

*You may keep this brochure
or return it to the box for others to use.*

WHITE RIVER LEDGES

Natural Area

INTERPRETIVE BROCHURE



*The White River Valley, viewed from
ledges of the natural area.*

Welcome to the White River Ledges Natural Area!

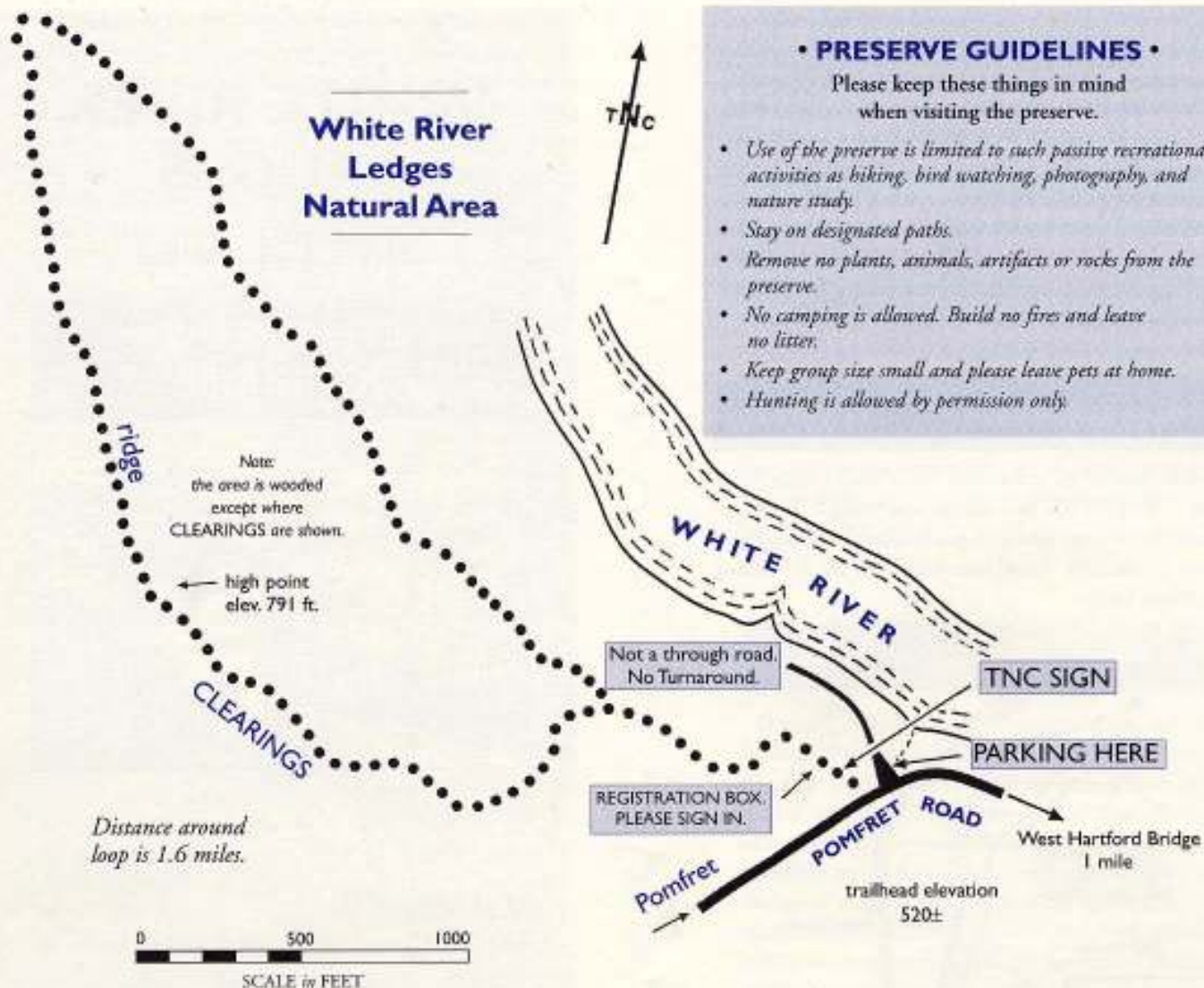
This 187-acre preserve is owned and managed by the Nature Conservancy. The protected area is located within a biophysical region called the Southern Vermont Piedmont, and contains several natural communities representative of that region, including Northern Hardwood Forest and Floodplain Forest. Thanks to visitors like you, who support and appreciate conservation, this natural area will continue to thrive for many future generations.

The purpose of this brochure is to provide the reader with information about the geologic and natural history of the land, its past and present uses, and its future. Please respect the plant and animal life as you proceed along the trail. We hope that you enjoy your walk through this beautiful natural area.

The Nature
Conservancy 

SAVE THE LAST GREAT PLACES ON EARTH

POMFRET / SHARON, VERMONT



Glacial History of White River Ledges

Between 3 million and 10,000 years ago, the area that is now Vermont experienced an ice age. During this period, Vermont was covered four separate times by enormous masses of ice called glaciers, which moved slowly southward from the Arctic and then retreated. The tremendous pressure and weight of each glacier as it moved was like a giant abrasive, reshaping the landscape by eroding existing formations and depositing eroded materials in new places.

After the last glacier retreated approximately 10,000 years ago, the Southern Vermont Piedmont region was left with the rolling hills and broad valleys we see today. Glacial erosion scoured and rounded off peaks, and blanketed the hillsides and valleys with sediment and boulders. "Piedmont" literally means "foot-mountain" or "foot-hill," and this region is indeed composed of rolling foothills in the lee of the Green Mountains to the west.

The Importance of the White River

The White River, which flows past this natural area, is part of a greater watershed that drains into the Connecticut River to the east. Following the retreat of the glaciers, this watershed looked very different than it does today. A large lake of melted glacier water filled the Connecticut River valley as far west as the town of Randolph and further north than St. Johnsbury. Eventually, Lake Hitchcock, as it is referred to, drained and became the Connecticut River and its tributaries. Since then, the White River has existed for thousands of years and its flowing waters have helped to shape the valley in which it lies.

As you glimpse views on this hike, take a moment to consider how the river functions in this landscape. Rivers are like the veins of our continent; they transport and supply water and vital nutrients to the lands through which they flow. Under natural conditions, rivers like the White often flood their banks several times a year, usually in the spring or late fall. These floodwaters

deposit significant amounts of silt and organic material that enrich the soils of the surrounding land. In fact, many riverside plants and animals depend upon seasonal flooding for their survival. As the longest undammed river in Vermont, the White River is fortunate to retain its natural flooding cycles.

Another river process that affects the landscape is ice scour. In winter, large sheets of ice can form on the river's surface. The velocity of the river water underneath these ice sheets often breaks them into large blocks and carries them downstream or pushes them up onto the shore. These large ice chunks on the shore scour away all but the hardiest of plants, and help to maintain exposed shorelines and special plant communities.

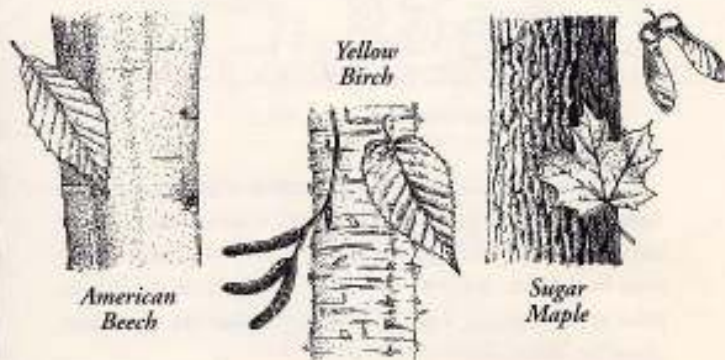
Rivers are also important habitat corridors for aquatic and terrestrial animals. Certain migratory fish such as Atlantic salmon depend upon river flows for their journey upstream to spawn. Mammals such as river otter, mink, raccoon and beaver use the river corridor to hunt, drink, wash, and in some cases, as shelter. Great blue herons, belted kingfishers, bank swallows, bald eagles, and several species of duck depend on the river's resources for food and daily travel. These are just a few of the many animals you may see in, on, and along Vermont's rivers.

Natural Communities

Natural communities are assemblages of organisms which occur in a particular physical environment. As you walk along the trail at White River Ledges Natural Area, you will pass through several variations of a natural community called Northern Hardwood Forest. Northern Hardwood Forests are found throughout the state, and are the most abundant type of forest in Vermont. Hopefully, this brochure will enhance your enjoyment of this and other Northern Hardwood Forests by helping you to identify some of the characteristic species and processes of this natural community.

NORTHERN HARDWOOD FOREST

Northern Hardwood Forests are found on gentle to steep slopes with moderately moist soils, at elevations below 2700 feet. They are generally dominated by three tree species: American beech, sugar maple, and yellow birch. These broad-leaved deciduous trees are easily identified from late spring through fall when leaves are present. Look at the illustrations below to help you identify these trees - can you pick them all out in the woods?



Other tree species also grow in Northern Hardwood Forests, such as hemlock, red spruce, white ash, red oak, white oak, white pine, and hophornbeam. Quantities and varieties of these trees will vary locally with the climate, slope, soil conditions, and past land uses of each forest.

In areas where the Northern Hardwood Forest has undergone some disturbance in past years, such as fire, logging, or clearing for agriculture, changes in vegetation are evident. These changes, which occur over time in response to a disturbance, are referred to as plant succession. As you near the highest point on the loop trail at White River Ledges, you will pass through an area that was once a sheep pasture. Here the forest is noticeably different - young white pines, an early-successional tree that grows well in open areas with disturbed soil, dominate the landscape. These stands of pine will eventually be replaced by hardwoods like those of the forest you have already walked through.



Rich Northern Hardwood Forest

RICH NORTHERN HARDWOOD FOREST

Along the trail at White River Ledges, there are several pockets of another natural community type: Rich Northern Hardwood Forest. Rich Northern Hardwood Forests occur where downslope movements of water through rich mineral bedrock provide vegetation with a steady supply of nutrients. As a result, plant diversity and overall growth are greater here than in Northern Hardwood Forests. Hardwood trees such as sugar maples, white ash, sweet birch, black cherry and basswood thrive in Rich Northern Hardwood Forests. Herbaceous plants of the forest floor are especially numerous, including blue cohosh, wood nettle, and many spring wildflowers. Look for the elegant maidenhair fern as you walk along the trail.

OTHER RIVERSIDE COMMUNITIES

Several other natural communities are directly adjacent to the White River. Floodplain forests are found on the lowest land near the river, where soils are subject to annual flooding but become relatively dry during the summer months. Clays and silts deposited by the flooding river are rich in organic matter, and help these forests to develop. Along this section of the White River, floodplain forests are found in small patches on either side of the river, and on small islands. They are dominated by box elder (an early successional species which may eventually be replaced by silver maple), with occasional cottonwoods and white ash. The forest floor is often covered with chest-high ostrich ferns, as well as other herbs, ferns, and sedges. Floodplain forests are no longer common in Vermont, because many of the state's nutrient-rich floodplains have been converted to agricultural lands.



*Silver-Maple Ostrich Fern
Riverine Floodplain Forest*

Another rare riverside community is the Calcareous Riverside Seep. This natural community occurs only in areas where calcium-rich groundwater seeps through exposed bedrock on the river shore. The bedrock is maintained in an open condition by annual flooding and ice scour on the river. Larger woody plants cannot gain a foothold here, but the nutrient-rich water seeping through bedrock crevices is an ideal habitat for many unusual grasses, forbs, sedges and mosses.

History of Human Land Use

The human history of the White River Ledges area goes back thousands of years. As early as 9,500 years ago, bands of Native Americans lived in the major river valleys of what is now Vermont. They were hunters and gatherers, and probably moved with the seasons to find adequate food and shelter. By the time the Europeans reached the area, Native Americans of two major language groups (Iroquois and Algonquin) were living in the region. These groups sometimes burned areas to enrich the soil, create fields for planting, or promote new growth for game species.

When European farmers moved in, they cleared large areas of forest and worked the land for agriculture. Richer lowlands along the White River were very desirable for cultivation. As the logging industry developed, the White River (along with the Connecticut River) became a major transportation corridor for felled softwood between northern Vermont and the pulp mills of Southern New England. Logging crews typically followed large rafts of logs downriver in long narrow boats that could handle rapid waters.

White River Ledges Natural Area has had its own history of ownership and land use. The floodplain area adjacent to the river was converted to agricultural land long ago, and remains in use today by organic farmers. In the recent past the area was also used as a sheep pasture. Since TNC purchased the land in 1998, the sheep have been relocated in order to protect the natural communities here. As we have seen, however, past land use activities can have long-lasting, observable impacts upon the landscape.

Exotic Invaders

One of the biggest threats to natural communities like those found at White River Ledges Natural Area is a direct result of human activity – invasive exotic vegetation. Non-native plant species, or exotics, have been introduced from other countries or regions. Sometimes they escaped from gardens, or they were deliberately planted as ornamentals. Some exotic plants can spread very quickly and will out-compete native plants for available nutrients, space, and sunlight. If left unchecked, invasive exotics can entirely displace rarer native plants and lead to their local extinction.



Honeysuckle

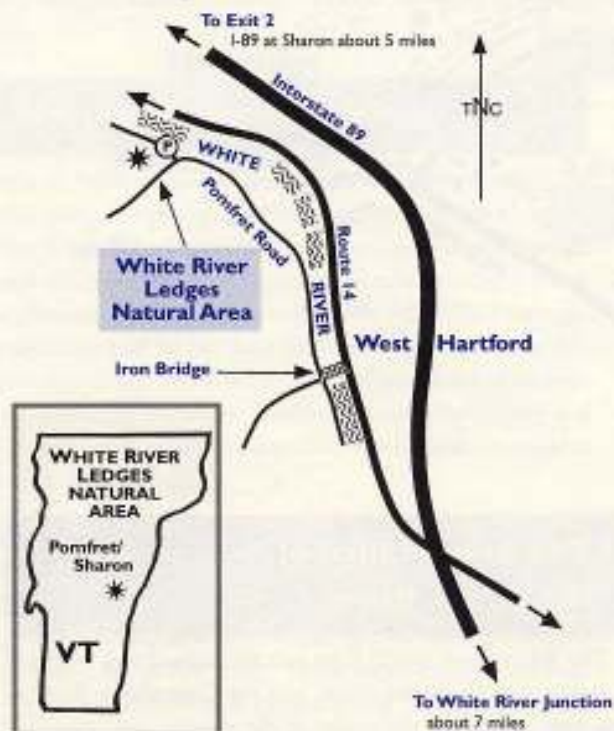
Several invasive exotic plants are a problem at White River Ledges Natural Area. In the Northern Hardwood Forest you are hiking through, there are patches of bush honeysuckle, an invasive plant that grows quickly and shades out native plants.

Along the river corridor, many invasive plants spread very rapidly, since their seeds or root fragments are carried by flowing water or by animals using the river as a travelway. Common buckthorn, Japanese knotweed, common reed, and cypress spurge are just a few of the species that are a problem along the White River.

The Nature Conservancy is committed to protecting natural communities and to making sure that native vegetation and natural processes continue in our preserves. Therefore, TNC is closely monitoring several invasive species at White River Ledges Natural Area. A Weed Management Plan has been developed for the control and/or elimination of invasive exotics that are established on the preserve, and for the prevention of new exotic invasions. As the management plan is implemented, results will be monitored to ensure that White River Ledges can maintain healthy, functioning natural communities for generations to come.

Congratulations!

You have finished the trail loop at White River Ledges Natural Area. We hope you have learned something from the experience that you can take with you and apply to other natural areas in Vermont. Good luck and thank you for visiting White River Ledges.



The Nature Conservancy 

SAVING THE LAST GREAT PLACES ON EARTH

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