

CHAPTER 3—Sense of Place

Warren’s boundaries encompass the upper watershed of the Mad River. The town’s eastern and western borders are defined by the parallel ranges of the Northfield and Green Mountains. The two ranges come together to form Granville Gulf to the south. Diverging ridges of the Green Mountains create a series of bowls drained by tributaries to the Mad River (Austin, Bradley, Clay, Lincoln and Stetson Brooks) to the west, and a plateau lies roughly between 1,200 and 1,500 feet elevation in East Warren. The Mad River plunges through the center of the town, where it flows north into a widening valley.

Historically, the town’s settlement patterns have been influenced by natural land forms and the distribution of natural features. East Warren’s broad plateau was among the town’s earliest settled areas and continues to be characterized by farming and residential development. Warren Village was located to take advantage of the hydro power of the Mad River and remains the center of the community. The high elevations and steep slopes of the Green Mountains support the town’s current primary economic base, alpine skiing and related tourism. Those same mountains contain some of the largest tracts of undeveloped forest and public land in the Mad River Valley.

Warren’s natural landscape is enhanced by its built environment. The interplay of natural and cultural features, unique to every community, forms a distinct “sense of place” that is easily recognized and valued by local residents. This chapter defines the unique blend of natural and cultural resources which shape Warren’s character, identifies threats to those resources, and recommends appropriate strategies for their use and protection.

Rural Character

Despite the **challenging diminishing** economic viability of **dairy** farming and forestry, Warren has retained much of its rural character. That character is created by the blending of complementary cultural and natural features, which are discussed in greater detail elsewhere in this and other chapters of the plan. It is useful to consider how these diverse features combine to shape the town’s rural character. For the purposes of this plan, rural character is defined by the following elements:

- **A working landscape**, defined by sustainable development and use of land-based resources, especially farming and forestry. Although local residents are increasingly less dependent upon the land for their livelihood, the town’s landscape and historic settlement patterns continue to attract new residents and visitors, and thereby continue to support the town’s economic base;
- **A healthy natural environment**, including clean air and water, expanses of open land, healthy wildlife populations, and a common commitment to the protection of those shared resources;
- **Diverse cultural amenities**, including historic buildings and settlement patterns, small-scale local institutions and organizations, and commercial, recreational and social opportunities that exceed those available to residents of many larger communities; and,

- **A rural lifestyle**, marked by relative privacy, peace and solitude; access to the land and nature; a lack of formality; and a strong sense of independence and individualism that is coupled with, though sometimes at odds with, a perception of community spirit and shared responsibility.

The elements which contribute, independently and in combination, to the Town's rural character and sense of place have been well documented. In 1988 the Mad River Valley Planning District (MRVPD) initiated a program to inventory and to protect the identifiable landscape features that combine to create the Valley's rural character. With the assistance of the Vermont Division for Historic Preservation, the MRVPD prepared the Mad River Valley Rural Resource Protection Plan.

Since 1988, the MRVPD, with the support of several agencies, municipalities and individuals from within and outside of the Mad River Valley, has actively pursued the goals and recommendations of the Rural Resource Plan. The success of these efforts was documented in the 1998 publication *Kicking Stones Down a Dirt Road: Rural Resource Protection in Vermont's Mad River Valley*.

The Mad River Watershed Conservation Partnership -- a collaboration of the Friends of the Mad River, the MRVPD, and the Vermont Land Trust was formed in 2000 to focus on local land conservation. The Partnership updated the 1988 Rural Resource Protection Plan in 2003/04 by conducting a new inventory of natural and cultural features in the watershed based on input from the Mad River Valley community on conservation priorities. The project used GIS technology (Geographic Information System) to document where these features exist and where they overlap. The inventory allows the Partnership, town boards, and other organizations to easily consult a compendium of data when evaluating the Mad River watershed's landscape and natural features and thinking strategically about which lands are the most important to conserve.

In addition to the MRVPD's rural resource protection efforts, which continue to receive the financial support of the town, the following discussion provides a framework for specific goals, policies and strategies to guide the use, protection and enhancement of the natural and cultural resources that contribute to Warren's rural character.

Natural Resources

Warren's natural resources are among the town's most valued assets. In response to the 2004 Questionnaire, registered voters overwhelmingly supported the proposal to allocate funds to the Warren Conservation Reserve Fund annually. This money could be used to purchase and protect critical agricultural, forested and open lands in the town. The strength of this support has been expressed in numerous planning processes and public debates over the years and is a defining characteristic of the community.

Warren's natural resources are fragile and especially susceptible to degradation due to land use and development activities. Many serve important ecological functions, such as water filtration, wildlife habitat and stormwater retention. The following discussion describes the natural resources found in Warren and the limitations and opportunities for their use and protection.

Climate

Climate describes weather conditions characteristic of an area over time. Climate is an important planning and design consideration because of its effect on soil erosion, plant growth, air quality, storm water runoff and flooding, groundwater supplies, road maintenance, energy demand for cooling and heating, access to alternative energy sources, and the viability of weather-dependent industries such as skiing.

In winter months, Vermont's northern climate is dominated by cold, dry Canadian air. The summer months bring warm, moist air from the Gulf of Mexico. Weather patterns vary locally with topography and relief. Warren experiences slightly lower average winter temperatures and greater precipitation than other parts of Vermont because it is located on the eastern side of some of the state's highest mountains.

According to data collected by Sugarbush Resort, average annual rainfall between 1986 and 1996 was 42 inches. Average annual snowfall was approximately 200 inches for the same period. Because of frequent winter thaws, however, natural snowfall does not provide consistent snow cover for skiing without the addition of artificial snow.

Air Quality

Weather patterns, especially wind, affect air quality. As in most of Vermont, Warren's air quality is exceptional. The town lies within a Class II "attainment" or "clean air" region as defined by Vermont's Air Quality Implementation Plan. As such, moderate changes in existing air quality are permissible. However, a maximum level of pollution, as defined by emissions, cannot be exceeded.

Given the lack of industrial development, local air quality concerns are limited mainly to emissions from traffic, heating systems (woodstoves in particular), diesel engines associated with Sugarbush's snow-making system, which is subject to state air quality permits, and some agricultural practices. While no serious problems have been identified, the cumulative effect of these sources will likely increase with additional growth and may have a greater impact on air quality in the future. Of more immediate concern are impacts on air quality resulting from activities out-of-state, which pose a serious threat to fragile, high elevation ecosystems.

Geology

Geologic events of the distant past have directly affected Warren's topography, soils and drainage patterns, which in turn have influenced local development patterns. The rock underlying Warren, originally sedimentary, was metamorphosed in Cambrian times, overturning, folding, and compressing the original layers to such an extent that their composition has become brittle. Generally, bedrock in Warren consists of highly metamorphosed graywacke, phyllite, gneiss and schist.

The bedrock beneath Warren folded with a general north-south orientation. A gentle dome once crested several miles above the present mountains. The theory of plate tectonics hypothesizes that two plates collided, which caused the pressure that formed the Green Mountains. Since then, the rock has been slowly eroding. Only the eastern part of the dome remains. The Green Mountains and the Northfield Range have eroded steeply on their western slopes and gently to the east. The eastern slopes have eroded with

secondary bowls, which were probably caused by glacial activity in much more recent geologic times.

Retreating ice at the end of the most recent period of glaciation, approximately 10,000 years ago, left gravel deposits in a number of places. Gravel can be found along terraces at higher elevations, along the receding glaciers' edges and in river deltas and lake beaches in the valley at about the 900-foot contour. As the glaciers melted, a lake appeared above the present Lake Champlain, reaching up the Winooski and Mad River valleys. At its shoreline, beaches and deltas formed, leaving gravel deposits such as those found near the Bobbin Mill and elementary school.

The most obvious implication of Warren's geologic history is the varied landscape comprised of broad plateaus, steep hillsides, intermittent knolls and defined ridgelines. These features have shaped past settlement patterns and continue to be an important development consideration, especially scenic resources and fragile features.

Soils

Areas that depend on on-site disposal of wastewater, like Warren, must be aware of soil conditions and how they shape the location and intensity of development. Soils found in Warren can generally be divided into gravelly soils deposited on terraces and old lake bottoms and soils that formed in glacial till in the mountains. Terrace and lake deposits are found in the floodplain of the Mad River Valley and in the Clay Brook Bowl near the Sugarbush Inn.

Development Capability

The town's on-site wastewater disposal ordinance was updated in 1999. These regulations require that on-site disposal (septic) systems be designed in accordance with Vermont Department of Environmental Conservation's Small Scale Wastewater Treatment and Disposal Rules (1996). The Vermont Rules were updated in 2002 (Wastewater System and Potable Water Supply Rules - Effective on August 16, 2002) and were to be updated again in 2004. These rules establish design standards dependent, in part, upon site and soil conditions. Warren's regulations will be updated to reference the current state regulations.

To assist in evaluating soils for on-site wastewater disposal, the U.S. Natural Resource Conservation Service (NRCS) has evaluated the soil types found in Vermont and rated them according to their suitability for on-site disposal. Map #4 shows the distribution of these soil categories throughout the Town. Table 3.1 describes the soil classes found in Warren. The scale of the map and inventory does not allow this information to be used for site-specific analysis. Generally suitable soils can be found along the Valley bottom, especially in and around Warren Village, and throughout the Clay, Bradley, Lincoln and Stetson Brook watersheds. The soils in the Northfield range are generally unsuitable.

Agricultural Lands

The lands that are best suited for farming are classified as prime farmland and farmland of statewide importance. Prime farmland has soils which, due to their chemical and physical properties, possess the highest potential productivity and the fewest

limitations for farming. They have high potential for sustained agriculture and little or no limitation for a wide variety of crops adapted to Vermont's climate. Farmland classified as being of statewide importance has good potential for growing crops, but one or more limitations will restrict the choice of crops and require more intensive management than farmland in the prime category. Both categories are a finite resource upon which the future of agriculture depends. Prime farmland and farmland of statewide importance agricultural soils are shown on Maps 2 & 11 they comprise about 17% of the town. The cultural, economic and environmental aspects of agriculture and farmland preservation are discussed in greater detail later in this chapter.

Earth Resources

No commercial mineral deposits have been located in Warren. Sand and gravel have been excavated over the years. Map 2 shows the general location of identified deposits. Extraction poses the risk of adverse social and environmental impacts on the community. Town-owned sources of sand and gravel are running low, and some future extraction of these resources from private land should be anticipated. Impacts include the following:

- reduction in groundwater recharge and filtration, and possible contamination resulting from on-site storage and disposal of materials.;
- alteration of surface drainage patterns resulting in increased runoff, soil erosion and stream sedimentation;
- destruction of natural or cultural resources;
- noise, dust and increased truck traffic;
- diminished scenic quality of the landscape and limitations on the future use of the site; and,
- reduction in neighboring property values.

Many of these impacts can be avoided or mitigated through careful site planning, operation and reclamation. The town's permitting process requires site reclamation and that adverse impacts to neighbors and the town be minimized.

Fragile Features

Fragile Features are those distinct environmental resources which serve important ecological functions, such as water filtration, wildlife habitat and stormwater retention, and which are especially susceptible to degradation due to land use and development activities. In Warren, these include wetlands, floodplains, steep slopes, Natural Heritage Sites, rivers and streams, groundwater, and wildlife habitat and corridors.

Wetlands

The State of Vermont defines wetlands as the transitional lands between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. Wetlands must have one or more of the following three attributes:

- 1) at least periodically, the land supports predominantly hydrophytes;

- 2) the substrate is predominantly undrained, hydric soil; and
- 3) the substrate is not soil and is saturated with water or covered by shallow water at some time during the growing season of each year.

All wetlands in Vermont are designated as Class I, Class II, or Class III wetlands through the Vermont Wetland Rules. Class I wetlands are those wetlands that are exceptional or irreplaceable in their contribution to Vermont's natural heritage and are therefore so significant that they merit the highest level of protection. Class II wetlands are those wetlands, other than Class I wetlands, that are so significant, either taken alone or in conjunction with other wetlands, that they merit protection. Class III wetlands are those wetlands that have not been determined by the Water Resources Board to be so significant that they merit protection either because they have not been evaluated or because when last evaluated, they were determined not to be sufficiently significant to merit protection.

Except for the area by Blueberry lake, there are not expansive wetlands in Warren, and no Class I wetlands have been identified. However, many smaller Class II wetland areas have been identified. These provide important wildlife habitat and retain and filter large volumes of runoff. The National Wetlands Inventory (NWI), conducted by the U.S. Fish & Wildlife Service in the 1970's, identified 176 acres of palustrine (upland) wetlands in Warren. This information should be updated since wetland areas experience seasonal fluctuations and are subject to change due to land use activities. Not all significant wetlands in the Town were identified by the NWI. The NWI does, however, give a general indication of the distribution and concentration of wetlands in Warren, depicted on Maps 2 & 9. The Town's major wetland complex occurs on the upper reaches of Mill Brook. Although the creation of Blueberry Lake resulted in the elimination of some wetlands, a large expanse still remains and provides valuable wildlife habitat.

Loss of wetlands (especially palustrine wetlands) is an issue of national, statewide and local concern. Significant wetlands are protected by the State of Vermont, and town officials are required to report any development proposals within or adjacent to such areas to the Agency of Natural Resources. Another mechanism for identifying and protecting wetlands on the local level is through the town's subdivision review process.

Floodplains

The steep, upland character of the Mad River and its tributaries means that the town has limited floodplain area, which makes all existing floodplains vital to the health of the Mad River and the safety of the community. Floodplains serve as "safety-valves" by temporarily retaining runoff during periods of heavy rain and spring thaw and reducing the velocity of rivers and streams. Floodplains also improve water quality by allowing contaminants in stormwater to settle out prior to reaching streams and rivers.

The impact of flooding on the community was made clear in June 1998, when an intense localized storm system caused severe flooding in the Mad River Valley. Floodwaters caused severe property damage in Warren Village and elsewhere along the Mad River and several tributary brooks and streams.

Floodplains limit development due to the hazards associated with periodic flooding; the harmful effects on channel capacity and downstream properties resulting from filling; and pollution from improper functioning of sewage disposal systems. Also,

because floodplains are generally level with gravelly soils, they are well suited for farming and, consequently, provide important open space, especially along the Route 100 corridor.

The town has created a Flood Hazard Overlay District which conforms to federal requirements for participation in the National Flood Insurance Program (NFIP). The restrictions are intended to protect life and property and to allow property owners to obtain flood insurance and mortgages at affordable rates. These regulations apply to land within the 100 year flood zones depicted on the Federal Flood Hazard Boundary Maps. Within these floodplain areas, building design standards are imposed to minimize property damage during flood events. Within the designated floodway building and land-filling is prohibited. The 1998 flood heightened local awareness regarding river dynamics and flooding. Not all areas outside of the designated floodplain were safe from flooding. As human activities like bridge construction, filling and the removal of vegetation alter flood prone areas and destabilize streambanks, it becomes increasingly important to identify areas that are outside of the mapped flood plain but are still susceptible to flood damage.

Steep Slopes

Steep slopes pose several land use and development challenges. Steep slopes are especially susceptible to erosion and high rates of runoff, particularly when cleared for construction, agriculture or forestry. State regulations restrict the installation of in-ground septic disposal systems on slopes in excess of 25%. The costs associated with the construction and maintenance of roads, sewer and water systems, or controlling erosion and preventing stream sedimentation, can be prohibitive on slopes of 15% or greater.

Figure 3.1 describes the development limitations the U.S. Natural Resource Conservation Service recommends for land based on slope. Generally, slopes in excess of 25% should not be developed. Clearing for agriculture, forestry and ski area activities should be conducted with careful attention to erosion control and stormwater management measures.

Development on slopes of 15-25% is discouraged by the Warren Land Use and Development Regulations, although limited development may take place providing measures are taken to ensure slope stabilization, erosion control and down-slope protection from stormwater runoff. Resource Map 3 shows those areas which are characterized by severe (15-25%) and extreme (25%+) slopes.

In addition to physical constraints, development on steep slopes may adversely affect the town's scenic landscape. Development on steep slopes, especially at higher elevations, tends to stand out from many vantage points in town and diminishes the scenic qualities of the forested hillsides. Special measures should be considered when reviewing development in such areas, including the careful siting of structures and landscaping and screening to minimize visibility of buildings and lighting.

Natural Heritage Sites

~~The State of Vermont maintains an inventory of rare, endangered and fragile environments. Three Natural Heritage Sites are found in Warren, including the habitat for a rare species of orchid, *Listeria auriculata*, in the vicinity of Blueberry Lake, and two rare plant communities in high elevations in the Green Mountain National Forest. These~~

sites should be protected from adverse impacts resulting from potentially damaging land use activities.

Rivers and Streams

According to the results of the 2004 Questionnaire, registered voters in Warren consider water quality of the Mad River and its tributaries to be among the top three conservation priorities. The Mad River provides a central focal point for the town's landscape and, according to an Agency of Natural Resources unpublished Vermont Swimholes Study, is a recreational resource of statewide significance. Its tributaries contribute to the unique character of distinct neighborhoods and the outstanding ecological, recreational and scenic resources of the Mad River system.

The Mad River has been the focus of one of the most comprehensive, broad-based, citizen initiated, watershed planning and protection efforts in New England. The Friends of the Mad River (Friends), formed in 1990, have actively promoted a program of river advocacy, education and protection. In 1993, the Friends launched a far-reaching public planning process that resulted in the publication of *The Best River Ever*: a conservation plan to protect and restore Vermont's beautiful Mad River Watershed.

In 2002, the Friends of the Mad River published an educational booklet called *Caring for the River, Caring for the Land: A guide to living in the Mad River Valley* as a compliment to *The Best River Ever*. This handbook contains many suggestions for ways to conserve natural resources in the Mad River Valley and should be used as a resource by Warren residents

The Best River Ever addresses a broad range of issues related to the health and well being of the Mad River. The plan addresses water quality issues related to wastewater disposal and non-point run-off; the maintenance of riparian vegetation; farm and forestry practices and their impact on the River; wildlife; recreation; and the cultural history of the River. Most importantly, the plan includes 112 specific recommendations for improving and protecting the health of the river. While many of these recommendations have already been implemented, an ongoing process is needed to ensure that the goals and recommendations of the plan are achieved.

The recommendations found in *The Best River Ever* are designed to protect and improve water quality in the Mad River and its tributaries. The following issues are critical to the health of the river and are within the town's ability to influence through existing programs and policies.

1) River health

The Friends of the Mad River currently sponsor the Mad River Watch program, which has monitored water quality in the Mad River and several tributaries every summer since 1986. For these purposes, water quality is measured by the level of E.coli bacteria in the river. E.coli is an indicator of the presence of human and animal waste and generally indicates the extent to which untreated waste is finding its way into the river through inadequate septic or wastewater treatment systems. In recent years, test sites within Warren have frequently exceeded state water quality standards for E.coli. Among the most important means of maintaining water quality standards are the proper siting, installation and maintenance of septic systems and the control of agricultural runoff. In Warren

Village, a new community wastewater system should lower the likelihood of this type of contamination.

2) Non-point pollution

Surface run-off from impervious surfaces and erosion threaten water quality and the health of streams. Runoff harms water quality through the addition of petrochemicals, heavy metals and other toxins from parking areas and other facilities and can cause excessive sedimentation that endangers fish habitat. Proper stormwater management and erosion control, especially in close proximity to streams and for any project involving extensive clearing and on steep slopes, is absolutely critical to the health of the river.

3) Riparian Vegetation

Maintaining a vegetated buffer along all streams is critically important to the overall health and well being of the river because it provides shade, stabilizes stream banks, and provides habitat for a variety of wildlife.

4) Headwater Streams

The quality and health of headwater streams is threatened by development at high elevations, on steep slopes and in areas with poor soils. Development in these fragile areas poses a direct threat to water quality as does the extension of roads and utilities necessary to service such development.

Groundwater

All Warren residents and businesses obtain potable water from groundwater sources. Generally, with the exception of the Sugarbush Village area served by Mountain Water Company, private drilled wells and springs serve the town. In areas of concentrated development, such as Warren Village and Alpine Village, the dependence on both private water supplies and on-site sewage disposal on small lots poses a potential threat to water supplies. A community wastewater system was installed in Warren Village in 2004. Further opportunities for community water supplies or community wastewater treatment/disposal should be explored. In the vicinity of Sugarbush Village most development is served by both private wastewater collection and community water supplies.

The principal source of water for Sugarbush Village is the Mountain Water Company, which is approved to provide water for up to approximately 310 users. Other community supplies serve individual condominium complexes. Federal clean water standards require a source protection plan for each community system to guard against contamination. These plans should be considered when developing local land use regulations to ensure that water supplies are not imperiled by future development activities within recharge areas.

Wildlife Habitat

Warren's human inhabitants are fortunate to share the Mad River Valley with a variety of other animal species **that depend on an inter-connected mosaic of unique habitats and land features for their survival. Maintaining viable populations of native wildlife has**

long been an important goal of Warren residents. To achieve this goal, it is important for the community to ~~residents and local officials must~~ understand the habitat needs of different species, where those habitats are found in the community, and how land use and human activity can best be guided so that the function of important habitat is not diminished. ~~However, human activity can have a harmful impact on many species. Through a greater awareness of the local wildlife population and an understanding of potential conflicts with the town's human population, such conflicts may be avoided. In addition to wetlands and riparian areas, which are shared by many species, planning in Warren must also take into account habitat for the whitetail deer, black bear, trout, and other lower profile species.~~

To assist with this challenge, the Town contracted with Arrowwood Environmental to conduct a *Natural Heritage Inventory and Assessment* for the Town, which was completed in April 2008. That report described the twelve distinct upland natural communities that exist in town (generally, all forested areas) and suggested management recommendations for those communities deems to be of statewide significance. In addition, the report identified the general location and ecological function of several types of habitat, as well as the importance of large tracts of unfragmented forest habitat and connections. That study, including the inventory of important landscape and ecological features, will function as an important resource in developing policies and programs to maintain wildlife populations and the Town's biological diversity.

~~Whitetail Deer~~ *Winter Habitat*

Deer are common in Warren, providing enjoyment to both hunters and passive viewers. While deer easily accommodate human populations, they do have specific habitat needs ~~that which~~ enable them to survive severe winter conditions. Deer wintering areas, or deeryards, are generally found on south ~~or west~~ facing slopes, typically below elevations of 2,000 feet, where coniferous forests predominate. ~~Not only are such areas critical to deer, but nearly half (169 species) of Vermont's vertebrate wildlife species rely on coniferous forests for at least part of their life needs.~~

Important deeryards that have been identified by the Vermont Department of Fish and Wildlife, depicted on Map 2 are concentrated along the steep valley wall separating the river valley from East Warren, on West Hill and the surrounding area, and in a narrow band along both sides of Lincoln Brook. It should be noted that deeryard boundaries change over time. Consequently, inventory maps need to be updated on a regular basis, and site analysis is usually required to determine the relative value of existing deeryards.

~~Black Bear~~ *Mast Stands:*

Masting trees are those that provide concentrated fruit or nut production. When concentrated into a stand, these trees provide a critical food supply for a variety of wildlife, including deer, turkey and bear. Mast stands are of particular importance to local bear populations, which tend to prefer stands that are isolated from human habitation.

Eleven mast stands have been identified in Warren, including six that show signs of frequent use by bears. These include the Slide Brook Basin which was described by

one state wildlife biologist Charles Wiley as being the “largest and most intensively used beech stand in the state, known to date.” Because of the impact of human activity on the use of mast stands by bear, it is important that not only productive trees be protected, but that adequate buffers be established to limit disturbance.

Under Vermont law and Act 250 protections (Title 10, Chapter 151 of the Vermont Statutes Annotated), black bear minimum habitat requirements must be maintained, including the requirements of large blocks of food, forest blocks that meet home range needs, and connectivity to large blocks of forestland that serves as populations sources, including hard mast stands, wetlands, and travel corridors—with buffer zones from land development of up to ½ mile in width.

Large areas of the Green Mountain Range and Northfield Mountain Range serve as prime habitat for black bear (see Map 2). In particular, the area south of Lincoln Gap Road, most of which is included in the Green Mountain National Forest, and the Slide Brook basin located between Lincoln Peak and Mount Ellen in Fayston, provide important bear habitat. The Slide Brook basin has been identified as some of the most productive bear habitat in Vermont due to the extensive beech forest and high seasonal concentration of bears. According to state wildlife biologist Charles Wiley, Slide Brook has the “largest and most intensively used beech stand in the state, known to date.” Much of this area is owned by Sugarbush Resort and is subject to Act 250 permit conditions limiting most development activities. However, these permits are subject to amendment, creating some degree of uncertainty regarding the future use and management of the area. Additional protection measures, such as deeded easement or public ownership, would ensure permanent protection of this critical resource.

Significant bear habitat may also be found in the Northfield Mountain Range. Unlike the Green Mountains, which encompass extensive public land holdings, greater concentration of development, and some level of habitat protection due to past permit activity, the Northfield Mountains have experienced more substantial land subdivision and residential development. Should these trends continue, the conflict between human inhabitants and bears can be expected to increase.

Riparian Habitat

As noted in the section of this chapter that addresses “rivers and streams,” riparian vegetation is not only important for maintaining water quality—and therefore fish populations—but also for providing necessary habitat for amphibians, several mammals, including river otter, long-tailed weasels, moose and big brown bats, and a variety of bird species. Over 3,000 acres of forested riparian habitat (along roughly 250 kilometers of stream corridor) have been identified in Warren. Establishing stream buffers that limit encroachments and maintain vegetation is an effective way to protect this resource.

Trout Fisheries

The Mad River system is a popular trout fishery, although this is largely attributable to the Department of Fish and Wildlife's trout stocking program. While brook and rainbow trout are stocked annually, natural regeneration of some brook trout, and to a lesser degree brown and rainbow trout, does occur. Improving the health and well being of the River, as discussed above, is an important means of protecting fish

habitat. Other, more specific, means of enhancing habitat are also addressed in The Best River Ever.

High Elevation Bird Habitat

Forested areas above elevations of 2,500 feet provide nesting habitat for Bicknell's Thrush and other songbirds. Land development and most forest management, including logging, should only be conducted with the guidance of the forest service or a professional biologist to avoid adverse impacts to breeding habitat.

Rare & Endangered Species Habitat

The Vermont Non-Games and Natural Areas Program maintains an inventory of the locations of rare plants and animals. The precise locations are made available to town planners, although they are not published or made available to the general public. Three rare plant species are known to exist in Warren. One plant species—the auricled twayblade (*Listerera auriculata*)—is on Vermont's list of endangered species and is quite rare in the state. Both that species and a rare sedge (*Carex haydenii*) are located in the vicinity of Blueberry Lake. An uncommon small flowered-rush (*Luzula parviflora*) may be found at high elevations in the vicinity of the Long Trail.

No rare animal species is known to exist in Warren, although the habitats for rare plants are considered within the broader category of significant wildlife habitat. In addition, the list of rare plants and animals only contains species what have been verified by state biologists. Because a comprehensive inventory of all land in the Town has not been conducted, it is reasonable to expect that additional rare habitats may exist in Warren. Effort should be undertaken to work with private landowners and public land managers to conduct a more comprehensive inventory.

Ledge, Talus & Cliff Habitats

These craggy features are used as nesting sites for a number of bird species, as well as denning sites for bobcats and porcupine. It is important that an adequate buffer be established—a minimum of 100 feet—to avoid disturbance from development activities.

Others

~~Other than three plant species (see Fragile Features discussion), no critical habitat for threatened or endangered wildlife populations have been identified in Warren. The Vermont Natural Heritage Program maintains a data base of critical habitats which is updated as endangered populations are identified. However, current data is based upon limited field investigation and additional populations may exist in Warren. Warren is home to several other wildlife species, such as mink, otter, fisher, coyote, turkey and ruffed grouse. Population levels for some species, including moose and bobcat, have risen steadily in recent decades. These reemerging populations share similar habitat needs with black bear. In order to meet seasonal food and habitat needs, many species must range a considerable distance throughout this and neighboring watersheds.~~

Wildlife Travel Corridors

The Arrowwood study describes travel corridors as “places where landscape and land use characteristics combine to form an area where wildlife can move across roads to and from habitat areas.” That study identified three categories of corridor locations: (1) general corridors likely used by a range of species; (2) potential travel corridors for bear and deer; and (3) travel corridors for amphibians moving from upland to wetland habitats.

Of the 38 possible corridors identified in the study, only a few were located in areas that had been extensively developed (e.g. Warren Village). Therefore, maintaining (and enhancing) corridors in these locations is important. Verifying the location and function of identified travel corridors is an important consideration when associated land is being developed, and when the Town is setting priorities for land conservation. In addition, maintaining and enhancing riparian buffers would facilitate wildlife travel between habitats. Finally, it is likely that additional travel corridors exist in town. Additional field work to identify such areas should be pursued.

~~Linear bands of relatively undeveloped forest serving to connect larger tracts of prime habitat allow for unimpeded travel. Important wildlife corridors have not been identified in Warren, although the Keeping Tracks® program sponsored by the Friends of the Mad River has begun to systematically monitor wildlife populations. The identification and mapping of such corridors could provide the basis for future protection.~~

Forest Resources

Forest covers approximately 22,000 acres or 85% of the town. The forest consists of low-density residential land use, privately owned undeveloped parcels under forest management, and the Green Mountain National Forest. ~~Because of the large acreage involved,~~ All of the natural resources discussed in this chapter are dependent upon the **continued** maintenance of **relatively large unfragmented blocks of forestland to maintain healthy forest cover conditions.**

Private Forest Land

Much of the private forest land in Warren is under some form of forest management. Sound forest management provides ecological benefits and recreational opportunities to the public and economic benefits to landowners. To encourage the **conservation preservation** and sound management of private forest land, the State of Vermont established the Current Use Program to reduce the tax burden on owners of forest parcels larger than 25 acres when the property is **left undeveloped and** managed in accordance with a forest management plan that is approved by the County Forester. While past participation in this program has been limited in Warren, greatly increased tax rates following the enactment of Act 60 have provided an incentive for increased enrollment. **In 2008, a total of 64 parcels, encompassing 6,276 acres of land, were enrolled in the Current Use Program. This means almost 25% of the total acreage of Warren is enrolled in the Current Use Program.**

~~The location of forest, especially on level terrain in proximity to agricultural land, also provides opportunities to locate development in a manner that is better integrated into the existing landscape.~~ **The particular attributes of privately owned forestland help dictate the degree to which development can be accommodated with minimal impacts to forest resources.** Where one or more Fragile Features exist, most development may not

be appropriate. In such areas, acceptable management practices (AMPs) are an important minimum standard to ensure that forest management activities do not result in soil erosion and impacts to surface waters.

Green Mountain National Forest

The Green Mountain National Forest (GMNF) includes approximately 7,180 acres in Warren. Most of these lands are subject to “multiple use” management, which balances environmental protection, recreation and resource extraction.

Besides land currently leased to Sugarbush for the operation of the ski area, GMNF land holdings are concentrated in the south-west section of Town, including substantial holdings in the Lincoln and Stetson Brook watersheds and east of Granville Gulf. There is growing interest in seeing the GMNF acquire additional parcels in Warren. In recent years, 72 acres of property at Warren Falls and 368 acres of land surrounding Blueberry Lake were added to the National Forest.

Map 1 shows the current Proclamation Boundary in the Town. Expansion of that boundary is being considered. The Proclamation Boundary defines the area within which the Forest Service can more easily acquire additional parcels because the approval of the US Congress is pre-determined. Within budget limits, land may be purchased at any time. Outside of the boundary, Congressional approval must be specifically sought and obtained for any land purchases.

Warren residents can influence management decisions by participating in the Green Mountain National Forest Plan revision process. Also, GMNF officials frequently consult with town officials and residents on issues such as expanding the Proclamation Boundary and designating “wilderness” and “working” areas within the Forest. The results of a 2004 Questionnaire results favored designating more wilderness areas in the GMNF, and additional wilderness areas were designated by Congress in the Vermont Wilderness Act of 2006. In Warren, a small portion of the new wilderness was added between Stetson and Austin Brooks.

Cultural Features

Cultural resources help us understand and celebrate our community heritage. They can be archaeological sites; historic sites, structures or settlement patterns; and larger cultural landscapes that reflect the character of a time, place or economy. Warren’s cultural resources offer a link to the past, help define the town’s present character, and provide a context for future growth and development.

Archaeological Sites

Unlike other areas of Vermont, such as the Champlain Valley, human habitation in Warren is not believed to have been widespread until Europeans settled the area two centuries ago. It is assumed that Native Americans ventured into the Valley as far back as the Paleo-Indian period (10,000 - 7,500 BC), and at least one Paleo-indian artifact (a fluted projectile point) has been documented in neighboring Waitsfield. According to a study of the Mad River Valley prepared for the Mad River Valley Planning District by Ann Dowd and Beth Trubitt in 1989, the most likely location for finding such prehistoric

artifacts is along the higher terraces above the river's floodplain. This study provides information regarding archaeological sensitivity throughout Warren.

Most archaeological sites date from industrial and agricultural activities occurring after statehood. Mill sites exist in Warren Village and along other tributaries. A particularly well-preserved site occurs along the upper stretches of Stetson Brook. Cellar holes dot the landscape, calling attention to the town's once dense settlement pattern. The town should use the development review process to require the protection of these remnants of the town's early history.

Historic Sites and Structures

Warren's rural landscape is shaped by the integration of natural land forms, traditional land uses and the historic built environment. More than 100 properties have been listed on the Vermont Historic Sites and Structure Survey, completed by the Division for Historic Preservation in 1983 and updated by the Mad River Valley Rural Resource Commission in 2004. Properties on the state survey are eligible for listing in the National Register of Historic Places.

More than half of the historic structures remaining in town are located in Warren Village, which was placed in the National Register as a Historic District in 1990. This designation provides certain tax benefits to owners of income-producing properties who restore their buildings and offers some protection against federal actions that could harm the documented historic resources. Listing on the National Register imposes no restriction on the use or alteration of historic structures and therefore, provides only limited protection of these resources.

Unlike some historic districts that contain a high concentration of buildings representative of one particular style or era, Warren Village contains examples of the many styles and periods that mark Vermont's history. This diversity allows for the continued evolution of the historic village without the need to impose any one architectural style. However, it is important that future development respect the village's architectural traditions. The replacement of the Pitcher Inn, which was destroyed by fire in 1993, is an example of modern development that is compatible with the town's historic traditions.

Maintaining the historic character of Warren Village was one of the highest priorities expressed by participants at the 1997/1998 Town Plan meetings. Residents raised concerns regarding perceived threats to the residential character of the village, the need to maintain its historic architectural heritage and problems related to traffic, parking and pedestrian circulation.

Many of these issues are addressed in relevant chapters of this plan and the 2004 Warren Village Pedestrian Enhancement Plan. Regarding the historic character of the village, however, future development and/or infrastructure improvements could be designed to reinforce the character and architectural vernacular of the village. This can be accomplished in a variety of ways, including village design standards in the Town's Land Use and Development Regulations, as well as local incentive programs for the restoration and maintenance of historic structures.

Historic structures are also found outside of Warren Village. Generally, these sites reflect the agricultural history of the community and include farm houses and associated farm buildings, especially barns. Unfortunately, the high cost of upkeep and

maintenance of large barns has resulted in several falling into disrepair after they are no longer used for agriculture. Adaptive re-use provisions have been added to the Land Use Development Regulations to help encourage the restoration and use of barns.

Warren is home to a number of historic bridges. In addition to the Village Covered Bridge, which is listed in the National Register, the Kingsbury Iron Bridge is the sole remaining iron truss bridge in the Valley. These bridges, built throughout the state following the 1927 flood, are a distinctive reminder of a defining moment in Vermont history.

Scenic Landscape

The natural landscape in Warren is dominated by four distinct features: 1) the rugged, steeply sloped ridgelines that enclose the valley to the east (Northfield Range) and west (Green Mountain Range); 2) the north-flowing Mad River and adjacent floodplain which constitute the valley floor; 3) a fertile plateau at mid-slope between the valley floor and the eastern ridge; and, 4) a feature somewhat unique to this particular valley, a series of intermediate ridges and freestanding knolls creating lesser east-west valleys.

Historically, the human imprint upon Warren has been generally harmonious with the natural landscape. Village centers and smaller hamlets have been positioned in the more level areas, on the floor, and along the upper plateau. These settlements are bounded by cropland pasture, as the terrain permits, and by sloping woodlands created by the intermediate ridges and knolls. This open land typically forms the backdrop or foreground for the built environment.

The road network is perhaps the most significant vantage point from which Warren's visual beauty may be enjoyed. Particularly where major arterials pass through open agricultural areas, the potential for spectacular long and intermediate views can be realized. In 2002 the Planning Commission, along with numerous volunteers, conducted a survey of the scenic qualities along all of the town-maintained roads in Warren using the criteria of the Vermont Scenic Road Program. The field guide inventory sheet identified six categories of positive scenic elements, including vegetation, landscape features, road characteristics, water, buildings, and other man-made structures. The inventory sheet also identified three categories of negative elements, including landscape scars, buildings, and other man-made structures. Twenty-three of the forty-four miles of town roads surveyed received scores high enough to warrant designation as a "Scenic Road" under Vermont's Scenic Road Program. The Selectboard considered this work in early 2004 and decided not to apply the state's scenic road program. Instead, they amended the road ordinance to provide the principal benefit of the state's program (public notification and a hearing process prior to any major changes) to all the roads in the town.

In 1998, the Planning Commission sponsored a Visual Preference Survey. The purpose of such a survey is to enable citizens to evaluate physical images of natural and built environments. The major finding of the survey was the widespread preference for the traditional settlement pattern, characterized by compact village centers with a formal arrangement of buildings, surrounded by a working landscape of productive farmland and forest.

Another important conclusion of the Visual Preference Survey is that development can serve as a positive visual feature. Instances in which development was viewed favorably were related to the degree to which the built environment blended with the surrounding landscape. Traditional Vermont vernacular architecture, especially buildings in a formal or village setting, received high scores. Modern highway-commercial development patterns and forms received low scores.

Residential development that respects the surrounding landscape also scored well. The placement of structures in open fields was not desired, although the careful siting of structures on field edges rated well.

Based on the many past efforts to define the scenic landscape, including the Visual Preference Survey and 2004 Questionnaire, the town's most important scenic features may be summarized as follows:

- open farmland and meadows, which often serve as the foreground for expansive views;
- Blueberry Lake, the Mad River and tributary streams;
- forested knolls, steep mountain-sides and ridgelines which provide the unbroken background for most distant views;
- scenic roads, especially those of a scale and character that discourages high speed travel while offering a pleasant walking and recreational environment;
- historic settlement patterns, including village centers and small clusters of buildings arranged around a common focal point, such as a road intersection or adjacent meadow; and,
- individual buildings which, because of their scale, character or historic significance, such as a large barn, serve as a visual and cultural focal point in the landscape.

There are a variety of tools available for protecting and enhancing the town's scenic landscape. The Land Use and Development Regulations are used to guide development in a manner that reinforces the historic settlement patterns and avoids the placement of structures that would stand in contrast to the surrounding landscape. Other regulatory provisions such as slope restrictions, resource protection overlay districts and clustering provisions also serve other policies related to natural resource protection and community facilities. Incentive programs, such as tax incentives, could also help landowners maintain the qualities of important properties that contribute to the town's landscape.

Agriculture

Agriculture has played an important role in the development of Warren. Early settlement patterns were influenced by the location of suitable farmland, especially in East Warren. In addition to providing economic and cultural benefits, the contrast between open fields and wooded hillsides continues to define the town's scenic beauty and rural character. Farmland is distributed broadly throughout East Warren, in the valley bottom along Route 100 and, to a lesser extent, on Fuller Hill and in Lincoln Hollow. Parcel sizes range from 15 acres to more than 100 acres. As of 2004, approximately 1,600 acres were in active agricultural use.

The **overall** economic viability of agriculture in Warren has steadily declined in the past twenty years, which is consistent with statewide trends. In 1965, eight dairy farms operated in town. The number had been reduced to three in 1976, and today a single dairy remains. This remaining dairy is relatively large by Vermont standards, with a herd of approximately 1,000 head. Operated by a local family, the farm is responsible for maintaining a major portion of the open land in Warren, as well as significant farmland acreage in neighboring Waitsfield and Fayston.

While overall dairy farming has significantly decreased in Warren, the localvore movement has encouraged the production of more locally produced agricultural products on a smaller individual scale while helping to maintain an overall ongoing agricultural community in Warren. On top of this, many residents are involved in ongoing local egg production. In addition, in 2009 with the assistance of the Town of Warren, the Kingsbury Farm on Route 100 was conserved and subsequently purchased by the Vermont Food Bank, and is once again producing significant quantities of vegetables both for the Food Bank and local residents.

In addition, a significant new contributor to agricultural pursuits in Warren is the surge of interest and investment in horse-based recreational and commercial activity. This has resulted in the reclamation of former pasture land and construction of numerous barns, stables, and indoor riding arenas. There are two large horse breeding and training facilities, several stables with various combinations of boarding, training, lessons and outdoor arena or trail rides, and numerous private owners of one to a dozen or more horses for personal use. Private horse ownership also provides a local market for hay, which further contributes to the maintenance of farmland, especially in East Warren. In addition, numerous small-scale “homestead” farms that keep a few acres in production contribute, on a cumulative basis, to the maintenance of open land. In sum, this is the most important contributor to maintenance of open space in town since the decline of the dairy industry.

Valley-wide interest in locally grown specialty foods has contributed to the agricultural as well as social life of the community. The town-owned East Warren Schoolhouse, which was renovated and rented by the Rootswork organization, and the surrounding private lands serve as the focus this movement. Rootswork and related or sublease enterprises have operated **a local market at the schoolhouse—currently the East Warren Community Market** ~~the Schoolhouse Market~~, a nationally acclaimed specialty cheese business, a school for cheese makers, a community garden, Community Sponsored Agriculture vegetable purchasing cooperative, and a flower farm, **as well as a rootcellar**. They have also revived the local Grange as a composting facility and have been granted a local FM radio license. Rootswork has made the second floor of the Schoolhouse available for group meetings and events and is renovating the kitchen for short-term commercial use. Their initiatives and those of others in the fields of hydroponics, beef, pork, lamb, and poultry raising and fruit and vegetable farming have made Warren a real hotbed in the emerging field of alternative agriculture.

While the combination of one large dairy operation and numerous small scale operations has maintained an agrarian landscape in much of Warren, the future of the town’s farmland is far from certain, **however, ongoing interest by local residents in small scale agricultural pursuits has been a positive step in helping to preserve this part of Warren’s landscape. Overall, however, development on productive farmland,**

especially prime and statewide agricultural land, **remains** is a threat to the town's rural character. The town has taken the following steps to protect farmland:

- 1) For almost fifteen years the town has guarded against the conversion of agricultural soils to non-productive uses with the Meadowland Overlay District (see Map 5 & 8). Adopted through the Land Use and Development Regulations, the Meadowland Overlay District encompasses most land actively farmed at the time the 1979 orthophotographs were produced. Encompassing approximately 1,800 acres, most of the town's prime agricultural soils are included within this district. The purpose is to guide land subdivision and other development of productive farmland in a manner that minimizes fragmentation and conversion while accommodating development.
- 2) The town also supports agriculture by several provisions in the Land Use and Development Regulations. Agriculture (which includes growing of crops, raising of livestock, operations of orchards and the sale of farm produce, etc.), i.e. a working landscape, is a Permitted Use in all Zoning Districts, except the very small Sugarbush Village Commercial District. Agricultural structures are also exempted from building height requirements and several other Performance Standards in the Land Use and Development Regulations.
- 3) The town maintained a tax stabilization program from 1983 to 1999. The program reduced the local tax burden for landowners whose land remained in agricultural production. When the program was phased out by the town in 1999, the former participants were encouraged to enroll in the State's Agriculture and Managed Forest Land Use Value Program, better known as the Current Use Program. This program was created in the late 1970's as a companion to legislation that required towns to list property at 100 percent of fair market value. Because of escalating land values, it was clear that property taxes based on fair market value were placing a heavy property tax burden on owners of productive farm and forest lands. The Current Use Program offers landowners use value property taxation based on the productive value of land rather than based on the traditional "highest and best" use of the land. In 2000, the current use value of the land in the program averaged about 20 percent of the full fair market value (Vermont Department of Taxes, 2001). The Current Use Program includes a Land Use Change Tax as a disincentive to develop land. The tax is 20% of the fair market value of a property or in the case of the sale of part of a property, a pro rata share of the fair market value of the entire property.
- 4) The town has acquired conservation easements on approximately 225 acres of farmland in Warren. The Mad River Watershed Conservation Partnership has assisted with putting an additional 350 acres of farmland under easement with the Vermont Land Trust. The Vermont Land Trust holds easements on over 900 acres of land within the Town of Warren. Within the past several years the State of Vermont and various private foundations have allocated considerable sums of

money for farmland conservation, creating additional opportunities for future acquisition efforts.

Conservation Strategies

Maintaining Warren's rural character, scenic landscape, productive farm and forest lands, fragile natural areas and historic resources have been objectives of the town since at least the mid-1970's. Many of the tools available for specific resources, such as adaptive reuse for historic structures and designation and appropriate maintenance of scenic roads, were described previously. Strategies for protecting the undeveloped character of many of the resources described in this chapter, such as farmland, forest, and wildlife habitat, may be collectively referred to as "open space protection". Some open space protection tools are regulatory, such as subdivision review standards that require the protection of important landscape features (e.g., farmland and steep slopes) as a condition of subdivision approval. Many of the regulatory tools, including those mentioned elsewhere in this chapter, are described in greater detail in Chapter 10 and are the subject of various policies set forth at the end of each chapter.

Non-regulatory options include many of the measures discussed elsewhere in this chapter, such as the purchase of development rights, or land acquisition. As noted above, the town has purchased development rights on two parcels totaling 225 acres. The Vermont Land Trust holds conservation easements on over 900 additional acres in Warren and 440 acres have been added to the Green Mountain National Forest in the past 10 years. (see Map 5).

In March, 1999, Warren voters agreed to combine the existing Transfer of Development Rights (TDR) Reserve Fund and the Blueberry Lake Conservation Reserve Fund into a single conservation fund called the Conservation Reserve Fund "for the purpose of acquisition and perpetual protection of critical agricultural, forest and open land in the Town". The Selectboard subsequently created the Warren Conservation Committee in August of 2002.

The Conservation Committee advises the Selectboard on land conservation projects and any expenditure of funds from the Conservation Reserve Fund. The Conservation Committee and Conservation Reserve Fund charter further states that "the Conservation Reserve Fund shall be used for land conservation only... and that it may be used for repair and restoration of lands conserved, in part or in full, by the Town of Warren...". The charter provides that "the Selectboard should seek to add to the Conservation Reserve Fund annually through a Town Meeting article". If used wisely, these funds could be used to leverage additional funds from the Vermont Housing and Conservation Fund and private foundations (such as the Freeman Foundation). This would substantially increase the amount of funding available for land conservation in Warren. The results of the 2004 Questionnaire (Appendix A) indicate strong town-wide support for the town making annual contributions to the Reserve Fund.

To use the reserve fund most wisely, the town has established open space priorities. Using the results from the 2004 Questionnaire (Appendix A), the Conservation Committee has established the following list of conservation priorities, in the order of importance:

- 1) Land with outdoor recreation resources, including parcels with existing or potential trails, river accesses (especially the Mad River and its tributaries), hunting areas, and potential playing fields and recreation areas;
- 2) Resources that would protect or enhance water quality, such as wetlands, headwater areas, and riparian buffers along the Mad River and its tributaries;
- 3) Land with identified wildlife values, including critical habitat for endangered species, black bear (including the Slide Brook basin), and identified wildlife corridors;
- 4) High elevation forest (ridgelines and prominent knolls) and farmland and meadows visible from well-traveled town roads and Route 100;
- 5) Productive farmland, especially land currently under farm management or with the potential for active farm management;
- 6) Productive forest, especially lands that are contiguous to other undeveloped tracts of forest and conserved parcels;
- 7) Land that contributes to the town's historic settlement patterns, including upland areas with poor access to town centers; undeveloped parcels that define the contrast between an open countryside and village centers; and, open space that contributes to the character of Warren Village.

Sense of Place Goals

Goal 3.A The maintenance, careful stewardship, preservation and enhancement of Warren's natural resources and environmental quality for the benefit of future generations.

Goal 3.B The preservation of the town's rural character, cultural heritage and historic working landscape.

Objective 3.1. To protect Warren's fragile features, open space and natural resources.

Implementation Strategies

- a) Through the town's Land Use and Development Regulations and Act 250 proceedings continue to:
 - i. Discourage development on slopes of 15% to 25%. Provide for limited development on such slopes, but only in a manner that minimizes site disturbance, runoff and erosion.
 - ii. Prohibit development on slopes with a gradient in excess of 25% (excluding facilities necessary for the operation of an alpine ski area).
 - iii. Prohibit the creation of parcels that would result in development on exposed bedrock and/or poor soils, wetland, upland areas, floodplain or natural heritage sites.
 - iv. Prevent land development and other activities that would result in an undue adverse effect on wetlands.

- v. Enforce standards to prevent the emission of excessive fumes, dust, odor, smoke, noise and glare from all land uses.
- b) Explore additional options for incorporating specific natural resource protection standards into the Land Use and Development Regulations. Maintain the Meadowland and Flood Hazard Overlay Districts.
- c) Encourage the US Forest Service's acquisition of additional lands to be included in the Green Mountain National Forest.
- d) Support and encourage land conservation organizations (i.e., Vermont Land Trust, Trust for Public Land, etc.) to work with the town to identify and preserve lands with fragile features and other important natural resources. **Encourage the activities of the Warren Conservation Commission and the continued coordination of expenditures of the Town of Warren Conservation Reserve Fund. Encourage the activities of the Conservation Committee.**
- e) Through the town's capital program, ensure that capital improvements and public facilities are planned in a manner that prevents the development and fragmentation of fragile features and natural resources.

Objective 3.2. To prevent degradation of water resources and improve water quality.

Implementation Strategies

- a) Strictly administer and enforce the town's on-site sewage disposal ordinance and require approval under the ordinance as a prerequisite to other development approvals. Revise the ordinance to comply with changes to state law.
- b) Support the maintenance and upgrade of the existing water classifications of all town surface waters.
- c) Use the Land Use and Development Regulations to require the maintenance of undisturbed, naturally vegetated buffers sufficient to protect water quality along the Mad River, tributary streams and Blueberry Lake. Buffer areas, including the depth and type of buffer, shall be identified for protection through the subdivision and site plan review process.
- d) Ensure that development within wellhead protection areas is carefully designed to prevent adverse impacts to groundwater supplies.
- e) Control runoff and erosion during all stages of development through stormwater and erosion control standards in the town's Land Use and Development Regulations and by enforcing standards and conditions during and after construction.

- f) Limit development in designated floodplains (except that which is related to the maintenance and continued use of existing structures) to recreation and other non-commercial and non-residential uses. Continue to administer the standards in the Flood Hazard Overlay District in the Land Use and Development Regulations. Update as needed to maintain town eligibility in the National Flood Insurance Program and as river conditions change.
- g) Encourage and support the Friends of the Mad River and other entities in their efforts to implement The Best River Ever: a conservation plan to protect and restore Vermont's beautiful Mad River Watershed and to ensure that its goals and recommendations are achieved.
- h) Encourage community support of the Mad River Watch program. Use this program to assist in the identification of water quality problems and take appropriate action to correct those problems.
- i) Update the inventory of significant wetlands in the town, including those less than three acres, and consider changes to the building permit process.

Objective 3.3. To protect and enhance Warren's wildlife populations.

Implementation Strategies

- a) Identify and, where reasonable, protect deer wintering areas (deeryards) from development and other uses which threaten the ability of the habitat to support deer.
- b) Protect bear habitat from development and other uses which threaten the ability of the habitat to support bear.
- c) Support the identification of critical wildlife travel corridors and ensure that identified corridors are protected from inappropriate development through the Land Use and Development Regulations. Consider **as a baseline data compiled by Arrowwood Environmental in their 2008 Warren Natural Heritage Inventory and Assessment which consists of three maps: 1) Wetland Natural Communities; 2) Wildlife Habitat Features; and 3) Upland Natural Communities.** ~~related to wildlife habitat generated by the local Keeping Track wildlife monitoring program and other organizations when updating local planning documents and/or reviewing development proposals.~~
- d) Support the permanent deeded preservation of identified black bear habitat in the Slide Brook Basin.

- e) Strictly enforce animal control laws (leash law) to eliminate conflict between domestic animals and wildlife.
- f) Join in the development of a program to improve fisheries habitat in the Mad River and its tributaries with other interested parties.
- g) Encourage the continued input from the Warren Conservation Commission on Development Review Board Subdivision applications.

Objective 3.4. To enhance the economic viability of agricultural and forestry activities in Warren.

Implementation Strategies

- a) Encourage the use of Town of Warren Conservation Reserve Fund to help purchase conservation easements on working agricultural land and prime farmland.
- b) Encourage participation in the Vermont Current Use Program to support the viability and maintenance of farm and forest land.
- c) Continue to maintain the Forest Reserve District and the Meadowland Overlay District as defined in Chapter 10 of this Plan.
- d) Use the town's Land Use and Development Regulations and other appropriate mechanisms to encourage the creation of local industries that provide a market for locally produced agricultural and forestry products.
- e) Continue to allow agricultural uses in all districts.

Objective 3.5. To maintain an adequate land base to support present and future forestry and agricultural activities.

Implementation Strategies

- a) Require that development, to the greatest extent possible, not be sited on productive farmland to allow continued and/or potential agricultural use. The Meadowland Overlay District shall be maintained in the Land Use and Development Regulations.
- b) Encourage the permanent protection of farmland and important natural resource areas, through conservation easements or comparable deed restrictions, during the subdivision and/or development review process.

- c) In conjunction with private conservation organizations, explore opportunities for purchasing development rights on farmland and other important natural resource areas, as described in this chapter.
- d) Continue to contribute to the town's Conservation Reserve Fund and consider an annual allocation to the fund at the Town Meeting.
- e) Support the efforts of private conservation organizations to protect farmland, forest land and other open space in Warren through landowner education and voluntary conservation mechanisms.
- f) Consider ways to update the town's transfer of development rights (TDR) program and make the changes needed to improve its use, including possibly designating additional receiving areas, changing allowable densities within existing receiving areas, or identifying non-regulatory incentives to increase the market demand for purchase of development rights within designated receiving areas (See Chapter 10).
- g) Encourage the preservation of forest land through expansion of the Green Mountain National Forest's proclamation boundary to include portions of the Northfield Mountain Range.
- h) Through the development review process and conservation actions, strongly discourage further subdivision and the associated extension of roads and infrastructure in the Forest Reserve District.
- i) Support a viable commercial recreation industry to encourage seasonal diversification and multiple uses of farm and forest land.

Objective 3.6. To provide for the responsible extraction of renewable and finite natural resources for municipal and commercial purposes.

Implementation Strategies

- a) Use the town's Land Use and Development Regulations or other appropriate mechanisms, to require that all forest management in Warren complies at a minimum with Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont.
- b) Participate in the review and revision of the Green Mountain National Forest Management Plan to ensure that wildlife habitat, recreation opportunities and aesthetic resources are protected and enhanced.
- c) Maintain strict standards to minimize potential conflicts between current land uses and the extraction of renewable and finite resources. These standards should

address the operation, maintenance and restoration of extraction sites based on the unique conditions of the area affected.

Objective 3.7. To protect and enhance Warren's scenic landscape and rural character.

Implementation Strategies

- a) Continue to require residential development that is designed in a manner that preserves scenic resources, meadowland, and fragile features and clusters the majority of development activity on the least sensitive portion of the land. (See Chapter 10).
- b) Encourage and support the efforts of the Mad River Valley Conservation Partnership in their efforts to implement their Conservation Opportunities plan.
- c) Maintain a high quality of site design for commercial and multi-family land uses through the enforcement of landscaping and site design standards in the Land Use and Development Regulations. Such standards should encourage the use of native vegetation and minimize the visual impact of parking, service and storage areas. (See Chapter 10)
- d) Rural cultural features, including farm and logging roads, stone walls, tree and fence lines, cellar holes and agricultural buildings, should be preserved by protective measures incorporated into site and subdivision plans, where appropriate. New lot lines should follow existing linear features, such as tree and fence lines to the extent practical. (See Chapter 10)
- e) **Encourage the use of alternative energy such as solar and small scale wind, the use of advanced technologies such as wireless communications, keeping in mind that the town values its scenic landscape and rural character.** Carefully review ~~the need for~~ the placement of **such** structures, including solar energy equipment, wind energy equipment and telecommunications towers. **A delicate balance must be sought in deciding the placement of solar and small scale wind energy equipment and the addition of cellular telecommunications towers.** ~~on ridgelines or prominent hilltops. Consider revising the Land Use and Development Regulations to stipulate that structures shall not extend above the elevation of the crown line of mature trees on defined ridgelines and knolls. This provision does not apply to wind turbines for the generation of electric power which shall be encouraged.~~
- f) Extend utility lines and develop associated rights-of-way in a manner which minimizes adverse impacts on the town's scenic landscape. Continue to require undergrounding when utility lines are extended to service new development whenever possible.

- g) Continue protecting those features within the road right-of-way that contribute to the scenic character of individual roads through the town's road ordinance. Coordinate the protection of those features with road maintenance and improvement projects.
- h) Maintain the visual quality of Warren's night sky through standards in the town's Land Use and Development Regulations that ensure that all outdoor lighting is designed and installed in a manner that minimizes glare, skyglow, and the impact on adjacent property owners.
- i) Explore adoption of forest management guidelines to protect the scenic landscape.

Objective 3.8. To maintain and upgrade Warren's historic built environment and promote greater understanding and appreciation of the town's architectural heritage.

Implementation Strategies

- a) Continue to allow for the adaptive reuse of historic barns and other historic structures in the Land Use and Development Regulations.
- b) Through the subdivision and conditional use review process ensure that new development is designed to reflect traditional patterns and forms of development, is compatible with its context and setting, and maintains and enhances the town's rural character (see Chapter 10).

Objective 3.9. To promote traditional access to undeveloped lands for public recreation.

Implementation Strategies

- a) Promote continued access to private lands for hunting, fishing and other forms of outdoor recreation, with due consideration given to landowner concerns such as liability, vandalism, safety and intrusion.
- b) Support the efforts of the Mad River Path Association, Vermont Association of Snow Travelers, Catamount Trail Association, U.S. Forest Service and other parties to create and maintain an integrated trail network throughout town.
- c) Protect identified trail corridors, including the Long Trail and Catamount Trail during the subdivision review process.

SOIL TYPES

The following soil types, identified by the U.S. Natural Resource Conservation Service, are the most common in Warren:

HOGBACK-RAWSONVILLE COMPLEX (17% of town) – tend to have shallow depth to bedrock, marginal suitability for septic, range from 8% to 60 % slope. These occur primarily in higher elevations, with the upper elevations of the Roxbury Mountains being solely this soils type.

TUNBRIDGE-LYMAN COMPLEX (15% of town) – tend to have shallow depth to bedrock, marginal suitability for septic, range from 8% to 35% slope. These soils are most common in the lower elevations of the valley.

BERKSHIRE FINE SANDY LOAM (14% of town) – tend to have greater than 6.0 feet of soil before it hits bedrock, suitable for a conventional septic system, slopes range from 3% to 35%. These soils are dispersed throughout the moderate elevations of Warren.

COLONEL FINE SANDY LOAM (12% of town) - tend to have greater than 6.0 feet of soil before it hits bedrock, suitable for a mound or curtain drain septic system, slopes range from 3% to 35%. These soils are generally found in the moderate elevations throughout Warren.

Table 3.1 Warren Septic Suitability By Soil Classification

Soil Class	Square Miles in Warren	Description of Suitability
1	2.6	well drained, dry soils suitable for conventional in-ground systems, although some soil replacement may be required to slow the rate of percolation
2	6.4	well suited for conventional in-ground systems
3	0	slow permeability and/or shallow depth to bedrock or seasonal high water table and typically require mound systems
4	9.9	slow permeability and/or shallow depth to bedrock or seasonal high water table and require mound systems and typically require testing, mound systems, and curtain drains
5	11.6	marginally suited for development, except in isolated pockets in which the depth to bedrock is greater than 24 inches and the slope is less than 20%
6	8.2	too rocky, steep, wet or otherwise unsuitable for disposal
7	0.2	not rated

Source: USDA Natural Resource Conservation Service

Figure 3.1 Development Constraints Associated with Steep Slopes

Slope and Recommended Management

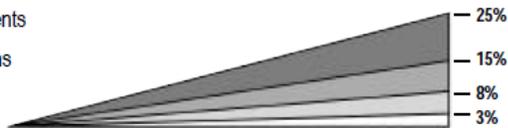
0-3% suitable for development, may require drainage improvements

3-8% most desirable for development, having the least restrictions

8-15% suitable for low density development with consideration given to erosion control, runoff and septic design

15-25% unsuitable for most development and septic systems, construction costly, erosion and runoff problems likely

25%+ all construction should be avoided, careful land management required



Source: U.S. Natural Resource Conservation Service