

# THE CHANGING LANDSCAPES OF CENTENNIAL WOODS NATURAL AREA

## *A FIELD GUIDE*



## **#1 FIELD SUCCESSION**

Because this field is no longer kept open by humans for pasture or other farm use, it is undergoing succession, or orderly change in the types of plant and animal communities that live here. This field of grasses, goldenrods, milkweed, and other herbaceous or non-woody plants is changing as the young white pine trees and other woody species invade it. Notice how much smaller the pines and hardwood trees are at the edge of the field compared to those even 50 feet into the woods. How long do you think it will be before the forest completely overtakes the field?

A very common area of increased plant diversity and animal activity is at the edge where two types of natural communities meet. The increased availability of food and shelter opportunities offered by these two communities allows this area to contain a greater diversity of animals. How many different kinds of insects can you find or hear in the grass? Do you know what kinds of animals depend on these insects for their nourishment? Look for traces of mice, rabbits, woodchucks, or birds that live in this field.

*The next stop is through the woods at the bottom of the hill.*

## **#2 THE MARSH**

Notice how moist it is underfoot. Where do you think the water comes from that keeps this area constantly wet? Consider how close you are to a very developed part of Burlington.

Water saturated soils do not have much room for air. Because roots need air to live, a variety of species have developed ways to get air to their roots. Hollow stems or shallow roots are just a couple of ways for plants to provide their roots with air.



Look for a dark green plant shaped like a soda straw growing here along the trail. The horsetail or scouring rush is a primitive plant with its spores in a cone atop the stalk. This plant incorporates silica, a crystalline compound that occurs abundantly in sand, into its tissue. Historically, Europeans used the scouring rush to polish pewter and to sand wood. Early settlers found its abrasive qualities to be useful in scouring their pots and pans.

On the opposite side of the stream is a cattail marsh. What dispersal mechanism do cattails have to assure that their seeds travel great distances to carry on new life? Their seeds are so light that they are able to be borne by the wind for miles. Imagine where the seeds that started this bed came from. Notice other plants and consider their means for seed dispersal.

*The next stop is where the trail comes close to the stream edge before the bridge.*

### **#3 THE STREAM**

Close your eyes and listen to the stream. Does it sound different here than it did when you came out of the woods? Where is the water going?

Notice the action of the water and see how the banks of the stream are being eroded from some places and being deposited in others. From where did the sand carried in the stream come? Imagine how much water was in this stream when it carried some of the large stones deposited in the pile in the streambed. Does there appear to be a pattern in the way different sized materials are deposited in the stream bed?

Meanders or curves are a good indication that the stream is actively undercutting its banks. Why doesn't the stream flow in a straight line? Look for areas nearby where water has cut away the sides of the stream bed. We have had to relocate the trail here because it caved into the stream in its former location. Perhaps we will have to relocate it again.

*The next stop is near the top of the hill. Keep right at the trail intersection ahead.*

#### **#4 PINES AND DISTURBANCES**

Look to the right side of the trail. Pine and white birch trees are growing here. These trees grow up in openings following land clearing or other disturbances and are considered pioneering or early successional species. White pine does particularly well in old pastures or hayfields left fallow. If the disturbance had been fire or logging, other trees such as pin cherry or poplar would have moved into the area. Compare the trees on the right side of the trail to those on the left. On which side of the trail is the more recently disturbed land? Were the disturbances similar on both sides of the trail?

Notice the barbed wire going through the tree trunks along the trail here. What can you deduce about the way trees grow? As you proceed along the trail, keep your eyes open for other signs of past human occupation of the area.

*The next stop is at the group seating area in the clearing at the top of the hill.*



## #5 THE OVERLOOK

In the early 1900's, the land in this area belonged to Fred Fiske, a Brookfield, Vermont native. He attended the University of Vermont and then purchased this land to farm. Clearly it has undergone considerable change since he farmed here. What might the view have been like from this vantage point back then?

Today, the view from here looking south offers a contrast between a somewhat natural environment and a human settlement. Centennial Woods is a protected natural area where many natural processes are allowed to occur and where many natural features are clearly evident. It is, however, subject to noise from aircraft flying overhead and motor vehicles on the nearby interstate highway as well as water pollution from the runoff of local shopping centers and other development.

The importance of Centennial Woods Natural Area lies in its close proximity to the UVM campus and the outskirts of Burlington, offering easy access for thousands of people. It will take on increasing significance as open space in and around Burlington decreases and urbanization pressures increase.

The little knoll you are standing on is the result of a large sand deposit. Sand deposits are formed from wind or water action. When the glaciers receded from this area about ten thousand years ago, this sand was deposited by a watercourse now known as the Winooski River. A delta was formed that extended from Shelburne to Colchester as the river flowed into the Champlain Sea. Try to imagine what Vermont looked like ten thousand years ago.

***The next stop is in the woods before you turn left and start down the hill.***

## #6 PINE FOREST

This part of Centennial Woods is a notable example of the type of pine forest which was once more abundant in the sandy soils of the Champlain Valley but which has now nearly disappeared due to various types of development. To the left in the ravine below, white pines form nearly a pure stand with trunk diameters of individual trees in excess of two feet and heights of over one hundred feet. How old do you think they are? Watch them sway in the wind as they tower above the forest floor.

Foresters taking core samples with an increment borer have counted the growth rings of these trees. These pines are all about the same age and probably started growing here when the site was abandoned as farmland. Can you believe they were seedlings when Lincoln delivered the Gettysburg Address?

Did you notice how much cooler and moister it is here than at the previous stop? As you look up you can see the dense crowns and closed canopies of the large white pines acting as a shield against the sun. Notice the plants that live in this shaded understory environment. Do they differ from the plants found in the understory in other parts of Centennial Woods?

Although white pines are called evergreens, they actually lose their needles, but just not all at once. In fact, individual white pine needles remain on the trees for two years. New needles replace the old ones as they fall off so that the trees stay green year-round. As a result of the accumulation of all these needles decomposing on the forest floor, the soil is very acid. How is the top layer of pine needles different from the layers underneath?

***The next stop is before you cross the small bridge near the foot of the hill. The trail continues to the left at the intersection ahead.***



## #7 HEMLOCK STAND

Hemlock trees are another type of evergreen. They generally prefer moist soil and shade. How is the shade in this stand different from the shade found under the pines? What other differences do you notice?

You can see lots of old and decaying logs on the forest floor here. Dig your fingers or a stick into one of them. They are being broken down by decomposer organisms. Fungi, mushrooms, molds, mosses, lichens, and bacteria return nutrients back to the soil to provide nourishment for new growth. These organisms break down the complex compounds of the forest into simpler substances. This process is a kind of nutrient cycling, releasing chemicals necessary for trees and plants to grow and reproduce.

*The next stop is where the forest opens up to the powerlines.*

## #8 THE POWERLINES

Corridors for powerlines carrying electricity to Burlington offer a stark contrast to the deep forest. The Vermont Electric Company is well aware of changes that take place in forest ecosystems. Forest succession that would normally occur in this corridor is interrupted by cutting back young trees and clearing much of the dense undergrowth that can be so common in recently disturbed areas. Along this edge wildlife can feed in the open and escape into the forest as at Stop #1. What are some of the differences between these two stops?

Notice how tall the powerline poles are. The trees from which they were cut came from a forest whose trees were similar in height to some of the trees in Centennial Woods. Utility poles are

grown in managed forests in the southern and western parts of the United States. What do you think managed forests look like when they are planted, when they are ready for harvest, or after harvesting?

*The next stop is at the top of the hill.*

## **#9 BEAVERS**

Notice the dead trees to the right. When a beaver dam was built downstream and flooded this area, the roots of these trees could not get enough air to survive and the trees died. These dead trees will eventually fall away and an open meadow may occupy this site for awhile. In turn, the meadow will probably be replaced by another kind of community as other plants invade the site. Another dam down the hill to the left was built in 1986. The flooded area behind this dam may also go through a similar series of changes.

Beavers manipulate their environment by building dams to provide access to food and lodging sites. An active beaver dam provides a change in the variety of plants and animals that visit or take up residence in the area. Raccoons may visit to feed on aquatic animals present at the site and deer may come to drink from the still water.

There are many signs of past beaver dams in these woods. Were you surprised to find out that beavers live in the city of Burlington? What do you think this area and this stream looked like before the beavers built their dam here?

*The next stop is in the woods, a short distance down the hill.*



## #10 TIP-UPS

Notice the wind-blown hemlocks or tip-ups. The shallow roots of these trees that are now exposed and covered with dirt and small rocks kept them from drowning when they stood erect. It is because of these shallow roots that they are easily knocked down by heavy winds. Notice the depression that is left from this tip-up. What kind of plants and animals will live in or visit this depression? Look along the forest floor for other depressions and irregularities that may have resulted from toppled trees.

Look to the left. Do you recall how well spaced the tree trunks were in the mature hemlock stand at Stop #7? In this younger stand, notice how close together the trees are growing as they reach for the sun. As they grow older their nutritional demands will become greater. Only a few trees will survive this competition to achieve heights similar to the mature hemlocks you saw earlier.

*This is the last stop along the interpretive trail. The trail continues through the forest and retraces the first section back through the wetland and up the hill to where you began. As you walk along the rest of the trail, use some of the knowledge and skills gained by this experience to look for other signs of disturbances and changes taking place. Remember the quote by John Burroughs at the beginning of this guide on the capacity to take a hint as being the secret of success in observing nature.*

## SUMMARY

We hope you have enjoyed your visit and have gained a better appreciation of the variety of processes that are occurring in Centennial Woods. You have witnessed a diversity of plant and animal habitats undergoing change. Please return at different times of the day or during different seasons. There is always something new to discover!

You are welcome to walk some of the other trails through Centennial Woods or visit other UVM natural areas. Further information regarding Centennial Woods or other areas is available from:

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