

Station 1. Bridge

Stretching out beyond you is the channel of the Castleton River and a mosaic of wetland plant communities that will be highlighted along the trail. In the foreground is the plant community for which West Rutland Marsh is named and acclaimed, the Cattail Marsh community, dominated by the common cattail (Typha latifolia). The term marsh refers to wetlands dominated by herbaceous (non-woody) plants. Common cattail is easy to recognize with its characteristic brown flowering stalk reminiscent of a very short tail of a cat.



Look carefully when the plant is in flower and see if you notice that there are two portions of this flowering stalk. The thick cattail portion is comprised of female flowers and directly above this is a narrower tassel of male flowers, which produce pollen. As the flower matures, the flower head breaks apart and the numerous seeds are dispersed by wind.

There are few places in Vermont with Cattail Marsh as extensive as it is in West Rutland Marsh. Large marshes provide a number of important values and functions. For example, some bird species that are relatively rare in Vermont need extensive Cattail Marshes to sustain their populations. In 1998, West Rutland Marsh was awarded the designation “Important Bird Area”. Yet, wetlands are often unappreciated. Since the time of settlement, almost half of Vermont’s wetlands have been lost or degraded. Although the landscape around you has been altered considerably by humans since settlement, it provides numerous important ecological and human values.

See if you can think about several important values and functions of the Cattail Marsh and surrounding wetlands.

Seasonal birds to look and listen for: American Bittern, Mallard, Tree Swallow, Marsh Wren, Red-winged Blackbird.

Station 3. Boardwalk

As you examine the landscape from the forested ridges on down to the open water of the Castleton River winding through the Cattail Marsh, it is clear that marshes and other wetland types are transitional between upland and aquatic communities. Generally, wetlands are described as vegetated ecosystems where the soil is saturated for at least a portion of the growing season. Thus, designated wetlands must meet three criteria:

- 1. Presence of wetland soils indicating saturated conditions
- 2. Dominance by plants that can survive in saturated soil
- 3. Presence of water at or near the surface during some of the growing season

Notice the different types of wetland communities around you. Here at the end of the board walk you see a shrub-dominated wetland community called a Shrub Swamp. Swamps are wetlands dominated by shrubs or trees. Notice that Cattail Marsh tends to grow in the deeper-water portions of the wetland and trees and shrubs are generally found in shallower areas or areas that are not as frequently flooded.



Look and see how many different types of shrub species you can pick out from the boardwalk.

Can you find shrubs with an opposite branching pattern and those with an alternate branching pattern?

Seasonal birds to look and listen for: Great Blue Heron, Least Bittern, Wood Duck, Virginia Rail, Belted Kingfisher.

Station 4. Wetland Soils

By probing into the soil, one can become a detective unraveling secrets of the past. Characteristics of the soil, like the color, feel, and smell, tell a story about the events that have occurred during the formation of the soil. Wetland soils develop when the soil is waterlogged repeatedly over time. Depending on how frequent flooding is and how long the soil is flooded or saturated, wetland soils develop different characteristics.



What makes waterlogged soils different from upland soil? An essential factor is that when soils become waterlogged, they become low in oxygen and when oxygen is low, a number of things can happen.

Decomposers, like bacteria, that use oxygen are scarce so decomposition is slow resulting in an accumulation of dark-colored organic matter. Soils composed mainly of organic material are called mucks or peats.

Some chemical compounds like hydrogen sulfide and methane(that do not contain oxygen) may be formed by anaerobic bacteria giving off the smell of rotten eggs (from hydrogen sulfide) or swamp gas (from methane)

When compounds like iron and manganese are in a soil environment without oxygen they change their chemical state and are characterized by a grayish color.

Yet, not all wetland soils are saturated all the time and therefore soils may show more or less of the characteristics listed above. For example, they may have more or less accumulated organic matter. A fascinating soil pattern can develop in soils that fluctuate between being waterlogged and drained. These soils can develop a grayish background color speckled with bright red nodules. The speckles of bright red develop as the soil water drains and some of the iron particles are exposed to an oxygen-rich environment.

Seasonal birds to look and listen for: Willow Flycatcher, Yellow Warbler, Common Yellowthroat, Swamp Sparrow, American Goldfinch.

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By Kathleen Doyle, Ph.D.

West Rutland Marsh  
BRIDGE  
to  
BRIDGE  
Interpretive Trail

It is our hope that this guide serves as a starting point for your exploration of West Rutland Marsh. You will find specific information about different natural communities in and around West Rutland Marsh, a discussion of ecological concepts pertinent to the area and information on selected plants and animals highlighted at the ten stations marked along the trail. There are questions for students to ponder, cues about things to listen and look for, and suggested activities to pursue further with your students. In this exploration, your role as a teacher is to facilitate student participation, ask and encourage questions, pay attention to student interests, and help to foster a sense of wonder and connection to the natural world. West Rutland Marsh changes dramatically throughout the year; some things that are prominent in one season are less prominent or absent in another. We hope that you make the opportunity to visit the marsh in more than one season to note the changes. We welcome your feedback and

Station 2. Phragmites

A major ecological threat to the Cattail Marsh natural community is the invasion of common reed (Phragmites australis). As you walk along the road, you may feel fenced in by this towering, 8 – 10 foot tall grass, so it is not surprising that the name Phragmites (pronounced Frag-my-tees) comes from the Greek word for fence “phragma”.

Notice how Phragmites is spreading through the marsh. It has the ability to outcompete native plants such as cattail. The Phragmites-dominated habitat is not as beneficial to wildlife for food and cover and the ecological functions of the marsh are changed. For example, the speed at which water filters through the wetland may change, altering flood control, water quality, and animal habitat. When Phragmites overtakes an area, the net result is a much less diverse landscape.

What differences do you notice comparing Cattail Marsh and the Phragmites-dominated area?

What characteristics do you think might allow an invasive species like Phragmites to be so successful?

What can be done to keep Phragmites from increasing or spreading to new areas?

Seasonal birds to look and listen for: Unattractive to birds, occasionally swallows may perch on the plumes.



Station 5. Aspen—Change over time

Quaking aspen (*Populus tremuloides*) is a fascinating tree to watch through the seasons. Depending on the weather conditions, the smooth bark ranges in color from gray, to white to olive green. The green color, apparent especially after spring rains, is due to the chlorophyll in the bark. The tree can photosynthesize even before the tree has leafed out.

In early spring, the clusters of flowers, called catkins, emerge before the leaves, resembling little caterpillars hanging down from the stems. Some trees have clusters of male flowers that produce wind-dispersed pollen, while other individuals have clusters of female flowers that will eventually shed the cottony masses of seeds.



Why might it be an advantage for the tree for the flowers to appear before the tree has leafed out?

Quaking aspen reveals its name if you watch the leaves. Because of the long flat leaf stalks, the leaves tremble or quake, in even the slightest breeze. As the leaves emerge in early spring, they have a soft wooly felt-like texture before becoming bright green. In the fall, aspen leaves are a lovely yellow. You may notice that all of the trees in a cluster leaf out and then loose their leaves all at the same time. This is because aspen spread by root sprouts, producing a cluster of stems that are genetically identical. Some aspen clones in the western United States are so large they have been estimated to be three times greater in mass than the largest giant sequoia.

**Seasonal birds to look and listen for:**  
Downy Woodpecker, Blue Jay, White-breasted Nuthatch, House Wren, Warbling Vireo.

Station 6. Berries and Fruit

Each species of animal requires food, cover and water in a close enough proximity to meet its particular needs. At this site, you can see a variety of shrubs and trees that provide food for birds and other wildlife.

How many different kinds of berries, fruits or seeds do you see at this site?

Some fruits are so delectable and sought after by birds that they do not last long. In the background (to the left), is a small smooth-barked tree that flowers in late April and May, known by several common names including service-berry, juneberry and shadbush (*Amelanchier* sp). The blue berries are produced in June, but are rapidly consumed by birds, in particular, American robins and cedar waxwings.

Another showy shrub with opposite, three-lobed leaves and a cluster of white flowers that emerge in May or June is the cranberry viburnum (*Viburnum opulus* var. *americanum*). It produces berries that turn red by fall and have a tart cranberry-like taste. A second *Viburnum* that can be found in the vicinity is called wild raisin (*Viburnum nudum* var. *cassinoides*) or withe-rod for its flexible stems. The buds and underside of the leaves have rusty, bran-like scales covering them. After blooming in summer, the shrub produces berries that eventually turn blue in September–October. The berries are eaten by grouse and other birds. You will notice the familiar wild grapes (*Vitis* sp), and the domesticated apple (*Pyrus malus*), a tree commonly planted by the early settlers. Both are important sources of food for birds and other wildlife.

A non-native species, European or common buckthorn (*Rhamnus cathartica*) has a sharp stout thorn at the tip of branches, which appear to be almost opposite. It is often inconspicuous, lacking showy flowers, but buckthorn often forms thickets along roadsides, dominates wetlands and takes over the ground layer of forests, outcompeting native species. The small blue fruits ripen in August or September and are consumed and widely dispersed by birds. Once the shrub becomes established, it out-competes many native shrubs, reducing the diversity and quality of food available to wildlife in the summer and winter.

**Seasonal birds to look and listen for:**  
Least Flycatcher, Gray Catbird, American Robin, Cedar Waxwing, Northern Cardinal, Baltimore Oriole.

Station 7. Variation across the landscape

As you look up from the bottom to the top of the slope, notice the change in vegetation from willow-dominated wetlands, to drier fields with goldenrod and scattered red cedar, to the ridge dominated by pines. (The view of the slope is best to the north of the sign post). At each location, a combination of factors such as climate, topography, soil conditions, and the presence of a variety of plants and animals determine the natural community that will develop over time. At each site, there is an intricate web of relationships between living things.



It is fascinating to think about how much the landscape surrounding a site has a vital influence on the character of the natural community that develops at the site. The movement of animals and plants across the landscape, the movement of nutrients down a slope, and patterns of weather including the speed of wind, all are affected by the character of the surrounding vegetation. The surrounding landscape can have a detrimental influence by supplying pollutants or invasive species or being a barrier to movement, as are roads or paved areas.

Can you think of other ways that the landscape surrounding a site influences what happens ecologically at a site?

Keep your eyes open for the pine cone gall that is said to prefer the tips of the twigs of the Heart-leaved willow (*Salix cordata*). The larva of the gall gnat, (in the family *Cecidomyiidae*) a tiny, delicate fly secretes a chemical that induces a willow bud to become deformed into the enlarged gall. Here the larva remains protected though the summer and winter emerging as a pupa in early spring. The adult emerges soon after and lays eggs in the new buds of the willow.

**Seasonal birds to look and listen for:**  
Red-tailed Hawk, American Kestrel, Mourning Dove, Ruby-throated Hummingbird, Eastern Kingbird.

Station 8. Sedge meadow

The meadow here in the foreground is dominated by sedges. Sedge Meadows are a common natural community in Vermont. They typically are permanently saturated and flood seasonally, occurring in somewhat drier settings than the Cattail Marsh. Notice the clumped growth form of the sedges creating drier, elevated hummocks in the wet meadow. Wetland species that are less tolerant of flooding are often rooted in these raised mounds.

Some people learn the rhyme “sedges have edges, rushes are round and grasses are hollow like holes in the ground” to help distinguish sedges from their grassy counterparts. Another way is to use a magnifying glass to learn to distinguish the inconspicuous, but surprisingly beautiful flowers.

A number of wildlife species frequent sedge meadows including the swamp sparrow, which nests in the sedges. Sedge meadows are also important breeding grounds for amphibians such as leopard frogs.

**Seasonal birds to look and listen for:**  
Northern Harrier, Wilson’s Snipe, Common Raven, Song Sparrow.



Station 9. Red Maple–Black Ash Hardwood Swamp Forest

Forested swamps dominated by red maple (*Acer rubrum*) and black ash (*Fraxinus nigra*) with a rich diversity of other trees, shrubs, ferns, herbs, grasses and mosses are one of the most common types of wetland in Vermont. They are found in places that become flooded in the spring, and typically dry out by late summer.



See if you can see for yourself how the red maple got its name. At almost anytime of year, you can find red: red buds, red flowers, red fruits, red leaf stalks and red leaves in fall. Black ash, on the other hand, was probably named for its dark colored buds.

Perhaps, because of its darkness, dense growth and diversity of plants, along with the call of a pileated woodpeckers or the song of a veery, the forest has a mysterious and intriguing quality of the unexpected, as you wait with anticipation for what will appear next. Older forest are particularly dense, as several distinct layers of vegetation can develop: the uppermost tree canopy, a layer of younger trees, a shorter shrub layer, an herbaceous layer and a ground layer of moss.

A characteristic feature of Red Maple–Black Ash Swamp forests is the uneven ground surface. Can you think about what might cause these slightly elevated hummocks to form on the ground?

Do you see any differences between what grows on the hummocks and what grows between the hummocks?

**Seasonal birds to look and listen for:**  
Yellow-bellied Sapsucker, Northern Flicker, Pileated Woodpecker, Red-eyed Vireo, Veery.

Station 10. Northern White Cedar



It is fitting to end our guided tour of West Rutland Marsh at a cluster of northern white cedar (*Thuja occidentalis*), a much-celebrated tree and one that has a strong connection with the marble region. The tree is also known as “arborvitae” which translates to “tree of life”. The name commemorates the life-saving properties of the tree. In 1535, the crew of Jacques Cartier’s Canadian expedition made a tea of the bark

and foliage (now known to be high in vitamin C) apparently curing them of scurvy. The native Americans called the tree “oo-soo-ha-tah” which means “feather leaf”, an apt description of the delicate foliage. These names are a reminder of the vital connection people have with the natural world and how individual species can come to symbolize the connections humans have with nature.

It is vital that we recognize our connections with the natural world and identify ways to learn about and sustain the natural world as it sustains us. Wetlands in general and West Rutland Marsh as an example, have not always been appreciated and celebrated. Unfortunately, some people continue to use the marsh as a dumping ground. Exotic invasive species, like Phragmites and European buckthorn are threats to the integrity of the natural communities in and around West Rutland Marsh. Without intervention, these species will continue to replace native plant species, changing the function of the ecosystem and making the landscape less suitable for a diversity of species. Yet, today there are advocates for West Rutland Marsh, including the town of West Rutland, state and federal agencies, and the Rutland County Audubon Society. These citizens, government entities and organizations are committed to collecting information, educating the public and protecting the biological treasures of West Rutland Marsh.

What might you do to be an advocate for West Rutland Marsh?

**Seasonal birds to look and listen for:**  
Turkey Vulture (soaring over the ridge), Hairy Woodpecker, American Crow, Black-capped Chickadee, Purple Finch.