated.¹⁷⁷ While the agency has the authority to enforce inclusion of the information, it cannot enforce implementation of the plans.

The Vermont Community Wildlife Program coordinator also participates in direct plan review when requested. "I do a lot of these town plan reviews and that's a quantifiable success," he said. "I'm also seeing town plans and zoning documents that reflect a greater awareness of then natural world."

While important, most states indicated that providing local plan reviews was beyond their current scope of work.

Strategies for encouraging the prioritization of conservation planning

Interviewees at both state and local scales expressed that local interest in wildlife planning would be greater if financial and regulatory incentives elevated conservation priorities. In the words of a New York conservation NGO representative, to encourage communities to consider state conservation priorities, "You need the carrot as well as the stick."¹⁷⁸

The Carrot: Financial Incentives



Creating ways to provide funding and incentives for conservation planning can enable communities that would like to address wildlife issues but do not have the resources to do so, as well as convince communities that may not be as enthusiastic about conservation planning that it is a good idea. A representative of a conservation NGO in New York told us about the importance of providing incentives to get communities involved in implementing New York's

SWAP, “I think the state ideally would take a leadership role, and institute a policy that rewards communities that incorporate plan recommendations into their planning. There has to be some type of incentive to get communities to do this.”

States have developed innovative methods of allocating funds to communities for conservation planning. In 2006 New York instituted a competitive application process for distributing State Wildlife Grant funds. Any organization may apply for these funds, including localities. An agency representative explained the open process, “We don’t care who has the best idea, we just want to hear about it.”¹⁷⁹ To date, at least one municipality has applied for funds to conduct a natural resource assessment for inclusion in their master plan.

In Massachusetts, the Community Preservation Act (CPA) set up a state matching fund by raising the filing fees on real estate documents. Interested municipalities can establish a property tax surcharge of up to 3 percent and use the money for three purposes: affordable housing, historic preservation, and open space protection. The state will provide a 100% match using the fund created by raising the filing fees. The availability of this resource has motivated many local land trusts to lobby for their communities to pass the property tax surcharge, in order to then work with the community to implement their existing open space plans using the money that the CPA provides. Another requirement of the law is that the municipality must put a conservation easement on any property acquired with CPA funds, to be held by a qualified local land trust. According to a representative of a Massachusetts conservation NGO, to date 127 out of 351 communities in the state have passed the CPA, and roughly half of the money is going to land conservation.¹⁸⁰

The Stick: Regulatory Opportunities



Regulatory protections for wildlife help ensure that conservation planning will be addressed at local scales through direct regulation, delegated regulation, state planning laws, disclosure requirements, and incentive-based approaches. While powerful, direct regulation by the state, such as through the adoption of endangered species acts, is the most difficult action for states to enact. Delegated regulation, such as through state administered coastal protection programs, is used by states to provide additional protections. States can require the inclusion of wildlife or

natural resource information in municipal plans through state planning enabling laws. Disclosure requirements, such as those required by environmental impact statements provide an additional regulatory mechanism for wildlife protection. Finally, incentive-based approaches, such as state-authorized funds for local planning that consistent with state goals, or providing funding for natural resource inventories can encourage the adoption of wildlife land use protections.

In our explorations of the Northeast states, we explored state enabled requirements for local planning laws. Regulatory requirements for inclusion of wildlife resource information in comprehensive plans varies by state. New Jersey's planning enabling law calls for local comprehensive plans to develop strategies for the protection of wildlife;¹⁸¹ Maine¹⁸² and Rhode Island¹⁸³ require local comprehensive plans to include an inventory of wildlife resources. Other states require identification or protection of natural features that may support wildlife or wildlife habitat, but do not identify wildlife issues directly.

As explained in the previous section, effective October 2007, Maine's comprehensive planning law now requires towns to incorporate Beginning with Habitat (BwH) data points and polygon data into all comprehensive plan revisions.¹⁸⁴ BwH staff will review the comprehensive plans to ensure that the data and information has been effectively incorporated.¹⁸⁵ "Its going to be pretty much mandatory that they work with our program and develop implementation strategies and certain feature land use plans as part of their comprehensive plan," explained a Maine wildlife agency representative. "I think that's really going to help get us in the front end."¹⁸⁶

VI. How can State Wildlife Action Plans be used to encourage collaboration?

As statewide comprehensive wildlife strategies that articulate species, habitats, and actions of greatest conservation need, the SWAPs can serve as powerful tools for incorporating conservation goals in local planning.

The plans were designed to encourage collaboration. Prior to approval by the Department of Interior, each SWAP was required to incorporate opportunities for wildlife conservation collaboration across scales. The seventh of eight required plan elements called for "coordinating the development, implementation, review, and revision of the plan with federal, state, and local agencies and Indian tribes that manage significant land and water areas within the state or administer programs that significantly affect the conservation of identified species and habitats."¹⁸⁷

Despite this requirement, the majority of Northeastern states did not engage municipal or county governments in the development of their plans. Maine and Vermont engaged localities through the participation of broader organizations.¹⁸⁸ In New Hampshire and New Jersey, representatives of local agencies participated in large stakeholder meetings and helped to set guidance for technical work.¹⁸⁹ Connecticut did perhaps the most to engage local actors during the plan development process. “Early on in the process,” representatives from the CT Department of Environmental Protection “passed out a questionnaire at local planning workshops that gave [them] input and feedback from local government bodies.”¹⁹⁰

Although local planners were not directly involved in SWAP planning all Northeast states acknowledge the need for the state agencies to collaborate with local planners in order to combat the threat of development patterns. States agencies articulated strategic action for collaboration with localities, including providing (a) community scale wildlife inventories, (b) technical assistance to local planners, (c) direct input for local planning processes and (d) financial incentives for encourage local conservation planning. A table including abbreviated actions each state identified for reaching out to local decision makers is included in Appendix B.

While in many places, the plans themselves can not be identified as the source for new community action, the plans have created opportunities for municipalities to incorporate wildlife concerns into their planning process in at least two states, New Hampshire and New Jersey.

Case study: SWAP sparks new community outreach (New Hampshire)

In New Hampshire, where rapid urban development was identified as the most significant threat to terrestrial, wetland and aquatic wildlife, a primary goal of the SWAP is to incorporate conservation strategies in local and landscape level decisions.¹⁹¹ In particular, the plan aims to, “provide public and private entities at all levels in the urban development and planning communities with information and assistance, including conservation science, maps, and mitigation guidelines to encourage sustainable development in sensitive wildlife areas.”¹⁹² Defined as a top implementation goal for the agency, NHFG has transitioned one biologist to spending 80 percent of her time on disseminating SWAP priority habitats and goals to other agencies, non-profit organizations and municipalities that can benefit from SWAP information.¹⁹³ Her principal outreach goals involve explaining the purpose and findings of the SWAP and sharing conservation area focus maps.¹⁹⁴ While outreach was a portion of her

position prior to the plan, the SWAP and maps have significantly altered the information being shared and the priority of distributing this information.¹⁹⁵ The agency's long-term visions call for biologists at each of the four regional offices to become more involved in community conservation, serving as state liaisons to local planning boards and conservation commissions where possible.¹⁹⁶

For more information on the New Hampshire Fish and Game outreach program, see the program profile on section IV.

Case Study: The Raritan-Piedmont Wildlife Habitat Partnership (New Jersey)

In New Jersey, SWAP priorities are being implemented through an innovative partnership of federal, state, and local government along with non-governmental organizations. The Raritan-Piedmont Wildlife Habitat Partnership (RPWHP) is designed in part to accomplish the SWAP goal of protecting and restoring grassland bird habitat in Somerset and Hunterdon Counties.¹⁹⁷ Development pressure from both the New York City and Philadelphia metropolitan areas make Somerset and Hunterdon two of the three fastest growing counties in the state.¹⁹⁸ According to New Jersey's SWAP, the counties are also home to nearly 9 percent of the best remaining grasslands in the state, which provide critical habitat for several bird species of concern.¹⁹⁹ Protection of these grassland bird habitats was listed as a priority conservation action in the plan.²⁰⁰

The idea for RPWHP was generated when Conservation Resources Incorporated (CRI), an organization dedicated to fostering cooperation between diverse conservation partners and channeling conservation funding, and Duke Farms, a 2700-acre estate in Hillsborough Township owned and operated by the Doris Duke Charitable Foundation (DDCF), began discussions about ways to protect the property's critical wildlife habitat –particularly habitat prioritized in the SWAP.²⁰¹ Realizing that only protecting habitat at Duke Farms was not sufficient given the high quality habitat and heavy development pressure in the area, DDCF granted CRI funds to develop a grasslands bird conservation plan for the Raritan-Piedmont region. Serving as an intermediary, CRI then re-granted the money to New Jersey Audubon to fund the actual writing of the plan. Once the plan was written, CRI received another grant from the DDCF to begin implementation.²⁰² Ultimately, this effort is implementing SWAP recommendations for grassland bird protection.²⁰³ Serving as an intermediary, CRI has helped connect state priorities

with on-the-ground action by serving as a bank, and facilitator of communication between stakeholders with shared conservation goals.²⁰⁴

For more information on RPWHP, interested parties should contact:

Conservation Resources, Inc.

Michael Catania, President

100 North Road Suite Two

PO Box 594

Chester, NJ 07930

Tel:(908)-879-7942

Fax:(908)-879-7943

Email: michael@conservationresourcesinc.org

Website: <http://www.conservationresourcesinc.org/rpwhp.htm>

VII. Recommendations

The following recommendations for encouraging state-local collaboration are based on insights from our interviewees and the trends that emerged from those conversations.

Bridge contact between state wildlife agencies and localities

- Create dedicated roles within the state agency to engage local land use decision makers. If possible, create positions in each of state wildlife area regional office, or incorporate local engagement into regional office roles so that each region of the state has a point of contact.
- Partner with organizations that have a common mission. Work directly with cooperative extension programs, natural heritage bureaus, state planning offices and associations of planning or local governments to help disseminate information.
- Take advantage of existing local and regional planning networks. Attend conferences or meetings with associations of local governments, state chapters of the American Planning Association and organizations designed to improve capacity in local planning efforts. Supply information to organization members through formal communication channels.
- Identify the most important ecological areas to prioritize municipal collaboration. Targeting areas most in need will help focus efforts when resources are a constraint.
- Engage localities in future statewide comprehensive plans, including scheduled revisions of state wildlife action plans.

Provide clear spatial priorities and technical assistance to facilitate local conservation planning

- Map spatial priorities at scales relevant for local land use. In all states where formal collaboration is occurring between states and localities, maps were central to the communication of priorities.
- Maps should be accompanied by information that explicitly defines the natural resource elements included on the map, and their relevance to providing community and ecosystem services. Best management practices for protecting these resources, including examples of local ordinances, should be shared. All information should be presented in language suitable for planning professionals who do not have training in natural resources.
- Maps and informational materials should be available in multiple formats. Maps and spatial priorities should be made available in hard copy for localities without GIS resources or other advanced technology. Electronic formats available on CDs that can be shipped to communities would also be useful and would provide a great way of sharing outreach to all communities at low cost. Finally, information should be available online for download. To assist in information accessibility, links to the maps and information should be created from websites outside the wildlife agency, including from sites such as the state office of planning, and the state chapters of the American Planning Association and associations of governments, when possible.
- Create opportunities for communities to integrate their own priorities with state identified priorities through community visioning processes, asset mapping, charettes and clear links to other local plans.
- Provide comprehensive technical assistance workshops by a multi-disciplinary team of state professionals that understand GIS technology, wildlife biology, planning and land use law. Creating a multi-disciplinary steering committee to guide outreach will increase accessibility of information to all audiences.

Provide incentives for prioritizing conservation planning

- Provide incentives for the incorporation of state conservation priorities through natural area inventories, conservation plans and open space plans.
- Allow communities to apply for State Wildlife Grant funds for local conservation planning efforts.

- Mandate the incorporation of state conservation priorities in local land use plans where possible. Build wildlife protections into the zoning code as well as comprehensive plans, to ensure they have the force of law. Ensure that protections are built into regional and state plans where local plans are not required.
- Strengthen regulatory connections between proposed local developments, environmental impact statements and state wildlife agencies.

Build on success

- Share stories of local success to show other communities the benefits of conservation planning. Highlight different types of communities, including urban, rural, progressive and traditional to show how conservation can be applied across communities. Also highlight a diversity of conservation tools in action.
- Don't get discouraged if local response is not immediate. Planning cycles are long-term and new information might not get incorporated until plans are updated.

Conclusion

Effective wildlife conservation depends on integrating landscape scale priorities into local land use planning. With the support and participation of those closest to the landscape - local elected officials, municipal boards, planners and citizens, - biodiversity conservation can be successful. Our research has shown that state wildlife agencies are developing and deploying strategies to educate, motivate and empower communities to protect their biodiversity resources. We hope our work will illuminate potential barriers and strategies for overcoming them, so that collaboration between states and localities is strengthened, protecting the natural heritage of the Northeast.

About this Study

During 2007–2008, a team of nine interdisciplinary graduate students at the University of Michigan School of Natural Resources and Environment investigated the development and implementation of the Comprehensive Wildlife Conservation Strategies, also known as State Wildlife Action Plans, for the nine Northeastern states of Connecticut, Maine, Massachusetts, New Jersey, New York, New Hampshire, Pennsylvania, Rhode Island, and Vermont. The team's findings of state wildlife conservation activities, emerging conservation priorities, new

conservation approaches and tools, and examples of current projects that demonstrate promising directions for accelerating habitat conservation are available in multiple publications through the School of Natural Resources and Environment website at www.snre.umich.edu.

Endnotes:

- 1 U.S. Census Bureau. (2006). "Census Regions and Divisions of the United States." Population Estimates, Census 2006. www.census.gov. Accessed April 12, 2008.
- 2 U.S. Census Bureau. (2006). "State and County Quick Facts." Population Estimates, Census 2006. <http://quickfacts.census.gov/qfd/>. Accessed April 12, 2008.
- 3 U.S. Census Bureau. (2006). "State and County Quick Facts." Population Estimates, Census 2006. <<http://quickfacts.census.gov/qfd/>>. Accessed April 13, 2008
- 4 Ibid.
- 5 Kelly, Eric Damian. (2004). *Managing Community Growth*. Westport, CT: Praeger. 5.
- 6 Ibid.
- 7 Massachusetts Division of Fish & Wildlife Department of Fish and Game. (2005). *Commonwealth of Massachusetts 2005 Comprehensive Wildlife Conservation Strategy*. Executive Office of Environmental Affairs .Boston, MA, 11
- 8 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>> Accessed 18 February 2008.
- 9 Teaming With Wildlife, New York Wildlife Action Plan Summary, State Wildlife Action Plan website, http://www.wildlifeactionplans.org/pdfs/action_plan_summaries/newyork.pdf. Accessed February 1 2007.
- 10 Michalak, J., and Lerner, J. (2007). "Linking Conservation and Land Use Planning: Using the State Wildlife Action Plan to Protect Wildlife From Urbanization." *Defenders of Wildlife*. Washington, DC.
- 11 Throughout this paper, the Northeast region is defined by the U.S. Census jurisdiction, which includes Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, New Jersey and Pennsylvania. The U.S. Fish and Wildlife Northeast Region, and the Northeast Association of Fish and Wildlife Agencies represent slightly different states and Canadian provinces.
- 12 Aldridge et al. "State Wildlife Action Plans in the Northeast: A Regional Synthesis." University of Michigan. (2008: in production.)
- 13 Lerner, J., Cochran, B., and Michalak, J. (2006). "Conservation Across the Landscape: A Review of the State Wildlife Action Plans." *Defenders of Wildlife*. Washington, D.C.
- 14 Ibid.
- 15 Michalak, J., and Lerner, J. (2007). "Linking Conservation and Land Use Planning: Using the State Wildlife Action Plan to Protect Wildlife From Urbanization." *Defenders of Wildlife*. Washington, DC.
- 16 Aldridge et al. "State Wildlife Action Plans in the Northeast: A Regional Synthesis." University of Michigan. (2008 -in production).
- 17 Ibid.
- 18 Maine Department of Inland Fisheries and Wildlife representative, telephone interview with Michelle Aldridge, October 12, 2007. Ann Arbor, MI.
- 19 Massachusetts Division of Fish and Wildlife representative, telephone interview with Michael Jastremski, November 20, 2007. Ann Arbor, MI
- 20 New Jersey Endangered and Non-Game Species Program representative, telephone interview with Michael Jastremski, October 24, 2007. Ann Arbor, MI.
- 21 New York State Department of Environmental Conservation representative, telephone interview with Michael Jastremski, September 12, 2007. Ann Arbor, MI.
- 22 Vermont Fish and Wildlife Representative, telephone interview with Michelle Aldridge, October 4, 2007. Ann Arbor, MI.
- 23 New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, September 7, 2007. Ann Arbor, MI.
- 24 Representatives of the Pennsylvania Game Commission and Pennsylvania Game and Boat Commission, telephone interview with Michelle Aldridge, November 20, 2007. Ann Arbor, MI.
- 25 Rhode Island Department of Environmental Management representative, e-mail interview with Michael Jastremski, received November 5, 2007.
- 26 U.S. Census Bureau. (2006) "State and County Quick Facts: Maine." <<http://www.census.gov>> Accessed April 12, 2008.
- 27 Ibid.
- 28 U.S. Census Bureau. (2006). Interim projections of the total population for the United States and states: April 1, 2000 to July 1, 2030. <<http://www.census.gov/population/projections/SummaryTabA1.pdf>> Accessed April 12, 2008.
- 29 U.S. Census Bureau. (2006) "State and County Quick Facts: Maine." <<http://www.census.gov>> Accessed April 12, 2008.
- 30 Teaming With Wildlife, Maine Wildlife Action Plan Summary, State Wildlife Action Plan website <http://www.wildlifeactionplans.org/pdfs/action_plan_summaries/maine.pdf> Accessed March 6, 2008.
- 31 Maine Department of Inland Fisheries and Wildlife. (2005). "Maine's Comprehensive Wildlife Conservation Strategy" Augusta, Maine.

32 Maine Department of Inland Fisheries and Wildlife. (2003). "About Beginning with Habitat." <http://www.beginningwithhabitat.org/about_bwh/index.html> Accessed 6 March 2008.

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

34 Ibid

35 Ibid

36 Ibid

37 Maine Department of Inland Fisheries and Wildlife. (2003). "About Beginning with Habitat." <http://www.beginningwithhabitat.org/about_bwh/index.html> Accessed March 6, 2008.

38 Ibid

39 Ibid

40 Maine Department of Inland Fisheries and Wildlife. (2003)

41 Maine Department of Inland Fisheries and Wildlife representative, email correspondence with Michelle Aldridge, received March 7, 2007. Ann Arbor, MI.

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

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

44 Beginning with Habitat staff representative, telephone interview with Michelle Aldridge, October 12, 2007. Ann Arbor, MI.

45 Ibid

46 Ibid

47 U.S. Census Bureau. (2006) "State and County Quick Facts: Massachusetts." <<http://www.census.gov>> Accessed 6 March 2008.

48 Ibid.

49 U.S. Census Bureau. (2006). Interim projections of the total population for the United States and states: April 1, 2000 to July 1, 2030. <<http://www.census.gov/population/projections/SummaryTabA1.pdf>> Accessed April 12, 2008.

50 Ibid.

51 Teaming With Wildlife, Massachusetts Wildlife Action Plan Summary, State Wildlife Action Plan website <http://www.wildlifeactionplans.org/pdfs/action_plan_summaries/maine.pdf> Accessed 6 February 2008.

52 Maine Department of Inland Fisheries and Wildlife. (2005). "Maine's Comprehensive Wildlife Conservation Strategy" Augusta, Maine.

53 ibid

54 Massachusetts Division of Fish and Wildlife representative, telephone interview with Michael Jastremski, November 28, 2007. Ann Arbor, MI

55 Ibid

56 Massachusetts Division of Fish and Wildlife.(2007). The Biomap Project. <<http://www.mass.gov/dfwele/dfw/nhosp/nhbiomap.htm>>. Accessed April 13, 2008.

57 Massachusetts Division of Fish and Wildlife representative, telephone interview with Michael Jastremski, November 20, 2007. Ann Arbor, MI

58 Massachusetts Division of Fish and Wildlife representative, telephone interview with Michael Jastremski, November 28, 2007. Ann Arbor, MI

59 Massachusetts Division of Fish and Wildlife representative, telephone interview with Michael Jastremski, November 20, 2007. Ann Arbor, MI

60 U.S. Census Bureau. (2006) "State and County Quick Facts: New Jersey." <<http://www.census.gov>> Accessed April 12, 2008.

61 Ibid.

62 U.S. Census Bureau. (2006). Interim projections of the total population for the United States and states: April 1, 2000 to July 1, 2030. <<http://www.census.gov/population/projections/SummaryTabA1.pdf>> Accessed April 12, 2008.

63 Ibid.

64 Teaming With Wildlife, New Jersey Wildlife Action Plan Summary, State Wildlife Action Plan website <http://www.wildlifeactionplans.org/pdfs/action_plan_summaries/newjersey.pdf> Accessed March 6, 2008.

65 New Jersey Division of Fish & Wildlife Endangered and Nongame Species Program (NJDFW), "New Jersey Wildlife Action Plan," (Trenton, NJ: 2005),

66 New Jersey Department of Environmental Protection, Division of Fish and Wildlife. 2007. New Jersey's Landscape Project. <<http://www.state.nj.us/dep/fgw/ensp/landscape/>> Accessed 25 March 2008.

67 New Jersey Endangered and Non-Game Species Program representative, telephone interview with Michael Jastremski, October 24, 2007. Ann Arbor, MI.

68 New Jersey Division of Fish & Wildlife Endangered and Nongame Species Program (NJDFW), "New Jersey Wildlife Action Plan," (Trenton, NJ: 2005).

69 Ibid.

70 New Jersey Department of Environmental Protection, Division of Fish and Wildlife. 2007. New Jersey's Landscape Project. <<http://www.state.nj.us/dep/fgw/ensp/landscape/>> Accessed 25 March 2008.

71 New Jersey Department of Environmental Protection, Division of Fish and Wildlife. 2008. Bureau of Geographic Information Systems. <<http://www.nj.gov/dep/gis/>> Accessed 11 April 2008.

72 New Jersey Endangered and Non-Game Species Program representative, telephone interview with Michael Jastremski, October 24, 2007. Ann Arbor, MI.

73 Ibid.

-
- 74 Ibid.
- 75 Ibid.
- 76 Ibid.
- 77 Ibid.
- 78 New Jersey Department of Environmental Protection, Division of Fish and Wildlife. 2008. Landscape Project Trainings. <http://www.state.nj.us/dep/fgw/ensp/landscape_train.htm> Accessed 11 April 2008.
- 79 New Jersey Endangered and Non-Game Species Program representative, telephone interview with Michael Jastremski, October 24, 2007. Ann Arbor, MI.
- 80 Ibid.
- 81 Association of New Jersey Environmental Commission representative, telephone interview with Michael Jastremski, October 30, 2007. Ann Arbor, MI.
- 82 New Jersey Endangered and Non-Game Species Program representative, telephone interview with Michael Jastremski, October 24, 2007. Ann Arbor, MI.
- 83 Ibid.
- 84 U.S. Census Bureau. (2006). "State and County Quick Facts: New York." <<http://www.census.gov>>
- 85 Ibid.
- 86 U.S. Census Bureau. (2006). Interim projections of the total population for the United States and states: April 1, 2000 to July 1, 2030. <<http://www.census.gov/population/projections/SummaryTabA1.pdf>> Accessed April 12, 2008.
- 87 Ibid.
- 88 Teaming With Wildlife, New York State Wildlife Action Plan Summary, State Wildlife Action Plan website <http://www.wildlifeactionplans.org/pdfs/action_plan_summaries/newyork.pdf> Accessed December 6, 2007.
- 89 New York State Department of Environmental Conservation (NYSDEC), "New York Comprehensive Wildlife Conservation Strategy." (Albany, NY: 2005).
- 90 Penhollow, M. E., P. G. Jensen, and L. Zucker. (2006). Wildlife and Conservation Framework: An Approach for Conserving Biodiversity in the Hudson River Estuary Corridor. New York Cooperative Fish and Wildlife Research Unit and New York State Department of Environmental Conservation, Hudson River Estuary Program, Ithaca, N.Y. Available online from the NYS Library as an electronic document. < www.nysl.nysed.gov>
- 91 NYSDEC. (2007). Hudson River Estuary Program website. <<http://www.dec.ny.gov/lands/4920.htm>>. Accessed 4 March 2008.
- 92 New York State Department of Environmental Conservation representative, telephone interview with Michael Jastremski, September 12, 2007. Ann Arbor, MI.
- 93 NYSDEC. (2007). Hudson River Estuary Action Agenda 2005-2009. 2007 update. NYSDEC, Albany, NY. <<http://www.dec.ny.gov/lands/5104.html>> Accessed 4 March 2008.
- 94 NYSDEC. (2007). "New York Comprehensive Wildlife Conservation Strategy." (Albany, NY: 2005). Pg. 21.
- 95 New York State Department of Environmental Conservation representative, telephone interview with Michael Jastremski, September 12, 2007. Ann Arbor, MI.
- 96 Ibid.
- 97 New York State Department of Environmental Conservation representative, telephone interview with Michael Jastremski, August 13, 2007. Manlius, NY.
- 98 New York State Department of Environmental Conservation representative, telephone interview with Michael Jastremski, September 12, 2007. Ann Arbor, MI.
- 99 Ibid
- 100 Ibid
- 101 Ibid
- 102 Ibid.
- 103 Kiviat, E., and G. Stevens. (2001). Biodiversity Assessment Manual for the Hudson River Estuary Corridor. New York State Department of Environmental Conservation. Albany, N.Y.
- 104 New York State Department of Environmental Conservation representative, telephone interview with Michael Jastremski, September 12, 2007. Ann Arbor, MI.
- 105 Heady, Laura. (2007). How the NYSDEC Hudson River Estuary Program and its partners have encouraged and supported habitat conservation in two Ulster County towns. NYSDEC, Albany, NY.
- 106 U.S. Census Bureau. (2006). "State and County Quick Facts: Vermont." <<http://www.census.gov>> Accessed December 6, 2007.
- 107 Teaming With Wildlife, Vermont Wildlife Action Plan Summary, State Wildlife Action Plan website <http://www.wildlifeactionplans.org/pdfs/action_plan_summaries/vermont.pdf> Accessed December 6, 2007.
- 108 Vermont Fish and Wildlife Department, (VFW), "Vermont's Wildlife Action Plan." (Waterbury, VT: 2005).
- 109 Vermont Fish and Wildlife representative. telephone interview with Michelle Aldridge, October 4, 2007. Ann Arbor, MI.
- 110 Ibid.
- 111 Ibid.
- 112 Ibid.
- 113 Ibid.
- 114 Ibid.
- 115 Ibid.

-
- 116 Ibid.
- 117 Ibid.
- 118 Ibid.
- 119 Vermont Local Conservation Commissioner, telephone interview with Michelle Aldridge, October 12, 2007. Ann Arbor, MI.
- 120 Ibid.
- 121 Ibid.
- 122 Population Finder: New Hampshire. (2005). U.S. Census Bureau, 2006 Population Estimates, Census 2000, 1990 Census
- 123 Teaming With Wildlife, New Hampshire Wildlife Action Plan Summary, State Wildlife Action Plan website
<http://www.wildlifeactionplans.org/pdfs/action_plan_summaries/newhampshire.pdf> (Accessed April 13, 2008).
- 124 Society for the Protection of New Hampshire Forests. (2005). "New Hampshire's Changing Landscape 2005."< <http://www.spnhf.org/research/research-projects.asp>> Accessed February 1 2007.
- 125 New Hampshire Fish and Game Department Nongame and Endangered Wildlife Program (NHFG), "New Hampshire Wildlife Action Plan,"(Concord, NH: 2005).
- 126 New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, April 16, 2007. Ann Arbor, MI.
- 127 Ibid.
- 128 New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, September 7, 2007. Ann Arbor, MI.
- 129 Ibid.
- 130 Ibid.
- 131 Ibid.
- 132 Ibid.
- 133 Ibid.
- 134 Ibid.
- 135 U.S. Census Bureau. (2004) 2002 Census of Governments, Volume 1, Number 1, Government Organization, GC02(1)-1, U.S. Government Printing Office, Washington, DC, 2002.
- 136 New Hampshire Conservation NGO representative, telephone interview with Michelle Aldridge, October 10, 2007. Ann Arbor, MI.
- 137 New Hampshire city environmental planner, telephone interview with Michelle Aldridge, March 10, 2008. Ann Arbor, MI.
- 138 Northeast state wildlife agency representative, telephone interview with Michelle Aldridge, October 4, 2007. Ann Arbor, MI.
- 139 New York State Department of Environmental Conservation representative, telephone interview with Michael Jastremski, August 13, 2007. Manlius, NY.
- 140 New York State Department of Environmental Conservation representative, telephone interview with Michael Jastremski, September 12, 2007. Ann Arbor, MI.
- 141 New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, October 9, 2007. Ann Arbor, MI.
- 142 New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, October 9, 2007. Ann Arbor, MI.
- 143 Rhode Island Department of Environmental Management representative, e-mail interview with Michael Jastremski, received November 5, 2007.
- 144 New Jersey Township Planner, telephone Interview with Michael Jastremski, November 7, 2007. Ann Arbor, MI.
- 145 New Hampshire city environmental planner, telephone interview with Michelle Aldridge, March 10, 2008. Ann Arbor, MI.
- 146 New Hampshire Fish and Game representative #2. telephone interview with the author., September 7, 2007. Ann Arbor, MI
- 147 Vermont Fish and Wildlife. (2004). "Conserving Vermont's Natural Heritage: A Guide to Community-Based Planning for the Conservation of Vermont's Fish, Wildlife, and Biological Diversity."< <http://www.vtfishandwildlife.com>> Accessed December 6, 2007.
- 148 Ibid.
- 149 Ibid.
- 150 Ibid.
- 151 New Jersey Town Planner, Telephone Interview with Michael Jastremski, November 7, 2007. Ann Arbor, MI.
- 152 Maine Department of Inland Fisheries and Wildlife representative, telephone interview with Michelle Aldridge, October 12, 2007. Ann Arbor, MI.
- 153 Maine Department of Inland Fisheries and Wildlife representative, Telephone interview with Michelle Aldridge, October 12, 2007. Ann Arbor, MI.
- 154 Maine Department of Inland Fisheries and Wildlife representative, telephone interview with Michelle Aldridge, October 12, 2007. Ann Arbor, MI.
- 155 Massachusetts Division of Fish and Wildlife representative, telephone interview with Michael Jastremski, November 28, 2007. Ann Arbor, MI
- 156 New York State Department of Environmental Conservation representative, telephone interview with Michael Jastremski, September 12, 2007. Ann Arbor, MI.
- 157 New Jersey Endangered and Non-Game Species Program representative, telephone interview with Michael Jastremski, October 24, 2007. Ann Arbor, MI.
- 158 New Hampshire regional planner, telephone interview with Michelle Aldridge, October 23, 2007. Ann Arbor, MI.
- 159 New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, September 7, 2007. Ann Arbor, MI.
- 160 Representatives of the Pennsylvania Game Commission and Pennsylvania Game and Boat Commission, telephone interview with Michelle Aldridge, November 20, 2007. Ann Arbor, MI.
- 161 New York Department of Environmental Conservation representative, telephone interview with Michael Jastremski, September 12, 2007. Ann Arbor, MI.

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

163 New Hampshire city environmental planner, telephone interview with Michelle Aldridge, March 10, 2008. Ann Arbor, MI.

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

165 Massachusetts Division of Fish and Wildlife representative, telephone interview with Michael Jastremski, November 20, 2007. Ann Arbor, MI

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

167 New Hampshire city environmental planner, telephone interview with Michelle Aldridge, March 10, 2008. Ann Arbor, MI.

168 Vermont Fish and Wildlife Representative, telephone interview with Michelle Aldridge, October 4, 2007. Ann Arbor, MI.

169 Vermont town Conservation Commissioner, telephone interview with Michelle Aldridge, November 7, 2008. Ann Arbor, MI.

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

171 Consultant to New York State town, telephone interview with Michael Jastremski, November 21, 2007. Ann Arbor, MI

172 New Jersey Endangered and Non-Game Species Program representative, telephone interview with Michael Jastremski, October 24, 2007. Ann Arbor, MI.

173 Ibid.

174 Vermont Fish and Wildlife Representative, telephone interview with Michelle Aldridge, October 4, 2007. Ann Arbor, MI.

175 Beginning with Habitat staff representative. telephone interview with Michelle Aldridge, October 12, 2007. Ann Arbor, MI.

176 Ibid

177 Ibid

178 New York State conservation NGO representative, telephone interview with Michael Jastremski, October 3rd, 2007. Ann Arbor, MI.

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

180 Massachusetts Conservation NGO representative, telephone interview with Edalin Michael, October 26, 2007. Ann Arbor, MI.

181 N.J. Stat. Ann. § 40:55D-28

182 Me. Rev. Stat. Ann. tit. 30-A § 4326.

183 R.I. Gen Laws § 45-22.2-6

184 Maine Department of Inland Fisheries and Wildlife representative, Telephone interview with Michelle Aldridge, October 12, 2007. Ann Arbor, MI.

185 Ibid.

186 Maine Department of Inland Fisheries and Wildlife representative, Telephone interview with Michelle Aldridge, October 12, 2007. Ann Arbor, MI.

187 U.S. Fish and Wildlife Service. "The Eight Required Elements to include in Comprehensive Wildlife Conservation Plans." Available online at: <http://www.fws.gov/Midwest/FederalAid/documents/eight_elements.pdf> Accessed 1 February, 2008.

188 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.

189 New Jersey Division of Fish & Wildlife Endangered and Nongame Species Program representative, telephone Interview with Sarah Levy, September 19, 2007. Ann Arbor, MI, 2007; New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, April 16, 2007. Ann Arbor, MI.

190 Connecticut Department of Environmental Protection, telephone interview with Christopher Theriot, October 22, 2007. Ann Arbor, MI.

191 New Hampshire Fish and Game Department. (2005). "New Hampshire Wildlife Action Plan." <<http://www.wildlife.state.nh.us>>. Accessed 16 November 2007.

192 Ibid.

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

194 Ibid.

195 Ibid.

196 New Hampshire Fish and Game representative, telephone interview with Michelle Aldridge, September 7, 2007. Ann Arbor, MI.

197 Conservation Resources Inc. (2007). "Raritan-Piedmont Wildlife Habitat Partnership".< <http://www.conservationresourcesinc.org/rpwhp.htm>>. Accessed April 13, 2008.

198 Ibid.

199 New Jersey Division of Fish & Wildlife Endangered and Nongame Species Program (NJDFW), "New Jersey Wildlife Action Plan," (Trenton, NJ: 2005), Pg 255.

200 Ibid.

201 New Jersey Conservation NGO representative, telephone interview with Michael Jastremski, October 30, 2007. Ann Arbor, MI.

202 Ibid.

203 Conservation Resources Inc. (2007). "Raritan-Piedmont Wildlife Habitat Partnership".< <http://www.conservationresourcesinc.org/rpwhp.htm>>. Accessed April 13, 2008.

204 204 New Jersey Conservation NGO representative, telephone interview with Michael Jastremski, October 30, 2007. Ann Arbor, MI.