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2005 Rare Species and Vernal Pool Survey
Wilderness Conservation Area
Essex and Manchester, MA

Prepared for:



Manchester-Essex Conservation Trust
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The Mass Environmental Trust



The Bruce Anderson Foundation
and

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Division of Fisheries and Wildlife

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1. INTRODUCTION

Hyla Ecological Services, Inc. (HES) conducted a Rare Species and Vernal Pool Survey for the Manchester-Essex Conservation Trust (MECT) between April and December 2005. The survey was conducted within the “Wilderness Conservation Area” and “Warren-Weld Woodland” in portions of Essex and Manchester, MA (Figure 1). The 2005 survey was intended to document the existence and locations of additional vernal pools and rare reptiles and amphibians as a follow-up to a study conducted by HES in 2004. In the 2004 survey, HES documented the presence of spotted turtles and four-toed salamanders, both listed as “Species of Special Concern” by the Massachusetts Natural Heritage and Endangered Species Program (NHESP), in addition to 30 vernal pools.

Funding for the vernal pool survey, spotted turtle trapping in three wetland areas (along Andrews Street), turtle radio-telemetry and the four-toed salamander survey was provided by MECT, under grants from the Massachusetts Environmental Trust and The Bruce Anderson Foundation. Funding for turtle trapping in three additional wetlands (within the Warren-Weld Woodland) was provided by the Commonwealth of Massachusetts Division of Fisheries and Wildlife (DFW).

The objectives of the survey were to:

- Locate and certify additional vernal pools.
- Conduct hoop trapping for spotted and Blanding’s turtles.
- Search for four-toed salamander breeding locations.

2. METHODS

2.1 Vernal Pool Survey

HES began the survey in April 2005, searching throughout portions of the Wilderness Conservation Area not surveyed in 2004 for areas of shallow standing water suitable for obligate-breeding vernal pool amphibians, including spotted salamanders (*Ambystoma maculatum*), blue-spotted salamanders (*Ambystoma laterale*) and wood frogs (*Rana sylvatica*). Searches were aided by use of Mass GIS color ortho-photographs and the GIS layer of “Potential Vernal Pools” from NHESP. Vernal pool searches were conducted on April 19 by a team of three biologists.

When a potential vernal pool was discovered, we counted all visible salamander and wood frog egg masses, and collected physical and habitat information about the pool. We examined all *Ambystoma* salamander egg masses and distinguished them as either spotted or blue-spotted. The location of each pool was recorded with a GPS, and later mapped with ArcMap GIS software. Official Vernal Pool Certification forms were filled out for each pool and submitted to NHESP.

2.2 Turtle Hoop Trapping Survey

We conducted a hoop trap survey for spotted turtles (*Clemmys guttata*) and Blanding's turtles (*Emydoidea blandingii*) in six wetland areas in Essex (Figure 2). We obtained a Scientific Collecting Permit from DFW, and obtained permission from the Essex County Greenbelt to conduct surveys within their properties. Hoop traps were first deployed on April 19, 2005 within three wetland areas off Andrews Street. Additional traps were added to three wetland areas within the Warren-Weld Woods beginning on April 28. Traps were operated for a variety of durations among the different wetlands between April 21 and July 10, 2005, at which point all trapping activities were concluded (Table 1). We recorded a total of 1,246 trap-nights.

Table 1 – Details of 2005 Hoop Trap Survey

Pool ID	# Hoop Traps	# Trap-Nights	Trapping Dates
Andrews A	4	56	4/19/05 – 5/3/05
Andrews B	4	92	4/19/05 – 5/12/05
Andrews C	5	70	4/19/05 – 5/3/05
Warren-Weld Wetland	21	789	*4/28/05 – 7/10/05
Hoar Pond	3	141	**5/5/05 – 7/10/05
MECT 21	3	98	***5/17/05 – 7/10/05
Total Trap-Nights		1246	
<p>*Traps G1-G10 were installed on 4/28/05. Traps G11-19 were installed on 5/3/05. Traps G4A and G4B were installed on 5/15/05. All traps, except for traps G5 and G13, were removed on 6/5/05. Traps G5 and G13 were removed on 7/10/05. **Trap 1 was installed on 5/5/05. Traps 2 and 3 were not installed until 5/19/05. Trap 2 was removed on 6/7/05, but traps 1 and 3 were removed on 7/10/05. ***Traps 1 and 3 were removed on 6/5/05. Trap 2 was removed on 7/10/05.</p>			

Traps were baited with sardines and checked three to four times a week throughout the trapping period. All captured turtles were identified and released at their point of capture. All rare turtles were measured (carapace and plastron lengths), weighed, and notched with a unique number on a marginal scute. All rare turtle observations were documented and submitted to NHESP.

2.3 Turtle Radio-telemetry Survey

We attached radio-transmitters to the carapace of a selected number of captured spotted turtles using waterproof epoxy putty. Radio-telemetry was performed approximately once a week until the end of June, at which point turtles were tracked approximately monthly until the onset of over-wintering in December. All telemetry locations were recorded with a Garmin Etrex GPS and mapped with ArcGIS 9 software.

2.4 Four-toed Salamander Nest Search

We surveyed areas of suitable four-toed salamander nesting habitat in vernal pools Andrews A-C on May 12. The search for egg clusters and adult salamanders consisted of 3 biologists examining microhabitats consisting of areas of *Sphagnum* moss overhanging shallow wetlands. We resurveyed the area in vernal pool Andrews B, where we observed two nests in 2004.

3. RESULTS

3.1 Vernal Pool Survey

We located, mapped and documented the existence of eleven new vernal pools in 2005, based on observations of spotted salamander and / or wood frog egg masses (Table 2; Figure 3). None of these pools was known to be certified prior to the survey, based on the NHESP Certified Vernal Pools GIS layer, nor were any of these pools previously identified as NHESP Potential Vernal Pools. No blue-spotted salamander egg masses were observed in any of the vernal pools.

Table 2 - Vernal Pool Biological and Physical Details

POOL #	# Spotted Sal. Egg Masses	# Wood Frog Egg Masses	Approx. Length (feet)	Approx. Width (feet)	Max. Water Depth (inches)	Easting Coordinates*	Northing Coordinates*
05-A	17	0	n/a	n/a	n/a	259352	927726
05-B	27	150	120	100	36	259042	928534
05-C	9	2	100	35	20	259085	928535
05-D	1	2	70	18	18	259071	928502
05-E	7	9	110	30	18	258778	928020
05-F	5	0	n/a	n/a	n/a	258764	927953
05-G	60	1	315	85	28	258962	927884
05-H	12	0	n/a	n/a	n/a	259049	927806
05-I	4	0	70	30	9	258728	927504
05-J	20	0	n/a	n/a	n/a	258769	927427
05-K	6	0	n/a	n/a	n/a	259328	927621

* State Plane Meters, Mass. Mainland, NAD 83

3.2 Turtle Hoop Trapping Survey

We captured 18 individual spotted turtles between April and July, 2005, including 11 males, 5 females and 2 juveniles. We individually marked 16 of the turtles; two were released without marks. We recaptured marked individuals on four occasions. We also captured three other turtle species (Table 3), including 29 painted turtles (*Chrysemys picta*), 9 snapping turtles (*Chelydra serpentina*) and an individual red-eared slider (*Trachemys scripta*), non-native to Massachusetts. We did not capture any Blanding's turtles.

Table 3 - Hoop Trap Turtle Capture Results

Pool / Wetland ID	# Spotted Turtles	# Painted Turtles	# Snapping Turtles	# Red-eared Sliders**
Andrews A	1	1	0	0
Andrews B	1	0	0	0
Andrews C	4*	5	0	0
Warren-Weld Wetland	13*	19	8	1
Hoar Pond	0	4	0	0
MECT 21	3	0	1	0
Totals	22*	29	9	1

* Includes Recaptures

** Introduced species in MA

Spotted turtles were captured in 5 of the 6 wetland areas. The greatest number of spotted turtle captures (13) was recorded from the Warren-Weld Wetland, including ten individuals and three recaptures. Andrews C had the next highest number of spotted turtle captures, including three individuals and one recapture.

3.3 Turtle Radio-telemetry Survey

We attached radio-transmitters to eight of the turtles (7 males, 1 female), and radio-tracked their movements throughout the season until the onset of over-wintering. We recorded and mapped 75 turtle observations between April 21 and December 1 (Figure 4), including hoop trap capture locations.

Turtles were observed exclusively within wetland habitat between April and July. During August, however, 5 of the 8 turtles, and in September all 8 of the turtles were observed aestivating in terrestrial habitat, at distances ranging from 25 to 420 feet from the nearest wetland (Figure 5). Most of the smaller wetlands and vernal pools were completely dry during this time period.

Figure 6 illustrates the movements of four individual spotted turtles (3 males, 1 female) throughout the course of the survey. These four individuals were all observed using at least two different wetland areas in addition to terrestrial aestivation habitats between and surrounding those wetlands. All four of these individuals were last located in over-wintering habitats different from where they were first captured, suggesting that at least some of these turtles over-winter in different locations from year to year.

Turtle #1 was the most mobile of the eight turtles, utilizing five different wetland areas and aestivating in the woods surrounding a vernal pool (see Table 4). The two farthest northerly and southerly wetland areas used by this individual are separated by approximately 2,500 feet.

Table 4 – Spotted Turtle #1: Capture Locations and Distance Between Movements

Date	Location	Distance Moved Since Previous Observation (feet)
4/21	Andrews A VP	-
4/28	Andrews B VP	330
5/31	David Carroll VP (DCVP)	2230
6/4	Shrub Swamp East of DCVP	770
6/8	DCVP	770
8/10-9/3	Woods South of DCVP	25-40
12/1	Shrub Swamp West of DCVP	400

3.4 Four-toed Salamander Nest Search

We did not observe any four-toed salamanders or egg clusters, including at the exact locations of two egg clusters found in 2004.

4. CONCLUSIONS

The spotted turtles captured and radio-tracked in this study demonstrated many of the important aspects of the life history of the species:

- they utilize a variety of wetland and terrestrial habitats throughout the year;
- they migrate great distances between wetlands;
- they aestivate in terrestrial habitat during the driest times of year;
- they do not necessarily over-winter in the same areas from year to year.

This study, most importantly, illustrates the importance of protecting large, unfragmented landscapes with a diversity of terrestrial and wetland habitat types. We followed the seasonal movements of eight individual turtles during one season. Four of the turtles (50%) migrated out of the wetland where they were first captured, traveled distances of up to 2200 feet between wetlands, and spent at least a month out of the year in terrestrial habitat as far as 420 feet from the nearest wetland. Most of these movements took place through protected, roadless habitat. The addition of new roads or increased vehicle use of the existing roads in the vicinity of the study area could obviously have serious negative consequences on the local spotted turtle population.

Despite the recent observation of a Blanding's turtle in Hoar Pond, we did not capture this species in our survey. The Warren-Weld Wetland offers ideal habitat for Blanding's turtles, and given the intensity of our trapping efforts, it is unlikely that a large population (if any) exists in the wetland.

Four-toed salamanders, though detected in 2004, are not abundant in the study area. There is ample suitable breeding habitat for the species surrounded by hundreds of acres of suitable terrestrial habitat. Interestingly, the two exact breeding locations observed in 2004 did not contain any salamanders or eggs in 2005. The 2005 survey was limited to one day, and limited in scope, however it was conducted on May 12, a time when four-toed salamander egg clusters should have been visible if present.

We found 11 new vernal pools during a one-day search of areas not surveyed in 2004, bringing the total new vernal pools observed by HES in two years to 41. Undoubtedly there remain some additional undiscovered vernal pools within the Wilderness Conservation Area, but it should be clear that this area is of extreme importance to vernal pool breeding amphibians.

5. ACKNOWLEDGEMENTS

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