

Natural, Historic and Cultural Resources

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1. Introduction

This chapter presents an inventory and assessment of natural, historic and cultural features that are found within the Town of Gray. Natural features include the town's topography, surface waters and associated watershed areas, wetlands, groundwater aquifers, soils, important wildlife habitat, and forest and agricultural resources. The discussion of natural features focuses on their interrelationship as a complete ecosystem within and around the town, as well as how existing and future land use development may affect the health of this natural system. The historic and cultural portion of the chapter presents a brief overview of the town's historic settlement patterns. This section also highlights some of the town's significant remaining historic buildings and sites and the importance of these resources as part of the community's character and quality of life. Seven maps have been produced to graphically illustrate the narrative information presented in this chapter.

2. Summary of Major Findings and Conclusions

- Water resources represent a shared regional resource. It will be important for Gray to work with its neighboring towns to insure that land use activities do not have adverse impacts within watersheds that cross municipal boundaries.
- Overall, the quality of Gray's surface waters are still very good. However, some areas of concern have been noted which point to a need for caution as greater portions of several watersheds within the town's are developed in the future. These include the upper watersheds of Collyer

Brook and the Pleasant River.

- Updated mapping of Gray's high yield groundwater aquifers by the Maine Geological Service has determined that the size of these aquifers is smaller in area than previously believed based on historic information. The town will need to re-evaluate its existing zoning regulations for these areas based on this new information. These aquifers are also the source of water for the municipal water system operated by the Gray Water District.
- Gray's municipal landfill, which was closed in the early 1990s, is located within the aquifer area. The town is in the process of developing a long-term monitoring program of this site to ensure that any potential impacts on area water quality are recognized.
- Based on a soil suitability analysis, much of the town's soils that are most suited for development have yet to be built upon. Development of these areas has been kept to a minimum due to limited road access as well as the decisions of landowners in those areas to use their property for other purposes. The areas where soils are most suitable for development also contain important natural resources and some of the town's largest remaining tracts of unfragmented wildlife habitat.
- Gray has approximately 1,600 acres of wetlands as defined by the U.S. Fish and Wildlife Service. However, not all of these wetlands are protected by the town's Shoreland Zoning regulations. There are also a number of streams which are not currently under the jurisdiction of these regulations.
- There are still a number of large tracts of land in Gray that remain unfragmented by roads and other development. These areas could represent a basis for future efforts to protect the town's important natural resources and wildlife habitat.

3. Topography

The topography of Gray refers to the shape of the surface of the land which is reflected in the hills and valleys across the town's landscape. This topography is defined by the change in elevation above sea level which is noted on Map 5-1 entitled Elevation and Slope. The map illustrates only major changes in elevation in Gray which are depicted by contour lines showing 100 foot changes in elevation within the town. The map also illustrates the slope of the terrain throughout the town. Slope is an indication of the steepness of the land's surface, such as on a hillside, which is based on the change in elevation versus the change in horizontal distance (also referred to as rise over run and represented as a percentage change on the map). The slope information is derived from county-wide soils mapping, prepared by the U.S.D.A. Soil Conservation Service, which assigns an average slope to each soil type. This generalized slope information is useful for town-wide planning purposes since it identifies areas that may be less suitable for various types of development due to the steepness of the terrain. Slopes in excess of 15% can place limitations on septic system installation

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and operation, add cost to the construction of buildings and roads, increase surface runoff, and can result in erosion from poorly managed construction sites.

The overall elevation change in Gray has a general west to east slope. Higher elevations, ranging from 500 to 600 feet, occur around Little Sebago Lake, and the lowest elevations, dropping below 100 feet, are found around the Royal River corridor. Little Sebago and Crystal Lake are flanked by ridge lines, running in a north-south direction, from Notched Pond to the Windham town line. The highest point in Gray, Adams Hill with an elevation 590 feet, is located near the southern end of this ridge to the east of Little Sebago Lake. There are a number of areas exhibiting steeper slopes, those with a grade above 15%, around the perimeter of the lake. However, slopes ranging between 8% and 15% can also be a concern when they are adjacent to a lake's shorefront due to the more rapid runoff of chemicals and eroded soil into the lake. Based on information presented in the Land Use Chapter of this plan the majority of these steeper slopes are still relatively undeveloped. However, this is likely to change in the future since the limited amount of developable shorefront property may foster more demand on the adjoining land areas where these steeper slopes are located.

The largest concentration of steeper slopes found in Gray are located along the Royal River and Collyer Brook corridors in the eastern corner of the town. As illustrated on the map the areas along Depot Road and Merrill Road exhibit a considerable degree of steepness, a good portion of which is estimated to be in excess of 25% slope. For the most part, development on these steeper areas has been confined to single family and duplex houses along existing road frontage with only one new subdivision road near lower Collyer Brook. There is also some agricultural land being cultivated in this area which needs to be monitored for potential runoff into stream corridors.

4. Water Resources

This section presents a summary of the town's surface waters, wetland areas, and groundwater resources. It also includes an overview of the existing water quality and potential threats to these resources.

4.1 Surface Water

The surface water resources in Gray are comprised of lakes and ponds, rivers and streams, and wetlands. Each of these water bodies is located within its own watershed area which are depicted on Map 5-2 entitled Surface Waters and Wetlands. A watershed represents the dividing line where rainfall and other surface runoff drain to the streams, rivers, or ponds contained within that boundary line. Watershed boundaries are delineated based on the hills and valleys of the town's topography, as well as man-made features such as roads, which also affect surface drainage patterns.

Gray is divided into three major watershed areas which include the Presumpscot River, the Royal River and the Piscataqua River. Within Gray, approximately 16,890 acres are contained in the Presumpscot watershed, 10,500 in the Royal River watershed and 2,085 in the Piscataqua River

watershed. All three drainage areas eventually empty into the Casco Bay Basin. These three major drainage areas are further divided into subwatershed areas that pertain to water bodies within the town. These subwatersheds are also illustrated on Map 5-2.

The three primary watersheds contained within the Presumpscot drainage are Little Sebago Lake, Pleasant River, and Forest Lake/Piscataqua River. The Little Sebago Lake watershed, which contains the town's largest of four great ponds, is approximately 6,100 acres in size, of which 1,300 acres represents the surface area of the lake. As illustrated on the map, there are a number of streams that contribute water to the lake. In fact, some of the lake's tributaries have watersheds that extend into the adjoining Town of Raymond. The northern headwaters of the lake are largely contained within the Morgan Meadow Wildlife Management Area (WMA) in Raymond, the outlet of which is Sucker Brook, which flows into the lake's upper basin. This WMA contains approximately 1,000 acres of conservation land which are managed by the Maine Department of Inland Fisheries & Wildlife (IF&W) as wildlife habitat and for various recreational activities.

Development within the Little Sebago watershed in Gray is comprised predominantly of single family housing, many of which are seasonal homes. The southern tip of the lake is located in the adjoining town of Windham where seasonal housing is also the dominant land use along the lake's shorefront. These houses, which rely on private septic systems for the treatment of wastewater, encompass almost the complete perimeter of the lake. Beyond this lake front development, land use within the watershed is predominantly forested with scattered fields and pockets of wetlands along the stream corridors. There are approximately 268 acres of wetlands, based on the National Wetland Inventory (NWI) mapping information, within the watershed.

The Pleasant River watershed contains approximately 10,600 acres in Gray. This drainage area represents the headwaters of the river system which flows into Windham where it eventually reaches its confluence with the Presumpscot River. As illustrated on Map 5-2 there are five subwatersheds in Gray that contribute to the Pleasant River drainage. These subwatersheds encompass a broad area of the town which results in a variety of land uses being represented within the entire watershed area. The eastern extent of the drainage area, which crosses the Maine Turnpike, includes high density development in the village area, as well as commercial development along the Portland Road and the West Gray Road. This portion of the watershed also contains the town's largest wetland area, Gray Meadow, which abuts the east side of the Portland Road. Development in the southern and western portions of the watershed is a combination of low-density residential development and agricultural operations. A significant portion of the watershed's western land area remains as undeveloped woodland and wetlands. There are a total of 852 wetland acres within this watershed.

The portion of the Royal River watershed located in Gray encompasses approximately 9,500 acres. This total includes the 220 acres of the Notched Pond subwatershed which drains into the Royal River at a location in the adjoining town of New Gloucester. The main branch of this river passes through the town for a relatively short distance in its eastern corner. However, the drainage area of its main tributaries extends along almost the entire length of the Gray and New Gloucester town line.

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The upper reaches of this drainage area, including the Libby Brook subwatershed, is fairly heavily developed with a mixture of land uses that involve the following: medium to high density residential, commercial and industrial facilities, agricultural operations, a golf course, gravel pits, and the State wildlife park and fish hatchery. The lower subwatersheds, including Collyer Brook and the river's main branch, is characterized by lower density residential development, agricultural uses, several large gravel pits, and a greater percentage of undeveloped land than the upper watershed area. The watershed has a total of 354 acres of NWI designated wetlands with a significant concentration along the Libby Brook corridor where it crosses the Spring Meadows Golf Course property.

The Crystal Lake watershed is a self-contained drainage basin with no outlet stream. The watershed contains a total 1,056 acres with the surface area of the lake accounting for 185 acres of the total. The lack of an outlet stream suggests that the lake may be more susceptible to pollution since there is less "flushing" action occurring. The watershed also has limited wetlands, only 33 acres, to help "treat" potential contaminants before they enter the lake. The lake frontage is completely developed with single family housing and a large subdivision that borders the northern tip of the lake. However, a significant portion of the watershed to the north and west still remains undeveloped.

The remaining watershed is the Forest Lake/Piscataqua River watershed located in the southern corner of the town. The watershed represents approximately 2,085 acres and the lake itself has a surface area of 212 acres. Only 79 acres of the lake are located in Gray with the remainder divided between the Towns of Windham and Cumberland. The outlet stream of the lake is the headwaters of the Piscataqua River which passes through Cumberland and other towns before reaching Casco Bay. The watershed is bisected by the Maine Turnpike and development, which is predominantly medium to high density residential in nature, is focused around the lake's frontage as well as along the Portland Road corridor. The watershed has approximately 118 acres of wetlands.

The protection of surface waters in Gray from a regulatory standpoint is done by means of the Shoreland Zoning regulations. These regulations establish buffer areas around the high water line of streams, rivers, lakes and ponds, which meet certain criteria established by the Maine Department of Inland Fisheries & Wildlife (IF&W). These zoning districts are illustrated on Map 4-2, Zoning Districts (in Chapter 4, Existing Land Use) as the Stream Protection and Limited Residential zoning districts. However, as the map illustrates, there are stream corridors in Gray which are not currently being protected under existing zoning regulations. Although these unregulated streams and ponds do not meet the minimum thresholds established by the state, they are an important part of the town's natural environmental system.

4.2 Groundwater

Groundwater is found below the surface of the ground in the soil and rock formations that make up Gray's surficial and bedrock geology. The amount of groundwater occurring at a given location depends on the characteristics of these soil and bedrock formations and their ability to store water, a characteristic referred to as porosity. Groundwater is the source for all water supplies in Gray,

providing water to private residential and non-residential wells within the community. It is also the source of the public water system, which provides water to the Gray Water District (GWD), from two wells located on Shaker Road, just north of the village area. These wells are approximately 100 feet deep and presently pumping between 150 and 225 gallons per minute. Prior to the installation of these wells in 1993, water was provided to the system from two springs located on the GWD property.

Groundwater occurring in sufficient quantities to yield useable amounts of water to a well is referred to as an aquifer. Although groundwater aquifers occur throughout Gray in various geologic formations, the amount of water available for public or private water supplies can vary considerably. While it may be possible to obtain a supply of water in most locations that is adequate to serve individual households or businesses, there are only a few areas where high yield aquifers exist. These areas are illustrated on Map 5-3 entitled High Yield Aquifers. The mapping of these aquifers, a geologic feature referred to as the Gray Delta, was completed by the Maine Geological Survey (MGS) in 1997. These significant aquifers are generally comprised of coarse grained sand and gravel material with the potential to yield 10 or more gallons-per-minute (gpm) to a well. As illustrated on Map 5-3 the boundaries of these aquifers do not necessarily coincide with the boundaries of the sand and gravel deposits. In some areas, a thin cover of favorable coarse-grained material may overlie fine-grained sediments, till, or bedrock. A well in that material would not be able to sustain a yield of 10 gpm, so the area was not mapped as an aquifer. In other areas, fine-grained sediments or till may overlie favorable coarse-grained sediments, in which case the MGS analysis may not have identified an aquifer that exists in a subsurface deposit of sand and gravel.

Map 5-3 also depicts the town's current Aquifer Overlay Zoning (AOZ) and Wellhead Protection Districts (WH1 and WH2) in relationship to the high yield aquifer mapped by the MGS. These zoning districts are one of the regulatory methods used by the town to protect the quality of the water supply contained in the aquifer. The delineation of these zoning districts was originally based on geological information that predates the more recent MGS study as well as other site specific studies conducted in the area. As the map illustrates there are differences between the two boundaries in a number of locations. A particular variation is evident north of the Gray Water District's well in the areas along Libby Brook, Hatchery Brook, and Mill Brook. These areas are included in the town's current aquifer/well protection districts, but were not found to be high yield aquifers based on the MGS study. These areas were originally included in the zoning district because they encompass the springs which had supplied the water district until 1993. However, these springs actually represent locations where groundwater is being *discharged* from the aquifer where the overlying sand and gravel deposit comes in contact with a layer of less permeable glaciomarine clay-silt. Therefore, based on the most recent mapping completed by the MGS certain areas previously included in the aquifer protection zoning districts are no longer believed to play a role in *recharging* the sand and gravel aquifer.

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In addition Map 5-3 shows that there is a difference between existing aquifer zoning and the boundaries of the high yield aquifer, as mapped by MGS, in other areas to the south and east of the Village area and in the vicinity of Little Sebago Lake. Although those areas included within the existing zoning district boundaries may include sand and gravel deposits, the MGS study has concluded that some of these areas have insufficient storage capacity or permeability to yield at least 10 gallons per minute to a well.

The western portion of the high yield aquifer, that underlies the village and areas to the west of the turnpike, represent some of the most densely developed portions of the town. Land uses in these areas consist of a mixture of high to medium density residential development, commercial and light industrial uses, schools, the State wildlife park, the town's public works facility and closed landfill, a golf course, gravel pits, and agricultural operations. The eastern portion of the aquifer has less of a variety of land uses, with residential being the most prominent. However, this area also contains a significant concentration of the town's larger gravels pit operations.

4.3 Wetlands

Wetlands represent the interface between the aquatic and terrestrial environments. Wetlands provide a variety of functions which include: helping to filter excess nutrients and contaminants from runoff before they enter surface waters; the temporary storage of flood waters; erosion control through the stabilization of river banks and other shoreland areas; and as habitat for a variety of water-dependent and upland species of animals.

Wetlands are defined based on a combination of plant species, soil types, and duration of flooding/saturation by water. For town-wide comprehensive planning purposes the source of information used to identify wetlands is based on the definition used in the National Wetlands Inventory (NWI). The NWI was produced during the mid-1980s by the U.S. Fish and Wildlife Service (USFWS) based on an analysis of aerial photography from that time period. This method of identifying wetlands allowed the USFWS to map wetlands for the entire country, but also made some types of wetlands more difficult to identify if they were obscured by tree cover. Therefore, certain types of wetlands, such as forested wetlands, may be under-represented in the NWI.

Map 5-2 illustrates NWI wetlands found in Gray. All wetlands in Gray are classified as Palustrine wetlands, which includes all non-tidal wetlands dominated by trees, shrubs, or emergent vegetation (associated with river and lake shore areas), which are traditionally referred to as swamps, marshes, and bogs. Certain wetlands have been designated as being of *medium or high value* by the Maine Department of Inland Fisheries and Wildlife (IF&W) and therefore are subjected to protection under the Shoreland Zoning regulations. Several of these wetlands are located in the greater Pleasant River watershed and include Gray Meadow, Allen Bog, and an unnamed wetland associated with the Thayer Brook corridor. Other large wetland systems protected under Shoreland Zoning are found in the Libby Brook subwatershed of the Royal River and the upper Little Sebago watershed (Refer to Map 4-2, Zoning Districts, for wetlands regulated under Shoreland Zoning in the Resource

Protection district). While these wetlands may be considered particularly important due to size and other factors, there are many other occurrences of smaller wetlands throughout the town, which are not protected, that also represent important elements within the community's natural environmental system.

Also illustrated on the Surface Waters Map are areas of poorly and very poorly drained soils. These soils are generally associated with wetlands, although the NWI mapping did not identify the existence of wetland vegetation based on aerial photo interpretation. However, it is likely that at least a portion of these soils are supporting the type of vegetation required to be designated as a true wetland. This would suggest that the amount of wetlands existing in Gray are under-reported and may need additional consideration from a regulatory and conservation standpoint. The total acreage of wetlands in Gray, based on the NWI data, is 1,640 acres while the amount of poorly and very poorly drained soils total 3,080 acres in size.

4.4 Water Quality and Potential Threats

The Maine Legislature, through the Department of Environmental Protection (DEP), has created a water quality classification system for all surface waters in Maine. Based on this classification system, the DEP has established "attainment goals," which is the minimum desirable water quality, for all water bodies.

There are four classifications in this system for rivers and streams and one classification for lakes and ponds. For rivers and streams the classes, from high to low are, AA, A, B, and C. The single classification for lakes and ponds is Great Ponds "A" (GPA). In reality, there are only slight differences between the allowed uses and qualities of the various classes. The classification is intended to be more of a hierarchy of risk rather than one of use or quality. Under this risk based approach the possibility of a breakdown in the ecosystem are rated based on loss of use due to either natural or human causes. Ecosystems that are more natural in their structure and function can be expected to be more resilient to stresses and recover more rapidly from those stresses. The DEP does periodic sampling of the state's water bodies and produces a bi-annual report on attainment levels. Sampling has been conducted in Gray by the Department over the past decade and some of the information reported here may be up to a decade old. The DEP also supplements its sampling program with data collected on lake quality by volunteers in the Lay Monitoring Program who do testing once or twice a month.

The attainment goal for streams in the Pleasant River watershed is Class B. With the exception of Thayer Brook, this river, as well as all its tributaries, meets that goal. Thayer Brook reportedly has reduced levels of dissolved oxygen which could degrade the environment for aquatic life. These reduced oxygen levels could be caused by runoff or erosion from adjoining farmland and other land uses within the watershed.

The Royal River has a water quality attainment goal of "A" which is due to contaminants identified

as being from the McKin hazardous waste site located on Yarmouth Road. All other tributaries of the Royal River, which include Collyer, Libby, Mill, Hatchery, and Cole Brooks, have water quality attainment levels of class B. Only Hatchery Brook is reportedly not in attainment due to the discharge of water from the state-operated fish hatchery. According to the DEP, although the state plans to install water treatment facilities at all of its hatchery operations a specific date for upgrading the Gray facility has not yet been determined.

Little Sebago Lake is presently not in attainment of the state's GPA goal for all great ponds. This is attributed to lower levels of dissolved oxygen at certain locations in the lake, as well as the amount of shorefront development, which poses a continuing threat to the ecosystem. Forest Lake is in attainment, even though the DEP lists it as "threatened" based on the amount of development around the lake and the potential for negative impacts on water quality in the future. Crystal Lake is also in attainment of the GPA classification and is not listed as threatened, although land use development levels are equivalent to those found at Forest Lake. Notched Pond is also in attainment and not considered to be threatened at this time.

Potential threats to surface water quality are classified as either point sources or non-point sources of pollution. Point sources are those that can be identified as coming from a specific location, such as a discharge from an outfall pipe. The only known point source of pollution in Gray is the fish hatchery which the state does plan to address in the future.

Non-point sources (NPS) come from more generalized locations such as nutrients from failed septic systems, contaminant runoff from buildings, parking lots, lawns, agricultural uses, and road salt, as well as erosion and sedimentation from improper construction or other activities that alter the surface of the land. Some of these potential threats were discussed earlier in this chapter which described the general land use patterns in each of the town's watershed areas. More detailed land use information can be found on Map 4-1 in Chapter 4. As a watershed becomes more developed with impervious materials there is a greater possibility for degradation of water quality due to NPS runoff.

Potential threats to groundwater quality includes those mentioned above with some additional considerations. Groundwater is primarily replenished by rainwater as it percolates through the surficial material down to the water table. Therefore, the creation of impervious surfaces can reduce recharge resulting in a decrease in the amount of water available. Gray currently addresses this issue, for its high yield aquifer, by means of its Aquifer Overlay Zoning district which regulates the amount of impervious material permitted while also requiring a larger minimum lot size.

Groundwater also has the potential to be negatively impacted through the removal of the aquifer's overburden by gravel extraction operations. Although the excavation process itself may not affect the aquifer it does reduce the filtering capabilities of the soil, and could increase evaporation and water temperatures if the excavation goes below the water table. There are a number of gravel pits located in the town's high yield aquifers, as illustrated on the Existing Land Use Map in Chapter 4.

Other threats to groundwater are posed by underground sources of pollution such as unprotected storage tanks for petroleum products, the burying of waste, or the seeping of contaminants into the water table from improper disposal. There are two sites in Gray which are of concern with regard to groundwater contamination. These include the old town landfill, located on the Shaker Road, and the McKin Site, on Mayall Road. The landfill was operated as an unlined facility from which contaminants were able to seep into the groundwater. The facility was closed with a synthetic cover in 1992 and various site investigations and monitoring activities were conducted subsequent to that closure. Water sampling conducted in 1994 found that tetrachloroethylene (PCE), a volatile organic compound (VOC), was present in detectable concentrations but not at sufficient levels to be included as a U.S. Environmental Protection Agency (EPA) Superfund Site. Another study was conducted under the auspices of the Maine DEP in an effort to model the potential impacts that pumping of the Gray Water District's wells might have on inducing contaminants into the water supply.¹ This modeling indicated that if the pumping rate remained below 500 gallons per minute (gpm) it would reduce the potential for contamination. The town is currently in the process of implementing a post-closure monitoring program of the landfill over the next 25 years as required by the DEP.

The McKin Site, located on Mayall Road, was used for the improper disposal of industrial solvents and other hazardous chemicals, during the 1980s. PCE was found to have migrated off the site into the groundwater which resulted in the facility being designated an EPA Superfund Site. Municipal water lines were extended into the area to service residences with affected wells and all future development is required to connect to the municipal water system. The EPA monitored the site for a period of time but determined that contamination levels had been reduced to a level that made continuous monitoring unwarranted. According to DEP records, PCE has been detected in the Royal River, but no sampling has been conducted recently. Contamination levels were not considered to be a further health threat.

5. Soils

The soils in Gray have certain characteristics that have been shaped over a long period of time due to the region's topography, climate, and the effects of living organisms acting on the soil. These soil characteristics make them more or less suited for various types of development or conservation activities. Soils have been mapped for Gray by the U.S. Soil Conservation Service (SCS) at a level of detail that is well suited for planning purposes at the town-wide level of analysis. The SCS mapping system groups soil characteristics into categories that are useful for evaluating, among other things, future development potential within Gray.

There are a number of ways in which soils characteristics can be evaluated to assess their development potential. One of the most common approaches involves determining the soil's

¹*Additional Evaluations, Gray Landfill, Gray, Maine*, by Robert Gerber, Inc. for the Maine Department of Environmental Protection, September 1995.

potential to accommodate on-site septic systems for the treatment and disposal of wastewater. This method is appropriate for Gray because of the lack of a municipal sewage treatment system. Another useful factors to consider is the potential for increased construction costs of homes and other structures due to soil characteristics. Some of the factors that increase development costs include soils that are shallow to bedrock, steep slopes, floodplains and high water tables. In addition, if appropriate construction and maintenance methods are not used in such locations, negative impacts on adjoining properties and the natural environment can occur.

The SCS has created a rating system for soils, based on these considerations, that has been used to evaluate the suitability of soils in Gray to accommodate future development. The three primary factors used to create this “development suitability index” are the ability to install septic system leach fields, construct dwellings with basements, and construct subdivision roads. The results of this rating system do not imply that particular areas of town *can not* be developed, but that certain areas may be more appropriate for development based on cost and potential negative impacts over the long-term.

Map 5-4, entitled Soil Suitability for Development, illustrates the SCS ranking for the soils in Gray. The scale ranges from very high to very low suitability for development. Some of the areas least suitable for development are concentrated around the Collyer Brook and Royal River corridors. Others are found along Libby Brook and the Pleasant River. The primary limitations in these areas are poorly drained soils, floodplains, and steeper slopes.

From an overall perspective, based on this rating system, much of the existing development in Gray has occurred on soils that have a medium to low suitability for development. Conversely, much of the town’s soils most suited for development are still undeveloped. These areas are located to the west of Little Sebago Lake, between Campbell Shore Road and Notched Pond, on Yarmouth Road to the east of the village, and between Yarmouth Road and the Maine Turnpike along the Cumberland/North Yarmouth town line.

6. Wildlife

The Town of Gray and neighboring communities are part of a region that is home to a variety of wildlife species. To a great extent, the management of these wildlife populations are conducted by State’s Department of Inland Fisheries & Wildlife (IF&W), although municipal involvement in this process also occurs through various regulatory and non-regulatory activities. For the purpose of wildlife management, the IF&W has divided the state into 30 Wildlife Management Districts. Gray is included in WMD 21 which extends from Biddeford to the south, Lewiston to the north, and Naples to the west. To the west, the district is bounded by Interstate 95 and does not include any coastal communities. The predominant forest types in this region include stands of northern hardwood, pine-hemlock-hardwood, and oak-hickory. Wildlife species include larger game animals such as moose and deer, smaller fur bearers such as beaver, fox, and coyote, upland game birds such as wild turkey, various wading birds and waterfowl, as well as non-game species of song birds,

reptiles and amphibians. Although all of these species are not managed by the state they do fill important niches within the ecosystem of which Gray is a part.

The IF&W is in the midst of a major planning effort that will eventually result in new or revised management goals and objectives for more than 70 species and groups of species, from box turtles to black bear and moose to mayflies. The Department's Fish and Wildlife Advisory Council endorsed goals and objectives developed by the working groups for deer, bear, moose, wild turkey, least tern, piping plover, and migratory shorebirds. These goals and objectives will, in part, address the following areas.

- Provide increased hunting and viewing opportunity for deer, while preventing over-browsing of deer wintering habitat in northern, western, and eastern Maine;
- Balance the desire for deer hunting and viewing opportunity in central, southern, and coastal Maine with the need to reduce negative impacts of deer, such as browsing damage, collisions with motor vehicles, and the potential risk of Lyme disease;
- Provide increased hunting and viewing opportunities for moose, while maintaining the availability of mature bulls;
- Address concerns for moose/vehicle collisions in some parts of the state;
- Increase the size and distribution of the wild turkey population within all suitable habitat in Maine, and provide additional spring hunting opportunities, as well as a limited fall season in the future; and
- Increase the least tern and piping plover (both Endangered) populations, and the number and quality of nesting sites in Maine.

Management goals and objectives for 113 species of passerines (songbirds), Atlantic puffin, razorbill, harlequin duck, common eider, Tomah mayfly, and Clayton's copper butterfly are pending endorsement. In the next few years the Department will convene additional working groups to address woodcock, ruffed grouse, snowshoe hare, waterfowl, island nesting terns, rails, fisher, marten, and several species dependent on vernal pools (seasonal, fishless habitats) as breeding habitats.

One approach used by the IF&W to manage wildlife populations is through a permit system for hunting and fishing. However, a broader approach to wildlife management which is now more commonly accepted is the preservation of a variety of habitat types that are necessary to support healthy populations of all native species. The IF&W, as well as other public agencies and private conservation groups, have assembled inventories of important habitat types that can function as more of a *complete system* as opposed to smaller, fragmented pieces of habitat.

Map 5-5 presents important wildlife habitat information that has been identified in Gray by IF&W and the U.S. Fish and Wildlife Service (USFWS). Some of these habitat areas, such as streams, ponds, and wetlands, have been discussed to some degree previously in this chapter. However, this map illustrates how those resources are integrated within the town's larger ecosystem.

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Riparian Habitat - Highlighted on the map are the corridors abutting rivers and streams which are referred to as riparian areas. These buffers encompass 150 feet around streams (75 feet on either side) and 500 feet around the Royal and Pleasant Rivers (250 feet on either side). These setbacks are the minimum prescribed by Shoreland Zoning regulations although not all streams in Gray are currently protected by these regulations. This type of habitat is important for many species and the corridors formed by these buffers can also serve as travel corridors for animals and provide “linkages” between patches of habitat that are otherwise separated by development. However, the 150 foot buffer around streams is generally considered to be an insufficient width, by wildlife biologists, for use by larger mammals.

Waterfowl/Wading Bird Habitat - These areas, identified by IF&W, are comprised of freshwater wetlands and surface waters of small ponds. This habitat provides nesting/feeding/roosting areas for ducks, herons and other wading birds and song birds, as well as various aquatic species. The adjacent upland areas are also used by other species as well.

Priority Trust Species Habitat - As part of its program to protect and restore the Gulf of Maine watershed, the USFWS has mapped habitats which are important for 64 species of birds, mammals, fish, plants, invertebrates, and reptiles that regularly inhabit this region. These species must meet one of the following criteria: be federally threatened or endangered; be identified as threatened or endangered by two of the three states in the Gulf of Maine watershed; or be a species which has a significantly declining population nationwide. The important habitats for these species, as illustrated on the map, includes freshwater wetlands, forested wetlands and upland forest areas. It also includes areas identified as grasslands, which in Gray’s case, includes many of the areas cultivated for agricultural purposes.

Deer Wintering Areas - As the name implies, deer wintering areas (DWA) are used by these animals as a protected refuge through the harsh winter months. A DWA is defined as a forested area used by deer when snow depth in the open/hardwoods exceeds 12 inches, when the deer are prone to sink in more than 8 inches, and the mean daily temperatures are below 32 degrees. As illustrated on Map 5-5, there are several DWAs scattered throughout the town with a particularly large area centered around the Ramsdell Road/Thayer Brook area. The boundaries of these DWAs have not been recently verified by IF&W, but land use development patterns indicate the largest wintering area is still primarily intact.

Rare, Threatened and Endangered Species - The IF&W also tracks the occurrence and status of animal and plant species that are rare, threatened, or endangered within the state. Two species have been observed in Gray: the Eastern Box Turtle (endangered) and the New England Cottontail (species of special concern). The map illustrates the approximate location where these species were observed along with a generalized buffer for habitat protection, which would need to be field verified. Two sitings are listed for the Cottontail and one for the Turtle.

Unfragmented Habitat Blocks - This final category of important habitat addresses the concept

discussed previously in this chapter which noted that the fragmentation of habitat into tracts of smaller sizes tends to diminish the potential for those areas to support viable wildlife populations. Map 5-5 illustrates larger tracts of land in Gray, as delineated by IF&W, that have not been bisected by roads or other types of development. A 1,000 foot buffer has been created around roadways (500 feet on either side) to delineate these unfragmented habitat blocks. *It should also be noted that in many instances, the blocks located along the town's border extend into adjoining communities, making them larger than they appear on this map.* This multi-town aspect of these blocks is a particularly important feature and one of the reasons that IF&W is promoting a regional approach to habitat management and protection.

Overlaying other important habitat areas onto these unfragmented blocks, as shown on the map, provides a useful perspective for identifying opportunities for future conservation efforts, as well as where important habitat is being encroached on by development. A review of these unfragmented blocks reveals that in many locations throughout the town, development has begun to “nibble away” around the edges. Eventually, some of these areas will be bisected completely by new roads which will significantly reduce their value as wildlife habitats.

7. Forest and Agricultural Resources

A considerable portion of Gray's land area is forested. Analysis conducted as part of the Existing Land Use Chapter, revealed that over 17,000 acres in Gray are still undeveloped. Aerial photography and other data sources show that the vast majority of this undeveloped land is wooded, which represents approximately 60% of the town's land area.

A portion of this forested acreage is being managed for timber products. According to the town's assessment records there are 60 parcels, owned by 34 property owners, that are enrolled in the Tree Growth program. Three additional properties, located in the Depot Road area, are owned and managed by the State of Maine as conservation areas. These parcels are illustrated on Map 5-6. The Tree Growth program allows properties to be assessed for tax purposes at a reduced level in exchange for managing the land for its timber resources. The total acreage of the affected parcels is approximately 3,200 acres, although not all of this acreage is enrolled in the program. According to assessment records, approximately 19% are managed for hardwoods, 21% for softwoods, and 60% for mixed stands.

Map 5-6 also illustrates the location of parcels currently used for agricultural purposes. These properties were identified based on assessment records and a review of aerial photography. Agricultural parcels includes properties that are used for crops, hay, and other growing stock, as well as dairy farms, livestock, or equestrian related uses. It is expected that there are additional properties involved in agricultural activities in Gray that could not be identified from the information sources noted above.

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Blank Page Map 5-6 - Agricultural Resources

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The map also identifies the soils in Gray that are considered prime agricultural soils. Prime farmland soil, as defined by the U.S. Department of Agriculture, is soil that is best suited for producing food, feed, forage and fiber, and oil seed crops. It has the soil quality, growing season, and moisture supply needed to produce a sustained high yield of crops while using acceptable farming methods. In other words, prime farmland produces the highest yields while requiring minimal amounts of energy and economic resources, and farming it results in the least damage to the environment.

There are three categories of prime farmland shown on the map. One is considered to be prime without any supplemental actions, while the other two require either additional irrigation or drainage to be considered prime. Some of the town's existing farms are located on the prime soils although most of these include the type of soil that requires additional irrigation. A good percentage of the town's total prime soil acreage has been developed for other types of land uses. However, some sizeable sites are still undeveloped.

8. Historic and Cultural Resources

Gray has a long and rich history as a community which is still evident in many of its remaining buildings, sites and landscapes. The town was originally part of the Province of Massachusetts Bay and was incorporated in 1778. Since that time the town has experienced a great many changes which have contributed to the historical fabric of the community, but which have also resulted in the loss of many unique structures and other artifacts.

In the typical fashion of a New England town, Gray's land use pattern evolved with various village, neighborhood, and industrial settlement areas that were surrounded by agricultural and other land based activities. These original settlement areas, as noted in the previous Comprehensive Plan, include Gray Village, Dry Mills, West Gray, East Gray, North Gray, and South Gray.

Gray Village has been the center of commercial and civic activities since the town's inception. Due to its location at the intersection of six major roads the Village has attracted trade and been the conduit for goods shipped from other centers of commercial and industrial activity. This trade hub status was also supported by the existence of the Portland-Lewiston Interurban Line, which was an electric train system that operated with stops in Gray until 1933. The remnants of the right-of-way used by this rail line are still visible on the town's tax maps, south of the Village, paralleling the Portland Road. The Village contains the town's largest concentration of remaining historic structures, although many have reportedly been lost over time to fire and redevelopment activities. Some of the most prominent existing historic structures include the following.

- Old Town Hall/Fire Station
- Old Daniel Hall store (1836)
- Large Hall building (1905)
- Smaller wooden building once the pharmacy of R.G. Hall (c.1800s)

- Stimpson Memorial Hall (1900): Included on the National Register of Historic Places
- Old primary school (1902): Now School District Superintendent's Office
- Old Hancock School: Now Gray Public Library
- Pennell Institute (1876): The first building was used as a high school until 1962. The first floor of this building is now used by the School District's Continuing Education program and the second floor is occupied by the Gray Historical Society. The building is listed on the National Register of Historic Places.
- Newbegin Gym (1937): Located on the Pennell Institute campus this building is now used by the Gray Department of Parks and Recreation.
- The "Laboratory": A smaller building on the Pennell campus that is now vacant
- Gray Baptist Church (1830)
- Civil War Monument (dedicated 1911)
- Gray Village Cemetery: Site of a stone commemorating the "Stranger," an unknown confederate soldier who died in 1862
- Congregational Church (1901): Replaced the original church built in 1829.

The Dry Mills settlement area is located around Crystal Lake which was historically referred to as Dry Pond. Around the turn of the 19th Century this area was the location of saw mills and grist mills that were the main industry for the town at that time. During the 1880s commercial charcoal was also produced at kilns in the area. Beginning in the early 1900s the first summer cottages were built around the lake which eventually came to encompass its entire shorefront area. The two most significant structures in Dry Mills are the Dry Mills Store and the Dry Mills School. The school was moved to a new location on Weymouth Road in 1989, where it underwent renovations. The school building is included in the National Register of Historic Places. The Gray Historical Society would also like to move the store to the same area.

East Gray, centered around the intersection of Mayall and Depot Roads, was a thriving area for farming and lumbering between 1880 and 1950. The Maine Central Railroad operated a depot in this area which was used to transport agricultural and lumber products to market. A large brick kiln also operated in this area which produced the bricks used to construct the Pennell Institute and the Hancock Building in Gray. This area began to decline in the 1950s when the railroad closed its depot. Remaining structures of note in East Gray are the Parson Perley House constructed in 1796 and the Reverend Nathan Merrill house, circa 1766, which was the first framed house built in Gray.

The South Gray settlement area was a section of town which was developed primarily as a result of its proximity along roadways that provided access between Gray and Portland. Along Portland, Dutton Hill, and Longhill Roads, several taverns were in operation during the 1800s. Four schools also operated in this section of town of which three still exist and have been converted into residences. A number of the other early homes along these roads are also still in existence today.

West Gray was another active manufacturing area during the 1800s consisting of several small businesses. Robert Allen operated a store there beginning in 1843 and also offered services that

included tailoring, shoemaking, blacksmithing, milling and manufacturing of barrel parts. For a time, fine carriages and sleighs were also manufactured in West Gray.

The final original settlement area of North Gray was centered around the intersection of the Lewiston and Mayall Roads. This part of town also had a number of mills for lumber and grain beginning as early as 1760. There was also a pottery making operation, blacksmith shop and general store. Perhaps most significant to this area was the Mayall Woolen Mill which started operation in 1791. This mill is reported to be the first machine-powered woolen mill in the country. It was operated until 1905 when it apparently became uneconomical to continue its use at this location due to transportation limitations.

This brief summary of the town’s historic settlement patterns, which is based on information compiled by the Gray Historical Society (GHS), provides a glimpse of various land use initiatives that still influence development activities within the community today. The Historical Society, which is located in the Pennell Institute building, has also gathered many artifacts from the town’s past which are displayed at various times in their offices. The Society recently received a New Century Community Program Grant, from the Maine Historic Preservation Commission, which was used to organize and archive its inventory of historic records. The GHS is also in the process of developing a more detailed inventory of historically significant structures and sites in order to fully document these community resources. Table 5-1 lists some of the most important historic resources that have been identified as part of this on-going inventory. The dates identified in the inventory are based on local records as well as assistance provided by Earle Shettleworth, Jr. of the Maine Historic Preservation Commission who was instrumental in identifying the architectural styles of the various structures.

The list includes 70 historic buildings/structures and 11 historic sites which are notable because of their era of construction, historic interest, and/or as examples of architectural styles. The list divides the structures and sites by location, type of structure, and period of construction. Many of these resources are concentrated in Gray Village, as noted in the table, but an even larger number are dispersed throughout the remainder of the community. The location of these historic resources, by reference number, are illustrated on Map 5-7. Also noted on the map are the locations of two potential historic districts, the significance of which are discussed below, based on preliminary assessments completed by the GHS.

Table 5-1
Inventory of Historic Buildings and Sites
Gray, Maine - 2002

Gray Center

- 1. Old firehouse, Town Hall and Office, 1835.**
Also was the location of the Gray Bank, est. by Samuel Mayall II.

- 2. Pennell Institute, 1876, and Pennell Lab. Bldg.,** gifts of Henry Pennell. Lab was the science laboratory and manul arts shop, was occupied for many years by the Gray News, and is now empty.

3. Newbegin Gymnasium at Pennell, gift of George Newbegin, 1937.
 4. **Stimson Memorial Hall, gift of the family of Theopholis Stimson, 1900.**
 5. Congregational Church, 1900.
 6. Former Hancock School, gift of James T. Hancock, 1930. Stick style trim. Became Gray Public Library. Addition, 1989.
 7. Primary School, 1902. Stick style trim. Now S.A.D. 15 office.
 8. Baptist Church, built in 1830 by the Universalist Society. Now houses antique business.
 9. Old Congregational Parsonage, Greek Revival, 1840's. Across from former P.O. on Shaker Rd.
 10. John T. Merrill House, mansard roof, 1870's. Now, home of Rear Admiral Willard Sweetser.
 11. "Clark's block" includes several buildings, late 1700's-1800's. Main St., west side.
 12. 14 Main St., Henry Pennell house, 1876. Was maternity hospital for Dr. Beck's patients.
 13. 18 Main St., 1876. Perley Sawyer home from c. 1915. Home of Margaret Sawyer.
 14. Douglass house, mansard roof, 1876.
 15. Currently Mae Beck home, brick early Greek Revival, 1832.
 16. Charles Pennell house, 32 Main St., c. 1803-1808.
 17. Colley Farm/Webb, 1700's. Still occupied by Colley descendents.
 18. Mayall/Snow House, 1830's Federal.
 19. Morrill house, 1830's Federal. Now home of Evelyn Morrill Durgin.
 20. Colonial Inn, 1832. Greek Revival. Now apartments.
 21. Old Alms House, built by Theopholous Stimson. Brick, 1830's. Now rear of property occupied by ladder company.
 22. Original Baptist Parsonage, 1840's.
 23. 9 Brown St., now Helen Davis' home, built late 1800's.
- Beyond Gray Center**
24. William Merrill House, now home of Dr. Beebe and family. Brick Federal style on north side of Shaker Rd. Early 1800's.
 25. Fogg House, Cape Cod style, on Lewiston Rd. across from Cole Farms 1700's.
 26. Weeks' House. Currently Stansfield home, built 1700's.
 27. Small (currently red) Cape Cod style house on north side of Yarmouth Road, said to be built in 1760's. Bay window added.
 28. 1776 farmhouse, was Jim Gillies' home, Yarmouth Rd. Sold c. 1999.
 29. Pastor Samuel Perley's Federal style home, late 1700's. Old stenciling inside. Yarmouth Rd., south side.
 30. Cyphus Perley/Dr. Gates' house, c. 1800's. Yarmouth Rd., north side.
 31. Goff House, brick Italianate, near corner of Mayall and Depot Rds., same builder as Pennell Institute. 1870's.
 32. George Perley House, c. 1830's. Was Town Farm from 1879 to 1942, now a B&B.
 33. Nathan Merrill House, Mayall Rd., 1766, considered Gray's earliest house still in existence.
 34. Greek Revival cape on Long Hill Rd., mid 1800's. Bay window on side a late addition.
 35. Hillcrest Farm, brick Federal, c. 1834. East side of Portland Rd., first house south of Long Hill Rd. Among owners: E. Cobb (1871), Charles Hill, and now, Donald Morse. Similar to #36.
 36. Webster House, east side of Portland Rd., brick Federal, was an early tavern, built 1810-20. Current owners, the Cellers.
 37. Farwell House, Portland Rd., Capt style, possibly latter 1700's.
 38. Hunt/Wood House, Hunt's Hill, 1797.
 39. Mayall/Snow House, 1830's Federal.
 40. Jedediah Libby farmhouse, east side of Old Portland Rd., now Center Rd. Built in 1874 with Greek Revival details on site of earlier home of Royal T. Nash.
 41. Cobb/Walter Gothic Revival house, Dutton Hill Rd., late 1800's.
 42. Qinnegan Lodge, on Quinnegan Rd., Cape style, 1700's.
 43. House on corner of Rte. 202 and Totten Rd., currently Clark house, mid 1800's.
 44. Bob Niss cape style on north side of Rte. 202, 1750-1800. Bay window is a late addition.
 45. Libby House on north side of Rte. 202, rural Federal, c. 1790's-early 1800's. Currently painted red.
 46. Greek Revival house, latter 1800's. South side of Rte. 202.
 47. Freeman farm on Rte. 202, built 1797. North side of Rte. 202.
 48. John Huston home, across from #46, 1800-1849. Late addition bay.

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49. Mansard-roofed home, south side of Rte. 202 near town line. 1870's.
50. Boarding house for Mayall Mills workers in 1800's, built by W. Beebe.
51. Orin Whitney farm on west side of Portland Rd., 1800's. Previous owner, Wilbur Hill.
52. "Old Cook House", Patience Karlson home on east side of Portland Rd. south of Whitney Rd., a Cape Cod with pin construction and hewn beams, which date it to before 1825.
53. Interurban Railroad Station, served 1914-1933, on Yarmouth Rd. Now a private home, with addition.
54. **Dry Mills Schoolhouse, 1858, moved in 1898 to Game Farm Rd. Restored and ready for visitors.**
55. Eddie Morse/R.&E. Wink house, Depot Rd., early 1800's.
56. Wood house, 1800's, Ramsdell Rd.
57. Ida Whitney house, 1800's, Ramsdell Rd.
58. W. Whitney house, 1820's, Totten Rd.
59. Lund house, 1800's, Route 202.
60. Currently Geo. Pulkkinen farmhouse, 1800's, 903 Center Rd.
61. Home at mast yard site, 1800's on Hunt's Hill Rd. below Center Rd. intersection.
62. Shaw house, 1800's, 24 Cambell Shore Rd.
63. Hubert Cobb house (was a Shaw house), 1830's. 66 Cambell Shore Rd.
64. Cape Cod style farmhouse, 1800's Cambell Shore Rd.
65. Weathered clapboard house, 1800's Cambell Shore Rd.
66. Gerald & Audrey Burns house, 1800's, Mtn. View Rd.
67. Cape Cod style house, 1800's, corner Mtn. View and Elder Cemetery Roads.
68. Former S. Sawyer farmhouse, 1800's, Center Rd. near Frost Rd.
69. George T. Merrill Farm, est. mid-1800's.
70. Noyes/Skillings house, latter 1700's-1800's. (Property deed, lot #51, 1784. 1822 deed cites buildings on it.) Cambell Shore Rd.

Historic Sites

71. Indian Kettle.
72. Site of Gray Fair and racetrack, 1884-1902.
73. Site of old corn cannery.
74. Site of King's Mast Yard on Pleasant River, est. 1762 by Moses Twitchell.
75. Probable site of old blockhouse, 1700's.
76. Site of Mayall Woolen Mills, est. by 1791 on Collyer's Brook
77. Original site of Dry Mills Schoolhouse, built 1858, moved to site on Game Farm Road. See #54
78. Gray Cemetery/Grave of unknown Confederate soldier (Ave. H). Listed on National Heritage Trail.
79. Elder Cemetery
80. Site of old Dry Mills Post Office, once known as "the smallest post office in Maine". P.O. building to be moved to site beside #54.
81. Site (since Dec. 1997) of 1917 Civil War soldiers' monument

Note: Buildings highlighted in **bold text** denotes buildings on the National Register of Historic Places
Source: Gray Historical Society

The preservation of Gray's historic and cultural buildings and sites is an important part of enhancing the community's quality of life. The two general approaches that can be employed to achieve this goal are education and/or regulation. The education approach would involve making use of the information compiled by the GHS to advise owners of historic properties about the significance and value of their property and encourage them to preserve the integrity of these sites and buildings during any renovation or development activities. This can be an effective approach in protecting historic resources, but it is only voluntary on behalf of the property owner and there is no guarantee that individuals will participate.

The second approach would involve regulating the alteration of historic structures through the town's

zoning ordinance. This method would require the establishment of a historic district zoning boundary, within which certain design standards would have to be adhered to when changing the exterior architecture of a historic building. Historic districts usually include a concentration of historic buildings and sites that, when taken as a whole, remain in a setting that provides a visual presentation of the history of a particular place in the community. It is likely that the Village area would be the most appropriate location for consideration as a historic district given the resources that still exist there. There appears to be sufficient historic resources in this area to warrant the establishment of a preliminary district boundary which would then be used as a basis for a more detailed architectural survey of the structures. This survey is a necessary preliminary step to establishing a historic district. The results of the survey would provide the basis for developing architectural guidelines that would then be used to review development proposals within the district. This review role would be fulfilled by a Historic District Commission which would have to be established as part of the zoning ordinance that creates the district.

9. Implications for the Future

Much of this chapter can be summarized in one broad concept: natural resources within Gray and the region in which the town is located function as an integrated system. The effects of land use activities in one portion of town have the potential to impact other parts of the town, as well as neighboring communities. Conversely, land use activities in neighboring towns can affect the quality of Gray's natural environment.

All land use recommendations that are developed as part of this comprehensive plan have the potential to impact the features of the natural environment discussed in this chapter. Many of the implications for the future discussed at the end of the Existing Land Use chapter (Chapter 4) are also applicable to this chapter and do not need to be restated.

Even if no changes are made to the town's land use regulations as a result of this comprehensive plan update, this lack of action will have an impact on the community's natural environment because the town will continue to grow in the future, as discussed in the Population and Housing chapter. The key then is to determine which areas are most appropriate for accepting future growth. This decision should not be based on which portions of town are most suitable for development based on just soil characteristics or highway access. It should also take into consideration the long-term safety of the town's water quality, maintaining a diversity of natural habitat and preserving a quality of life that is appropriate for the community.

Although most watersheds in Gray do not appear to have reached a critical level at this time, continued monitoring and education will be warranted as the town grows in the future. The use of *best management practices* for agricultural, forestry, and other resource-based land use activities should also be implemented by all properties engaging in these activities. Watersheds that need to be more closely monitored in the future include the upper Collyer Brook, between the Lewiston and Shaker Roads, and the upper Pleasant River, around the Portland Road and Maine Turnpike. These

areas are the most densely developed portions of the town and are also the areas currently zoned for future commercial and industrial growth. Commercial and industrial land uses tend to have more impervious surfaces, such as larger buildings and parking areas, which can increase runoff into surface waters.

These same watersheds also overly the town's high yield groundwater aquifer that supplies water to the Gray Water District's municipal wells. Therefore, the continued oversight and regulation discussed above will also help to preserve the quality of the public water supply. This applies not only to future development, but existing land uses as well because properties owners within the water supply area will need to be regularly reminded of the potential impacts that their actions might have on water quality and the identified aquifer. It also means that the town and the Gray Water District will have to continue to work together closely to ensure that land use activities do not adversely affect the long-term use of this aquifer as a public water supply.

From a wildlife habitat perspective the town still has unique opportunities for preserving important habitats which encompasses relatively large tracts of land within Gray. However, if the current low density residential development patterns continue to occur in the future it will encroach on these areas and fragment larger tracts of land into isolated islands of wildlife habitat. These larger habitat blocks have also played a role within the town's forest products and agricultural businesses. For example, the existence of large, forested tracts of land have enabled the owners to better manage them for their timber products. The same is true for tracts of farmland within the community. This illustrates how habitat preservation can both serve the needs of wildlife and also support the local and state economies.

Gray has a relatively small amount of wetland wildlife habitat that has been deemed to be of particular importance by the State Department of Inland Fisheries and Wildlife, as well as the U.S. Fish and Wildlife Service. Although these areas receive some protection under the Shoreland Zoning regulations, continued growth within the adjoining upland areas around the perimeter of these wetlands will tend to marginalize their usefulness as habitat areas. The wetland networks associated with Gray Meadow, the upper Pleasant River/Thayer Brook corridor, and Libby Brook are likely to encounter this type of development pressure from growth in the future based on existing land use trends.

Finally, in order to preserve the town's historic and cultural resources continued education of property owners will be a critical factor. Without the informed interest and understanding of the public, Gray's varied cultural resources cannot be comprehensively identified, evaluated, and protected. To identify and evaluate this rich diversity of resources, it will be necessary to conduct detailed research and field surveys because a site, building, or a potential historic district must first be identified and evaluated before strategies for preservation can be developed and implemented.