

# Vermont Town Forest Recreation Planning

## NATURAL RESOURCES GUIDE



Vermont Town Forest  
Recreation Planning



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## About This Guide

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As landowners and stewards of over 68,000 acres, Vermont communities have a unique responsibility to balance community values, public access, and use, while protecting that vast array of ecological services the forest provides, from water quality to wildlife habitat. **The Vermont Town Forest Recreation Planning Natural Resource Guide is designed to assist municipalities in making informed decisions about recreational activities by providing a range of considerations in protecting, maintaining, and enhancing natural resources in town forests.** The guide offers general recommendations regarding compatible uses and activities in various natural features, including seasonal considerations, buffers, and management considerations.

Vermont is fortunate to have staff at the Agency of Natural Resources and private consultants available to assist communities in their town's unique needs. Local decisions should ultimately be informed by site-specific information and in some cases, in consultation with a professional. This document is not intended to substitute on-site technical assistance.

The Vermont Town Forest Natural Resource Guide was developed as part of the Vermont Town Forest Recreation Planning project, an initiative of the Vermont Urban and Community Forestry Program. The Vermont Urban and Community Forestry Program is a partnership between Vermont Department of Forests, Parks and Recreation, and University of Vermont Extension.



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# Vernal Pools

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## *What are they?*

Vernal Pools are small, seasonally flooded forested wetlands that hold water in the spring and typically dry out by late summer. Vernal Pools, 1) occur in the forest (though there are exceptions to this), 2) have seasonal hydrology, 3) are isolated from surface waters, 4) are small, 5) lack fish, and 6) have vernal pool indicator species present. Vernal pool indicator species are those species that are dependent on these habitats.



## *Why are they important?*

Vernal Pools provide critical habitat for a wide variety of amphibians and invertebrates, including indicator species such as wood frogs, spotted salamanders, blue-spotted salamanders, Jefferson salamanders, fairy shrimp, and fingernail clams. Unlike other amphibians in the region, the eggs of these indicator species do not have any defenses against predation by fish; they are therefore reliant on the fishless aquatic habitat of Vernal Pools.

## *General Management Considerations*

The species of amphibians that breed in these pools spend most of their adult lives in the forests which surround the pools. For this reason, the health and function of a vernal pool are intimately linked with the condition of the upland forest surrounding the pool. This fact, along with the seasonal hydrology of the pools, is critical to understanding the proper management of these resources.

As outlined in Vermont Fish and Wildlife Department's (VT F&W) *Wildlife Habitat Management-A Landowner's Guide*, once you have identified the location of a Vernal Pool, use a management zone system based on the area used by amphibians' population to protect this resource. VT F&W recommends three zones: the breeding pool, a 100 ft zone around the pool, and a third zone that extends to 600 feet from the pool edge.

The first zone is the boundary of the Vernal Pool, as measured by the boundary of the spring high-water mark. Avoid any disturbance or impact on the Vernal Pool during any time of year. The second zone is a 100-foot zone around the Vernal Pool. This area is important because the density of amphibians within this zone is very high both during the spring breeding period and the fall juvenile dispersal period. In general, this area should remain undisturbed. VT F&W recommends only light harvesting (only on frozen ground in mid-winter, if necessary) that leaves at least an 80 percent canopy cover within this zone. The final zone extends to 600 feet from the



edge of the pool. According to VT F&W, any forest management in this zone should strive to maintain a minimum of 60 percent of the canopy cover composed of trees at least 25 feet tall, including leaving some large mature hardwoods. Also, any management activities should seek to maintain a moist forest floor with deep leaf litter and abundant coarse woody debris of various sizes.

Additional consideration should be given to the impact of dogs. Many dogs will readily enter the water when available. Vernal pools are particularly vulnerable to this type of disturbance, especially when amphibians are present or have laid their eggs. Egg masses can be destroyed or covered by silt due to this kind of activity.

### *Regulatory Considerations*

Vernal Pools are Class II wetlands and are therefore regulated by the State of Vermont under the Vermont Wetland Rules (ANR, 2017). These regulations apply to the Vernal Pool as well as a 50' buffer around the pool. In some cases, the state regulations may apply to a buffer greater than 50 feet. See Wetlands.



## Vernal Pool Management Matrix

Activity	Compatibility in Pool*	Compatibility in 100' Buffer*	Compatibility in 600' Buffer*	Considerations
<b>Hiking Trails</b>	N	Y	Y	Avoid creating ruts or standing water. Consider adding signage or limiting access during the spring migration period.
<b>Biking Trails</b>	N	Y	Y	Avoid creating ruts or standing water. Close trails during the spring migration period
<b>X-C Ski Trails</b>	N	Y	Y	Avoid creating ruts or standing water
<b>ATV trails</b>	N	N	Y	Avoid trails through wet areas. Avoid creating ruts or standing water. Close trails during the spring migration period.
<b>Snowmobile Trails</b>	N	Y	Y	Avoid trails through wet areas. Avoid creating ruts or standing water. Close trails during the spring migration period.
<b>New Access Roads</b>	N	N	Y	Avoid roads through wet areas. Avoid creating ruts or standing water. Close roads during the spring migration period.
<b>Structures/ Buildings</b>	N	N	Y	See guidelines in text and links provided. Only appropriate if most of the buffer remains forested.
<b>Parking Lots</b>	N	N	Y	See guidelines in text and link provided. Only appropriate if most of the buffer remains forested. Runoff needs to be managed.
<b>Forestry/ Logging</b>	N	C	Y	Some forestry activity is compatible, see text and links provided.
<b>Camping</b>	N	N	Y	Camping may be compatible in a larger buffer zone. See general guidelines in the text.
<b>Sugaring</b>	N	Y	Y	Refer to forestry guidelines in text and links provided.
<b>Extraction (gravel, sand)</b>	N	N	N	Extraction can disrupt local hydrology and negatively impact nearby Vernal Pool. See development guidelines in text and links provided.

The compatibility of activities was considered on three levels- Yes (Y), No (N), and Compatible if the considerations are followed (C).



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# Deer Wintering Areas (DWA)

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## *What are they?*

Deer wintering areas, or “deer yards,” are forests where white-tailed deer congregate during the winter months in Vermont. Most DWA’s consist of dense stands of mature or maturing evergreen trees with relatively closed canopies. In winter, the tight-knit crowns of forests like these intercept snowfall, generally resulting in shallower snow conditions, and create slightly warmer temperatures. Deer congregate in these areas when the snow depth exceeds ~ 18 inches. Hardwood DWA’s do exist in VT but



are uncommon and mostly found in southern VT. They are associated with steep south-facing slopes in the lee of high ridges or mountains. The most heavily used wintering areas often have a southerly aspect, although stands with a northerly, westerly or easterly aspect are used as well.

## *Why are they important?*

By providing easier mobility, DWA’s help deer save energy in the winter and support the continued survival and reproduction of this species within the northern extent of their range.

Eastern hemlock, balsam fir, and Northern white-cedar stands provide the best winter habitat for deer, but pine and spruce are also sometimes utilized. DWA’s are also home to bobcat, coyote, bear, and fisher. Other animals such as conifer-nesting birds, porcupines, and fox utilize these habitats during other seasons.

## *General Management Considerations*

One of the primary benefits of DWA’s is that they help deer conserve energy at a time when temperatures are cold, and food is scarce. Any activity that creates stress and/or movements by deer during the winter can cause the expenditure of crucial energy reserves. Winter recreational activities, especially those with large groups, such as snowshoeing, cross country skiing, and snowmobiling in and near DWA’s, should be discouraged. Dogs accompanying trail users in the winter can disturb and stress deer using DWAs during the winter as well.

In terms of forest management, maintaining a relatively intact canopy of evergreen trees is critical to maintaining the functionality of these habitats. The best deer wintering habitats maintain at least 70% closed forest canopy of evergreen trees. The dense conifer cover is the most important aspect of the wintering area. Wintering deer are surviving on fat stores, not available food during winter. Additional forest management activities that may be compatible with the continued use of these habitats by deer include the creation of small openings (less than 1 acre), where the regeneration new trees, plants, and shrubs can occur. These openings in or around DWA’s provide winter browse for deer and spur the regeneration of future generations of evergreen trees.





## Regulatory Considerations

While no law specifically protects deer wintering areas, projects that go through permitting processes such as Act 250, Section 248, or wetland permitting, typically, must consider impacts to these critical Requirements include avoiding the direct loss of the forest used as deer wintering habitat and limiting activities within 300 feet of the boundary of the habitat during winter months.

## Deer Wintering Areas Management Matrix

Activity	Compatibility	Compatibility in 300 ft Buffer*	Considerations
<b>Hiking Trails</b>	Y	Y	Hiking trails within actively used deer wintering areas should be closed during winter months. Use during other seasons is compatible.
<b>Biking Trails</b>	Y	Y	Biking trails within actively used deer wintering areas should be closed during winter months. Use during other seasons is compatible.
<b>X-C Ski Trails</b>	N	N	Refer to comments in the text.
<b>ATV trails</b>	Y	Y	Non-winter uses only.
<b>Snowmobile Trails</b>	N	N	Snowmobile use near an active DWA will negatively impact the wildlife value of this critical habitat.
<b>New Access Roads</b>	N	Y	Dirt roads that receive low use and are closed during the winter may be compatible.
<b>Structures/Buildings</b>	N	N	Buildings and the human activity that accompanies this development would likely have a negative impact on the DWA.
<b>Parking Lots</b>	N	N	Cars and the human activity that accompanies this development would likely have a negative impact on the DWA.
<b>Forestry /Logging</b>	Y	Y	Forest management can help to maintain and enhance these areas for deer. Access roads should be closed when forest management activities end.
<b>Camping</b>	Y	Y	Non-winter uses only.
<b>Sugaring</b>	N	Y	Sugaring activities may be compatible if forest management does not actively promote hardwood growth over evergreen tree cover. Mainlines in DWA should not be daylighted. Sugaring within or through a DWA is a difficult operation to conduct without impacts to the DWA.
<b>Extraction (gravel, sand)</b>	N	Y	Non-winter uses only. Habitat mitigation may be required.

Compatibility of activities was considered on three levels- Yes (Y), No (N), and Compatible if the considerations are followed (C).



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# Ledges/Cliffs/Talus

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## *What are they?*

Ledge and cliff habitat develops where bedrock outcrops occur in areas of steep slopes. Ledges and cliffs can occur as a sheer rock wall or as a jumble of rocks and crevices. Though there is no technical distinction, “ledges” are generally small areas of rock outcroppings within a forest, whereas “cliffs” tend to be larger and have a less forested cover. Talus areas are fields of large rocks/boulders that typically develop at the base of cliffs and ledges, though can sometimes occur independently of these features.



## *Why are they important?*

Ledges, cliffs, and talus can provide important habitat for a wide range of wildlife species, depending on the nature and extent of the rock structures. Vertical rock structure (cliffs) can be important habitat for species such as peregrine falcons, common ravens, and the small-footed bat. In areas with broken ledge and talus, the hollows and small caves created by the rock are used extensively by coyote, porcupine, fisher and other weasels, ruffed grouse, and other wildlife as refugia from inclement weather and for escape cover.

In many areas throughout the northeast, bobcats use ledges for courting and breeding grounds and areas of broken ledge (often at the foot of a ledge or cliff) for birthing and rearing their young. These areas protect bobcat young from predators like coyote. Bobcats, coyote, and fisher are reported to also utilize broken ledge for relief from extreme heat and/or cold. There is some evidence that ledges facing south and west (areas that generally are more exposed to the sun) may receive higher use by certain species and are more valuable to wildlife. The Eastern small-footed myotis, a species considered threatened in Vermont, is associated with cliff, ledge, and talus habitat.

## *General Management Considerations*

A forested canopy should be maintained over ledge, cliffs, and talus habitats that occur in the forest, though the selective removal of individual trees near these habitats is compatible with continued use by wildlife. Ledges are likely to contain very steep slopes, and forest management activities should be conducted only in a manner consistent with minimizing the erosion of soils.

## *Regulatory Considerations*

No law specifically protects these habitats in Vermont unless there are state records of threatened or endangered species associated with the site.



## Ledges/Cliffs/Talus Management Matrix

Activity	Compatibility*	Comments (seasonal restrictions, buffers, mgmt.)
<b>Hiking Trails</b>	N	Hiking trails should be located at least 100 feet from broken ledge and talus that provides concealment cover for wildlife.
<b>Biking Trails</b>	N	Bike trails should be located at least 100 feet from broken ledge and talus that provides concealment cover for wildlife.
<b>X-C Ski Trails</b>	N	Ski trails should be located at least 100 feet from broken ledge and talus that provides concealment cover for wildlife.
<b>ATV trails</b>	N	ATV trails should be least 300 feet from broken ledge and talus that provides concealment cover for wildlife.
<b>Snowmobile Trails</b>	N	Snowmobile trails should be at least 300 feet from broken ledge and talus that provides concealment cover for wildlife.
<b>New Access Roads</b>	N	Access roads should be at least 300 feet from broken ledge and talus that provides concealment cover for wildlife.
<b>Structures/Buildings</b>	N	Structures and buildings should be at least 300 feet from broken ledge and talus that provides concealment cover for wildlife.
<b>Parking Lots</b>	N	Parking lots should be at least 300 feet from broken ledge and talus that provides concealment cover for wildlife.
<b>Forestry/Logging</b>	C	Removal of individual trees while maintaining a relatively intact canopy can be considered. Minimize soil erosion.
<b>Camping</b>	N	Camping areas should be at least 300 feet from broken ledge and talus that provides concealment cover for wildlife.
<b>Sugaring</b>	Y	Sugaring activities are generally compatible.
<b>Extraction (gravel, sand)</b>	N	Extraction areas should be at least 300 feet from broken ledge and talus that provides concealment cover for wildlife.
<b>Rock Climbing</b>	C	Avoid sensitive sites such as rare, threatened, and endangered plants and communities and avoid peregrine nest sites during nesting season.

Compatibility of activities was considered on three levels- Yes (Y), No (N), and Compatible if the considerations are followed (C).



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# Mast Stands

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## *What are they?*

“Mast” is the nuts and seeds of trees and shrubs, many of which are eaten by a variety of wildlife.

“Hard mast” are the seeds and nuts of trees, especially those of beech, oak, and hickory.

“Soft mast” are the fruits and berries of a variety of species, including woody plants such as serviceberry and cherry. These food resources are generally only available seasonally, usually in fall. A “mast stand” is an area where many of the trees or shrubs that provide hard and/or soft mast are growing together in one area.



## *Why are they important?*

Hard and soft mast is an important and often essential source of food for a variety of wildlife. Black bears may rely on acorns and beechnuts to provide enough energy for over-wintering and the production of cubs. These nuts also provide a fat-rich food source for white-tailed deer, wild turkey, squirrels, and many other species of wildlife; as many as 171 species of birds, mammals, amphibians, and reptiles use these beech and oak forests as habitat (DeGraaf et al., 1992). Soft mast, like cherries and serviceberries, is an important food source for migrating songbirds, which utilize these food sources to provide energy for their annual migrations.

## *General Management Considerations*

Forest management activities that promote the establishment, maintenance, and long-term persistence of hard and soft mast-producing species within the forest should be encouraged. The use of mast stands by wildlife, particularly sensitive species such as black bears can be negatively impacted by the presence of human development and activity. For this reason, human access to and recreational use of these stands should be carefully considered.

## *Regulatory Considerations*

While no law specifically protects mast stands, projects that go through other permitting processes such as Act 250, Section 248, or wetland permitting, typically, consider the impact of development on wildlife habitat and productive mast stands. Specifically, development activities within this important habitat can reduce the ability of wildlife to access these important resources.





## Mast Stands Management Matrix

Activity	Compatibility* in Mast Stand	Comments (seasonal restrictions, buffers, mgmt.)
<b>Hiking Trails</b>	Y	Limiting use in Fall (September 15 – November 15) in areas exhibiting extensive bear use should be considered. Trail construction should avoid the cutting of mast-producing species.
<b>Biking Trails</b>	Y	Limit use in Fall (September 15 – November 15) in areas exhibiting extensive bear use. Trail construction should avoid the cutting of mast-producing species.
<b>X-C Ski Trails</b>	Y	Ski trails are an appropriate use. Any trail construction should avoid the creation of large openings within mast stands and the removal of mast-producing species.
<b>ATV trails</b>	Y	ATV use is appropriate; however, ATV use during the fall months should be prohibited (September 15 - November 15) within mast stands, and trail construction should avoid the cutting of mast-producing species.
<b>Snowmobile Trails</b>	Y	Trail construction should avoid the cutting of mast-producing species.
<b>New Access Roads</b>	N	The construction of permanent roads within mast stands, and their buffer should be avoided, if possible.
<b>Structures/Buildings</b>	N	No structures should be allowed within the mast stand. Some small buildings, with minimal clearing and no external lighting, are compatible.
<b>Parking Lots</b>	N	No parking lots should be allowed within the mast stand. Small dirt parking lots (without lighting) is appropriate.
<b>Forestry/Logging</b>	Y	Forest management activities that maintain and enhance mast producing species is a compatible use. Temporary forest management roads may be compatible but should be closed after management activities are completed.
<b>Camping</b>	Y	Limited, remote camping is a compatible use. Camping should be prohibited during the September 15 – November 15 period.
<b>Sugaring</b>	Y	Sugaring is a compatible use. The removal of mast-producing species should be discouraged.
<b>Extraction (gravel, sand)</b>	N	Gravel extraction activities should be prohibited within a ¼ mile buffer of mast stands (exhibiting evidence of bear use) during the fall months (September 15 – November 15).

Compatibility of activities was considered on three levels- Yes (Y), No (N), and Compatible if the considerations are followed (C).



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# Interior Forests

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## *What are they?*

“Interior Forest” or “Forest Interior” habitats are larger blocks of forests that are relatively distant from human development. The term forest interior is often used interchangeably with the term “core forests,” and defined as being at least 100 meters from the nearest human infrastructure or development, such as a road, house, or agricultural area.



## *Why are they important?*

Because forest interior habitats cover large areas, they can often provide the many life requisites for species such as black bear, moose, and fisher, which have large home ranges and need to travel extensive distances to meet foraging and reproductive needs. Black bear, in particular, exemplifies the type of wildlife that requires large areas of interior forest, covering large territories in search of a diversity of habitat elements such as wetlands, berry-producing shrubs, mast-bearing food species, and remote denning sites.

A wide variety of birds in Vermont utilize interior forest habitats. These include species such as the broad-winged and red-shouldered hawks, owls, and forest songbirds like the ovenbird, wood thrush, scarlet tanager, pileated woodpecker, and Canada and black and white warblers. Several of these species suffer from greater nest predation (by animals such as squirrels, raccoons, snakes, and other birds) and nest parasitism (by other birds such as the brown-headed cowbird) where nesting grounds are near fragmenting features, such as roads and development, and the habitat edges they create.

## *General Management Considerations*

Interior forests are important because they provide wildlife habitat that is relatively removed from the negative influence of human activities. They are relatively unfragmented, contain less forest edge, and generally feature large, continuous areas with a wide range of wildlife habitat opportunities. Large-scale human activities, development, and infrastructure threatens the existence and function of interior forests and should be avoided whenever possible.

Management strategies that enhance habitat for interior-dependent forest species such as bear, fisher and a variety of songbirds are recommended, including practices that maintain or create conditions similar to those found in old-growth and undisturbed forests. These features include a multi-layered forest canopy, downed and standing dead trees, trees are grown to extended rotation ages, and trees maintained indefinitely as “biological legacies.” The maintenance of canopy closure over trails, and lowering trail density in interior forest areas can limit the impact of recreation on these interior forests and their dependent wildlife species.



## Regulatory Considerations

While no law specifically protects interior forests, projects that go through other permitting processes such as Act 250, or Section 248 sometimes consider impacts to these habitats. Vermont's recently adopted Act 171 (An Act Relating to Miscellaneous Timber Harvesting, Forestry, and State Lands Issues) may also provide additional regulatory and planning protection to forest interior habitats as the law attempts to minimize forest fragmentation.

## Interior Forest Management Matrix

Activity	Compatibility*	Comments (seasonal restrictions, buffers, mgmt.)
<b>Hiking Trails</b>	Y	Hiking trails in forest interior habitat are generally compatible and should maintain a continuous closed canopy over the trail. Limit trail sprawl, seek to leave large "un-trailed" areas, and keep trails as close as possible to fragmenting features like roads and open areas.
<b>Biking Trails</b>	Y	Biking trails in forest interior habitat are generally compatible. See "Hiking Trail" considerations, above.
<b>X-C Ski Trails</b>	Y	X-C ski trails in forest interior habitat are generally compatible. See "Hiking Trail" considerations, above.
<b>ATV trails</b>	N	ATV trails along the edge of interior forests may be compatible. ATV trails that bisect or enter the interior of these habitats should be avoided.
<b>Snowmobile Trails</b>	N	Snowmobile trails along the edge of interior forests may be compatible. Trails that bisect or enter the interior of these habitats should be avoided.
<b>New Access Roads</b>	N	The construction of permanent access roads is not compatible; intensive human activity can greatly diminish the value of forest interior wildlife habitats. Certain compatible uses like forestry or logging may require access roads, and efforts to minimize their impact need to be considered when developing access.
<b>Structures/Buildings</b>	N	Structures and buildings are not compatible; intensive human activity can greatly diminish the value of forest interior wildlife habitats.
<b>Parking Lots</b>	N	Parking lots are not compatible; intensive human activity can greatly diminish the value of forest interior wildlife habitats.
<b>Forestry/Logging</b>	Y	If forest management activities maintain and enhance forest interior conditions (see General Management Considerations), they are compatible. Travel on forest access roads following harvesting should be limited when forest management activities are completed.
<b>Camping</b>	Y	Rustic campsites are compatible.
<b>Sugaring</b>	C	Sugaring activities are compatible, provided that they do not result in extensive infrastructure development, human presence, and the simplification of forest structure and species diversity.
<b>Extraction (gravel, sand)</b>	N	Extraction is not compatible; intensive human activity can greatly diminish the value of forest interior wildlife habitats.

Compatibility of activities was considered on three levels- Yes (Y), No (N), and Compatible if the considerations are followed (C).



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# Significant Natural Communities

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## *What are they?*

In areas with similar climate, precipitation, soils, geology, and topography, reoccurring assemblages of plants dominate. These categories of vegetation are called “Natural Communities,” and are our way of categorizing different vegetation patterns across the landscape. Vermont’s Natural Communities have been described in the book: [Wetland, Woodland, Wildland: A Guide to the Natural Communities of Vermont](#) (Thompson & Sorenson, 2000).



Natural communities include familiar forest types such as Northern Hardwood Forests, Hemlock-Northern Hardwood Forests, Northern White Cedar Swamps, and on the summits of the Green Mountains, Montane Spruce-Fir Forests. They also include more rare communities such as Dwarf Shrub Bogs, Temperate Calcareous Cliffs, and Pine-Oak-Heath Sandplain Forests.

Each natural community type is ranked based on its relative rarity in Vermont on an S1 – S5 scale. Communities with an S1-rank are those types that are extremely rare in the state, such as Alpine Meadows and Pitch Pine Woodland Bogs. S5-ranked communities are common and widespread in the state and include such familiar types as the Northern Hardwood Forests and Alder Swamps. Each occurrence of a natural community is also ranked based on its quality (“EO-rank”). “Significant” natural communities are those sites that are both uncommon and in generally good condition.

While natural communities occur in both uplands and wetlands, this section focuses on the management of uplands.

## *Why are they important?*

Traditionally, forests and other ecosystems in Vermont have been described by their “cover type” or “forest type,” classifications that focus primarily just on the tree species present. Natural communities are a more holistic way of describing all the elements of our ecosystems, including plants, wildlife, abiotic factors, and how all of these elements change over time. Healthy natural communities provide many ecosystem-wide benefits, such as clean air and clean water, and habitat for all of Vermont’s wildlife. Conserving a diversity of natural community types is often considered a good “coarse filter” approach for conserving biodiversity in general across the landscape.





## *General Management Considerations*

Management recommendations for upland natural communities of statewide significance depend largely on the natural community in question, how rare it is, and how large of an area it typically occupies on the landscape. Occurrences of large, common communities such as Northern Hardwood Forests and Red Spruce Northern Hardwood Forests are much more resilient to small-scale disturbances than less common communities that occur in small areas. Recreational activities, including some motorized recreation, are typically compatible with these larger natural communities, whereas the occurrence of smaller and more sensitive natural communities may reduce the compatibility of some recreational activity.

Rare and uncommon natural communities are also generally more sensitive to disturbance than more common communities. The site conditions that give rise to these rare and uncommon communities (geology, soils, slope, aspect, etc.) are typically highly localized and susceptible to disturbance. This, coupled with the fact that they are typically geographically small sites, means that any disruption could have a detrimental effect on the entire community. Recreational activities in these sites should be limited to non-motorized recreation. Clearing of land for other recreational activities should be avoided.

More information about managing specific natural community types can be found through the Vermont Non-Game and Natural Heritage Inventory.

## *Regulatory Considerations*

There is no regulatory agency that regulates all impacts to significant natural communities. However, projects that go through other permitting processes such as Act 250, Section 248, or wetland permitting typically consider impacts to significant natural communities.



## Significant Upland Natural Communities (NC) Management Matrix

Activity	Compatibility Common NC*	Compatibility Rare NC*	Comments (seasonal restrictions, buffers, mgmt.)
<b>Hiking Trails</b>	Y	N	Depends on Natural Community Type.
<b>Biking Trails</b>	Y	N	Depends on Natural Community Type.
<b>X-C Ski Trails</b>	Y	C	Depends on Natural Community Type.
<b>ATV trails</b>	C	N	Depends on Natural Community Type. The potential for introduction of invasive species should be considered.
<b>Snowmobile Trails</b>	C	N	Depends on Natural Community Type.
<b>New Access Roads</b>	C	N	Depends on Natural Community Type.
<b>Structures/Buildings</b>	N	N	Impacts to significant Natural Communities from development should be avoided
<b>Parking Lots</b>	N	N	Impacts to significant Natural Communities from development should be avoided
<b>Forestry/Logging</b>	Y	C	Depending on the nature and extent of proposed activities and Natural Communities, it may be compatible. Rare Natural Communities should be avoided unless management includes a focus on maintaining and/or restoring functions. The potential for introduction of invasive species should always be considered.
<b>Camping</b>	Y	Y	Depends on Natural Community Type.
<b>Sugaring</b>	Y	N	Depends on Natural Community Type.
<b>Extraction (gravel, sand)</b>	N	N	Extraction is incompatible

Compatibility of activities was considered on three levels- Yes (Y), No (N), and Compatible if the considerations are followed (C).



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# Wetlands

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## *What are they?*

Wetlands are complex and diverse systems. In fact, wetlands are some of the most ecologically rich and diverse systems that provide a wide variety of benefits such as water quality improvement, flooding control, and important habitat.



Wetlands are regulated features (i.e., there are laws protecting wetlands); therefore, defining what is and is not a wetland has become standardized. For a site to be considered a wetland, three factors need to be present:

1) wetland hydrology, 2) wetland soils, and 3) wetland plants. The wetland hydrology drives the entire ecology of the wetland system and can be widely variable. Some wetlands are sites of groundwater discharge. Other wetlands flood from adjacent lakes or rivers during snowmelt or high precipitation events, or form from seasonally saturated or ponded conditions. Wetland hydrology gives rise to certain indicators in the soil that develop under these conditions. These distinctive soil features provide habitat for plants that grow best in wetland conditions and are considered hydrophytic (water-loving).

Given these diverse factors, it is not surprising that wetlands occur in a wide variety of landscape positions and can take many different forms. Some wetland types, such as forested swamps and shallow emergent marshes, can occupy tens or hundreds of acres. Other types, such as Seeps and Vernal Pools, are quite small and best measured in square feet. While some wetlands typically feature standing water, others may have water present only at certain times of the year.

## *Why are they important?*

There has been a lot of scientific research on the role that wetlands play in our landscape. This role is usually discussed in terms of wetland functions and values. The Vermont Wetlands Program recognizes 10 different wetland functions and values:

- ❖ Water storage for floodwater and storm runoff
- ❖ Surface and groundwater protection
- ❖ Fish habitat
- ❖ Wildlife habitat
- ❖ Exemplary wetland natural community
- ❖ Rare, threatened and endangered species habitat
- ❖ Education and research in natural sciences
- ❖ Recreational value and economic benefits
- ❖ Open space and aesthetics



- ❖ Erosion control through binding and stabilizing the soil

Not every wetland performs every function or provides every value on this list. As part of wetland evaluation, a wetland ecologist performs a *functions and values assessment* to determine wetland significance; some wetlands may perform just one or two, others may not be significant for any of these (see Regulatory Considerations).

### *General Management Considerations*

In general, high-impact activities in wetlands should be avoided. When assessing the potential impacts to wetlands from a proposed activity, it is best to think of protecting the functions and values of that wetland. This involves first determining what functions and values make the wetland significant, then assessing if the proposed activity would negatively affect the wetland's ability to perform that function. In many cases, the proper functioning of a wetland requires an undisturbed wetland buffer.

Also, wetlands provide important nesting habitat for migratory birds and waterfowl, such as the great blue heron. Wetlands with active heron rookeries are extremely vulnerable to disturbance. Recreational access should be limited during nesting season. Keep in mind, most activities in wetlands and the 50-foot wetland buffer are regulated by law (see Regulatory Considerations).

### *Regulatory Considerations*

Impacts to wetlands are regulated by both state and federal law. In Vermont, the Wetlands Program (part of the Agency of Natural Resources, Department of Environmental Conservation (DEC)) oversees enforcing the wetland regulations for the state. Some wetlands are also under the jurisdiction of the federal Clean Water Act and are regulated by the Vermont field office of the U.S. Army Corps of Engineers. According to Vermont state law, wetlands are classified as Class 1, Class 2, or Class 3.

Class 1 wetlands are those that are exceptional for a number of the functions and values and have state-wide significance. There is only a handful of Class 1 wetlands in the state, and these typically have are protected by a 100-foot buffer. Class 2 wetlands (the majority of the mapped wetlands in the state) are those wetlands that perform at least one of the functions and values listed above. These are also referred to as “significant” wetlands and are typically protected with a 50-foot buffer. Most activities in the wetland or buffer of Class 1 and 2 wetlands require a Wetland Permit from the Vermont Wetlands Program. Wetlands that do not perform any of the functions or values listed above are considered Class 3 wetlands and are not regulated by the State of Vermont. Please note, while Class 3 wetlands are not regulated, they maybe provide important values and functions. For example, forested seeps may be classified as Class 3 and provide emergent vegetation vital to black bears emerging from spring hibernation.

The US Army Corps of Engineers (ACOE) does not break wetlands into different classes based on functions and values. The ACOE authority comes from the Clean Water Act, so any wetland associated with surface waters or with a significant nexus between the wetland and surface waters is under ACOE jurisdiction. Because this can get a bit complicated, it is best to assume that all wetlands fall under ACOE jurisdiction. Under many circumstances, the ACOE has certain impact thresholds corresponding to different levels of permitting required, including a “self-





verifying” threshold. This “self-verifying” level generally means that activities that impact less than designated square footage, if some general conditions are met, do not require a permit.

If you think there is a wetland on your town forest that may be directly or indirectly impacted by a project, it is recommended that you contact a state wetlands ecologist and the Army Corps of Engineers.



## Wetlands Management Matrix

Activity	Compatibility in Wetland*	Compatibility in Buffer*	Comments (seasonal restrictions, buffers, mgmt.)
<b>Hiking Trails</b>	N	Y	Small, single track hiking trails that do not involve tree clearing may be compatible in the wetland buffer. Care should be taken not to disrupt local hydrology near the wetland. Proper trail construction to prevent soil erosion is crucial. Poorly constructed trails can divert or concentrate drainage patterns resulting in altered hydrology.
<b>Biking Trails</b>	N	Y	See comments for Hiking Trails
<b>X-C Ski Trails</b>	N	Maybe	Single track cross country ski trails may be compatible, see comments for hiking trails. Wider groomed ski trails that involve clearing may or may not be compatible in the wetland buffer, depending on the nature of the wetland and the degree of proposed impacts.
<b>ATV trails</b>	N	N	Creation and use of ATV trails are generally not compatible in wetlands or wetland buffers. ATV traffic has the potential for creating soil disturbance and disrupting local hydrology. ATV traffic has numerous, well documented, negative impacts on many wetland functions and values.
<b>Snowmobile Trails</b>	N	N	Wide, groomed snowmobile trails that involve clearing may not be compatible in the wetland buffer, depending on the nature of the wetland and the degree of proposed impacts.
<b>New Access Roads</b>	N	N	Impacts to wetlands and wetland buffers from new roads should be avoided.
<b>Structures/Buildings</b>	N	N	Impacts to wetlands and wetland buffers from new buildings should be avoided.
<b>Parking Lots</b>	N	N	Impacts to wetlands and wetland buffers from parking lots should be avoided.
<b>Forestry/Logging</b>	C	C	Certain silvicultural activities and forestry operations are compatible in wetlands and wetland buffers; however, without proper planning and care, these activities can cause significant negative impacts to the wetland system. Forest management in these areas should adhere to Vermont AMP's. See links to guidelines in the Resources section.
<b>Camping</b>	N	Y	Limited, low impact camping may be appropriate in a wetland buffer, depending on the nature and extent of the impact and the characteristics of the wetland.
<b>Sugaring</b>	N	Y	Sugaring practices are mostly compatible with the wetland buffer, provided they do not cause soil disturbance or alter hydrology.
<b>Extraction (gravel, sand)</b>	N	N	Extraction is not compatible.

Compatibility of activities was considered on three levels- Yes (Y), No (N), and Compatible if the considerations are followed (C).



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# Rare, Threatened or Endangered Species

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## *What are they?*

Rare, threatened, or endangered (RTE) species are those plant or animal species that are imperiled in the state. An “endangered” species is one whose continued existence in the state is in jeopardy. A “threatened” species is a species that may become endangered in the foreseeable future. A rare species is a species that may become threatened or whose populations are low enough to cause concern. Both the “threatened” and “endangered” categories are legal designations the result of a species being



placed on either the Vermont State or the US Federal Threatened or Endangered species list. The “rare” designation is a more informal category of species that is given to a species by Vermont Agency of Natural Resources biologists.

Every species in Vermont is ranked according to how common or rare it is in the state (S-rank). The scale is a number ranking of S1-S5. S1 indicates a very rare species; S2 rare; S3 uncommon; S4 common, and S5 indicates a species that is very common and widespread in the state. The S-rank of a species is continually updated based on new information and is independent of the legal “threatened” or “endangered” listing.

## *Why are they important?*

Conserving biodiversity is the cornerstone of the conservation movement today. Maintaining biodiversity has been linked to healthy, functioning ecosystems, and so the loss of biodiversity threatens the integrity of those natural systems. This is especially true in light of our rapidly changing climate and the introduction of invasive exotic plants and pathogens.

## *General Management Considerations*

Impacts on RTE species can be “Direct” or “Indirect.” “Direct” impacts are those that directly harm an individual plant or animal. Indirect impacts are those that may not result in immediate harm to an individual but may negatively affect the individual in more subtle ways; these latter impacts are typically actions that affect the quality, diversity, or abundance of an RTE species’ habitat.

All impacts, direct or indirect, on RTE species should be avoided. A biologist from Vermont Agency of Natural Resources should be consulted if of impacts on RTE species is expected.



## *Regulatory Considerations*

The Vermont Endangered and Threatened Species Rule (10 V.S.A. 5401-10) protects listed species in the state, while the Federal Endangered Species Act (ESA, 1973) protects federally listed species. For a species to be protected under these laws, it must be officially listed as threatened or endangered. Under state law, Vermont ANR prohibits the “taking” of any listed species without a permit. In addition, critical habitat for a listed species may also be protected.

In addition to the legal protections of listed species, ANR often requests avoidance and minimization for any proposed impacts to non-listed rare species. Typically, these come up during other permitting processes such as Act 250, Section 248, or wetlands permitting.

If any S1-S3 ranked species occurs on your town forest and may be impacted by a proposed activity or development, the Vermont Natural Heritage Inventory should be consulted.

## *Rare, Threatened, and Endangered Species Management Matrix*

Impacts on RTE species can vary widely depending on the nature of the activity and the RTE species involved. For this reason, specific management recommendations in a table cannot be provided. Managers should check the ANR BioFinder or Natural Resource Atlas for the presence of any Rare, Threatened or, Endangered species. In general, impacts should be avoided in these areas.





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# Floodplain Forests

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## *What are they?*

Floodplain Forests are natural communities that occur along the rivers and lakes in the state. These forests have evolved to thrive under these conditions the natural (sometimes drastic) seasonal flooding events that occur along our large rivers and streams. There are five different natural community floodplain forest types currently recognized in the state. Most are dominated by silver maple trees, though some (on drier levees) are mixed with sugar maple, and one (mainly in the Northeast Kingdom of Vermont) includes conifers. An undisturbed floodplain forest is a beautiful place of towering trees forming a dense canopy over an open understory of tall ferns.



Unfortunately, the location of floodplain forests along major rivers with fertile soils and flat topography has made them preferred sites for development and agriculture. Though once a widespread and abundant natural community, only small fragments now remain. In addition, the remnant patches of floodplain forest are often highly infested with non-native invasive plant species.

## *Why are they important?*

Floodplain forests occupy a unique place on the landscape: in the flood zone along major rivers, streams, and lakes. Their forested nature and association with these surface waters make them incredibly important for a wide range of ecological functions and values. They help to mitigate flooding and soil loss/erosion during flood events, by slowing the downstream flow of water. Since they are well-vegetated, the roots help to bind the soil and prevent erosion during these flood events. They are also linked to improved water quality, filtering out excess nutrients before they reach surface waters. Intact floodplain forests can also act as wildlife travel corridors, and provide important habitat for fish and other aquatic organisms.

## *General Management Considerations*

Most remnant floodplain forests are relatively small sites occupied by rare or uncommon natural communities, and many are mapped wetlands. Any development or activity that would have a negative impact on them should be avoided. One of the most challenging aspects of managing floodplain forests is managing non-native invasive plant species; see the Resources section for more information.

## *Regulatory Considerations*

Most floodplain forests are wetlands and, therefore, subject to State and Federal wetland regulations (see Wetlands). In addition, most are located within FEMA flood zones and state delineated River Corridors and subject to regulations from those programs.



## Floodplain Forests Management Matrix

Activity	Compatibility	Comments (seasonal restrictions, buffers, mgmt.)
<b>Hiking Trails</b>	Y	Hiking trails are generally compatible, depending on wetland status and natural community type.
<b>Biking Trails</b>	Y	Biking trails are generally compatible, depending on wetland status and natural community type.
<b>X-C Ski Trails</b>	Y	Ski trails are generally compatible, depending on wetland status and natural community type.
<b>ATV trails</b>	N	ATV trails are generally not compatible. It is easy for an ATV to go off-trail in these sites. Excess ATV use can cause erosion and further open the natural community up to invasive plant species.
<b>Snowmobile Trails</b>	Y	If snowmobile trails are limited in extent and well-controlled, they can be compatible, depending on wetland status and natural community type. Erosion and invasive species are not generally a concern for this winter-only use.
<b>New Access Roads</b>	N	Since these communities are uncommon or rare, impacts from new access roads should be avoided.
<b>Structures/Buildings</b>	N	Since these communities are uncommon or rare, impacts from new buildings should be avoided. In addition, state regulations may preclude this development.
<b>Parking Lots</b>	N	Since these communities are uncommon or rare, impacts from new parking lots should be avoided. In addition, state regulations may preclude this development.
<b>Forestry/Logging</b>	C	Since these communities are uncommon or rare and typically very small, allowed silvicultural activity should be limited to activity that maintains and restores floodplain community functions. Forest management to control invasive plant species or encourage desirable canopy species can be considered.
<b>Camping</b>	Y	Limited rustic camping may be compatible, depending on wetland status and natural community type. Maintaining an area of exposed soils can encourage invasive plant species and pose an erosion risk and should be avoided.
<b>Sugaring</b>	Y	Sugaring operations are generally compatible, depending on wetland status and natural community type.
<b>Extraction (gravel, sand)</b>	N	Extraction activities would cause irreversible harm to these uncommon and rare natural communities and decrease their functionality as outlined in the text.

Compatibility of activities was considered on three levels- Yes (Y), No (N), and Compatible if the considerations are followed (C).



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# Streams/Rivers

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## *What are they?*

A stream can be defined as the full length and width, including the bed and banks, of any watercourse. A stream has a channel that periodically or continuously contains moving water, has a defined bed, and has banks that serve to confine water at low or moderate flows. “Streams,” also include “intermittent” and “ephemeral” streams that do not have surface water flow throughout the year and/or throughout the defined channel. Riparian buffers are defined areas on either side of a stream which are managed, or left unmanaged, to protect their function. (ANR, 2005)



## *Why are they important?*

Streams and riparian buffers provide important functions and values on the landscape. Streams not only provide the water that plants and animals depend on for survival but also habitat for aquatic biota. Riparian buffers support and protect that habitat and biota in several ways. The following is a list of some of the significant functions and values provided by riparian buffers:

- ❖ Surface and groundwater quality: provides temperature and light control; filtration of sediments, nutrients, pathogens, and toxins in runoff; infiltration and maintenance of streamflow
- ❖ Leaf litter and woody debris: provide food and cover for aquatic species as well as structural habitat diversity within the stream channel
- ❖ Channel stability: prevents excessive scour and erosion of streambanks
- ❖ Wildlife corridor: If large enough, provides movement corridor for terrestrial wildlife

Small headwater streams, as are often found in forested environments, have the greatest potential to accept and transport sediment. It is important that they are maintained in an undisturbed vegetated condition to help trap and slow the flow of pollutants downstream. Removing vegetation from the banks of small, shaded streams can have a much greater impact on stream temperature and aquatic habitat than removing vegetation from larger rivers, where only a fraction of the water is shaded. (Hawes and Smith, 2005)

## *General Management Guidelines*

**Stream Crossings:** the location where recreational or silvicultural trails cross streams can have a significant impact on the movement and distribution of aquatic species. A high-quality stream crossing accommodates wildlife and aquatic organism movement and minimizes habitat fragmentation. Stream crossings should be designed to maintain the course, the current, and the



cross-section of the natural stream channel and maintain existing in-stream conditions. Stream crossings should be strategically located to minimize the number needed and to minimize impacts to the watercourse. Crossings should be constructed perpendicular to the channel and span the width of the channel. (Vermont Department of Fish and Wildlife, 2009)

Bridges, rather than culverts, are generally recommended for recreational stream crossings and may be appropriate for silvicultural crossings. Culverts often cause changes to channel alignment, channel diversity, and hydraulic conditions, which may degrade habitats above and below the structure. An undersized stream crossing can lead to bank erosion, flooding of adjacent property, or failure of the structure. Culverts can be designed to maintain natural stream substrates within the structure and minimize disruption to the channel and riparian corridors. The timing of construction, erosion, and sediment control planning and post-construction revegetation are all critical components of a successfully constructed stream crossing. (Vermont Department of Fish and Wildlife, 2009)

Riparian Buffer: The State of Vermont generally identifies a riparian buffer for intermittent and perennial streams, which vary from 25' to 100' buffer depending on the use being considered or the water feature being protected. Buffers generally begin at the top of the bank or top of the slope and extend away from the water on either side of the stream or river. The functions and values of the riparian buffer zone are dependent upon its naturally vegetated and undisturbed condition. For these reasons, activities requiring extensive vegetative clearing and/or earth disturbance (cut or fill) are not compatible. Activities that require only minimal vegetative clearing and/or earth disturbance can be compatible in the riparian buffer but may require seasonal restrictions. (ANR, 2005)

### *Regulatory Considerations*

Individual towns may protect streams and riparian buffers through municipal land use/zoning ordinances. These will vary from town to town and should be consulted before project development and/or implementation.

The State of Vermont regulates streams through its Land Use and Development Law, Act 250. Specifically, under Criterion 1E, the State looks for the maintenance of undisturbed, naturally vegetated riparian buffer zones. Undisturbed is defined as no activities that may cause or contribute to ground or vegetation disturbance or soil compaction. Contact the Act 250 District Coordinator to determine whether a proposed project is subject to Act 250 jurisdiction.

The State of Vermont also regulates activities that involve construction or excavation in rivers and streams. Stream Alteration Permits regulate activities that take place in or along streams. The permit program is intended to prevent the creation of flood hazards, protect against damages to aquatic life, and protect the rights of neighboring landowners. Contact the district ANR river management engineer to determine whether a proposed project is subject to this regulation.

The U.S. Army Corps of Engineers (ACOE) regulates streams through its jurisdiction from Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act. The USAOE issues General Permits (GPs) for activities subject to ACOE jurisdiction. The General Permit NAE-2017-02232 (dated December 6, 2017) consists of 21 separate general permits. Because this can get a bit complicated, it is best to assume that all stream impacts fall under ACOE jurisdiction.





Under many circumstances, the ACOE has certain impact thresholds corresponding to different levels of permitting required, including a “self-verifying” threshold. This “self-verifying” level generally means that under certain square footage of impacts, if some general conditions are met, no permit application is required. Contact the Vermont Project Office to determine whether a proposed project is subject to this regulation.

## Streams/Rivers Management Matrix

Activity	Compatibility* in the Watercourse	Compatibility in the Riparian Buffer Zone	Comments (seasonal restrictions, buffers, mgmt.)
<b>Non-motorized Recreational Trails (Hiking, Biking, Skiing)</b>	Y	Y	<u>Stream Crossings:</u> see considerations above, plus cross where the channel is narrow and clearly defined and where the banks are stable, and approaches are less than 10% grade; minimize tree clearing <u>Riparian Buffer:</u> primitive/unimproved trails through the riparian buffer are compatible; minimize tree clearing; no stumping
<b>Motorized Recreation Trails (ATV, Snowmobile)</b>	Y	Y	<u>Stream Crossings:</u> see above. <u>Riparian Buffer:</u> primitive/unimproved trails through the riparian buffer is compatible with minimal tree clearing; no stumping; avoid trails through wet areas; avoid creating ruts or standing water; close trails seasonally as needed.
<b>New Access Roads</b>	Y	N	<u>Stream Crossings:</u> Cross where the channel is narrow and clearly defined and where the banks are stable, and approaches are less than 10% grade; use bridges or culverts designed to meet aquatic organism passage guidelines to span the channel width; cross perpendicular to the watercourse; minimize tree clearing; use erosion controls during and after construction <u>Riparian Buffer:</u> New roads should not be constructed in the riparian buffer except for the necessary construction of stream crossings
<b>Permanent Structures/Buildings</b>	N	N	<u>Stream Crossing:</u> no structures or buildings in the stream channel <u>Riparian Buffer:</u> temporary structures that do not require clearing or fill (such as picnic tables and benches) are compatible
<b>Parking Lots</b>	N	N	Permanent structures that require extensive clearing and fill are not compatible
<b>Forestry/Logging/Sugaring</b>	C	C	<u>Stream Crossing:</u> Compliance with Forestry AMPs. <u>Riparian Buffer:</u> Compliance with Forestry AMPs and an approved forest management plan.
<b>Camping</b>	N	Y	Rustic/unimproved campsites within the riparian buffer are compatible
<b>Extraction (gravel, sand)</b>	Y	N	<u>Stream:</u> State of Vermont allows for the extraction of less than 10 cubic yards of instream materials annually. <u>Riparian Buffer:</u> extraction within the riparian buffer is not compatible

Compatibility of activities was considered on three levels- Yes (Y), No (N), and Compatible if the considerations are followed (C).



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# Early Succession Forests

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## *What are they?*

“Early successional forests” are areas dominated by young growth of tree and shrub species. Usually, these forests feature a dense growth of “shade-intolerant” species that prefer open, sunny conditions.

## *Why are they important?*

Early successional forests often have a high woody stem density, which can favor species such as a variety of mice, white-tailed deer, snowshoe hare, black bear, and a variety of predators. A young, dense canopy of trees provides habitat for a variety of birds, including the chestnut-sided warbler, common yellowthroat, and ruffed grouse. Some of these forests, especially old fields that are filling with shrubs, contain apple, hawthorn, cherry, and other berry-producing soft mast shrubs with high wildlife food value. With the natural reversion of fields to forestland (and the maturing of our forests) in Vermont, this habitat type has been in steep decline.



## *General Management Guidelines*

Without active human intervention, early successional forests often mature into closed-canopy forest habitats, which may no longer contain some of the unique attributes of an early successional forest, such as soft mast producing species. Reverting fields and pasture and other early successional habitats may be kept in early successional stages by periodic mowing or burning. If you wish to maintain early successional habitat, staggering treatments is recommended, with a portion of the area, rather than the whole area, managed by one of these techniques at a time. Maintain the presence of soft mast species such as apples. Avoid conversion of early successional habitat to trails, roads, parking areas, buildings/structures. To minimize any necessary impacts, locate projects on the edges of these habitat areas.

## *Regulatory Considerations*

No regulatory issues are governing early successional habitats.



## Early Succession Forests Management Matrix

Activity	Compatibility*	Comments (seasonal restrictions, buffers, mgmt.)
<b>Hiking Trails</b>	Y	Minimize the alteration and conversion of this habitat type during trail construction.
<b>Biking Trails</b>	Y	Minimize the alteration and conversion of this habitat type during trail construction. Attention should be placed on limiting soil erosion associated with these trails.
<b>X-C Ski Trails</b>	Y	Minimize the alteration and conversion of this habitat type during trail construction.
<b>ATV trails</b>	Y	Minimize the alteration and conversion of this habitat type during trail construction. Attention should be placed on limiting soil erosion associated with these trails.
<b>Snowmobile Trails</b>	Y	Minimize the alteration and conversion of this habitat type during trail construction.
<b>New Access Roads</b>	Y	Avoid the alteration and conversion of this habitat type. Limit new access roads to the edge of such habitats.
<b>Structures/Buildings</b>	N	The construction of buildings and associated infrastructure will diminish the size, continuity, and value to wildlife of these habitats and are not compatible.
<b>Parking Lots</b>	N	The construction of parking lots will diminish the size, continuity, and value to wildlife of these habitats and are not compatible.
<b>Forestry/Logging</b>	Y	Forest management activities may seek to maintain or create early successional habitat. Important fruit, nut, and berry-producing species should not be removed.
<b>Camping</b>	Y	Camping in existing open areas is compatible. Clearing of young forests for camping is not compatible.
<b>Sugaring</b>	N	Sugaring within successional habitat is not compatible. Sugaring operations around forest openings are compatible.
<b>Extraction (gravel, sand)</b>	N	Gravel extraction represents a loss of early succession habitat and is not compatible.

Compatibility of activities was considered on three levels- Yes (Y), No (N), and Compatible if the considerations are followed (C).



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# Lakes and Ponds

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## *What are they?*

Lakes and ponds are relatively large bodies of water that are “standing” or moving slowly (apart from any river or another outlet that serves to feed or drain them). Technically, ponds are shallower than lakes, which results in aquatic plants growing throughout the pond and the water often freezing to the bottom. Lakes tend to be deeper and have some areas where the photic zone (depth that light penetrates) does not go to the bottom, and aquatic plants do not grow. These differences in depth lead to a whole host of differences in lake turn-over and aquatic ecology. However, colloquial use of the terms “lake” and “pond” are a little looser. What is commonly known as a lake may technically be a pond, and what is commonly known as a pond may be called a lake.



## *Why are they important?*

Ecologically speaking, lakes and ponds provide habitat for a wide range of plants and animals that are found only in these lentic (standing water) systems. Aquatic birds and mammals such as beaver, otter, muskrat, herons, eagles, osprey, and a whole host of waterfowl rely on these habitats. In addition, there are many species of rare, threatened, and endangered plant species that grow only in these specialized habitats found in lentic systems.

In addition to biodiversity, lakes and ponds are important because humans use them in many ways. From sources of drinking water to swimming, boating, fishing, and playing, lakes and ponds are an integral part of our natural environment.

## *General Management Considerations*

Management of lakes and ponds consists of managing both the aquatic system as well as the surrounding shorelines, which have a direct and significant impact on the health of the lake or pond. The most common aquatic management that occurs is the control of aquatic nuisance or invasive species. In terms of shorelines management, in 2014, Vermont passed a law that provides guidelines and regulations intended to protect the shorelines of lakes and ponds (thereby helping to protect the ecology of the lentic systems).

## *Regulatory Considerations*

Placement of permanent structures within lakes and ponds is regulated by the U.S. Army Corps of Engineers, whose jurisdiction includes all navigable waterways in the U.S. The Vermont Department of Environmental Conservation (DEC) Lakes and Ponds Management and Protection Program, also regulates development and activities along the shores of lakes and ponds greater than 10 acres in size. The Shoreland Protection Act requires a permit for any new development,



redevelopment, or clearing within 250 feet of the mean water level of the lake or pond. See the links in the Resources section for more details.

## Lakes and Ponds Management Matrix

Activity	Compatibility in water*	Compatibility on shoreline (250' from water) *	Comments (seasonal restrictions, buffers, mgmt.)
<b>Hiking Trails</b>	NA**	Y	Hiking trails that do not require cutting of trees can be compatible on the shoreline.
<b>Biking Trails</b>	NA	Y	Biking trails that do not require cutting of trees can be compatible along the shoreline.
<b>X-C Ski Trails</b>	NA	Y	Ski trails that do not require cutting of trees may be compatible.
<b>ATV trails</b>	NA	N	ATV trails generally require cutting of trees, which is regulated by the VT Shoreline Protection Act. Potential erosion and drainage issues may arise.
<b>Snowmobile Trails</b>	NA	N	Creation of snowmobile trails generally requires cutting of trees.
<b>New Access Roads</b>	NA	N	New access roads should be placed outside of the 250' shoreline zone to protect the lake/pond system.
<b>Structures/Buildings</b>	NA	N	New buildings should be placed outside of the 250' shoreline zone to protect the lake/pond system.
<b>Parking Lots</b>	NA	N	Parking lots should be placed outside of the 250' shoreline zone to protect the lake/pond system.
<b>Forestry/Logging</b>	NA	C	Some silviculture is acceptable in the shoreline zone, based on criteria in the Shoreline Protection Act though some requirements must be adhered to before and during implementation.
<b>Camping</b>	NA	Y	Rustic camping requiring no or minimal clearing may be compatible but may be regulated by Vermont DEC.
<b>Sugaring</b>	NA	Y	Sugaring operations are generally compatible.
<b>Extraction (gravel, sand)</b>	N	N	New gravel pits should be placed outside of the 250' shoreline zone to protect the lake/pond system.
<b>Swimming/Beach Activities</b>	Y	Y	Swimming and beach activity is generally compatible. Development of new beaches is regulated by Vermont DEC.

Compatibility of activities was considered on three levels- Yes (Y), No (N), and Compatible if the considerations are followed (C).

\*\* NA- Not Applicable





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# Technical Assistance

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## Vermont Department of Forests, Parks and Recreation

VT Department of Forests, Parks, and Recreation County Foresters are available to assist communities in managing and stewarding their town forest. County Foresters are a great resource when your community is considering potential activities and uses in the town forest as it relates to the impact on natural resources. To find contact information for your County Forester, visit: <https://fpr.vermont.gov/forest/managing-your-woodlands/county-forester-program>

## Vermont Fish and Wildlife Department

VT Fish and Wildlife Department staff are available to consult with communities to review of known wildlife and fisheries resources of interest and the potential for impacts. Staff may be available to provide on-site technical assistance in natural resource identification. To find contact information visit: <https://vtfishandwildlife.com/conserve/>



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# General Resources

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## Mapping Resources

Agency of Natural Resources. Biofinder. Available online at <https://anr.vermont.gov/maps/biofinder>

Agency of Natural Resources. ANR Atlas. Available online at <https://anrmaps.vermont.gov/websites/anra5/>

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