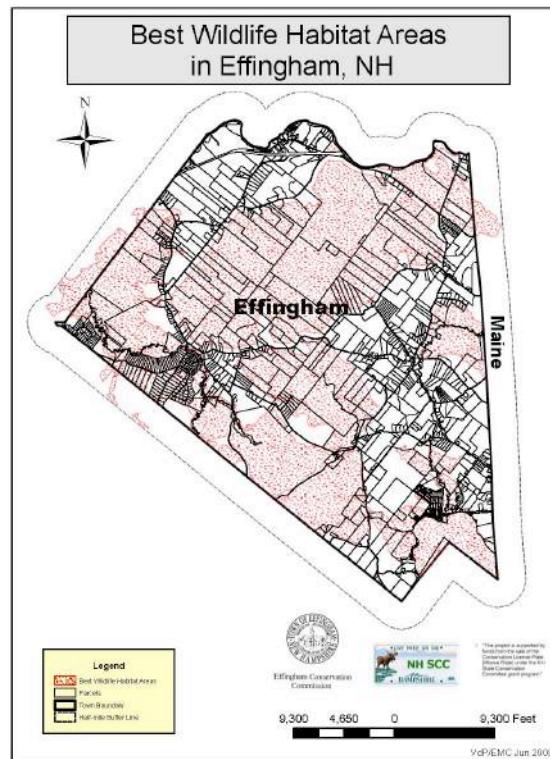


FINAL REPORT
On the
2007-2009 WILDLIFE ACTION PLAN IMPLEMENTATION PROJECT

for the
TOWN OF EFFINGHAM
[Carroll County, NH]



Rick Van de Poll, Ph.D.
Ecosystem Management Consultants
30 N. Sandwich Rd.
Center Sandwich, NH 03227
603-284-6851
rickvdp@gmail.com

June 2009



"This project is supported by funds from the sale of the Conservation License Plate (Moose Plate) under the NH State Conservation Committee grant program."



Effingham Conservation
Commission

Executive Summary

Between July 2007 and June 2009 a comprehensive study paid for by the NHSCC's "Moose Plate" Grant Program was completed of Effingham's best wildlife habitat. Using the 2005 Wildlife Action Plan (WAP) published by the New Hampshire Fish & Game Department, an implementation project was conducted that 1) identified the best wetland and upland habitats using available GIS data; 2) identified target WAP-listed rare wildlife species for subsequent sampling; 3) used standard field sampling techniques in order to verify and document the occurrences of these rare wildlife species; and 4) used Arc9 GIS (ArcMap) to plot the occurrences, estimate minimum viable habitat surrounding each occurrence, and draft a best habitat map that reflected this data.

Information from the 2005-2007 Effingham Wetlands Inventory & Protection Project was used to update habitat maps, plot known occurrences of rare wildlife species, and locate the best wetland wildlife habitat in town. Selected field excursions into previously unvisited upland habitat areas, as well as a careful review of aerial photography was used to provide an initial estimate of the best upland habitat areas in Effingham. A total of 3141 acres of wetlands and 12,043 acres of uplands were initially identified as the best habitat areas.

The list of critically imperiled species was divided into two parts for the WAP Implementation Project: **moderately imperiled** species were determined to be those on the Wildlife Action Plan list that had a "low threat" or "moderate threat" assigned to them; those on the WAP list that were assigned "serious threat" or "critical threat" were determined to be **critically imperiled**. This determination departed from the traditional focus on endangered and threatened species in keeping with the WAP's goal of promoting the protection of lesser known species.

A total of 50 moderately or critically imperiled species was initially identified as target species for the sampling effort in 2007 and 2008. By June 2008 this list had grown to 88 species, largely based on the input of NH Audubon and The Nature Conservancy personnel who were concerned about Odonata and Lepidoptera species, respectively. By the end of 2008 three more species were added based on observations of unexpected species, and in 2009 1 species was added because it appeared on the revised "Special Concern" list published by the NH Fish & Game Department.

Field sampling in 2007 and 2008 has been summarized in two seasonal summary reports that were submitted in January 2008 and January 2009 respectively. In all, a total of 149 records of rare species representing 33 species were documented in Effingham during the two-year field effort. Ten of these species were critically imperiled and 23 were moderately imperiled. Eleven of these species had not been recorded in Effingham before, including three rare moths, a blue-spotted salamander, and several dragonfly species.

Roughly 68% of the WAP-derived best habitat areas in Effingham were identified as best habitat areas during this project. This number fell to 58% within the half-mile buffer zone of town. A total of 5914 acres of wetlands and their buffers plus 8075 acres of additional upland habitat were identified as the best wildlife habitat areas in Effingham. Principal areas included the lower Pine River and Heath Pond Bog, Watts Wildlife Sanctuary, Wilkinson Brook, Pine River State Forest, Province Lake, South River, and Green Mountain.

A set of recommendations have been provided in this report that outline several conservation strategies to help protect these important wildlife habitat areas. Based on implementation strategies in the WAP, these include a seven-point, bulleted list of action steps: 1) prioritize conservation initiatives; 2) coordinate conservation activities with public & private agencies; 3) outreach & education; 4) land protection; 5) local policy development & initiatives; 6) habitat management & monitoring; and 7) further field research.



Acknowledgments

The author would gratefully like to acknowledge the following individuals, agencies, and organizations:

Effingham Conservation Commission
Effingham Planning Board
Effingham Board of Selectmen
Green Mountain Conservation Group
NH Audubon Society
NH Department of Transportation
NH Fish & Game Department
NH Department of Resources & Economic Development
NH Natural Heritage Bureau
NH State Conservation Committee
Society for the Protection of NH Forests
The Nature Conservancy
UNH Cooperative Extension

Particular individuals must also be recognized within these organizations for their general support, guidance and feedback: Kamalendu Nath, Chair of the Effingham Conservation Commission; Ms. Emily Brunkhurst of the Non-Game & Endangered Species Division of the NH Fish & Game Department; Ms. Pam Hunt of the NH Audubon Society, and Mr. Jeff Lougee of The Nature Conservancy. Field sampling assistance was also provided by Kamal Nath, Emelyn Albert, and Al Levesque, Barbara Thompson, and Tim White of the Effingham Conservation Commission; Matt Carpenter and Ben Nugent (& crew) of the Fisheries Division of the NH Fish & Game Department; Jeff Lougee of The Nature Conservancy, and Pam Hunt of the NH Audubon Society.



CONTENTS

<i>Executive Summary</i>	<i>i</i>
<i>Acknowledgments</i>	<i>ii</i>

I. Overview	1
II. Task 6 – GIS Mapping of Wildlife Habitat	3
III. Task 8 – Conservation Recommendations for Effingham	5
A. Prioritize Conservation Initiatives	5
B. Coordinate Conservation Activities with Public and Private Agencies	7
C. Outreach & Education	9
D. Land Protection	10
E. Local Regulation & Policy Development	11
F. Habitat Management & Monitoring	13
G. Research & Further Sampling	15
III. References	18

List of Figures

Cover & Frontispiece. Effingham's Best Wildlife Habitat Areas	
Figure 1. Pine Barrens habitat	2
Figure 2. Lower Pine River panorama	4
Figure 3. Habitat management, natural. Tornado damage.	8

List of Tables

Table 1. List of Existing Conservation Lands	5
--	---

APPENDICES

<u>A)</u>	<u>Maps</u>	
	Core Wildlife Habitat Areas of Effingham, NH	A-1
	Core Wildlife Habitat Areas – Inset PRSF	A-2
	Rare Wildlife Occurrences- Effingham, NH	A-3
	Effingham, NH WAP-derived Priority Habitats with Overlay of Field Findings	A-4
	Best Wildlife Habitat Areas in Effingham, NH	A-5
	Best Wildlife Habitat Areas & Land under Conservation	A-6
	Best Wildlife Habitat by Type or Area in Effingham, NH	A-7
<u>B)</u>	<u>Lists</u>	
	Updated rare species occurrence records	B-1
	Critical wildlife species list for Effingham	B-4

APPENDIX B –WILDLIFE OCCURRENCE LISTS

Updated rare species occurrence records	B-1 to B-3
Critical wildlife species list for Effingham	
By Assemblage	B-4 to B-6
By Threat category	B-7

I. OVERVIEW

The 2007-2009 Wildlife Action Plan (WAP) Implementation Project (“the Project”) was created to better understand the wildlife habitat in Effingham and the species that occur within it. The Effingham Conservation Commission, with the assistance of the author, obtained a NH State Conservation Committee (“Moose Plate”) grant to conduct an in-depth investigation into the occurrence of rare wildlife species in town along with an analysis of those wetland and upland habitats that support them. The following tasks were incorporated into the Project:

- Task 1) Analyze the best wetland wildlife habitat in Effingham using 2005-2007 wetland assessment project data
- Task 2) Analyze the Wildlife Action Plan and identify the best upland wildlife habitat in Effingham
- Task 3) Conduct seasonal sampling of moderately imperiled wildlife species in order to test general habitat quality
- Task 4) Derive targeted list of critically imperiled wildlife that are poorly understood in Effingham
- Task 5) Conduct seasonally adjusted, time and/or area-constrained sampling of critically imperiled species
- Task 6) Using GPS-based data and Arc9 GIS, modify and update the significant wildlife habitat map of Effingham
- Task 7) Produce seasonal summary reports of field findings, complete with maps and narrative that describe habitat conditions and their use by target species
- Task 8) Draft and present a wildlife conservation plan for Effingham that includes municipally supported habitat protection initiatives and recommendations for preserving critically imperiled species

In 2005-2007, the Effingham Wetlands Inventory and Protection Project identified eleven *exemplary* wetlands that ranked very high in their overall assessment of habitat quality. The data contained in the “*Final Report on the 2005-2007 Wetlands Inventory & Protection Project, Effingham, NH [Carroll County]*” was invaluable as a starting point in updating the WAP habitat maps for the town. A second step included field surveys of upland habitat areas, as well as a careful review of digital aerial photography. To better understand the *condition* of the wetland and upland habitats, as well as which rare species occurred in these habitats, however, further field research was required. This comprised the work of Tasks 3, 4 and 5, where all rare wildlife species known to occur or that could occur in Effingham was searched for. Seasonal summary reports on both the 2007 and 2008 field season have already been submitted, and these can be accessed either through the NH State Conservation Committee or Effingham Conservation Commission web site

[\[www.effinghamconservationcommission.web.officelive.com\]](http://www.effinghamconservationcommission.web.officelive.com)¹

In order to modify and update the significant wildlife habitat map of Effingham (Task 6), the initial map estimate of good habitat areas was integrated with the Task 3 and Task 5 field results. During the field sampling effort, habitat condition was determined by observing various environmental characteristics, including habitat extent, level of natural and artificial disturbance, habitat structure, and successional age. Using the 2006 1-foot color aerial photographs published by NH GRANIT additional habitat information was also derived for areas where field sampling did not take place. These high resolution photographs also allowed me to estimate the location of *minimum viable habitat* for each of the 149 rare species occurrences recorded during the 2005-2007 and 2007-2008 field seasons. Critical habitat areas for each record of occurrence were then aggregated into a single coverage of best wildlife habitat.

¹ Copies are also available at the Town Office.

It must be stated that estimating habitat condition and usage is not an accurate science. Species records, while helpful, do not entirely ensure that viable populations of organisms exist. Chance occurrences, such as the rusty blackbird that was recorded roosting at Watts Wildlife Sanctuary, or the single Blanding's turtle that was found near Wilkinson Swamp, can only provide a preliminary indication that suitable habitat exists for a rare species in a particular area. In addition, habitat conditions change with time, both for the better or for the worse depending on what type(s) of habitat is required for a particular species. Grasslands and sapling meadows may grow into forests, for instance, and eastern towhees and whip-poor-wills will likely disappear. The migration routes of vernal pool-obligate amphibians may get cut-off by roadways and other development, and scattered populations will lose their genetic "strength" through isolation. It is for this reason that the accompanying maps of "best wildlife habitat" can only serve as an *approximation* and not an absolute indicator of where the best wildlife habitat exists or where one or more rare species occur.

Since previous reports have contained descriptions of the derivations of best wildlife habitat areas (Tasks 1 & 2), as well as the results of the field sampling effort over the past two years (Tasks 3, 4, 5 & 7), this report will focus on the remaining two uncompleted tasks, namely, Task 6: the use of Arc9 GIS maps to derive a map estimate of the best wildlife habitat in Effingham; and Task 8: presenting conservation recommendations to the town. Task 9, the submission of semi-annual reports on the progress of the Project has been completed by virtue of a separate document. In addition to the narrative description of Task 6 and Task 8, several updated maps have been provided in the Appendix as well as an updated list of rare wildlife occurrences, the latter of which reflects the 2009 revisions to the state's list of endangered, threatened, and special concern wildlife.



Figure 1. Pine Barrens habitat. Ephemeral habitats in Effingham present one of the long-term Challenges for conservationists and habitat managers. Whereas fire has historically "managed" these flat, well-drained areas in favor of certain moth and butterfly species, currently they are under threat by both development and succession. Not only are they among the rarest habitat types in the state, they also require the greatest amount of attention in terms of maintaining their ecological viability.

II. TASK 6 – USING ARC9 GIS MAPS TO DERIVE THE BEST WILDLIFE HABITAT MAP OF EFFINGHAM

The conversion of the ArcView 3.2a data from the Wetlands Inventory and Protection Project to the Arc9 (ArcMap 9.2) platform took place mostly in late fall 2008. Among other capabilities, this conversion allowed for the use of the above-mentioned, high resolution aerial photography to review previously mapped habitat areas as well as check for the condition of these areas. The extent of private roadways, residences, and other forms of land disturbance was directly visible in these ortho-rectified photographs². A clearer extent of both forested and open wetlands was also afforded. In areas where private property access was not possible it also provided a direct view of land cover as of April 2006. Perhaps most critically, it allowed for a direct comparison between field-derived data and remote imagery data. There were several advantages to this type of analysis:

- 1) It provided a mechanism for updating the wetland data layer that was previously extrapolated from fieldwork and 1998 digital orthophotoquads (DOQ's);
- 2) It allowed for a more accurate assessment of the impacts of roads on wildlife habitat, thereby improving estimates of road setback distances when defining unfragmented blocks;
- 3) It provided context for establishing minimum viable habitat areas around each rare species occurrence record;
- 4) It allowed for the derivation of shallow water fringe wetland mapping at Province Lake and along the Ossipee River; and
- 5) It yielded cover type information for isolated pockets of habitat that were not easily accessible, such as backyard fields, ridge top vernal pools, wet meadows, and the extent of the lowland spruce-fir forest on Green Mountain

Appendix A illustrates the 2006 1-foot color aerial photographs as a backdrop to three separate maps. The first shows the core wildlife habitat areas that surround the 149 records of rare wildlife occurrences in Effingham. The second shows an inset of the first map in the vicinity of the PRSF and Clough Road. The third depicts the town with all 149 symbol-coded rare wildlife occurrences. Used with either DEM-derived contour lines or 3D imagery these photographs can be very useful in assigning habitat extent and approximate condition.

The derivation of minimum viable habitat areas around rare species occurrences was completed using best available knowledge and data on each species. All 33 species were treated separately, and researched using the WAP Appendix A, B & D, literature listed in the reference section, field data, and personal experience. Information on bird and dragonfly species was provided by Pam Hunt of NHAS, and data on moth species was provided by Jeff Lougee and Dale Schweitzer of TNC.

Once minimum viable habitat areas were created for each record of occurrence, they were aggregated by threat level – i.e. critical, serious, moderate, and low. This was completed by

² *Ortho*-rectification simply means that an image from an airplane has been “adjusted” for the skewed angle of sight from a camera lens. In this way, a distance on the aerial photo when scaled upwards reflects the actual distance on the ground.

assigning a different symbol according to the attribute table for this shapefile. Red shading was used for visibility and use in black-and-white reproductions, as needed. Further use of ArcMap data provided with this report will allow for any combination of symbols or shading to be used for these species records, as well as the for the easy addition of new species records as they come in.

A final step in the best habitat map derivation process was the review of those areas that were not covered by minimum viable habitat polygons using both field data and the 2006 color aerials. As stated above, this is not an exact science, and some degree of approximation was involved. For example, whereas habitat specific species such as dragonflies and moths could be tied to high quality wetlands and pine lands habitats, respectively, the estimated occurrence of minimum viable habitat for wide-ranging species such as bobcat and Coopers hawk was not as easily approximated. In the case of species that use a number of habitats for their 'home range,' minimum viable habitat mapping was limited to the immediate unfragmented habitat area surrounding the occurrence. Thus, habitat condition factored heavily into the decision to include or exclude an area within the minimum viable habitat polygon.

The accompanying data set (on CD) contains the following layers that can be updated as needed in the future:

- ❖ WAP-derived habitats and habitat condition in Effingham³
- ❖ RVP-derived habitats in Effingham
- ❖ Intersections of WAP versus RVP-derived habitat types
- ❖ Critically imperiled (rare) wildlife species records in Effingham (N = 149)
- ❖ Critically imperiled wildlife species occurrences by threat category
- ❖ Minimum viable habitat polygons around each species occurrence
- ❖ Best wildlife habitat areas derived from the above (by type and all combined)
- ❖ Lands under conservation (5-22-09) in Effingham
- ❖ Intersection between lands under conservation and best wildlife habitat areas
- ❖ Intersection between town tax parcels (2006) and best wildlife habitat areas



Figure 2. Lower Pine River and complex wetland habitat types. This was the site for blue-spotted salamander.

III. Task 8 - CONSERVATION RECOMMENDATIONS FOR EFFINGHAM

A. Prioritize Conservation Initiatives

A total of 13,989 acres of area was determined to hold the best wildlife habitat in Effingham. This encompasses 664 parcels, 14 of which are protected by some form of

³ Most map data includes the half-mile (2640 ft.) area around Effingham as well.

conservation restriction (see below). There are approximately 6034 acres of land protected in Effingham, 91% (5499 ac.) of which lies in one or more of the best wildlife habitat areas (**in bold**). Roughly 40% of the best habitat areas in Effingham are protected by some form of conservation restriction.

Table 1. List of conservation properties in Effingham (5-22-09)

NAME	NAME - SECONDARY	PPTYPE	ACRES
Green Mountain Natural Area	Green Mountain Natural Area	FO	39.9
Watts Wildlife Sanctuary	Watts Wildlife Sanctuary	FO	267.7
Varrieur	Varrieur – Rte 153 & Ossipee R.	CE	30.3
Little Property - Watts Wildlife Sanctuary	Little Property - Watts Wildlife Sanctuary	FO	131.1
Patricia Watts Addition	High Watch Preserve	FO	59.4
Dwight Mills Addition	High Watch Preserve	FO	655.2
Heath Pond Bog Natural Area	Heath Pond Bog Natural Area	FO	891.6
Green Mountain State Forest	Green Mountain State Forest	FO	15.3
Heath Pond Bog Natural Area Right-of-Way	Heath Pond Bog Natural Area Right-of-Way	RW	0.4
Heath Pond Bog Natural Area	Heath Pond Bog Natural Area	FO	0.7
Heath Pond Bog Natural Area Right-of-Way	Heath Pond Bog Natural Area Right-of-Way	RW	0.3
Heath Pond Bog Natural Area	Heath Pond Bog Natural Area	FO	0.4
Heath Pond Bog Natural Area Right-of-Way	Heath Pond Bog Natural Area Right-of-Way	RW	3.5
Moulton Tract	Wilkinson Brook Parcel	FO	205.4
Nath Easement	Wilkinson Brook Parcel	CE	319.3
Pine River State Forest	Pine River State Forest	FO	2245.3
Leavitt Easement	Leavitt Easement	CE	46.0
Charlie Watts Tract	High Watch Preserve	FO	1034.7
Dr. Melvin Harmon Preserve	High Watch Preserve	FO	0.0
Dearborn Trail Addition	High Watch Preserve	FO	87.6
PPTYPE = Protection Type: FO – Fee Ownership; CE = Conservation Easement; RW = Right-of-Way			

Two notable areas that support rare wildlife species and their habitat that are not yet protected are the northwest part of Province Lake and the Lower Pine River wetland and its buffer to the west. These areas currently support several serious and moderate threat level species on lands that could be developed. Of these two areas, the wetland buffer lots along Pine River Road have the greatest potential for development, and in fact, have seen a number of new residences built in the last ten years. The Province Lake area also contains excellent potential for a wildlife corridor to the north towards Wilkinson Swamp that currently supports bobcat, moose, black bear, deer, coyote and other wide-ranging species. Corridor connections between Upper Wilkinson Swamp and Green Mountain as well as the Lower Pine River and Green Mountain need to be established. Aside from this “first cut” assessment of potential high quality wildlife habitat lands in greatest need of protection, it is strongly recommended that the Effingham Conservation

Commission develop a formal **conservation plan** that goes beyond this report and identifies specific parcels, parcel owners, a timeline, funding mechanisms, and a suggested method of conservation protection for each of these parcels of concern. This can best be done with the help of a local conservation organization such as the Green Mountain Conservation group, who has intimate knowledge of the land use pattern in the area. Use of ArcMap GIS data is crucial in the derivation of high priority sites. Funding source will need to be identified, although the following have been used in the past:

- a) Federal Forest Legacy Program – mostly large, complex parcel purchases that require broad-scale regional and statewide support; currently underfunded, waitlisted projects until 2011;
- b) Land Conservation Heritage Investment Program (LCHIP) – suitable for most local projects, but requiring a substantial match and broad-scale community (and regional) support; currently underfunded but may see modest increase in next biennium;
- c) Aquatic Resource Mitigation (ARM) Fund of the NH Department of Environmental Services – this new program is for wetland functional value protection and is operated on a watershed (HUC 10) basis; schedule for the Ossipee/Saco River is 2011, with approvals in 2012; amount of \$ dependent on inputs from in-lieu fees paid into the fund; potential good source of funds for a restoration/preservation mixed project;
- d) Federal Farm & Ranchland Program – this funds the restoration, creation, and preservation of farmland and could be of great benefit for protecting the grasslands of Effingham, notably the Green Mountain Road complex, the Effingham Center area, and the Stevens Road area; this also requires broad-scale community support and is administered by the County Conservation Districts in cooperation with UNH Cooperative Extension
- e) Municipal Conservation Funds are usually established to provide a funding mechanism to support its duties under RSA 36-A. Towns accept monies from the Land Use Change Tax (LUCT), which results from lands under current use being taken out of current use (may be for development. This money is typically used by communities to support land conservation efforts, inclusive of acquiring, accepting, and stewarding conservation easements. As is the case with Effingham, money in this fund is too small to be of significant value in acquiring property, but can be very useful in offsetting the legal costs of protecting a property or in providing a match for a larger grant funding proposal.
- f) Landowner Incentive Program – administered by the County Conservation Districts, this federal program was established to provide yet another small grants program (like SIP, EQUIP, and WHIP) for landowners wishing to protect natural resources on their lands. This program was set up to provide direct support for small scale land

protection. Currently underfunded and inactive, it is possible that this program may get re-invigorated during the lifetime of the current administration.

Although sources of money do not necessarily drive the ability to conserve land - landowners can be solicited for conservation protection or to donate their land to the Town, for instance – adequate funds can ensure that the protection and stewardship of a particular parcel is done thoroughly. Having a comprehensive conservation plan in place with a detailed budget will yield a higher likelihood of success over the long term. At the very least, the conservation plan should have action steps for the upcoming five to ten years, especially since a great many of the standard granting agencies have multi-year waiting lists and/or budget cuts that limit the number of approvals in any given year.

B. Coordinate Conservation Activities with Public and Private Agencies

The following agencies and organizations have a direct interest in conservation in Effingham:

- (1) NH Department of Resources and Economic Development, Division of Forests and Lands (DFL)
- (2) NH Fish & Game Department (NHFG)
- (3) NH Natural Heritage Bureau (NHNHB)
- (4) NH Audubon Society (NHAS)
- (5) Society for the Protection of NH Forests (SPNHF)
- (6) NH Chapter of The Nature Conservancy (TNC)
- (7) Green Mountain Conservation Group (GMCG)
- (8) UNH Cooperative Extension (UNHCE)

Besides the Effingham Conservation Commission, organizations that have a direct interest in property (either in fee or as an easement holder) include DFL, NHAS, SPNHF, TNC, and GMCG. The remainder has an interest in wildlife, inclusive of rare plants and exemplary natural communities. UNH Cooperative Extension also has an interest in direct education and outreach to citizens concerning wildlife conservation. Each of these organizations typically coordinate their efforts to protect wildlife and the habitat they depend on, and have therefore already played an active role in this project as well as past conservation initiatives in Effingham.

Although it is beyond the scope of this report to provide in-depth background on each of these organizations, it is incumbent upon the ECC to understand who to turn to for assistance for the various activities suggested in this set of conservation recommendations. For instance, relative to the protection of the most valuable upland habitat in Effingham – the 1441 acres of Pine Barrens identified in this project – the NH DFL holds the greatest interest and should be consulted relative to its plans for the long-term management of the Pine River State Forest (PRSF). The PRSF is the largest piece of conservation land in Effingham (3500 acres, 2789 acres of which is in Effingham). It includes the dry oak-pine forests along the Wakefield town line as well as the wetland-dominated Lower Pine River wetland complex and the Heath Pond Bog Natural Area. Although the latter is a “Natural Area,” it is still subject to timber harvesting as was recently done during the last winter. Such activities should be coordinated with NHFG and TNC to provide optimal habitat enhancement for the rare Pine Barrens moths that were found during the moth sampling efforts in 2007 and 2008.

The NHDFL should also be consulted for support in any land protection efforts in the Lower Pine River, whether or not the lands are protected or managed for wildlife. The state, while

currently seeking to unload many of its land assets, may be interested in taking title to lands purchased that are adjacent to the PRSF. This may be particularly true for lands abutting the Heath Pond Natural Area, since there may be less management (i.e. timber management) oversight than other areas. The lack of high visibility from a road and limited public access may also make this less of a “burden.”

Coordination with NHDFL should also occur with NHFG, NHAS, and TNC, since the latter agencies have a direct interest in the rare wildlife that occurs in this area. Habitat management, restoration, and enhancement are possible within the Heath Pond unit for several rare species, including whip-poor-will, spotted turtle, and several Pine Barrens moths. The latter group may be improved by prescribed burning efforts to release forest canopy and regenerate more of the typical pitch pine-scrub oak woodland habitat found nearby in the Ossipee Pine Barrens. An allowance for such limited ground fire burns in selected areas of the PRSF may serve state-listed species not yet discovered in this area, such as the Pine Barrens Pinion Moth and the Pine Barrens Zanclognatha.

Similar ongoing habitat management coordination should also occur with the Forest Society relative to the mix of habitats at the High Watch Preserve. The low grassy wetlands yielded a rare dragonfly in 2006 and several other rare species could occur with careful maintenance of the open wet meadows there. Bald eagles regularly use the tall pines along Route 153 and a regularly used wildlife corridor for larger mammals exists between the High Watch Preserve and the Watts Wildlife Sanctuary. With the help of the local residents in that area, this habitat corridor could continue to exist in perpetuity if easements were secured in this area. Certainly the GMCG, now at its new home in this area, could be interested in helping make this happen.

C. Outreach and Education



Figure 3. Habitat management, natural. A boon to open land wildlife, this twister ripped through Effingham in 2008. Effingham Conservation Commission has been involved in advising and overseeing conservation activities such as the aforementioned wetlands protection project, the culvert assessment project performed by UNH students, the bird watch trail at the Larry Leavitt Preserve, and the current WAP Implementation Project. It has also been the primary organization responsible for rewriting the natural resources chapter of the Town Master Plan, revising the Effingham Wetlands Ordinance, and publicly advocating in favor of protecting natural resources, wetlands, and open space. It maintains a very attractive web site and helps sponsor community events such as town-wide clean-ups (KELF) and participates in community fairs. It takes an active role in supporting GMCG’s efforts in water quality monitoring and taking action on violations, notably the filling and dredging of wetlands. Currently it is promoting the further revision of the Wetlands Ordinance in support of greater protection of the eleven exemplary wetlands noted above. Without a doubt, the Effingham Conservation Commission is a

strong organization that is capable of performing the outreach and educational needs of any wildlife habitat conservation project that it engages in.

That said, a few suggestions are in order:

- 1) **In coordination with some of the above agencies, sponsor regular wildlife workshops** – this can be done as part of a regular series (such as the winter lecture series of the GMCG or the Forest Society), or it can be done as stand-alone ‘walk-talks’ that are directed at priority conservation targets such the PRSF. Given the abundance of good publicly available walking lands where good wildlife habitat exists, this should not be hard to organize and repeat. Usage of existing ECC conservation lands may also promote the conservation successes to date.
- 2) **Sponsor a Land Conservation Forum** – one of the best ways to invite participation among private landowners is to provide free information about what kinds of habitat is on their land. An ‘out-take’ of this project could be one where selected areas of the town are highlighted during a series of landowner outreach lectures and workshops. Whereas the project talks have been a very useful forum for this kind of outreach, an even more direct exchange between wildlife biologists and private landowners may yield even greater results in terms of cooperative initiatives to protect wildlife habitat.
- 3) **Sponsor a Bio-Blitz** – these events have been successful in garnering public support for wildlife and biodiversity. Typically focused on a particular area or tract of land, it could be used to highlight the wildlife or biodiversity value of the entire town. Participation by local volunteers, science advisors, and regionally known biologists is a key to success. Bio-blitzes have even been used as fund-raisers (i.e. like a bloom-a-thon⁴) for conservation initiatives.
- 4) **Maintain the publication of a series of informational brochures** - these have been contemplated in the past for wetlands, and one is currently in draft form for the WAP Implementation Project. They are an excellent way to advertise the activities of the conservation commission as well demonstrate the active care with which they treat the natural resources of the town. There are any number of topics that could provide valuable assistance to the town citizenry, and an every other year schedule may be a good balance between effort and saturation.
- 5) **Provide an opportunity for citizens to report wildlife sightings** – an on-line reporting form would be ideal, although it will take some coordination with NHFG since some reports will likely involve rare species of greatest conservation concern. The current Wildlife Reporting Form is still under development at NHFG, and perhaps once this has been completed it can be uploaded as a web link on the ECC web site. In the meanwhile,

⁴ “Bloom-a-thons” or “bird-a-thons” seek sponsors on a dollar-per-species basis in order to fund-raise for conservation. It provides an alternative to the traditional “direct ask” approach.

there should be some mechanism developed for reporting and recording wildlife observations of note, particularly those involving species that have not yet been reported in Effingham or which are state-listed endangered or threatened.

D. Land Protection

The two principal forms of land protection for wildlife are **fee simple acquisition** and the securing of a **conservation easement**. The former involves a direct transfer of land from one entity to a conservation organization and the other involves the transfer of development rights but not the title. While these two forms have many variations – deeded covenants, executory interest assignment, restricted or reserved rights – both have the effect of preserving wildlife habitat. This is the most direct way of ensuring that such habitat is protected in perpetuity. It is also typically the most costly form of such protection. Unless a landowner is willing to donate a parcel of land or the development rights upon it – and even then there will be closing costs and stewardship monitoring costs – the fair market value exchange of land could be the most expensive proposition for the Conservation Commission to consider among the suite of land protection activities.

Since the Effingham Conservation Commission is already in the business of acquiring land and in the future could consider receiving conservation easements, this set of recommendations will be short. It is apparent that with the number of lands under their oversight that the Commission has already learned the “fine art” of stewarding conservation lands. The following suggestions are made on the basis of such a familiarity with land conservation transactions and therefore contain little detail on that which can be found in a standard guide to land conservation such as the one put out by the Forest Society. (Some of these suggestions may have already been implemented by the ECC!):

- 1) **Ensure that each conservation property has a suitable baseline documentation report (BDR) of ecological attributes that can be used to monitor changes over time** – this is one of the weakest links to property management that is best addressed at the outset of the transaction – i.e. where a BDR is signed by the landowner and filed as an exhibit to the conservation easement or deed transfer. A well-documented property allows a land steward to better understand the property and to monitor for any potential violations that may occur in the future. It also provides a mechanism for monitoring wildlife populations that may also reflect changing habitat conditions. The latter may be desirable (for target species), or it may be detrimental and require active habitat management.
- 2) **Ensure that conservation land boundaries are adequately marked** – surprisingly, there are a number of conservation lands that are hard to find because of poor boundary marking. A simple 4” x 4” metal tag that advertises the ECC (or other landowner) also provides a direct positive advertisement for any visitors to a given property (although this may not be true for landowners who post their property under an easement). Good boundary marking will also improve the chances that the property will be adequately monitored in the future. Although it is technically the landowner’s responsibility to mark

their boundaries, it may be offered as a “perk” for donated properties where little cash is left over for marking boundaries or doing a survey.

- 3) **Utilize local volunteers to steward each conservation property** – this may already be in place, although it is certainly desirable to have people who have not yet protected their land to consider this activity as a way of encouraging them to do the same thing with their land. Using local “talent” also provides an easier mechanism for reporting incidents such as timber trespass that may occur between the times when the property is regularly monitored. Establishing good landowner relations for easement properties can also be augmented by using neighbors or local residents for monitoring the conservation property.
- 4) **Provide access and parking where possible** – one of the least supported conservation efforts tend to be for those properties that are remote or otherwise inaccessible. As the ECC has done at the Larry Leavitt Preserve, the promotion of visibility can go a long ways towards positive reinforcement of the role of the conservation commission. Whereas the ‘down side’ of trails and public access is the possible abuse by motorized vehicles, there are usually more benefits than detriments in such an arrangement. As lands become increasingly developed, the number of parcels that provide free access to wildlife habitat and their observation will only become increasingly important.

E. Local Regulation & Policy Development

This section is intended to mimic the section in Chapter Five of the WAP. It is based on the fact that uninformed or uncaring people tend to intentionally or negligently abuse open spaces when they find an opportunity, and these abuses have impacts on the welfare of the local or regional citizenry. Effingham already has a stout set of local regulations that govern development of land, as well as some regulations that protect the natural environment. Although this sub-section is not intended to provide specific guidance for revising or rewriting these local regulations, certain actions could be taken to aid in the long-term protection of wildlife habitat. As is the case with any local policy or regulation, the town has the right to exceed the state standards as long as it does not unjustly infringe upon the private property rights of the landowners. That said, it is important to keep in mind that **wildlife in the state of New Hampshire is in the public domain**, and that local regulations and policies can treat abuse to wildlife and its habitat as an infringement of the public good. Where the dividing line is between municipal and state enforcement of these wildlife laws is, however, best left up to the town’s legal counsel to determine. A few suggestions are in order, however:

- 1) **Ensure that any municipal planning document contains a specific reference to the value of all wildlife, inclusive of rare and endangered species and the exemplary habitats in which they exist** - very often the reference to wildlife in master plans is very vague and imprecise. While it is typically beyond the scope of a plan to discuss specific details such as loon nesting areas, heron rookeries, and good fishing holes for trout, it is not inappropriate to state that the town (Commission) is committed to protecting *all native biodiversity in their natural habitat* and to do so as a preamble to the section on

wildlife and wildlife habitat in the natural resources chapter of the master plan. This allows for activities such as habitat restoration, invasive species control, habitat easement procurement, and the protection of wetland wildlife habitat buffers.

- 2) **Utilize the functions and values assessment of Effingham's 11 exemplary wetland to enhance protection of wildlife habitat associated with these wetlands** - while this suggestion has already been initiated by the commission, it is noteworthy that of the best wildlife habitat areas in Effingham, over 50% of them occurred in or adjacent to wetlands. Notably, the Pine River basin, Wilkinson Swamp, and Watts Wildlife Sanctuary ranked the highest among the 11 wetlands when considering wildlife habitat value, and the upland buffer areas to these wetlands were critically important for their ecological integrity ranking. The state's recommended buffer setback of 100 feet from prime wetlands can actually be exceeded if these exemplary wetlands are designated locally and not through the prime wetlands protection legislation (RSA 482-A:15). Currently in the state house there are potential threats to this 100-foot setback distance, and it is worth noting that any law passed locally may outlast any state-recognized designation. Finding the proper balance between wildlife habitat value and appreciation, minimum setback distances for natural buffers, timber harvesting restriction, and private property rights "taking" is a challenging path to follow but a worthy one. Herein consider that public education and outreach, as well as support by the local governing body, is essential to successful protection of these invaluable habitats.
- 3) **Consider wildlife habitat in any future zoning ordinance amendment** – in many towns the subdivision of property is regulated by separate regulations that guide such development. These regulations address many of the environmental impacts associated with development, such as roads, stormwater, drinking water supply, salt storage, and setbacks, yet they do not typically include an *assessment of the overall environmental impact* of the development. In certain towns, cluster sub-division ordinances are being put into place that directly require an assessment of environmental impact. The latter typically includes an ecological assessment of impacts to wildlife, wetlands and other natural resources within the property but outside of the "footprint" of the development. Encouraging the completion of an ecological assessment (or EA) that looks beyond the footprint and even beyond the property (i.e. in assessing cumulative impacts in the neighborhood) can help ensure better protection of wildlife habitat. The latter is particularly true if bonus points are offered (i.e. more lots allowed) in exchange for conservation easements or other restrictive covenants on the undeveloped portion of the property.
- 4) **Add a Conservation District Overlay to the Zoning Ordinance** – this mechanism is another way to ensure adequate planning for large development projects. It can directly tie into the WAP Implementation Project by requiring ecological assessments, wildlife impact studies, water resource management plans, or other design reviews of the project

if it falls within one of the “best wildlife habitat areas.” The general goal of such a district is to add a layer of review to any development that occurs within high quality habitat areas and to prevent unnecessary impacts to natural resources. Putting such a review under a generalized term such as “conservation” avoids the restricted reviews associated with wetlands, water resource, drinking water supply, floodplain, viewshed, forestry, or other more specific zoning overlays districts.

F. Habitat Management & Monitoring

Aside from directly protecting habitat through zoning, setback regulations, land acquisition or easements, certain types of habitat could be improved for wildlife (and theoretically enhance their populations) with active management. This has already been referenced under sub-section B above (“Coordinating Conservation Activities with Public and Private Agencies”). Five specific areas come to mind in terms of active habitat enhancement: 1) Pine Barrens management in the PRSF; and 2) South River Marsh; 3) Province Lake; 4) Watts Wildlife Sanctuary; and 5) Green Mountain

1. Pine River State Forest

Habitat management at the PRSF is perhaps more likely considering that the land is owned by a State-based agency that is already active in managing the land, albeit mostly for timber. While there are some strong incentives for maintaining a closed forest canopy to sustain (pine) timber supplies, there are certain areas where previous fire frequency and poor sandy soils may actually enhance adjacent timber lots by providing open canopy areas within a matrix of closed canopy forest. Previous management that has created such small openings have primarily focused on white-tailed deer, wherein the state has cleared and planted 1-2 acre patches of switchgrass for wildlife forage. Clearing larger areas and burning the groundcover would be required for enhancing habitat for the more endangered wildlife associated with Pine Barrens, however. The three rare moth species that were trapped, as well as whip-poor-will, common nighthawk, and eastern towhee could all benefit from such a practice. Those areas that already contain scrubland elements within a closed canopy forest would be the best management sites. At least two of these areas lie right along Clough road and could easily serve as prescribed burn sites. Greater detail on this recommendation will be outlined in the moth trapping report to the state that appends this document.

2. South River Marsh

Habitat management at South River Marsh could occur on the town’s large holding north of the transfer station. There are several uncommon and exemplary wetland types in the South River Marsh area, inclusive of a lowland black spruce-fir swamp, a leatherleaf fen, a small kame terrace with a lowland spruce-fir forest, an open water beaver marsh, and a small drainageway fen. Whereas these habitats do not require active manipulation in order to enhance their wildlife habitat characteristics, they would certainly be improved if further logging of timber or roadway impacts were prevented. In addition, the open sapling meadow that sits astride the main access road behind the beaver marsh provides a 6-acre wildlife opening that should be maintained for species that require such open scrub habitats, such as ruffed grouse, American

woodcock, and eastern towhee. Periodic brush-hogging or cutting with a 'brontosaurus' on a 10-15 year rotation would maintain this habitat type.

3. Province Lake

Province Lake Northwest provides a unique set of aquatic and wetland habitats that support a number of rare wildlife species. Perhaps most notable is the nesting pair of loons, although the presence of summering bald eagles has also garnered some local attention and interest. Ensuring the presence of a loon nesting platform will continue to attract the loons who may, if cormorants do not get in their way, successfully breed in the future. Similarly, the procurement of a forever-wild easement on the Effingham Conservation Commission shore land lots will ensure that the roosting and possible nesting trees for the bald eagles will remain. Although it is too early to determine whether these individuals will consider this area suitable nesting habitat, the probability of nesting would be enhanced if the tall pines in the area are not cut or removed. Concurrently, an easement should be sought for the adjacent 11-acre black gum swamp, especially since it has already been identified, recorded with the state, and pursued as a conservation area. Continuing negotiations with the landowners is needed to move this closer to protection. As with the eagle roost trees, this form of habitat "management" simply requires that a "no-action" approach is taken for the benefit of the rare species present.

4. Watts Wildlife Sanctuary

Watts Wildlife Sanctuary has already had some habitat "management" in the form of Huntress Bridge Road, which has bisected the fen-marsh and severely impacted the hydrology of this exemplary wetland. Driving down the road and taking a look at the difference in vegetation types on either side of the road will offer some clue as the severity of this impact. While removing the road would be the best solution (!), this is not economically or socially viable. A less effective but probable enhancement activity would be to create water and wildlife box culvert underpasses that helps restore flow and provides a means for amphibian, turtle, snake, and other slow-moving wildlife to cross the road without direct impacts by cars. More importantly is the restoration of the hydrologic connection between the spruce-tamarack swamp in the south side and the (now) red maple-winterberry swamp on the north side. Enhancement of groundwater seepage as it slowly flows northerly to the Ossipee River may expand the scrub spruce and tamarack growth that is currently supporting the southern-most population of nesting palm warblers in the state.

5. Green Mountain

There are a large number of habitat management opportunities on Green Mountain, not the least of which includes timber management activities that may enhance the unique lowland (montane) spruce-fir forest and northern hardwoods-conifer forest at the high elevations of the mountain. Since these two habitat types are found nowhere else in Effingham, it would behoove the landowners and conservation agencies in charge of Green Mountain forest management to carefully consider timber harvesting prescriptions that enhance these two habitats. Limited selective harvesting of hemlock in the spruce-fir zone would increase the regeneration of spruce and fir, especially near the summit on the north side. A similar treatment (i.e. < 25% basal area

reduction harvest) of oak and red maple in the northern hardwoods-conifer zone would have a similar ameliorating effect on this habitat. Promotion of snowshoe hare browse through these activities would have a positive effect on the resident bobcat, moose, bear, and deer. In all situations, a suitable (i.e. > 100-foot) riparian buffer should be maintained so as not to impact stream salamander and northern water shrew habitat (along the perennial water courses).

G. Research and Further Sampling

There are a number of future research and sampling efforts that can be undertaken to help document the presence and viability of the critical wildlife species in Effingham. As stated above, only one-third of the target species were observed during this study, and in many cases, these species were only observed once. Establishing the population extent of these species is a first step. Searching for other rare wildlife species not observed during this study is another. Both efforts can take place both in areas already surveyed as well as in areas not surveyed. Monitoring populations of known occurrences over a long period of time will also be required if appropriate site-specific management is necessary. Although the list of possible research activities regarding the rare wildlife of Effingham is endless, the following suggestions are offered as preliminary steps in this long-term process.

1. Pine Barrens Moths

The most critically imperiled wildlife species in Effingham are moths. It is likely that there are more rare species present than was detected during the three-night sampling, and it is also likely that there are fewer of them at PRSF than in nearby Ossipee where the habitat is “better.” The marginal nature of the pine lands habitat in Effingham is largely due to the prevention of fire. Evidence of old fires is readily visible in soil cores, and the presence of canopy pitch pines in many areas suggests that these sites had been frequently burned by crown and/ or groundcover fires. Regardless of the documented value for rare moths and butterflies that prescribed burns have yielded elsewhere in the state, establishing a clearer idea of what is actually present in Effingham’s pine lands is a necessary first step in managing these habitats for rare Lepidoptera in the future.

2. Blue-spotted Salamander

This species was a significant addition to the fauna of Effingham not only because it has not been recorded in the town before, but because it suggests that there are still large gaps in the knowledge base about the extent and condition of this species complex. Still under scrutiny regarding the exact nature of its distribution, the blue-spotted salamander is part of a complex with Jefferson’s salamander (*Ambystoma jeffersonianum*) that forms pure strain diploid adults, triploid and polyploid clonal females, and a variety of hybrids, color morphs and forms that span between the two species. Not only is very little known about where this species occurs in Effingham, but nothing is known about its genetic make-up. Is this a pure form blue-spotted (*A. laterale*) or does it have polyploidy suggestive of a mixed ancestry? Clearly more individuals need to be collected and genetically sampled, and the extent of the population mapped.

3. Bald Eagle

Already discussed above, this species is one of the more famous representatives of Effingham's wildlife. As I have noted in previous reports, it appears likely that Effingham will support a breeding pair of bald eagles in the not-too-distant future. A lot depends on the sex of the adult and immature that has been observed over the past several years, as well as the viability of the nesting area. The latter depends on some seclusion from human activity, freedom from most competing aerial predators (notably ospreys), and the availability of non-toxic fish and other prey. More than any other species, it behooves the ECC to continue to seek observations and other reports of eagles in town. Of particular importance is the observation of adult eagle pairs in January and February – i.e. just prior to breeding season.

4. Bridle Shiner

The bridle shiner is a small minnow that is fond of the weedy shorelines of oligotrophic lakes. Historically it has been documented in a fairly large number of water bodies, but only a handful in the last 20 years. The direct observation of a school of roughly 200 individuals in Province Lake needs to be confirmed by the NH Fish & Game Department or other suitable wildlife biology specialists. Since catching these fish with nets or hooks can be tricky in such weedy shallows, it may require an electroshock fishing approach administered by boat. The NH Fish & Game team that worked with us in Pine River and Wilkinson Brook can readily handle this effort and should be solicited for their support.

5. Rare Odonates

Pam Hunt of NHAS has initiated and maintains the NH Dragonfly and Damselfly Survey (NHDS) for the past three years and has already aggregated a huge amount of data on the occurrence and distribution of Odonate species in the state. Whereas we have doubled the number of known species occurrences in Effingham in the last two years, at least a dozen more species are possible. In addition, the records of rare species, which currently numbers six, need to be expanded to provide a better sense of their occurrence at specific locales. Since very little is known about many of these species, a great deal of knowledge can be gained with relatively little effort. The way in which the ECC has already contributed their efforts to sampling for dragonflies and damselflies is noteworthy – two of the rare species were collected by the Chair of Commission in net surveys and by collecting exuviae. The Chair is encouraged to improve his identification skills of these rare species and work with the NHDS in monitoring the expansion of known sites for rare species both observed and as yet unobserved.

6. Bobcat Denning

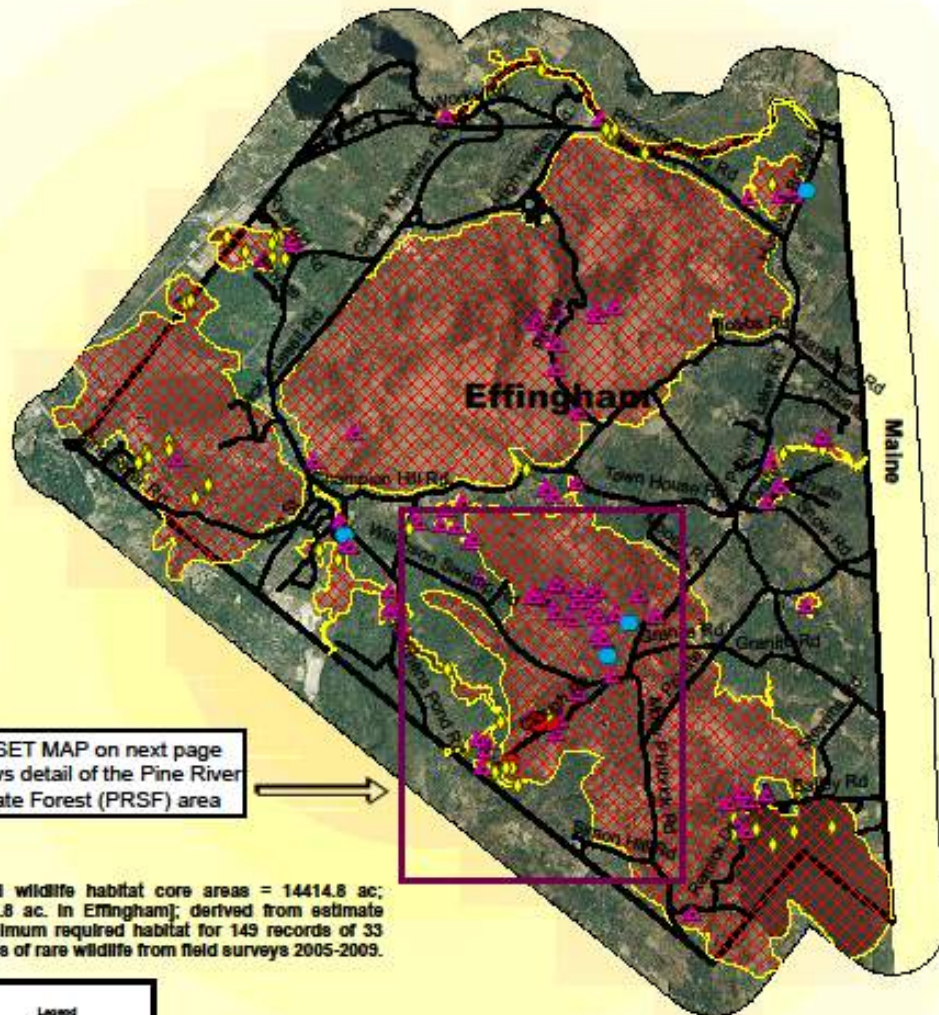
Sixteen records of bobcats were made by the author and contributing observers during the two-year study, and yet at least two dozen other records could have been garnered by town residents if pressed. While it appears that bobcats are fairly common and widespread in Effingham, it is unclear where they breed. Possible den sites have been researched to some extent on Green Mountain, although definitive proof was not found. Since denning is THE rate determining step in population growth and stability, it is imperative that the town have a better sense of where this species breeds and rears its young. It is possible that denning sites exist both on Green Mountain and off

Simon Hill Road near Pocket Mountain as these are the two areas where the most frequent bobcat sign was recorded (other than one location in Wilkinson Swamp). Since the process of locating dens can be difficult to do, the observation of repeated trails, claw marks, multiple scat piles, and ultimately, the presence of bobcat kittens and their sign is the best way to document breeding site evidence. Searching southeast to southwest-facing steep talus slopes offer the best opportunity for detection. Being careful not to disturb breeding cats in the den territory is also a must, since these animals are quite sensitive to intrusion. For that reason, no more than one visit per week in any remote locale is suggested. If an observer is well-trained, sufficient evidence should be detectable during a single visit in mid to late April. Late lying snow will aid in the detection of multiple trails and scent posts.

APPENDIX A – MAPS

Core Wildlife Habitat of Effingham, NH	A-1
Core Wildlife Areas – Inset PRSF	A-2
Rare Wildlife Occurrences- Effingham, NH	A-3
Effingham, NH WAP-derived Priority Habitats with Overlay of Field Findings	A-4
Best Wildlife Habitat Areas (All) in Effingham, NH	A-5
Best Wildlife Habitat Areas & Lands under Conservation in Effingham, NH	A-6
Best Wildlife Habitat by Type or Area In Effingham, NH	A-7

Core Wildlife Habitat - Effingham, NH



INSET MAP on next page shows detail of the Pine River State Forest (PRSF) area

Critical wildlife habitat core areas = 14414.8 ac; [13304.8 ac. in Effingham]; derived from estimate of minimum required habitat for 149 records of 33 species of rare wildlife from field surveys 2005-2009.



This project is supported by
funds from a grant of the
Conservation Lands Trust
Maine, funded under the 10-
00-000-0000-0000-0000-
Conservation grant program.



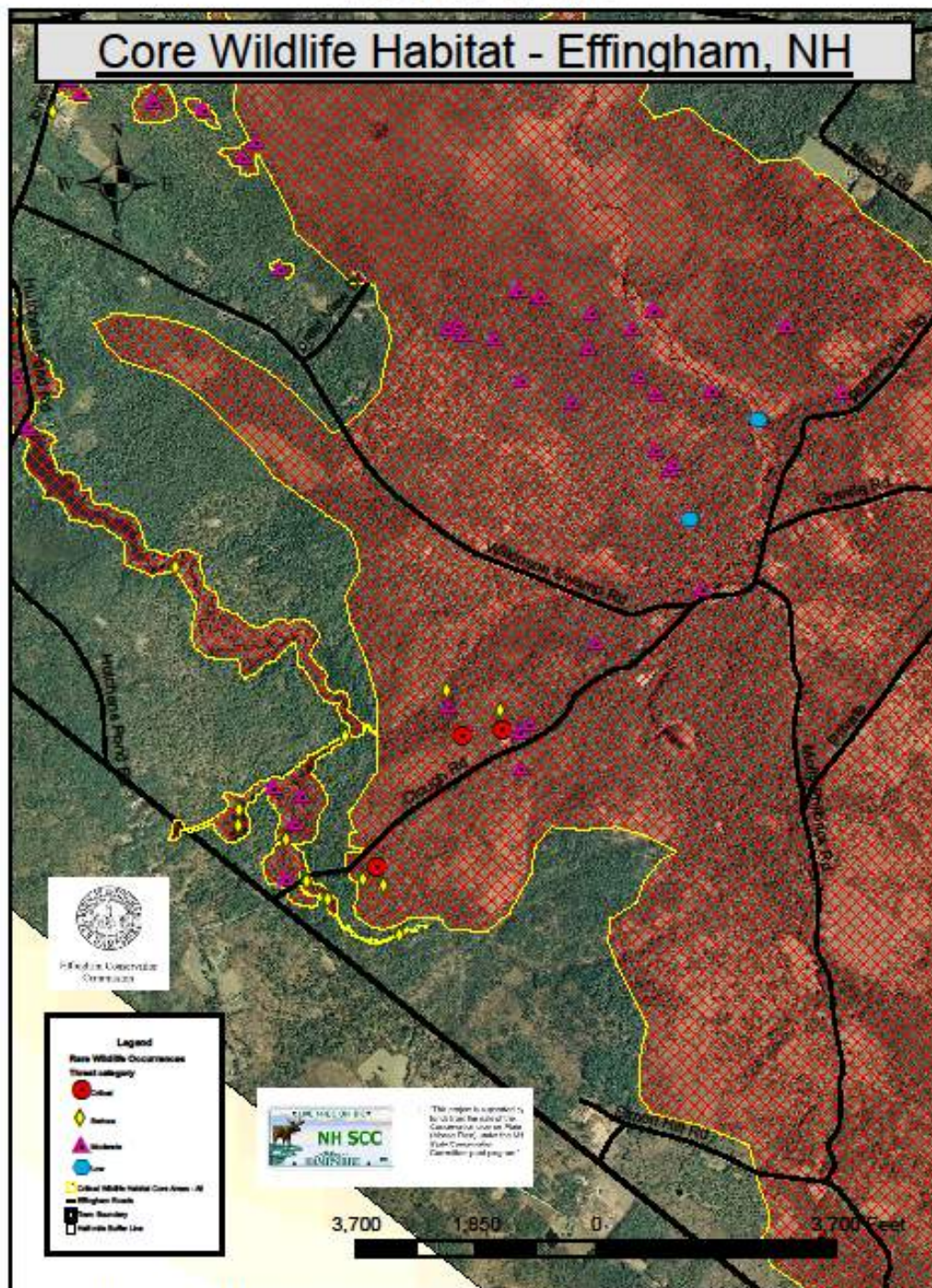
13,000 6,500 0 13,000 Feet

ABOUT THIS MAP

VdP/EMC Jun 2009

Core Wildlife Habitat includes minimum viable habitat areas surrounding the 149 rare wildlife occurrences that were derived from field surveys between 2007 - 2009, plus records from the wetlands inventory project (2005-2007). Core habitat areas estimated from site inspection and review of 2006 1-foot color aerial photographs, courtesy of NH GRANIT.

INSET MAP OF PRSF

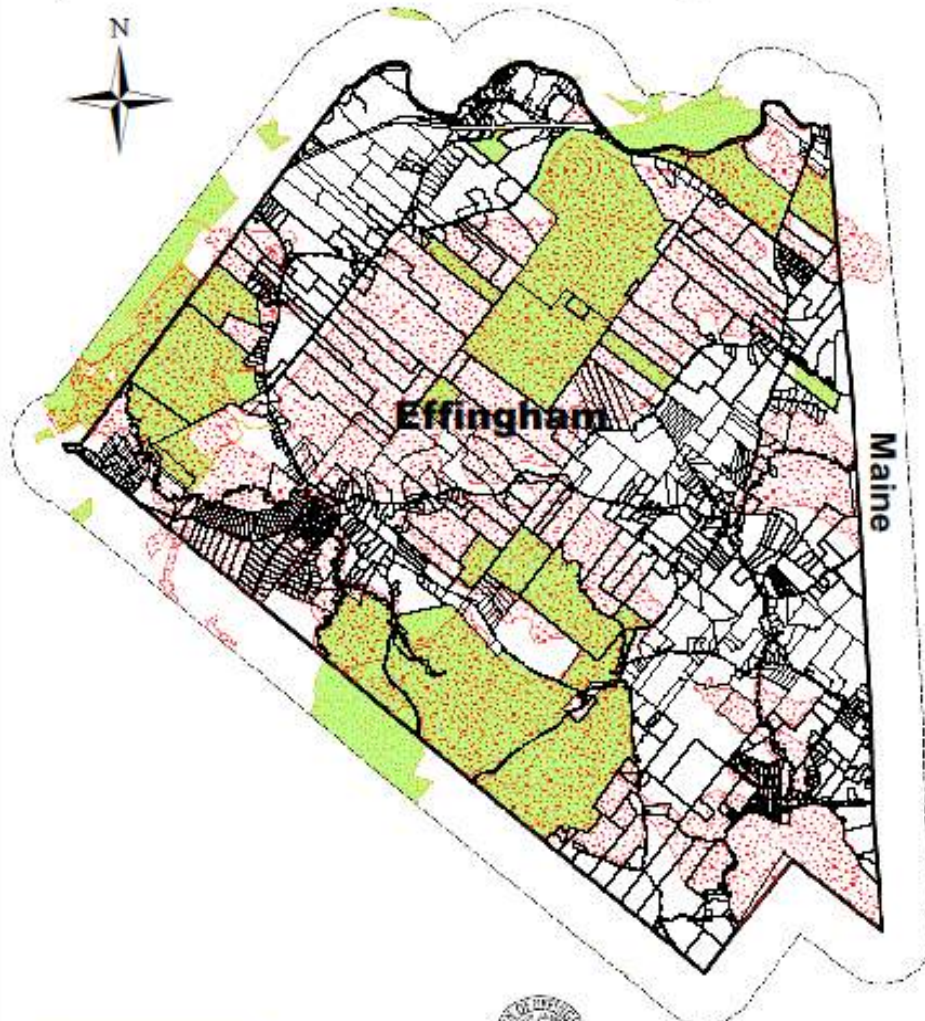


ABOUT THIS MAP

VdP/EMC Jun 2009

Core Wildlife Habitat includes minimum viable habitat areas surrounding the 149 rare wildlife occurrences that were derived from field surveys between 2007 - 2009, plus records from the wetlands inventory project (2005-2007). Core habitat areas estimated from site inspection and review of 2006 1-foot color aerial photographs, courtesy of NH GRANIT.

NAME	NAMEALT	PPTYPE	ACRES	AREA	PERIMETER
Green Mountain Natural Area	Green Mountain Natural Area	FO	39.9	1736948.2	8141.6
Watts Wildlife Sanctuary	Watts Wildlife Sanctuary	FO	267.7	11662074.2	15603.9
Varrieur	Varrieur	CE	30.3	1318812.9	7540.4
Little Property - Watts Wildlife Sanctuary	Little Property - Watts Wildlife Sanctuary	FO	131.1	5710664.8	10510.4
Patricia Watts Addition	High Watch Preserve	FO	59.4	2587133.0	6544.0
Dwight Mills Addition	High Watch Preserve	FO	655.2	28538874.1	32833.9
Heath Pond Bog Natural Area	Heath Pond Bog Natural Area	FO	891.6	38838153.5	37479.8
Green Mountain State Forest	Green Mountain State Forest	FO	15.3	664693.9	3378.3
Heath Pond Bog Natural Area Right-of-Way	Heath Pond Bog Natural Area Right-of-Way	RW	0.4	15354.0	1080.3
Heath Pond Bog Natural Area	Heath Pond Bog Natural Area	FO	0.7	29326.6	721.1
Heath Pond Bog Natural Area Right-of-Way	Heath Pond Bog Natural Area Right-of-Way	RW	0.3	14418.8	1014.7
Heath Pond Bog Natural Area	Heath Pond Bog Natural Area	FO	0.4	19312.3	796.1
Heath Pond Bog Natural Area Right-of-Way	Heath Pond Bog Natural Area Right-of-Way	RW	3.5	153347.9	10298.9
Moulton Tract	Wilkinson Brook Parcel	FO	205.4	8947579.9	14693.4
Nath Easement	Wilkinson Brook Parcel	CE	319.3	13907824.6	19495.9
Pine River State Forest	Pine River State Forest	FO	2245.3	97806622.6	68137.2
Leavitt Easement	Leavitt Easement	CE	46.0	2001983.9	7301.6
Charlie Watts Tract	High Watch Preserve	FO	1034.7	45072903.9	30805.8
Dr. Melvin Harmon Preserve	High Watch Preserve	FO	0.0	2.7	394.3
Dearborn Trail Addition	High Watch Preserve	FO	87.6	3814412.6	10267.3

Effington Conservation
 Commission

"This project is supported, in whole or in part, by all five Conservation Science Trade Mission Plateau's central to slide Conservation Committee grant program."

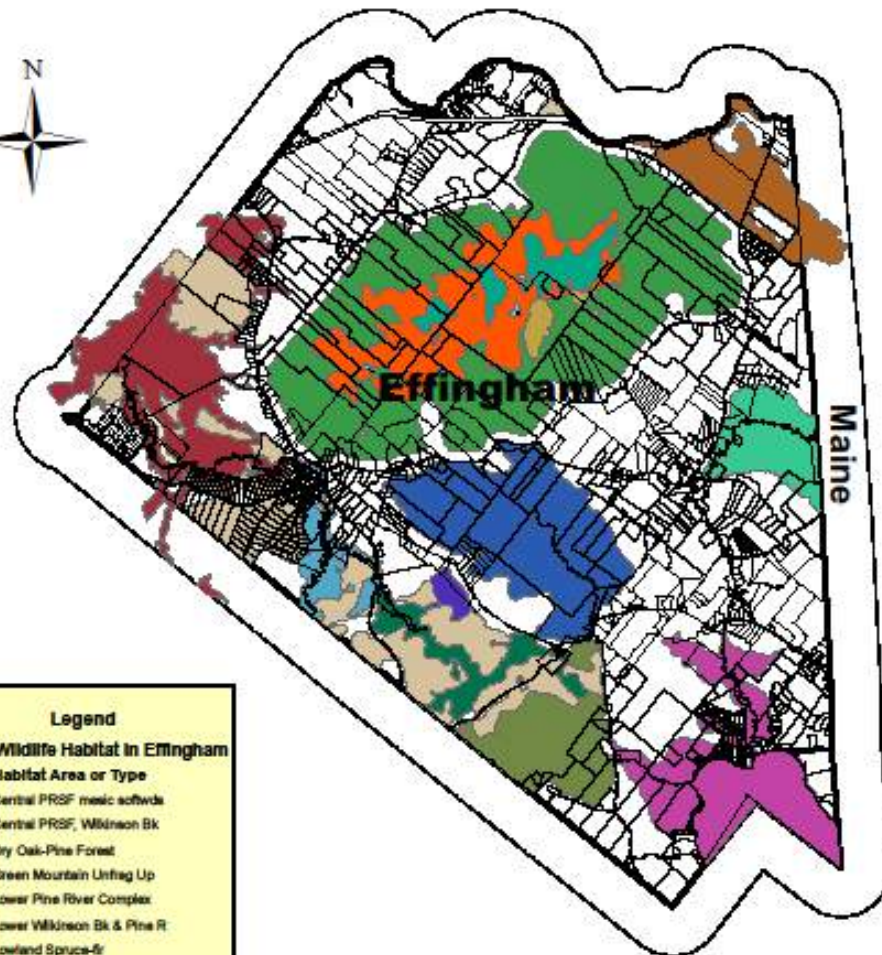
9,400 4,700 0 9,400 Feet

VdP/EMC Jun 2009

**ABOUT
THIS
MAP**

Conservation lands were derived from the 2009 NH GRANIT database as downloaded from www.nhgranit.org on 8-2-09. Core habitat areas as shown in red are derived from field observations of WAP-listed species of greatest conservation concern. Best habitat areas were derived from field data, documented occurrences of rare species and their habitats, as well as a careful analysis of the 2006 1-ft color aerial photographs, courtesy of Complex Systems Research Center, Durham, NH.

Best Wildlife Habitat Areas by Type or Area in Effingham, NH



Effingham Conservation Commission



This project is supported by the New Hampshire State Conservation Committee grant program.

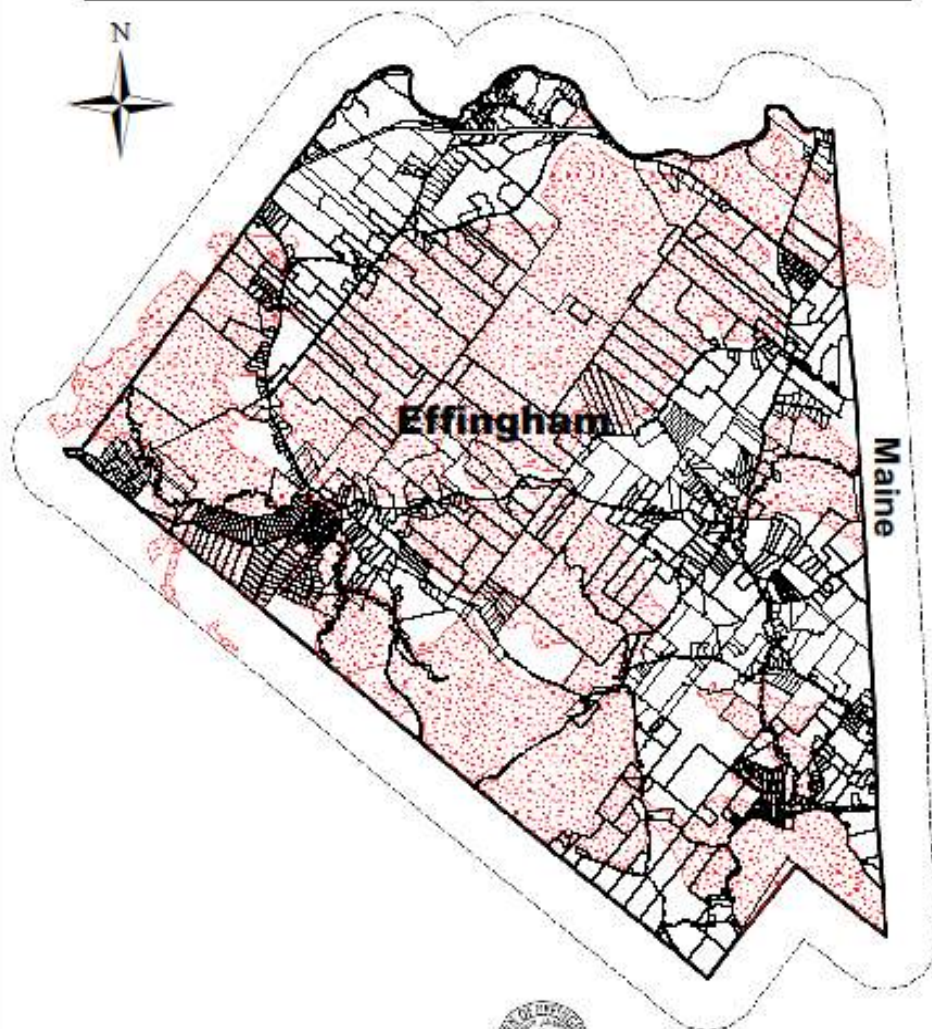
10,000 5,000 0 10,000 Feet

VdP/EMC Jun 2009

ABOUT THIS MAP

Best habitat types/areas were determined through field observations during the 2005-7 wetlands inventory project and during the seasonal sampling of rare wildlife species during the WAP-implementation project in 2007-9. Areas not visited were interpreted using the 2008 1-ft color aerial photographs, courtesy of Complex Systems Research Center, Durham, NH.

Best Wildlife Habitat Areas (All) in Effingham, NH



Effingham Conservation
Commission



This project is supported by
several grants from the
Conservation Commission, State
of New Hampshire, and the
Effingham Conservation
Commission.

9,400 4,700 0 9,400 Feet



VdP/EMC Jun 2009

ABOUT THIS MAP

Best habitat types/areas were determined through field observations during the 2005-7 wetlands inventory project and during the seasonal sampling of rare wildlife species during the WAP-implementation project in 2007-9. Areas not visited were interpreted using the 2006 1-ft color aerial photographs, courtesy of Complex Systems Research Center, Durham, NH.

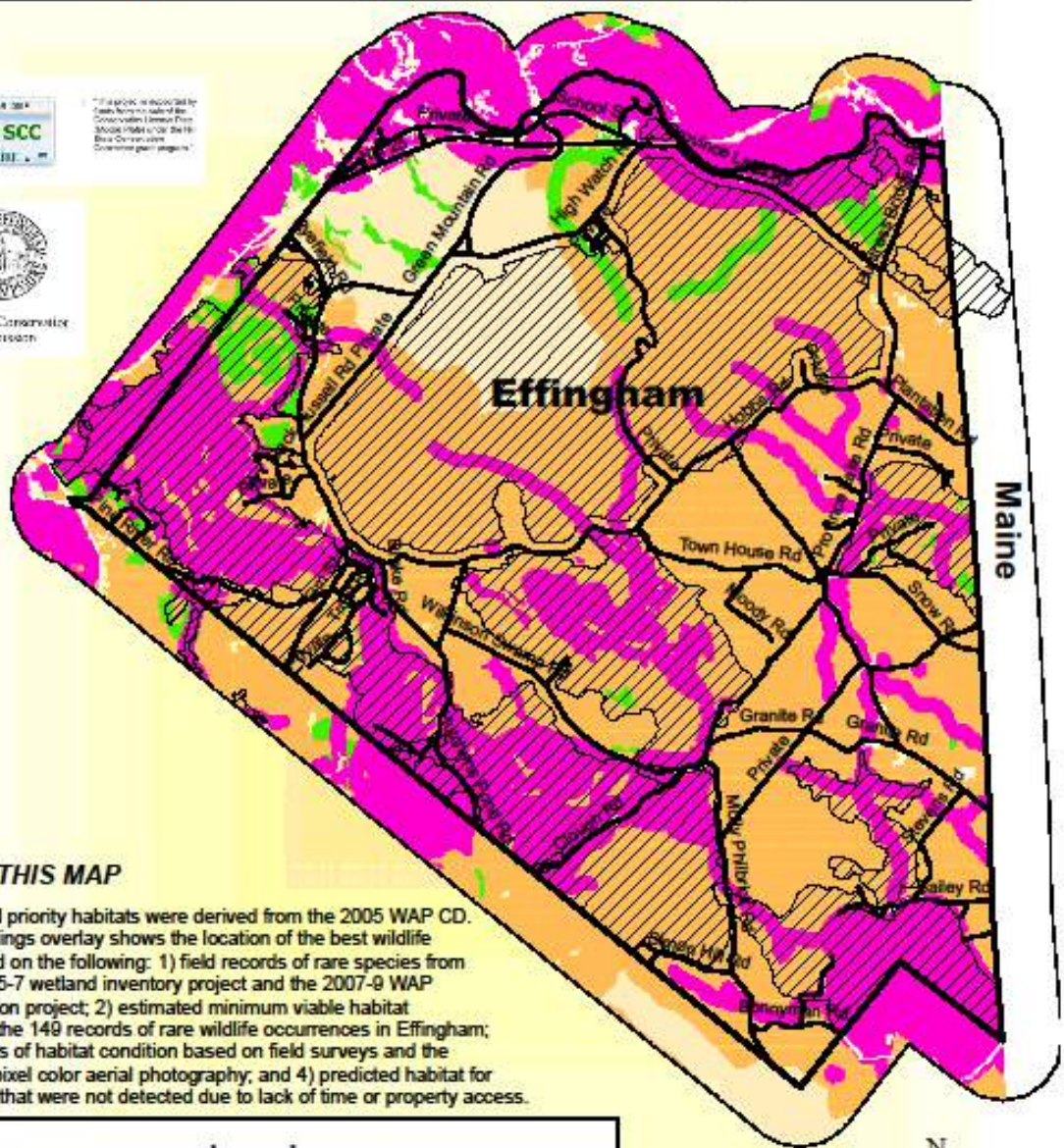
Effingham, NH WAP-derived Priority Habitats with Overlay of Field Findings



"This project is supported by
funds from the state of New
Hampshire, created from
Moose Money and the
New Hampshire
Conservation Trust."



Effingham Conservation
Commission



ABOUT THIS MAP

WAP-derived priority habitats were derived from the 2005 WAP CD. The field findings overlay shows the location of the best wildlife habitat based on the following: 1) field records of rare species from both the 2005-7 wetland inventory project and the 2007-9 WAP implementation project; 2) estimated minimum viable habitat surrounding the 149 records of rare wildlife occurrences in Effingham; 3) an analysis of habitat condition based on field surveys and the 2006, 1-foot pixel color aerial photography; and 4) predicted habitat for rare species that were not detected due to lack of time or property access.

Legend

- Best Wildlife Habitat in Effingham based on Field Findings
- Town Boundary

Highest Ranked Wildlife Habitat by Ecological Condition (from WAP)

- Highest ranked habitat in NH (by ecological condition)
- Highest ranked habitat in biological region (by ecological condition)
- Supporting landscapes
- Habitat not top-ranked (at statewide scale)



6250 3125 0 6250 Feet



VdP/EMC Jun 2009

Rare Wildlife Occurrences - Effingham, NH



Critical wildlife habitat core areas = 14414.8 ac; [13304.8 ac. in Effingham]; derived from estimate of minimum required habitat for 149 records of 33 species of rare wildlife from field surveys 2005-2009.



[†]It is given in support of the
Soviet Union at a sale of the
Conservation League. For
More info, write to: 2nd Fl.
2500 Connecticut Ave.
Conservation League, Suite 201



13,000 6,500 0 13,000 Feet

ABOUT THIS MAP

VdP/EMC Jun 2009

Core Wildlife habitat areas derived from field surveys between 2007 - 2009, plus records from the wetlands inventory project (2005-2007). Core habitat areas estimated from site inspection and review of 2008 1-foot color aerial photographs, courtesy of NH GRANIT.