

Natural Resources Plan (Unabridged)

Developed for Sunapee Conservation Commission, 2010

I. Introduction

Natural resources are one of the most fundamental elements of the “quality of life” of a place where people live and visit. Sunapee relies on its natural resources for drinking water, agricultural production, construction materials, wood-based heat, country setting, wildlife, scenic vistas, and recreational opportunities. This Section explores Sunapee’s natural resources and provides guidance for their protection. The Sunapee Natural Resource Inventory (2009) is included as Appendix D.

Goals for Natural Resources

1. Create and maintain a process for natural resource protection.
2. Protect the natural environment.
3. Provide public access to significant natural areas.
4. Provide an opportunity for the use of significant natural resources.

Vision for Natural Resources

The vision for Sunapee includes these community values pertaining to natural resources:

- Maintain and enhance the quality of Lake Sunapee
- Peace and quiet
- Dark night sky
- Maintain scenic views
- Enhance seasonal recreation opportunities
- Improve the quality of Perkins Pond.

Related Goals from Land Use Section

The Land Use Section describes the community’s goals for the types and locations of growth. These land use goals have an influence on natural resources:

- Encourage high-density housing in the village areas served by utilities and lower-density housing in outlying areas.
- Encourage preservation of significant historic, natural, and scenic resources.
- Recognize areas with large undeveloped tracts of land and protect them with zoning controls which will maintain the character of the area.
- Encourage the development of trails, bike paths, and other recreational ways.

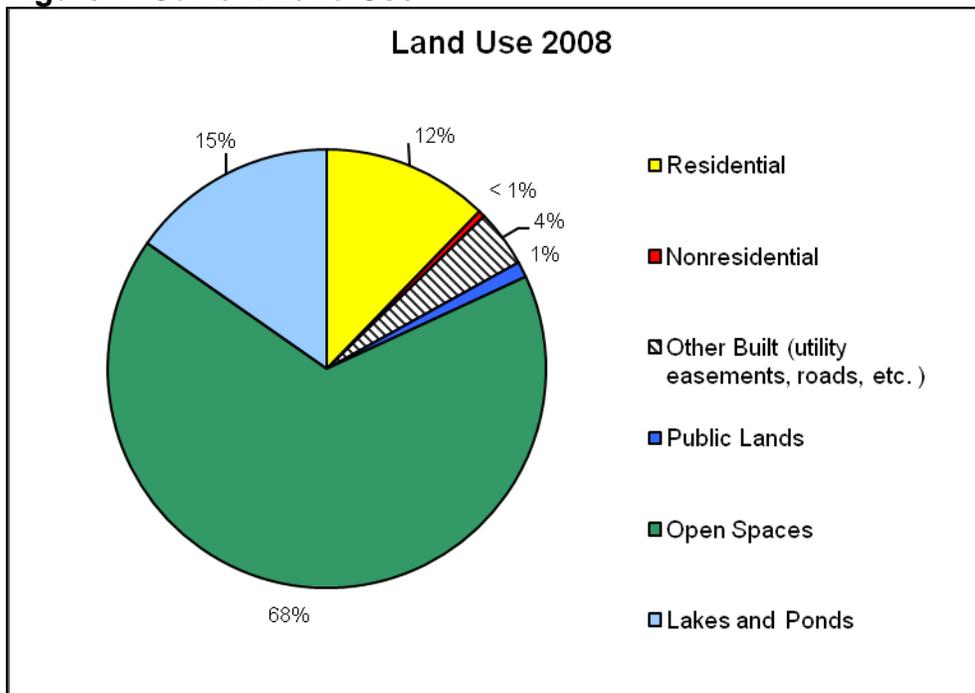
II. Existing Natural Resources & Protections

Land-Based Resources

Sunapee is ecologically linked to its neighboring towns by Lake Sunapee and its watershed, as well as to towns downstream along the Sugar River. The town lies within the Connecticut River Basin, which covers 11,000 square miles in Vermont, New Hampshire, Massachusetts, and Connecticut.

Existing residential development is clustered along the lakeshores. Commercial development is located in Sunapee Harbor, Georges Mills, and along Routes 11 and 103. The western part of town is less developed than the eastern part near Lake Sunapee.

Figure 1: Current Land Use



Source: Town parcel data from Sunapee Master Plan, 2010.

Within the region, there are three large blocks of unfragmented land with some coverage in Sunapee (Map 3 in the Natural Resources Inventory, Appendix D):

- A 1,204-acre block in the western end of town, lying north of the Sugar River and south of Perkins Pond and containing significant wetland areas, including the Wendell Marsh Wildlife Management Area.
- A 4,230-acre block in Croydon, Springfield and the northwest corner of town, connecting to the shorelines of Perkins Pond, Ledge Pond, and Lake Coniston.
- A 30,000 acre tract of forested land, the Sunapee-Pillsbury Highlands, which extends into the southeast corner of Sunapee, much of which is

protected from development by the Mount Sunapee and Pillsbury State Parks and private conservation.

These large contiguous blocks of unfragmented land provide habitat and movement corridors for wildlife and protection for water resources.

Agricultural Soils

The Sullivan County Soil Survey places Sunapee's agricultural soils in three classes:

- Prime farmland (2.8% of total land area)
- Farmland of statewide importance (3.3%)
- Farmland of local importance. (21.8%)

Forest Soils

Sunapee is heavily forested, with over 80% of its land covered by hemlock-hardwood-pine mixed forest, mixed with significant areas of lowland spruce-fir forest and northern hardwood-conifer forest (Section 3.2, Land Use and Land Cover, Appendix D). There is an abundance of soil types that support sufficient tree growth for commercial forestry operations.

Earth and Mineral Resources

Sand and gravel resources represent about 4 percent of the town's total land area. The largest deposit is located in the southwest corner of town in the outwash plains along Wendell Brook. This is likely the only area in town that can support commercial sand and gravel excavation for use in local construction and export to other communities.

There is one active granite quarry in Sunapee, located approximately one mile south of the village, east of Route 103 B. The granite is identified as "Concord Granite," which is medium to fine grained, white or gray.

Land-Based Resource Protections

Land use is shaped and natural resources are protected by state regulation and by the town's zoning and other regulations. Sunapee has five zoning districts: Village, Mixed Use, Residential, Rural Residential, and Rural Lands. Farming and forestry are permitted by right in the Rural Residential and Rural Lands districts, roughly two-thirds of the town's area. Commercial and industrial uses are restricted to the Village and Mixed Use districts, and residential development is allowed in all districts.

Sunapee utilizes cluster development and planned unit development techniques to promote the conservation of open space and natural features. These techniques permit developing portions of a parcel while setting aside open space, where environmentally sensitive areas may be protected

In a proposed major subdivision, the Planning Board may require that up to 15% of the total area, be designated as open space.

In addition to these local protections, sand and gravel operations are regulated by the state under the provisions of RSA 155-e.

Public ownership and conservation easements also protect agricultural areas and productive forests, most notably a large area protected through adjacent conservation easements near Route 103 in the southern half of town. The Sunapee Conservation Commission has developed forest management plans for the town forests.

Water-Based Resources

The most prominent geographic feature of the town is Lake Sunapee, which forms the eastern edge of town. Several other water bodies dot Sunapee’s landscape to the west and north.

The Lake Sunapee watershed includes sections of the towns of Goshen, New London, Newbury, Springfield, Sunapee, and Sutton. Threats to water bodies in the Sunapee include:

- Pollution from stormwater runoff
- Sedimentation caused by erosion from land development activities
- Impacts of impervious cover to water quality and stormwater runoff
- Impacts from aging septic systems
- Road salt use and storage

Watersheds and Surface Waters

Sunapee is rich in surface water bodies, with five lakes or ponds over 100 acres and numerous smaller ponds (Table 1). Lake Sunapee covers 4,090 acres, with over half in Sunapee. This lake is identified as important wildlife habitat in New Hampshire (Section 3.9 in the Natural Resource Inventory, Appendix D), and also provides recreational and scenic value to the town.

Table 1: Major Water Bodies in Sunapee

Name	Towns Bordering	Acreage
Ledge Pond	Sunapee	110
Mountain View Lake	Sunapee, Newbury	105
Otter Pond	Sunapee, New London	185
Perkin’s Pond	Sunapee	157
Lake Sunapee	Sunapee, New London, Newbury	4,090
Wendell Pond	Sunapee	11
Total Acreage of Major Water Bodies		4,658

Roughly 40% of the town drains into Lake Sunapee. Lake Sunapee and all of the rest of the town drains into the Sugar River.

The Sugar River is the largest river in the region. It is tapped for hydroelectric energy near Sunapee Harbor, provides the town's primary water supply and serves as a secondary water supply for Claremont.

Wetlands

Wetlands play an important ecological role for wildlife, water quality, and flood retention.

Wetlands cover 2,100 acres in Sunapee, or 15.6% of the town's land area (Map 5 in the Natural Resource Inventory, Appendix D).

The extensive marshes and floodplain forests along the Sugar River in Sunapee provide flood retention, shoreline anchoring, wildlife habitat, and scenic views from Route 11. The many smaller wetlands provide similar functions.

Groundwater Resources

Sunapee has limited groundwater resources in the form of stratified drift aquifers. Stratified drift aquifers in Sunapee have low transmissivity (flow rate of water through the aquifer, usually expressed as square-feet per day) and cover 390 acres, only 2.9 percent of the town's land area (Map 4 in the Natural Resource Inventory, Appendix D). Water stored in bedrock is another source of groundwater in Sunapee. Wells in stratified-drift aquifers generally produce more water than bedrock wells and can support very large community water systems.

Roughly half of Sunapee's residents receive their drinking water from Lake Sunapee, through a service connection with Sunapee Water Works. The other half receives their drinking water from bedrock wells, either from the Georges Mills Water Works or private wells.

Groundwater wells draw water from a zone around the wellhead. The wellhead protection area, delineated based on the volume of water withdrawn by the well, represents the groundwater resource. Wellhead protection areas cover roughly 1,300 acres, or 10% of the town's land area (Map 4 in the Natural Resources Inventory, Appendix D).

Floodplains

Floodplains are primarily found in the vicinity of the Sugar River with small areas of floodplain along the Lake Sunapee shoreline. Floodplains accommodate excess water during flooding and provide travel corridors for wildlife.

Development in floodplains presents some special problems, including the possibility of property damage during flooding, the restriction of flood water storage, and the increased likelihood of erosion and sedimentation which can cause increased turbidity and nutrient loading.

Water-Based Resource Protections

Surface waters and wetlands in Sunapee are protected by both state and local regulation. Sunapee's six major water bodies and the Sugar River fall under the jurisdiction of the Comprehensive Shoreland Protection Act which limits land uses within a 250' shoreland buffer to protect water quality and aquatic habitat. There are restrictions on the amount of impervious surface in this zone and provisions to preserve natural vegetation. A summary of Comprehensive Shoreland Protection Act standards is included in the Natural Resource Inventory, Appendix D. Activities impacting wetlands are regulated by the State Wetlands Bureau.

Sunapee protects its water resources through a Water Resources Overlay District comprised of wetlands, aquifers, and shoreline areas. Areas covered by these overlay districts have additional regulations which protect water resources and ecologically fragile areas.

The Wetlands Overlay District increases the minimum lot size and prohibits the construction of structures or buildings, and dredging or filling in wetlands.

Streets, roads, and utility right-of-way easements and water impoundments affecting wetlands require approval from the State Wetlands Bureau, USDA Natural Resources Conservation Service, and Sunapee Conservation Commission, as well as the Sunapee Planning Board.

The Aquifer Overlay District increases the minimum lot size and limits the maximum lot coverage. The Aquifer Overlay District allows construction of buildings, but prohibits potentially polluting uses, such as landfills, salt storage, and hazardous materials storage. In addition, natural drainage and vegetation must be maintained, to allow for recharge of the aquifer.

Sunapee's Shoreline Overlay District supplements the requirements of the Comprehensive Shoreland Protection Act. Within 300 ft. of lakes and ponds greater than 10 acres, erosion and sedimentation control plans are required for all construction, filling, grading, dredging and other land disturbance, using design standards in the Stormwater Management and Erosion and Sediment Control Handbook for Urban and Developing Areas in New Hampshire, 1992, Rockingham County Conservation District & USDA SCS. Also, within the 300-ft zone, only lime fertilizer application is permitted.

Within the Shoreline Overlay District, docks and beaches are permitted uses, subject to the requirements of the state. Cutting and clearing is regulated within 150 ft of the shoreline, and construction requires an approved erosion control plan.

The Sunapee Zoning Ordinance prohibits construction on slopes greater than 25%. Driveways, stairways, and utilities are exempt, but require a drainage and erosion control plan. An erosion control plan is also required for land clearing of greater than 100,000 square feet.

Excavation is regulated by the state.

Lake Sunapee has been protected by concerned citizens since 1898 when the Lake Sunapee Protective Association (LSPA) was formed. LSPA provides environmental education about issues that affect the lake and its watershed. LSPA is active in managing the milfoil infestation on Lake Sunapee; divers harvest the plants; lake hosts educate boaters on milfoil and inspect boats. There is a boat washing station in Sunapee Harbor.

The Sunapee Area Watershed Coalition recently completed a watershed management plan for Lake Sunapee. The plan identifies seven focus areas for improving water quality in the lake and brings together the surrounding communities and stakeholders. Similar recommendations would likely prove effective in improving water quality in other watersheds in Sunapee.

Sunapee organizes household hazardous waste collections with neighboring towns and the Upper Valley Lake Sunapee Regional Planning Commission; these collections minimize the risk of inappropriate disposal or accidental release of common toxic materials into the water supply.

New Hampshire Department of Environmental Services (NHDES) and local lake associations monitor water quality in Lake Sunapee, Ledge Pond, and Mountainview Lake through the Volunteer Lake Assessment Program. Each year, a water quality report is produced and improvements or declines in water quality are identified.

The Federal Emergency Management Agency (FEMA) has prepared Special Flood Hazard Area maps which identify the 100-year flood areas. These maps may serve as planning tools to establish zoning districts that limit certain land uses in flood-prone areas.

Conserved and public lands protect shorelines on Ledge Pond, Lake Sunapee, and the Sugar River as well as several smaller streams. The Georges Mills Water Works owns or has an easement on 15 acres near its wellheads. Several areas of wetland are also protected, notably Wendell Marsh and the Redwater Creek area.

Scenic & Wildlife-Based Resources

Ridges run generally north-south in town and provide remarkable views of Lake Sunapee and other water bodies, villages, forest, and open fields.

Sunapee's natural landscape is a mixed forest interspersed with grasslands, wetlands, and water bodies which provide habitat for many species of wildlife.

Agricultural activities are scattered throughout town, offering a scenic working landscape that contributes to Sunapee's rural character.

According to the New Hampshire Natural Heritage Bureau database of occurrences of rare, threatened, and endangered species and exemplary natural communities, there is only one record of a rare species in Sunapee, the common loon (Map 8 in the Natural Resource Inventory). Other rare plant and animal species have been found and recorded in surrounding towns (Table 2). It is possible that these species also utilize habitat in Sunapee.

Table 2: Rare species in Sunapee and surrounding towns

Species	Type	Species	Type
Common loon	Bird	Graceful clearwing	Insect
Least bittern	Bird	Brook floater	Mollusk
Common nighthawk	Bird	Fragrant fern	Plant
Pied-billed grebe	Bird	Loesel's twayblade	Plant
Northern leopard frog	Amphibian	Tubular thoroughwort	Plant
Wood turtle	Reptile	Peat moss (2 spp.)	Plant

Wetlands provide habitat for a great number of amphibians, reptiles, birds, and invertebrates; moose are a frequent visitor to marshes and shallow ponds during the summer months. Vernal pools provide breeding habitat to amphibians in the spring.

Grasslands are intermittent features in the landscape. They become established after a disturbance and are eventually taken over by forests. Several species of bird rely on the grasses for breeding grounds and as a source of food.

The aquatic habitats in Sunapee range from large lakes to small shallow marshes, and support a wide variety of fish and invertebrate life. Lake Sunapee supports both cold-water and warm-water species, including landlocked salmon, lake trout, smallmouth bass, pickerel, horned pout, and rock bass (NH Fish and Game, 2004). Perkins Pond supports warm-water species, including smallmouth bass, pickerel, and horned pout. The Sugar River provides a cold-water habitat for brook, brown, and rainbow trout.

Many of the lakes and wetlands in Sunapee have been ranked as top-tier habitat by New Hampshire Fish and Game. There are large areas of high-quality habitat around Ledge Pond, Perkins Pond, and Lake Sunapee, and, to a lesser extent,

around Mountainview Lake and Otter Pond. The floodplain forests and wetlands along the Sugar River, near Wendell village and the Wendell Wildlife Management Area, are also high-quality habitat.

Wildlife travel corridors are an important resource. These travel ways are often disrupted by roads and development.

Small wind energy systems and solar power systems have the potential to further impact wildlife and scenic views from the resulting land clearing.

Scenic & Wildlife Resource Protections

Public land ownership and land conservation protect scenic and wildlife resources on roughly 1,900 acres in Sunapee. There are three state Wildlife Management Areas, 15 acres of water supply land, several parcels left by trust deeds to the town, and a large number of privately-owned parcels with conservation easements.

These resources may also be protected through the Cluster and Planned Unit Development regulations and the open-space provisions in the subdivision regulations. Through the state wetland permitting process, impacts to vernal pools and wildlife are included in the review of permit applications.

Table 3: Summary spreadsheet of Natural Resource Protections

Natural Resource	Acres	% Protected *	Existing Regulatory and Non-Regulatory Protections	Policies to Consider
<i>Water Supply</i>			Erosion control plans for steep driveways/roads and large clearing No building on slopes >25%	Expand scope of erosion control plans. Incorporate Low Impact Development principles and Best Management Practices for siting, design, construction, and post construction
Wellheads	1,324	12%	Household hazardous waste collections Water quality monitoring on Lake Sunapee	Add additional potential drinking water contamination sources (PCS's) to prohibited uses
Shorelines	1,000	6%	Town restrictions on land uses within 300' of lakes Increase in minimum lot size Maximum lot coverage provision in Zoning Ordinance State restrictions on land uses within 300' of lakes and Sugar River	Widen shoreline overlay district beyond 300'
Aquifers	392	37%	Increase in minimum lot size Maximum lot coverage provision in Zoning Ordinance Prohibitions on potentially polluting land uses Restrictions on building and "intensive coverage"	Add additional potential drinking water contamination sources (PCS's) to prohibited uses
<i>Wetlands</i>	2,102	22%	Increase in minimum lot size No building of structures in wetland Dredge/fill requires state permit under the Clean Water Act	Designate prime wetlands
<i>Agricultural soils</i>	3,772	16%	Agriculture permitted by right in Rural Residential and Rural Lands	PUD & Cluster incentives
<i>Forest soils</i>	12,896	15%	Forestry permitted by right in Rural Residential and Rural Lands	PUD & Cluster incentives
<i>Wildlife habitat</i>	2,179	14%	- no specific protections -	Seek conservation easements and land purchases
<i>Unfragmented land</i>			- no specific protections -	Density transfers from rural areas to village areas
<i>Scenic areas</i>			PUD & Cluster	Ridgeline Development restrictions

* % Protected: Percent of the resource area that is protected from development through public ownership and/or conservation easement.

Please note - All natural resources, including those that have no specific protections in the Town's land use regulations, may be protected by the open space set-aside provisions for a cluster development or planned unit development or may be protected by conservation easements

III. Opportunities and Challenges

Among the challenges created by growth and development are opportunities to promote natural resource protection.

Institutional Practices & Partnerships

The town currently participates in regional efforts to foster the protection of natural resources. The Sunapee Conservation Commission works with landowners and regional or statewide land trusts such as the Ausbon Sargent Land Preservation Trust and the Society for the Protection of New Hampshire Forests to permanently protect land through conservation easements. Organizations such as the Lake Sunapee Protective Association (LSPA) and the Sunapee Area Watershed Coalition (SAWC) provide mechanisms for cooperation in the protection of shared water resources. Such a process is helpful regionally and locally in facilitating a cooperative approach to resource protection.

However, within the town itself, there is no institutional framework to address internal natural resource protection. The town should establish a process for addressing natural resource issues that are within the control of the town by identifying boards, commissions and staff to be responsible for the process.

Land Use & Development

Since 1998, the amount of land in residential use has increased by 600 acres. Much of this growth has come from the conversion of forested lands. The development challenge is to encourage growth in identified village areas and discourage it in rural lands or sensitive areas.

Land availability in village centers is limited by restrictions on shoreland development and steep slopes. Zoning changes may be necessary to ensure that adequate land area away from surface waters is available for future village growth. Concentrating businesses and services in these village areas will also require attention to water and sewer infrastructure.

Rural areas within Sunapee have been identified for low-density residential development. Focusing growth away from rural and sensitive areas has the potential to significantly benefit natural resources. This land use policy should continue to be supported by land conservation efforts.

To assist with this component of Sunapee's land use policy, the town may consider providing for the transfer of development rights from rural lands to locations near village centers served by water and sewer infrastructure. Densities could vary within the village area given features such as the availability of roads, proximity of sidewalks and other features. Basing density on the availability of certain features can allow location-based sensitivity to development.

New construction as well as the removal of older homes and replacement with larger homes should adhere to sound development practices to minimize threats to water quality. Sunapee should consider ways to minimize residential development impacts on water quality, possibly by regulating development at the land use development, design, construction, and post construction phases.

Ridgelines and hilltops are popular locations for new development, providing scenic vistas to the lakes or countryside. Developments in these locations threaten water quality, given their steep slopes and erosion potential. Furthermore, much of Sunapee is underlain with glacial till with hardpan at shallow depths which have poor to moderate absorptive capabilities. This makes septic system failure a critical issue, as the soils and surficial geology do not have the capacity to serve as a natural leachfield.

Land Uses

Human activities or operations of certain kinds pose a reasonable risk that contaminants will enter the environment. The New Hampshire Groundwater Protection Act (RSA 485-C) identified Potential Contamination Sources which should be avoided near surface water or groundwater supplies. Five of these are recommended as priorities for prohibition in the state model groundwater protection ordinance. Sunapee should consider prohibiting these within an enhanced Shoreland Overlay District and/or around public drinking water supplies.

- Hazardous waste disposal facilities
- Solid waste landfill
- Outdoor road salt or other bulk chemical storage
- Snow dump
- Septage lagoon
- Other Potential Contamination Sources per RSA 485-C

Laundromats and dry cleaners and other PCS could be provided for by Special Exception allowing additional development review. Currently no salt storage sheds, junkyards, nor solid/hazardous waste facilities are permitted within 300 ft. of lakes or ponds greater than 10 acres.

The town may consider adopting additional groundwater protection regulations through the use of zoning and/or a health bylaw regarding underground storage tanks. Sunapee could include underground residential tanks of any size in required inspections, monitoring systems and technical standards. The town could prohibit any underground storage tanks in environmentally sensitive areas mapped as potential aquifer zones or important recharge areas. These new provisions may be incorporated within the Shoreland Protection Overlay and have an expanded jurisdiction by adding a “sensitive area” element which would

focus the provisions on critical watersheds, perhaps those that are used as drinking water supplies or where water bodies are already threatened such as Perkins Pond.

Siting and Design

The siting and design of development can have a significant impact on water quality. Low Impact Development (LID), which minimizes impervious surfaces and incorporates Best Management Practices (BMPs) to lessen development's impact on water quality, is a reinvented concept that is gaining recognition. It is a process where development avoids features that may cause an impact to water quality, like steep slopes, shorelands, wetlands and other important resources. This could also apply to scenic resources like hilltops and ridgelines. One example of a Low Impact Development principle is to minimize the amount of impervious surface so that stormwater run-off does not increase from development.

Sunapee could start addressing the amount of impervious surfaces by reducing off-street parking requirements. Current lot coverage requirement (coverage ranges from 30% in rural district to 80% in village) could be supported with requirements for stormwater infiltration and treatment. Promoting flexible and/or shared parking in village areas would also help limit the amount of impervious surfaces. Existing stormwater design standards such as storm occurrence that designs are based, could be enhanced to be more robust which would minimize failures due to larger storms.

Construction

The best of development proposals are only effective if they are implemented according to plan. Furthermore, erosion control during the construction process is critical and is often overlooked. Current BMPs should be used during the construction of development to avoid and remove sedimentation from stormwater and protect water resources from pollution. One of the most effective administrative ways to do this is to require a sediment and erosion control plan. Currently such a plan is required for driveways on steep slopes, roads, large clearings (>100,000 sq ft), and disturbances within the Shoreline Overlay District.

Soil compaction during the construction process may also limit groundwater infiltration. Care should be taken to avoid soil compaction or aerate soils if they should become impacted during construction. This type of detail may be incorporated in Planning Board decision as a condition subsequent to approval.

Where construction takes place is also critical. The town allows development within the 100-year floodplain. For public health and safety reasons, no development is recommended in Sunapee's floodplains. Other sensitive areas where construction should be avoided include wetlands and wetland buffers, steep slopes, near surface waters and within aquifer recharge areas. Many of

these locations have development restrictions found in the Water Resource Protection Overlay.

Waste Disposal

A major cause of nonpoint source pollution is malfunctioning or improperly used septic systems. Rural development in Sunapee relies predominately on private septic systems, as the sewer system serves the more densely developed sections of Sunapee. Failing septic systems pose a great direct threat to water quality, as a failed septic system releases untreated or semi-treated waste that contaminates and enriches lakes and streams.

Older septic systems, particularly those installed before plumbing code, can be a particular threat to water bodies that are in close proximity. Homeowner education programs are particularly useful to inform homeowners about septic systems and alternatives to household chemicals. The town could help educate its residents about this important preventive maintenance practice and have an inspection program to identify failing systems. Perkins Pond has been identified as being threatened by high phosphorus levels which according to the New Hampshire Department of Environmental Services is attributable to failing septic systems.

The town should be sure that the density of development does not contribute to septic system effluent loading. Lot sizing by soil type would be an effective way to accomplish this together with the existing minimum lot size standards. This is not a substitute for the proper siting, design, construction and maintenance of septic systems.

Sunapee could adopt health regulations to complement the aquifer protection overlay provisions. This could include more strict design standards of new and replacement septic systems. Under NH RSA 147:1, health officials may adopt regulations for the prevention and removal of a nuisance relating to public health through an inspection program.

Other towns have established more stringent standards for septic system design than required by the state. These might include a larger leach bed size, setting minimum design loading rates, greater depth to ledge or seasonal high water table or greater setbacks from surface water, wells, drainageways, and slopes. Conversion from seasonal to year-round use and repair or replacement of septic systems may, by local regulations, be subject to review and subsequent improvement of systems to meet local standards.

The town should also continue to support household hazardous waste collection days and promote the idea of proper disposal of toxic substances.

Post Construction

There are a number of homeowner practices that affect water quality. These practices may be restricted through homeowner's covenants or municipal laws. Practices such as the use of fuels, fertilizer use, and maintenance of stormwater infrastructure can be regulated to protect the environment. This is done by requiring adherence to Best Management Practices (BMP). For example, Sunapee currently restricts fertilizer use within 300 feet of surface waters.

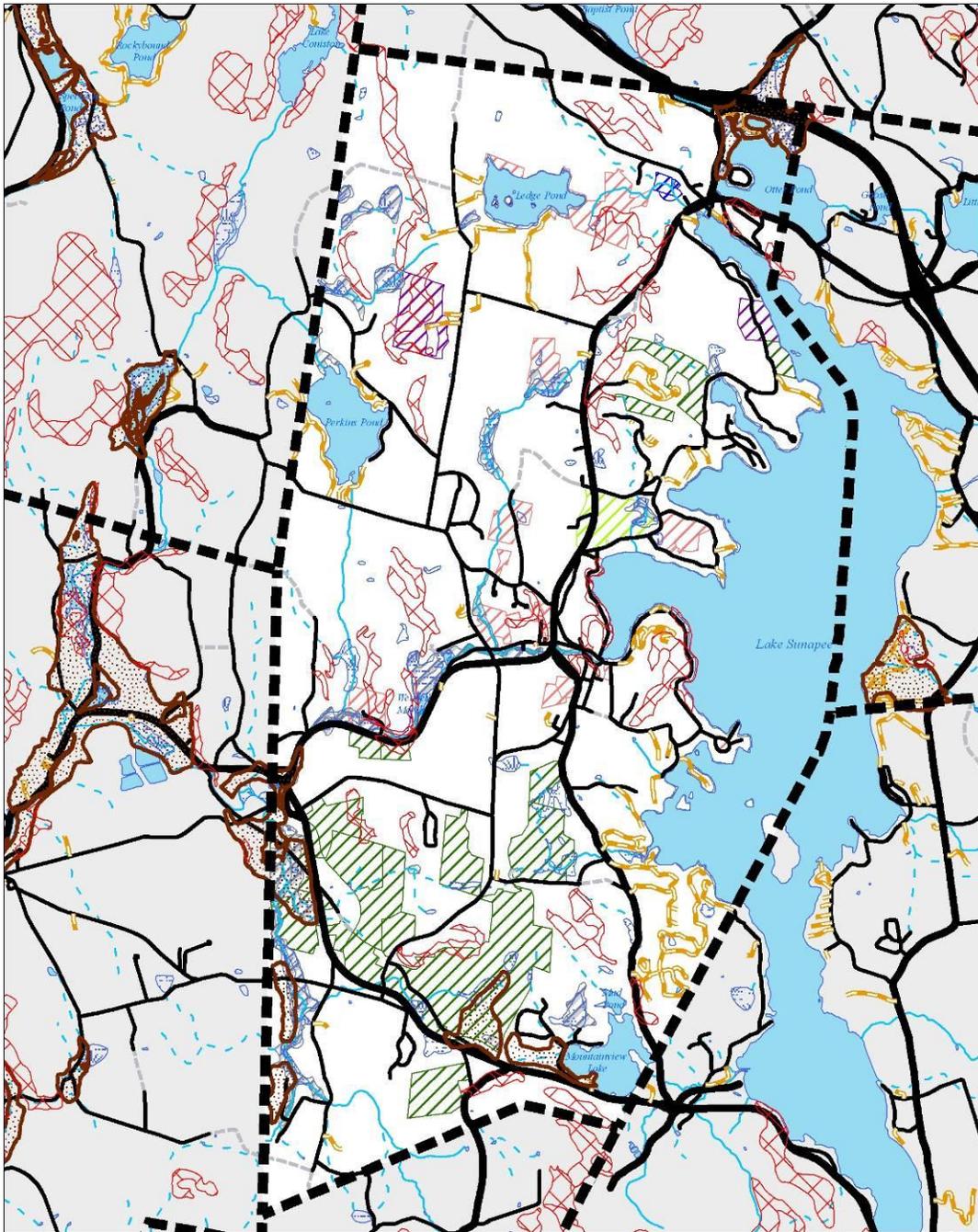
Sunapee may consider requiring Potential Contamination Sources (PCS's) to provide a stormwater management plan, BMPs, and spill prevention, control and countermeasure plan. When impervious surfaces are extensive, there could be the additional requirement of a stormwater management plan including treatment of runoff to remove sediments, nutrients, chlorides, hydrocarbons, metals and pathogens.

Development Constraints

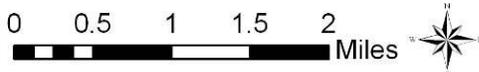
Topography is an important factor in assessing development suitability. While areas of relatively high relief are considered a visual asset, they are also areas that may be vulnerable to development. Due to the sensitivity of these areas, development should either be discouraged or carefully managed to maintain visual quality and minimize soil erosion. Alternatively, low lying areas are typically associated with water resources such as river corridors or wetlands and may be prone to flooding, and/or contain deposits of sand and gravel or rich farmland soils.

The slope or steepness of the land is defined by the change of elevation over horizontal distance. For instance, a 10 foot rise within 100 feet is a 10% slope. Slope is important for planning purposes for several reasons. The increase in slope corresponds to the potential increase for surface runoff and erosion. The soil depth is also thinner as slopes increase, thereby decreasing the capacity of the land to filter septic system effluent.

Slopes can be determined from USGS topographic maps. The most suitable slopes for development are from 0 to 12-15%. Within the town, slopes vary significantly (Map 2). Once slopes exceed 15 to 20 % slope, there is greater chance for environmental impact and increased development costs. Consideration should be given to eliminating some of the exceptions for slope disturbances at 25 percent and greater, e.g. driveways.



Map 1: Development Constraints



- | | |
|--------------------|------------------------|
| Legend | Steep Slopes (>25%) |
| Town Lines | Aquifers |
| Roads | 100-Year Floodplain |
| State | Town Land |
| Local | Conserved Town Land |
| Private | Water Department Land |
| Waterbodies | State Land |
| Lakes | Private Conserved Land |
| Streams | |
| Swamps/Marshes | |



MAP PREPARED BY UVLSRPC
FOR SUNAPEE MASTER PLAN,
JANUARY 2010
 Upper Valley Lake Sunapee
Regional Planning Commission

Data Sources:
Base data, steep slopes (from soil surveys),
aquifers, and floodplains from NH GRANIT.
Public/Conserved Land from town and state
records, 2008.

Summer Population & Recreation Pressures

Seasonal home construction has supported a large summertime population focused on recreation. A large seasonal population places pressures on natural resources but is helpful to the local economy.

A large seasonal population has the potential to help protect natural features. This is most easily accomplished by providing appropriate ways to access and recreate using those resources.

Providing access to resources allows:

- Concentrating access in appropriate locations, and
- Raising awareness of important resources through interpretation and recreation.

Identifying and focusing access to natural resources may be accomplished by creating recreation linkages between significant centers of activity.

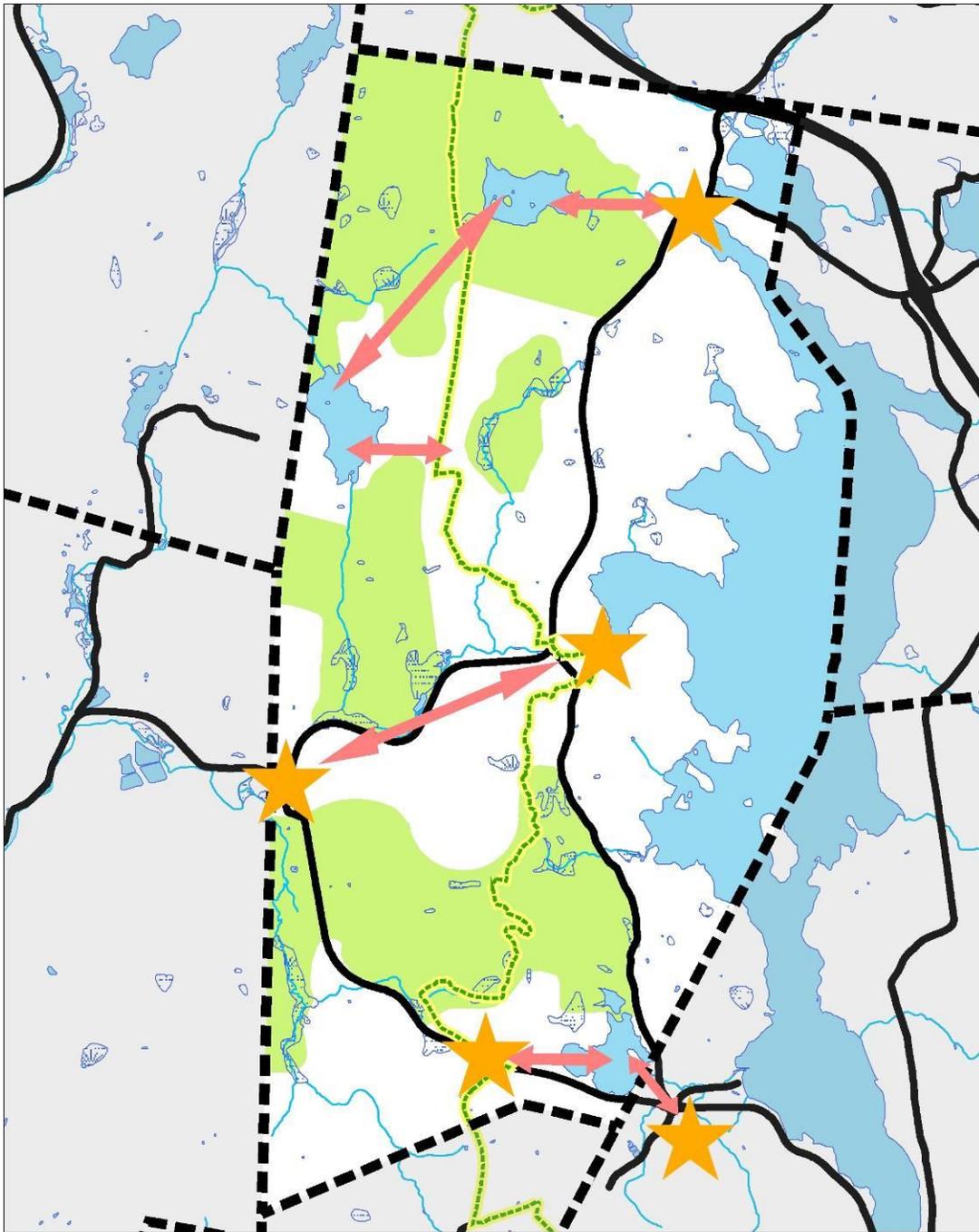
Centers of Activity & Tying Natural Resources to Recreation

A number of cultural and recreational opportunities are unique to Sunapee, and serve as important centers of community activity. These included single-point resources such as the Town Hall, Abbott Library, village centers, Dewey Beach, and Ski Tow Hill and linear resources such as river corridors and trails.

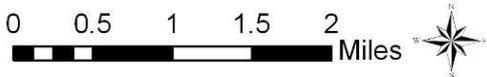
These resources can serve as a reference point for expanding similar activities or complementary development. For example, the town has established a village district around the Sunapee Harbor that allows for similar uses. This district can provide a mechanism for village development.

These “activity centers” can be linked by walkways and trails, for example, the Sunapee Riverwalk. These links provide access to natural resources, raising awareness about the resources and providing the public with recreational opportunities. This concept may include rejuvenation of the Sugar River Improvement Plan at Sunapee Harbor which was conceptually developed during the 1966 Master Plan. A comprehensive and contemporary concept for making these linkages is found on the following page.

Making connections among centers of activities and rural conserved lands can begin with the existing trail system. The existing Sunapee-Ragged-Kearsarge Greenway spans the town north to south and is proximate to many of the centers of activity. Identifying this recreational corridor and nurturing its enhancement through permanent easements through subdivisions or the purchase of land by the town will produce a network of trails for hiking, horseback riding, cross-country skiing, and snowmobiling.



Map 2: Activity Centers Concept



- Legend**
- Town Lines
 - State Roads
 - Waterbodies**
 - Lakes
 - Swamps/Marshes
 - Streams
 - ★ Centers of Activity
 - ↔ Potential Trail Linkages
 - SRK Greenway
 - Future Land Use Concept**
 - Conservation Zones



MAP PREPARED BY UVLSRPC FOR SUNAPEE MASTER PLAN, JANUARY 2010



Upper Valley Lake Sunapee Regional Planning Commission

Data Sources:
 Base data from NH GRANIT. Greenway trail from SRK Greenway, 2009. Future land use concept, Sunapee Master Plan, 2010.

IV. Goals & Recommendations

1. Create and maintain a process for natural resource protection.

- Collaborate with the Towns of Goshen, New London, Newbury, Springfield, Sutton, the Sunapee Area Watershed Coalition, and the Lake Sunapee Protective Association in the protection of Lake Sunapee.
- Educate the citizens of Sunapee on the value of natural resources and the importance of protecting these resources.
- Assign town boards and staff to implement resource protection initiatives and administer code enforcement to protect water quality, wetlands, and other natural resources.

2. Protect the natural environment

- Protect undeveloped natural areas.
 - i. Implement a Visual Resource Protection District around scenic areas and/or a Ridgeline Development ordinance.
 - ii. Actively protect water quality, wildlife habitat, scenic areas, and open space through conservation easements and land purchases.
 - iii. Increase the percentage of Land Use Change Tax dedicated to conservation. When land is removed from Current Use, a Land Use Change Tax is levied. Currently, in Sunapee, 50% of that tax is dedicated to the Conservation Fund and can be used by the Conservation Commission for conservation easements or land purchases.
- Protect and enhance sensitive natural areas.
 - i. Designate “prime wetlands”, which would identify highly valuable wetlands in Sunapee and allow special review by the State Wetlands Bureau for projects impacting those wetlands.
 - ii. Protect Lake Sunapee as a public drinking water supply.
- Balance the protection of natural areas with community development goals
 - i. Amend the zoning ordinance to reduce densities in rural areas and increase densities in village areas where connections to municipal water and sewer system are possible.
 - ii. Implement a Transfer of Development Rights provision to encourage preservation of rural lands.
 - iii. Introduce additional Low Impact Development provisions within zoning, subdivision and site plan review.
- Address existing nonpoint pollution sources in sensitive areas.
 - i. Reclassify areas around drinking water wells according to the state Groundwater Protection Act. Reclassification provides local authority to enforce Best Management

Practices and prohibits establishment of six high-risk land uses in protected areas.

- ii. Create a local health ordinance for groundwater protection to allow inspection of septic systems for failure.
 - iii. Amend the existing water resource Overlay District to strengthen stormwater management and erosion control regulation by requiring stormwater treatment onsite, requiring submission of erosion control plans for construction permits, and minimizing disturbance to wetlands.
- Continue to purchase conservation lands and acquire easements to protect water quality.
 - Increase the percentage of Land Use Change Tax dedicated to conservation.
 - Educate the public as to the value of conservation lands and easements.

3. Provide public access to significant natural areas

- Coordinate natural resource protection with recreation goals and facility operation by fostering low-impact recreation in undeveloped areas while allowing high-impact recreation in appropriate locations.
- Incorporate into subdivision and site plan review regulations requirements for developers to protect natural resources and provide easements for trails connecting conservation and recreation areas.

4. Provide an opportunity for the use of significant natural resources

- Protect and support a working landscape of managed forests and active agricultural land.
 - i. Protect prime agricultural soils and productive forest soils through amendment to the zoning ordinance. These soils are identified by the USDA Natural Resources Conservation Service as the most productive soil types for agriculture or farming.
 - ii. Continue to protect the infrastructure required to support forestry and agricultural activities, e.g. log and farm roads, accessory structures, etc.
 - iii. Maintain existing agriculture-friendly zoning provisions.
- Ensure that all cultivation, management, harvesting, or extraction of natural resources takes place under conditions which foster compatibility with existing surrounding land uses through landowner education, especially regarding Best Management Practices for forestry, agriculture, and erosion control.