Welcome to the Walk of Change Nature Trail

Here at Knight Island State Park, the landscape has been affected by many physical environmental and cultural factors over the geologic timescale. These include weather extremes, glaciers, human habitation and livestock grazing. Enjoy a walk along the trail system, and keep watch for signs of these changes; you might even witness some happening now. The sections in this brochure correspond with numbered stops beginning at the Ranger's Quarters and continuing north along the East Trail and returning on the West Trail. This hike takes approximately one hour.

1. Farming is History

Look around--- imagine a view unobstructed by trees. Such a scene is similar to the Vermont landscape of the middle nineteenth century; farms were abundant. The foundation you see here is all that remains of a farmhouse from that era. Knight Island, and most other Lake Champlain islands, did not escape the farming frenzy. Most of the island was used as pasture for cattle. Milk was transported by boat to a creamery in North Hero village to the northwest. As you walk along the trails, you will see more evidence of Knight Island's farming history.

2. Reclaiming Knight Island

By the late 1800's, farms in Vermont were being abandoned as their owners left Vermont for more fertile lands in the Midwest and western U.S. Farming on Knight Island managed to survive until the 1920's. Farm equipment and tools, such as this dump rake, remind us of the island's history. Knight Island was uninhabited from the 1920's until the 1980's when new owners began operating it as a private campground. The State of Vermont acquired most of the island in 1990 under a partnership with the Lake Champlain Land Trust and The Nature Conservancy.

3. Monarch butterflies

Monarch butterflies have one of the most unusual and extreme life cycles of North American butterflies. Adults migrate north, arriving in the northeast early in the growing season. After mating, a female lays her eggs on Common Milkweed, like you can see here.

Common milkweed

The eggs hatch into larvae (caterpillars) after usually only a few days. The caterpillars concentrate toxins from eating milkweed as a self-defense strategy. After feeding on milkweed for about two weeks, the fully grown caterpillar creates a covering around itself using silk and becomes a chrysalis. The life-changing process that it undergoes inside is called metamorphosis. During this time, all of its cells essentially break down and coding in its DNA rebuilds a new organism-the butterfly.

Monarch caterpillar

After about ten days, the butterfly emerges. The adult butterfly stage of life is about six weeks. The adult monarchs will also feed on milkweed, capitalizing on the ability to retain the natural toxins of the plant. There is enough time for three or four generations of monarchs to grow and hatch in a northern climate. The final adults from the last generation don't mate; they migrate to overwintering areas in Mexico and southern California where they overwinter for six to eight months.

4. Rocky Growing and Rocky Mowing

What can this pile of stones tell us? Stone piles and walls can be found in most New England woodlands and field edges. They are remnants of former land clearing for farming. The size of the stones may reveal whether the adjacent land was used for crops or pasture. Stone piles or walls with large rocks usually suggest the adjacent land was a mowed field or a pasture in which only the large rocks needed to be removed. Small stones need to be removed from cultivated plots annually. This pile of small stones reveals that the surrounding area was used for crops. The crops grown on Knight Island were beans, com and peas.

5. The Change of Seasons' Sweet Treat

Maple syrup is a springtime crop on Vermont farms. But why isn't it made all year long? The window of time when the sugar content is sufficient for tapping is a narrow one, usually only a few to several weeks at the end of winter and beginning of early spring.

Sugaring season begins when nights are still cold (well below freezing) but the days warm (well above freezing). Sap in tree roots thaws during the warm days expelling carbon dioxide. The expanding C02 puts pressure on sap vessels, causing the sap to migrate upward along paths of least resistance towards the buds and tap holes. Cold nights, warm days, sap galore! Warm nights, warm days, sap no more!

The stately sugar maples you see before you are the generous providers of the sap we use to make pure maple syrup. These sugar maples arc the survivors of an old sugarbush---a grove of maple trees maintained specifically for tapping and harvesting sap. On average, about 40 gallons of sap is needed to make one gallon of syrup.

Sugar maple

6. Is this The End?

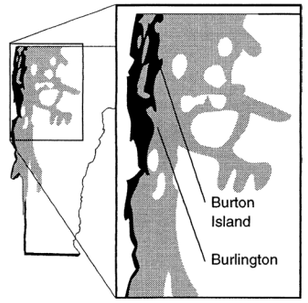
As you walked to this stop you may have noticed a change in light and temperature. You just walked through a climax community. In this case, it is a patch of mature forest. This does not mean the end of change, though, or static condition in the forest. New growth slows as the forest canopy becomes enclosed with fewer, larger trees that are more spaced out. At this state in a forest's evolution, change is brought by natural events such as storms bringing wind and ice, or from cultural means like logging.

Eastern hemlock branch

Large hemlocks such as those here are often characteristic of mature forests. These long-lived, slow-growing trees are very shade tolerant. Hemlocks can grow very slowly for many years in the understory until an opening in the canopy provides opportunity for upward growth. When a hemlock reaches the canopy, it often shades out other species that do not have the same shade tolerance. Many hemlocks here are over 200 years-old.

7. Lake Vermont, Champlain Sea, Lake Champlain

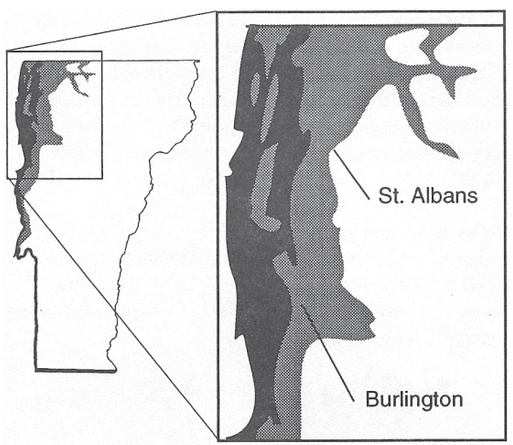
During the last glaciation, Vermont lay under a mile of ice for about 40,000 years. About 12,000 years ago, the glacier began to melt, retreating north. As the glacier melted, it created a large cold-water lake, known as Lake Vermont. Lake Vermont was much larger than modern Lake Champlain.



LAKE VERMONT

The weight of several thousand feet of ice over the land depressed the crust of the earth. The elevation of the Champlain Valley was several hundred feet lower than it is today. As the glaciers melted northward, the oceans rose and salt water flowed into Lake Vermont via the St. Lawrence Valley. This created the Champlain Sea. The Champlain Sea, in geological terms, was relatively short-lived. Without the weight of the overlaying ice, the land began to rise in the south, where the glaciers melted first and were not as thick, then later in the north. Geologists studying ancient shorelines around the Champlain Valley see evidence of this differential rebound rate in shoreline features that tilt north to south. Eventually, the land under the Richelieu River rose sufficiently to exclude marine waters. Modern Lake Champlain formed as seawater was diluted and eventually flushed from the basin.

CHAMPLAIN SEA

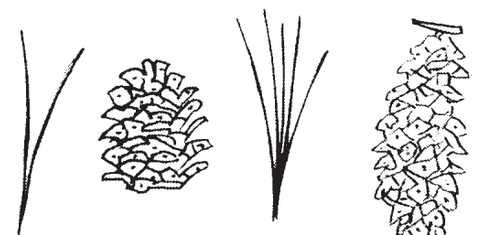


8. The Glacial Movers

Boulders, such as this one, are called glacial erratics. The glaciers ripped bedrock and loose debris from the earth. The debris was carried in suspension within the mass of ice as the glacier move south. As the glacier melted and retreated, suspended debris was released from the glacier's grasp. The glaciers that covered this region left a changed landscape. Material, such as this boulder, was moved long distances. This boulder probably came from several hundred miles north in what is now Quebec.

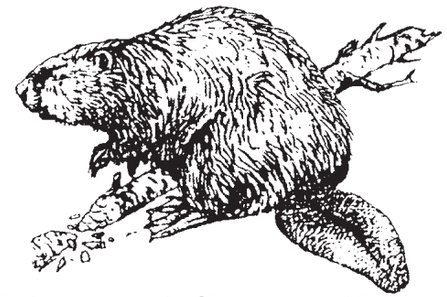
9. Tree Plantations

This pure stand of red pine is not natural, but a plantation established around 1950 by the island's owner with assistance from the Vermont Forest Service. Several thousand white pine, red pine, and eastern larch were planted here. Red pine has had the highest survival rate on the island, followed by white pine. Only two eastern larches have survived. You can see them in the meadow just past the beaver pond. While all species are native to Vermont, only white pine and maybe red pine would have grown naturally on Knight Island.



Red pine *White pine*

Eastern larch needles and cone



10. Nature's Agent of Landscape Change

Beavers are more protected from predators in the water, and their summertime foods - cattail, pickerelweed, and water lilies – are all wetland and aquatic species. During the fall, beavers are busy collecting and stashing twigs and branches in the pond floor for winter food storage. Beavers feed on the inner bark, or cambium, of trees such as aspen, willow, and birch though they will feed on other species as well. In the winter they happily munch on the bark of their stash without having to leave the protection of the pond. The industrious beavers' dam construction creates chains of wetland habitat that benefits aquatic vegetation, amphibians, birds, reptiles, and insects.

Thank you for visiting Knight Island State Park's Walk of Change Nature Trail. Please visit again, and look for more changes.

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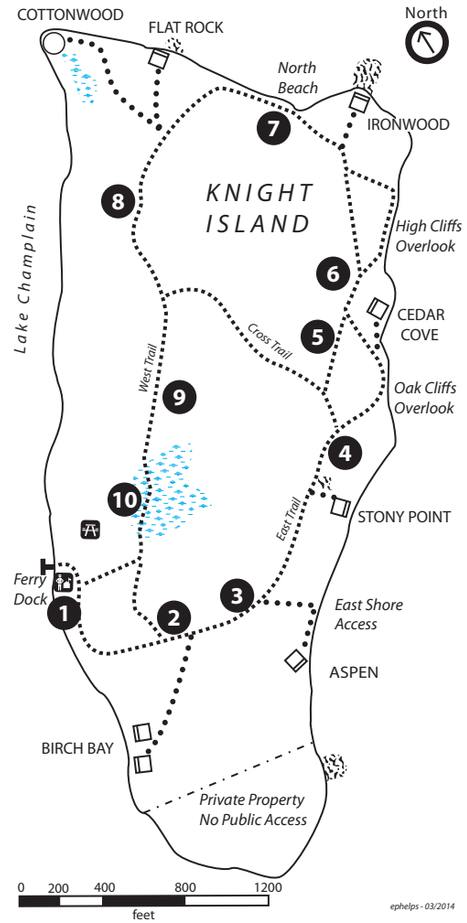

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