

# Ecological Inventory of the Ninevah Foundation Lands Mount Holly and Plymouth, Vermont

## Summary of Final Report for the Ninevah Foundation, April 2018

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This report summarizes the results of an ecological inventory of roughly 3,400 acres of property owned by the Ninevah Foundation in the towns of Mount Holly and Plymouth (referred to here as the NF Lands).

I worked closely with cartographer Andrew Toepfer, who created four maps: (1) Wetlands; (2) Natural Features; (3) Cultural Features; and (4) Rare, Threatened, Endangered and State-Significant Upland Natural Communities.\*

The NF Lands, tucked up in the elevated basins found at the south end of the Coolidge Range in the Green Mountains, present a surprisingly diverse landscape of natural communities. Not only was there an unusual rich northern hardwood forest perched high in the mountains, but also wetlands, including numerous vernal pools and seeps, appeared almost everywhere I went on the elevated flats north and south of Lake Ninevah. And Lake Ninevah – the crown jewel – and its large peatland occupying a bay at its south end, are among Vermont’s ecological treasures, both for their biodiversity, including many rare plants, and their sheer beauty.

Highlights of my report are presented in the following five sections:

### Uplands

NF Lands support several state-significant examples of uncommon upland forests on the tops and upper slopes of both Salt Ash and Bear Mountains. These mountains have good examples of montane<sup>†</sup> yellow birch-red spruce forest, the latter intermingled with montane spruce-fir forest. Their location makes them part of the state-significant forests in the adjacent Coolidge State Forest.

A **high-elevation example of rich northern hardwood forest** in three areas totaling 67 acres on Salt Ash Mountain. These woods are distinctive for their fertile soil that produces a wealth of spring wildflowers and nutrient-demanding plants, and for their near pristine condition.

A **1.5 acre “montane tall herb glade”** within the northern hardwood forest on Salt Ash Mountain. This is an exceptionally large example of luxuriant, diverse tall herb growth in breaks

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\* Natural community: An interacting assemblage of organisms, their physical environment and the natural processes that affect them

State-significant: Natural community occurrences that are exemplary and of conservation importance at the state level

<sup>†</sup> Montane: In mountainous country

in the forest canopy that straddles the property boundary with Coolidge State Forest. It is an unusual natural community type that has only recently been found elsewhere in Vermont on the Coolidge Range.

Because of its size (over 1,800 acres), condition, and the fact that it is part of an enormous northern hardwood forest on the Coolidge Range, **the northern hardwood forest on NF Lands qualifies as state-significant.**

Also notable is a **four-acre beech forest that provides important bear hard mast**, described in the Wildlife and Natural Features section.

### **Wetlands**

We mapped **a total of 300 wetlands, many state-significant, covering 220 acres – 12 times the number of wetlands previously recorded** on NF Lands. Most of the wetlands are small – one acre or less – but add greatly to ecological diversity, providing important wildlife habitat for moose, deer, bear, breeding salamanders and frogs, and a plethora of invertebrates that are critical members of forest ecosystems. Small wetlands are also extremely important for plant diversity.

The single largest wetland natural community on NF Lands is the 34-acre fen that occupies the large cove at the south end of Lake Ninevah.

We also documented a total of **52 vernal pools** – natural pools present in the spring. Over half of these vernal pools are state-significant because they provide critical breeding habitat for animals such as mole salamanders, wood frogs, and a few invertebrates. Previously only four vernal pools had been confirmed on NF Lands. The high concentrations of vernal pools found on the low flat ridge south of the lake and on the small plateau north of the lake are unprecedented in Vermont to my knowledge.

### **Wildlife and Natural Features**

The inventory located and mapped wildlife information such as game trail, potential bear den site, beaver dam, and coyote activity spot; forest features such as legacy trees, older and primary forest, plantation, hemlock grove, soft mast trees, and small upland forest natural communities; plant features other than rare and uncommon species, such as invasive and locally uncommon species; water features such as springs, cascades, and waterfalls; and geologic features such block, bluff, boulder, bedrock outcrop, cutbank, ravine, slope failure, and plunge pool.

Due to time constraints, this part of our inventory represents only a sampling of the wildlife and natural features on NF Lands, so the Natural Features map should be considered a preliminary map on which to expand.

**Bears** warrant special mention. Bear sign was found throughout the NF Lands with a concentration on Salt Ash Mountain and the wetlands at the base of the mountain along upper Patch Brook. The four-acre beech forest on the southeast-facing slope of Salt Ash Mountain's

south shoulder is of critical importance for bear, other mammals and birds. Beechnuts – the hard mast produced by beech trees – are a vitally important source of fat-rich food for bears to help them make it through Vermont’s long winters.

We encountered over 20 bear-marked beech (claw marks on bark from climbing trees), including many freshly clawed trees and several piles of fresh bear scat at this site. It is also important that the NF Lands are a key part of the Green Mountain Bear Corridor – a critical link in bear movement between the great forest blocks of Green Mountain National Forest to the north and south of Lake Ninevah.

**Legacy trees**, including the largest and sometimes oldest trees, were mapped not only because of their intrinsic value as large trees of a variety of species, but also because of their value for wildlife. With age, legacy trees often form large cavities as they rot internally, creating potential homes for a variety of wildlife, from flying squirrels to porcupine. And when they fall to the ground, if large enough, they can be den sites for bear.

### **Rare, Threatened, Endangered and Uncommon Species**

We documented five new rare, threatened, endangered and uncommon species on NF Lands and on Lake Ninevah, bringing the total species now confirmed to 18. These species include two birds, the Common Loon and the rusty blackbird, the latter protected as Endangered and Threatened in Vermont. All except two of the species are associated with wetlands or the lake, which highlights the biodiversity importance of the NF Lands wetlands and Lake Ninevah.

(Please refer to the Rare, Threatened, Endangered and Uncommon Species map for the complete list and location of all 18 species).

### **Invasive Plants**

My report cites six invasive plant species now documented on NF Lands: common buckthorn, garlic mustard, giant hogweed, Japanese knotweed, wall-lettuce and wild chervil. Subsequent to the inventory, two more species were reported: wild (or poison) parsnip and goutweed.

The locations of these invasives are shown in the central and southern regions of the Natural Features map. It is heartening to know that no invasives have been found in the northern area of NF Lands. The southern area, which has the great majority of invasive plants, clearly shows that the invasives are spreading along town roads, especially Sawyer Hill Road and Lake Ninevah Road.

Note from the Ninevah Foundation:

Information about the invasive plants on NF Lands is available at

<http://www.ninevahfoundation.org/wp-content/uploads/2018/07/Ninevah-Foundation-Land-Invasive-Plants-2018-1.pdf>

In 2016, the Ninevah Foundation began implementing a strategic plan to control these invasive plants, in collaboration with area landowners.