

# Natural Areas Inventory and Assessment Butler Island North Hero, Vermont



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## **Project Background**

The Vermont Fish and Wildlife Department was contacted by both the North Hero Planning Commission in 2007 and residents of Butler Island in 2008 with questions about natural areas and wildlife habitat on Butler Island. In 2008, a group of Butler Island landowners, organized by Barry Hickok, asked for an inventory of the natural areas on the island. Eric Sorenson, ecologist with the Nongame and Natural Heritage Program of Vermont Fish Wildlife Department conducted the inventory and assessment work in 2008.

It is the Vermont Fish and Wildlife Department's policy to enter onto private lands for inventory work only when a landowner has given specific permission. Barry Hickok contacted many residents of the island to obtain permission for this inventory project. Eric Sorenson used this information as the basis for deciding which portions of Butler Island would be inventoried for the project and the following report is based on this work. On the ground information was only collected on properties for which landowner permission was obtained. However, considerable information is available on the natural features of the island regarding wetlands, soils, geology, and land use and cover from existing information, and this was also used in this report.

## **Methods and Approach**

Background information was collected on Butler Island from the following sources:

- Centennial Geologic Map of Vermont, Doll, 1961
- Natural Resources Conservation Service Grand Isle Soil Survey, 1953
- US Fish and Wildlife Service National Wetlands Inventory, 2004 digital data
- USGS topographic map, St. Albans Bay, 1964, photorevised 1984
- Survey of the Butler Island by Everett Marshall, 1985
- Aerial photographs from 1962, 1992, 1995, 2003, and 2006
- Aerial photographs taken from a low elevation flight on October 31, 2007 (see cover photos)

A site visit was conducted to Butler Island on July 30, 2008. Barry Hickok provided transportation to the island and circumnavigated the island to provide an overview of features that can be observed from Lake Champlain. During the site visit, information about species, natural communities, and wildlife was collected in field notes.

The maps produced for this report are based on the available information listed above and data collected during the site visit. Most of the northern interior of the island was not visited as landowner permission had not been granted.

## **Geology**

The majority of Butler Island bedrock is Hathaway formation, a metamorphic chert with imbedded fragments of limestone, dolomite, and sandstone. Iberville shale occurs in two locations on the western side of the island. Iberville shale is rich in calcium, and although Hathaway formation is not classified this way, the exposed bedrock in within this formation displays calcareous nature, as reflected by the vegetation present.

## **Soils**

The majority of the hilly and rocky areas of Butler Island are mapped as St. Albans-Dutchess rocky loam. This soil is shallow to bedrock but generally well drained. There are several other upland, rocky soil types mapped in very small areas. The other major group of soils is made up of silts and clays that were deposited on the island when it was under the surface of an inland sea during the last glacial period. These Covington and Livingston soils are wet, fine textured, and lack any rock or stone near the surface. These soils were the primary agricultural soils used on the island in the past and are known for supporting the rare Wet Clayplain Forest natural community.

## **Land Use History**

Butler Island has a long human land use history that has been well studied and documented in the North Hero Town History. Relevant to this natural areas inventory is that most of the southern half of the island (except the large wetland) was completely cleared of trees for agricultural uses. Agriculture mostly ended on the island in the 1930s. These open lands are visible on the 1962 aerial photographs and are also depicted on the 1964 topographic map (unforested lands are shown as white on the topographic map, see Figure 1). All of the forests that have regenerated on these formerly cleared lands are now young forests and tend to include more invasive non-native species, such as shrub honeysuckles and buckthorns. Another relevant piece of island history is that northern white cedar (*Thuja occidentalis*) was harvested from the island in sufficient quantity to warrant transporting it to Québec. There is currently very little northern white cedar growing on Butler Island. It is likely that the former abundance of northern white cedar occurred in the rare Limestone Bluff Cedar-Pine Forest natural community. This natural community type is a characteristic feature of the limestone and dolomite bluffs of the Lake Champlain shoreline, including many of the islands.

Camps and associated yards and docks are the primary development on Butler Islands. Because of this development pattern, the shoreline natural communities have been altered disproportionately to the interior forest and wetland natural communities.

## **Natural Communities and Wetlands**

A natural community is an interacting assemblage of plants and animals, their physical environment, and the natural processes that affect them. As these assemblages of plants and animals repeat across the landscape wherever similar environmental conditions exist, it is possible to describe these repeating assemblages as natural community types. The Vermont Fish and Wildlife Department recognizes 80 natural community types.<sup>1</sup> Each natural community type is ranked for how rare or common it is in Vermont. Each example of a natural community that is evaluated on the ground by Fish and Wildlife Department staff is assigned a quality rank that

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<sup>1</sup> Wetland, Woodland, Wildland: A Guide to the Natural Communities of Vermont. E.H. Thompson and E.R. Sorenson. 2000 and 2005. Published by The Nature Conservancy and Vermont Department of Fish and Wildlife, distributed by University Press of New England.  
[http://www.vtfishandwildlife.com/wildlife\\_nongame.cfm](http://www.vtfishandwildlife.com/wildlife_nongame.cfm)

categorizes the condition and viability of that example. High quality examples are considered state-significant.

The approximate locations of natural communities identified during the inventory are shown on Figure 1. These boundaries are meant for planning purposes and should not be considered accurate field delineations of natural communities or wetlands.

### Uplands

**Mesic Maple-Ash-Hickory-Oak Forest** dominates the northern end of Butler Island, primarily on the soils mapped as St. Albans-Dutchess. This is an uncommon natural community type in Vermont and is found primarily in the warmer climate of the Champlain Valley. On Butler Island, this community is dominated by sugar maple (*Acer saccharum*), with red oak (*Quercus rubra*), bitternut hickory (*Carya cordiformis*), white ash (*Fraxinus americana*), and basswood (*Tilia americana*). There is healthy regeneration of tree species in the forests observed and a rich flora of herbs, reflecting the calcium-enriched soils. The forest varies in its maturity, with some areas containing older trees and lots of downed wood and other areas quite young. This is a state-significant example of this community type.

**Limestone Bluff Cedar-Pine Forest** occurs in a few small patches on the tops of rocky bluffs along the shoreline, with the best example observed on the southwest side of the island. Other small areas of this community were observed at Eagle Bluff and north along the northwestern side of the island, but these are too small to map. This community occurs on shallow soils over calcareous bedrock and is dominated by northern white cedar. Other trees include hemlock (*Tsuga canadensis*), white pine (*Pinus strobus*), red oak, and hophornbeam (*Ostrya virginiana*). The low shrub limber honeysuckle (*Lonicera dioica*), one of our native honeysuckles, occurs here. Herbs include grasses, sedges, goldenrods, asters, and the rare to uncommon purple rock-creep (*Arabis divaricarpa*).



Limestone Bluff Cedar-Pine Forest. Illustration by Libby Davidson from Wetland, Woodland, Wildland

**Temperate Calcareous Cliff** occurs in several locations around Butler Island where there are nearly vertical walls of rock rising from the shoreline. The largest of these, and the only one mapped, is Eagle Bluff on the eastern tip of the island. This is an uncommon natural community type. Cliffs typically have very sparse vegetation. At Eagle Bluff there are scattered red oak, white oak (*Quercus alba*), hophornbeam, and eastern red cedar (*Juniperus virginiana*) at the top of the cliff, with several dry-site herbs, including the invasive spotted knapweed (*Centaurea maculosa*). There are spectacular views to the south from this overlook.

### Wetlands

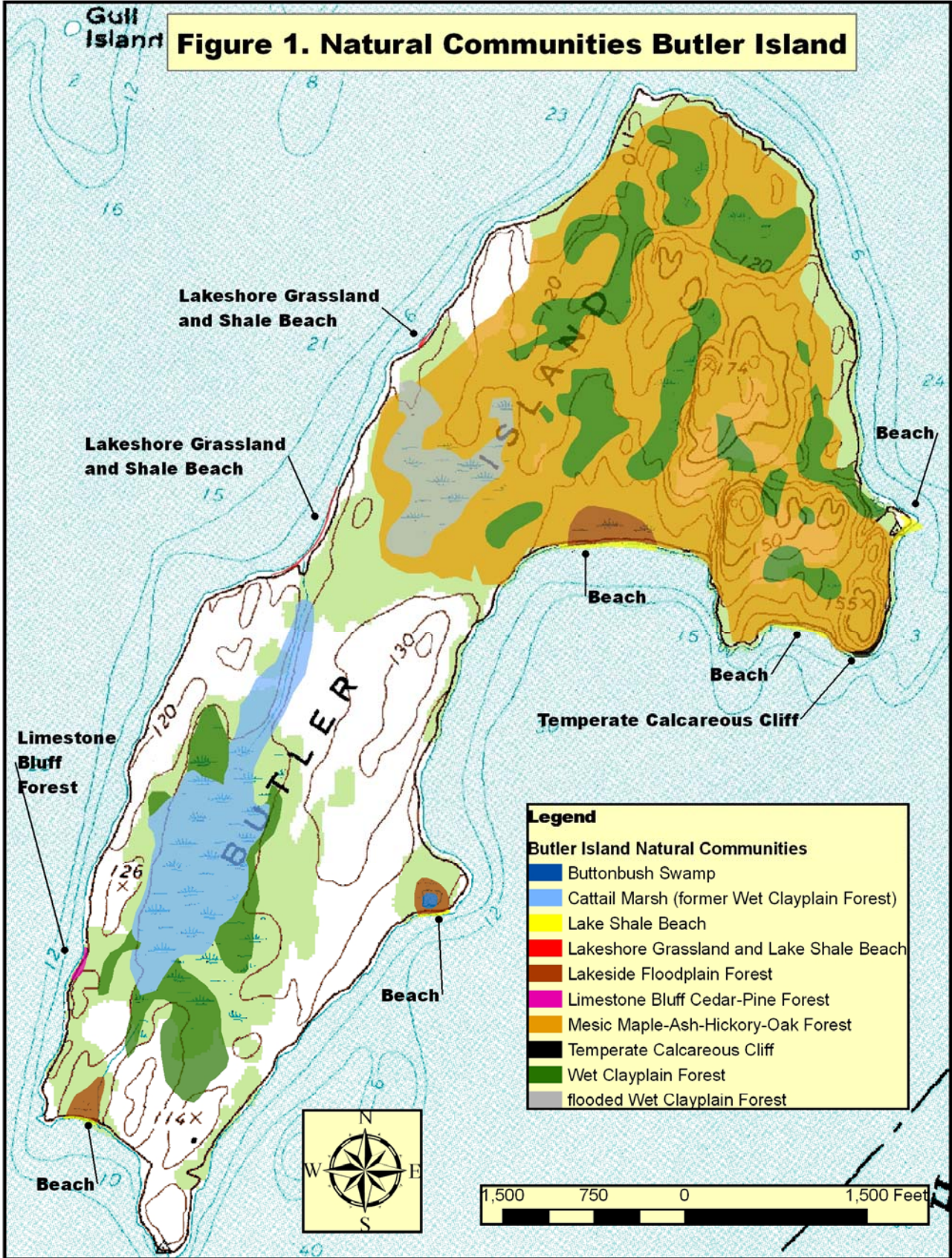
Wetlands have abundant water, with soils either inundated or saturated for all or part of the growing season. Wetlands also have specially adapted plant species. The locations of wetlands shown in Figure 1 are approximate and the actual boundaries should be determined by field delineations. All of the wetlands shown are considered Class Two and are protected under the Vermont Wetland Rules, along with a 50 foot buffer zone.

**Wet Clayplain Forest** is a rare wetland type restricted to the Champlain Valley in Vermont. This natural community type is closely associated with Livingston and Covington soils. Dominant species observed in examples at the northern end of the island include red maple (*Acer rubrum*), black ash (*Fraxinus nigra*), green ash (*Fraxinus pennsylvanica*), yellow birch (*Betula alleghaniensis*), hemlock, winterberry holly (*Ilex verticillata*), highbush blueberry (*Vaccinium corymbosum*), sensitive fern (*Onoclea sensibilis*), and marsh fern (*Thelypteris palustris*). These swamps contain seasonal pools which are likely important for breeding amphibians. Most of the areas mapped as Wet Clayplain Forest on Figure 1 have not been visited, so this determination was made based on soils maps and review of aerial photographs.

**Cattail Marsh** occupies the large central portion of the wetland complex at the southern end of Butler Island. This wetland was forested with hardwood trees at the time of the 1962 aerial photographs and would likely have qualified as a Wet Clayplain Forest at that time (it is underlain by Livingston silt clay). Beaver activity likely resulted in the conversion of this wetland to Cattail Marsh. There are still some scattered dead trees in the marsh. In addition to common cattail (*Typha latifolia*), other species include rice cutgrass (*Leersia oryzoides*), blue vervain (*Verbena hastata*), and winterberry holly.

**Lakeside Floodplain Forest** occurs in at least three locations on south-facing bays. This hardwood-dominated wetland type is flooded annually when Lake Champlain is at high water levels. Lakeside Floodplain Forests are typically associated with a Lake Shale Beach on the lakeward side. Silver maple (*Acer saccharinum*) and green ash are dominant and there is a sparse herb layer due to annual flooding.

**Buttonbush Swamp** occurs in association with at least the western example of Lakeside Floodplain Forest. This wetland type has long periods of inundation and is dominated by buttonbush (*Cephalanthus occidentalis*).



### Shoreline Communities

**Lake Shale Beach** occurs primarily along sheltered bays of the island shoreline. The shale is derived from natural erosion of the adjacent cliffs and bluffs and is formed into beaches by wave and ice action. The beaches are dynamic, so are sparsely vegetated. Typical herbs include Indian hemp (*Apocynum cannabinum*), clammyweed (*Polanisia dodecandra*), and Canada anemone (*Anemone canadensis*). These beaches may provide important nesting habitat for turtles, although most are well used by the human island residents. Lake Shale Beach is only mapped in several locations on Figure 1, but likely occurs along much of the eastern and western shorelines.

**Lakeshore Grassland** occurs in association with Lake Shale Beach, but is lakeward of the beach. This wetland community is subject to annual flooding, wave action, and ice scour, but is typically densely vegetated with herbs. Characteristic species include freshwater cordgrass (*Spartina pectinata*), fringed loosestrife (*Lysimachia ciliata*), and common bluejoint grass (*Calamagrostis canadensis*).



Lakeshore Grassland. Illustration by Libby Davidson from Wetland, Woodland, Wildland

### **Rare and Uncommon Species**

Five rare to uncommon species are currently known to occur on Butler Island. Three of these species are listed as State Threatened and are thereby protected under Vermont's Endangered Species Law (Title 10 V.S.A. Chapter 123). A thorough search of the island for rare plant or animal species has not been conducted. In addition, there are historical records of two rare plants that have not been observed on the island since 1879.

**Obedience (*Physostegia virginiana*)** is a rare, State Threatened plant that grows primarily on river and lake rocky and gravelly shorelines. On Butler Island it was last documented in 1985 along the Lake Shale Beach west of Eagle Bluff.

**Marsh vetchling** (*Lathyrus palustris*) is a rare, State Threatened plant known from wet shorelines along Lake Champlain. On Butler Island it is known only from the Lakeshore Grassland associated with Sunset Beach on the western side of the island.

**Canada milkvetch** (*Astragalus canadensis*) is a rare, State Threatened plant known only from rocky lake shores of Lake Champlain. On Butler Island it occurs on the Lake Shale Beach on the northwestern side of the island.

**Northern meadow-rue** (*Thalictrum venulosum*) is an uncommon plant of wet shorelines. On Butler Island it has been documented on the wet shores of Sunset Beach and the beach west of Eagle Bluff.

**Limestone rock-cress** (*Arabis divaricarpa*) is a rare to uncommon plant characteristic of limy cliffs and outcrops. On Butler Island it is known to occur in the Limestone Bluff Cedar-Pine Forest on the southwest side of the island.

**Tall wormwood** (*Artemisia campestris* spp. *caudata*) and **beach pea** (*Lathyrus maritimus*) are both rare species that were identified and collected on Butler Island in 1879 by E. Brainerd, but have not been observed since.

### **Nonnative Invasive Species**

These are species that are not native to Vermont, that are aggressive colonizers of open or disturbed land, and that displace native species and impair wildlife habitat. Nonnative invasive plant species are a significant threat to biological diversity in Vermont and the region. On Butler Island, those areas that have been in forest cover for the last 100 years are generally free of invasive species or these species occur in low abundance. This applies to most of the mapped natural communities, especially the northern forested half of the island. In contrast, the southern half of the island was cleared for agricultural use until the 1930s and this former open land has been colonized by several nonnative invasive species. These include spotted knapweed (*Centaurea maculosa*) and burnet-saxifrage (*Pimpinella saxifraga*) both of which is abundant in old fields and on cleared bluffs. Nonnative honeysuckles (*Lonicera* spp.) and common buckthorn (*Rhamnus cathartica*) are two shrubs that are common in former open lands and young forests.

### **Wildlife Habitat**

Shoreline development of Butler Island has resulted in most of the interior part of the island having little development. No interior roads and no interior structures were observed during this limited survey. This means that the interior of the island sees little disturbance from human uses that cause habitat fragmentation or disturb wildlife.

The entire island has been mapped as winter deer yard by the Fish and Wildlife Department. White-tailed deer are abundant on the island, with heavy browse and clustered deer pellets observed in some locations. There is little softwood cover on the island, but the temperate climate found on Lake Champlain likely contributes to the healthy overwintering population.

The large area of Mesic Maple-Ash-Oak-Hickory Forest on the north end of the island with its imbedded wetlands provides very good interior forest habitat that is important to many wildlife species, including many neotropical migrant songbirds. Barred owls were heard calling here on July 30, 2008.

The Wet Clayplain Forests on the northern end of the island are likely important habitat for breeding amphibians, especially spotted salamander, spring peeper, and wood frog. Jim Andrews, an expert on reptiles and amphibians from Salisbury Vermont, conducted an inventory of the island in October 15, 2008 and identified the following species on the island: common garter snake, blue-spotted salamander, northern leopard frog, spring peeper, eastern newt, green frog, and red-backed salamander.

The large wetland complex on the south side of the island provides important habitat for wetland dependant species, such as mink, nesting waterfowl, and wading birds. Mallards and great blue herons were both observed in this wetland on July 30, 2008, as were other common marsh birds, such as red-winged blackbird.

The natural features of the Butler Island shoreline have been compromised in many locations by the development of camps, lawns, and docks, but these shorelines still provide important habitat for shorebirds such as spotted sandpiper. The beaches may provide nesting habitat for turtles.

The southern interior of Butler Island is largely early successional habitat resulting from regrowth of the abandoned agricultural lands. Early successional habitat such as this is important for ruffed grouse, woodcock, many species of warblers, and browse for deer.

## **Conservation Recommendations**

The pattern of shoreline development of camps on Butler Island has resulted in a compromise of the quality of the shoreline natural communities and habitat. However, this same development pattern has led to very little habitat fragmentation in the island's interior. The following conservation recommendations are meant to highlight important natural areas on Butler Island and provide some guidance on what would be necessary to conserve these features. These recommendations are provided to assist island residents and the town of North Hero in planning for the island's future.

**Nonnative Invasive Species:** Controlling the spread of invasive species and eliminating them where possible would be an important conservation effort on Butler Island. This would require considerable work and coordination among the island residents.

**Interior Island Habitat:** Maintaining the quality of the state-significant example of Mesic Maple-Ash-Hickory-Oak Forest and the unfragmented nature of the island's interior can be achieved by limiting development in this area. Interior roads, houses, or camps would decrease the quality of this habitat.

**Natural Communities:** The natural communities described above and shown on Figure 1 would be logical locations to focus conservation work on the island. These areas are diverse, natural, and contain much of the biological diversity found on the island.

**Rare Species:** Rare species protection will require more detailed inventory work to locate precisely the distribution of each species and to design a protection strategy for each. The simplest approach is to protect the larger habitats or natural communities in which these species occur. Those species that are listed as State Threatened are protected under state law and an Endangered Species Permit is required from the Agency of Natural Resources before taking or removing any individuals of these species.

**Wetlands:** The wetlands on Butler Island provide many important functions, especially wildlife habitat and contribution to the biological diversity of the island (each wetland contains species that are unlikely to occur in the adjacent uplands). Most of the wetlands and the adjacent 50 foot upland buffer zones on Butler Island are protected under the Vermont Wetland Rules. Most activities in these wetlands, except for logging and other allowed uses, require a Conditional Use Determination from the Water Quality Division of the Department of Environmental Conservation.

**Shorelines:** Butler Island's shorelines provide good examples of several natural community types and habitat for most of the island's known rare plant populations. Focusing future shoreline development in areas without rare species or good quality natural communities will help to maintain the quality of these known areas.

**Butler Island is a special place with a long human history and with many important natural features. Balancing future development and the wishes of landowners with conservation of these natural features is always a difficult balance. We wish the town of North Hero and the residents of Butler Island good luck in this complex planning process.**