Examples of Habitat Designations and how they might affect landowners

Green Mountain Maidenhair Fern (Adiantum viridimontanum), state threatened. Critical habitat would entail protection of serpentine outcrops with known populations and outcrops within 10 miles of known populations. How Selected: The Green Mountain Maidenhair fern is highly restricted in Vermont and throughout its range. It is a serpentine endemic and occurs only on serpentine outcrops in the northern portion of the state where serpentine bedrock is exposed. It was first discovered and first described in the state by a researcher from UVM who named it after the Green Mountains. It is one of only four Vermont plants that are endemic to northern New England and adjacent areas.

Justification: The Green Mountain Maidenhair fern is listed as state threatened and is globally rare. Its entire range is restricted to northern Vermont and Maine and southern Quebec. The Green Mountain Maidenhair occurs at six locations in VT, all in the north central portion of the state in three towns: Eden, Lowell, and Westfield. There are 14 populations known in Quebec, and a single occurrence known from Maine. It is listed as Division 1, the highest level of rarity, in New England Wildflower's Society's Flora Conservanda. The fern occurs only on serpentine bedrock, a rare mineral type that is high in magnesium and some heavy metals and supports a unique flora. It grows only on steep cliffs, talus slopes, and thin soils of woodlands and forest edges associated with serpentine bedrock.

By protecting the rare serpentine outcrops we can ensure the long term survival of this endemic species. Unlike most of Vermont's flora, the Green Mountain Maidenhair is restricted to only three jurisdictions, and Vermont harbors about 1/3 of the known populations. For that reason it is imperative that Vermont's populations be protected. The fern also requires adjacent, unoccupied outcrops to colonize. Protecting serpentine outcrops has the additional benefit of protecting a few other plants that are rare in the state.

How Designation Might Affect Landowners and Others: One of the Vermont populations is on land owned by The Nature Conservancy; the other five are privately owned. One of these is an abandoned asbestos mine which is now a hazardous waste site, and another is owned by a religious order. It is unlikely that any of the serpentine areas on these properties could be developed because of the ledges and outcrops. Development elsewhere on the property would not likely be a threat to the ferns. Assistance to Landowners and Others: The Fish and Wildlife Department has been involved in mitigation plans for the abandoned asbestos mine. We have been in contact with two of the other owners and showed them the ferns. We have also worked with one landowner to permit a small subdivision that did not impact the ferns.

State endangered Bald Eagle nest sites. How Selected: From current records of nesting Bald Eagles in Vermont. A current record of nests are those that have been occupied (i.e., the presence of a single adult or a pair of adult eagles, eagle eggs, or eagle chicks any time between March 15 – August 1) in at least one of the previous three years. A nest site would be proposed for removal as critical if it had not been occupied in any of the previous five years.

Justification: Until 2002, Bald Eagles had not had a documented nest in Vermont since the 1940's. The first successful Vermont nest did not occur until 2008. Since then the number of nesting eagles has grown from that single occurrence to 15 in 2015. While encouraging, this level of success is less than 40% of the minimum threshold necessary to consider delisting the species. Nest sites typically are

selected on or near major lakes, ponds, and rivers. This behavioral trait limits the potential nest locations to only a small portion of the Vermont landscape which highlights the important and critical nature of this habitat.

A Bald Eagle nest is already protected by the Bald and Golden Eagle Protection Act. The Act states: "In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment." The Bald and Golden Eagle Protection Act applies to everyone, not just activities with a federal nexus.

How Designation Might Impact Landowners and Others: All human uses within 330 feet of the active nest (the nest site) would be severely limited during the nesting season (March 15 to August 1) to those that did not create an injury, death, or abandonment outcome. This would include recreational activities and pre-construction work such as surveying. Tree clearing in the immediate proximity of the nest, regardless of the time of year, would have to be evaluated by VFWD biologists before being implemented.

Activities that significantly alter or unreasonably harm the essential nesting habitat may be prohibited. Projects that may be affected include, but are not limited to: construction, installation, expansion, alteration or repair of permanent structures; agricultural management; mineral exploration and extraction; forest management; road projects and construction; shoreland alteration; utility construction; water crossing; water impoundment; aquaculture; conversion of seasonal dwelling; installation of subsurface wastewater disposal system. In determining whether a project significantly alters or unreasonably harms essential nesting habitat, the following factors will be considered:

a) Magnitude and time of year of noise and human activity generated by the project.
b) Physical alteration to the landscape.
c) Destruction of or alteration to key habitat components such as perch trees, roost trees, and foraging areas.
d) Reduction in the seclusion of the nest site and adjacent shoreland area.
e) Demonstrated tolerance of the particular eagles to human activity and disturbance.
f) Reduction in the future suitability of the nest site to bald eagles.

Assistance to Landowners and Others: VFWD biologists would work with landowners and others who might be affected to develop an eagle nesting area management plan that seeks to meet landowner goals while protecting the integrity of the eagle nesting area.

Management prescriptions for eagle nest sites may vary depending on the behavior of an eagle pair, topography, vegetation, and surrounding land use. Rigid silvicultural approaches for general application may not be appropriate. The points to keep in mind when managing land with eagle nests are to retain the function of the nest site. Begin by identifying an undisturbed buffer of 330 feet around the nest tree. Without knowing how individual eagle pairs respond to human presence this may or may not be adequate; however, it is a good general guideline. Determine the necessity of any tree removal from this area. Tree harvesting and other activities between September 1 and January 1 are likely to be less disruptive to nesting eagles or fledglings than other times of the year. The results of any necessary harvesting must result in a condition that preserves the structure and cover values the eagle pair

perceived in the first place when selecting the site. Treatment areas beyond the immediate 330 foot zone can be managed more aggressively, but keep in mind the need to retain the general characteristics of the surrounding cover. Individual trees that pose a threat to human safety, could interrupt power transmission, or create a navigation hazard need to be addressed on a case by case basis. VFWD biologists are available to assist with on-site decision making.

Here is national guidance (2007):
https://www.fws.gov/southdakotafieldoffice/NationalBaldEagleManagementGuidelines.pdf
Category C. Timber Operations and Forestry Practices

- Avoid clear cutting or removal of overstory trees within 330 feet of the nest at any time.
- Avoid timber harvesting operations, including road construction and chain saw and yardin operations, during the breeding season within 660 feet of the nest. The distance may be decreased to 330 feet around alternate nests within a particular territory, including nests that were attended during the current breeding season but not used to raise young, after eggs laid in another nest within the territory have hatched.
- Selective thinning and other silviculture management practices designed to conserve or enhance habitat, including prescribed burning close to the nest tree, should be undertaken outside the breeding season. Precautions such as raking leaves and woody debris from around the nest tree should be taken to prevent crown fire or fire climbing the nest tree. If it is determined that a burn during the breeding season would be beneficial, then, to ensure that no take or disturbance will occur, these activities should be conducted only when neither adult eagles nor young are present at the nest tree (i.e., at the beginning of, or end of, the breeding season, either before the particular nest is active or after the young have fledged from that nest). Appropriate Federal and state biologists should be consulted before any prescribe d burning is conducted during the breeding season.
- Avoid construction of log transfer facilities and in-water log storage areas within 330 feet of the nest. [Note: this practice is no longer used due to state and federal water quality regulations]

Bat Hibernation sites (e.g., caves and abandoned mines) used by threatened or endangered bat species hibernacula. This would apply to Indiana Bat, Northern Long-eared Bat, Little Brown Bat, Eastern Small-footed bat, or Tricolored Bat. How Selected: Cave and abandoned mine sites where individuals of the species have been observed during the winter hibernation period during more than one survey event. A threshold number of bats found at a cave or mine has not yet been established.

Justification: Vermont has six species of bats that hibernate in the state by overwintering in caves and abandoned mines. Five of those six species are now listed as state threatened or endangered due to very low or decreasing populations. In addition, two of the species are federally protected under the Endangered Species Act. Due to cold winter temperatures and the lack of insects to forage on, these bat species seek very specific sites with a narrow range of stable temperatures and humidity levels in order to drop into long torpor bouts, or hibernation. Only a limited number of these sites are known to the VFWD and are used year after year, often by the same individuals. This high inter-annual site fidelity, combined with the long life-span of many species (with age records for the little brown bat of over 30 years) make the long-term conservation of these hibernation sites critical to overall survival. Habitat immediately surrounding the hibernacula is necessary for bats to roost in when they are active and highly concentrated during the fall swarm and spring emergence periods.

The relatively small number of suitable hibernation sites often hold highly concentrated numbers of bats. In addition, hibernating bats are extremely susceptible to disturbance because it takes several minutes for them to warm up enough to move around or fly away and each arousal from torpor uses up a significant amount of stored energy at a time when no food is available to replenish these fat stores.

Without protection through something like a critical habitat designation, hibernation sites may be altered in a way that 1. Changes their microclimate suitability as a hibernacula for bats, 2. Specifically entraps or excludes bats (e.g., old mine entrances sealed off), or 3. Affects suitability as fall swarm areas due to conversion of the forested area in the immediately surrounding area.

How Designation Might Impact Landowners and Others:
The designation of a hibernacula site as critical habitat would likely result in the protection of the cave or abandoned mine that could restrict certain activities that could compromise the suitability of the site as a hibernacula for bats by altering the entrance or airflow. A buffer area may be created around the site to protect the integrity of the hibernacula from threats such as flooding and would likely include restrictions on forest conversion activities. A buffer would be included in the critical habitat designation and delineated (likely something on the order of 30 m/100 ft has been discussed)

Assistance to Landowners and Others: The VFWD has already been working with landowners who have bat hibernacula on their property. In some cases, funds have been obtained through grants or partnerships (with The Nature Conservancy (TNC), for example) to erect a bat-friendly gate around the hibernacula entrance which allows the bats to continue to use the site and maintain the current airflow, but keeps out human activity that would cause disturbance during the winter and may be of concern for safety reasons to the landowner already. In other cases, the landowner may open the gate to allow human entry during the summer. The VFWD has also created forest management guidelines for bats, and specific guidelines for Indiana bat habitat, that provide guidance to landowners on the retention and enhancement of features that are important both for avoiding direct take and for retaining habitat important to the survival of individuals and the population in Vermont. These guidelines include special attention to hibernacula and the areas directly surrounding a hibernacula.

If specific hibernacula sites were designated as critical habitat, the VFWD would once again reach out to landowners to explain the new designation, offer technical assistance, offer to conduct surveys at or around the site to determine if it is still being used by bats, and explore funding sources if a gate or other protection is recommended.

Spawning habitat for the state endangered Lake Sturgeon (Acipenser fulvescens). How Selected: Historic spawning sites in tributaries to Lake Champlain including the Missisquoi, Lamoille and Winooski rivers and Otter Creek.

Justification: Lake Sturgeon prefer spawning in fast, shallow, water with rocky substrates. Lake Sturgeon migrate from Lake Champlain to spawning grounds in tributaries from late April to mid- June.
Loss of spawning habitat may be a major factor in the inability of some sturgeon populations to recover in North America. Dams on tributaries block migration to upstream spawning and nursery habitats. Dams built at the natural upstream limit of sturgeon migration can also reduce spawning habitat downstream of the dam by disrupting natural flow regimes and/or reducing the recruitment of rubble and cobble to spawning sites downstream of the dam.

Multiple dams have been built on all the tributaries to Lake Champlain used by lake sturgeon for spawning. The Missisquoi and Lamoille rivers have had dams built that block sturgeon migration to historic spawning sites resulting in substantial reductions in the amount of available spawning and nursery habitat. The dams on the Winooski River and Otter Creek are most likely built at the upstream extent of sturgeon migration but may still have impacts on sturgeon spawning success by altering flows and the recruitment of spawning substrate.

How Designation Might Affect Landowners and Others: Lake Sturgeon spawning sites are located in public waters of the state which are regulated by a number of existing programs including but not limited to stream alteration regulations, Federal Energy Regulatory Commission licensing requirements for hydro-electric facilities and Army Corp of Engineers regulations. The new designation should have minimal impacts on the landowners and business's proposing development at these sites because they are already closely regulated.

Assistance to Landowners and Others: The VFWD provides technical assistance to landowners or organizations on projects that would impact Lake Sturgeon spawning habitats.

State threatened Spiny Softshell Turtle communal nesting sites and communal wintering sites. How Selected: Sites where at least three nests in a single year have been documented or wintering sites with multiple turtles.

Justification: Nesting along the shore of Lake Champlain is limited by widespread development and human activity to the point that the dynamic creation of new deposits of shale pebble and sand beaches suitable for turtle nesting are likely limited. This is further limited by the need for the suitable nesting substrate to receive adequate sunlight to incubate the eggs for several months (May/June – August/Sept). The threshold of three nests does not include dispersed single or pairs of nests laid by prospecting female softshells that find some new shale/sand deposits or attempt nesting on beaches that have human activity. Numbers of softshell nests documented at communal sites currently range from 9-70 nests. We have knowledge of several sites with only one known nest. In one case we know of two nests and suspect more might be found. As a practical matter we manage the communal sites and hope the loners succeed from time to time. We monitor sites for several years before determining only single nests found. We believe female nesters have site fidelity but will switch locations when one site is unavailable (e.g., high lake level during June). Documenting the number of nests is the high count based on several years of monitoring and may not include all nests that are actually laid.

We presently only know of three communal wintering sites. These underwater hibernacula are critical to the survival of Spiny Softshell Turtles that spend half the year underwater at wintering sites. Their physiology changes so they can survive on dissolved oxygen in the water column that they absorb through their skin. In addition to sufficient dissolved oxygen, sites need to be protected from ice scour and other disturbances that could threaten their survival or impact the maturation of eggs developing in the larger females (male turtles are smaller).

How Designation Might Impact Landowners and Others: Three communal nesting sites are known from state-owned shorelines. One is known from a privately owned, undeveloped beach and we work cooperatively with the owner. Designation of Critical Habitat potentially puts more restrictions on landowners who have been good stewards of their shoreline properties from a wildlife perspective. We would carefully determine the number of nests over several years because some nests go undiscovered

(may not hatch out due to drowning or emergence hole is not detected - especially on a sand beach). We are attempting to focus on the fewer number of nesting locations that have a relatively larger conservation importance to the Vermont population of the listed species. However, we risk not protecting sites that are just starting to develop or only support a very few nests.

The designation of a nesting site would likely prohibit changing the depositional/erosion dynamic of the shoreline by limiting cement/rock walls and jetties, construction of permanent structures, and leaving boats and equipment on nesting substrate or otherwise covering the needed nesting substrate.

The communal wintering sites are all located in deep water that protects the turtles from ice scour so the habitats are public waters. Marina and other development in the water have the potential to impact this critical habitat

Assistance to Landowners and Others: We might be able to zone the beach so a portion is developed, say with a permanent dock, but other sections managed for nesting. At one private site we are allowed to manage a portion of the shoreline and leave another section available for people. The turtles do not always realize where this demarcation is. One of the reasons the owner partners with us is we control skunks and raccoons that are a concern to their operations. We have a similar arrangement with the Vermont Forest, Parks and Recreation Department (VFPR) at a state park where we cordon off a portion of the beach for turtles and the rest is open for swimming/picnicking. This is the compromise reasonable stewards have accepted. We have tried to convince another private landowners to manage a portion of his beach for softshells. Although he likes the turtles he is wary of setting aside any portion of his relatively small frontage.

We know the locations of the few communal wintering sites and we should be able to advise potential proponents of development that would threaten critical wintering habitats for the Spiny Softshell Turtle to avoid impacts. Survey work in advance of construction is often done for aquatic habitats.