

#8 TREE MORTALITY

Fortunately, most of the trees here are healthy. Whereas many of them will eventually die of old age, some will not be so fortunate and will die before their time. As you can see around you, some will be blown over in wind storms and yet others will succumb to pests and diseases. Three examples of the latter are singled out below.

A healthy **American beech** can live for more than 300 years, grow to well over 80 feet, and produce beechnuts (called "mast") which wildlife love to eat. The **Woolly beech scale** insect (which got here from Europe around 1900) punctures the bark, which in turn permits a fungus to get into the tree that leads to the **Beech bark disease** now killing so many of our beeches here.

A **Butternut**, which can grow to over 80 feet, produces nuts that are a favorite of squirrels and other animals. Yet another fungal disease, **Butternut canker** (introduced from Asia during the 1960s) threatens the very survival of these trees.

The **Eastern hemlock** grows well under cool, moist, and shady conditions. A tiny insect, the **Hemlock woolly adelgid** (this one introduced from Asia in the 1920s) is now killing Hemlocks not too many miles south of the Sanctuary, and we are fearful that it might migrate northward. The insect can be recognized by its white cottony covering.

#9 CLUBMOSES

Clubmosses (also called **Ground-pines** or **Ground-cedars**) are small evergreen perennials found here and there on the shaded forest floor of the Sanctuary (see those to the left of the Trail here). They can spread widely by "running", their horizontally growing underground stems sending up new plants at frequent intervals. (Despite their name, clubmosses are not mosses.)

#10 MOSSES

Mosses do not produce flowers and fruits. They are small non-woody perennials, usually with upright stalks, and they generally prefer moist sites. Sphagnum moss (also known as Peat moss) is one of the several kinds of mosses that can be found in the Sanctuary. Some beautiful mosses are growing on the rock to the right of the Trail.

#11 THE LIVING SOIL

The soil contains untold kinds and numbers of microorganisms (fungi and bacteria). Their job is to decompose the leaves, twigs, and other plant and animal droppings. The top layer of the soil is called the **litter layer**. It forms a natural mulch. The soil is home to many animals: mice, ants, wasps, spiders, earthworms, millipedes, sowbugs, slugs, nematodes, etc.

#12 FLOWERS

The rich alkaline soils found in the Sanctuary deriving from the limy schist bedrock lead to a splendid understory of flowering plants. Among those you will see here are such early spring flowering plants as Spring beauty, Blue cohosh, Round-lobed hepatica, and Jack-in-the-pulpit.

#13 LICHENS

Lichens are organisms composed of a fungus (which forms the visible structure) and a green alga or similar organism (which lives inside the fungal cells) — an inseparable union known as a symbiotic relationship. Lichens usually attach themselves to rocks or trees. See the rock to the left of the Trail.

#14 INVASIVE EXOTIC PLANTS

About 20% of our wild northeastern plants have come to us from Europe, Asia, or Africa since colonial times, whether intentionally or otherwise. Here in the Sanctuary we must deal with the **Oriental bittersweet** (you will see some examples just ahead, at the end of the Trail near the vehicular pull-off not far from the road); and we must be on the lookout for two others present in the neighborhood, **Common buckthorn** and **Glossy buckthorn**. With both buckthorns having become established in the neighborhood, we must remain on the lookout for a possible invasion into the Sanctuary, especially into any of the more open areas.

SANCTUARY REGULATIONS

- * **This conserved area is to be held in perpetuity as a wildlife refuge, natural area, and site for contemplation and inspiration.**
- * **Human pedestrian daytime traffic only.**
- * **Please stay on the trails so as to minimize disturbance of the plants and animals.**
- * **No bicycles or mechanized vehicles of any kind, including all-terrain vehicles (ATVs) and snowmobiles.**
- * **No dogs (except for leashed seeing-eye dogs), horses, pack animals, other livestock, or any pets.**
- * **No hunting, fishing, or trapping.**
- * **No removal of any game, wildlife, or plant, dead or alive.**
- * **No use of metal detectors or removal of artifacts.**
- * **No fires.**
- * **No camping.**
- * **Please observe a strict low impact, carry-in carry-out, leave-no-trace policy to help us keep the Sanctuary pristine.**

[**Note:** These special Wildlife Sanctuary regulations are of necessity considerably more stringent than those applicable to the remainder of the Windmill Ridge Nature Reserve & Trail.]

QUESTIONS?

Contact the
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DUNN NATURE TRAIL



A self-guided tour, including the history, geology, flora, and fauna of this Sanctuary

[3rd edition]

HOW TO USE THIS GUIDE

The **Dunn Nature Trail** offers a 1.33-mile round-trip walk through this majestic northern hardwood forest within a portion of the **Stephen Martin Memorial Wildlife Sanctuary** that has been left relatively undisturbed for more than half a century and is now protected in perpetuity. The Dunn Nature Trail (see map inside) is marked with **blue disks**. Numbered **stations** (signposts) are placed at points of natural or cultural interest, these in turn being described in the pages that follow. The **regulations** governing the Sanctuary can be found at the end, but in the last analysis the most important of these is for you to really try to leave no trace of having visited.

A more advanced (32 p.) guide is also available. And both of these publications are available at <www.windmillhillpinnacle.org>.

→ PLEASE ←
TAKE ONLY PHOTOGRAPHS
LEAVE ONLY FOOTPRINTS
STAY ON THE TRAIL
REMOVE NOTHING

WINDMILL HILL PINNACLE ASSOCIATION
PO Box 584, Saxtons River, VT 05143
2014

#1 NORTHERN HARDWOOD FOREST

Typical of the northern hardwood forest type growing in southeastern Vermont is a mixture primarily of Sugar maple, Northern red oak, American beech, Black birch, White ash, and Eastern hemlock. The White ash and Basswood found here are indicators of the rich limy (calcareous) soils found locally in the Sanctuary.

Look for name tags on trees along the Trail.

#2 STONE WALLS & ROCK PILES

Vermont's woodlands are criss-crossed by thousands of miles of stone walls, built by our early settlers for one or more of the following reasons: to enclose, or else to keep out, livestock; to clear a field for tilling; and/or to mark property boundaries. They now provide a habitat and thoroughfare for many small creatures; and they inhibit soil erosion.

Keep your eye out on the Trail (both behind us and ahead of us) for occasional **rock piles**, which the early settlers made in places where those rocks were not needed for nearby wall construction.

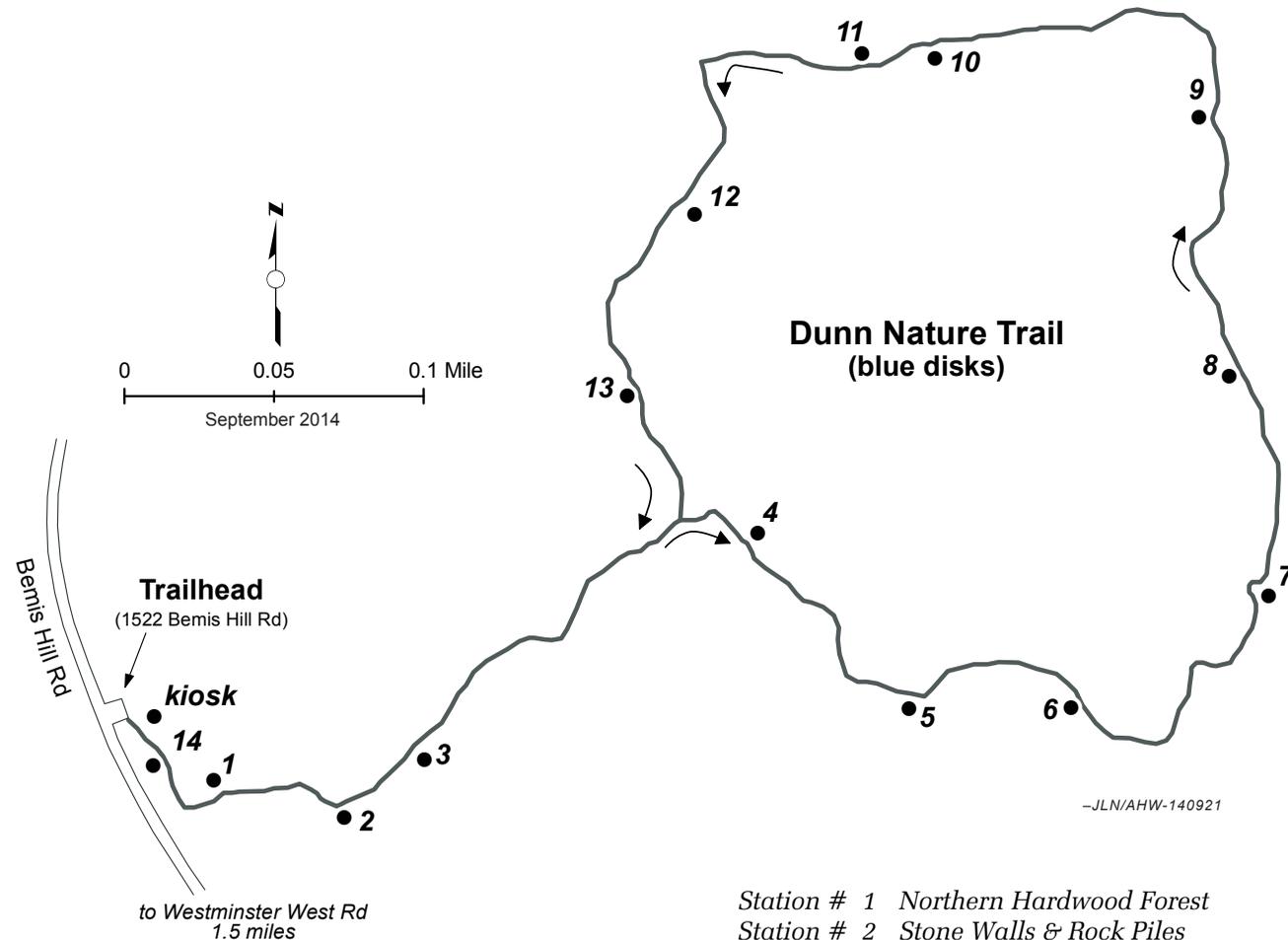
#3 FERNS

Ferns do not produce flowers and fruits. They reproduce by sending up new stalks from their generally horizontal underground stems, or else by producing spores which drop and produce new plants. Christmas fern, Sensitive fern, and Interrupted fern are some of those that you can find in the Sanctuary.

#4 A LIME KILN

Here on the left you see the remains of a farmstead lime kiln that is over 150 years old. Lime was an important commodity in Vermont during the 18th and 19th centuries. Limy schist forms most of the bedrock in this area. This impure limestone was roasted for some hours at a high temperature, which converted it to **lime** (also called **quicklime**). That lime would then be mixed with water to produce **slaked lime**, much of which was used by farmers in Vermont to "sweeten" the generally acidic soils.

WINDMILL HILL PINNACLE ASSOCIATION STEPHEN MARTIN MEMORIAL WILDLIFE SANCTUARY < Southern (Westminster) Portion >



- Station # 1 Northern Hardwood Forest
- Station # 2 Stone Walls & Rock Piles
- Station # 3 Ferns
- Station # 4 A Lime Kiln
- Station # 5 Beneath It All
- Station # 6 A Vernal Pool
- Station # 7 Birds & Beasts
- Station # 8 Tree Mortality
- Station # 9 Clubmosses
- Station # 10 Mosses
- Station # 11 The Living Soil
- Station # 12 Flowers
- Station # 13 Lichens
- Station # 14 Invasive Exotic Plants

The 1.33-mile round-trip **Dunn Nature Trail**, which is marked with **blue disks**, begins at the Martin Sanctuary Trailhead (and vehicular pull-off) at 1522 Bemis Hill Road in Westminster. For its initial 0.25 mile, the Dunn Nature Trail →
< Continued >

#5 BENEATH IT ALL

Beneath the mantle of soil, and poking through here and there, is the bedrock upon which all else rests here, as can be seen ahead of you to the right. This underlying bedrock (the lithosphere) was formed many millions of years ago. The bedrock in the Sanctuary consists primarily of relatively friable **limy (calcareous) schist**. The most recent glacier to cover this area melted away roughly 14 or 15 thousand years ago, leaving behind deposits of sand and gravel known as **glacial till**, and also a scattering of boulders known as **glacial erratics**.

#6 A VERNAL POOL

Woodland vernal pools are relatively small, shallow bodies of water that collect annually in woodland depressions having no inlet or outlet. The water period lasts at least through the spring season before drying up (hence the name "vernal"). No fish live in it, this permitting certain amphibians to breed here and then have their young develop in relative safety.

Note the major outcropping of bedrock, consisting of limy schist, on the left side here of the Dunn Nature Trail.

#7 BIRDS & BEASTS

As you walk quietly along the Dunn Nature Trail, you will occasionally see some of the wildlife that make their home here, or at least notice evidence of their presence. Among them, you are likely to see Black-capped chickadees, Red squirrels, White-tailed deer, or maybe even a Moose. The hollow American beech just to the left here of the Dunn Nature Trail has been home to a Porcupine. You might come across a red eft or a Spotted salamander (some almost 8 inches long!), or if your are lucky a secretive (and harmless) Red-bellied snake.