
Northern Hardwood Seepage Forest

A Newly Classified
Natural Community in
Vermont

December 17, 2021

Dan Farrell

Wildlife Diversity Program
VT Fish and Wildlife Department



A Guide to the Natural Communities of Vermont

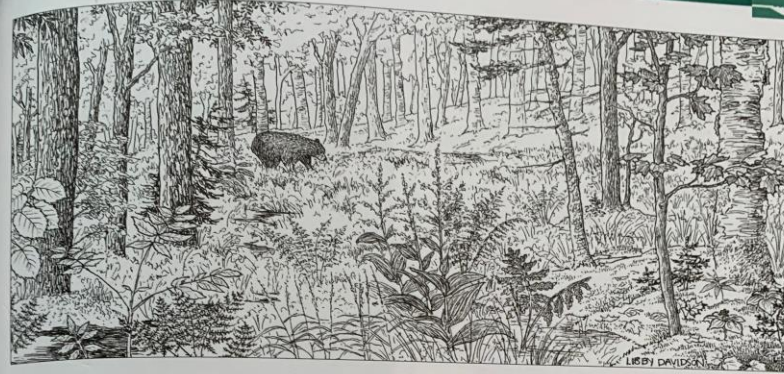
Wetland, Woodland, Wildland

Elizabeth H. Thompson
Eric R. Sorenson
Robert J. Zaino

Illustrated by
Libby Davidson
Betsy Brigham
Darlen McElwain

Expanded
SECOND EDITION

NORTHERN HARDWOOD SEEPAGE FOREST



DISTRIBUTION/ABUNDANCE

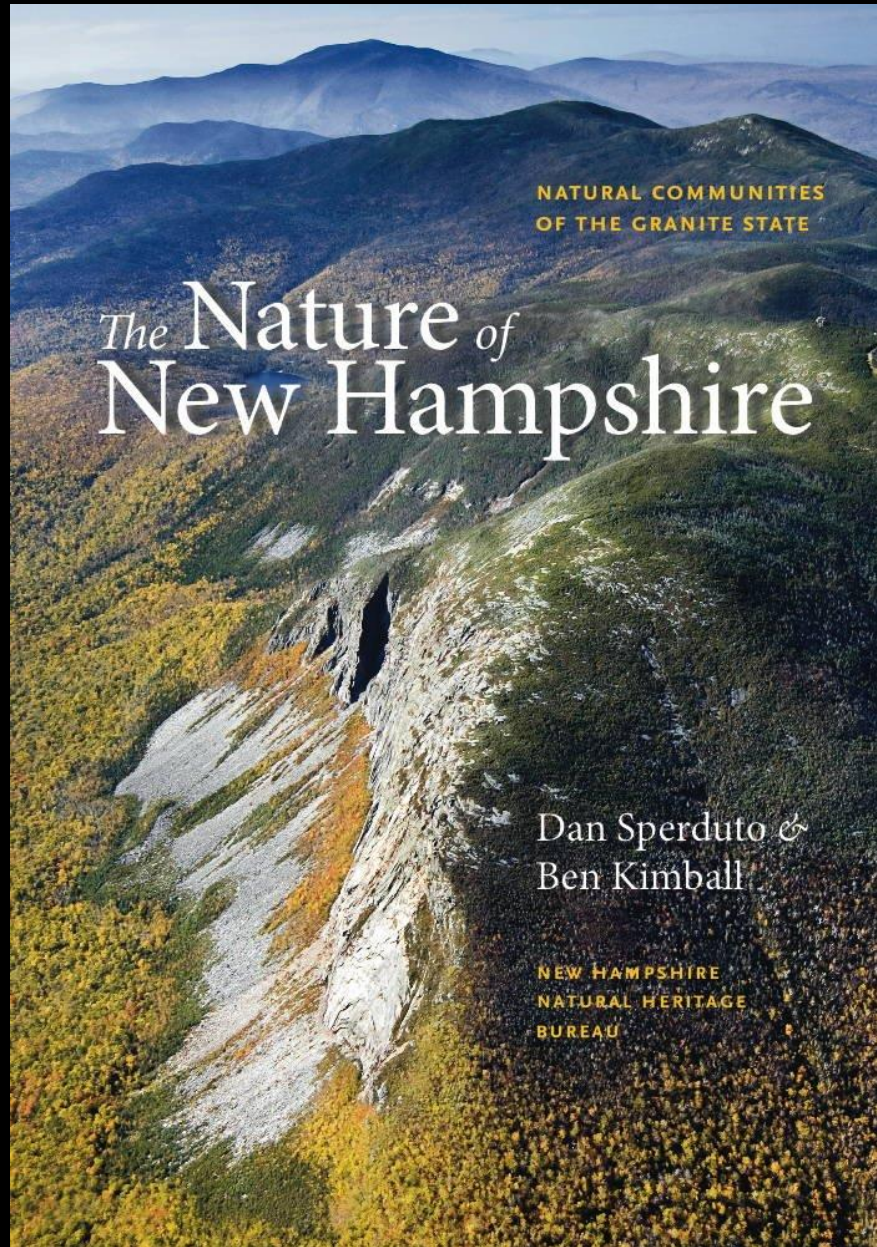
Northern Hardwood Seepage Forests are likely found throughout Vermont, though this community is still poorly documented in the southern portion of the state. Most of the known examples in Vermont occur in the Northern Green Mountains, Northern Vermont Piedmont, and Northeastern Highlands. Similar communities occur in Maine and New Hampshire.

ECOLOGY AND PHYSICAL SETTING

Often sprawling across expanses of gently sloping land, these wet forests are a meeting place for upland and wetland species. There are few other communities where species like black ash and sugar maple grow side by side. Northern Hardwood Seepage Forests occur where shallow bedrock or hardpan results in horizontal flow, and sometimes surface discharge, of groundwater. The rate of groundwater movement, seasonal duration of soil saturation, and chemical composition of the water all shape these forests. The source of seepage is variable. In some cases, seepage may be emerging where dense basal till forces an upwelling of water that has traveled through the more porous ablation till upslope (Phillips 2017). This often occurs where steep slopes transition to more gentle slopes, a landscape position where seepage forests are often found. Snowmelt may provide an early-season influx of water to supplement the groundwater.

The soils are loams or silt loams, rich in organic material and frequently stony or gravelly. In many cases, shallow surface layers of muck occur atop dense till, which prevents the water from infiltrating. Deep organic soils do not accumulate because of fluctuating water tables. The ground surface tends to be uneven, creating a fine-scale mosaic of upland and wetland conditions with elevation changes of several inches to two feet. This microtopography is the result of both mineral soil unevenness, and hummocks and hollows created by shallow-rooted tree tip-ups. Boulders also create microtopography in some settings. Small open seeps and seepage runs are common, and these often coalesce to form stream channels.

Northern Hardwood Seepage Forests frequently form the headwaters of small streams, and the relatively constant flow of cold groundwater plays an important role in downstream water quality. Many fish and other aquatic organisms depend

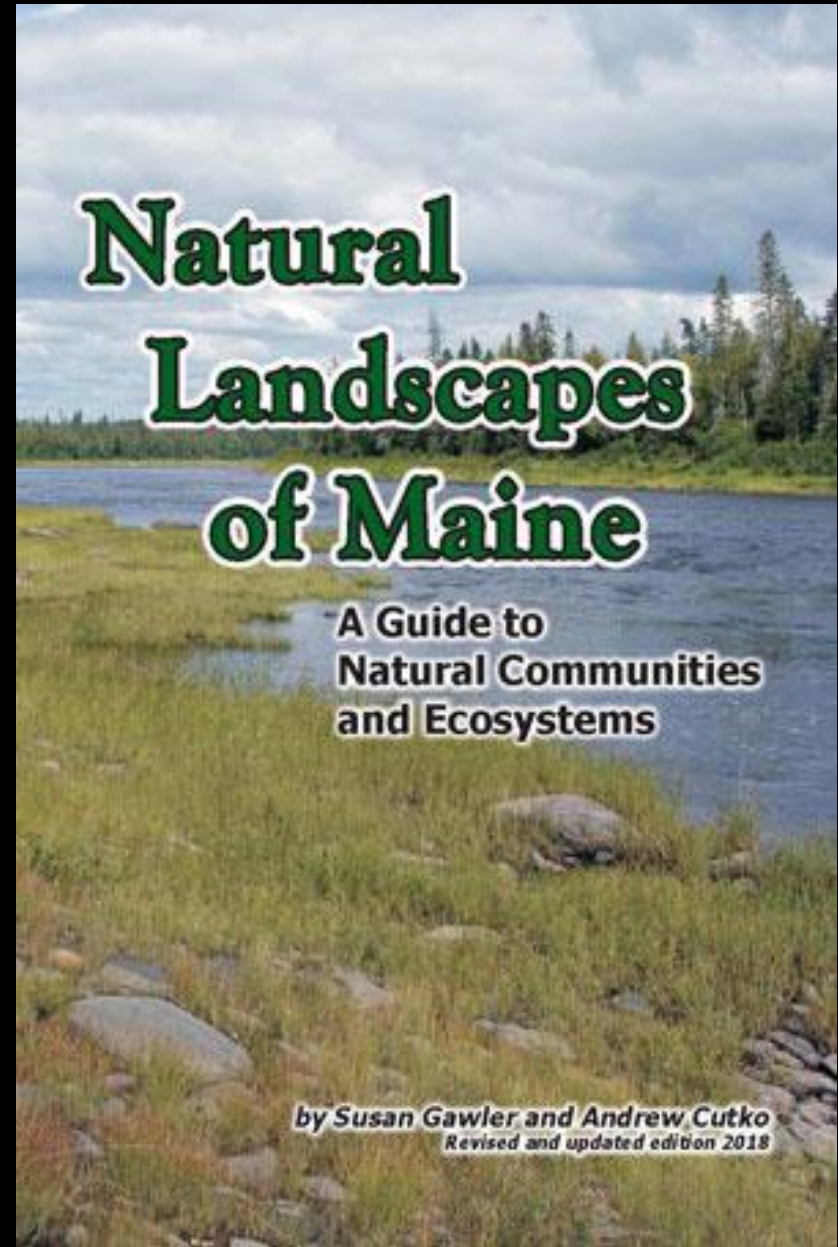


NATURAL COMMUNITIES
OF THE GRANITE STATE

The Nature of New Hampshire

Dan Sperduto &
Ben Kimball

NEW HAMPSHIRE
NATURAL HERITAGE
BUREAU



Natural Landscapes of Maine

A Guide to
Natural Communities
and Ecosystems

by Susan Gawler and Andrew Cutko
Revised and updated edition 2018

ATLAS TIMBERLANDS ECOLOGICAL ASSESSMENT

SIGNIFICANT NATURAL COMMUNITIES AND
WILDLIFE HABITAT OF THE ATLAS TIMBERLANDS



PREPARED BY HANNAH PHILLIPS
UNIVERSITY OF VERMONT ECOLOGICAL PLANNING PROGRAM
RUBENSTEIN SCHOOL OF THE ENVIRONMENT AND NATURAL RESOURCES

FOR THE

ATLAS TIMBERLANDS PARTNERSHIP
VERMONT LAND TRUST
THE NATURE CONSERVANCY-VERMONT CHAPTER



Elizabeth Thompson



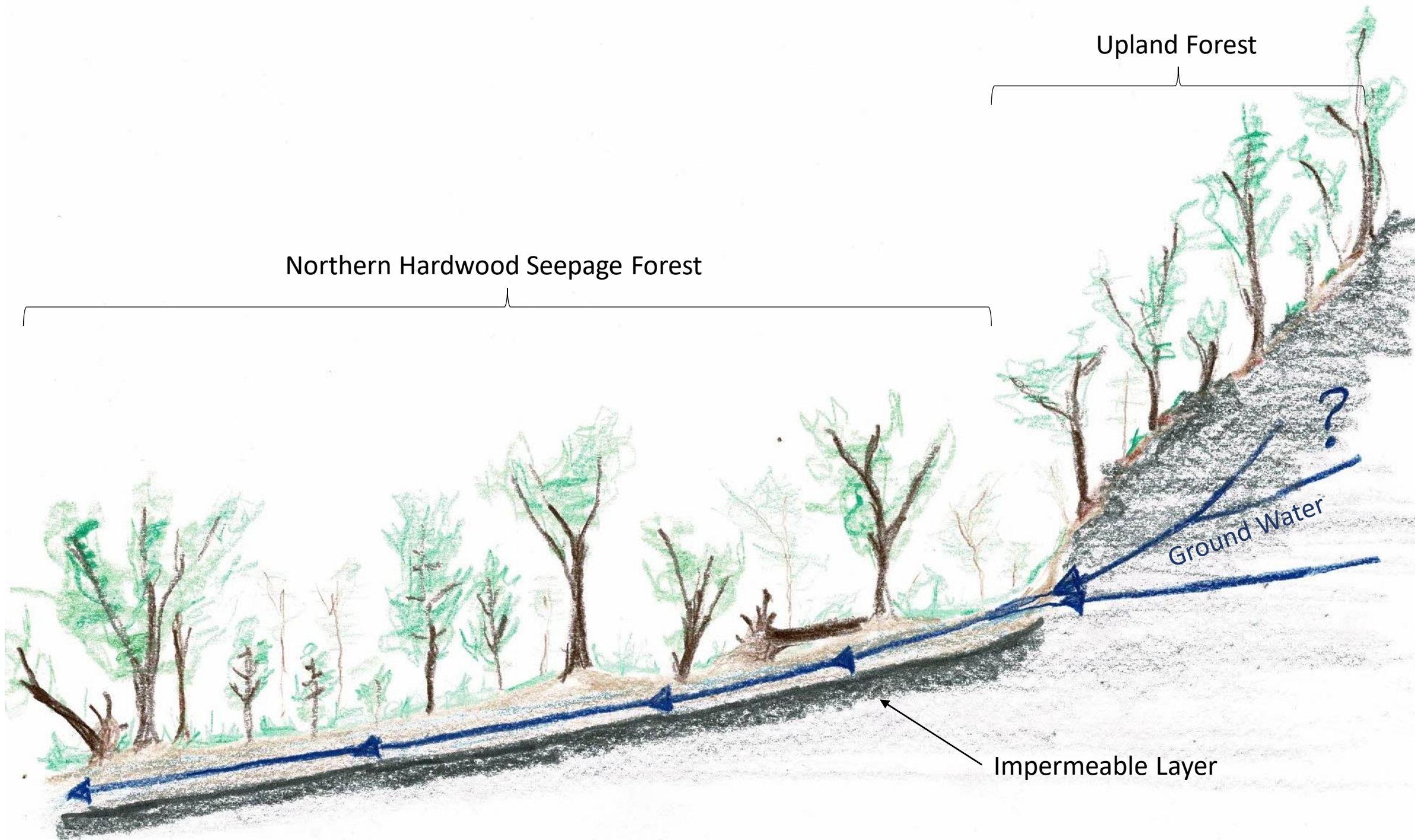
Geography



Importance of Northern Hardwood Seepage Forests

- High plant diversity
- Wetlands (often un-mapped)
- Animal life
- Flood resilience





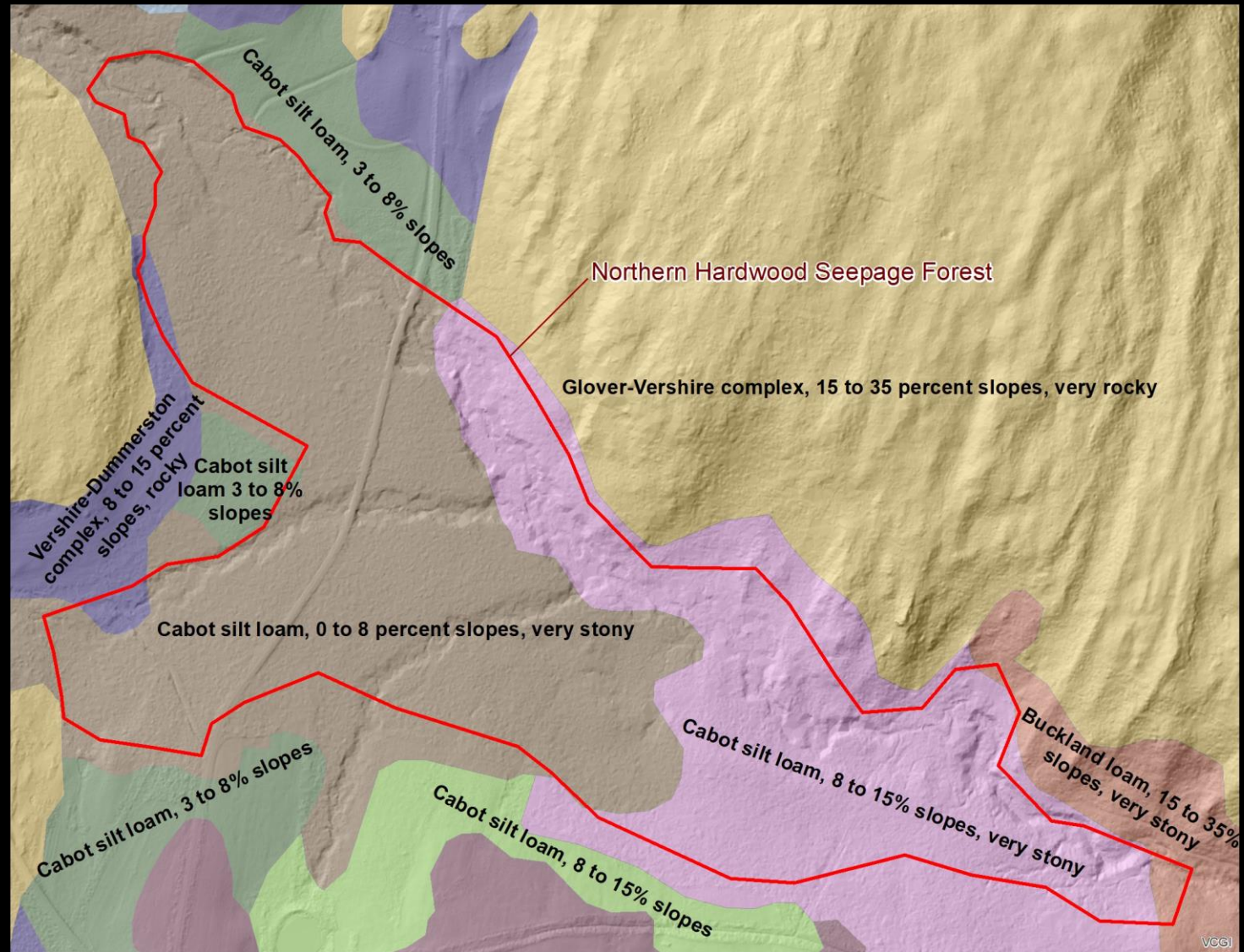






Associated Soils

- Cabot
- Peru
- Marlow
- Buckland













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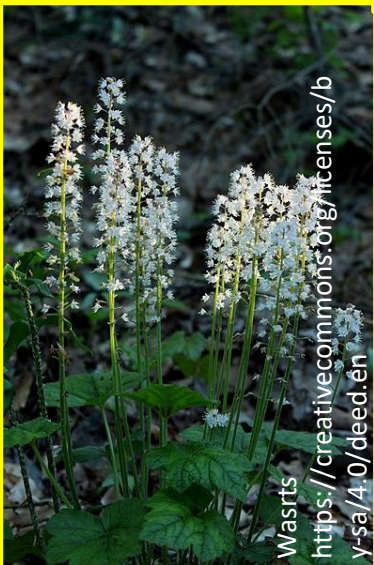
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Northern Wild Licorice
Everett Marshall



Hairy Wood Mint
Aaron Marcus



Large Toothwort
Aaron Marcus



Musk Flower



Northern Wild Licorice



Large Yellow-lady's Slipper



Long-bracted Green Orchid
Aaron Marcus



Musk Flower

Variant: Montane Seepage Forest



Bob Zaino

Variant: Montane Seepage Forest



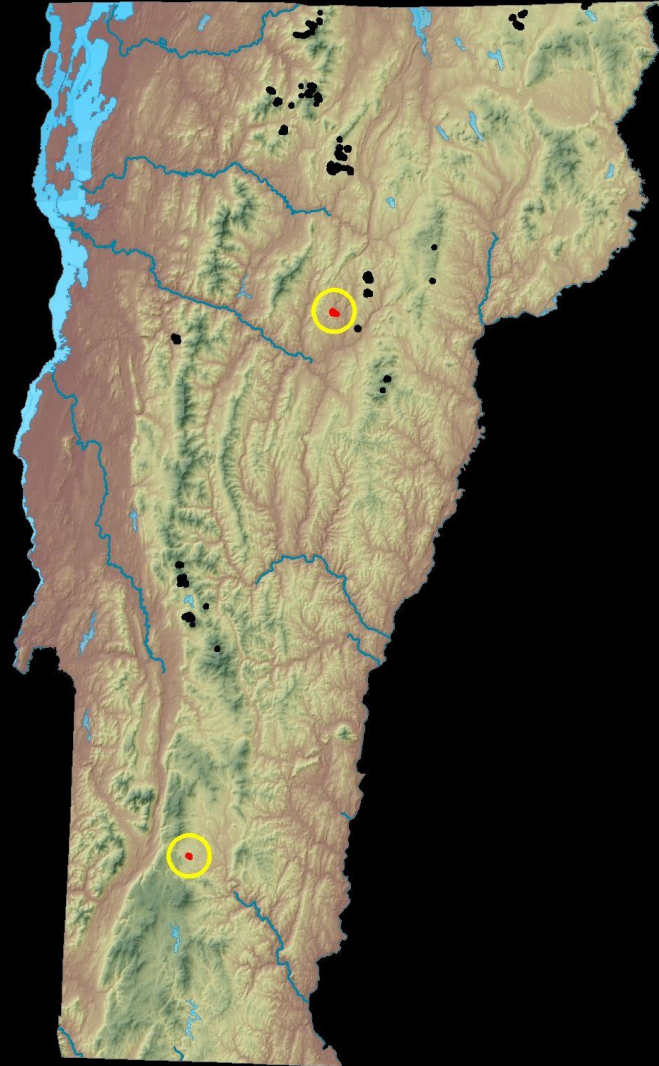
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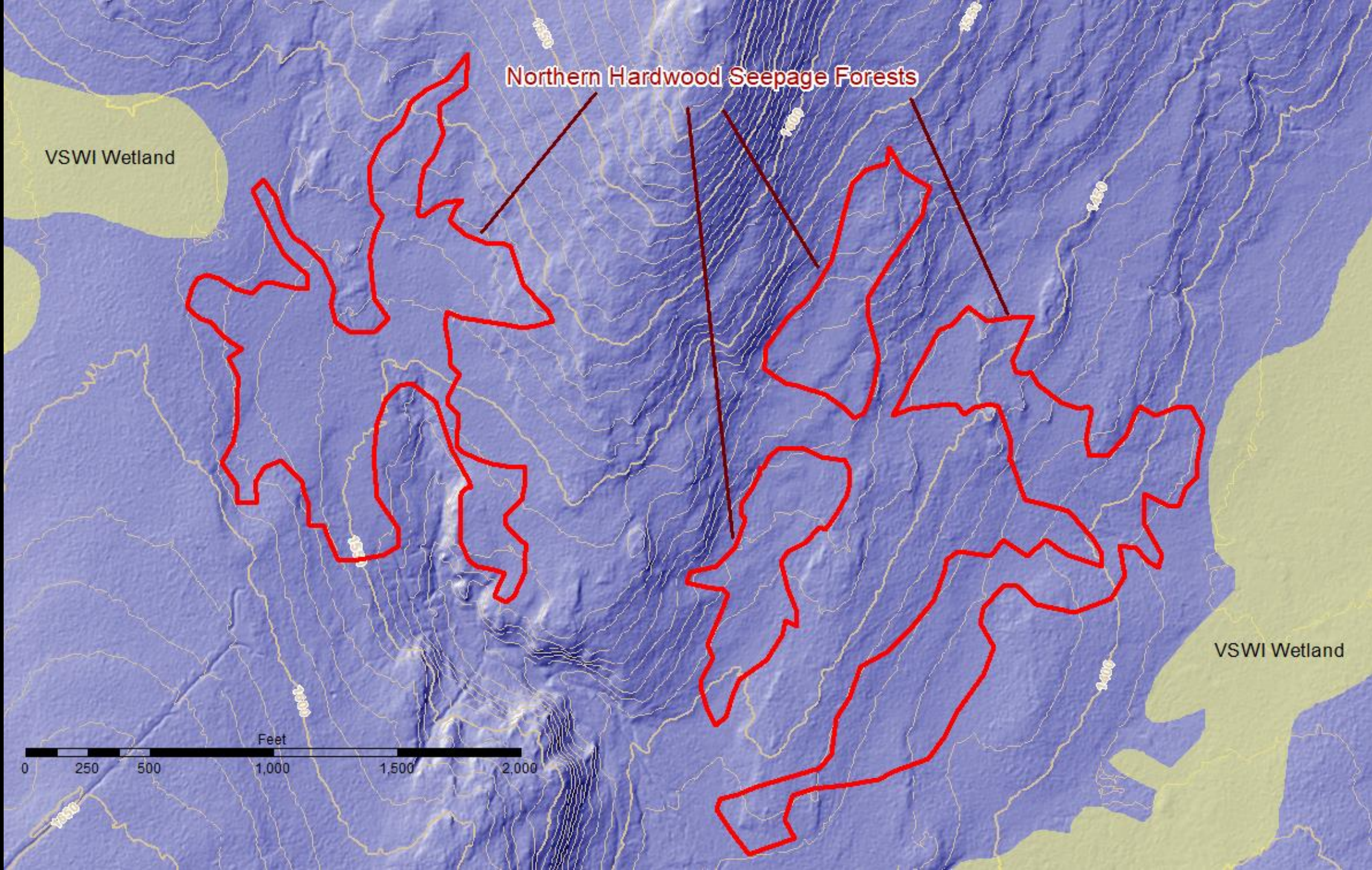
Variant: Black Ash Seepage Woodland



Charlie Hohn

Variant: Hemlock Seepage Forest

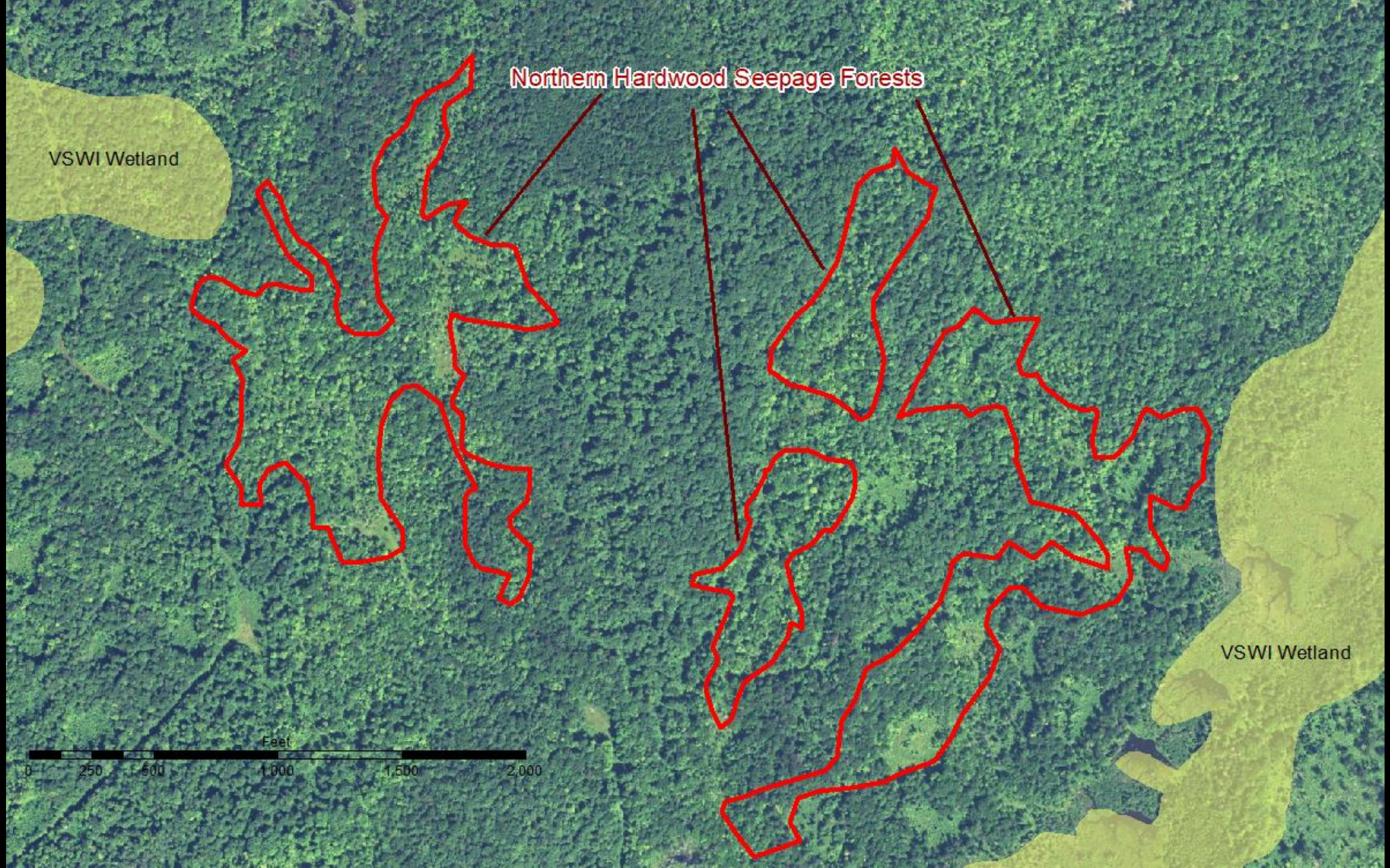




Northern Hardwood Seepage Forests

VSWI Wetland

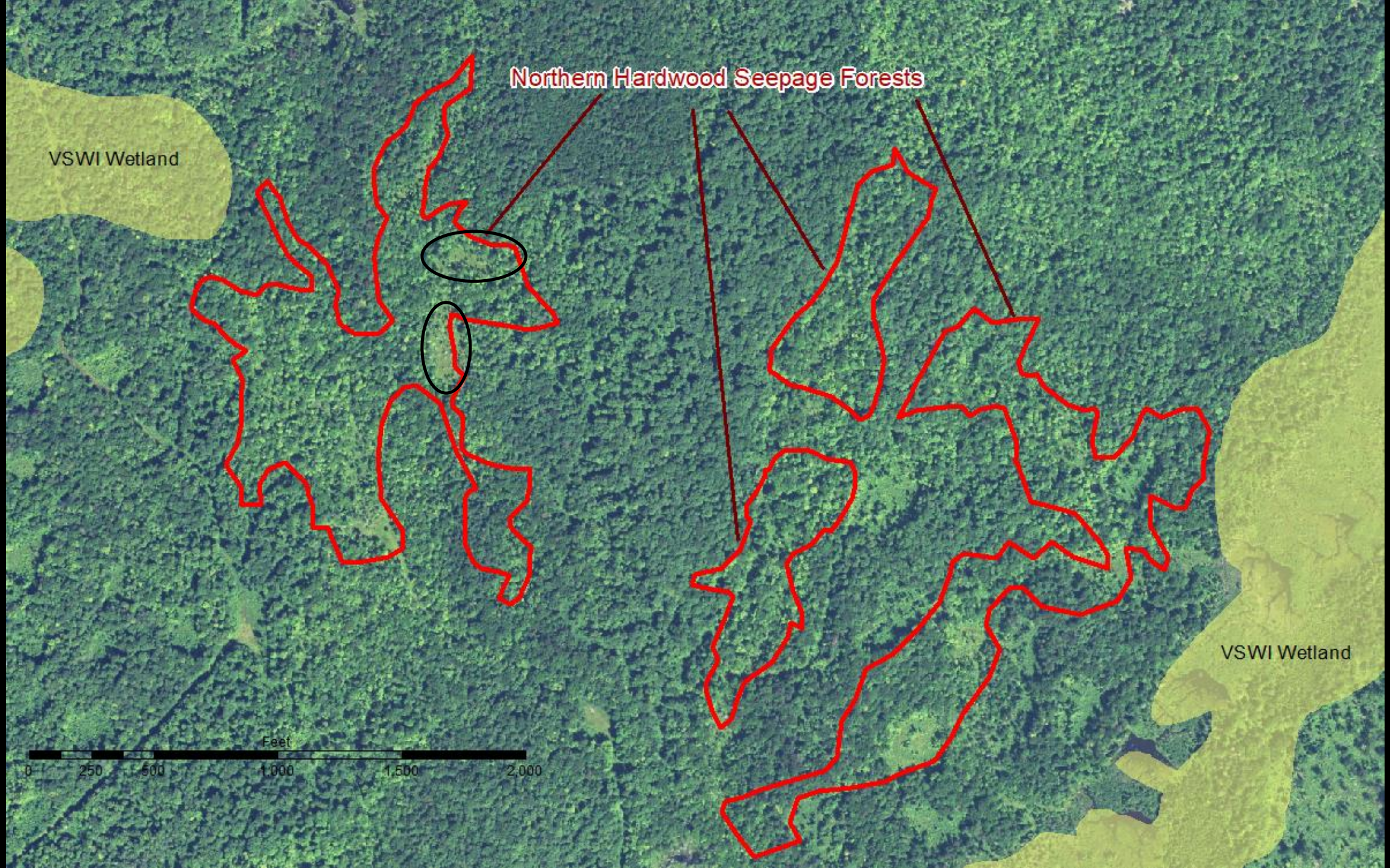
VSWI Wetland



Northern Hardwood Seepage Forests

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Management Considerations

- Easily damaged
- Delineate in summer
- Protect hydrology and topography
- Large cuts may raise water table*



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- Protect hydrology and topography
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*Slesak, R.A.; Lenhart, C.F.; Brooks, K.N.; D'Amato, A.W.; Palik, B.J. Water table response to harvesting and simulated emerald ash borer mortality in black ash wetlands in Minnesota, USA. *Can. J. For. Res.* 2014, 44, 961–968.

Northern Hardwood Seepage Forest

Outstanding Questions

- How many are there?
- Where are they?
- What is the variation in species composition?
- Are there acidic types?



Acknowledgements

Allaire Diamond
Aaron Marcus
Everett Marshall
Matthew Peters

Hannah Phillips
Eric Sorenson
Elizabeth Thompson
Robert Zaino

