# 11 | Natural Resources

## 11.A OVERVIEW

Waitsfield lies within the heart of the Mad River Valley, defined by the Northfield Range to the east, and the main range of the Green Mountains to the west. The physical features of Waitsfield's landscape have greatly influenced local patterns of human activity, settlement and commerce. Waitsfield Village developed around the most reliable source of power at the time, the Mad River. The town's traditional agricultural base, which once extended into the surrounding hills, is today largely confined to its most productive soils, found along the river valley and the broad plateau around Waitsfield Common. Those areas least desirable for development, Waitsfield's remote and rocky uplands, form a scenic backdrop and include productive forest lands, headwaters and important wildlife habitat.

Though waterpower has long been replaced by other sources of energy, and the town has slowly shifted away from its agricultural base, the physical landscape and the quality of the natural environment continue to attract visitors and residents and influence local development patterns. Waitsfield's natural setting offers a range of cultural, environmental, recreational and economic opportunities, while at the same time posing a number of significant constraints and challenges.

The town's natural landscape is enhanced by its built environment. This integration of natural and cultural features create a distinct sense of "place" that is unique to Waitsfield. The following describes the natural features that contribute to the town's unique sense of place, and options for conserving and protecting these resources for existing and future generations.

## 11.B CLIMATE

Climate and weather patterns are important planning and design considerations because of their effect on such things as soil erosion, wildlife populations, plant growth, air quality, stormwater 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.

Vermont's northern climate is dominated in winter months by cold, dry Canadian air, and in summer by warm moist air from the Gulf of Mexico. Weather patterns vary locally with topography and relief. Located on the eastern side of some of the state's highest mountains, Waitsfield experiences slightly lower average winter temperatures and higher rates of precipitation than other parts of Vermont. On average, the town receives over 43 inches of precipitation (measured as rainfall) annually.

Much attention has been given to global climate change in recent years. The effects of climate change are already evident in Vermont, including more intense storms linked to rising average temperatures. Over the next 50 years, climate change models have projected that the average temperatures in the state will increase five to nine degrees Fahrenheit. Such an increase would reduce the number of months with average low temperatures below freezing from the current six to four, and increase the number of months with average highs above 80°F from two to three or four.

While some human residents may not miss the extra months of winter weather, the plants and animals around us will. Climate change is expected to alter the frequency and magnitude of storm events, rain-on-snow events, ice storms, and even the timing and frequency of droughts. Climate change is also expected to alter the town's natural environment by changing the plant species that can thrive in Waitsfield, the migrating patterns of birds, the timing of the budding and flowering of plants, the temperature of rivers and ponds, and countless other changes throughout the interconnected web of life.

If climate change proceeds as currently anticipated, the climate and natural environment in Vermont will become more like that of the mid-Atlantic region by the end of the 21st century. For more than 50 years, Waitsfield has been a winter tourism and recreation destination, but climate change has the potential to undermine this critical component of the Mad River Valley's economy.

Waitsfield should anticipate that a changing climate will bring dramatic social, economic, and environmental change to The Valley which indicates a need

for diversification of the local economy, action to limit future emission of climate changing air pollutants, and steps to enable our human and natural communities to adapt as effectively as possible to the changes that are likely coming.

## 11.C AIR QUALITY

Weather patterns, especially wind, impact air quality. Like most of Vermont, Waitsfield's is fortunate to enjoy exceptional air quality. 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, although a maximum level of pollution cannot be exceeded in accordance with Vermont's Air Pollution Control Regulations.

Given the absence of large-scale pollution generators in the community, local air quality concerns are limited mainly to emissions from traffic, inefficient or improperly operated heating systems and some agricultural practices. While no existing problems have been identified, the cumulative effect of these sources may increase with additional growth.

Of more immediate concern are impacts on air quality resulting from pollution generated far from Vermont. Most notably, the coal-burning power plants of the Midwest have been cited as the main cause of airborne pollutants that are detrimental to the health of forests and pond ecosystems, particularly fragile high-elevation ecosystems, throughout the Northeast. These impacts, in addition to global climate change, are arguably the largest air quality-related challenges facing Waitsfield in the next several decades.

## 11.D TOPOGRAPHY

Waitsfield, Warren and Fayston comprise the upper watershed of the Mad River, which drains northward into the Winooski River and ultimately into Lake Champlain. Much of Moretown and a portion of Duxbury also share the watershed to the north. Waitsfield's topography is characterized by a mountainous eastern border, marked by the ridge line of the Northfield Range; the broad plateau west of the range that runs from East Warren to the south of Waitsfield Common; the Mad River Valley below; and a series of steep, intermittent ridges and hills bordering the river valley, leading west into Fayston.

**Elevation**. Elevation in Waitsfield ranges from a height of 2,911 feet above mean sea level at the summit of Scrag Mountain, the town's most prominent peak, to 608 feet at the point where the Mad River flows into Moretown. Differences in elevation affect local climate, weather and growing seasons, which vary throughout town. Traditionally, settlement has been concentrated between the elevations of 650 and 1,500 feet. Land over 1,500 feet in elevation (4,507 acres) remains largely undeveloped, although some residential development has occurred in recent years. Land over 2,500 feet in elevation (393 acres) is somewhat protected from incompatible development through Act 250, although that law does not prohibit development.

**Slope.** Waitsfield's steeper slopes and hillsides are poorly suited for most types of development, posing serious limitations for site clearance, construction and the installation of infrastructure and utilities; and serious risks for stormwater runoff, slope failure, soil erosion, and the sedimentation of surface waters. The U.S. Natural Resource Conservation Service (NRCS) has identified general development constraints and management recommendations for different slope categories.

According to the NRCS, careful management to limit site disturbance is necessary on slopes in excess of 15 percent. All construction activities should be avoided on slopes in excess of 25 percent. State regulations also prohibit the installation of on-site wastewater systems on slopes in excess of 20 percent. General areas of steep slope are identified on Map 3 in Appendix B; however site assessments may be needed to determine slope limitations and management requirements for a particular development site.

In addition to physical constraints, development on steep slopes and prominent ridge lines can adversely impact the town's scenic landscape. Development in such areas, particularly at higher elevations, is often highly visible from numerous vantage points, and contrasts dramatically with the scenic backdrop provided by unbroken forest cover. Land above an elevation of 1,500 feet and the steep hillsides and prominent knolls rising from the valley floor have been identified through computer-based visual sensitivity analysis and community visual assessments as being especially vulnerable. Special measures have been incorporated in local land use regulations to prevent such development, or otherwise minimize its aesthetic impact through careful siting, landscaping and screening.

## 11.E WATER RESOURCES

Clean, plentiful water is a basic resource that is too often taken for granted. Waitsfield's water resources include abundant, naturally replenished surface and ground water supplies that sustain the natural environment and support a variety of human activities. Surface waters include upland headwaters and tributaries of the Mad River, the main stem of the Mad River, and small ponds scattered throughout town. Local ground waters include one of the largest identified aquifers in the state. The quality of these waters, which is thought to have improved over the past 30 years, must continue to be maintained and enhanced.

**Rivers and Streams.** Waitsfield is located entirely within the Mad River watershed (with the very minor exception of limited high elevation acreage located east of the ridge line of the Northfield Range which is within the Dog River watershed). The Mad River, which flows 7.5 miles through town, is fed by upland headwaters and a number of major tributaries located partly or entirely within the town, including Folsom, Pine and High Bridge Brooks, which form in the Northfield Range, and the lower sections of Mill and Shepard Brooks flowing in from Fayston (see Map 6 in Appendix B). The Mad River and each of its major tributaries are distinct in character, and serve a number of important ecological, cultural, recreational, and aesthetic functions.

Most surface waters in Waitsfield are designated by the state for management purposes as Class B waters, which are intended to support a variety of environmental, public and recreational uses. Headwater streams, defined by the Vermont Environmental Board as all year-round and intermittent streams above an elevation of 1,500 feet, are provided limited protection if a development is subject to Act 250 review. Headwaters above 2,500 feet in elevation are defined as more pristine Class A waters.

Surface waters can serve as a barometer of environmental well-being. The 1991 report, Watching the River's Health: The Condition of the Mad River and How to Improve and Protect It, resulted in the formation of the Friends of the Mad River, a nonprofit river advocacy group. The organization's mission is to restore and maintain the physical, chemical and biological integrity of the river system, and build public support for clean water.

In 1995, a river management plan, The Best River Ever, was developed that identified the following major problems and threats to the river and its tributaries:

- Accelerated erosion and stream sedimentation resulting from poor construction, road and land management practices;
- Impacts from stormwater including altered hydrology and sedimentation;
- Lack of stream bank vegetation, resulting in stream bank erosion and higher water temperatures that affect local trout habitat;
- Threats to biodiversity and ecosystems from invasive species such as Didymosphenia geminata (rock snot) and Japanese knotweed;
- Water pollution from failing on-site septic systems, stormwater runoff, and poor agricultural practices;
- Threats to public river access from development, overuse, misuse and changes in land ownership;
- Other threats, from contaminants, excessive water withdrawal for snow making, and gravel removal; and
- Lack of information and education about the river, including how the river functions, and how we contribute to the river's problems.

The Best River Ever also included over 100 specific recommendations to address each of these areas, many of which have been implemented.

The Friends of the Mad River have sponsored a number of programs and projects over the years to monitor and enhance water quality, support recreational

uses, and learn more about how the river functions. These include:

- Annual river cleanups;
- Assisting riparian landowners with stream bank stabilization and tree planting projects;
- Completion of extensive geomorphic (physical) assessments of the river leading to the development of the Upper Mad River Corridor Plan;
- Wildlife monitoring through sponsorship of Keeping Track®;
- Publication of a Mad River resource guide for teachers;
- Publication and distribution to every household of a guide for protecting the Mad River; and
- The Mad River Watch Program, which is an ongoing lay monitoring program that collects and publicly reports water quality data.

High bacteria (E.coli) counts have long been documented through local monitoring data and also in a 1998 study of selected tributaries of the Mad River. This pollution results from failing septic systems, agricultural runoff, and other sources. Currently the Folsom Brook and the Mad River, from the covered bridge in Waitsfield Village to its mouth, are included on the state's list of impaired waters targeted for improvement. These surface waters are listed because monitoring data indicate that bacteria levels currently exceed state water quality standards and impair the use of these waters for swimming and other contact recreation.

A total maximum daily load (TMDL) will be developed that will establish maximum pollutant levels from various sources and/or land uses. TMDL development will involve pollutant source assessments, the calculation of pollution loading rates that meet water quality standards, and associated source reduction requirements.

Gaining public access to the river and protecting its riparian zone is also a local priority. For many years, the only permanent access to the Mad River in Waitsfield was the Couples Club Recreation Field. In 1993, the town acquired the six-acre Lareau Swim Hole parcel for use as a wayside park. Since then, the town has also acquired: the five-acre former Austin parcel adjacent to the swim hole; a deeded access to the river on the former Woliner (now Neill) parcel, which includes a segment of the Mad River Greenway and a small parking area for the greenway adjacent to the Meadow Road; and a seven-acre parcel with river frontage immediately upstream of the swim hole (Tardy parcel). One hundred twenty-five acres of nearby woodland known as Wu Ledges, with approximately one-half mile of river frontage on the east side, was donated to the town in 2004. The combination of the Wu Ledges, Austin, Lareau and Tardy parcels protects approximately six-tenths of a mile of river frontage on the east side and about 0.15 mile on the west side, with about 300 feet protected on both sides.

In December of 2000 the town purchased the Munn site, a tract of 12.2 acres located at the intersection of Rt. 100 and Kingsbury Road, for the purpose of possible gravel extraction, recreation, wastewater disposal and/or scenic protection. This parcel has approximately 800 feet of frontage on the east side of Mad River.

Phase I and Phase II geomorphic assessments of the Mad River and some of the tributaries were recently conducted with financial assistance of the Department of Environmental Conservation's Ecosystem Restoration Program. Those studies resulted in the mapping of the fluvial erosion hazard area for the Mad River.

**Groundwater.** Fractured bedrock in the high elevations of the Northfield Range and gravel deposits in the lowlands and along the valley floor serve as the principal recharge areas for local groundwater supplies. Groundwater sustains base flows for the Mad River and its tributaries. It also currently provides potable water supply to all Waitsfield's homes and businesses, through a combination of private and small community wells and springs.

While the town benefits from generally abundant groundwater supplies, this dependence on scattered wells, particularly along Route 100 and in village areas, poses risks of potential groundwater contamination from a variety of sources. Once a groundwater source is contaminated, remediation, if feasible, is typically very expensive. There are a number of known contamination sites in Waitsfield, most of which are associated with leaking underground fuel storage tanks. The state requires remediation and/or monitoring of these sites to prevent further contamination of groundwater and potable water supplies.

Groundwater supplies are also affected by periods of drought. During droughts many shallow wells and springs may temporarily dry up. With climate change, weather patterns should expected to change, but it is difficult to predict at the local level whether this will result in increased or decreased precipitation.

Given the density of development and the lack of a comprehensive plan for wastewater disposal, the groundwater source areas in Irasville and Waitsfield Village are particularly at risk for contamination. Concerns over potential contamination have been a driving force in the effort to provide these centers with municipal water. After more than a decade of planning, design, funding acquisition, and permitting, construction of a new municipal water system began in 2010 to serve the Irasville and Waitsfield Village growth center.

Vital to the protection of groundwater sources is an awareness of their recharge areas. Aquifer recharge areas are zones that contribute to subsurface supplies. A recharge area consists not only of the land area directly above the aquifer through which precipitation percolates, but also of upland areas from which runoff drains towards the aquifer. Uses of these lands, which may have the potential for spills of toxic or dangerous substances, also have the potential to pollute the aquifer. Excessive impermeable surfaces (e.g. from parking lots, buildings, etc.) deplete the groundwater supply. Also, as there is exchange between surface and ground waters, land uses that pollute upstream waters may in time damage downstream aquifers.

Aquifer recharge areas have yet to be adequately mapped, but source protection areas (SPAs) have been delineated as required by the state to protect public community water systems serving 15 or more service connections, or 25 or more users year-round. Under new state and federal regulations, source protection plans also must be developed for non-transient, non-community public water systems, which serve more than 25 people for at least six months of the year. SPAs are delineated for the Fly-In business park, Verd-Mont mobile home park, the elementary and Spring Hill schools, the shopping centers in Irasville, Mad River Meadows, the Eagles, and Butternut Hill .

Within designated SPAs, special consideration must be given to prohibiting, or carefully managing, development and practices that could contaminate local ground water supplies. These include poorly designed or failing septic systems, underground storage tanks, and the storage of hazardous materials and road salt.

Vermont's groundwater protection law (10 VSA, Chapter 48) sets forth general policies for SPAs, and the Agency of Natural Resources (ANR) has published recommended land use guidelines for SPAs. In addition, in 2008 the Vermont Legislature passed Act 199 that enhanced groundwater protection in Vermont by declaring groundwater to be a public trust resource that must be managed by the state for the benefit of all Vermonters.

Act 199 also established a large groundwater withdrawal-permitting program that requires any commercial groundwater withdrawal of more than 57,600 gallons per day (gpd) to obtain a permit from ANR. One of the criteria that a large groundwater withdrawal must meet is that the withdrawal must conform to any town or regional plan. As such, Vermont municipalities have the authority to control where and to what extent large groundwater withdrawals occur through their town plan, as well as the ability to regulate commercial extraction through zoning.

## 11.F EARTH RESOURCES

**Geologic Features & Hazards.** The bedrock underlying Waitsfield consists largely of highly metamorphosed graywacke, phyllite, gneiss and schist. Despite its location in the heart of the Green Mountains, there are no large-scale commercial rock quarries or mineral deposits in town. Only two small-scale quarry operations exist, both of which are operated on a limited basis. The Mad River does offer the recreational collector a chance to find small amounts of placer gold in return for a hard day's work; hand panning for recreational purposes does not require a state permit but landowner permission should be sought and granted prior to any panning.

Geologic hazards are minimal, though isolated rock falls and slides are common on steep or unstable slopes. Regional earthquakes, typically centered in the Adirondack Mountains or southern Quebec, occur with enough frequency and strength that public infrastructure, buildings and utility systems should incorporate basic seismic standards for earthquake resistance.

**Sand and Gravel.** Sand and gravel, found in association with glacial and stream deposits, are locally more abundant and economically viable to extract for

commercial and municipal purposes. The total extent of these deposits is unknown, although soils maps indicate roughly 2,200 acres of sand and 1,900 acres of gravel is known to exist here. There are two permitted, privately owned sand and gravel pits in town, but only one is active.

Historically, gravel extraction from the Mad River was common. In the 1980s, it was recognized that gravel extraction was depriving many of the state's river systems of the sediment needed to maintain its geomorphic stability and causing extreme streambed degradation Gravel extraction from the rivers and streams is now carefully regulated by the state.

Upland extraction operations also raise a host of potential conflicts. Active extraction operations result in noise, dust, truck traffic and visual blight. Such operations also can create safety hazards, affect groundwater supplies, result in the deterioration of local roads and infrastructure, create tensions with neighboring landowners, and impact an area's rural character for residents and visitors.

However, road maintenance and construction projects are dependent upon sand and gravel, which if not available locally must be hauled from more distant locations at great expense. In order to maintain safe, attractive roads in a cost-effective manner, the town has secured a reliable and economic source of gravel located east of Route 100 on the former Howard-Tucker parcel, which is accessed from the AmeriGas property south of Armstrong Road. The Town obtained permits for sand and gravel extraction in 2009, and anticipates that the site will provide the Town's road and construction needs for a minimum of twenty years.

The adverse impacts of sand and gravel operations can be addressed to a certain extent through local and state regulations, good management practices and mitigation. These tools can help to ensure that extraction operations have minimal impact on the local area and neighboring properties, and that sites are adequately reclaimed to allow for subsequent use once extraction is completed. Nonetheless, proposed operations must be carefully evaluated on a case-by-case basis to determine their compatibility with local circumstances and priorities.

## 11.G SOILS

**Agricultural Soils.** Within the Mad River Valley, Waitsfield contains the greatest concentration of soils defined by the National Resource Conservation Service (NRCS) as prime agricultural soils. This includes 1,200 acres of prime agricultural soils and another 3,100 acres of soils of statewide agricultural importance. Most of these soils are found in valley bottomlands, but also extend along the broad plateau south of Waitsfield Common (see Map 4 in Appendix B).

The town's less fertile upland soils went out of production a century ago with the abandonment of hill farms, but local farmers continue to rely on the best soils to remain economically viable. The location of active farmland in town strongly correlates with the location of prime agricultural soils. Because these soils are relatively well-drained and support on-site septic systems, they are also inexpensive to develop for a variety of other uses. Subdivision and associated development continue to threaten productive farmland, particularly outside of designated floodplain areas.

Prime agricultural soils are a finite resource. Once converted to other uses, they are rarely returned to agriculture. They sustain and enhance local capacity for food production, and support existing and future farming operations. For these reasons, the town's best agricultural soils must be protected from other forms of development.

Farmers are also required to observe accepted agricultural practices, including the maintenance of buffer strips along waterways, to help minimize soil erosion and loss from farming operations.

**Forestry Soils.** NRCS also has identified the best soils to support commercial forestry, including many upland soils that are too shallow, rocky or steep to support other types of development. As a result, prime forestry soils are generally less threatened by development, but are more sensitive to site disturbance and erosion. To help prevent soil erosion, the state has adopted acceptable management practices to prevent soil erosion and maintain water quality on logging jobs.

**Septic System Suitability.** Currently, all the town's sewage treatment needs are addressed through individual or clustered on-site systems. Soil suitability for on-site septic systems, as determined from state design standards, varies widely throughout town. Map 5 in Appendix B gives an indication of soil suitability for on-site septic systems under state standards. Under this soil classification system, approximately half of the total acreage of Waitsfield is considered either marginally suitable or unsuitable for on-site systems. The majority of the unsuitable soils are located on very steep slopes, with the heaviest concentration being above 1,500 feet in the Northfield Range.

State standards adopted in 2002 reduced required isolation distances to bedrock and groundwater and allow for alternative technologies, which may open up more land to development over time. Local land use regulations should adequately safeguard these areas from incompatible forms of development rather than relying on state septic regulations to limit development.

## 11.H FOREST RESOURCES

Forest is the dominant land cover in Waitsfield, accounting for almost 12,300 acres, or approximately

75 percent, of the town's total land area. Forest resources provide a number of benefits, including an economic return for local landowners, air and water quality, stream flow attenuation, wildlife habitat, recreation opportunities for town residents and visitors, and an important visual backdrop to most scenic vistas. In assessing issues relating to forest resources in town, an understanding of concerns relating to timber management and ownership patterns is important and are addressed under the land use chapter of this plan (Chapter 12).

**Forest Fragmentation.** Forest fragmentation refers to the division of large tracts of contiguous forest land into smaller, disjointed parcels, or their conversion to non-forest cover that diminishes the forest's capability of supporting sustainable forest management, species diversity of both plants and animals, and a host of ecosystem functions. In particular, the fragmentation of productive forestland through subdivision into smaller and smaller pieces and multiple ownerships is a growing problem nationally and in Vermont. According to the U.S. Department of Agriculture, the amount of forest cover in Vermont is decreasing for the first time in approximately 100 years , and the Winooski River watershed is Vermont's most threatened watershed with regard to likely forestland fragmentation.

**Forest Management.** Sound forest management results in a stable economic return for landowners, local resources to support local industry, and perhaps most importantly, an incentive for keeping large tracts of land free of development and available to the public for recreation, wildlife, scenic enjoyment, other "ecosystem services." However, poor forest management can result in the degradation of biological diversity and can damage scenic landscapes.

Generally, a sound forest management plan should consider multiple objectives, including sustainable timber production, the protection of water quality, maintaining a diversity of wildlife habitat, recreational opportunities, and aesthetic enhancement, depending on the site specifics of the parcel in question and the landowner's vision and needs. Whatever the objectives of a forest property owner, developing and implementing a forest management plan in consultation with a qualified forestry professional is one of the best means of managing a forest parcel for long term, sustainable forest production. Such a plan also provides an opportunity to balance timber production with other important objectives including wildlife protection and recreation.

**Private Forest Lands.** The majority of forestland in Waitsfield is under private ownership. While much of the private forest is made up of large parcels associated with single-family residences, many undeveloped parcels of managed timber lands also exist. Much of this privately-owned forestland is located in the Northfield Range, although large tracts of managed woodlands are located adjacent to the valley bottom. Of the privately-owned forestland in town, more than 4,000 acres are currently enrolled in the state current use program, and are therefore managed in accordance with a forest management plan approved by the county forester. In addition to land under forest management, small saw mills currently operate in Waitsfield, providing a value added industrial base utilizing local forest resources

**Municipal Forests.** In 1991, the town received a gift of 360 acres located on the southwest portion of Scrag Mountain, including much of the ridgeline south of the summit. Since then the town acquired an additional 20-acre parcel, and adjacent parcels of 60 acres and 200 acres were donated to the town in 2008, expanding the municipal forest to approximately 640 contiguous acres of rugged high-elevation land straddling the Northfield ridge. This land provides multiple municipal use opportunities to the town involving recreation, wildlife, scenic and watershed resources, and timber management. Primary access for public recreation and town forest management is enabled through a condition attached to a subdivision approval on private land at the north end of Bowen Road. There is no deeded access to land on the east side of the ridge, but if access cannot be arranged with abutting landowners Vermont statutes may enable the town to access these lands for timber harvesting purposes.

As mentioned in the Water Resources section above, the town also acquired the 125-acre Wu Ledges forest through a donation in 2004. The Wu Ledges parcel encompasses substantial frontage along the east side of the Mad River and much of the hillside that provides the eastern backdrop to Irasville. In addition, as part of the Hastings Meadow subdivision, the town acquired fee title to an adjacent 14-acre forested parcel, a conservation easement on an adjacent undeveloped 25-acre parcel, and trail rights on some neighboring private land. Together, these lands include a diversity of forest types and natural communities, and a network of public trails for hiking, snowshoeing, skiing and mountain biking.

The Conservation Commission has taken the lead on stewardship and management of the Scrag and Wu Ledges forests on behalf of the town. Over the last few years the Commission has overseen the completion of extensive inventories of the natural communities, bird habitat, and timber resources of these parcels. The Commission is now embarking on the process of developing comprehensive management plans for these parcels, integrating the various inventories with information on other attributes, such as recreational opportunities, along with public input on goals and uses.

Public lands like the Scrag and Wu Ledges forests provide a variety of benefits through management of their natural resources and open space amenities and by serving as buffers between more developed areas. These public lands require fewer and less costly services than more intensively used private properties, and thus serve to diminish the need for ongoing taxpayer support. Municipal revenue can be realized through periodic sales of carefully managed renewable timber, thus contributing to Vermont's highly-valued working landscape and forest products industry. Tourism and recreation opportunities, supported by the public access and visual amenities available from undeveloped town forest lands, are a major element of the Mad River Valley's economic structure. Well-considered uses of those lands, including public participation in the planning and management process, will help to maintain and improve the quality of The Valley lifestyle.

Opportunities to expand municipal forests through the purchase or gift of land may exist. Any expansion, however, should be followed by a comprehensive management plan, and should result in the acquisition of lands that will meet the town's policies and objectives with respect to its valuable natural assets.

**Camel's Hump State Forest (Howe Block).** Approximately 550 acres of the Camel's Hump State Forest are located in Waitsfield, in the Howe Block, along the Fayston boundary immediately south of Irasville on Dana Hill. This land is under multiple use management, subject to a Land Management Plan developed by the Vermont Department of Forest, Parks and Recreation. In addition to protecting much of a highly visible hillside, the state forest is actively used by local residents for hunting, hiking, skiing and biking.

## 11.I ENVIRONMENTALLY SENSITIVE AREAS

Environmentally sensitive areas include those areas or features that serve important ecological functions, and are especially susceptible to degradation from land use and development activities. As such, they are generally considered for protection through both regulatory and non-regulatory means.

**Wetlands.** Wetlands historically were viewed as worthless, mosquito-ridden bogs best suited for draining and filling for more productive uses. Wetland areas are now known to serve a variety of important ecological functions, including but not limited to storm water management and flood control, surface and ground water recharge and protection and wildlife habitat. Thus, they are now protected under state, federal and local regulations. Wetlands also present significant development constraints associated with poor drainage and high water tables.

There are no extensive wetland areas in Waitsfield, but many smaller wetlands are scattered throughout town (see Map 6 in Appendix B). The largest concentrations are found in the flood plains of the Mad River and in poorly drained areas in higher elevations south of Bald Mountain, including Printice Swamp.

As of the writing of this plan, there are roughly 640 acres of mapped wetlands regulated by the state as shown on the Vermont Significant Wetland Inventory (VSWI) map for the town. This VSWI map is being updated and it is expected that more of the small wetlands, not previously shown, will be included. Even when this process is complete, site specific information and delineations may be required for the review of impacts associated with a particular development.

Protection is provided through the designation of buffer areas at least 50 feet in width within which very few activities are allowed.

The loss of wetlands, especially upland (palustrine) wetlands, is an issue of national, state and local concern. In some circumstances, where full protection is not feasible given other considerations, mitigation resulting in no net loss of wetland area or function may be appropriate. Wetlands have been identified in areas designated for development within Irasville. In 2001, a functional evaluation of delineated wetlands in Irasville was completed, which showed that the majority of the wetlands in the district were classified as wet meadows and had limited wetland functions.

To the extent feasible, Irasville's wetlands should be incorporated in site planning, design, and storm water management systems. However, in order to achieve higher densities of concentrated development as envisioned for this area, some may need to be developed and mitigation of impacts provided. Further planning for Irasville should continue to explore options for wetlands protection and mitigation with state and federal officials.

**Floodplains and River Corridors.** Flooding is Waitsfield's most common form of natural disaster and the most costly and dangerous to public health and safety. Flooding is also part of a natural process to dissipate the potentially damaging energy carried by raging rivers and minimize water quality degradation.

Waitsfield has experienced flooding and attendant damages stemming from high rainfall events, rain on snow events, higher than normal spring runoff events, and higher than normal precipitation that was associated with tropical storms and hurricanes. The frequency and magnitude of flooding can also be associated with the amount of impervious cover that inhibits infiltration, resulting in greater stormwater runoff.

Flooding can cause inundation – floodwaters rising to levels that can flood roads and basements, whose velocities can be destructive to buildings and dangerous to people. Flooding can also cause fluvial (river-based) erosion, particularly if the stream channel is unstable. Fluvial erosion can threaten public infrastructure (e.g. roads, bridges, and culverts), private homes and business, and public safety and can result in significant property damage.

Mapped floodplains include those areas that have a one percent chance of flooding in any year. These areas serve as a safety-valve by temporarily carrying and retaining bank overflow from spring runoff and heavy storms, and are vital to the health of the river and the safety of the community. Waitsfield's mapped 100-year flood plain extends mostly along the Mad River and the lower reaches of its major tributaries (see Map 6 in Appendix B). Over the past several years, the flood plain maps have been reviewed and updated.

In addition to the risks associated with inundation, there is the related hazard posed by storm-swollen streams and rivers, which may unexpectedly deepen, over-widen, or jump their banks and cut new channels. Due largely to human influences, many stream and river channels are no longer stable. Their instability creates an erosion hazard during major storms, which are becoming more common as a result of climate change. Fluvial (river-related) erosion hazards often exist in locations that are unlikely to be inundated with flood waters. Eroding stream banks are also a significant source of sediment and polluting nutrients entering major rivers and lakes, which decreases water quality.

Management efforts, directed toward long-term solutions that help curb escalating costs and minimize the danger posed or damage caused by storm-swollen streams, can help reduce flood and erosion hazards along river and stream corridors, improve water quality and aquatic habitat, and enhance aesthetic and recreational values of the town's rivers and streams.

Waitsfield experienced a significant flood in 1998 and, most recently, a flood in the spring of 2011, and a devastating flood from Tropical Storm Irene in August of that same year. Waitsfield is committed to improving its resiliency to flood impacts. The town has adopted flood hazard area regulations to limit development within flood hazard areas, as required for municipal participation in the federal flood insurance program. These regulations are intended to protect life and property, and to allow property owners to obtain National Flood Insurance Program (NFIP) flood insurance and mortgages at relatively affordable rates. In 2010, the town adopted new floodplain and fluvial erosion hazard regulations and maps as mandated by the Federal Emergency Management Agency (FEMA) and the NFIP. The town updated its flood hazard bylaws and added a fluvial erosion hazard bylaw to reduce the impacts associated with flooding.

The town adopted the Vermont Transportation Agency's Road and Bridge Standards contained in the most recent edition of The Orange Book for Local Officials to reduce stormwater impacts on town road infrastructure. The town is also working with the University of Vermont to conduct a stormwater management master plan for the town.

Given the increasing cost of taxpayer-funded flood recovery, Waitsfield is also committed to developing and implementing flood hazard mitigation to reduce and avoid the costs associated with the damage that would otherwise occur to homes, businesses, and public infrastructure in the wake of a flood. Hazard mitigation is defined as taking sustained actions to reduce or eliminate the long-term risks to people and property from flooding. Flood hazard mitigation includes strategies that use the beneficial functions of landscape features such as floodplains, river corridors, wetlands, and shorelines to cost-effectively reduce the impacts of flooding. These features provide the town with a first line of defense to dampen the damaging effects of flooding by storing floodwaters, as well as the sediment, nutrient pollution loads, and debris carried by floodwaters. Nationwide, one dollar spent in mitigation saves four dollars in avoided costs from flood damages.

**Wildlife Habitat.** Waitsfield is home to a variety of plant and animal species and natural communities (distinct assemblages of plants and animals in particular environmental settings) that contribute to local biological diversity and ecological integrity, and support traditional activities such as hunting, fishing, foraging, bird-watching and other wildlife viewing. Forested upland areas harbor a wide array of bird species; mammals, such as black bear, deer, bobcat, moose, coyote, fisher, and rumored catamount populations; and many species of reptiles, amphibians, and insects. The Mad River and its tributaries support natural and stocked populations of brook, brown and rainbow trout. Wetland and river corridors, open lands and field edges also provide critical habitat for a variety of species. Wetlands supporting wildlife habitat, although not common in Waitsfield, are essential for the survival of mink, otter, beaver, black bear, moose, ducks, herons, other wading birds and shore birds, a variety of amphibians and reptiles, and other species.

Human activities, however, can have devastating impacts on local wildlife populations, including:

- The fragmentation and loss of contiguous habitat areas due to subdivision and development;
- The fragmentation or interruption of seasonal travel corridors;
- Habitat degradation from air and water pollution; and
- The introduction of exotic species.

The extent of knowledge about wildlife habitat in Waitsfield and the Mad River Valley has been significantly bolstered by the 2007 Natural Heritage Element Inventory and Assessment for Waitsfield and Fayston prepared by Arrowood Environmental. The purpose of this inventory was to map and assess the natural heritage elements that are important to the preservation of biological diversity. The scope of the project included the identification, inventory, assessment and ranking of five resource elements: wetlands, vernal pools, upland natural communities, wildlife habitat and connecting lands and rare elements.

The Arrowwood study provides an overview of the various natural communities found as well as specific habitat types (land with physical characteristics that are critical to the survival of one or more species). While the study includes several maps of different natural features, those maps are not necessarily comprehensive in that extensive fieldwork was not

conducted as part of the study. Therefore, delineation of natural heritage resources still must occur on a site-by-site basis, and unmapped resources likely exist in Town. The study does, however, identify the physical features that comprise the significant wildlife habitats in Waitsfield, including:

- **Core Habitat**, described as "forested wildlife habitat that is far removed from human activities and their artifacts, such as roads, houses and active farmland." This includes all of the Forest Reserve District and some adjacent land, especially Mount Waitsfield and the steep valley wall adjacent to the Mad River east of the North Road, as well as much of the land encompassing ——the Wu Ledges Town Forest and adjacent areas especially to the south.
- **Deer Winter Habitat**, or deeryard, is generally found on south or west facing slopes 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. Due to their relatively high concentration, deeryards in Waitsfield serve a regional function. Covering approximately 4,000 acres, deeryards are concentrated primarily along the steep slopes parallel to the Mad River, and in the Folsom Brook drainage area.
- **Wetlands** identified in the study include several different types that are important to wildlife, including floodplain forests, seeps, wetland complexes, oxbow communities and vernal pools, which typically contain water only seasonally.
- **Mast Stands** are concentrated stands of masting trees (e.g., American beech) that provide 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. Eight mast stands were identified in Waitsfield, most — but not all — within larger areas defined as core habitat.
- **Forested 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 temperature — 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. Establishing stream buffers that limit encroachments and maintain vegetation is an effective way to protect this resource.
- **Grassland Habitat**, which consists of active farmland used for pasture or hay, is important to a variety of mammals and birds (some species, including deer, fox and bear, even use agricultural land planted in row crops).
- **Rare & Endangered Species Habitat** sites are inventoried by the Vermont Non-Game and Natural Heritage Project. Because of the vulnerability of the species in question, the precise locations of identified habitats are made available only to relevant officials and experts, and are not published or made available to the general public. To date, no rare or threatened habitats have been identified in Waitsfield, although a complete inventory has not been undertaken.
- **Ledge, Talus & Cliff Habitats** 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. These areas include several craggy outcrops on the steep lower valley wall rising east of the Mad River, and in the Northfield Range.
- **Wildlife Travel Corridors** are places where landscape and land use characteristics combine to form an area where wildlife can move across roads to and from habitat areas. Three categories of corridor locations were identified: (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 between upland and wetland habitats. Although 27 "likely" travel corridors have been identified in Waitsfield, field verification of the location and function of travel corridors is needed.

The Arrowwood study includes management recommendations that can help landowners manage their property in a manner that maintains the ecological functions for wildlife. The study also identified "contiguous habitat units" that describe large areas where

several different habitat types are combined to form a unit of relatively continuous wildlife habitat. All or a portion of 14 different contiguous habitat units have been identified in Waitsfield. This provides a useful context for understanding how various wildlife habitats interrelate in supporting the Mad River Valley's wildlife populations. As discussed in Chapter 8, maintenance of road infrastructure such as culverts and bridges should be done in a way that anticipates the increased frequency and magnitude of high storm flows that are likely with climate change (e.g. using larger diameter and/or bottomless arch culverts). Such actions can offer a win-win solution by reducing maintenance costs in the mid-to-longterm and providing ecological benefits by improving conditions for the movement of aquatic and terrestrial animals within and along stream corridors that roads cross.

As is true of other shared natural resources like the Mad River and our mountain ridgelines, it is important for Waitsfield and the neighboring towns to think about wildlife habitat and natural heritage resources not only on a town-by-town basis but also in a broader, collective context. Such an integrated perspective—one that is not confined by town boundaries—is essential if we and our neighbors throughout the Mad River Valley and beyond are to sustain the diversity of habitat and species that is a defining part of our sense of place. The Arrowwood study for Waitsfield and Fayston, and a parallel one that Arrowwood completed for Warren in 2008, provide an excellent foundation of knowledge from which to advance this type of shared approach to the conservation of wildlife habitat and key natural heritage assets.

The Mad River Valley towns have taken a step in this direction with the development of the Forests, Wildlife, & Communities (FWC) Project in 2008. FWC Project is a collaboration among the Mad River Valley Planning District, local and state conservation organizations, state and federal agencies, and representatives in the town of the Mad River Valley to implement a regional and landscape level approach to wildlife and forestland conservation by engaging and assisting landowners, residents, and local officials about community-oriented and landowner-based strategies for forestland and wildlife habitat conservation. One output of the FWC Project has been the development of maps that bring a valley-wide lens to the individual Arrowwood studies. Through the support of the VT Fish & Wildlife Department and various FWC Project partners, the maps help prioritize previously mapped resources and serve as a valuable resource for municipal and watershed level planning. The 2011 Tiered Ecological Priorities Map, developed as a planning tool for municipal governments in the Mad River Valley, identifies areas that ecologists have deemed important for conservation. The map prioritizes resources into four levels, reflecting what are believed to be the most important places for maintaining The Valley's fish and wildlife populations and biological diversity. A second map, Ecological Conservation Focus Areas, identifies the degree of co-occurrance or overlapping of several ecological principles. It shows areas appropriate for conservation action, such as where to focus technical assistance or voluntary land acquisition. Together, the information in these maps provide a platform from which the towns and landowners can consider appropriate actions—whether individually or collectively—to sustain the Valley's vital habitats.

## 11.J INVASIVE EXOTIC SPECIES

While some exotic species don't pose a danger in their new host environments, many persist and proliferate to the detriment of native species, natural communities, and ecosystem functions. These organisms can pose a risk because they often have no natural predators and can out-compete native species, greatly reducing biodiversity and altering "ecosystem services" such as forest productivity and outdoor recreation. Thus, these species—which can include both terrestrial and aquatic plants and animals—have been labeled "invasive exotic species."

Invasive exotic species pose a number of environmental, economic, and human health threats. Unfortunately, Waitsfield and the rest of the Mad River Valley are not immune to the effects of invasive exotic species, and the threat from them is growing. The list of such species that are already present in the Mad River Valley is extensive – for instance, Japanese knotweed, glossy buckthorn, honeysuckle, Japanese barberry, Didymo (or "Rock Snot"), winged euonymus or "burning bush," purple loosestrife, and wild chervil. And others that could have a transformative effect on our forests—such as Asian longhorn beetle, emerald ash borer, and hemlock wooly adelgid—are not here yet but may not be far off.

While some species like knotweed are already widespread, the good news is that many are not yet prolific locally and so offer an opportunity for effective

management to prevent or limit their spread. Before the threat and impacts of existing and new exotic invasive species intensify, the Town should do whatever it can independently and in collaboration with others (e.g., the other Mad River Valley towns, appropriate state agencies, nonprofit organizations like the Friends of the Mad River and the Vermont Chapter of The Nature Conservancy) to develop and implement an effective prevention and management regime. Potential elements include:

- Surveying the presence and location of invasives in town (and the Mad River Valley more broadly). Seek input from foresters and other land managers on what they are finding.
- Developing an "Early Detection/Rapid Response" protocol to limit and control small-scale outbreaks of invasives before they proliferate into larger, more difficult problems.
- Addressing invasives in the development and implementation of management plans for town-owned lands.
- Linking with the emerging statewide citizen science monitoring initiative for invasives, which will include a mapping component and protocols for assessment.
- Working with the town road crew to adopt and implement best management practices to prevent the spread of invasives (e.g., ensuring all fill that is moved in town is "weed-free," cleaning equipment, changing mowing regimes). The New Hampshire Department of Transportation's 2008 publication "Best Management Practices for Invasive Plants" is one source for formulating BMPs.
- Replacing any plantings in front of town-owned buildings that have invasives. Use this project as an example to help the public understand and prevent the spread of invasives.
- Promoting the use of natives by any applicants that are seeking design approvals through the town. At the very least, make sure that the list of approved plants does not include known invasives.
- Educating landowners about invasives by having information on the town website.
- Conducting and publicizing an invasives management/restoration project on town lands.
- Encouraging residents to replace any invasives on their property with native species.
- Exploring the establishment of a Valley-wide Cooperative Invasive Species Management Area (CISMA) to promote collaborative planning, management, and outreach to prevent or reduce the spread of invasives.

## 11.K GOALS

11.K-1 The responsible stewardship and sustainable use of Waitsfield's natural resources in a manner that protects and enhances the town's and the broader Mad River Valley's environmental well-being for the benefit of future generations.

11.K-2 The conservation of natural features that contribute to Waitsfield's and the Mad River Valley's ecological health and biological diversity.

11.K-3 Flood resiliency, mitigation, and restoration following flood events such as the one that occurred in May 2011 and Tropical Storm Irene which occurred in August 2011. Particular attention should be paid to protecting the flood-prone Historic District in Waitsfield.

## 11.L POLICIES

11.L-1 Identify and protect important natural resources, including prime agricultural soils, forest resources (soils, products, habitat), significant wildlife habitat, floodplains, river corridors, water resources and other features described in this plan.

11.L-2 Accomplish the protection of identified natural resources through measures and programs that support, where appropriate, the sustainable use of those resources, including management of productive forests, agricultural use of productive soils, commercial and non-commercial recreational use of land and water, and the generation of renewable energy in appropriate locations.

11.L-3 Support the continuation and expansion of the state current use program to tax farm and forest

properties at their productive value rather than their development potential. Encourage the participation of Waitsfield property owners in that program.

11.L-4 Support the efforts of local, regional and statewide conservation organizations to protect open space in Waitsfield through voluntary programs (e.g., purchase or donation of development rights). Priorities for open space protection include:

11.L-4.a Productive agricultural land and working farms;

11.L-4.b Primary agricultural soils, including those not presently in production, unless such soils are located on parcels identified as appropriate areas for future development ;

11.L-4.c High elevation land (above 1,500 feet) in the Northfield Mountain Range;

11.L-4.d Significant wildlife habitat and travel corridors (as defined in this chapter);

11.L-4.e Trail corridors, river accesses and areas for dispersed recreation (e.g., hunting, hiking, biking and other non-motorized activities);

11.L-4.f Riparian lands, river corridors and floodplain;

11.L-4.g Identified scenic viewsheds; and

11.L-4.h Undeveloped parcels adjacent to existing conserved lands.

11.L-5 Pursue land conservation projects in accordance with the overall policies of this plan, including, but not necessarily limited to, those related to land use, housing and economic development.

11.L-6 Support the efforts of the Mad River Valley Planning District, Mad River Valley Rural Resource Commission and other organizations to implement and update the Mad River Valley Rural Resource Protection Plan.

11.L-7 Explore the benefits of expanding of the Green Mountain National Forest proclamation boundary to encompass land located east of Route 100 which would allow the Town to obtain and/or facilitate federal technical and conservation assistance and Forest Service funds.

11.L-8 Ensure that the extraction of finite earth resources, including sand and gravel, is conducted carefully to minimize adverse impacts on surrounding properties and the community at large, and to ensure restoration of the site upon completion of the extraction activity. Development of such resources should be carefully sited to retain, to the extent possible, future access.

11.L-9 Prohibit land development on slopes of 25% or greater.

11.L-10 Enact, incentivize and support measures to preserve primary agricultural soils for continued and future agricultural use and prevent the fragmentation and development of these resources through the town's land use regulations.

11.L-11 Design land subdivisions and land development, outside of designated growth centers, to minimize development on and fragmentation of land characterized by primary agricultural soils.

11.L-12 Prohibit land development on wetlands, unless it can be done with appropriate mitigation, particularly with regard to any critical ecological function that may be compromised by development.

11.L-13 Design all land subdivision above an elevation of 1,500 feet carefully to minimize or mitigate adverse impacts to significant wildlife habitat, productive forest land, scenic viewsheds, shallow soils and headwater streams. Appropriate methods to avoid or mitigate such impacts include clustering development on the least sensitive portion of the site and retaining the bulk of the subdivided parcel(s) as open space.

11.L-14 Prohibit land development, including the construction of roads and extension of utilities, above an elevation of 1,700 feet, with the exception of activities related to non-commercial recreation, forest management and low-impact seasonal camps.

11.L-15 Design land subdivision and land development to avoid undue adverse impacts to significant wildlife habitat and wildlife travel corridors, including those in the 2007 Natural Heritage Inventory, and contiguous habitat units located outside of designated growth areas, including village and industrial districts and appropriate areas for residential hamlets. An adverse impact to significant wildlife habitat is any consequence of development that would demonstrably reduce the ecological function of habitat on a particular parcel. An adverse impact to contiguous habitat units (or core habitat) is one that would result in a demonstrable reduction in the ecological function of the area, or the type of impact that, along with other impacts in the area, would lead to a cumulative reduction in the ecological function of the habitat in the contiguous habitat unit.

11.L-16 Design local incentives to encourage the conservation of large, unfragmented landscapes.

11.L-17 Protect and enhance the quality of Waitsfield's surface waters through the maintenance of vegetated buffers and river corridors along all streams.

11.L-18 Prohibit the removal of gravel from the Mad River and tributaries in excess of volumes presently allowed by the state.

11.L-19 Design land subdivisions and land development to control storm water runoff, increase infiltration and avoid adverse off-site impacts to water quality. Post-development storm water should infiltrate or flow off the property at similar rates and locations to pre-development conditions.

11.L-20 Consult with the Friends of the Mad River and local fishery groups on projects that may potentially impact the Mad River and tributaries.

11.L-21 Support the efforts of the Friends of the Mad River and other organizations to implement and update the Best River Ever: A Conservation Plan to Protect and Restore Vermont's Beautiful Mad River Watershed.

11.L-22 Support the establishment of municipal water and the further investigation of wastewater options to serve designated growth centers as a means of avoiding contamination of ground and surface waters.

11.L-23 Maintain the existing classifications of the town's surface waters, with the exception of headwater streams above an elevation of 1,500 feet which should be upgraded to Class A.

11.L-24 Develop and implement a plan to allow the encroachment into wetlands with limited ecological functions within the Irasville Village District. Such a plan should include clear strategies for the maintenance or replacement of any lost ecological functions either within or outside of the district.

11.L-25 Design land development within mapped water supply source protection areas carefully to avoid groundwater contamination, and uses posing a high risk of contamination.

11.L-26 Control the extraction of groundwater for commercial purposes carefully to ensure that water is extracted at sustainable rates and to prevent the depletion of water supplies in the community.

11.L-27 Promote sustainable forest management to ensure the maintenance of water quality, the enhancement of wildlife habitat and the avoidance of adverse impacts on scenic resources, including upland areas in the Northfield Mountain range. (See Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont).

11.L-28 Continue to evaluate development proposals against the policies of this plan during local and state regulatory processes to ensure that such proposals are in conformance with the plan.

11.L-29 Manage town-owned conservation properties (Scrag, Wu Ledges, Austin, Tardy) for a responsible, sustainable mix of public values in accordance with management plans prepared by the Conservation Commission with appropriate public input.

11.L-30 Collaborate with other Mad River Valley towns and appropriate public and private organizations to further the sound stewardship across municipal boundaries of shared natural assets including the Mad River, mountain ridgelines, wildlife and habitat.

11.L-31 Prevent and eliminate invasive exotic species in Waitsfield and the Mad River Valley through town actions, public engagement with landowners and other residents, and collaborative efforts with other towns and partners.

11.L-32 Continue to prevent development of critical facilities in flood-prone areas and in the floodplain and floodway.

11.L-33 Continue to protect natural and beneficial functions for mitigating flood hazards.

11.L-34 Promote hazard mitigation as a cost-effective measure to improve the town's resilience to flooding.

11.L-35 Protect the Historic District using hazard mitigation strategies, including flood-proofing and/or elevating structures.

11.L-36 Support the the goals of the Forests, Wildlife, & Communities Project, utilizing the Tiered Ecological Priorities Map for conservation planning and development review proceedings. Reference the Ecological Conservation Focus Area Map when focusing on technical assistance or ascertaining cost-efficient utilization of the town's conservation resources.

## 11.M TASKS

11.M-1 Enact, through zoning and/or subdivision regulations, measures to preserve primary agricultural soils for continued and future agricultural use and minimize the fragmentation and development of these resources. [Planning Commission]

11.M-2 Form a committee, to include willing landowners, to develop a multi-property management and conservation plan for lands in the Forest Reserve District. [Conservation Commission, Planning Commission, Tree Warden]

11.M-3 Develop a revised master plan for Irasville that includes water, wastewater, and stormwater systems designed to correct and avoid contamination of surface and groundwaters. [Selectboard, Town Administrator, Planning Commission]

11.M-4 Appoint representatives to participate, on behalf of the town, with the Agency of Natural Resources (ANR) in the preparation of TMDLs (total maximum daily load) for the Mad River and larger Winooski River watersheds. [Planning Commission, Friends of the Mad River*]

11.M-5 Consult with the Friends of the Mad River and local fishery groups on projects that may potentially impact the Mad River and tributaries. [Planning Commission, Friends of the Mad River*]

11.M-6 Integrate fish and wildlife inventory data and information into strategies that encourage the preservation of these resources and wildlife corridors in the area. [Conservation Commission, Planning Commission]

11.M-7 Participate in the review and revision of the Camel's Hump State Forest (Dana Hill Forest) management plan to ensure that wildlife habitat, recreation opportunities and aesthetic resources are protected and enhanced. [Selectboard, Town Administrator, Conservation Commission]

11.M-8 Develop long range management plans for undeveloped town-owned parcels, including Scrag Forest, Wu Ledges, Lareau Swimhole and adjacent land, and the Brook Road parcel. [Conservation Commission, Selectboard]

11.M-9 Develop a criteria/ranking system with which the town can evaluate proposed conservation projects for conformance with this plan. [Conservation Commission]

11.M-10 Consider preparing and/or adopting Best Management Practices (BMPs) to guide for forest management activities in Waitsfield, and explore appropriate means with which to encourage local compliance with those BMPs. [Tree Warden, Planning Commission, Conservation Commission]

11.M-11 Coordinate with land conservation organizations to ensure that conservation projects in Waitsfield are consistent with the goals and policies of this plan. [Selectboard, Town Administrator, Planning Commission, Conservation Commission, Mad River Watershed Conservation Partnership*, Forests, Wildlife, & Communities Project]

11.M-12 Maintain a reserve fund to support local land conservation efforts, with annual allocations included in the capital budget and program. [Selectboard, Town Administrator]

11.M-13 Explore ways to educate landowners, especially new arrivals to the community, about techniques for good land stewardship and natural resource conservation. [Planning Commission, area real estate brokers*]

11.M-14 Develop and implement flood hazard mitigation plans when possible. [Planning Commission, Development Review Board, Selectboard]

11.M-15 Review and compare the Agency of Natural Resources and Agency of Transportation's guidelines on transportation infrastructure maintenance and development. Determine which should be used in Waitsfield. [Planning Commission, Friends of the Mad River*]

11.M-16 Explore the establishment of a Valley-wide Cooperative Invasive Species Management Area (CISMA) to promote collaborative planning, management, and outreach to prevent or reduce the spread of invasives. [Conservation Commission, Planning Commission, Friends of the Mad River*, Vermont Chapter of The Nature Conservancy*, Vermont Agency of Natural Resources*, The Mad River Path Association, Mad River Valley Recreation District]