

## **CHAPTER VIII - NATURAL AND CULTURAL RESOURCES**

Together, the natural and cultural resources of Newbury have formed the magnet which has drawn residents, visitors and businesses to this community. These are the resources which define much of Newbury's rural character and charm. These are the resources which attract and, thereby provide, the Town's economic and tax base. As such, these are the resources people feel strongly about protecting in order to retain Newbury's rural character and maintain Newbury as a highly desirable place to live, visit and work.

### **NATURAL RESOURCES**

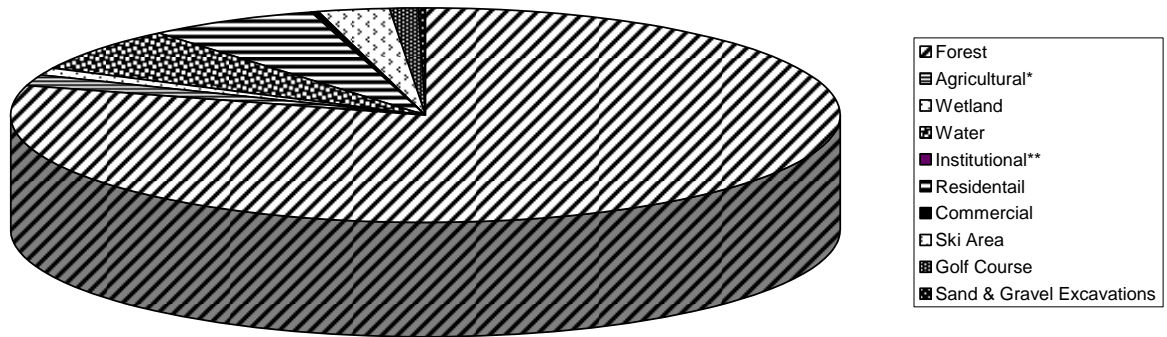
Lake Sunapee and Mt. Sunapee are the focal points in an area blessed with natural beauty. Newbury's natural resources include forests, open fields and agricultural lands, mineral deposits, wildlife and rare plant species, scenic vistas, and surface and ground water. How the community manages and protects these resources while accommodating the development pressures will determine, to a large extent, whether or not the town is successful in retaining its rural character into the future.

### **FOREST RESOURCES**

On average, four out of five acres in Newbury are currently covered with forests. According to a 2007 land use analysis, 19,329 acres, or about 79% of the total area of Newbury (85% of the land area), was in forest use, making it far and away the most dominant land use in Newbury (see Figure VIII-1 and Map VIII-1). Publicly owned lands with a substantial amount of forest cover include the Mt. Sunapee State Park, the John Hay National Wildlife Refuge and the Society for the Protection of New Hampshire Forests lands.

**MAP VIII-1**  
**Land Use**

**Figure VIII-1: Newbury Land Use - 2007**



Much of the forested land in Newbury is located on hillsides which have steep slopes (see Map VIII-2) and shallow soils and is not very suitable for development. However, these forest resources have value for other reasons such as providing marketable timber, providing wildlife habitat, acting as a natural erosion control measure and contributing significantly to scenic values. Recognizing and understanding the benefits provided by undeveloped forest resources will assist the community in making informed decisions about the future of this important resource. Forest lands have many benefits, which include:

- Forests are an economic resource providing jobs, a renewable energy resource, raw materials needed for construction and for the makers of furniture, paper, and other wood products.
- Forests are an important part of the mix of natural resources needed to attract and sustain tourism by providing the playground for a wide variety of recreational activities.
- Forests are a significant component of the natural landscape and its splendid scenic qualities. In particular, the scenic vistas of the wooded hillsides contrasting with the clear blue mountain lakes are an important scenic resource to maintain.

**MAP VIII-2**  
**Steep Slopes**

- Forests help to improve air quality.
- Forests provide a natural means of land stabilization which can assist in minimizing soil erosion and, thus, minimizing sedimentation impacts on the water quality of nearby streams and lakes.

### **Issues: Forest Resources**

1. Poorly managed forest harvesting operations such as liquidation clearing can result in negative environmental effects, such as wildlife habitat degradation or elimination, and soil erosion resulting in adverse impacts on surface water quality due to sedimentation from storm water flows.
2. Cutting trees and clearing roads and lots for development is generating excessive storm water flows and causing problems associated with soil erosion and sedimentation into receiving waters.
3. Forested hillsides and hilltops are important components in the mosaic of natural and cultural features combining to form the scenic landscape in Newbury. Subdivision and development of large areas of forested land, particularly on the hillsides and hilltops surrounding Newbury's lakes and ponds, could result in substantial loss of tree cover. The end result of this change to the scenic landscape would be to irretrievably convert what is now a rural image into a suburban one.
4. Forest clear-cutting for any reason can cause unnecessary adverse environmental impacts including soil erosion and visual impacts.
5. The Town's land development regulations lack site development design standards which could assist in preserving many of the natural features of the land.

### **Goal: Forest Resources**

Preserve and protect Newbury's forest resources to ensure that they continue to have environmental, aesthetic and economic values.

### **Recommendations: Forest Resources**

1. The Conservation Commission should study and evaluate whether additional safeguards are needed relative to forestry practices which can cause significant adverse impacts on stream and lake water quality if storm water drainage is not adequately managed. The Commission should consider the use of Low Impact Development (LID) techniques to reduce stormwater runoff and sedimentation from forestry practice. The Commission should bring any recommended

amendments to local land use regulations to the Planning Board for consideration and any recommended changes to the state laws governing forestry practices to the attention of the local legislators.

2. The Planning Board should reevaluate the standards and controls provided by the Subdivision Control Regulations and the Site Plan Review Regulations relative to management of storm drainage generated by new subdivision and site developments respectively. In particular, clearing of lots for development needs to be incorporated into surface water drainage plans to ensure proper management of storm water flows generated by developments. The Planning Board should consider incorporating the use of Low Impact Development (LID) techniques to reduce stormwater runoff and sedimentation into the Subdivision Regulations and the Site Plan Review Regulations.
3. The Planning Board should consider expanding the boundaries of the Skyline/Hillside Conservation Overlay District aimed at protecting the Town's scenic quality and rural character. The Planning Board should study and monitor the effectiveness of the administration and enforcement of the provisions of the Skyline/Hillside Conservation Overlay District, and, if needed, make recommendations to improve techniques to administer and enforce the provisions of the District.

Additionally, the Planning Board should consider crafting a Forest Conservation District with a large minimum lot size to present to the voters at town Meeting to preserve large blocks of forested land. The following benefits could be provided by a Forest Conservation District: (1) encouraging continuation of large contiguous tracts of forest land in private ownership to provide forest resources and outdoor recreation; (2) encouraging forestry and timber harvesting and permit other compatible land uses; (3) preserving scenic views; (4) protecting wildlife habitat; (5) protecting water quality of surface waters throughout the watershed; (6) protecting natural areas; (7) avoiding the burden of unreasonable town expenditures for the purpose of providing town services to locations which are remote and difficult to access; and (8) avoiding the risk to health and safety of town employees and volunteers of providing emergency services to locations which are remote and difficult to access.

4. To curb the practice of forest clear-cutting, the Planning Board should incorporate a standard into their regulations restricting the subdivision or development of a parcel for five years if it has been clear-cut.
5. The Planning Board should study developing and incorporating site development design standards into the Zoning Ordinance and/or Subdivision Control Regulations which would preserve rural character. These site development design standards would include protection of significant natural and open space resources

through development of site standards for maximum building envelopes. A building envelope area is defined as the area within the lot which conforms to all setback and buffer requirements, and includes enough developable land to accommodate the construction of a typical rural lot, including a house, driveway, on-site wastewater disposal system and a water well.

Defining a maximum building envelope area will assist in managing the amount of tree removal and site disturbance on lots in new developments. It would permit the Planning Board some measure of management over the location of new homes, particularly when trying to preserve natural features such as open fields, agricultural resources, wetlands, streams, ponds, groundwater, wildlife, natural communities & rare plant species, scenic resources, skylines and ridge lines, steep hillsides, and flood plains.

The Planning Board should consult the following publications, among others, in developing such subdivision design standards to preserve rural character:

- “Preserving Rural Character” - Planning Advisory Service Report # 429; and
- “Dealing with Change in the Connecticut River Valley: A Design Manual for Conservation and Development” - Yaro, Robert D., et al.

## **AGRICULTURAL & OPEN SPACE RESOURCES**

One hundred years ago, agricultural uses dominated the local landscape. Today, open fields and agricultural cropland account for only about 1.6% of the total area of Newbury (1.7% of the land area). The scarcity of these resources becomes evident in comparing the percentage of open lands in Newbury with those in the State. Newbury has about one-sixth of the percentage of open lands which exists statewide. The agricultural resources are scattered around Town, as shown on Map VIII-1: Land Use included earlier in this chapter.

In contrast to much of the steep, forested areas which pose significant constraints for development, agricultural lands usually impose the least constraints to development for other types of uses, whether they are residential, commercial, industrial or institutional. This, in large part, explains why so few of these resources remain today. It is also the reason why the community needs to act soon if any of these locally important resources are to be retained.

If any of these resources are to be preserved for future generations of residents or visitors, then the community needs to understand and recognize the importance of these agricultural and open space resources to the Town. The values or benefits imparted by open space and agricultural lands include the following:

- enhance the rural and small-town character which has been identified as a desirable aspect of Newbury;

- provide scenic views that contribute to the quality of life in town and to a visitor's aesthetic experience;
- encourage community pride and help maintain a balance between the natural world and the world of mankind;
- enhance and protect wildlife habitats; and
- ensure a positive fiscal impact on the town by enhancing property values. Maintaining a property in agricultural & open space use is a positive fiscal benefit to the Town.

Preservation of farmland in Newbury today is motivated primarily by the benefits associated with retaining working farms as part of the rural landscape. Working farms have been part of Newbury's rural landscape for over 100 years. Precious few remain.

Secondly preservation of farmland is motivated primarily by aesthetic benefits provided by open space lands. As noted above, open space lands enhance the rural and small-town character of Newbury, and provide scenic views that contribute to the quality of life in town and to a visitor's aesthetic experience. Additionally, protection of farmlands will help preserve some prime agricultural soils which are becoming a scarce national, state and local resource with the continuing decline of agricultural land use.

The current use program in New Hampshire provides property owners the benefit of reduced property taxes on open space lands, but does not ensure long-term protection of these valuable resources with monitoring provided by the conservation Commission or non-profit land-protection organization. The purchase or donation of conservation easements, development rights or fee simple acquisition of significant open space lands affords ongoing, long-term protection for these important resources. These open space resources, which are so readily developable, are irretrievably lost once converted to one of the competing suburban or urban land uses, which places an emphasis on protection efforts of these scarce remaining natural resources.

### **Community Survey Results: Agricultural and Open Space Resources**

In the 1994 Community Survey, 79% of the people responding to the survey supported farming as a desirable future land use in Newbury. Ninety percent of the respondents of the 1994 survey supported the town accepting the donation of land or conservation easements on property for conservation or recreational enjoyment of the people. In that same survey, 71% of those surveyed supported the use of property tax dollars to purchase property or easements for conservation purposes.

## **Issue: Agricultural and Open Space Resources**

Newbury's agricultural and open space lands have dwindled to only about 385 acres or about 1.6% of the area of Town. Once converted and developed for other uses, they are irretrievably lost. As noted above, these open space resources provide strong visual contrast with the lakes and wooded hillsides, and are a key component in creating the striking visual landscape of Newbury.

## **Goal: Agricultural and Open Space Resources**

Conserve our agricultural and open space lands for their positive impact on the economic base resulting from their positive addition to the rural working landscape and scenic and aesthetic qualities, and the quality of life for Newbury residents.

## **Recommendations: Agricultural and Open Space Resources**

1. The Newbury Conservation Commission should work closely with the local and state land protection organizations to preserve some of these remaining scarce agricultural and open space resources through the use of conservation easements or fee simple acquisition.
2. The town should consider amending the Zoning Ordinance to give the Planning Board the authority to require an alternative development layout, such as that provided by the Cluster Development Ordinance, in lieu of the standard suburban lot layout, in instances where the Planning Board feels a proposed development may adversely affect significant natural or historic resources such as an important parcel of agricultural or other open space land.
3. Use limited building envelopes for new lots to preserve agricultural resources. Refer to Recommendation #5 under **Forest Resources**.

## **EARTH MINERAL RESOURCES**

Newbury's earth mineral resources include deposits of sand and gravel, Kinsman quartz, monsonite, quartz, potash feldspar, plagioclase, muscovite, biotite, garnet, beryl calcite, and mica. Out of these various earth mineral deposits, currently only sand and gravel deposits are mined commercially.

Sand and gravel operations occupy a prominent place in our economy. These earth resources provide construction aggregate for roads and other development activities and, thus, it is important that known deposits of these resources be identified and wisely used.

At the same time, earth excavations can be a disruptive land use, creating dust, noise, fumes and heavy truck traffic, and leaving a damaged landscape. Excavation activities may cause erosion

and sedimentation, fuel spills, and exposure of the water table, which may, in turn, contaminate the groundwater. Excavation too close to the water table may result in local flooding in wet years when the water table is unusually high. Thus, it is important that excavation operations be performed with care. Plans for excavations should consider impacts on aesthetics, wildlife, ground and surface waters, air quality, roads, adjacent land uses, and the character of the surrounding area. Restoration plans and security to ensure implementation of those plans are needed for every excavation.

The New Hampshire Legislature, in 1989, amended the enabling statute which addresses the purpose and description of a Master Plan to incorporate a Construction Materials section. RSA 644:2, VIII-a calls for a "construction materials section which summarizes known sources of construction materials which are available for future construction material needs, including, at a minimum, the location and estimated extent of excavations which have been granted permits under RSA 155-E, as well as reports filed pursuant to RSA 155-E:2, I(d) with respect to non-permitted excavations."

This section of the Newbury Master Plan discusses construction materials located in the town of Newbury. Sources of information on the location of construction material resources include:

1. The Merrimack County Soils Survey prepared in 1961 provides soils maps which identify the locations of deposits of sand, gravel, road fill, and topsoil, all of which are designated in the soils survey as construction materials. The soils are rated as good, fair or poor for road fill soils and topsoil. Probable and improbable ratings are provided for each soil type for sandy and gravel soils. The ratings are based on observed performance of the soils and on estimated data and test data conducted as part of the Natural Resource Conservation Soil Survey. This information is intended for town-wide land use planning purposes and not site specific planning because it does have limitations. Due to map scales and associated margins of error, there may be small areas of different soil types included within the mapped area of another soil type.

The Natural Resource Conservation Service is in the process of revising and updating the Merrimack County Soil Survey last done in 1961. Once this updated soils survey data is available, then the Planning Board should have maps prepared identifying the locations of construction materials in Town.

2. A recently completed, cooperative project by the N.H. Department of Environmental Services and the U.S. Geological Survey has resulted in the study and mapping of stratified-drift aquifers in New Hampshire. The town of Newbury is covered in two separate reports entitled: "Geohydrology and Water Quality of Stratified-Drift Aquifers in the Contoocook River Basin, South-Central New Hampshire" and "Geohydrology and Water Quality of Stratified-Drift Aquifers in the Lower Connecticut River Basin, Southwestern New Hampshire" by the U.S. Geological Survey in cooperation with the N.H. Department of Environmental Services.

By their very nature, stratified-drift aquifers are prime sand and gravel deposits. The locations of these stratified-drift aquifers in Newbury are displayed on Map VIII-10: Aquifers found in the Groundwater Resources section of this chapter. This map shows the existence of a large interconnected aquifer which starts near the intersection of Gillingham Drive and Sutton Road on the north end extending in a southwesterly direction through South Newbury along South Road to the Gillingham Pond and Pleasant View Road area and then continuing westward along Newell Road cross-country to Mountain Road.

Table VIII-1 provides a list of active and abandoned sand and gravel excavations in Newbury. The locations of these operations are identified on Map VIII-3.

One of the provisions of the state law governing earth excavations (RSA 155-E) is that a town must allow reasonable opportunities somewhere in town for excavations. Local regulations affecting earth excavations in Newbury currently include:

1. A new application for an earth excavation in Newbury would first entail obtaining approval from the Zoning Board of Adjustment for a Use Permitted By Special Exception in either the Residential/Business or Residential/Rural District.
2. The second step would be for an applicant to apply to the Planning Board under RSA 155-E and receive their approval for an earth excavation permit.

These provisions seem to provide for reasonable opportunities while providing local review processes to ensure appropriate locations for such potentially disruptive uses, and adequate standards and safeguards to provide for responsible operations causing minimal environmental impacts.

**TABLE VIII-1**  
**Existing Sand & Gravel Excavations**  
**Newbury, N.H.: 2007**

Map Identifier Letter	Name of Property Owner	Size of Excavation		Status
		Total Area in Acres	Excavated Area in Acres	
A	Ruth Kinsman	40 ac.	4 ac.	Active
B	Willow Pond	62 ac.	10 ac.	Active
C	Marion Deroche	4.5 ac.	0.5 ac.	Active
E	Clark Davis	0.59 ac	NA	Abandoned
F	Eric Unger	0.5 ac.	NA	Abandoned

Source: Dennis Pavlicek, Town Administrator

**MAP VIII-3**  
**Existing Sand and Gravel Excavations**  
**Newbury,N.H.:2007**

One of the provisions of the state law allows a town in which known aquifers exist, so designated by the U.S. Geological Survey, to protect those groundwater resources by prohibiting any excavation which would substantially damage a known aquifer. The Stratified-Drift Aquifer Maps provide the information to the Planning Board to make this evaluation as part of an application for an earth excavation. The possible damage resulting from an earth excavation located directly over a known aquifer could include adverse effects on the water table from digging too deep and the danger of pollution from spills of truck oils and other chemicals used on the site which could percolate through the soils into the groundwater.

Construction materials resources are valuable for their use in local construction and for export to other communities. Responsible excavation operations which provide careful attention to environmental concerns and site restoration can continue to provide Newbury with a stable economic resource that also meets other goals of preserving rural character, aesthetics and the environment.

#### **Issues: Earth Mineral Resources**

1. The Natural Resource Conservation Service is in the process of revising and updating the Merrimack County Soil Survey last done in 1961. This updated Soil Survey can provide the basis for identifying and mapping the locations of construction materials in Newbury.
2. Earth excavations can be a disruptive land use, creating dust, noise, fumes and heavy truck traffic, and leaving a damaged landscape. Excavation activities may cause erosion and sedimentation, fuel spills, and exposure of the water table, which may, in turn, contaminate the groundwater. Excavation too close to the water table may result in local flooding in wet years when the water table is unusually high. The town lacks local earth excavation regulations.
3. Until the town adopts local earth excavation regulations, the town is left with managing earth excavations with RSA 155-E, the state law governing earth excavations.
4. The town lacks the expertise in-house to evaluate the potential environmental impacts of earth excavations.

#### **Goals: Earth Mineral Resources**

1. Ensure that extraction methods will not result in significant degradation to the aesthetic, environmental, or economic values of surrounding areas.
2. Ensure the restoration of land areas that are disturbed by the extraction of

earth minerals.

### **Recommendations: Earth Mineral Resources**

1. Once the updated Soil Survey of Merrimack County is available, then the Planning Board should have maps prepared identifying the locations of construction materials in Town.
2. The Planning Board should consider developing and adopting local earth excavation regulations for new or expanded gravel pits. These local earth excavation regulations should establish operation and reclamation standards which exceed the minimums established by the state law governing local earth excavations (RSA 155-E).

It is important that excavation operations be performed with care. Plans for excavations should consider impacts on aesthetics, wildlife, ground and surface waters, air quality, roads, adjacent land uses, and the character of the surrounding area. Restoration plans and security to ensure implementation of those plans are needed for every excavation.

3. Until the Planning Board develops and adopts local earth excavation regulations, the Planning Board should carefully review each application for a new or expanded earth excavation to ensure the operation will comply with the provisions of RSA 155-E, including the Minimum and Express Operational Standards, the Minimum Express Reclamation Standards, Incremental Reclamation and Prohibited Projects.
4. In reviewing an earth excavation application for a new or expanded gravel pit, the Planning Board should call upon any outside engineering or environmental consultants, including the Natural Resource Conservation Service, at the applicant's expense, for advice on potential adverse impacts of the proposed operation and recommendations on how to mitigate those impacts, and review of the proposed reclamation plans.

### **RARE PLANTS, WILDLIFE, & NATURAL COMMUNITIES**

The wide variety of ecosystems provided by the lakes and streams, forests, fields, and wetlands found in Newbury support a diverse population of wildlife.

The first wildlife habitat feature which has been identified and mapped in Newbury is deer wintering areas or deer yards. In 1986, the New Hampshire Fish and Game Department began mapping deer yards using aerial photography to locate areas ten acres or more in size with dense evergreen cover. Starting with the latest Fish & Game Dept. deer yard maps, Richard Wright used aerial photos, local knowledge, and site surveys to update the deer yard maps shown on

Map VIII-4. The Wildlife Action Plan Cover Types shown in Map VIII-5 is a second wildlife habitat feature which has been identified and mapped in Newbury.

Rare plants, wildlife and natural communities information from the N.H. Natural Heritage Bureau indicates there are areas in Newbury where such resources may possibly occur. The general locations of these rare plants, rare wildlife and rare natural communities are shown on the Map VIII-6: Rare Plants, Wildlife and Natural Communities. Please note that these are only general locations in order to maintain confidentiality of precise locations of these protected species. Additionally, it is interesting to note that Newbury is the home of the nation's largest pitch pine tree!

Important benefits imparted by wildlife and plant resources include:

- An abundant and diverse supply of wildlife and plant resources provides opportunities for education, entertainment, leisure, and recreation, including hunting, fishing, photography, bird watching, nature studies, art and similar activities.
- The presence or absence of native wildlife species, sensitive to pollution or loss of habitat, helps to indicate the condition of the natural environment.

#### **Issues: Rare Plants, Wildlife, & Natural Communities**

1. Subdivision and development can directly eliminate wildlife habitats and the existence of rare plant species. Additionally, subdivision and development can result in fragmentation of wildlife habitats, which can lead to degradation of the habitat and/or loss of the wildlife altogether.
2. Methods of waste disposal, construction, road paving and maintenance, and other human activities can lead to pollution or destruction of wildlife habitats and rare plant species resources.

#### **Goal: Rare Plants, Wildlife, & Natural Communities**

Encourage protection measures and preserve sufficient healthy habitats to ensure the continuation of the community's wildlife and rare plant species resources.

#### **Recommendations: Rare Plants, Wildlife, & Natural Communities**

1. The Planning Board should refer any subdivision or site plan review application which is proposed within the broadly outlined areas identifying the possible occurrence of rare plants, rare wildlife and rare natural communities (see Map VIII-6: Rare Plants, Wildlife, and Natural Communities) to the New Hampshire Heritage Bureau for review and comment on any potential impacts on these rare plants, wildlife and natural communities.

**MAP VIII-4**  
**Deer Wintering Areas**

**MAP VIII-5**

**Rare Plants, Wildlife, and Natural Communities**

**MAP VIII-6**  
**Rare Plant Species & Natural Communities**

## EXOTIC AQUATIC PLANTS, ANIMALS & INVASIVE PLANT SPECIES

Invasive plants are introduced species that can thrive in areas beyond their natural range of dispersal. These plants are characteristically adaptable, aggressive, and have a high reproductive capacity. Their vigor combined with a lack of natural enemies often leads to outbreak populations.

Aquatic Species includes both aquatic plant and aquatic animal species. Invasive aquatic plants are introduced plants that have adapted to living in, on, or next to water, and that can grow either submerged or partially submerged in water. Invasive aquatic animals require a watery habitat, but do not necessarily have to live entirely in water.

Some of the exotic aquatic plants and animal species include:

- Zebra Mussels
- Milfoil
- Eurasian Milfoil
- Fanwort
- Water Chestnut
- Purple Loosestrife

Identifying invasive species is made easier with the availability of the **Guide to Invasive Upland Species in New Hampshire** by the NH Department of Agriculture and the NH Invasives Species Committee,

Milfoil (*Myriophyllum heterophyllum*, *Myriophyllum spicatum*) and fanwort (*Cabomba caroliniana*) are exotic aquatic plants that have become economic and recreational nuisances in some of New Hampshire's lakes and ponds. Dense stands of these plants inhabit shoreline areas frequented by water based recreationalists. Exotic plants can create the following problems:

- Displacement of beneficial wildlife.
- Reduction of aesthetic quality of lakes.
- Devaluation of waterfront property.
- Littering of beaches with plant fragments.
- Makes swimming difficult and dangerous.
- Snags fish lines and stunts fish life.
- Becomes tangled in outboard motor propellers.

- Chokes boat traffic lanes.
- Requires substantial funds for managing.

The spread of these plants to other uninfected water bodies by transient boat traffic has increased over the last few years. If accidentally introduced into a lake, they grow at explosive rates. Many times new infestations are not discovered by state biologists until the weeds become a nuisance requiring expensive control methods. Once fully established, they are virtually impossible to eradicate. Therefore, education, vigilance, and early detection are key components in keeping these non-native nuisance weeds in check.

Impacts from invasive and exotic plants include:

- One study estimates that the total costs of invasive species in the United States amount to more than \$100 billion each year.
- Invasive species impact nearly half of the species currently listed as Threatened or Endangered under the U.S. Federal Endangered Species Act.
- The U.S. spends \$120 billion annually on the control and impacts of more than 800 invasive species infestations. This does not account for the values of species extinctions and losses in biodiversity, ecosystems, services and aesthetics.
- Nine out of 21 of the most endangered ecosystems in the U.S. are significantly impacted by exotic invasions.
- 80 percent of the nation's fish communities are considered degraded because of decline or loss of native species and introduction of exotics.

A new invasive species just encountered in New Hampshire is "Didymo" or "Rock Snot". This alga, *Didymosphenia geminata*, is commonly called "Didymo" and it does not present a health hazard to humans, although some reports indicate that people often experience irritated eyes while swimming in waters downstream from contaminated areas. Anglers find the algae a nuisance in that it fouls fishing line and lures with a gooey mass of material.

The real danger of Didymo lies in the impact that it may have on our fish populations. The algae thrive in cool, nutrient-poor water where it forms blooms that result in massive mats. It crowds out the native organisms in streams and rivers that trout and other fish feed on resulting in the decline of their populations. "Didymo" reduces the area of clean substrate upon which fish nest and lay eggs. The resulting change in habitat could conceivably cause a shift in the types of aquatic insects present. It also tends to out-compete and limit the growth of native algal species, many of which are food sources for aquatic insects, which in turn are preyed upon by fish and other creatures.

In South Dakota, brown trout populations have been severely reduced in the Rapid Creek area of the Black Hills downstream from Pactola Dam. Up to 90 percent of the stream bottom in the area is covered with the algae.

Didymo is most often found on the bottoms of streams and rivers where it attaches itself by stalks to the gravelly bottom of the stream or river bed, smothering out rocks and other submerged plants. Didymo appears as a thick white, light gray, pale yellow-brown, or beige (not green) mass, which cover more than 90 percent of the river bottom in places. Once established, it may look like a brown shag carpet covering the whole river or stream bottom. It frequently forms flowing "rat's tails" that often turn white at their ends and look like a length of toilet paper. Although it may look slimy, it is actually spongy and feels scratchy, much like wet cotton wool.

The algae have also caused problems by clogging water intakes in Canadian streams and rivers. The algae have been documented in Arkansas, Tennessee, Montana, South Dakota, Vermont and British Columbia in North America. It is also found in New Zealand and Poland.

#### **Issues: Exotic Aquatic Plants, Animals & Invasive Plant Species**

1. Exotic aquatic plants and animals and invasive plant species threaten our water, plant and land resources.

#### **Goal: Exotic Aquatic Plants, Animals & Invasive Plant Species**

1. Eliminate the introduction and spread of exotic aquatic plants and animals and invasive plant species.
2. Reduce and eliminate existing populations of exotic aquatic plants and animals and invasive plant species.

#### **Recommendations: Exotic Aquatic Plants, Animals & Invasive Plant Species**

1. Promote existing educational programs for boaters and fisherman to be educated to follow the correct steps for entering and exiting a lake or stream relative to protecting the lake or stream from the spread of exotic aquatic plants and animals.
2. The towns and the lake protective associations need to work together to ensure volunteers man the public boating access points to ensure boaters and fishermen comply with regulations and practices for protecting the lake from the spread of exotic aquatic plants and animals.
3. The towns and the lake protective associations need to work together to educate the public about the impacts of exotic aquatic plants and animals and invasive plant species and then educate the public about the actions to take.

4. The towns and the lake protective associations should host an annual Lake Day which would provide an educational format to highlight the impacts from invasive species and the impacts from exotic species of plants & animals.

## **SCENIC RESOURCES**

Newbury's diverse landscape features, including its wooded hillsides, open fields, mountain lakes, wetlands and small settlements, blend together and contrast to create Newbury's splendid scenic qualities. Perhaps no other single feature is so important in defining the rural and small town character cherished by those who come to live, work and visit in this community blessed with natural beauty. The lingering image of a sunset over Lake Sunapee with the autumn colors in full blaze along the flank of Mt Sunapee is one of the primary reasons why we were attracted here in the first place, why this is a special place to be today, and why we want to remain here in the future. Preservation of these scenic resources is critical to maintaining the rural and small town character of Newbury. The challenge is to accommodate development while preserving the Town's scenic resources and rural character in the process.

Some of the best scenic views in town include the following:

- The view of Mt. Sunapee and the ledges at Lake Solitude from Route 103 at the Bradford town line;
- The view northward across Lake Todd from Route 103;
- The view looking northward of Lake Sunapee and the surrounding hills from the town docks in Newbury Center;
- From Gillingham Drive looking across Lake Todd to Mt. Sunapee;
- From Baker Hill Road looking south and west to Mt. Sunapee, Mt. Okemo, Mt. Ascutney, and Lake Sunapee;
- From Post Road and Redhouse Road to the Mink Hills;
- From Morse Hill Road to Mt. Sunapee;
- From Post Road to Bald Sunapee;
- From South Road looking north;
- From the Hay Estate to Lake and Mt. Sunapee;
- From Route 103A at Grace Hill overlooking Lake Sunapee;

- View from the High Meadow development in all directions; and
- From Mt. Sunapee overlooking Lake Sunapee and the White Mountains to the north.

Benefits or values imparted by scenic views and vistas include:

- The quality of life for Newbury residents; and
- Scenic resources are a vital component in defining the small town and rural character of the Town.

The Towns of Newbury and Sunapee with the assistance of the Regional Planning Commission applied for and received funding to designate a Cultural and Scenic Byway along Route 103. The Scenic Byway Program involves a partnership of economic development and conservation interests and funding to support both. Scenic Byway funding can be used to support economic development efforts related to tourism while also supporting conservation of the scenic and other resources which are so vital to the whole concept of a Scenic Byway. Newbury received Scenic Byway funding to purchase and refurbish the caboose now located in the Bell Cove area that is used as a museum along with signage and landscaping improvements.

### **Community Survey Results: Scenic Resources**

As part of the 1994 Community Survey, people in town were asked why they feel Newbury is a desirable place to live. Scenic and unpolluted natural environment was the third most frequent response, with a rating of 81%, which closely followed small town atmosphere (83%) and uncrowded and quiet living conditions (82%). The same question was asked as part of the 2006 Community Survey with similar results. Scenic and unpolluted natural environment received the second highest response with a rating of 84% behind three other factors receiving 85%: lakes, small town atmosphere, and uncrowded and quiet living conditions.

Ninety percent of the respondents to the 1994 Community Survey supported the town accepting the donation of property and conservation easements on property for conservation and recreational enjoyment of the people of Newbury, which could include scenic views, among other things.

Additionally, 46% of those surveyed in 1994 supported the use of local property tax revenues to purchase property or easements for scenic views, while 34% opposed the idea and 19% were uncertain about the proposal. A similar response was received to the same question in the 2006 Community Survey when 45% supported the use of local property tax revenues to purchase property or easements for scenic views, while 39% opposed the idea and 15% were uncertain about the proposal.

In the 2006 Community survey when asked whether or not people would support the creation of additional scenic views of Lake Sunapee through some selective clearing along the highways for construction of roadside turnouts, 43% said yes, 50% said no, and 7% has no opinion.

In the 2006 Community Survey, when asked how strongly would people support the adoption of additional local regulations to protect scenic views around the lakes and ponds in Newbury by screening building development on the hillsides which is visible from the lakes and by implementing design controls, 78% agreed or strongly agreed, 12% were neutral, and 10% disagreed or strongly disagreed.

### **Issues: Scenic Resources**

1. Inappropriate development within the viewshed of a scenic resource, particularly viewsheds visible from the public road system or public properties, can destroy its scenic value. The traditional strip residential development pattern along the existing road network results in promoting an image of suburban residential sprawl throughout Town. The actual development pattern is one of strip residential development along the road system, but predominantly undeveloped areas behind those strips.
2. Views of ridgelines or hilltops are particularly vulnerable to poorly sited communication towers or residential developments which can have a significant negative impact on the scenic qualities of the landscape.
3. Continued participation in the Scenic and Cultural Byway Program could provide funding for items such as conservation or scenic view easements and acquisition and development of scenic view pull-offs or turn-outs.

### **Goals: Scenic Resources**

1. Preserve and protect important scenic resources to ensure that Newbury continues to maintain a small-town, rural identity.
2. Ensure that scenic resources continue to provide aesthetic value for residents, visitors and businesses.

### **Recommendations: Scenic Resources**

1. Seek to implement zoning that stops the suburban pattern of strip development along the existing rural road system. For larger parcels, a less suburban pattern of residential development can be accomplished by creating interior roads providing access for new lots and creating open space along the existing rural road system. Alternatively, minor subdivisions of small parcels creating new lots fronting and

accessing on the existing rural road system can increase the setback for new structures from those roads. The preferred pattern of residential development would be to promote open space along the existing road system, and develop residential uses behind these field or forest open spaces adjacent to the rural roads.

Use limited building envelopes for new lots to preserve scenic resources. Refer to Recommendation #5 under **Forest Resources**.

2. The Planning Board should consider expanding the boundaries of the Skyline/Hillside Conservation Overlay District aimed at protecting the Town's scenic quality and rural character. The Planning Board should study and monitor the effectiveness of the administration and enforcement of the provisions of the Skyline/Hillside Conservation Overlay District, and make recommendations to improve techniques to administer and enforce the provisions of the District.
3. Newbury should continue to participate in the Scenic and Cultural Byway Study along Route 103 and to pursue funding to implement such a scenic byway. This could include funding for items such as conservation or scenic view easements and acquisition and development of scenic view pull-offs or turn-outs.

## **WATER RESOURCES**

Newbury's water resources are highly valued by both residents and visitors to the area. Lake Sunapee, Lake Todd, and numerous brooks and smaller ponds contribute to the scenic environment, provide wildlife habitat and recreation opportunities, and are a major factor in the local and regional economy. Water area inside the town of Newbury totals 1,619 acres. This accounts for 6.7% of the total area of Newbury. However, a much larger portion of Lake Sunapee lies immediately north providing a stronger presence of the lakes. In this section, issues related to surface water resources, including brooks, lakes, ponds, floodplains and wetlands are discussed, as well as those related to the groundwater from which all of Newbury's individual wells draw their supply.

### **Community Survey Results: Water Resources**

Protection of the quality of Newbury's water resources is important to Newbury property owners, as reflected in the 1994 Community Survey. When asked, "Why do you feel Newbury is a desirable place to live?", 81% percent of survey respondents checked off "scenic & unpolluted natural environment." Three-quarters specified "lakes." Sixty-three percent checked off "outdoor recreation opportunities" and 58% percent named the "Mt. Sunapee State Park beach and ski area," the enjoyment of both of which is dependent on clean surface waters. Similar results were obtained from the 2006 Community survey to the same question. Eight-five percent of the respondents indicated lakes were important, 84% said scenic and unpolluted natural environment was

important, 74% indicated outdoor recreation opportunities and 65% named the "Mt. Sunapee State Park beach and ski area.

In the 1994 Community Survey, respondents' goals for the future development of Newbury were dependent on surface water quality as well. While a vast majority of survey respondents (78%) were in agreement that Newbury should "be primarily a rural residential community" over the next ten years, 48% also responded that Newbury should "encourage outdoor recreation related business" and 40% would like to see "tourist related business" encouraged. Sixty percent specified "motels/inns/bed & breakfasts" as one of the commercial uses they would like to see in Newbury in the future.

Again similar results were received from the 2006 Community Survey. In 2006, 88% agreed or strongly agreed that Newbury should "be primarily a rural residential community" in the future, 69% also agreed or strongly agreed that Newbury should "encourage outdoor recreation related business" and 55% agreed or strongly agreed they would like to see "tourist related business" encouraged.

## **BROOKS, PONDS & LAKES**

A major surface water divide runs through Newbury. Lake Todd, Doctors' Colony Pond, Loch Lyndon Reservoir, Lake Solitude, Gillingham Pond, and several brooks flow southeasterly to the Contoocook River via the Warner River, forming part of the Merrimack Basin (Map VIII-6). To the northwest, surface waters drain into Lake Sunapee, from which waters flow to the Connecticut River via the Sugar River. Chalk Pond, Blodgett Brook, and many smaller brooks are part of the Lake Sunapee Watershed. Newbury's lakes and ponds cover 1,523 acres, or 6 % of the Town. These lakes and ponds are associated with almost twenty miles of shoreline. About thirty-three miles of permanent streams, as identified by the Planning Board, flow within Newbury.

Lake Sunapee is a significant regional resource and the anchor for the region's tourist economy. Thirty percent of the Lake Sunapee Watershed lies within the borders of Newbury. As part of the Lake Sunapee Watershed Study conducted in 1994, Upper Valley Lake Sunapee Regional Planning Commission (UVLSRPC) estimated the number of residential units in the Newbury portion of the Watershed to be 981, with approximately 2,408 year-round and seasonal residents. This is a larger figure than any other community in the Watershed. As part of the Lake Sunapee Watershed Study, UVLSRPC conducted a build-out analysis which projected the maximum number of residential units that could be developed in each Watershed community under current land use regulations. The build-out analysis projected that if Newbury's zoning and subdivision regulations do not change, the number of dwelling units in the Watershed can almost triple to 2,507. If all of these units were year-round, this would mean approximately 4,057 additional Newbury residents living in the Watershed<sup>1</sup>. Although it

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<sup>1</sup> Springfield and Sunapee both have potential for even higher watershed populations. For details, please see the Lake Sunapee

is likely that Newbury will always have some seasonal housing, it should be kept in mind that the proportion of housing units in town that are lived in year-round has been increasing. This means that the average annual volume of wastewater associated with each additional housing unit is increasing as well.

Surface water pollution can result from a variety of human activities within a watershed. In general, the closer the activity is to the brook or pond, the greater its impact is on the surface water quality. Much can be done at the local level to prevent degradation of the quality of surface waters. Shoreline protection and erosion and sedimentation control can both be used to reduce the amount of pollution that would otherwise enter streams, lakes and ponds as a result of a given development. Newbury's water bodies are currently protected to different degrees through a variety of means. The NH Shoreland Protection Act applies to Lake Sunapee, Chalk Pond, Gillingham Pond, Lake Todd, and Loch Lyndon Reservoir. The Shoreland Act provides for a fifty-foot building setback and a 75

to 125-foot septic system setback, depending on soil types. The Act also regulates the location of solid waste facilities, the fertilizing of lawns, shoreline frontage, and requires that any existing natural woodland buffer within 150 feet of the shore be maintained.

Newbury's Zoning Ordinance includes a Shore Land Overlay District which requires a seventy-five-foot shoreline setback for structures and septic systems. The lake, pond and stream shorelines subject to this requirement are shown on Map VIII-7. Limits have also been placed on removal of vegetation within fifty feet of the shoreline. Within the fifty-foot buffer, only fifty percent (50%) of the basal area in each 200 feet of shore frontage can be cut in a twenty year period.

**MAP VIII-7**  
**Ponds and Permanent Streams**

Erosion and sedimentation control is another tool which can be used to decrease surface water quality degradation associated with development. While special attention to shoreline development and maintenance of adequately sized vegetated buffers prevent much sedimentation, development in the headwaters of a stream or river, which also tend to contain the steeper lands, can result in erosion and the associated sedimentation of surface waters. Of the approximately 5,220 acres of land in Newbury with slopes greater than 25%, approximately half (2,308 acres) are protected from development through public ownership or conservation easement.

Development on steep slopes is a significant source of sedimentation of surface waters for several reasons. The erosion potential is greater because the soils tend to be shallower in these areas and the volume and velocity of surface water runoff is higher. The resulting sedimentation can be associated with increased siltation and turbidity, and increased nutrient and chemical loading. Areas with slopes over 15 percent pose a challenge to development in an environmentally sound and cost-effective way. Land with slopes over 25 percent is often best left as open space due to the potential for erosion when disturbed.

#### **Issues: Brooks, Ponds & Lakes**

1. Some Newbury surface waters continue to show signs of degradation. Data collected by the Lake Sunapee Protective Association (LSPA) using NH Department of Environmental Services protocols has shown that over the last decade, the longer-term trend of increased phosphorus levels in lakes, ponds and streams has continued. Increasing specific conductivity values in Newbury's surface waters are due primarily to road salt application. Housing and other development, transportation infrastructure and impervious surfaces continue to impact water quality (including groundwater) and have been exacerbated by changing precipitation patterns. More frequent and more intense storms, possibly due to climate change, have caused severe erosion and accompanying water quality problems in developments areas such as the Chalk Pond area.

The Sunapee Area Watershed Coalition (SAWC) has as a goal to develop a watershed plan that will have recommendations for phosphorous loading mitigation.

In 2007, as part of the Watershed Pilot Grant, a phosphorous loading model was completed which predicted a 277% increase in phosphorous loading from 2005 levels at 87% of full build-out, based on current zoning and housing size trends.

In 2007 a continuously reporting monitoring station was launched into Lake Sunapee to provide the Lake Sunapee Protective Association with

real time data on water parameters throughout the year. The instrumented buoy is part of a global network (GLEON) and the data will be analyzed and compared to other lakes around the globe.

The potential additional four thousand residents living in the Newbury portion of the Lake Sunapee Watershed at full build-out would mean four thousand more people fertilizing lawns, washing cars, using household chemicals, and expecting ice-free roads to drive on in winter. With no centralized wastewater treatment in Newbury, all wastewater would enter the hydrological cycle with only the benefit of septic system treatment. Although this level of growth will not occur within the time frame of this Master Plan, further study is needed now to project the impacts the potential growth of build-out would have on the quality of the water in the Lake and to assess the need for zoning density changes or other action which might preempt further water quality degradation.

2. The N.H. Office of State Planning and Audubon Society of New Hampshire recommend a minimum one-hundred-foot vegetated buffer along the shoreline to gain an adequate level of removal of most major pollutants (Buffers for Wetlands and Surface Waters - A Guidebook for New Hampshire Municipalities, Revised May, 1997). This recommendation is based on a review of the most recent scientific literature. Newbury's Shore Land Overlay District regulations require only a fifty-foot buffer.
3. Although Newbury's Shore Land Overlay District allows removal of only 50% of the basal area of trees in the shoreline buffer, the Ordinance could be stronger when applied to the protection of the essential shrubs and ground cover. The current language states that a "healthy, well-distributed stand of trees, saplings, shrubs and ground covers" must be left in place, but does not make clear that, although 50% of the basal area of trees may be removed, the shrubs and ground covers should be maintained as fully as possible to retain the soil.
4. Newbury's Zoning Ordinance discourages, but does not regulate, use of fertilizers within the shoreline buffer. Currently, only fertilization of lawns on those shorelines covered by the NH Comprehensive Shoreland Protection Act is regulated in Newbury. Fertilizers from lawns and agriculture can be a significant source of nutrient loading to surface water bodies. Upper Valley Lake Sunapee Regional Planning Commission developed some recommended guidelines in conjunction with N.H. Department of Environmental Services which address use of best management practices on agricultural lands, restriction of non-agricultural fertilizers to lime or wood ash, and maintenance of a fifteen-foot

unfertilized buffer.

5. The shorelines of Lake Sunapee, Chalk Pond, and most of that of Lake Todd have already been the focus of much residential development. Most of the existing shoreline development around Lake Sunapee is residential. It is recognized that the interests of property owners in expanding or redeveloping these residences must be balanced with the need to prevent further water quality degradation.

Erosion and sedimentation are not adequately controlled by Newbury's land use regulations. Newbury's Zoning Ordinance currently contains several provisions relative to steep slopes. Clear cutting on steep slopes is limited and lower density development is accomplished in areas containing steep slopes through a provision that only 40% of the portion of the lot with slopes over 25% can count toward the minimum lot size. However, erosion and sedimentation are not addressed through this zoning provision, as the development activities are not prohibited from occurring on the steep areas. Additional regulations are also needed to address development activities on moderate slopes, design and construction of driveways, and construction projects that disturb large areas or result in large impervious areas. These are all activities with a high risk for resulting erosion and sedimentation if improperly planned, but an opportunity for prior review to address the issue if regulations are in place.

6. Centralized wastewater treatment and disposal for Newbury Center and the Lake Sunapee shoreline have been discussed as one means for reducing nutrient loading. If more intensive and higher density uses are desired for Newbury Center, then centralized wastewater treatment and disposal for this expanded village area will be needed to support those uses and still protect the water quality. The 2006 Community Survey results indicate that there is support for providing centralized wastewater treatment and disposal for Newbury Center and the Lake Sunapee shoreline with 64% and 61% supporting the idea respectively.
7. Boat discharges of gray water, sewage and/or fuel into lakes can significantly degrade water quality and negatively affect wildlife.
8. Eurasian Milfoil and other nuisance plants and animals can contaminate surface waters and negatively affect desirable species and human activities.
9. Runoff from roads often enters surface waters directly or via drainage structures and carries with it salt, sediment and other pollutants.

10. More emphasis on inter-municipal and inter-agency cooperation is needed to protect the brooks, ponds and lakes in Newbury, particularly Lake Sunapee.

### **Goal: Brooks, Ponds & Lakes**

Maintain or improve the water quality in all of the Town's surface water features. Ensure they continue to support recreational, visual, environmental, and other important values.

### **Recommendations: Brooks, Ponds & Lakes**

1. Newbury, along with the other communities in the Lake Sunapee Watershed, should continue to participate as part of the Sunapee Area Watershed Coalition's effort to develop a watershed management plan. This study, projected to be completed by the end of 2007, is funded through a NH Department of Environmental Services Pilot Grant. The purpose, in part, is to study the link between water quality and the increase in impervious surface coverage resulting from land use development.
2. Consider the feasibility of increasing the shoreline buffer width to the one hundred foot minimum to increase protection of surface waters in Newbury as recommended by the publication: "*Buffers for Wetlands and Surface Waters - A Guidebook for New Hampshire Municipalities, Revised May, 1997*".
3. The Zoning Ordinance should be amended to require that shoreline buffer zone ground covers and shrubs be left intact to the fullest extent practical.
4. Strengthen the Zoning Ordinance to decrease the nutrient loading into water bodies associated with the use of fertilizer.
5. Steps the town can take to ensure that development is not sited or constructed in a way that will lead to sedimentation of surface waters include:
  - A. strengthening the Town's zoning and subdivision regulations to ensure that proper care is taken to prevent erosion and sedimentation during and after construction when development occurs on moderate slopes (15%-25%), by requiring erosion/sedimentation control plans for these steeper areas. The Planning Board should consider incorporating the use of Low Impact Development (LID) techniques to reduce stormwater runoff and sedimentation into the Subdivision Regulations.

- B. adopting driveway regulations with standards to limit the grade of and control runoff from driveways that can themselves be a source of erosion problems; and
  - C. strengthening the Site Plan Review Regulations to ensure that larger construction projects, including those involving reuse or redevelopment of a site, do not generate erosion and sedimentation during or after construction.
- 6. Carefully study the potential impacts of centralized wastewater treatment and disposal, including the anticipated density and character of development that would result and the associated water quality impacts.
  - 7. Cooperate with the State's efforts to control pollution associated with boating.
  - 8. Cooperate with the State's efforts to eliminate the introduction and spread of nuisance species in lakes.
  - 9. The town and State should provide ongoing opportunities for those responsible for road construction and maintenance to learn about cost effective methods for reducing the amount of polluted runoff that enters surface water from roads, and sand and salt storage areas.
  - 10. The town should take the lead in promoting inter-municipal and inter-agency cooperation in protecting surface water resources, particularly Lake Sunapee, by hosting a Lake Day, where selectmen, planning boards, and conservation commissions from neighboring communities along with the lake protective associations gather to share ideas and thoughts on common issues and concerns relative to protecting the surface water resources.

## **FLOODPLAINS**

The 1986 Flood Insurance Rate Maps for Newbury identified the 100-year floodplain areas around the lakes and ponds and along Mountain Brook north of Doctors' Colony Pond, along the West Branch near the Bradford town line, south of Gillingham Pond, and in several areas along the tributaries to Lake Todd (Map VIII-8). These mapped floodplains cover only 215 acres, or less than 1% of the land area of Newbury. While these floodplain areas are the flatter areas along brooks predicted by the Federal Emergency Management Agency (FEMA) to flood an average of once every hundred years, important flood storage capacity is also provided by Newbury's lakes, ponds, and wetlands.

Floodplains fill an important need, as flood water must go somewhere, and can be very hazardous areas in which to locate development. Development in the floodplain can lead to property damage and risks to health and safety. Development in one area of the floodplain can also cause increased risks to other areas. If structures, or other impermeable surfaces such as paved parking areas, are located in the floodplain, flood levels will increase elsewhere and the limits of the floodplain areas are also likely to increase.

Federal flood insurance regulations do not require that a community prohibit development in the floodplain, only that structures be elevated or flood proofed. However, these minimal requirements do not take residents' safety or the incremental effects of floodplain development into account, only the insurability of the structures themselves.

Newbury's Zoning Ordinance currently exceeds the minimum federal requirements by prohibiting new development in the 100 year floodplain areas. The exception is the modification of existing non-conforming structures which require elevating or flood proofing if built in the floodplain.

**Issue: Floodplains**

1. FEMA's requirements for participation in the National Flood Insurance Program require periodic changes in local land use regulations.

**Goal: Floodplains**

Manage development of the 100-year floodplain to preclude the construction of buildings and the creation of impermeable surfaces in order that the floodplain can perform its function of passing and storing flood waters and so as not to adversely affect downstream property owners.

**Recommendations: Floodplains**

Continue to update Newbury's land use regulations as needed to meet FEMA's minimum requirements for participation in the National Flood Insurance Program.

**MAP VIII-8**  
**100 Year Floodplain**

## **WETLANDS**

Most wetland areas in Newbury are found in areas of poorly drained soils associated with ponds and brooks such as Blodgett Brook, Mountain Brook, Pine Brook, Ring Brook, and Gillingham Pond. Large wetland complexes are located in South Newbury and north of Chalk Pond. Newbury currently uses the state's definition of a wetland to define wetland boundaries. The wetlands shown on Map VIII-9 are wetlands identified by the National Wetland Inventory Maps. This map identifies about 275 acres of wetlands or about 1.1% of the total area of the town (1.2% of the total land area). They approximate the wetlands as defined by the state and Newbury's Zoning Ordinance. Wetland values include:

- storage of floodwaters,
- storage and adsorption of soluble nutrients that otherwise would contaminate downstream water bodies,
- discharge of water to water bodies during periods of low flow,
- groundwater recharge,
- filtration,
- habitat for many species that depend on wetlands for part or all of their life cycle, and
- recreational opportunities.

Wetlands are inappropriate areas for construction of buildings or septic systems or activities that involve alteration of the natural drainage patterns. Newbury's Zoning Ordinance reflects this in allowing only uses that do not involve structures, filling, or dredging.

### **Issues: Wetlands**

1. The town needs to monitor the effectiveness of the administration and enforcement of the Wetlands Conservation Overlay District.
2. The town should consider using Low Impact Development techniques adjacent to wetlands.

### **Goal: Wetlands**

Promote protection of wetlands that provide significant contributions to the purification of surface waters, habitat preservation, or flood control.

**MAP VIII-8**  
**Wetlands**

## **Recommendations: Wetlands**

1. The Planning Board should study and monitor the effectiveness of the administration and enforcement of the provisions of the Wetlands Conservation Overlay District, and, if needed, make recommendations to improve techniques to administer and enforce the provisions of the district.
2. Low Impact Development (LID) techniques should become part of the Subdivision Regulations to manage stormwater runoff adjacent to wetlands to assist in the process of filtering potential pollutants from the runoff.

## **GROUNDWATER RESOURCES**

Groundwater is water that is found in the ground in the pores of subsurface deposits. The term "aquifer" describes water-saturated earth materials from which a water supply can be obtained. There are three types of groundwater aquifers: stratified drift, till and bedrock. Stratified drift and till aquifers are composed of unconsolidated glacial deposits, while bedrock aquifers are fractures in solid rock. In stratified drift aquifers, the materials are sorted sand and gravel. In till aquifers, the materials are a gravel, sand, silt, and clay mixture. All water supply in Newbury is currently provided by individual wells drawing from one of these types of groundwater resources.

Stratified drift aquifers are generally capable of storing, transmitting and yielding the larger volumes of water needed for a public water supply. Through a cooperative effort of U.S. Geological Survey and N.H. Department of Environmental Services, stratified drift aquifers have been mapped for Newbury (Map VIII-10). These occur primarily in the southern areas of town. The largest area of high transmissivity is located in South Newbury from north of Route 103 to the southwest between South Road and Route 103. A large portion of this high potential future water supply between Emily Lane and the South Road-Morse Lane intersection is currently undeveloped.

Several land uses are associated with greater-than-average risk of groundwater contamination due to the activities and materials involved. Uses which are not appropriate in important aquifer areas include:

- Any principal use involving the production, sale, storage, or transportation of fuel oil, gasoline, or other regulated substances;

**MAP VIII-10**  
**Aquifers**

- Disposal, processing, or recycling of regulated substances;
- Car washes;
- Septage lagoons;
- Snow dumps;
- Solid waste facilities;
- Storage of road salt or other de-icing chemicals;
- Subsurface wastewater disposal systems other than domestic wastewater and groundwater remediation systems;
- Transportation terminals;
- Underground storage of fuel or other regulated substances; and
- Vehicle service and repair shops.

Other uses may or may not pose an undue risk depending on the control measures proposed and the degree of threat to water quality which would result if the control measures failed. Uses that warrant special consideration include:

- Cleaning services;
- Commercial agriculture and related activities;
- Excavations;
- Food processing facilities;
- General service and repair shops;
- Laboratories and professional offices;
- Manufacturing facilities;
- Metal working shops;
- Any use rendering impervious more than 20% of the lot area; and

- Any other use which involves regulated substances in quantities greater than those associated with normal household use.

Since all water supply in Newbury currently comes from private wells, all of the above uses need to be carefully planned and monitored to ensure contamination does not occur.

### **Issues: Groundwater Resources**

1. Newbury residents, visitors and businesses are dependent on groundwater both for a source of potable water and for dilution of contaminants in wastewater. Therefore, great care must be taken to prevent hazardous substances from entering the groundwater and to limit development density to a level that enables adequate dilution.
2. Chemicals used by homeowners and small businesses often end up in the hydrologic cycle due to the expense and impracticality of proper disposal.
3. Newbury does not currently have a centralized water system.
4. Road salt is a potential source of contamination of private wells and potential public water supply aquifers.

### **Goal: Groundwater Resources**

Protect the groundwater resources located in town to ensure that an adequate supply of clean drinking water is available to residents, visitors and businesses.

### **Recommendations: Groundwater Resources**

1. Newbury's Zoning Ordinance and Site Plan Review Regulations should be reviewed to ensure that existing and future private supply wells throughout town are protected from activities that are associated with hazardous substances. Local land use boards should closely scrutinize nonresidential land use proposals through Special Exception and Site Plan Review processes for potential adverse impacts on the groundwater.

The Planning Board recommends there be a study done in conjunction with the NH Department of Environmental Services of what groundwater resources for private wells should be protected in Newbury and how to protect those resources. The Planning Board encourages property owners to test existing wells for water quality and install treatment systems as needed.

2. When given the opportunity, Newbury should participate in regional hazardous waste collections to provide a practical, cost-effective means of disposal.
3. Since potential public supply well sites are limited in Newbury, consideration should be given to land banking a well site for future needs.
4. The town and State should provide ongoing opportunities for those responsible for winter road maintenance to learn about safe, cost-effective methods for reducing the use of road salt.

## CONSERVATION

Newbury has a substantial amount of land preserved through conservation easements or public ownership totaling 5,382 acres which accounts for about 22% of the total area of Newbury. Map VIII-11: Conserved and Public Lands and Trails shows the location of the lands in Newbury currently preserved through conservation easements or public ownership.

One of the important town owned lands that will provide not only recreational opportunities, but also significant open space is Fishersfield Park. Fishersfield Park, officially to open in 2008 will boast a collegiate sized soccer field, beach volleyball court, clay tennis court, paved basketball court, a bocce and horseshoes area and 100 acres of hiking trails, many of which wind around the historic stone walls, paddocks, and laneways of a 19<sup>th</sup> century New Hampshire sheep farm. Most trails loop away from and back to the picturesque picnic area surrounding the “fish” pond. This park is the culmination of tremendous vision for the town Of Newbury combining the true spirit of conservation, recreation, leisure and athletics. The project will live on as one of the jewels of our community combining the best parts of our heritage with the natural beauty and community spirit of volunteerism that is Newbury.

The community needs to understand and recognize the importance of open space and conserved land resources to the community if any additional conserved land resources are to be preserved for future generations of residents or visitors. The values or benefits imparted by conserved and open space lands include the following:

- enhance the rural and small-town character which has been identified as a desirable aspect of Newbury;
- provide scenic views that contribute to the quality of life in town and to a visitor’s aesthetic experience;
- encourage community pride and help maintain a balance between the natural world and the world of mankind;

**Map VIII-11**  
**Conserved and Public Lands and Trails Map**

- enhance and protect wildlife habitats; and
- ensure a positive fiscal impact on the town by enhancing property values and keeping property taxes down.

The current use program in New Hampshire provides property owners the benefit of reduced property taxes on open space lands, but does not ensure long-term protection of these valuable resources. The purchase of additional conservation easements which eliminate or reduce development rights or fee simple acquisition of significant open space lands affords ongoing, long-term protection for these important resources.

The town has prepared a Conservation Plan under the direction of the Conservation Commission with the assistance of a consultant, E. Ann Poole, MSc – Ecologist & Environmental Planner. This Conservation Plan builds on the Natural Resource Inventory initially completed by the Conservation Commission in 2001 and updated in 2007. The Commission undertook this two-year project to document the natural features of Newbury that should be protected and raise awareness that preserving these features is the key to retaining the rural character of the town. The Conservation Plan is the result of that project.

Specifically, objectives of the town-wide Conservation Plan were to:

- Analyze information regarding existing ecological conditions and land use in the town of Newbury and update the 2001 Natural Resources Inventory;
- Assess natural areas and potentially important ecologically-significant sites in town;
- Assist the Newbury Conservation Commission to identify and rank areas for conservation;
- Involve residents, as represented by the Newbury Conservation Commission and others, in developing alternative strategies for resource conservation; and,
- Prepare a strategic Conservation Plan for inclusion in the 2007 Master Plan that will inform and support conservation and land use planning, including specific recommendations for regulations if needed.

The Project was conducted in a series of five (5) phased stages:

Phase I. Data Gathering

Phase II. NRI Update

Phase III. Draft Conservation Plan

Phase IV. Outreach

Phase V. Final Conservation Plan

The Conservation Plan:

- Presents GIS-based information regarding existing ecological conditions and land use in the town of Newbury and updates the 2001 Natural Resources Inventory;

- Points out natural areas and potentially important ecologically-significant sites in town;
- Informs the Conservation Commission and others as to alternative strategies for resource conservation; and
- Provides guidance in the form of specific recommendations that will inform and support conservation and land use planning.

The Conservation Plan presents information and discusses the following:

- Land Cover;
- Land Use;
- Important Natural Features including promontories and scenic vistas, rare species, important natural areas, potential linkages & wildlife corridors;
- Threats including land use conversion & development, fragmentation, parcelization and biological pollution;
- Conservation Priorities including Northeast Newbury, Center Newbury, Sunapee Valley, Gillingham Plains and South Newbury Valley;
- Overview of Land Protection Tools & Techniques including large lot zoning, downzoning, transfer of development rights, cluster or open space development, mandatory open space set asides, sensitive environmental areas and regulatory options; and
- Recommendations.

A complete copy of the Conservation Plan can be found in Appendix B of this Master Plan.

The issues and recommendations from the Conservation Plan have been incorporated into those outlined at the end of this chapter.

### **Community Survey Results: Conservation**

Ninety percent of the respondents of the 1994 survey supported the town accepting the donation of land or conservation easements on property for conservation or recreational enjoyment of the people. In that same survey, 71% of those surveyed supported the use of property tax dollars to purchase property or easements for conservation purposes.

The 2006 Community survey asked people whether they would support the use of their tax dollars to purchase property or easements for conservation. Seventy-three percent said yes, fifteen percent said no and thirteen percent said they were uncertain.

Minimizing land conversion, fragmentation, and parcelization requires a combination of overlapping approaches:

- Land use planning and design;
- Land conservation; and,
- Wise management of both conservation land and developed land.

Issues and recommendations for each approach follow.

### **Issues: Land Use Planning & Design**

1. Land conversion, fragmentation, and parcelization result in permanent changes from which recovery is unlikely, if not impossible. Development will continue but the Town of Newbury can do a better job guiding how and where development occurs by implementing broader elements of natural resource-based community planning and design. In particular, the Town of Newbury could be more effective in meeting the communities' needs for improved natural resource management through informed and active use of the master planning process and rule-making authority.
2. The town Master Plan, currently being updated, will include a Natural Resources chapter. When completed, that chapter should identify community goals, uses, and funding for land preservation. These are critical components of a natural resource-based planning approach. The Master Plan should address where development should occur and what type of development is desired. Zoning and subdivision regulations then implement plan goals, including design elements that can reduce fragmentation. At the subdivision level, for instance, conservation subdivisions can help to conserve important natural areas and wildlife corridors (See Map 8). On the individual site level, design elements that adapt structures to the existing topography, limit the building "footprint" to the smallest necessary area of land, reduce impervious surfaces, and retain natural vegetation help to reduce fragmentation and support wildlife populations, while serving to protect water quality.

### **Issues: Land Conservation**

1. For most people, the need to conserve and protect the natural environment is not obvious. When an animal is seen, it is assumed that it and others are thriving. It is only after they stop seeing wildlife, that they realize that something is amiss.
2. For biodiversity, bigger is better. Relatively large areas of contiguous, unfragmented natural land with a diversity of habitat types – grassland, shrubland and forest – need to be maintained. Large areas of unfragmented land are necessary to ensure the protection of sensitive species. Isolated pockets of natural lands are of value to the community but, to maximize ecological value, it's important to connect blocks of unfragmented land wherever possible.
3. As population and development have increased in Newbury, the number of large blocks of open space has diminished. This has put wildlife and the natural environment at risk. In order to allow for more development and protect the environment, there needs to be thoughtful consideration about where the town can grow and where wildlife and the environment should get priority. A broad distribution of moderately-sized **natural areas**, in the 125 to 500 acre range, can support species that don't need

really large blocks of land in which to breed, and can support small populations of more localized sensitive species. Ideally, these smaller tracts should be as close as possible to any larger tracts, contain a diversity of habitat types, and be linked to other natural areas. Stream valleys and ridge tops often do “double duty” serving as both critical habitat and wildlife corridors. Riparian (streamside) corridors, for example, are used by almost 70 percent of all vertebrate species.

4. When the town has decided what areas need to be preserved, a plan of implementation needs to be developed. The plan is needed to guide development into areas not harmful to wildlife.
5. Currently 50% of the Land Use Change Tax penalty under the Current Use program goes to the Conservation Fund. As land costs increase and LUCT receipts decrease, a larger allocation towards the Conservation Fund will provide the Town a better opportunity to preserve some of the lost open space.

#### **Issues: Wise Land Management**

1. It is necessary to not only add land for conservation, but also to manage conservation lands and other properties to support key species. Whether natural lands are publicly or privately owned, management usually means making some decisions about what constitutes a “key” species. For instance, bird species that live in grassy or shrubby habitats, like the American woodcock, American bittern, and common grackle, have declined dramatically in the past thirty years as pastures and hayland have gone out of production.
2. There are many species that do not need large forests in which to live. For these species, such as woodpeckers, small mammals and some larger ones, even narrow undisturbed corridors can provide critical travel routes. As noted, often such corridors are located on ridge tops or along waterways. Permanent conservation of these small but important areas is ideal, but wise management by private landowners can also work. Streamside buffers of natural vegetation, and the use of natural landscaping in these areas instead of lawns, are important contributions that individual homeowners can make.
3. For owners of large forested properties, a forest stewardship plan can help them enhance their property’s value to wildlife while accommodating timber harvesting or other economic activities. If certain areas are to be protected in the long term, a conservation easement can be attached to the property and held by a land trust. Easement monitoring is important to ensure the terms of the easement are being upheld.

### **Goals: Conservation**

1. To promote the conservation, protection and sound management of natural resources in Newbury;
2. To preserve and enhance the ecological integrity of the Town's natural communities and wildlife habitats;
3. To sustain the scenic quality and visual character of the Town; to support landscaped-based recreational opportunities; and
4. To address non-indigenous, invasive nuisance species in an environmentally sensitive manner.

### **Recommendations: Land Use Planning & Design**

1. The Planning Board and the Conservation Commission should conduct a comprehensive environmental review and evaluation of the adequacy of existing ordinances, policies and regulations to conserve priority natural resources. The review should include: (1) resource conservation measures, (2) conservation subdivision techniques, (3) stormwater management practices, (4) waterbody and watercourse buffer requirements and building setbacks therefrom, (5) wildlife crossing and corridor requirements, and (6) performance based zoning practices.
2. The Planning Board should investigate the need for and consider adopting zoning regulations requiring developers to practice conservation subdivision design. Town zoning, subdivision and land use ordinances can provide flexible techniques to encourage appropriate economic growth with incentives for open space and resource protection. The Town of Norwich, Vermont, for example, has adopted a conservation subdivision planning and design ordinance for protecting corridors. The creative mix and use of compliance and incentive-based ordinances can provide the town with capacities to protect resources on a site-by-site basis and link through greenways to other conservation and recreation sites across the town.
3. The Conservation Commission should develop a habitat conservation checklist for application review. A checklist may increase adherence by applicants and planning boards to habitat-related objectives and design criteria.
4. The Planning Board and the Conservation Commission should adopt a policy requiring that at least one Conservation Commission member be present on all Planning Board site visits where there is proposed construction of structures, roads, or clearing of land on undeveloped land.

5. The Conservation Commission should review town-owned conservation and open space lands to ensure the appropriate deed restrictions were recorded to implement Town Meeting and town board votes.

### **Recommendations: Land Conservation**

1. The Conservation Commission working in concert with other outside organizations, such as SPNHF, Ausborn Sargent, LSPA, and SAWC, should educate landowners and the general public about the benefits of conservation.
2. The Conservation Commission should work to protect a few large tracts of natural land. Research shows that forest interior birds seem to require a minimum of 1500 acres, while 5000 acres or more is ideal. This may seem extreme but tracts this size may be possible to protect in the context of townwide or regional planning. By building partnerships and combining forces with other towns, state agencies, and conservation organizations, it may be possible to protect a large block in perpetuity.
3. The Conservation Commission should develop a prioritized list of important land areas to protect. Some should be selected to preserve critical habitat. Others should be selected to create a network of protected wildlife corridors along stream valleys and on ridge tops to connect blocks of unfragmented land. In addition to studying critical habitat, selection criteria can be developed by using mapped information regarding existing **important natural areas** (See Map 6), unfragmented land (See Map 4), and wildlife corridors (See Map 8) and how they relate to waterways, wetlands, ridge tops and other key areas. The width of wildlife corridors is subject to debate, but some studies have suggested that corridors must be at least 350 feet in width to maintain at least some “interior” (as opposed to “edge”) conditions.
4. The Conservation Commission should develop an implementation plan to protect the important land areas. Various techniques should be considered such as incentives to maintain open space, easement donation or purchase, land purchase, and land use regulations. Subdivision regulations can be used to guide development away from wildlife corridors.
5. The Conservation Commission should work toward achieving a 100% allocation of the land use change tax to the Conservation Fund.

### **Recommendations: Wise Land Management**

1. The Conservation Commission should encourage public and private owners to manage conservation lands to provide diverse habitat. To preserve some wildlife species, some conservation lands must be managed to create or maintain shrub and grasslands (clearing, mowing, burning, etc.). On the other hand, some forest species require extensive tracts of undisturbed forest. The need for a diversity of habitats further

underscores the value of conserving large parcels that can accommodate different landscapes.

2. The Conservation Commission should encourage non-conservation land owners to manage individual properties to provide diverse habitat. Private land owners should be encouraged to use economic incentives such as the Landowner Incentive Program (LIP) administered by NH Fish & Game, the Environmental Quality Incentives Program (EQIP) or Wildlife Habitat Incentives Program (WHIP) administered by the USDA Natural Resources Conservation Service, and enrolling in land in Current Use, to conserve soil, water, native grasses, and other native species.
3. Land owners should be encouraged to prepare Property Management Plans for land located in the Important Natural Areas or wildlife corridors. Those lands should be managed in such a manner as to protect ecologically-important features and functions.
4. Property-specific management plans should be developed for all conservation properties owned or otherwise managed by the Town of Newbury. The plans should identify goal(s) to be achieved, what is to be protected, and specify how it is to be maintained. Minimum-impact trails would be used to accommodate recreational, research-oriented, and educational outings. Activities such as haying, brush cutting, or timber removal would go forward only with the approval of the conservation commission. More specifically, these areas should have no permanent roads and, after cessation of activities temporary roads and clearings be converted to rugged, natural surface trails for hikers and/or horseback riding.

## **CULTURAL RESOURCES**

Cultural resources play an important role in the overall quality of life in Newbury. Cultural resources include such things as musical events at the Band Stand, volunteers on town boards, a town newsletter, Old Home Day and other cultural activities.

One of the issues identified early on in the process of updating the Master Plan was that Newbury needs to improve its sense of community. There are several factors which contribute to a feeling of disconnectedness. First of all, the lakes and topography of Newbury have created numerous small neighborhoods which are not easily interconnected and remain relatively isolated. Compounding the isolation created by the natural conditions, the town of Newbury is broken up into several telephone service areas. Additionally, with the closing of the Newbury Elementary School, the town no longer has that focal point for the community. Finally, the population fluctuations from season to season make it difficult to maintain a cohesive community.

In recent years, some strides have been made in the town developing a stronger sense of community and making Newbury Center more of a focal point for community services and facilities. Construction of the Safety Services Building in 1985, conversion of the former

Newbury Elementary School into use for the town Offices in 1989 and the subsequent addition in 2005, and expansion of the Library in 1998 has transformed Newbury Center into the governmental service center. Additionally, recreational improvements in Newbury Center such as the Caboose & Information Center in Bell Cove, acquisition of additional land and expansion of the town Beach, improvements to the town Docks, acquisition of the former and refurbished railroad station and acquisition of the Bald Sunapee and Camacho properties all contribute to making Newbury Center more of a focal point for the community. The sidewalk and related improvements planned for construction in 2010 will provide pedestrian circulation in Newbury Center that will connect these various governmental uses together. The efforts of the town Beautification Committee and the old Home Days event have further added to the sense of community.

### **Community Survey Results: Cultural Resources**

The 2006 Community Survey asked people to indicate which suggestions they would support to help foster an improved sense of community. Those responding to the survey indicated support for the following ideas:

- 62% A small periodic town Newsletter similar to the Bradford Bridge**
- 56% Cultural events like concerts or lectures**
- 49% Regular articles in newspapers**
- 42% Strategically located bulletin boards around Town**
- 40% Expanded use of town Website**
- 30% A parents and/or citizens organization to administer town athletic programs**
- 30% An outing club to plan and foster tourist and local community activities**
- 29% Periodic community information discussions on local current events sponsored by the town boards and community organizations**
- 28% Increased use of E-Mail communications**
- 17% More use of local cable for announcements**

The 2006 Community Survey inquired whether people would support the use of local property taxes to build a community center which would support activities and programs for a wide variety of community organizations serving all age groups. Forty-six percent indicated they would support that idea, 36% said they would not and 18% had no opinion.

### **Issues: Cultural Resources**

1. The town needs an up-to-date war memorial commemorating Newbury's veterans from past wars.
2. The town lacks a community center where a variety of activities for all age groups can take place.

**Goal: Cultural Resources**

Provide continued support for cultural resources and activities in the community to foster an improved sense of community and community spirit.

**Recommendations: Cultural Resources**

1. The town should provide an up-to-date war memorial commemorating Newbury's veterans from past wars by upgrading the Veterans Hall and the Veterans Memorial.
2. The town should consider either erecting a new structure or reusing an exiting one for use as a community center that could accommodate a wide variety of activities for all age groups.