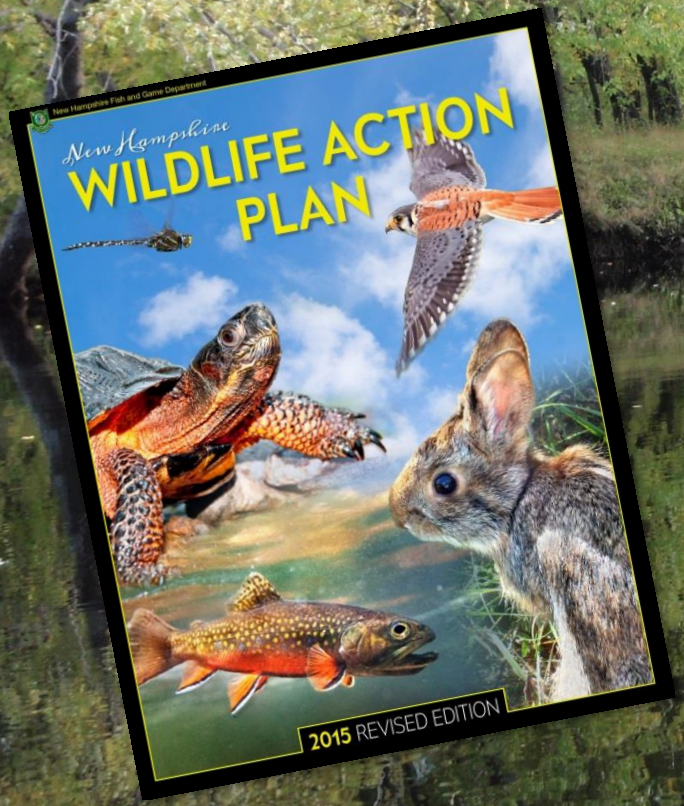
Using Species and Habitat Information in the Wildlife Action Plan to Conserve and Manage Habitat



Emily Preston
and
Michael Marchand,
Wildlife Biologists
NH Fish and Game Department

What is the Wildlife Action Plan?

Restore rare wildlife and habitats.

Keep common species common.

2015 Revision: Species and Habitats

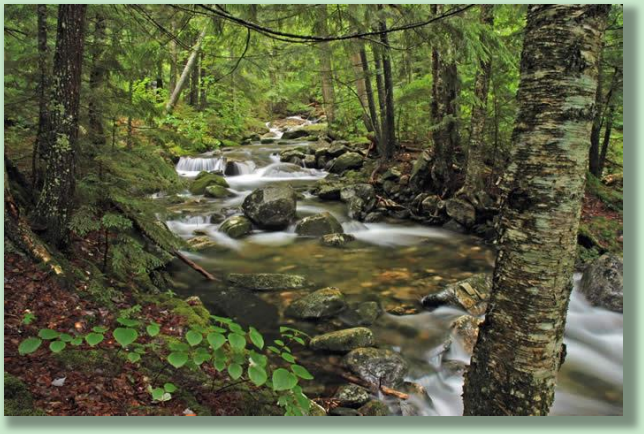
Data

Maps

Action

169 Species

27 Habitats



Species and Habitat Profiles

Overview

- Justification
- Habitat types for species
- Distribution including a map
- Data on condition, protection and management
- Habitat management status

Species and Habitat Profiles

Threats

- Includes more on how each specific threat affects the species or habitat
- Threat rank based on
  - spatial extent within NH
  - severity
  - immediacy
  - certainty
  - reversibility

Species and Habitat Profiles

Actions

- Specific actions that address the high and medium ranked threats
  - Habitat management
  - Direct work on species
  - Policy or regulatory changes
  - Partnerships to solve problems
- Monitoring
- Research

Threats

- Pollution
  - Waste water
  - Pollutants
- Climate Change
  - Habitat shifting
  - Drought, extreme temps
  - Storms & flooding
- Natural System Modifications
  - Dams & water management/use
- Invasive and problematic species, genes, & diseases
- Development

Conservation Actions!

Chapter 5

Broad actions affecting multiple species and habitats.

Habitat Management and Protection Actions.

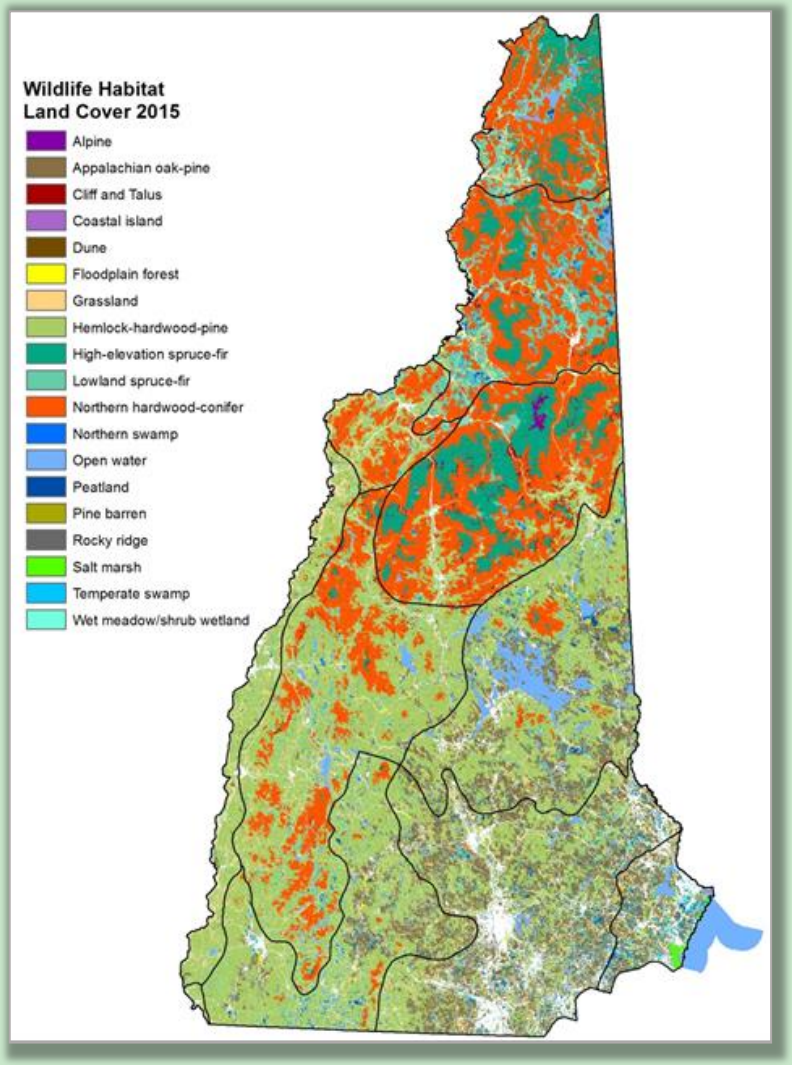
Education Actions.

Actions!

Planning Actions

Interagency Actions

2015 Revision: Updated Maps



Based on Regional Data

New Hampshire Data used to improve accuracy

Mapped to accuracy of ± ¼ acre

Updated Maps

ADDED HABITAT TYPES

Floodplain Habitats

Northern Swamps

Temperate Swamps

Large Warmwater Rivers

Coldwater Rivers and Streams

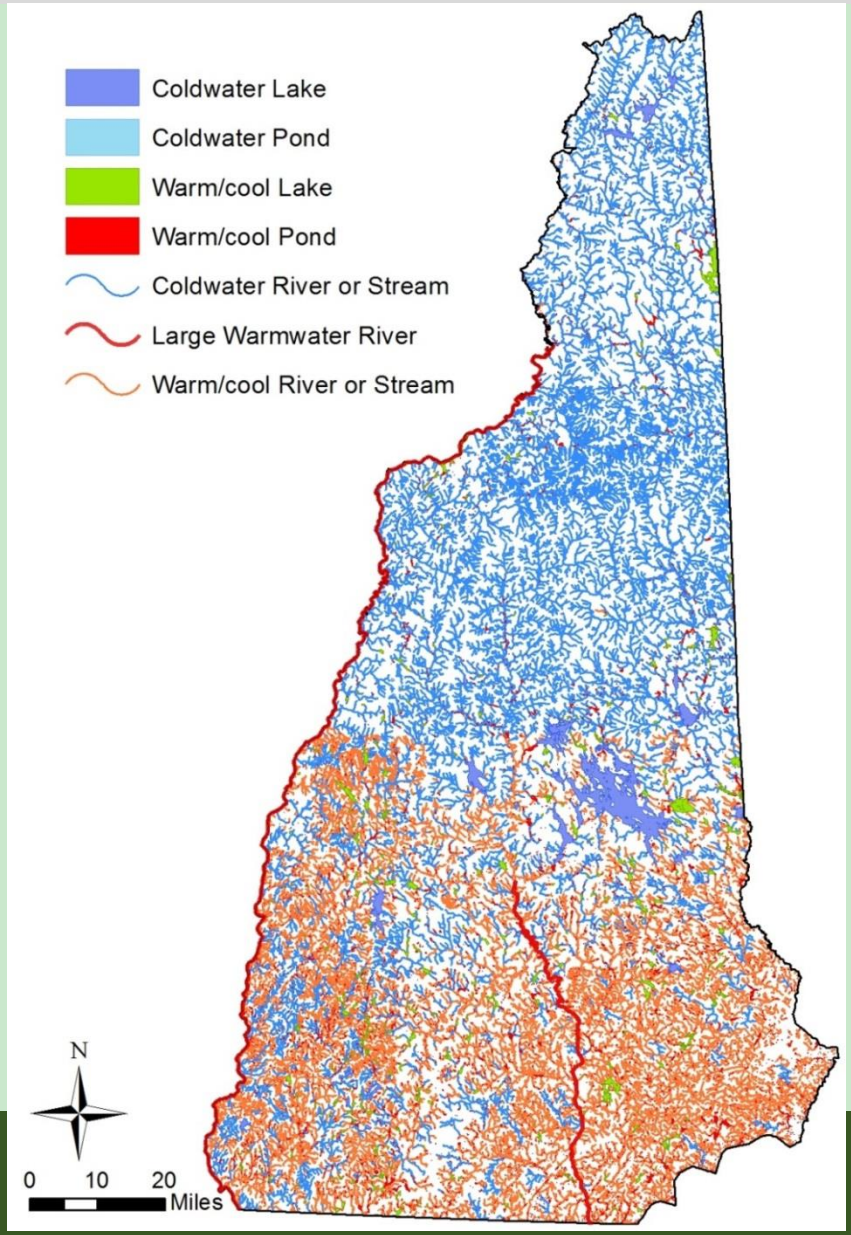
Warm water Rivers and Streams

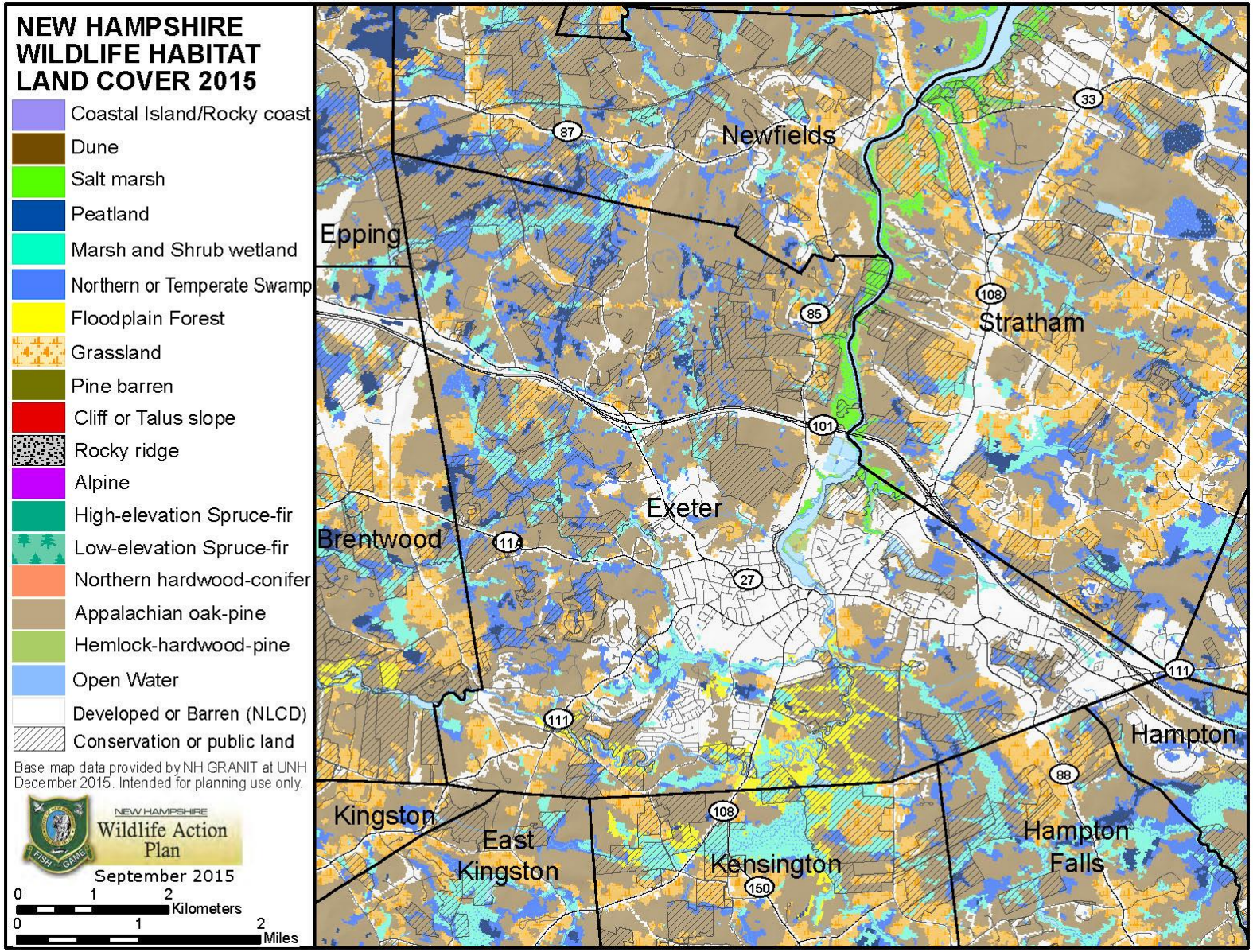
Lakes and Ponds with Coldwater Habitat

Warmwater Lakes and Ponds

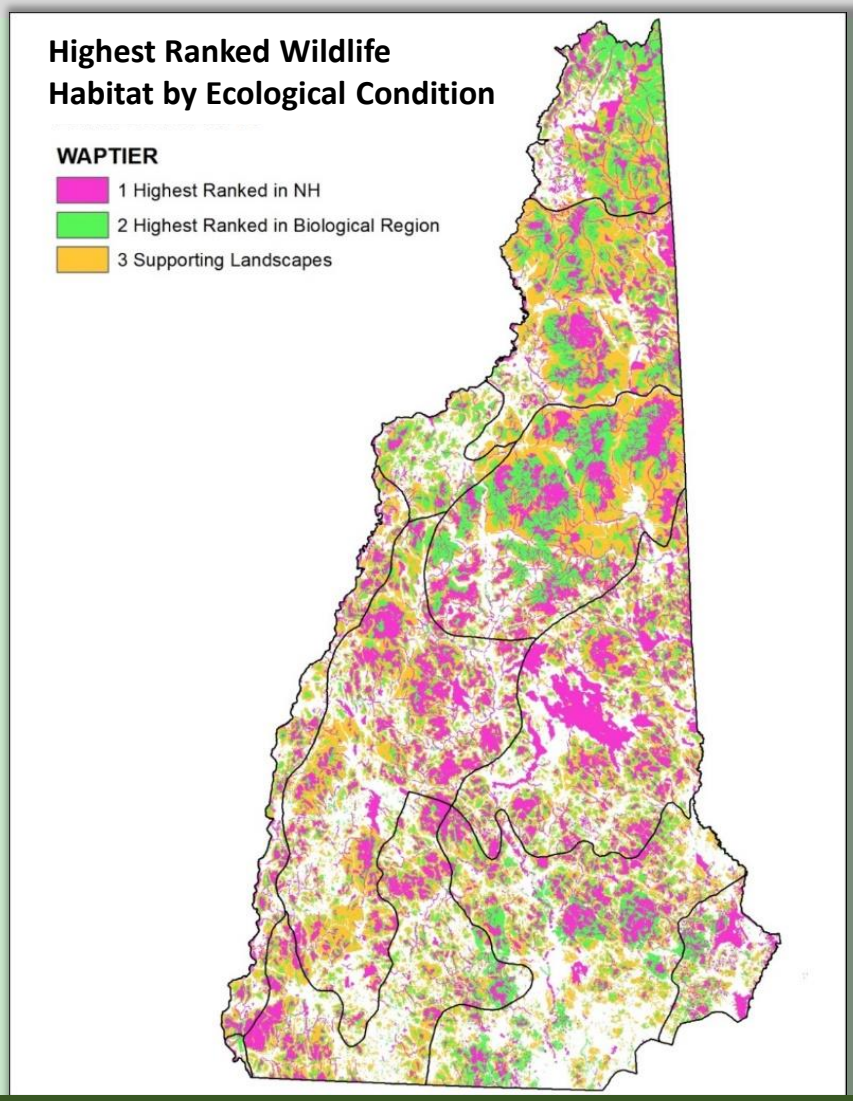
Estuarine

Marine




NEW HAMPSHIRE
WILDLIFE HABITAT
LAND COVER 2015
Coastal Island/Rocky coast
Dune
Salt marsh
Peatland
Marsh and Shrub wetland
Northern or Temperate Swamp
Floodplain Forest
Grassland
Pine barren
Cliff or Talus slope
Rocky ridge
Alpine
High-elevation Spruce-fir
Low-elevation Spruce-fir
Northern hardwood-conifer
Appalachian oak-pine
Hemlock-hardwood-pine
Open Water
Developed or Barren (NLCD)
Conservation or public land
Base map data provided by NH GRANIT at UNH
December 2015. Intended for planning use only.
NEW HAMPSHIRE
Wildlife Action Plan
September 2015
0 1 2 Kilometers
0 1 2 Miles
Newfields
Epping
Stratham
Exeter
Brentwood
Kingston
East Kingston
Kensington
Hampton
Hampton Falls
87
33
108
85
101
111A
27
111
88
150

Updated Maps



Biological factors

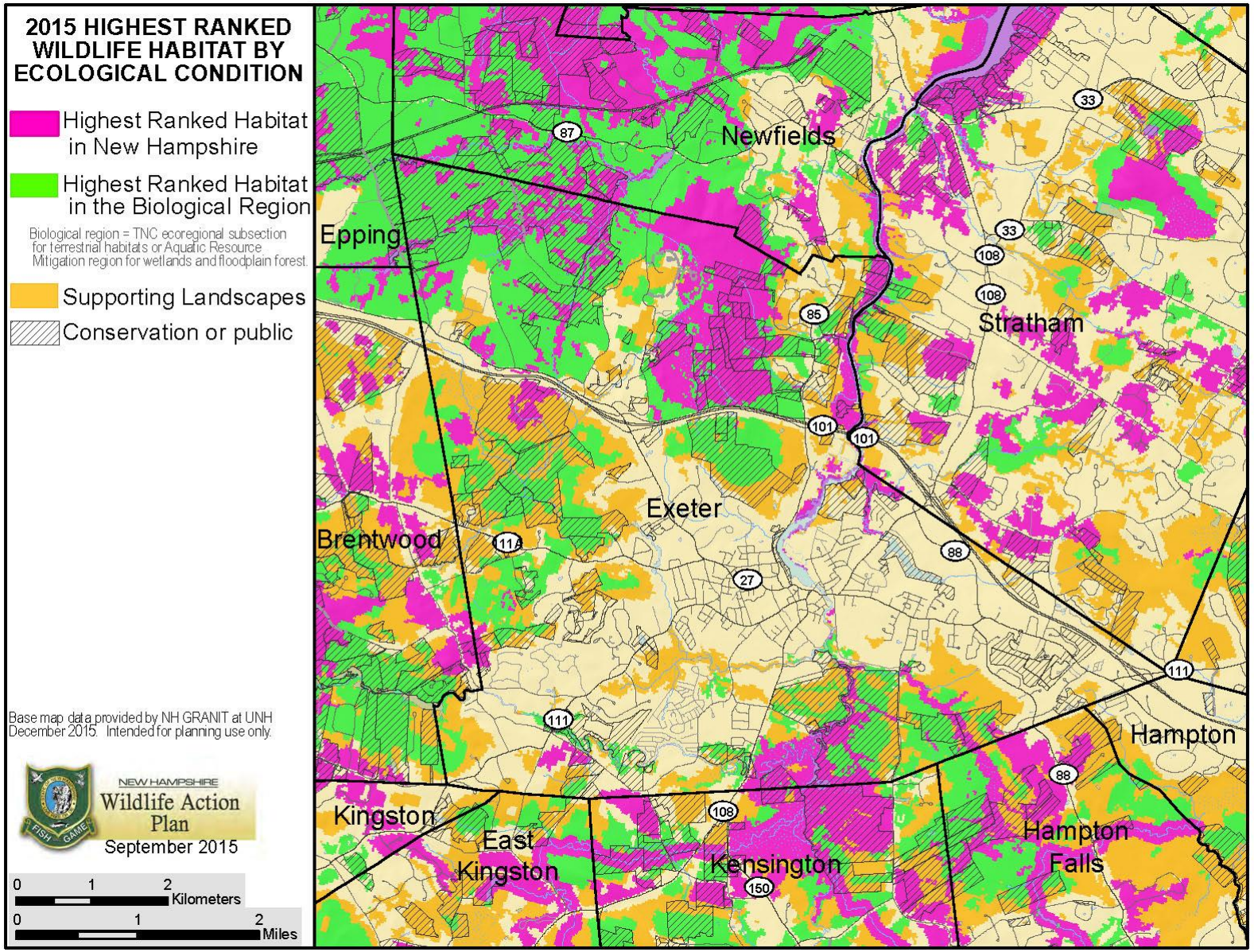
- rare plant & animal species, biodiversity

Landscape factors

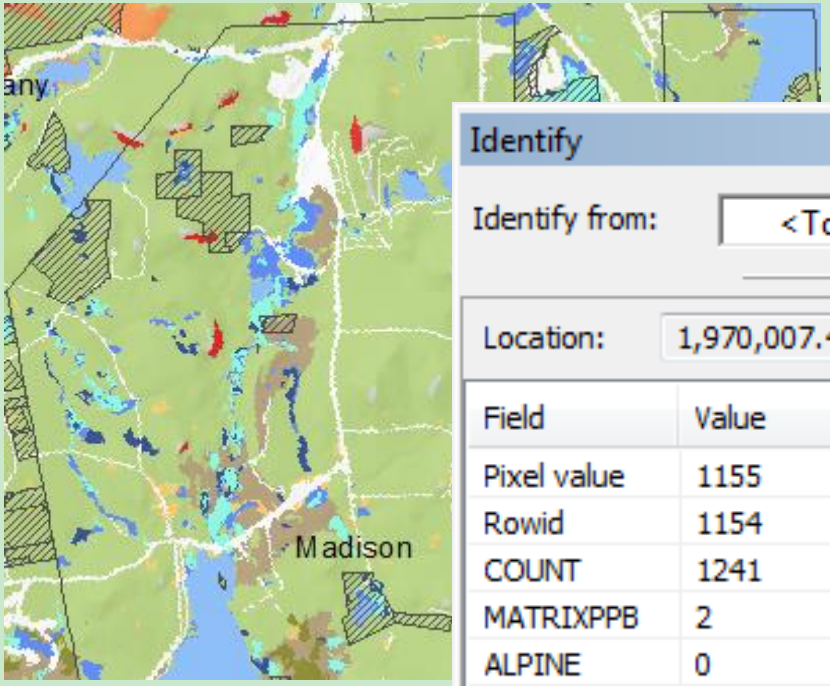
- size of habitat, proximity to other patches of that habitat

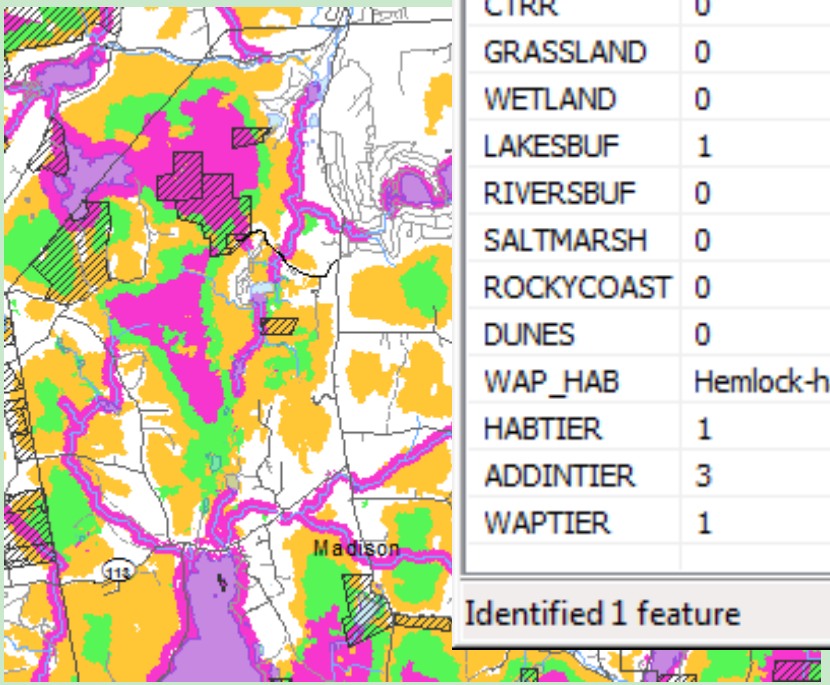
Human impact

- Effects of development, roads and utility corridors and pollutants



University of New Hampshire Cooperative Extension





Identify

Identify from: <Top-most layer>

Location: 1,970,007.460 2,582,953.112 Meters

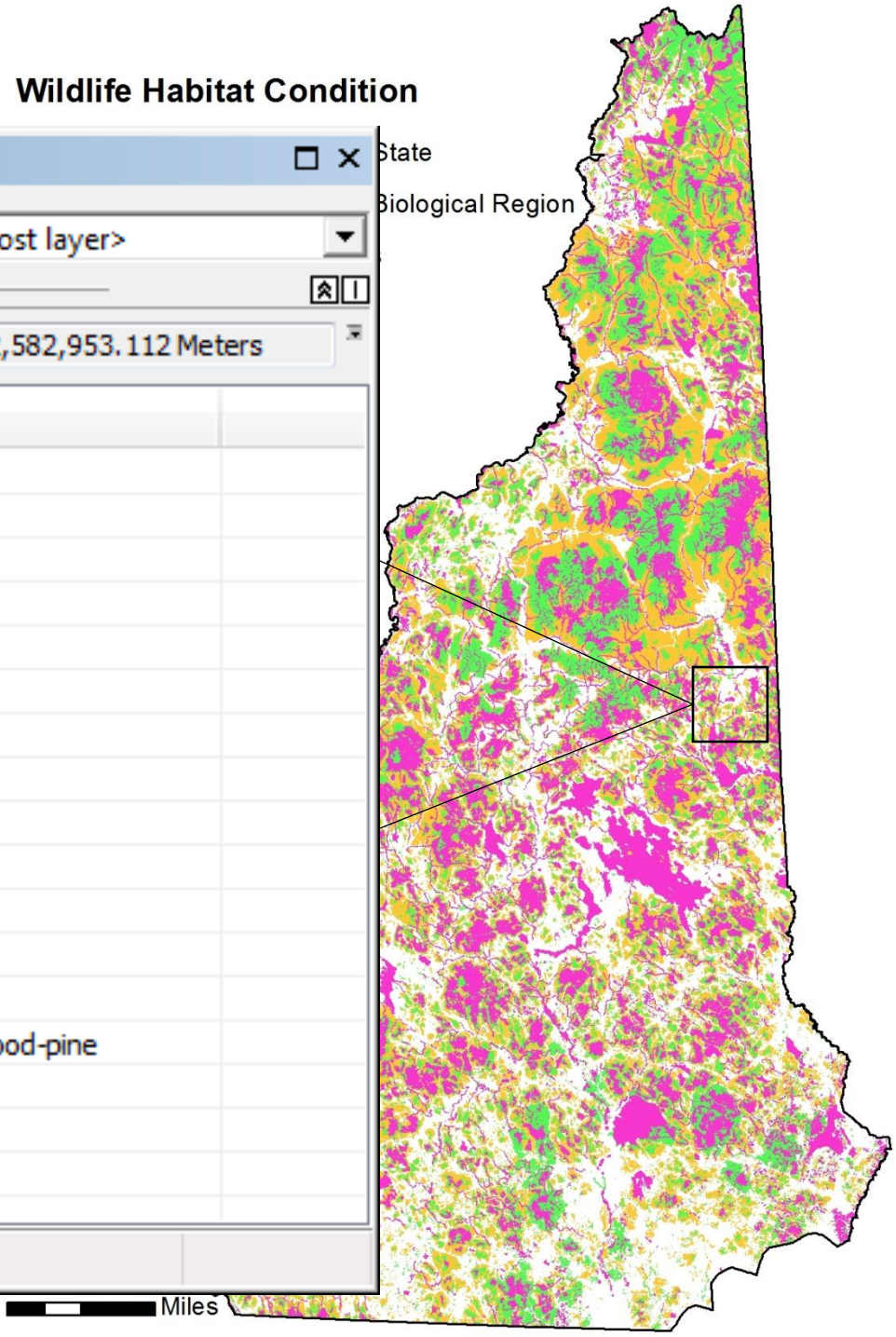
Field	Value
Pixel value	1155
Rowid	1154
COUNT	1241
MATRIXPPB	2
ALPINE	0
CTRR	0
GRASSLAND	0
WETLAND	0
LAKESBUF	1
RIVERSBUF	0
SALTMARSH	0
ROCKYCOAST	0
DUNES	0
WAP_HAB	Hemlock-hardwood-pine
HABTIER	1
ADDINTIER	3
WAPTIER	1

Identified 1 feature

Wildlife Habitat Condition

State

Biological Region



NH Wildlife Action Plan on the web

New Hampshire
FISH AND GAME
Connecting you to life outdoors

Guardian of the state's fish, wildlife, and marine resources.

Search This Site SEARCH

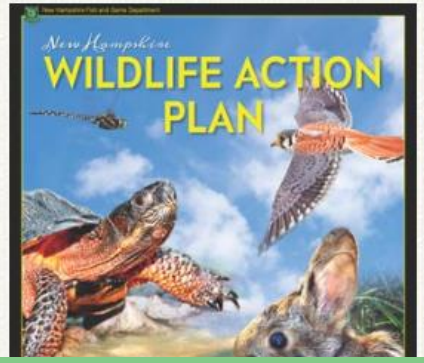
Home | Hunting | Fishing | Coastal | Wildlife | OHRV | Education | Newsroom | About

In This Section

- Conservation Planning Tools
- Events
- Habitats
- Input, Planning and Updates
- Maps
- Workshops and Presentations
- Endangered

NH Wildlife Action Plan

Taking Action for Wildlife!



How does NH Fish and Game and its many conservation partners around the state prioritize actions for wildlife and land management? How do you, as a member of your community and a

environment? The entire

Conservation Planning Tools

especially for community conservation planners

www.wildlife.state.nh.us/wildlife/wap.html

In This Section

- Wildlife in NH
- Nongame & Endangered Wildlife Program
- FAQs
- Habitats
- Publications
- Wildlife Management Areas

Species Occurring in New Hampshire

New Hampshire is home to more than 500 species of vertebrate animals. This list would be much longer if a complete list of invertebrates (insects, crustaceans, clams and snails) were included. About 75 percent are nongame wildlife species not hunted, fished or trapped. Twenty-seven species are endangered and fourteen are threatened in the state. With your help we are able to maintain New Hampshire's rich diversity of wildlife through research, management and education projects outlined in the Actions of the Wildlife Action Plan.

- Anadromous Fish
- Freshwater Fish

Legend:

- e = state-endangered
- t = state-threatened

Habitat Types and Species

See Also:

- Habitat Maps
- See a list of all Species Occurring in NH
- How NH chooses Habitats & Species of Greatest Conservation Need
- What is habitat management and why do we have to do it? Learn more about habitat management.

The New Hampshire landscape is rich with habitats for fish and wildlife -- from granite peaks, forests, and wetlands to grasslands, coastal islands, and nearly a thousand lakes and ponds. Twenty-seven habitats are identified in NH's Wildlife Action Plan -- some of them common and some extremely rare. Most are mapped in GIS so they can be used to plan and prioritize habitat protection, restoration, or research.

New Hampshire is home to more than 500 different wildlife species. The Wildlife Action Plan identifies 169 of these as a 'Species of Greatest Conservation Need.' In the charts below you can find information about New Hampshire's habitat types, the wildlife species that can be found there, and helpful links to learn more. Please note that these are just brief summaries; complete descriptions of habitats, their components, wildlife species and the justification for their conservation, data sources and citations can be found in Appendices A and B of the Wildlife Action Plan.

Select a tab to view content.

Forests

Appalachian Oak-Pine Forest
Hemlock Hardwood Pine Forest

Wetlands

Floodplain Habitats

Habitat | Species | Learn More

Photo credit: Ben Kimball, NH Natural Heritage Bureau.

Floodplain habitats occur in valleys adjacent to river channels and are prone to periodic flooding. Also referred to as riparian forests, they support diverse natural communities, protect and enhance water quality by filtering and sequestering pollution, and control erosion and sediment. Many wildlife species use these forests at some point in their life cycle. It would not be uncommon to find red-shouldered hawks, veery, or chestnut-sided warblers breeding in floodplain forests. Evidence of beaver, mink, or otter can usually be found along the water's edge. Other wetland types, like shrub swamps and vernal pools, can be found within floodplain forests, and these areas are particularly important for Jefferson salamanders, northern leopard frog, wood turtles, and state-endangered Blanding's turtles. Since these species, like most wildlife species, use a variety of habitats, uplands adjacent to floodplain forests are also crucial for these species. With their rich soils, floodplains can serve as high quality farmland, and many floodplains have been converted to agriculture. Other human activities that have threatened these habitats include residential and commercial development along rivers, and the installation of dams, which has altered the natural flooding regime. Floodplain habitats are particularly vulnerable to invasive plants because the frequent disturbances from flooding give non-native species opportunities to establish, and these species tend to thrive in the nutrient rich soils. Annual flooding can control invasive plants, if the natural flood regime is not altered. Some conservation actions

Wetlands

Floodplain Habitats

Habitat | Species | Learn More

Species
Bald Eagle
Big Brown Bat
Blanding's Turtle
Blue-Spotted Salamander Complex
Cerulean Warbler
Eastern Red Bat
Eastern Ribbonsnake
Hoary Bat
Jefferson Salamander Complex
Moose
Northern Leopard Frog
Purple Finch
Rapids Clubtail
Silver-Haired Bat

Wetlands

Floodplain Habitats

Habitat | Species | Learn More

- See the Wildlife Action Plan Habitat Profile
- Floodplain Forest Brochure

Marsh and Shrub Wetlands

Northern Swamps

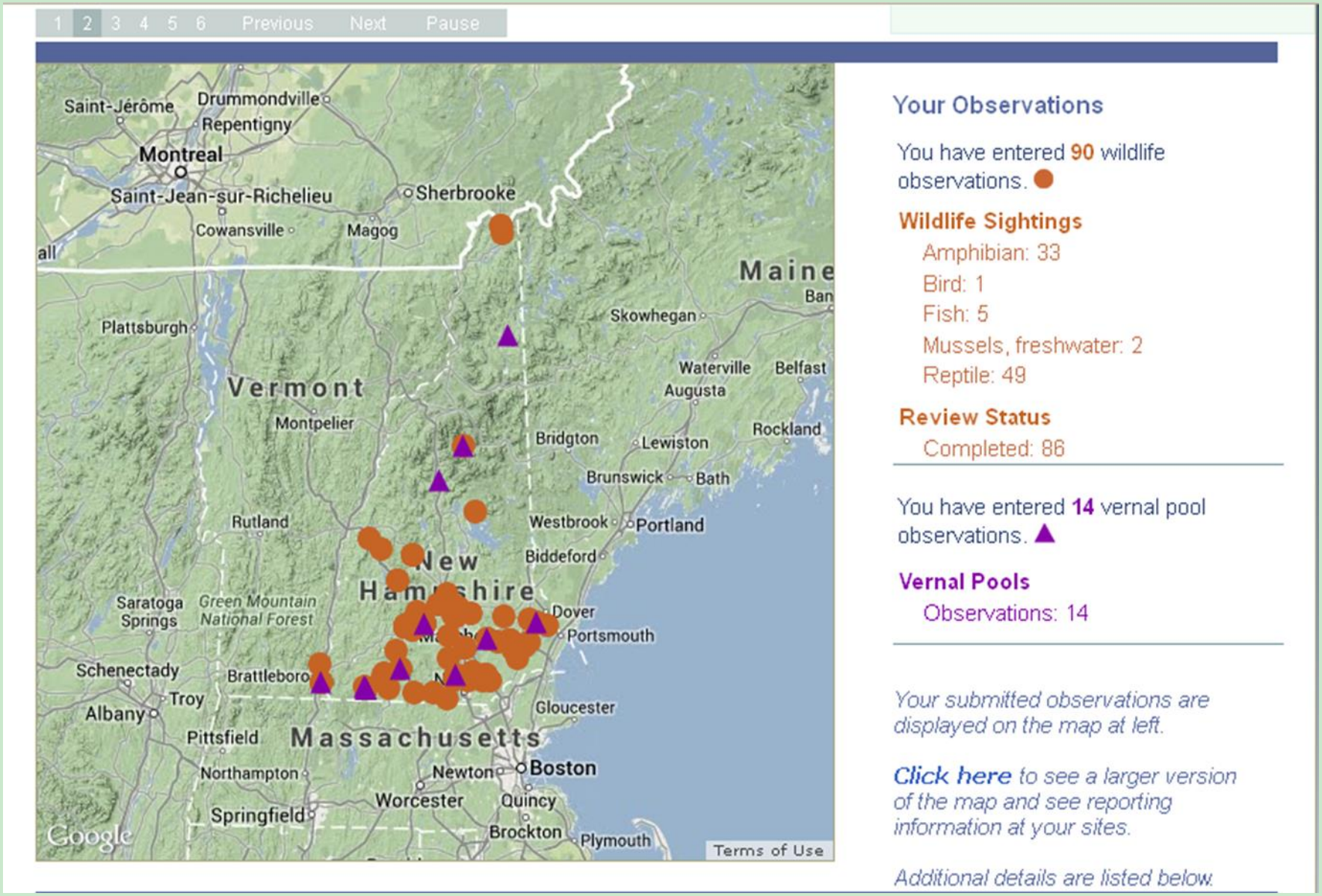
Peatlands

Temperate Swamps

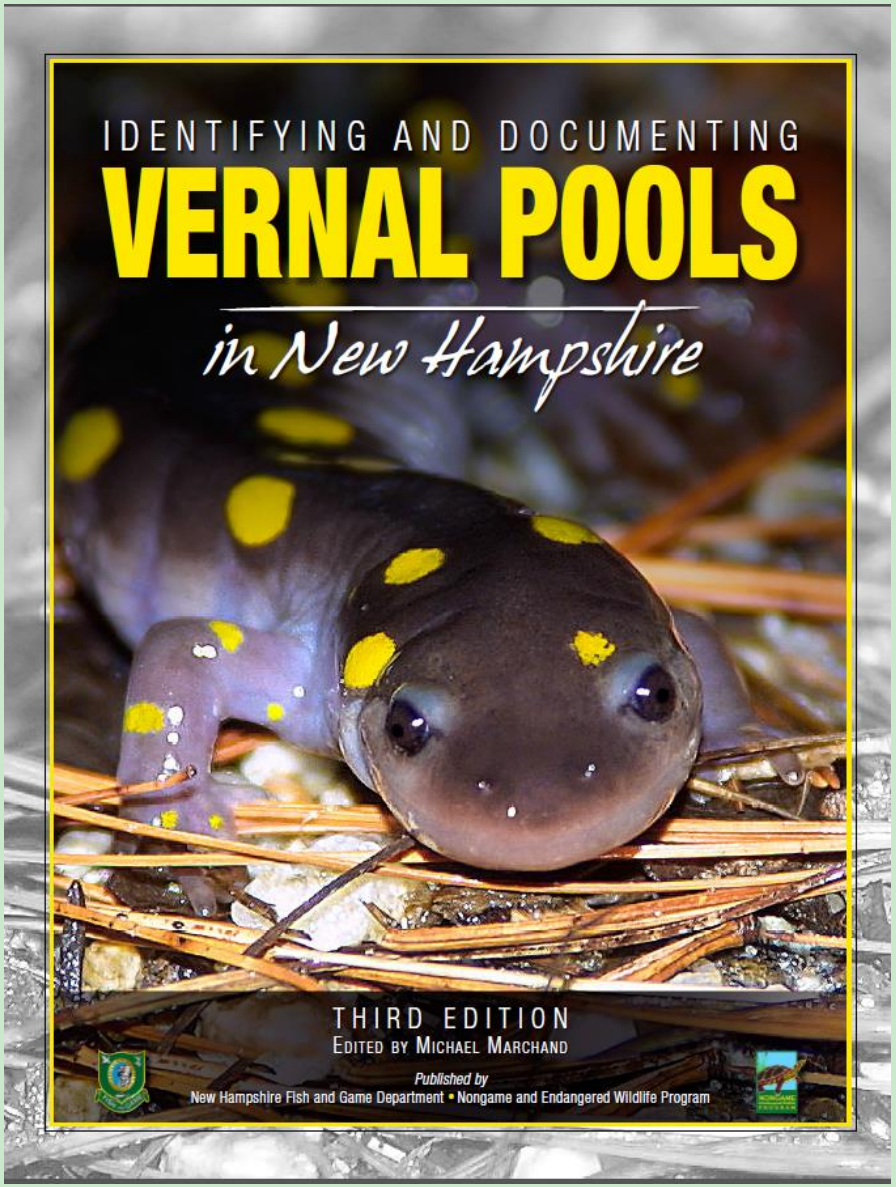
Vernal Pools

Resources: Wildlife Sightings

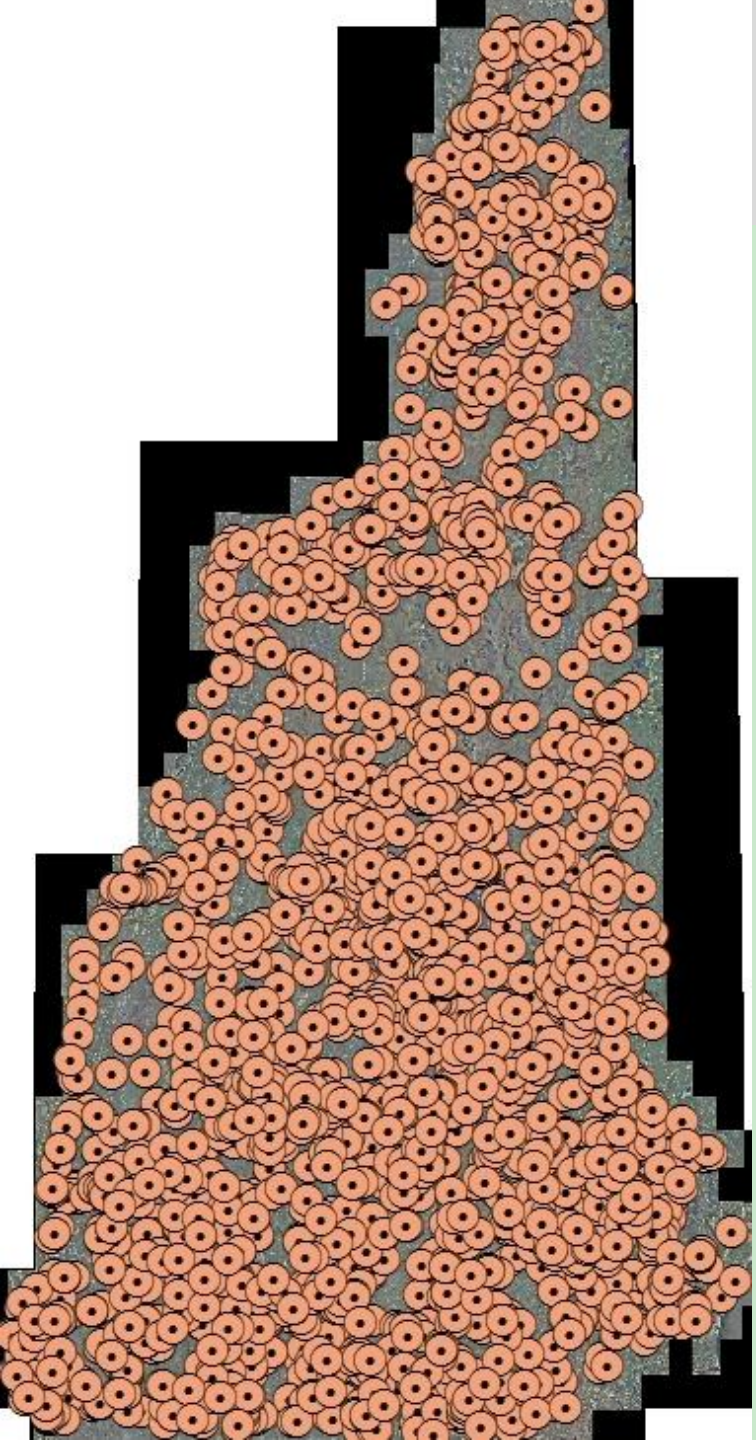
MOBILE: http://NHWildlifeSightings.unh.edu/mobile



Resources: NEW Vernal Pool Manual



Includes an easy-to-use data sheet that matches the data format for the Wildlife Sightings Database



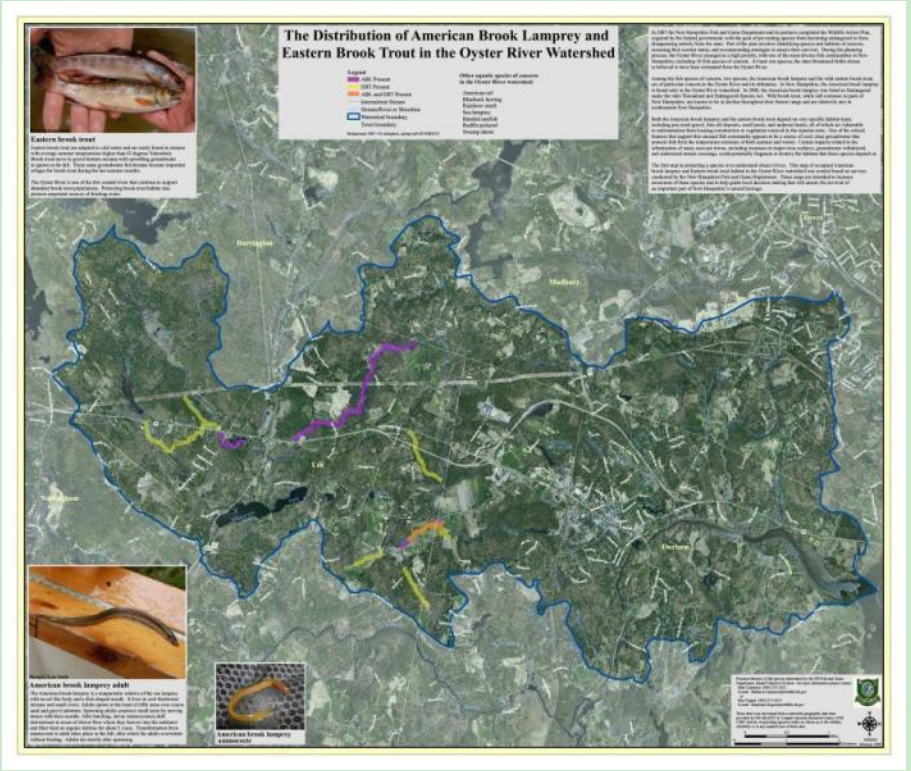
Fish Survey Database

There are over 3,600 records in the NHFG Fish Survey Database.

Over 2,600 surveys have been conducted since 2005.

How do we provide information that is useful and easily accessible? Work in process…..

Online outreach (ESRI Story Maps)
Future tool

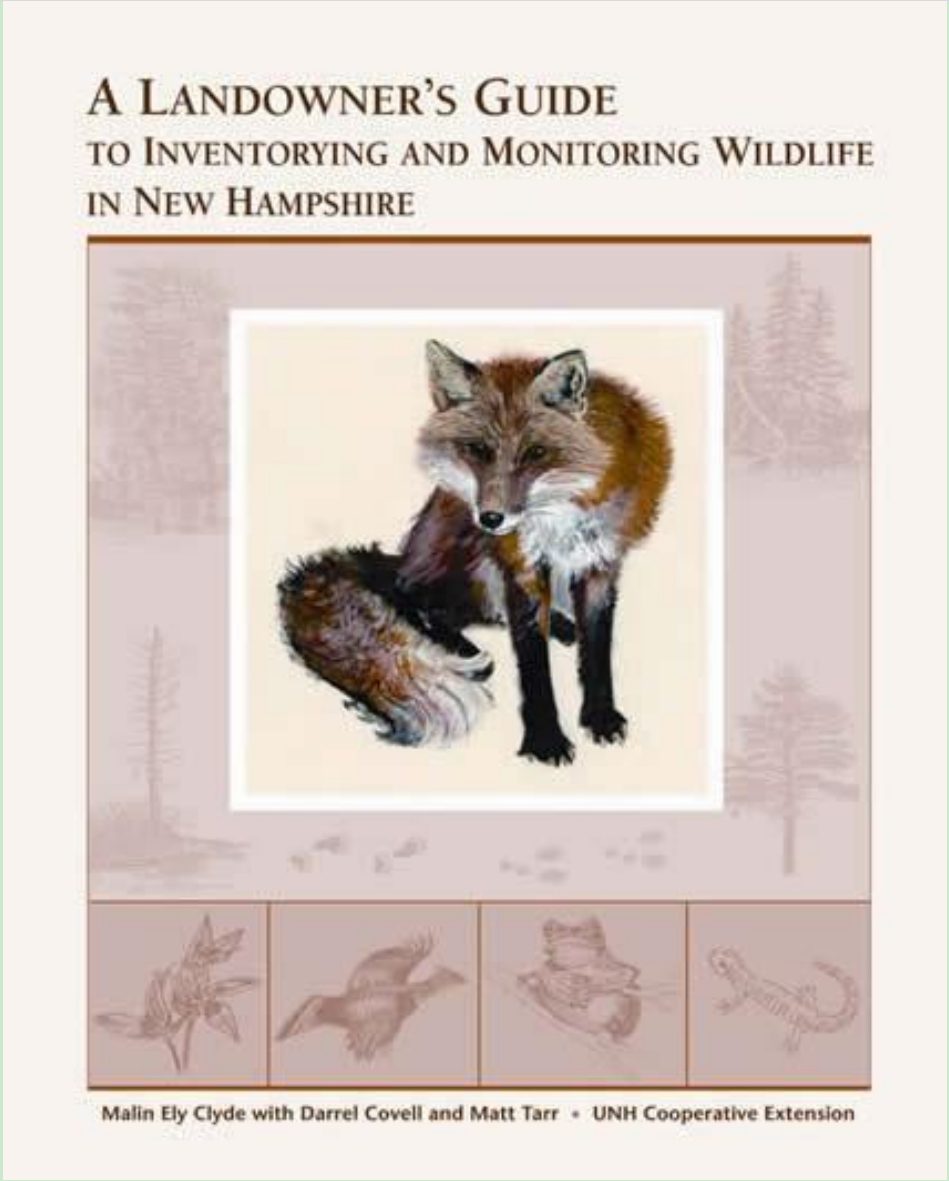


Traditional Outreach (Posters, presentations, brochures, site walks, etc.)

Resources: Collecting Data

Using some standard data collection methods can help.

takingactionforwildlife.org



Resources: NH Natural Heritage Bureau

NEW HAMPSHIRE NATURAL HERITAGE BUREAU
DRED - DIVISION OF FORESTS & LANDS
PO BOX 1856 -- 172 PEMBROKE ROAD, CONCORD, NH 03302-1856
(603) 271-2214

Rare Plants, Rare Animals,
and Exemplary Natural Communities
in New Hampshire Towns

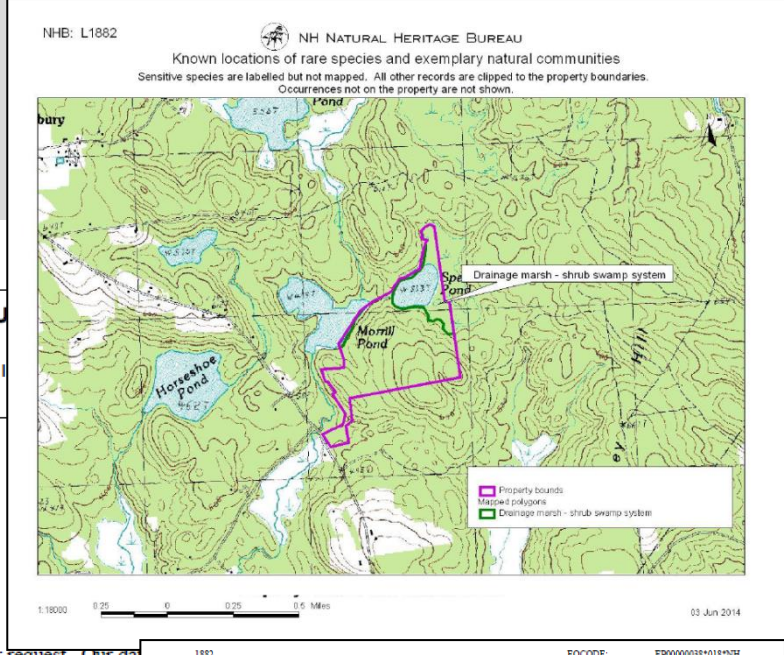
July 2013

NH Natural Heritage Bureau

Town Flag	Species or Community Name	Listed? Federal	Listed? State	# reported last 20 yrs Town	# reported last 20 yrs State
Alstead					
	Natural Communities - Terrestrial				
**	Hemlock forest	--	--	1	4
	Rich mesic forest	--	--	Historical	50
**	Semi-rich mesic sugar maple forest	--	--	1	20
**	Temperate ridge - cliff - talus system	--	--	1	7
	Natural Communities - Palustrine				
**	Drainage marsh - shrub swamp system	--	--	2	18
**	Herbaceous seepage marsh	--	--	1	5
**	Red maple - black ash swamp	--	--	1	17
	Plants				
	Black Maple (*Acer nigrum*)	--	T	Historical	10
	bur-reed sedge (*Carex sparganioides*)	--	E	Historical	5
	Downy False Foxglove (*Aureolaria virginica*)	--	E	Historical	15
	Four-leaved Milkweed (*Asclepias quadrifolia*)	--	E	Historical	8
	green adder's-mouth (*Malaxis unifolia*)	--	T	Historical	56
	large-fruited sanicle (*Sanicula trifoliata*)	--	T	Historical	16
	long-headed windflower (*Anemone cylindrica*)	--	E	Historical	11
	narrow-leaved glade fern (*Diplazium pycnocarpon*)	--	E	Historical	6
	Philadelphia panicgrass (*Panicum philadelphicum*)	--	E	Historical	8
*	showy orchid (*Galearis spectabilis*)	--	T	1	16
	Virginia mountain-mint (*Pycnanthemum virginianum*)	--	E	Historical	3
	Virginia stickseed (*Hackelia virginiana*)	--	E	Historical	22
	White Colic-root (*Aletris farinosa*)	--	E	Historical	1
	Wild Campion (*Silene caroliniana* ssp. *pensylvanica*)	--	E	Historical	1
	Vertebrates - Fish				
**	Northern Redbelly Dace (*Phoxinus eos*)	--	SC	1	12

http://www.nhdfl.org/library/pdf/Natural%20Heritage/Townlist.pdf

NHB Datachecks


NHB: L1882

NH Natural Heritage Bureau

Known locations of rare species and exemplary natural communities

Sensitive species are labelled but not mapped. All other records are clipped to the property boundaries.
Occurrences not on the property are not shown.

New Hampshire Natural Heritage Bureau

DRED - Division of Forests & Lands
PO Box 1856 -- 172 Pembroke Road, Concord, NH 03302-1
Phone: (603) 271-2214 Fax: (603) 271-6488

To: xxx

From: Melissa Coppola, NH Natural Heritage Bureau
Date: 6/3/2014
Re: Review by NH Natural Heritage Bureau of request dated 5/30/2014

NHB File ID: 1882 **Town:** Canterbury
Project type: Landowner Request **Location:** xxx

I have searched our database for records of rare species and exemplary natural communities on the property(s) identified in your request. Our da
known records for species officially listed as Threatened or Endangered by either the state of New Hampshire or the federal government, as well
natural communities judged by experts to be at risk in New Hampshire but not yet formally listed.

NHB records on the property(s):

	Mapping Precision	% within tract	Last Reported	Listing Status		Co
Natural Community				**Federal**	**NH**	**Glob**
Drainage marsh - shrub swamp system	Good	12.4	2009	--	--	-

NHB records within one mile of the property(s):

	Last Reported	Listing Status		Co
Vertebrate species (For more information, contact Kim Tuttle, NH F&G at 271-6544)		**Federal**	**NH**	**Glob**
Blanding's Turtle (*Emydoidea blandingii*)	2010	--	E	G4
Invertebrate Species		**Federal**	**NH**	**Glob**
Ebony Boghaunter (*Williamsonia fletcheri*)	2007	--	SC	G4

Listing codes: T = Threatened, E = Endangered SC = Special Concern
Rank prefix: G = Global, S = State, T = Global or state rank for a sub-species or variety (taxon)
Rank suffix: 1-5 = Most (1) to least (5) imperiled. "--", U, NR = Not ranked. B = Breeding population, N = Non-breeding. H = Historical, X = Extirpated.

A negative result (no record in our database) does not mean that no rare species are present. Our data can only tell you of known occurrences, ba
gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certa
site survey would provide better information on what species and communities are indeed present.

**NOTE: This review *cannot* be used to satisfy a permit or other regulatory requirement to check for rare species o
could be affected by a proposed project, since it provides detailed information only for records actually on the pro**

1882 EOCODE: EP00000038*018*NH

New Hampshire Natural Heritage Bureau - System Record

Drainage marsh - shrub swamp system

Legal Status
Federal: Not listed
State: Not listed

Conservation Status
Global: Not ranked (need more information)
State: Demonstrably widespread, abundant, and secure

Description at this Location
Quality Rank: Good quality, condition and landscape context ('B' on a scale of A-D).
Quality Comments: 2009: See L2 EIA forms.

Detailed Description: 2009: At the large wetland basin that feeds into the Crane Neck Pond from the east, there are a couple of beaver-ponded areas (former swamps) at the upper end of the wetland system's east end. *Brasenia schreberi* (water shield) covers about 50% of the water surface of the more western of the two ponds (***aquatic bed*** community). A beaver dam marks a drop to the larger, main marsh basin. There is another dam a short distance along the southern margin of the marsh. Water flows out of the main basin here, and down into a small ***red maple - black ash swamp*** (pH = 4.8

General Area: 2009: The greater Crane Neck Pond wetland complex is a prominent feature of the northern part of a large (1,000+ ac.), un-fragmented forest block bounded by Baptist Road to the north, Morrill Rd to the southwest, Clough Pond Road to the east, and Old Shaker Road far away to the southeast. A few woods roads and snow machine trails cross this area, but there are no houses other than those near the roads. Second-growth ***hemlock - beech - oak - pine forest*** is the most common forest type, some of which has been logged in recent years. Small seepage swamps occupy small drainage ways that feed into the marshes, and small vernal pools and basin swamps punctuate the upland forests on the rolling, low-relief terrain (including ***black gum - red maple basin swamps***).

General Comments: 2009: Spender Pond is mis-spelled as « Spencer Pond » on the USGS topo (source : Jim Carter, formerly of DRED. Supposedly this mistake will be corrected in a future map update. Locally, this wetland is called « Spender Meadow », and the conservation land surveyed in 2009 is called « Schoodac Conservation and Recreation Area ».

Management Comments:

Location
Survey Site Name: Crane Neck Pond
Managed By: Schoodac Conservation Area

County: Merrimack
Town(s): Canterbury
Size: 204.5 acres

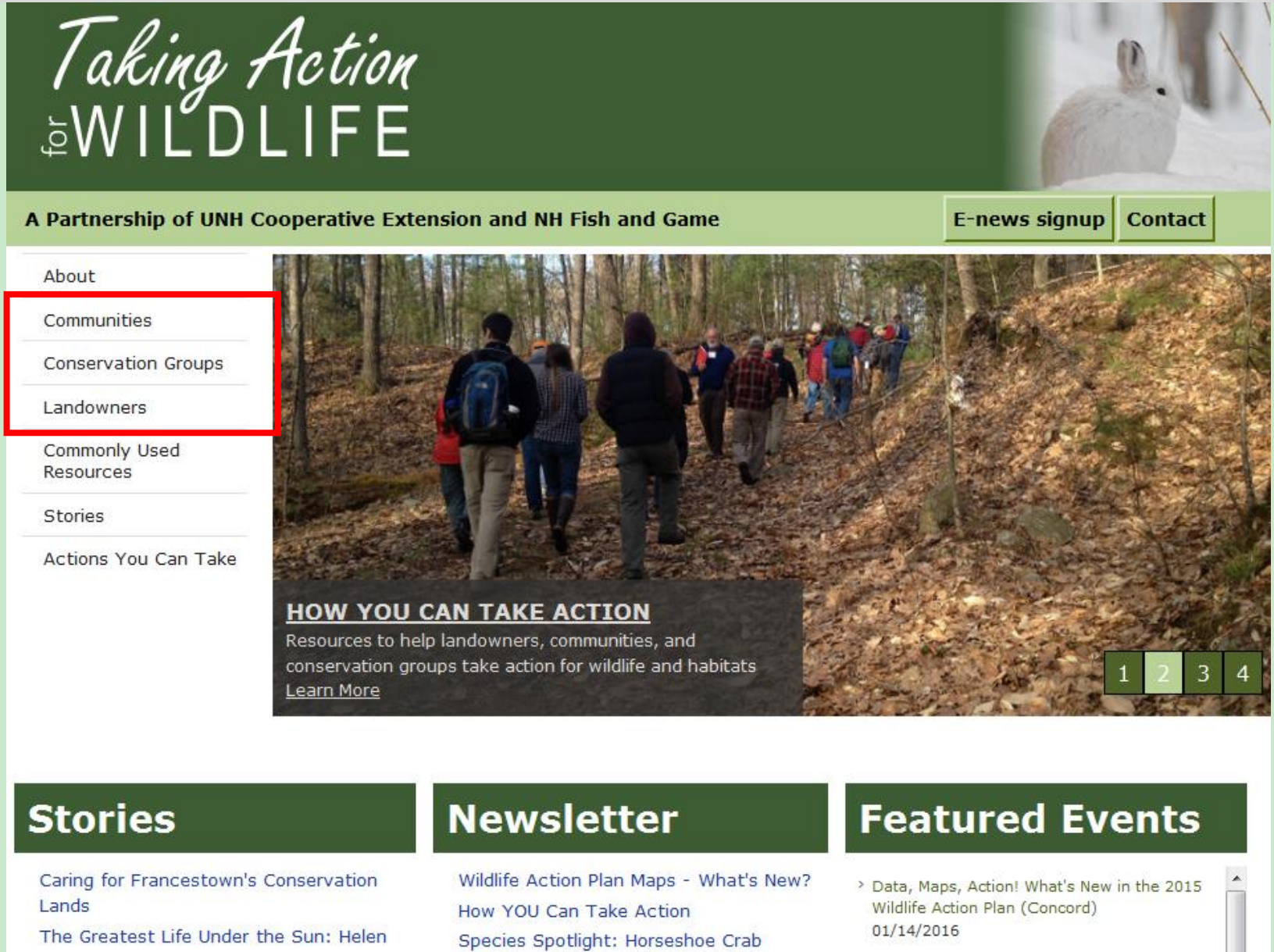
USGS quad(s): Penacook (4307135)
Lat, Long: 432013N, 0713230W
Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2009: This system includes the wetlands around Crane Neck, Morrill, and Spender Ponds, as well as the large wetland basin that feeds into the Crane Neck Pond from the east. Best access is either via long walk from F&ccess on Morrill Pond, or via the snowmobile trail off of Clough Pond Road on the west side of the road opposite the SnowShaker Club house.

Dates documented
First reported: 2009-08-27 Last reported: 2009-08-31

Resources: Taking Action for Wildlife



Making Habitat Happen




Why is habitat management important? Some habitats require disturbances to maintain their unique characteristics. Sometimes these disturbances occur naturally, but sometimes we can manage habitat to mimic natural disturbances in places where disturbance has been eliminated or diminished. Habitat management can restore habitats and wildlife in decline.

What can landowners and communities do? First, realize that every property is different. The recommendations on this site provide a good, basic understanding of the work involved in managing a variety of habitat types, but before you begin work on your property, consult your UNH Cooperative Extension County Forester or Wildlife Specialist.

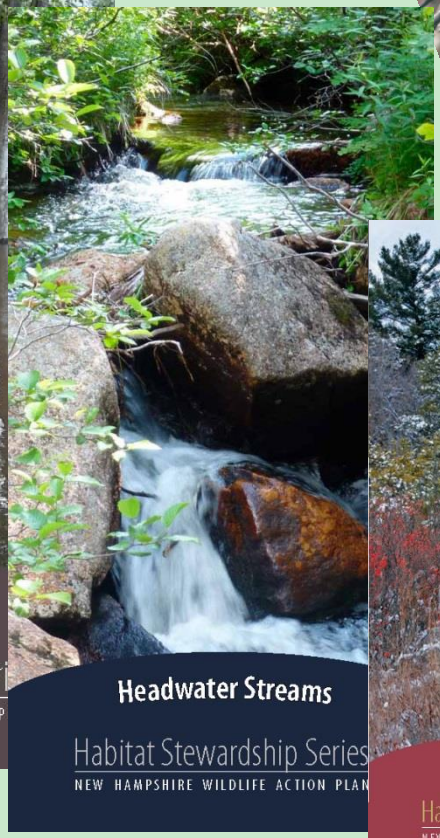
How will we help you? Your County Forester or Wildlife Specialist can provide one-on-one site visits to your property to help you plan and execute wildlife habitat management projects on your property. There is also financial assistance available to landowners to help cover the cost of management.

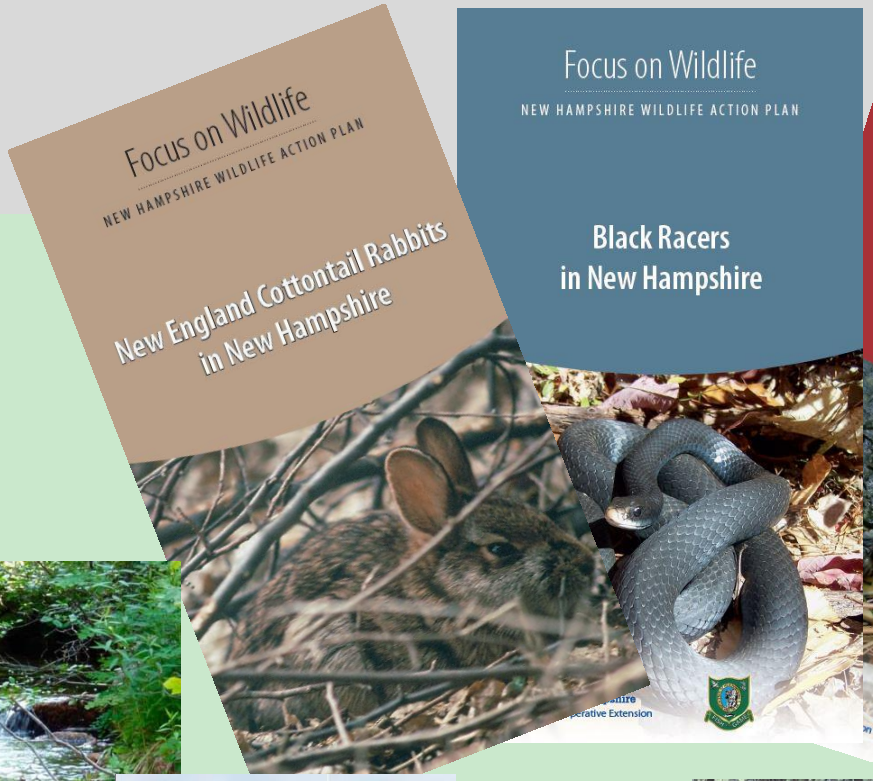
What type of habitat will you manage?

- Managing Grasslands
- Managing Shrublands
- Management in Riparian Areas

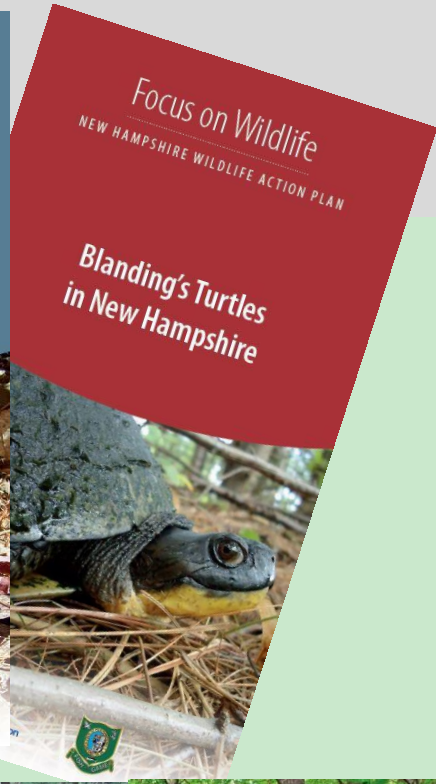
Resources


Floodplain Forests
Habitat Stewardship Seri
NEW HAMPSHIRE WILDLIFE ACTION P


Headwater Streams
Habitat Stewardship Series
NEW HAMPSHIRE WILDLIFE ACTION PLAN


Focus on Wildlife
NEW HAMPSHIRE WILDLIFE ACTION PLAN
New England Cottontail Rabbits in New Hampshire

Focus on Wildlife
NEW HAMPSHIRE WILDLIFE ACTION PLAN
Black Racers in New Hampshire


Focus on Wildlife
NEW HAMPSHIRE WILDLIFE ACTION PLAN
Blanding's Turtles in New Hampshire


Shrublands
Habitat Stewardship Series
NEW HAMPSHIRE WILDLIFE ACTION PLAN


Lowland Spruce-Fir Forests
Habitat Stewardship Series
NEW HAMPSHIRE WILDLIFE ACTION PLAN


Vernal Pools
Habitat Stewardship Series
NEW HAMPSHIRE WILDLIFE ACTION PLAN


Hemlock-Hardwood-Pine Forest
Habitat Stewardship Series
NEW HAMPSHIRE WILDLIFE ACTION PLAN

The Stewardship Network
New England

Mobilizing volunteers to care for and study our lands and waters

Online Hub for Volunteerism

Calendar of events
Registration system
Citizen science hub

Shared Communication

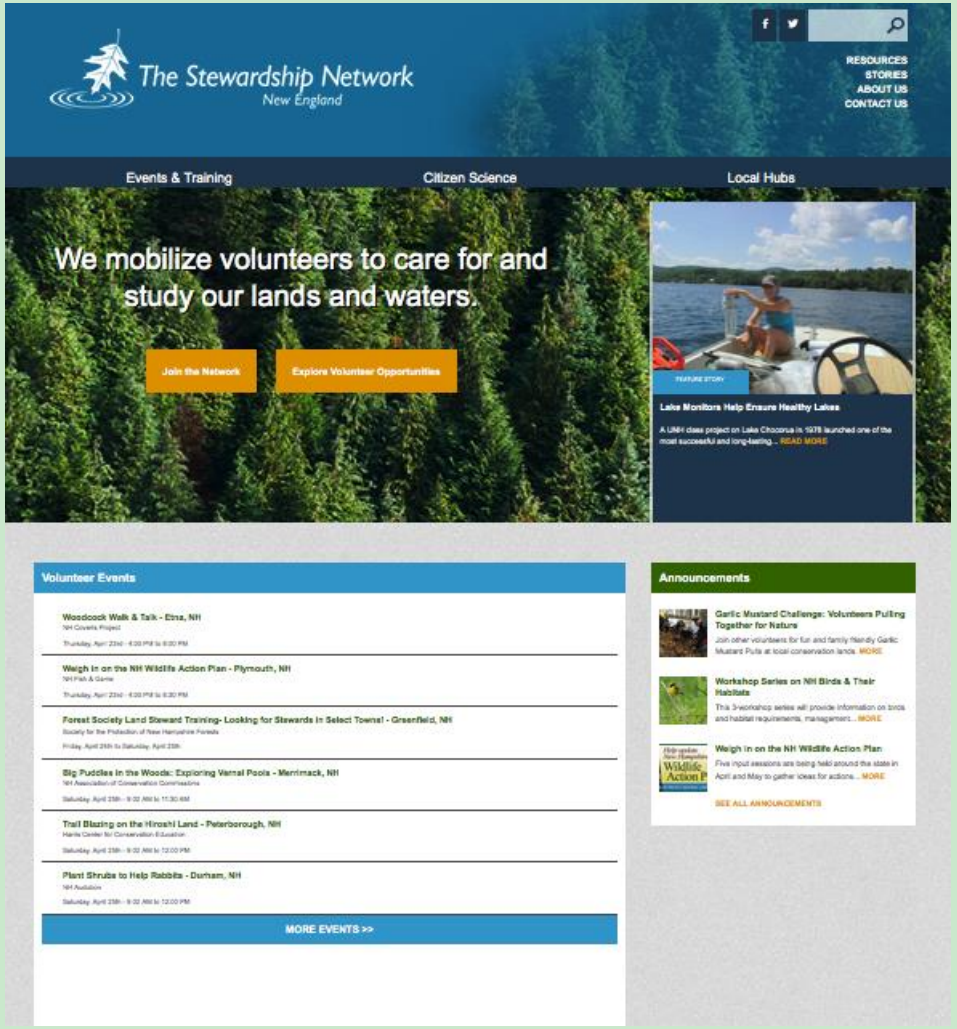
Training for Volunteers

Sharing Tools and Expertise

Stewardship Resource Center
Collaborative Internships

Cross boundary efforts

Invasive plants, trails, citizen science



Newengland.stewardshipnetwork.org

Resources: NRCS Funding Programs

USDA NRCS
United States Department of Agriculture
Natural Resources Conservation Service

New Hampshire Drinking Water Improvement Partnership

How to we use all this information?

Appendix A: Mammals

American Marten

Martes americana

Federal Listing	N/A
State Listing	T
Global Rank	G5
State Rank	S2
Regional Status	High

Photo by Ravenel Bennett

Justification (Reason for Concern in NH)

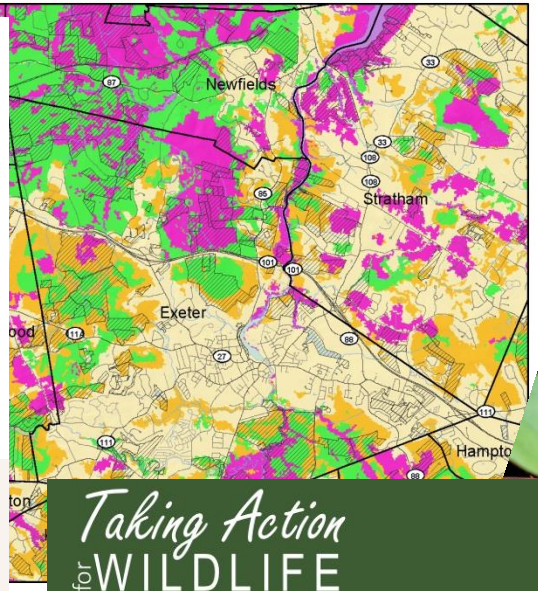
In New Hampshire, marten were once common and economically important. By 1935, habitat loss and trapping had resulted in a drastic population decline. Marten remained scarce despite 2 reintroduction attempts (Kelly et al. 2009) and were one of the first species classified as threatened on the states list of threatened and endangered species. Since the early 1980s, evidence of marten has been observed in towns throughout north
marten distribution, it app
However, marten demogr
Hampshire, marten are of
large range and sensitivity

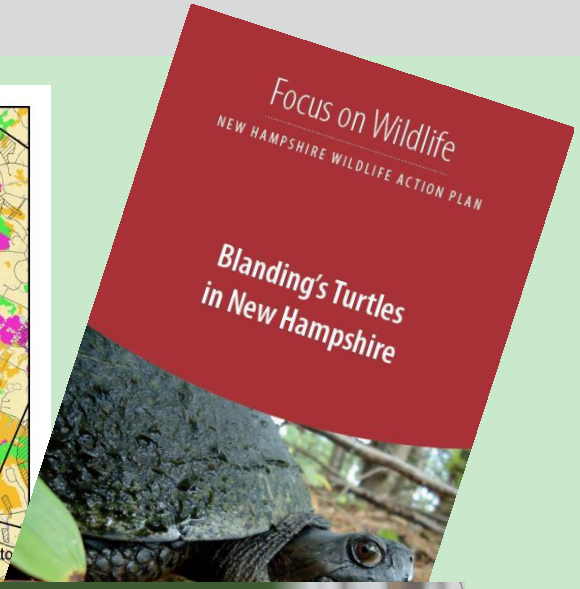
Distribution

Marten were once found
documented as far south
populations are found in t
Mountain National Forest
from development (e.g., r
coniferous/deciduous cov
southern edge of their cur
marten could expand into
unknown (Kelly 2005).

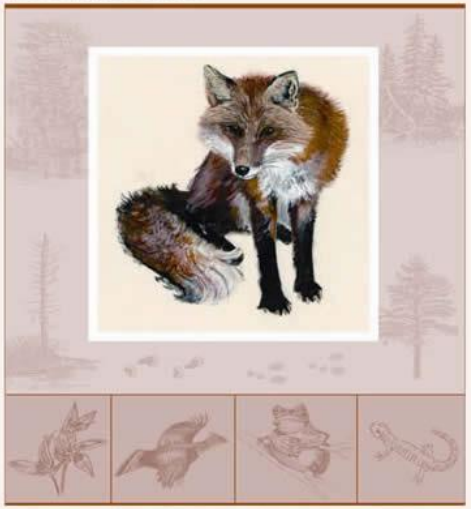
Habitat

In the Northeast, America
coniferous, and deciduous





A LANDOWNER'S GUIDE
TO INVENTORYING AND MONITORING WILDLIFE
IN NEW HAMPSHIRE

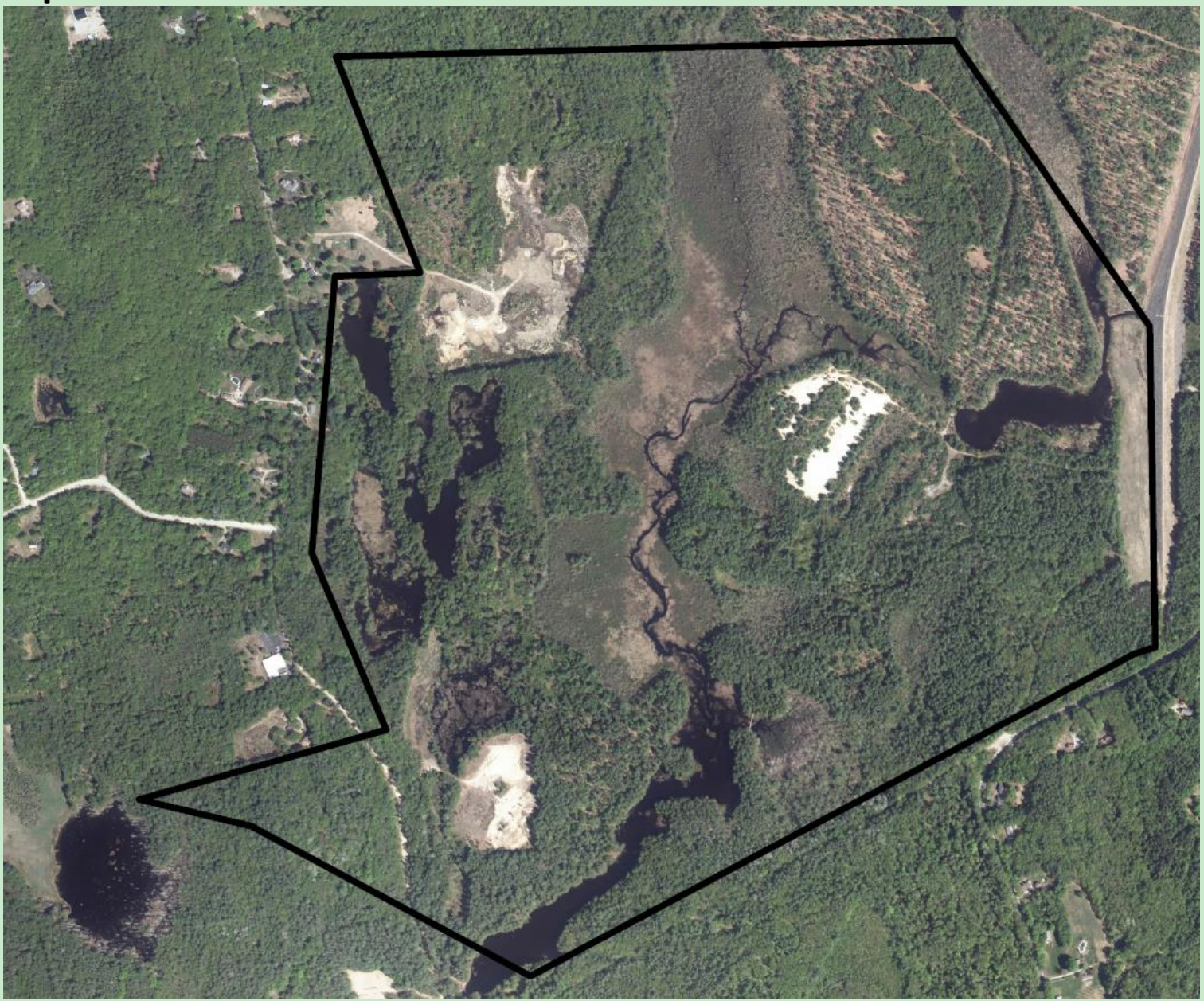


Malin Ely Clyde with Darrel Covell and Matt Tarr • UNH Cooperative Extension

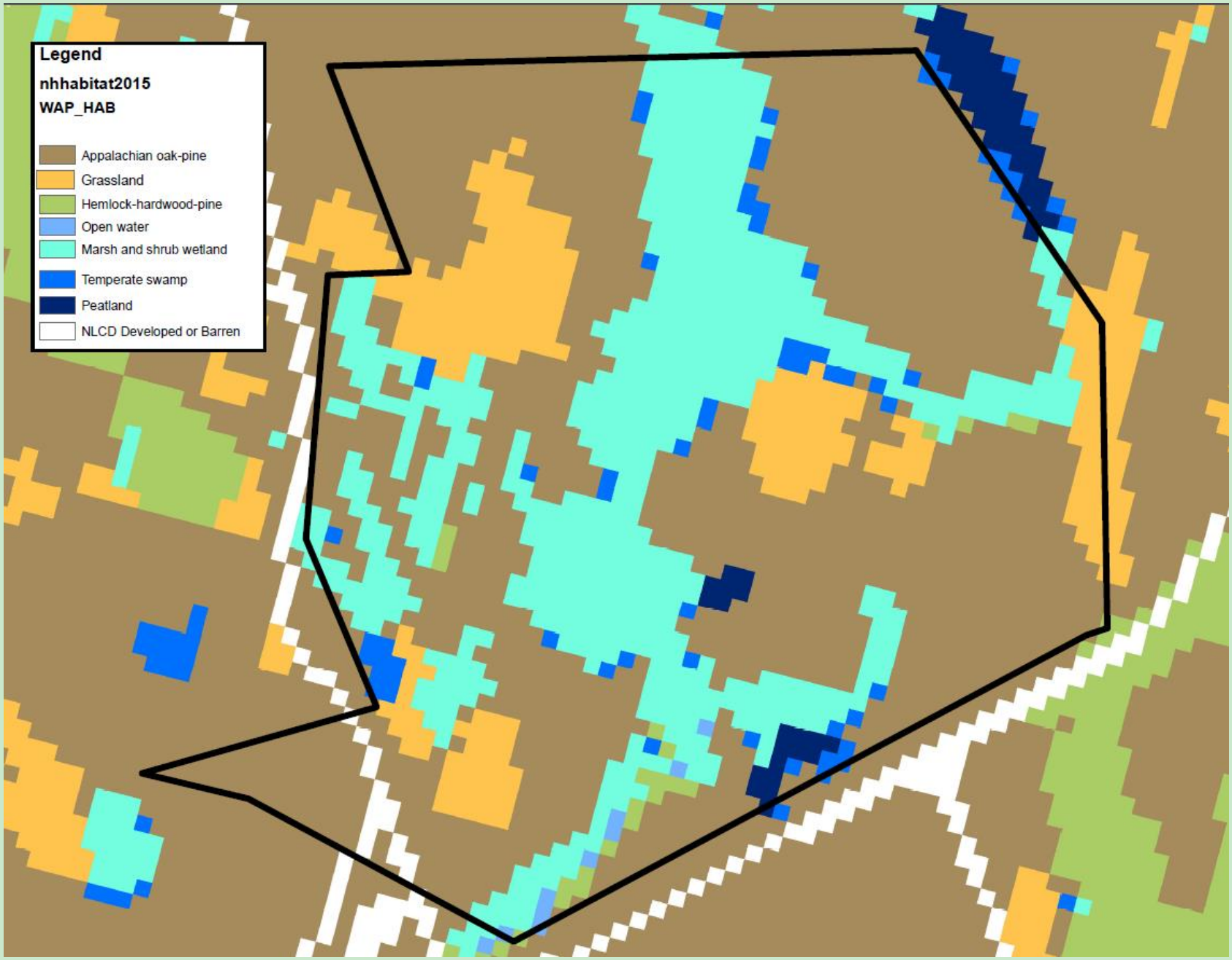
Example: Southern NH

Objective: Land Trust wishes to conserve 500 acres in Turtleville, NH and manage property in perpetuity through an approved stewardship plan.

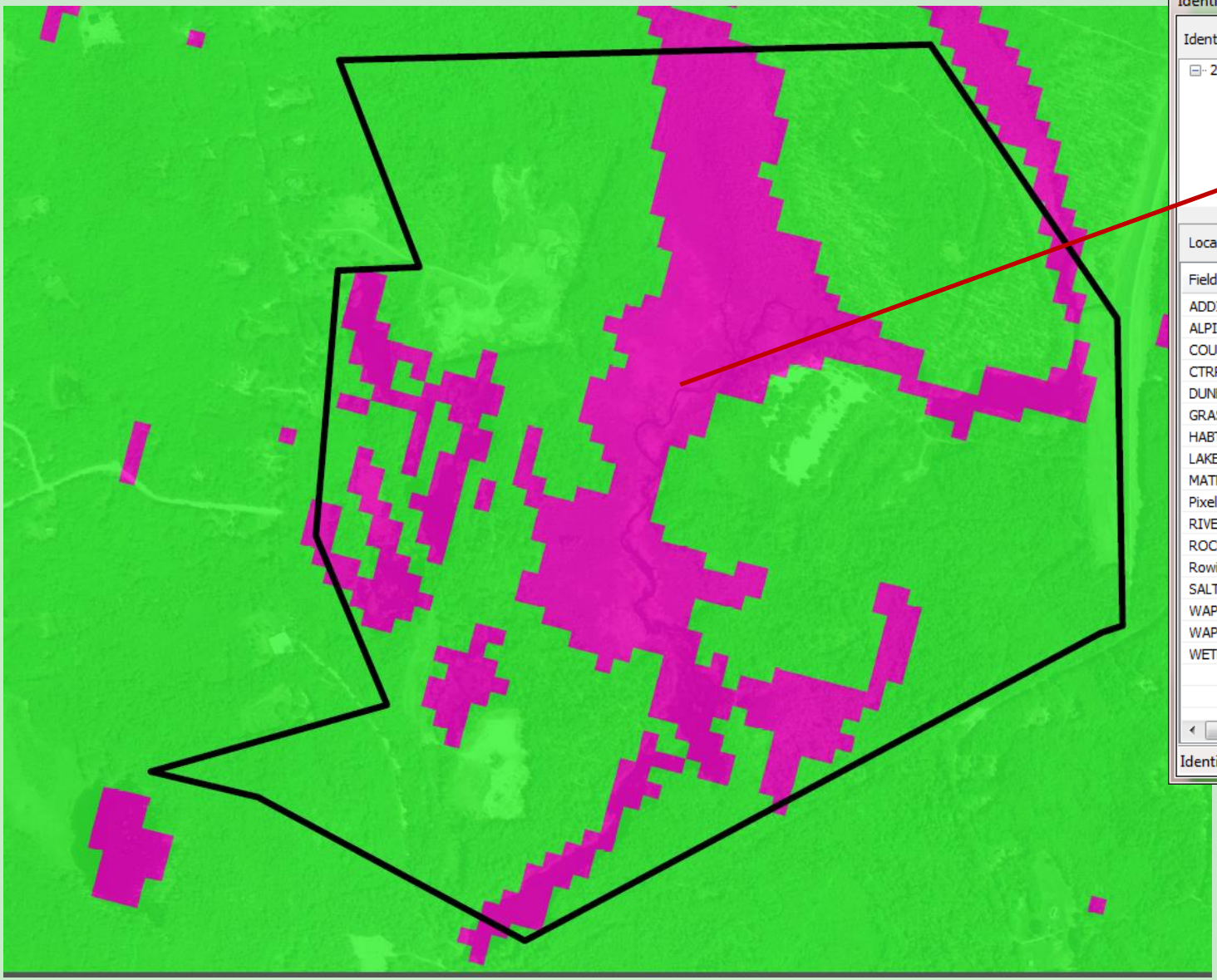
Example: Southeastern NH - Turtleville

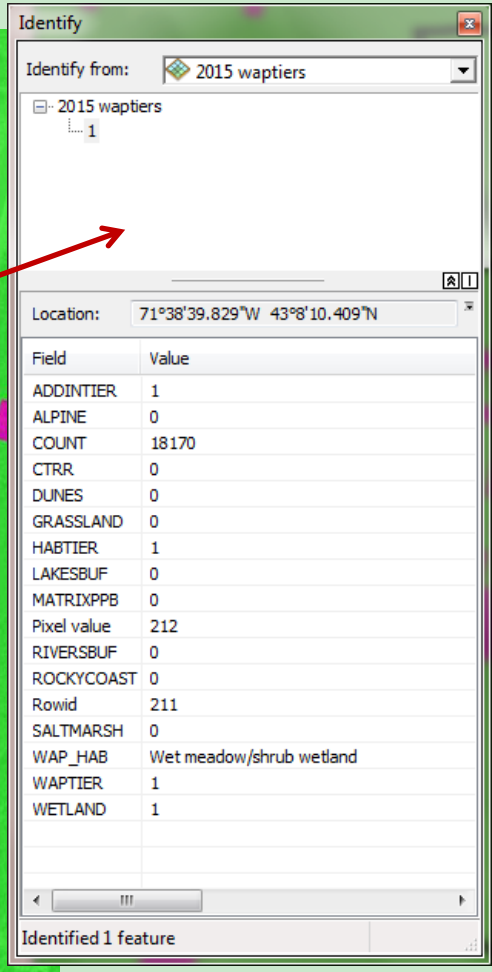


Turtleville - WAP Habitats



Turtleville – NH WAP TIERS



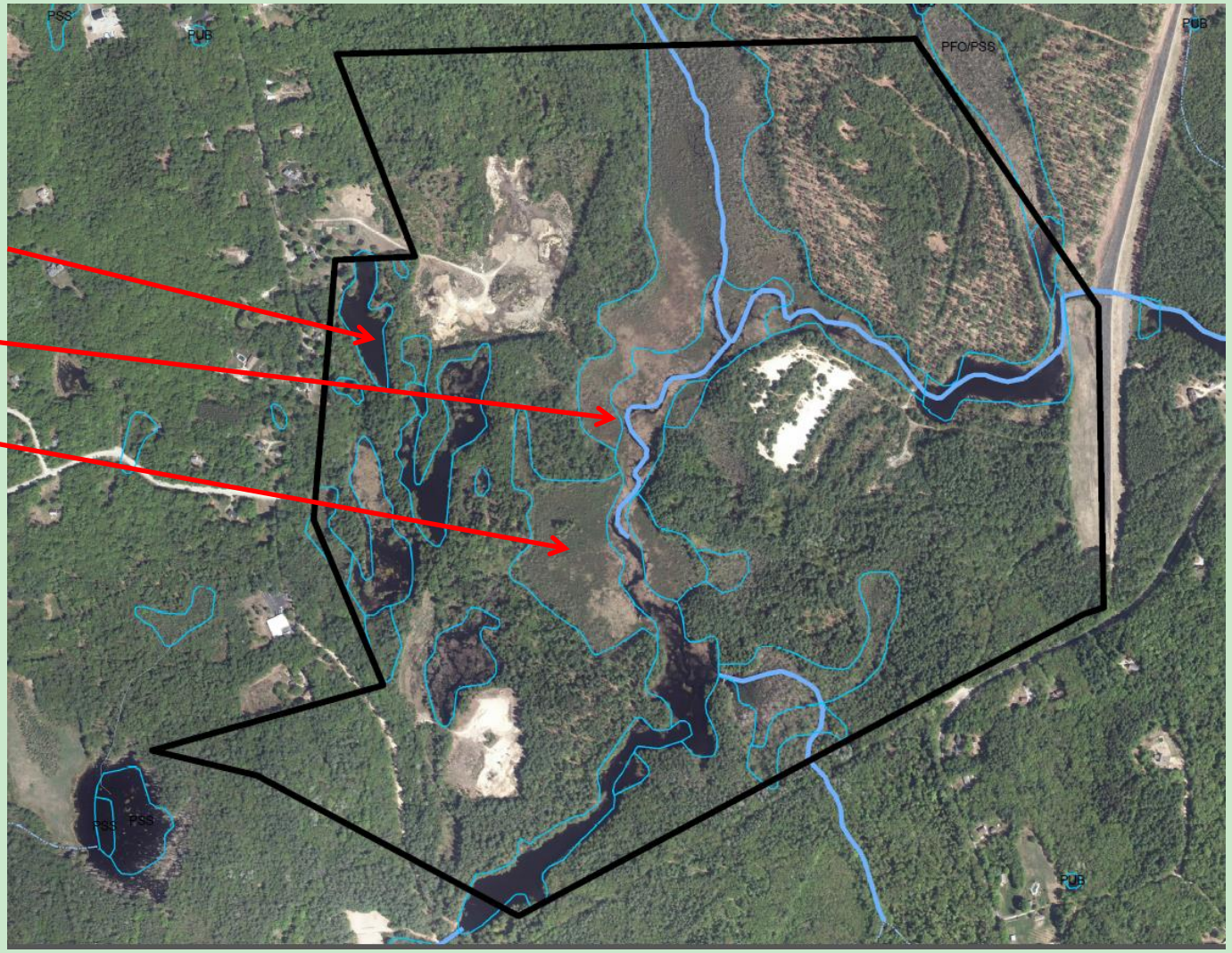


Increased Rank Points – ARM $$$

Turtleville - Wetlands

Diversity of vegetative structure and surface water

Vernal Pools?



Turtleville - Sand Pit

NHB Datachecks

Memo

NH Natural Heritage Bureau
NHB Datacheck Results Letter

To:

From: Amy Lamb, NH Natural Heritage Bureau
Date: 11/12/2015 (valid for one year from this date)
Re: Review by NH Natural Heritage Bureau
NHB File ID:

NHB records on the property(s):

No Species Documented on Property but several species within one mile.

NHB records within one mile of the property(s):

Vertebrate species	State[1]	Federal
Blanding's Turtle (*Emydoidea blandingii*)	E	--
Northern Black Racer (*Coluber constrictor constrictor*)	T	--
Spotted Turtle (*Clemmys guttata*)	T	--

[1]Codes: "E" = Endangered, "T" = Threatened, "SC" = Special Concern, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet

Department of Resources and Economic Development
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

DRED/NHB
172 Pembroke Rd.
Concord, NH 03301

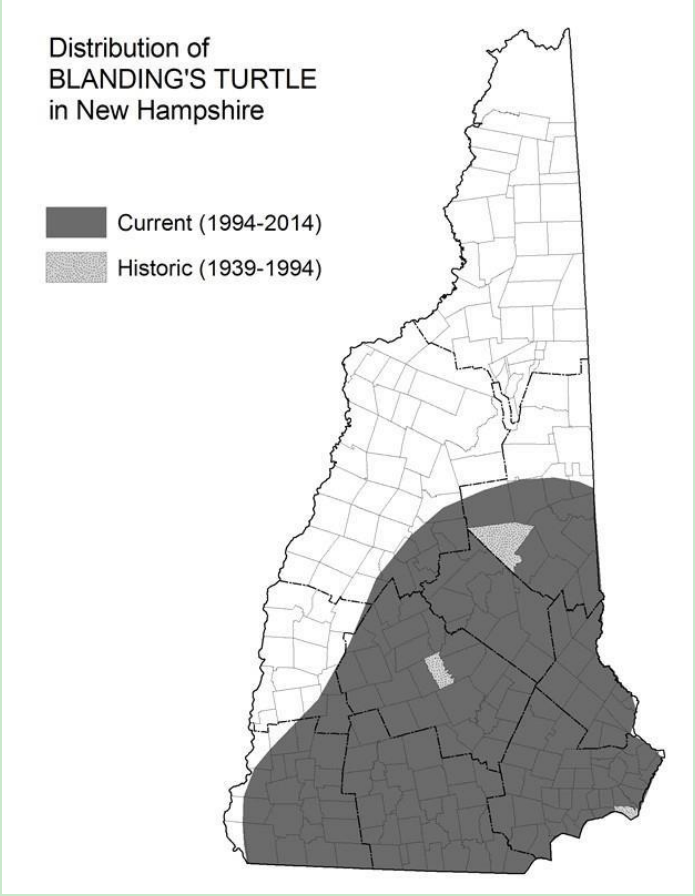
NH Natural Heritage Bureau

NH Natural Heritage Bureau

Town Flag	Species or Community Name	Listed? Federal	Listed? State	# reported last 20 yrs Town	# reported last 20 yrs State
Turtleville					
	Natural Communities - Terrestrial				
**	Appalachian oak - pine rocky ridge	--	--	2	14
**	Mesic Appalachian oak - hickory forest	--	--	1	6
**	Red oak - black birch wooded talus	--	--	1	5
**	Red oak - ironwood - Pennsylvania sedge woodland	--	--	2	12
**	Semi-rich oak - sugar maple forest	--	--	1	9
**	Temperate ridge - cliff - talus system	--	--	1	7
	Natural Communities - Palustrine				
**	Black gum - red maple basin swamp	--	--	1	32
**	Circumneutral hardwood forest seep	--	--	1	5
**	Medium level fen system	--	--	2	62
	Plants				
**	American ginseng (*Panax quinquefolius*)	--	T	1	77
**	Small Whorled Pogonia (*Isotria medeoloides*)	T	T	1	51
	Vertebrates - Mammals				
***	Small Footed Bat (*Myotis leibii*)	--	E	1	5
	Vertebrates - Reptiles				
***	Blanding's Turtle (*Emydoidea blandingii*)	--	E	24	709
**	Eastern Hognose Snake (*Heterodon platirhinos*)	--	E	2	41
**	Northern Black Racer (*Coluber constrictor constrictor*)	--	T	2	54
**	Spotted Turtle (*Clemmys guttata*)	--	T	1	119
**	Wood Turtle (*Glyptemys insculpta*)	--	SC	6	193
	Vertebrates - Fish				
**	American Eel (*Anguilla rostrata*)	--	SC	1	177
**	Redfin Pickerel (*Esox americanus americanus*)	--	SC	1	32
	Invertebrates - Dragonflies & Damselflies				
**	Martha's Pennant (*Celithemis martha*)	--	--	1	22
	Invertebrates - Mollusks				
**	Brook Floater (*Alasmidonta varicosa*)	--	E	1	32

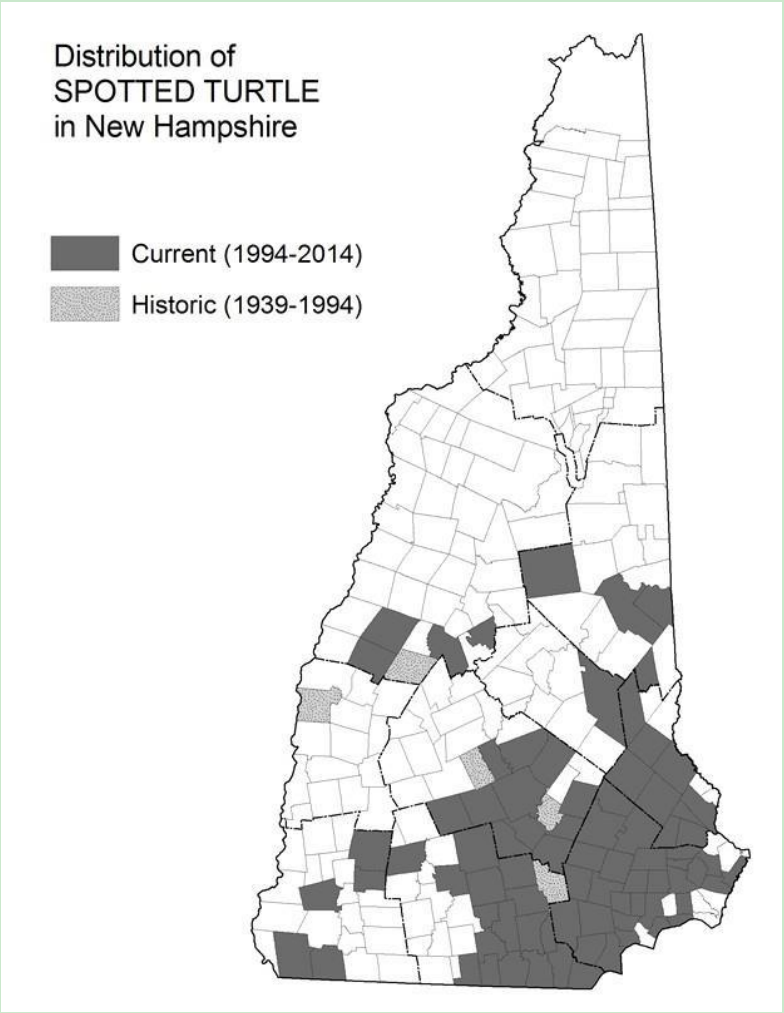
Species Profiles

Blanding's Turtle



Species Profiles

Spotted Turtle



Blanding's turtle: Habitat

Habitat (Detailed description of habitat use)

- Blanding's turtles require large intact landscapes consisting of a diversity of wetland types and sizes, sandy open areas for nesting, and limited human disturbance (such as roads and associated threats) (Joyal 1996, Jenkins and Babbitt 2003). Preferred aquatic habitats include marshes, vegetated ponds, forested and shrub swamps, fens, oxbows, and vernal pools (Ernst et al. 1994, Fowle 2001)….
- Habitat use may shift seasonally and vary geographically. Vernal pools are used extensively in spring and summer (Joyal 1996)…
- Female turtles lay eggs in upland habitats, usually between late May and early July. Suitable nest sites include an open canopy with sand, loam, or gravelly substrate (Graham 1999)…

NH Wildlife Action Plan Habitats (Appendix B)

- Marsh and Shrub Wetlands
- Vernal Pools
- Floodplain Habitats
- Peatlands
- Temperate Swamps

Blanding's Turtle

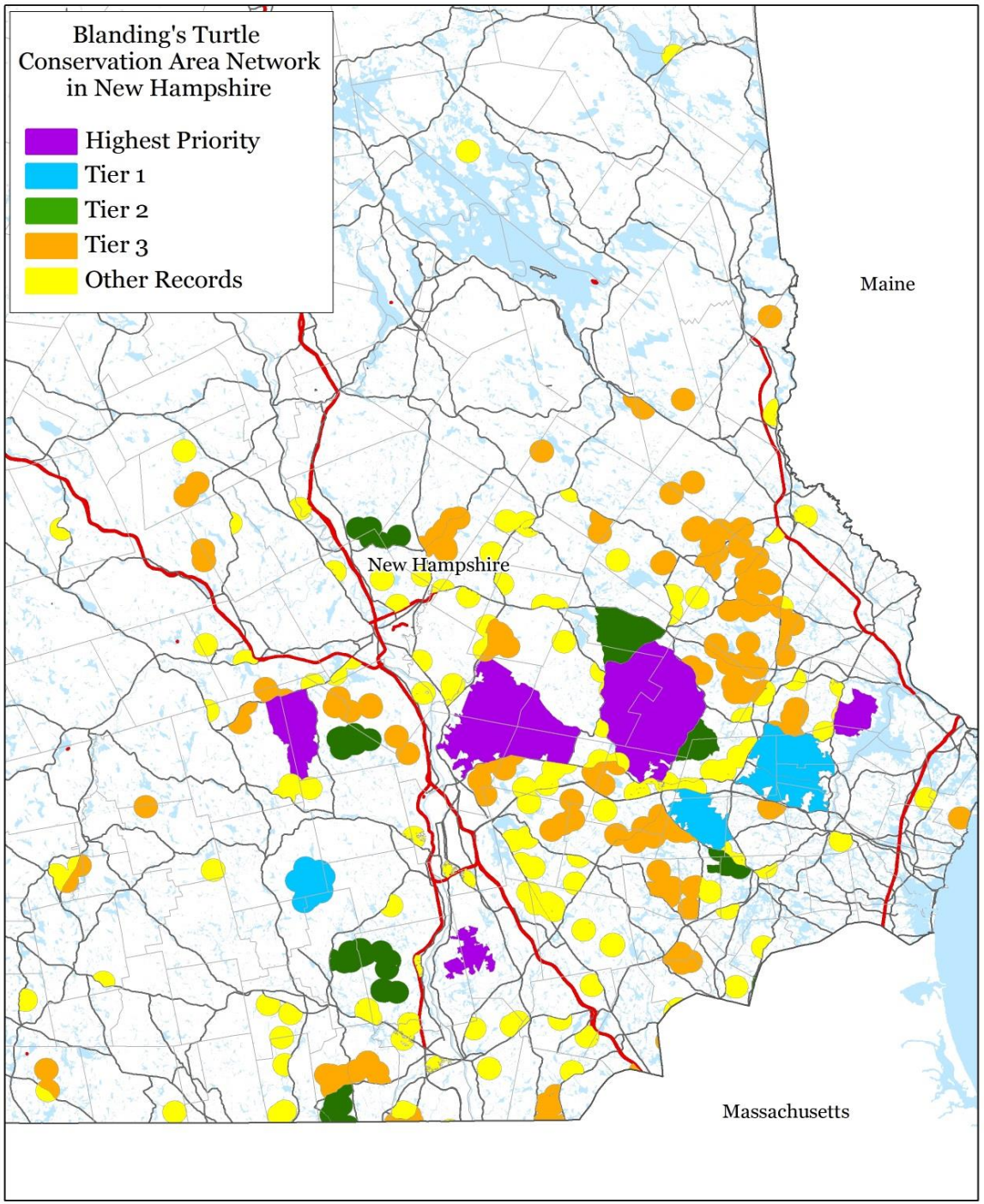
WAP Habitat: Marsh and Shrub Wetlands

WAP Habitat: Vernal Pools (Appendix B)

- 10 potential vernal pools identified during March.
- 6 vernal pools documented (April) on Property with evidence of vernal pool obligates ($$$)
- 1 Blanding's turtle observed during surveys ($$$)

Visual Surveys - Spring

Documentation of State E, T, SC wildlife gives extra points in Aquatic Resource Mitigation Fund (ARM) evaluation and helps direct land management strategy



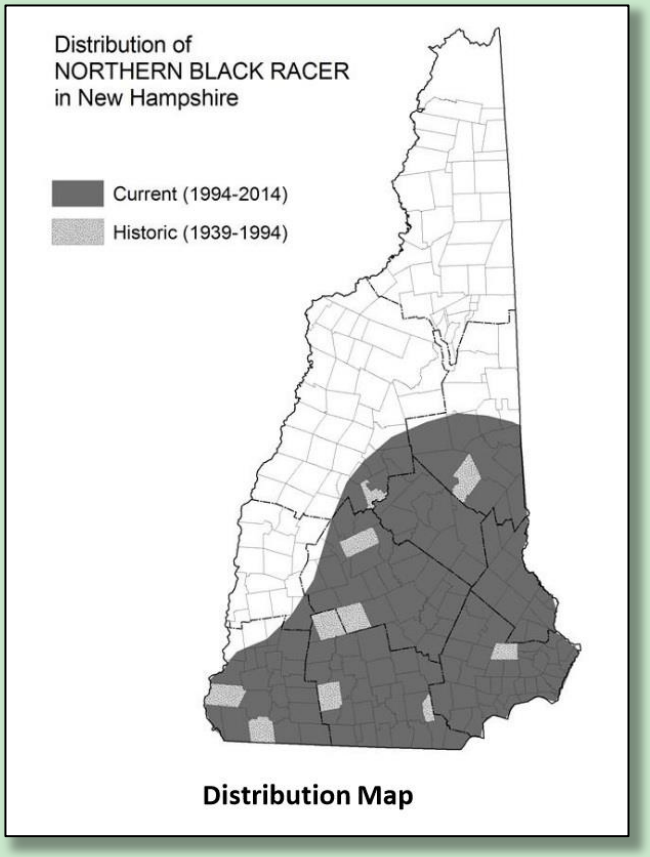
Contact NHFG

Biologist determines that property in Turtleville is in a **Highest Priority Blanding's turtle Focal Area**

Blandingsturtle.org

Species Profiles

Black Racer



Distribution Map

Black Racer : Habitat

Habitat (Detailed description of habitat use)

- The Northern black racer (*Coluber constrictor constrictor*) is…associated with a wide variety of early successional habitats, including brushy areas; utility right-of-ways; grasslands; old fields; sand pits; rocky ridges and ledges; and the edges of agricultural fields (Hunter et al. 1999, Kjoss and Litvaitis 2000, Ernst and Ernst 2003, NHFG Data). As racers move between habitat patches they may use forested habitats, particularly those that have been altered from timber harvests (NHFG Data). ..
- **NH Wildlife Action Plan Habitats (Appendix B)**

- Shrublands (Limited, some thinning)
- Grasslands (several disturbed areas)
- Appalachian Oak Pine Forest (Yes)
- Developed Habitats (at edges; rip rap slopes)
- Hemlock Hardwood Pine Forest (Yes)
- Rocky Ridge (No)
- Cliff and Talus (No)

Chapter 2: NH's Wildlife Habitats

Sand pits!? You Must be Joking!

Sand & Gravel excavation areas

- Common nighthawk and killdeer nesting
- Bank swallows nesting in steep sand banks
- Blanding's, spotted, and wood turtles nesting in areas of bare soil without large trees
- Black racers, hognose snakes, and smooth green snakes utilizing the diverse vegetative structure and laying eggs in bare sandy areas
- Tiger beetles using exposed sandy areas provided by excavation areas.
- New England cottontail using dense regenerating shrubland habitat.
- Nesting and migration habitat for shrubland and grassland birds

Racer Presence – Not confirmed

- Surveys not conducted
- Habitat seems suitable so species is determined to be ‘potentially’ occurring on property.
- NHFG biologists indicate species is present in Turtleville, could potentially occur on Property, and some types of habitat management could benefit the species in future.

$ (Not as good as documented but still good)

Success!!! Land is Conserved

Funders recognize the important of land for:

- Water and water quality protection.
- State Endangered and Threatened Wildlife Protection.
- WAP Tier 1 and 2 habitats.
- Diversity of wetlands and interconnected uplands.
- Threat from development
- Passive recreation opportunities

Now What?

Property Management/ Stewardship/ Restoration

Species Profiles

Blanding's Turtle

Threats

- Habitat impacts from development of surrounding uplands (Threat Rank: High)
- Mortality of individuals from vehicles on roadways (Threat Rank: High)
- Habitat conversion from the direct filling of wetlands for development (Threat Rank: Medium)
- Mortality from casual collection of individuals from the wild or moving animals to a different location (Threat Rank: Medium)
- Mortality from the commercial collection of individuals from the wild (Threat Rank: Medium)
- Habitat conversion and mortality from the removal of beaver and human-made dams (Threat Rank: Medium)

Species Profiles

Blanding's Turtle

Actions

- Minimize road mortality to Blanding's turtles
- Outreach to landowners
- Encourage alternatives to dewatering wetlands potentially occupied by Blanding's turtles.
- Identify priority habitat at Blanding's turtle sites.
- Conserve priority Blanding's turtle parcels
- Monitor Blanding's turtle populations
- Minimize disturbance to Blanding's turtles from recreational activities.
- Implement and promote the use of forestry guidelines in areas where Blanding's turtles occur
- Maintain & enhance nesting habitat

Species Profiles Blanding's Turtle

Actions

Maintain & enhance nesting habitat
Primary Threat Addressed: Mortality from subsidized or introduced predators
Specific Threat (IUCN Threat Levels): Invasive & other problematic species, genes & diseases
Objective:
Create, enhance, and maintain multiple nesting areas at each priority Blanding's turtle site.
General Strategy:
A complete overview of nest enhancement guidelines can be found in 'Guidelines for Nest Site Management and Creation within High Priority Blanding's Turtle Sites in the Northeastern United States' available at blandingsturtle.org. Existing nesting areas should be identified, protected, and enhanced as necessary. Large disturbed areas, including active and abandoned excavation areas, are New Hampshire Wildlife Action Plan often important nesting areas for turtles when they occur in proximity to suitable wetlands. Loaming and planting excavated areas often reduces their suitability for nesting turtles and many other wildlife species (e.g., black racers, eastern hognose snake, New England cottontail, bank swallow, kingfisher, shrubland and grassland birds).

Political Location: Watershed Location:
Belknap County, Carroll County, Cheshire County, Grafton County, Hillsborough County, Merrimack County, Rockingham County, Strafford County

Best Management Practices

Purpose: Provide guidance to reduce adult mortality and enhance suitability of habitat.

- Recreation
- Forestry
- Turtle nest habitat creation

Blanding's turtle 'seasons' **may vary depending on weather**	
Active season	1 March to 15 September
Nesting season	25 May to 4 July
Staging, Nesting, & Incubation	15 May to 15 September

blandingsturtle.org

Nest Site Guidelines

Guidelines for enhancing and creating nesting habitat for Blanding's turtles in the Northeastern United States in the context of regional conservation

Northeast Blanding's Turtle Working Group (October 1, 2013)

Summary.—This document provides an overview of nesting habitat enhancement and creation for Blanding's turtles in the northeastern United States, based on literature and unpublished data. Suitable nesting areas are essential components of a landscape-based approach to the regional conservation of Blanding's turtle. Because of the expense and monitoring requirements of nesting habitat programs, they should be primarily implemented at regional priority sites. Because of the lack of replicated experimental studies and overall uncertainty, existing nesting areas should be preserved and enhanced unless they are perceived by managers to be an ecological trap. Available case studies, including an analysis of 19 nesting areas in Massachusetts and New Hampshire, indicate that the ideal configuration of nesting habitat would encompass multiple nesting areas near clusters of suitable wetlands in the interior of a site.

Context.—Most species of freshwater turtle in New England, New York, and Pennsylvania are of conservation concern and are likely to decline in number and overall extent as a result of habitat fragmentation and degradation (NEPARC 2010). For the successful conservation of representative populations northeastern freshwater turtles, it is often necessary or ideal to create, maintain, or expand nesting habitat. Blanding's turtle (*Emydoidea blandingii*) is restricted to small, isolated populations in eastern New England, New York, and Pennsylvania, where populations are often found in conjunction suitable nesting areas. Many authors have reviewed the nesting requirements of Blanding's turtle (Kiviat et al. 2000; Compton 2007; Dowling et al. 2010) or provided new data on nest area characteristics (Kiviat et al. 2000; Beaudry et al. 2010; Jones and Sievert 2012). Several authors have drafted recommended guidelines for the creation and management of nesting habitat (Kiviat et al. 2000; Mass. NHESP 2010), or have undertaken experiments on Blanding's turtle, related species, or surrogates (Marchand and Litvaitis 2004; Dowling et al. 2010; Buhlmann and Osborn 2011; Mass. NHESP unpublished data). Survey protocols to detect nesting activity have also been developed (Ross 2009). Despite considerable attention in recent years, many questions about the usefulness and effectiveness of nesting habitat management remain. In this document, we present a summary of the current knowledge of nest site creation and management as it pertains to Blanding's turtle, and make recommendations for implementation.

Broad-scale Characteristics of Confirmed Nesting Areas in the Northeast.—Although nest-site selection at a broad scale has not been systematically surveyed, Blanding's turtles females are known to nest both in **concentrated aggregations** and in **dispersed, remote sites** where only one turtle may nest at a site in a given year (Beaudry et al. 2010; B.W. Compton et al., unpublished data). Replicating the phenomena observed at concentrated nesting areas is probably preferable to the dispersed model, which puts females at greater risk of road mortality. Further, Blanding's turtles are known to nest in a very wide variety of anthropogenic and natural nesting sites. **Anthropogenic habitats** commonly used for nesting include borrow pits, dredge piles, vineyards, residential yards and gardens, areas recently cleared for development, selection cuts or clear cuts, playing fields, abandoned gravel pits, road shoulders and causeways, ATV trails, powerlines, military training areas, wasteland areas, and berms or clearings constructed for Blanding's turtle (Dowling et al. 2010; Beaudry et al. 2010; Grgurovic, pers. comm.; NE Blanding's Turtle Working Group, unpublished data). In the northeastern United States, **natural nesting areas appear to be relatively rare**, and consist mostly of rocky outcrops in Maine (Beaudry et al. 2010) and possibly disturbed dune areas in the St. Lawrence Valley. In Nova Scotia, Blanding's turtles are known to nest on cobble lakeshores (Standing et al. 1999), and so they may sometimes nest on beaches in New England and New York. Of 19 confirmed communal nesting areas (≥2 Blanding's turtle nests per year) in Massachusetts and New Hampshire, many are situated in abandoned gravel pits and residential landscapes (Grgurovic 2006; Jones and Sievert 2012). The contiguous open area of these features ranged from 0.01 to 4.4 ha and the median size was 0.74 ha.

Table 1. Key aspects of Blanding's turtle nesting habitat in the Northeast

Parameter	Description
Total area	0.01 to 4.4 ha; median = 0.74 ha; some larger mosaics
Aspect	A range of primarily southerly aspects are ideal
Topography	Gently rolling, stable terrain with berms and mounds
Vegetation	Cespitose grasses and sedges with bryophytes and lichens
Soil	Well-drained, well-graded sand, gravel, or sandy loam
Other	Near known occupied wetlands, containing staging wetlands, away from roads; site-tailored monitoring plan

Figure 1. The largest known communal nesting area in New England (Worcester Co., MA) has a gently rolling topography, relatively dense cover of cespitose grasses and sedges, with exposed sand blowouts and tire ruts.

Figure 2. This nesting area in Jefferson Co., NY consists of poorly graded sand interspersed with islands of graminoids and birches.

Figure 3. A major nesting area in St. Lawrence Co., NY is dominated by rolling topography, sand substrate, and graminoids, mosses, and shrubs.

Figure 4. Blanding's turtles nest in this parklike clearing created for karner blue butterflies in Saratoga Co., NY. The site is a gently rolling hillside interspersed with mature oaks. The vegetation cover is primarily little bluestem.

Fine-scale Characteristics of Confirmed Nesting Areas in the Northeast.—Although some nest-site creation guidelines call for broad, level areas (MA NHESP 2010), most known communal nesting areas have pronounced topography in the form of gravel pit walls, mounds, berms, and ditches in addition to broad, level areas. The largest known nesting area in New England (MA-WO-OX), as well as most other communal nesting areas, has a gently rolling topography (Figs. 1–4). The substrate is usually a mix of well-

Species Profiles

Black Racer

Threats

- Habitat conversion due to development of upland habitat
- Habitat conversion and mortality from mining (sand & gravel)
- Mortality of individuals from vehicles on roadways
- Mortality of individuals from vehicles on utility rights of way
- Mortality from human persecution
- Mortality from the destruction of dens and crevices during various human activities (landscaping, vehicle compaction, forestry)
- Habitat degradation and conversion due to the succession from grass and shrubs to forested areas
- Mortality from welded plastic erosion control blankets

Species Profiles

Black Racer

Actions *(15 actions identified)*

- Document communal den sites
- Discourage landowners from reclaiming abandoned sand and gravel pits
- Add language and actions into existing and new management plans that benefit or reduce impacts to racers
- Protect critical racer habitat at priority populations
- Promote wildlife friendly erosion control matting to reduce mortality of snakes.

Stewardship Issue: Landowner and users of property desire access/parking improvements to property and associated trails to get people onto property. Easement language allows for such improvements.

Parking lot Considerations

Recommend no curbing or gentle sloped curbing such as Cape Cod curbing and minimize use of detention basins.

Erosion Control Netting

Natural materials preferred over welded plastic

Recreation/Trails

- Avoid sensitive habitats such as vernal pools and nesting areas.
- Avoid circling wetlands
- Leave some areas without trails.
- Prohibit motorized vehicles

Pets

Consider requiring dogs on leash during active season

Stewardship Issue: Land trust is developing a stewardship plan to direct future management targets. Forestry and sand pit restoration is considered.

Forestry Planning

- A licensed forester was consulted, along with NHFG biologists.
- Landowner decided to pursue a limited forestry operation to generate young forest habitat and generate revenue.
- Due to sensitivity of wildlife habitats, all active forestry was conducted under frozen conditions.
- Potential black racer den sites were identified and avoided.

Blanding's turtle 'seasons' **may vary depending on weather**	
Active season	1 March to 15 September
Nesting season	25 May to 4 July
Staging, Nesting, & Incubation	15 May to 15 September

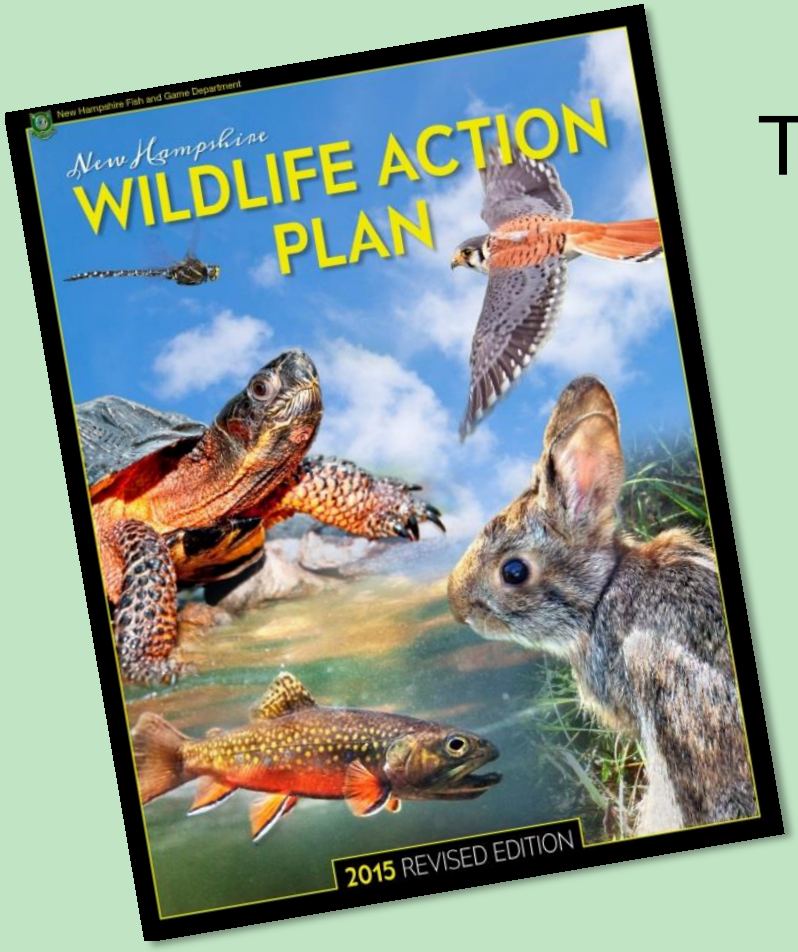
blandingsturtle.org

Sand Pit Restoration: Action Decisions

- **Maintain high wildlife habitat qualities present.**
- **Enforce prohibition of motorized vehicles.**
- **Gate/block vehicle access points.**
- **Periodically remove encroaching pines.**
- **Rerouted trail around sand pit area.**

Questions?

www.wildlife.state.nh.us/wildlife/wap.htm



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