



Partial Biotic Inventory and Management Implications for Van Vliet Hemlocks State Natural Area

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Primary Authors:

Heidi Putnam: Woodruff/Rhineland Service Station, Conservation Biology Intern, UWSP Resource Management; Natural Resource Planning major, Laura Jaskiewicz and Carly Lapin: WDNR Bureau of NHC.

Contributors: This paper would not have been possible without the efforts and expertise of many people. The following are those individuals whose work contributed to the study:

- **Shannon Callahan**, WDNR Florence Service Center, Conservation Biology Intern
- **Sara Fisher**, WDNR Rhineland Service Station, Conservation Biology Intern
- **Friends of Van Vliet Hemlocks**
- **Laura Jaskiewicz**, WDNR Rhineland Service Station, Research Scientist
- **Carly Lapin**, WDNR Rhineland Service Station, District Ecologist
- **North Lakeland Discovery Center Bird Club**
- **Tom Olson**, Friends of Van Vliet Hemlocks
- **WDNR NHC Staff**
- **Jim Woodford**, WDNR Rhineland Service Station, NHC Field Operations Section Chief

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Introduction

The Wisconsin Department of Natural Resources (WDNR) Bureau of Natural Heritage Conservation (NHC) and Heidi Putnam, an intern from the University of Wisconsin – Stevens Point completed a partial biotic inventory of mammal, bird, tree, and plant species found in the Van Vliet Hemlocks State Natural Area (VVH SNA) in 2017. Data from this effort was combined with historical data provided by the WDNR and the North Lakeland Discovery Center Bird Club (NLDCBC) to complete the partial inventory and provide suggestions for management on the property.

Background on Past Efforts

Previously, VVH SNA was assessed for the WDNR's Natural Heritage Inventory (NHI), and multiple Natural Community Site Evaluations completed from 2001 through 2014 with some observations recorded as early as 1974. Most of these evaluations were completed by Andy Clark, NHI botanist. Other evaluations were also completed within the SNA by Carmen Hardin and William Smith of the WDNR and Kurt Schmude of the Lake Superior Research Institute.

SNA Location and Description

VVH SNA is one of the largest (433 acres) old-growth hemlock hardwood forests left in Wisconsin. The SNA is located in the township of Presque Isle in Vilas County and is part of the Northern Highland American Legion State Forest. The SNA is located in the North Central Forest Ecological Landscape, and its topography is characterized by end and ground moraines with some pitted outwash and bedrock-controlled areas (Fig. 1; Prichard et al. 2013). In addition to the hemlock-hardwood forest of the SNA, other areas of interest include undisturbed black ash-cedar swamps in kettle depressions, several small, undeveloped bog lakes, large beds of emergent aquatic macrophytes, and frontage on Averill and Van Vliet lakes (Fig. 1; WDNR 2017b).



Figure 1. Topographic map of Van Vliet Hemlocks SNA (outlined in red) and the surrounding landscape.

Methods and Results

Throughout the months of June, July, and August of 2017, Putnam spent 30 hours in the field collecting inventory data. In addition, 50 hours were spent in the field by WDNR species and taxa experts to assist with data collection. Afterwards, 15 hours were used for reviewing existing reports from WDNR biotic inventory records and Discovery Center eBird reports for inclusion in the partial biotic inventory.

Mammal Track Survey

On March 2, 2017, a WDNR observer conducted a snow tracking survey on the outer loop of the eastern trails from 11am – 12:45pm. Snow conditions were considered to be average

to poor, and the day was overcast with light flurries. The average temperature was 20°F, and there was approximately 1” of fresh snow which had fallen before 6PM the previous day. The tracks that were observed had been left by mammals throughout the night and into the morning. For each set of tracks that was observed along the survey trail, the type of animal that left the tracks was determined to either taxa or species and recorded. Mammal species observed during the survey are listed in Table 1.

Table 1. Mammals documented at Van Vliet Hemlock SNA in March 2017.

Common Name	Scientific Name	State Status
Canid Species (possibly fox)	<i>Canidae sp. (Vulpes vulpes)</i>	-
Snowshoe Hare	<i>Lepus americanus</i>	-
White-tailed Deer	<i>Odocoileus virginianus</i>	-
Fisher	<i>Pekania pennanti</i>	-
Various Squirrel Species	<i>Sciuridae spp.</i>	-
Eastern Cottontail	<i>Sylvilagus floridanus</i>	-

Breeding Bird Survey

A breeding bird survey was conducted June 7, 2017 by the WDNR along both Western and Eastern trails. A second survey was completed by NLDCBC on July 13, 2017 along the Western Trails. Bird surveys were conducted in the early morning on foot in suitable weather conditions (no rain or high winds). Observers identified and recorded bird species that were seen and heard during the survey. Bird species observed during the survey are listed in Table 2.

During the June survey, one Wisconsin Species of Special Concern and Species of Greatest Conservation Need (SGCN), the Least Flycatcher, was documented (WDNR 2015; WDNR 2017c). A special concern designation signifies that a species has some problem of abundance or distribution suspected but not yet proven so that focus can be given before it becomes threatened or endangered (WDNR 2017c). SGCN have low and/or declining populations and are in need of conservation action, as identified in Wisconsin’s Wildlife Action Plan (WDNR 2015). Although the Least Flycatcher is a common breeder in Wisconsin, the North American Breeding Bird Survey data show significant declines for this species in Wisconsin and across its range from two separate trend analysis periods: 1966-2015 and 1995-2015 (Sauer et al. 2017). Evidence shows that forest fragmentation has been a major factor in the decline of the species (Kreitinger et al. 2013). VVH SNA benefits interior forest nesting bird species that are intolerant of fragmentation.

Table 2. Birds observed at Van Vliet Hemlocks SNA in Summer 2017.

Common Name	Scientific Name	State Status
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	-
Canada Goose	<i>Branta canadensis</i>	-
Broad-winged Hawk	<i>Buteo platypterus</i>	-
Hermit Thrush	<i>Catharus guttatus</i>	-
Brown Creeper	<i>Certhia americana</i>	-
Eastern Wood-Pewee	<i>Contopus virens</i>	-
American Crow	<i>Corvus brachyrhynchos</i>	-
Blue Jay	<i>Cyanocitta cristata</i>	-
Pileated Woodpecker	<i>Dryocopus pileatus</i>	-
Least Flycatcher	<i>Empidonax minimus</i>	Species of Special Concern; Species of Greatest Conservation Need
Common Loon	<i>Gavia immer</i>	-
Mourning Warbler	<i>Geothlypis philadelphia</i>	-
Hooded Merganser	<i>Lophodytes cucullatus</i>	-
Swamp Sparrow	<i>Melospiza georgiana</i>	-
Lincoln's Sparrow	<i>Melospiza lincolnii</i>	-
Song Sparrow	<i>Melospiza melodia</i>	-
Black-and-white Warbler	<i>Mniotilta varia</i>	-
Nashville Warbler	<i>Oreothlypis ruficapilla</i>	-
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	-
Scarlet Tanager	<i>Piranga olivacea</i>	-
Black-capped Chickadee	<i>Poecile atricapillus</i>	-
Ovenbird	<i>Seiurus aurocapilla</i>	-
Northern Parula	<i>Setophaga americana</i>	-
Yellow-rumped Warbler	<i>Setophaga coronata</i>	-
Blackburnian Warbler	<i>Setophaga fusca</i>	-
American Redstart	<i>Setophaga ruticilla</i>	-
Black-throated Green Warbler	<i>Setophaga virens</i>	-
Red-breasted Nuthatch	<i>Sitta canadensis</i>	-
White-breasted Nuthatch	<i>Sitta carolinensis</i>	-
European Starling	<i>Sturnus vulgaris</i>	-
Tree Swallow	<i>Tachycineta bicolor</i>	-
Winter Wren	<i>Troglodytes hiemalis</i>	-
American Robin	<i>Turdus migratorius</i>	-
Red-eyed Vireo	<i>Vireo olivaceus</i>	-
Blue-headed Vireo	<i>Vireo solitarius</i>	-

Plant Survey

On June 2 and July 7, 2017, trees and herbaceous plants were surveyed on foot along the VVH SNA trail network, identifying each plant species encountered. The trees and plants

that were observed are listed in Table 3. Primary canopy tree species include eastern hemlock (*Tsuga canadensis*), sugar maple (*Acer saccharum*), yellow birch (*Betula alleghaniensis*), and basswood (*Tilia americana*). One invasive species of note, hemp nettle (*Galeopsis tetrahit*), was documented throughout much of the property.

Table 3. Plants observed at Van Vliet Hemlocks SNA in Summer 2017.

Common Name	Scientific Name	State Status
Balsam Fir	<i>Abies balsamea</i>	-
Red Maple	<i>Acer rubrum</i>	-
Sugar Maple	<i>Acer saccharum</i>	-
Mountain Maple	<i>Acer spicatum</i>	-
White baneberry	<i>Actaea pachypoda</i>	-
Red Baneberry	<i>Actaea rubra</i>	-
Northern Maidenhair Fern	<i>Adiantum pedatum</i>	-
Serviceberry	<i>Amelanchier spp.</i>	-
Wild Sarsaparilla	<i>Aralia nudicaulis</i>	-
Common Burdock	<i>Arctium minus</i>	Introduced - Naturalized
Jack in the pulpit	<i>Arisaema triphyllum</i>	-
Common Ladyfern	<i>Athyrium felix-femina</i>	-
Yellow Birch	<i>Betula alleghaniensis</i>	-
Paper Birch	<i>Betula papyrifera</i>	-
Yellow Marsh Marigold	<i>Caltha palustris</i>	-
Wild Basil	<i>Clinopodium vulgare</i>	-
Blue-bead Lily	<i>Clintonia borealis</i>	-
Goldthread	<i>Coptis trifolia</i>	-
Bunchberry	<i>Cornus canadensis</i>	-
Eastern Leatherwood	<i>Dirca palustris</i>	-
Spinulose Wood Fern	<i>Dryopteris carthusiana</i>	-
Field Horsetail	<i>Equisetum arvense</i>	-
Wild Strawberry	<i>Fragaria vesca</i>	-
Black Ash	<i>Fraxinus nigra</i>	-
Hemp Nettle	<i>Galeopsis tetrahit</i>	Invasive - Restricted
Bedstraw	<i>Galium spp.</i>	-
Wild Geranium	<i>Geranium maculatum</i>	-
Western Oak Fern	<i>Gymnocarpium dryopteris</i>	-
Orange Hawkweed	<i>Hieracium aurantiacum</i>	Invasive – Non-restricted
Jewelweed	<i>Impatiens capensis</i>	-
Blue Flag Iris	<i>Iris versicolor</i>	-
Honeysuckle	<i>Lonicera spp.</i>	-
Princess pine	<i>Lycopodium obscurum</i>	-
Clubmoss	<i>Lycopodium spp.</i>	-
Canada Mayflower	<i>Maianthemum canadense</i>	-
False Solomon's Seal	<i>Maianthemum racemosum</i>	-

Sensitive Fern	<i>Onoclea sensibilis</i>	-
Cinnamon Fern	<i>Osmunda cinnamomea</i>	-
Interrupted Fern	<i>Osmunda claytoniana</i>	-
Wood Sorrel	<i>Oxalis spp.</i>	-
Long Beechfern	<i>Phegopteris connectilis</i>	-
Eastern White Pine	<i>Pinus strobus</i>	-
Common Plantain	<i>Plantago major</i>	-
Hairy Solomon's Seal	<i>Polygonatum pubescens</i>	-
Big Toothed Aspen	<i>Populus grandidentata</i>	-
White Rattlesnakeroot	<i>Prenanthes alba</i>	-
Heal-all	<i>Prunella vulgaris</i>	-
Shinleaf	<i>Pyrola elliptica</i>	-
Buttercup	<i>Ranunculus spp.</i>	-
Gooseberry	<i>Ribes spp.</i>	-
Elderberry	<i>Sambucus sp.</i>	-
Purple Pitcher Plant	<i>Sarracenia purpurea</i>	-
Bladder Campion	<i>Silene latifolia</i>	-
Bittersweet Nightshade	<i>Solanum dulcamara</i>	Introduced - Naturalized
American Basswood	<i>Tillia americana</i>	-
Starflower	<i>Trientalis borealis</i>	-
White Trillium	<i>Trillium grandiflorum</i>	-
Eastern Hemlock	<i>Tsuga canadensis</i>	-
Bellwort	<i>Uvularia spp.</i>	-
Common Mullein	<i>Verbascum thapsus</i>	Introduced - Naturalized
Violet	<i>Viola spp.</i>	-

Discussion

The 2017 biotic inventory surveys that were conducted in VVH SNA found one Species of Special Concern and SGCN, the Least Flycatcher, and one significant invasive species infestation, hemp nettle. The Least Flycatcher is an interior forest nesting bird that will likely remain present at the property as long as no major land cover changes occur. VVH SNA is passively managed, so threats to the forest on the property would only come in the form of natural disturbance, such as fire or windthrow. The population of invasive hemp nettle within the SNA seems to be aggressively spreading, and therefore will require attention so that it does not continue to spread and outcompete native plant species on the property.

The Northern Highland American Legion Biotic Inventory Report (Epstein et al. 1999) identifies multiple natural communities in the region that are high priority conservation opportunities due to rare and native species. VVH SNA contains a significant extent of northern mesic forest as well as areas of northern wet-mesic forest (Fig. 2; Prichard et al. 2013).

Natural Community Descriptions

- Northern mesic forest:** Comprised of hemlock, sugar maple, and yellow birch, the northern mesic forest of VVH SNA contains areas of old growth and older forest. Large, continuous stands of old growth trees are not common in Wisconsin (Prichard et al. 2013).
- Northern wet-mesic forest:** This forested wetland is typically dominated by northern white cedar (*Thuja occidentalis*) and supports rich communities of mosses, lichens, liverworts, ferns, sedges, orchids, and wildflowers. The fairy slipper orchid (*Calypso bulbosa*) is a state threatened plant species that has been documented on the property (WDNR 2017a).

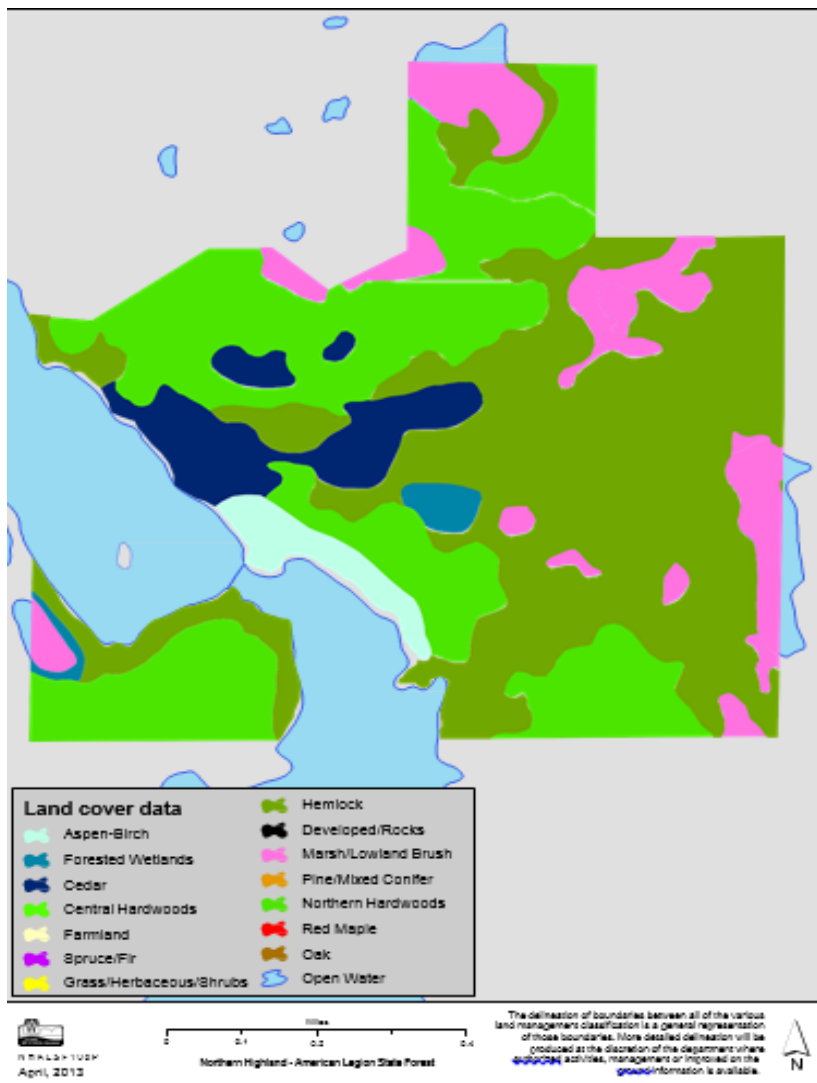


Figure 2. Predominant cover types of Van Vliet Hemlocks SNA (Prichard et al. 2013).

Management Implications

VVH SNA was purchased from the Board of Commissioners of Public Trust Lands in 2012 and is now managed under the Northern Highland-American Legion (NHAL) State Forest Master Plan. The NHAL State Forest Master Plan provides for passive management of VVH SNA. One of the short-term goals of the property is to establish and maintain large amounts of coarse woody debris, numerous standing dead snags, and an age diversity of trees (Prichard et al. 2013). The main long-term goal is to maintain old-growth hemlock hardwood communities that provide habitat for species that require these types of ecological conditions and function as an ecological reference (Prichard et al. 2013). Based on the 2017 review of the biotic community, these short- and long- term goals are being met and should continue to be followed.

In 2013, the only active management prescribed for Van Vliet was to control invasive species and maintain public safety. After one season of assessing the extent of hemp nettle invasion on the property and conducting control of the species, it is advised that more resources outside of WDNR are utilized to fully control the infestation (Lapin 2017). Volunteers and members of the community are encouraged to set up work days to remove hemp nettle and slow the spread of current patches across the property.

Another threat to the property, as identified by the WDNR's NHI Natural Community Site Evaluation completed in 2013, is heavy logging and development of adjacent properties. Providing information to surrounding landowners about land use methods and development zoning to protect the ecological importance of the area is recommended. In addition to protecting the habitat that hemlock hardwood communities provide, state listed species would benefit from the continued protection of the area.

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