2. Natural Resources

Introduction

Seabrook's natural resources are a critical consideration in establishing a proper approach for land use planning and management. Understanding natural resource values provides a rational basis for determining which areas of the town are more appropriate for protection and open space and which areas are more suitable for development. Natural resources such as slope, soils, forest resources, beaches and dunes, wildlife and water and estuarine resources add to Seabrook's character, provide recreational opportunities and contribute to the quality of life for Seabrook residents. These natural resources also provide both opportunities and limitations for growth. Steep slopes and wetlands, for example, are less suitable for development, while better drained, flatter areas are more suitable. On the other hand, these well-drained areas may be associated with groundwater areas that require protection. Given these potential resource limitations and opportunities, the natural resource base of Seabrook provides an important factor as the basis for local land use decisions. The following is a description and analysis of Seabrook's natural resource base.

Topography and Geology

Seabrook lies within the Seaboard Lowland Section of the New England physiographic region, one of the subdivisions of the Appalachian Highlands. Topographically the town is gently sloping with elevations that range from sea level to approximately 60 feet above sea level west of I-95. Grape Hill on the southern border of the town with Salisbury, Massachusetts at Seabrook's southern border reaches 234 feet, although its highest point in Seabrook is 220 feet. Slopes of less than 8% predominate throughout Seabrook with the only exception being Grape Hill and some stretches of various stream banks, which have slopes greater than 15**%. See Map 1**, **Topography and Groundwater Resources in Appendix 2A, Natural Resource Maps.** All the maps prepared for the Natural Resource Chapter are in a separate map file that is incorporated as an attachment to this Master Plan.

Land use limitations based on slope begins when the slope is between 12 and 15%. Development on steep slopes is likely to reduce soil stability, causing erosion and sedimentation into brooks, streams and surface water bodies. Slopes greater than 25%, typically found along some of Seabrook's water courses such as Cains Brook, are usually best left naturally vegetated as part of a community's open space system or to satisfy subdivision open space requirements.

Although Seabrook's topography tends to reflect the underlying bedrock, many areas conform to deep surface deposits that formed during the period of glaciation between 10,000 and one million years ago during the Pleistocene Epoch. The glacier moved from the northwest to the southeast picking up soil, rock and other debris, which were later, deposited as glacial drift when the ice sheet melted. The 2000 *Master Plan, Town of Seabrook*, provides a full explanation of both the bedrock and surficial geology of Seabrook. This plan update only highlights the surficial geology below.

There are four major subdivisions of geologic deposits that influence Seabrook's topography. These are listed below in reverse order of deposition (starting with the uppermost and therefore youngest of the deposits):

- *Marine Clays and Swamp Deposits* occur in low, poorly drained areas of Seabrook and cover much of the eastern portion of the town. These deposits typically contain high water tables and may have water seasonally ponded at the surface. Much of the intertidal marsh area of Seabrook is made up of these deposits. The town's freshwater resources are also associated with these deposits and are contained within the hydric soil group discussed below. These deposits tend to be located in tidal marsh areas as well as areas associated with the brooks and streams of Seabrook such as Cains Brook/Mill Creek and Shephards Brook.

- *Stratified Drift* is composed of fine to medium sands and gravel deposited in proximity to glacial ice. The most significant area of these deposits is in west Seabrook extending from Riley Road at the Massachusetts border to the intersection of NH Routes 150 and 84 in Kensington. Based on studies by the US Geological Survey this area represents high potential for groundwater yields. In fact, it is a substantial groundwater aquifer and major source of Seabrook's water supply discussed in the Water Resources Section of this Chapter. Less significant deposits are found along the town boundary with Hampton Falls west of US I-95 and straddling US Route 1 along the boundary with Salisbury.

- *Glacial Till* is composed of an unsorted mix of sand, silt, clay, gravel and boulders that overlies much of the bedrock in Seabrook. These deposits are formed in association with moving glacial ice. These generally poorly permeable glacial deposits may limit percolation for proper siting of underground sewage disposal systems and do not generally hold sizable supplies of groundwater. Such deposits are limited to Seabrook's higher elevations west of I-95 including New Zealand Hill and Grape Hill.

- *Bedrock outcrops* in Seabrook are composed of both igneous and metamorphic rocks that are exposed at the surface. These areas are generally limited to minor areas within glacial till deposits. There are several outcrops located within the tidal marsh in the northeast portion of the town and are noted on the **Map 2, Natural Resources.**

Soils

The soils in Seabrook have developed over time from the interaction of climate, vegetation, topography and surficial materials. Since much of the surface materials of Seabrook are underlain by marine clays and, many of the soils tend to be moist and/or stony with areas of high water table, shallow ledge or ledge outcroppings. Where there is stratified drift, the soils tend to be more sandy, gravely and better drained. Hydric soils tend to be found in low spots associated with surface water features or in areas underlain by silt and clay deposits such as the river alluvium noted above and are scattered throughout the town. Soil types are derived from the *Soil Survey of Rockingham County, New Hampshire,* produced by the US Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS).

Soil Conditions

The following is a description of Seabrook's soils based upon soil conditions that are grouped into four (4) broad categories for planning purposes as shown on the **Soils Conditions Map, Map 3**.

Wetland (Hydric) Soils

These include all poorly and very poorly drained soils often associated with silts and clays including muck, peat, swamps and marshes as defined by the NRCS for the State of New Hampshire. Hydric soils make up over 50% of Seabrook's land area. These include such soil groups as Scarboro Muck, Ipswich Mucky Peat and Walpole Fine Sandy Loam. The water table is at or near the surface 5 to 9 months of the year. Wetland soils are associated with low lying areas in Seabrook, such as the tidal marshes and along Seabrook's water courses and ponds such as Cains and Cains Mill Ponds.

These areas are best suited to natural open space or limited development because wetland soils provide several natural functions that are beneficial to the community. These functions include: absorbing excess flood waters preventing downstream flooding; providing valuable habitat for fish and wildlife; providing groundwater recharge to local aquifers; and trapping sediment and other pollutants, thus acting as a surface water filter.

Hydric soils are similar to, but may not be precisely the same as, wetlands as defined by the US Army Corps of Engineers under section 404 of the Federal Clean Water Act. Army Corps wetlands are also referred to as "Federal Jurisdictional Wetlands". For regulatory purposes both the NH Wetlands Bureau and the Corps employ the Corps definition. Further discussion of the town's wetland resources is located in the Water Resources section.

Seasonally Wet Soils

These soils are somewhat better drained than the wetland soils, but typically have a seasonal water table within 2 1/2 to 3 feet of the surface, a perched water table or slowly permeable sub-layer during the wet season. These include such soil groups as Woodbridge and Deerfield fine sandy loam. They tend to be located in the central part of Seabrook often on the lower slopes of hills and on low knolls associated with streams such as Cains Brook, Mary's Brook and Gove Brook and their tributaries. The town should encourage low density uses and those that are not likely to pollute the groundwater. Flooded basements and submerged leach fields may be expected.

Shallow to Bedrock Soils

This soil group tends to be located on low, knobby hills and ridges that typically have bedrock within 1-3 feet of the surface. They are found in scattered areas generally along a north-south line just west of I-95 and a north-south pattern just west of the marsh soils as seen in on the **Soils Conditions Map.** This soil group is made up of the Chatfield-Hollis-Canton soil complex. While this group tends to have a shallow to bedrock characteristic, there will be some areas that do have deeper soils.

Sandy and Gravelly Soils

Sandy and gravelly soils are excessively well drained Hinckley and Canton fine sandy gravelly soils that are typically associated with the stratified drift deposits from glacial outwash. These are located in the western part of Seabrook west of I-95. These soils have good potential for development since there are few limitations for construction. However, these areas are also associated with significant groundwater supplies. Seabrook's municipal well field is located in such deposits west of I-95. Thus, development density and wastewater discharge must be managed to prevent groundwater pollution from effluent since these soils are very permeable.

Forest and Agricultural Resources

Forest Resources

There are few large tracts of woodland or forest resources in Seabrook. **See Natural Resources Map.** What forest resources are left are second growth deciduous and coniferous species. The larger areas of forest occur in three locations:

- west of Interstate 95
- north of Cains Brook between 1-95 and US Route 1 and
- the areas of Seabrook that are transitional between the upland wooded areas along the tidal streams such as those areas bordering Mill Creek and lower Shepherd Brook.

These forest resources represent a response to a relatively wet climate (42 inches of rain annually) with warm summers and cold winters. Variation in soil and slope will result in a variation in vegetation. Where soils are wet there may be a preponderance of hardwoods such as red maple and yellow birch. A mixed forest including white pine and eastern hemlock will more likely occur on drier sandy/gravelly soils.

In the early part of the 19th century almost all of this area was logged off and in some areas up to 90 % of the land was open. Since then the forested areas recovered until the middle of the 20th century. According to a statewide study conducted by the Society for the Protection of New Hampshire Forests, Seabrook's land area is

less than 30% forested and is less forested than adjacent communities.[1] In addition, there are few if any large contiguous blocks with no forested area greater than 500 acres.

From 1953 to 1982 when Seabrook began to experience rapid growth, the town lost over 1675 acres or over 65% of forested land (*Regional Open Space Plan, Rockingham Planning Commission*, March, 2000). This trend is expected to continue according to the Forest Society Study with Seabrook losing another 15% of its forest cover by 2020. At present, there are no Certified Tree Farms in Seabrook. (A Certified Tree Farm designation is based on a long-term forest management program that is certified by the UNH Cooperative Extension Program for Rockingham County.) Ensuring a long-term policy toward proper management of the town's forest and tree resources has a number of values: open space and scenic enhancement, recreation, preservation of wildlife habitat, and water quality protection.

Agricultural Resources/Farmland Soil

The USDA Natural Resource Conservation Service has identified three categories of farmland soils in New Hampshire-- prime farmland soils, soils of statewide importance, and soils of local importance. This classification is based upon the productivity of the soils for food and fiber crops. Prime farmland soils have the capacity to produce sustained high yield of crops. Soils of statewide significance are deemed to be important for farming in New Hampshire, but are of less value than prime farmlands because the soils are not as fertile and require more erosion control practices. Similarly, soils of local importance may be important for farming in Seabrook, but are not as valuable as either the prime farmland soils or those of statewide significance. These soils are not as fertile and are usually poorly drained.

Seabrook has approximately 120 acres that are defined as prime farmland, 327 acres that are of state importance and 1584 acres that are of local importance or a total of 2031 acres. The greatest concentration of prime soils and soils of statewide importance are in the western portion of Seabrook near the border with South Hampton and Kensington. **See Map 4, Agricultural Lands.** The encroachment of development on agricultural soils or lands that are currently in agricultural use is an issue of concern for the long-term use of land in Seabrook. Once converted to more intensive uses, these lands are usually irretrievably lost for agricultural purposes. A second map, **Map 5, Agricultural Lands Developed**, includes an overlay of the developed areas and on a relative basis how much farmland soil has been lost to development. At present, more than half of Seabrook's farmland soils—1088 acres—have been developed.

Fish and Wildlife Resources

Seabrook's mixture of habitats include forests and woodlands, open fields, tidal marshes, estuary, fresh water wetlands, surface waters and streams which provide habitat for valuable fish and wildlife resources. The following discussion briefly describes the town's fish and wildlife resources.

Wildlife Habitat Plan

In February 2007 the New Hampshire Fish and Game Department published a *Wildlife Action Plan* for the entire state. The data incorporated in this study can be used on a town-by-town basis for purposes of land use planning and resource management. This plan identified nineteen (19) habitat types, eight (8) of which are within the Town of Seabrook and are noted on **Map 2, Natural Resource.** These include:

- **Coastal Beach and Sand Dunes**

  Seabrook Beach extends approximately 1.6 miles from Hampton to the north to Salisbury on the south. Seabrook's coastal beach and sand dune system is a constantly changing area of sand, gravel and associated vegetation that are deposited and subject to wave and wind action. The dune area is one of the few remaining such areas in the state and is considered to be one of New

[1] New Hampshire's Changing Landscape, The Society for Protection of New Hampshire Forests and the Nature Conservancy, 1999.

Hampshire's most at-risk habitats. The beach and dune habitat is associated with a barrier beach system that extends from Plum Island in Massachusetts to Great Boar's Head in the town of Hampton. The barrier beach in New Hampshire is backed by an extensive salt marsh system, the Blackwater River and portions of Hampton/Seabrook Harbor. The barrier beach has been heavily developed with primarily residential development on the ocean side and commercial/residential development on the landward side along the US Route 1A corridor. The dunes and beach are used by numerous birds such as the Piping Plover for breeding, migration or wintering. These fragile areas face ongoing impacts from recreational activities, residential building activity, oil spills and rising sea level. The dunes comprise approximately 109 acres in Seabrook. Over 30 of these are situated to the west of US Route 1A and are referred to as the "back" dunes. The town has acquired title to the dunes as a means for long-term protection and conservation.

- **Rocky Ridge and Talus**

  This habitat type is typically associated with higher alpine elevations. However, NH Fish & Game has identified several small areas of rock outcrop in the tidal marsh just north of Farm Lane. In this type of habitat area there is minimal wildlife value. There are only 14 acres of this habitat in Seabrook.

- **Grasslands**

  There is small 62-acre area of grassland habitat north of NH Route 107 near the confluence of the Hampton Falls River and Gove Brook. These areas tend to be dominated by grasses, wildflowers and sedges with minimal tree or shrub cover. These are typically hayfields or pastures. To maintain this habitat type the fields need to be mowed.

- **Salt Marsh**

  The salt marsh habitat is a grass-dominated tidally influenced wetland area that exists in the transition zone between the Seabrook estuary and the adjacent uplands. These intertidal marshes are marked by a saline and brackish environment and contain such bird species as the American black duck, common tern, great blue heron, Northern harrier, seaside sparrow, semi-palmated sandpiper, willet and numerous migrating birds. This habitat is found in the eastern side of the watershed associated with Tide Mill Creek and the Hampton-Seabrook Estuary. Based on the *Wildlife Action Plan* there are approximately 1242 acres of Salt Marsh in Seabrook. This resource area is further discussed in the Surface Water Resources Section of this chapter.

- **Marsh/Shrub Wetland Complex**

  This freshwater complex is associated primarily with the various ponds in the Cains Brook watershed as well as the lower part of Cains Brook east of the Noyes Pond Dam to Centennial Avenue. In total there are approximately 86 acres of this habitat. There are also complexes west of I-95 just south of Route 107 as well as the headwaters of the Hampton Falls River in the northwest portion of Seabrook. These areas have a broad range of flood regimes, often controlled by man-made dams and the presence or departure of beavers. This habitat type includes wet meadows, emergent marshes and scrub-shrub wetlands. Typical wildlife includes American bittern, band sunfish, great blue heron, Northern harrier, smooth green snake, spotted turtle, Blandings turtle and New England cottontail. Such wetlands are also prime habitat for mammals such as beaver, otter, muskrat and mink as well as toads, frogs and salamanders.

- **Peatland Complex**

  There are several locations of peatland habitat in Seabrook—one south of Walton Road and another associated with Mary's Brook and several sizable complexes west of I-95 as shown on the **Natural Resources Map, Map 2**. Typical species include Blanding's turtle, Eastern towhee,

ribbon snake, spotted turtle and spruce grouse. There are approximately 88 acres of this habitat in Seabrook.

- **Appalachian Oak-Pine Forest**

  This upland area contains mixed forest with fields and meadows in varying stages of succession. Along with the Tidal Marsh habitat this forest complex covers the most extensive area in Seabrook, approximately 2175 acres. These forests include oak, hickory, mountain laurel and sugar maple and are typically associated with the relatively warmer drier climatic conditions of southern New Hampshire. This habitat provides for a variety of wildlife from songbirds to mammals including American woodcock, woodpeckers, thrushes, bluebirds, robins and warblers, common nighthawk, Cooper's hawk, Eastern box turtle, New England cottontail, ribbon snake, ruffed grouse, spotted turtle, wood thrush and wood turtle.

- **Hemlock-Hardwood- Pine Forest**

  This forest habitat is typically a transition forest between hardwood conifer and oak-pine forests. It is usually comprised of dry sandy soils with red oak and white pine. There are only 15 acres of this habitat in Seabrook located south of Ledge Road in the southwestern corner of Seabrook associated with the primary sand and gravel aquifer of the town.

From this data, Fish and Game has ranked the habitats based on their value statewide and their value within a sub-region. Seabrook is located within the Tidal Coastal Watershed sub-region. Within both the state and sub-regional category, Saltmarsh is a Habitat of Highest Relative Rank. In addition, Fish and Game then prepared Conservation Focus Area Maps where there were clusters of habitat in the same geographic area, referred to as areas of co-occurrence. Within Seabrook there are three (3) such Focus Areas, which are associated with the open estuary (mud flats), the tidal marsh complex or dune system. In each of these areas not only is there is a variety of wildlife, there are also rare species and exemplary natural communities. In addition, these areas are protected through public ownership or easement.

Mammals

The New Hampshire Fish and Game Department tracks data for the state's wildlife resources. Much of the data and information is the result of NH Fish & Game (NH F&G) surveys of game species from hunting records by town for the whole state. Although these records are not based on scientific field surveys, they are indicative of the general numbers of individual species within the town, particularly when compared to other communities. For the most recent year of compiled data for the state and Seabrook (2007), there were no bears harvested and only one turkey was harvested. There were also only 14 deer harvested, in contrast to Hampton Falls where there were 30 deer harvested. These numbers are similar for other communities in Rockingham County where there are many more deer harvested than in the northern counties of the state. By contrast bear and turkey harvests are much larger the further one goes north in the state.

The NH F & G also tracks coyote, bobcat, fisher and gray fox. In general, it appears that the amount of game hunted or trapped in Seabrook has been on the decline for almost all species. Deer, on the other hand, seem to be more prevalent.

Inland Fish and Wildlife Resources

Water bodies in Seabrook and the surrounding area support both coldwater and warm water species. In general, there is little data with respect to aquatic habitats that has been scientifically identified and recorded. There is site specific data that was gathered as part of the application to the NHDES Wetlands Bureau for the dredging Cains Pond. It is likely that some or all of the resources can be found in or adjacent to the other ponds and freshwater resources in Seabrook. A more detailed discussion of these species is found in the *Cains Brook/Mill Creek Watershed Management Plan* prepared in December, 2006 and updated in September 2008. Based on the assessment for the dredging application the following wildlife were

observed: bull frog, green frog, Eastern painted turtle, wood duck, American black duck, mallard, gray catbird, cedar wax wing and belted kingfisher. Examples of wildlife that could be expected to be observed include the common snapping turtle, great blue heron, common yellowthroat, Eastern phoebe, and tufted titmouse. Local sources have also indicated that spotted and painted turtles have been identified in and around the ponds of Seabrook.

Within Seabrook's ponds and brooks the following fish species have been also been observed or have been noted historically: American eel, bass, horn pout, kibby, perch and sea-run brown trout. Pickerel and sun fish have specifically been identified in Noyes Pond. There is also evidence of freshwater mussels in the Cains Brook watershed and in some locations along the brook, as well as Lamprey eels as far up as Cains Mill Pond. Silvery minnows and mummichogs have been identified in the upper reaches of Mill Creek. At present, many of these species do not inhabit the Cains Brook system, because of the deterioration of the pond's water quality, reduced depth and man-made barriers to free fish passage.

A significant area of the community that has relatively little documentation of habitat is within the tidal marsh and Hampton-Seabrook estuary. This is a significant resource area that is in large part dependent on the quality of the upstream water that discharges into the tidal creeks and its associated wetlands. This resource provides nutrients to a variety of fish and shellfish that inhabit the lower waters of Mill Creek, Brown's River and the Hampton-Seabrook Estuary.

Coastal and Estuarine Fish and Wildlife

Almost all of the species are associated with the Hampton-Seabrook Estuary and are discussed below in the Wetlands portion of the Surface Water Section.

Rare Plants, Rare Animals and Exemplary Natural Communities

The New Hampshire Natural Heritage Bureau, a bureau in the Division of Forest and Lands, finds, tracks, and facilitates the protection of the state's rare plants and exemplary natural communities. The Bureau also tracks rare animal species in cooperation with the Nongame and Endangered Wildlife Program of the NH Fish and Game Department.

In Seabrook there are 52 rare species of special concern and exemplary natural communities that have been listed by the NH Natural Heritage Inventory (NHI) under the Native Plant Protection Act of 1987 (NH RSA 217-A) and the New Hampshire Endangered Species Conservation Act of 1979 (NH RSA 212-A). Many of these were lasted reported over 100 years ago, but are still assumed to be secure according to the NHI.

These resources have been placed into three groupings of resources. In Seabrook there are 13 listed natural communities, 35 listed plant species and 4 vertebrate species. Within the tidal marsh there are six distinct natural communities including Brackish Marsh, High Salt Marsh and low salt marsh. There are ten plant species also associated with the tidal marsh including Dwarf Glasswort, Netted Chain Fern, and Salt Marsh Gerardia.

While there are no federally listed endangered species there is one federally listed threatened species (Piping Plover). There are 25 state endangered plant species and ten state threatened plant species as well as one state endangered bird (Common Tern) and threatened state bird (Common Tern). There is one state threatened reptile—the Blandings turtle. A full list of these resources is found in **Appendix 2B, Rare Plants, Rare Animals and Exemplary Natural Communities**
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In an effort to protect these resource areas the NHI does not identify precise locations. It will publish upon request from a local community a map of the community illustrating general locations. For mapping purposes, the precise locations are offset. These general locations are found on **Map 2, Natural Resources**. Based on

this data the preponderance of locations are east of Route 1 associated with the tidal marsh and Cains Brook/Mill Creek where there is a grouping of phenomena on the lower reaches or tidal portion of the this creek.

Surface Water Resources

Seabrook has a variety of surface water resources including streams, ponds, and wetlands as shown on **Map 6, Surface Water Resources.** The discussion below provides an overview of these resources.

Watersheds

Seabrook is divided into seven (7) minor watersheds as shown in **Table 2-1.** All of these are part of the larger Coastal River Basin, which occupies much of southeastern New Hampshire. **Table 2-1** provides a summary of the key data for each of the watersheds. The Blackwater, Cains Brook, Gove Brook/Hampton Falls River either originate in or are contained partially an adjacent community.

Table 2-1
Seabrook's Watersheds

Watershed	Acres	% of Town	Stream Origin	Stream Length
1. Blackwater/Hampton Harbor	1,794	30	Salisbury, MA	3.8
2. Cains Brook/Tide Mill Creek	1,554	26	Interstate 95	3.1
3. Gove Brook/ Hampton Falls River	1,136	19	Northwest Seabrook—Southwest Hampton Falls	1.7
4. Browns River	777	13	North of Rocks Road—East of US Route 1	3.1
5. Rocky Brook/Hunt's Island Creek	418	7	North of Farm Lane Road	1.7
6. Lucy Brook/Black River	179	3	Southeast Seabrook	
7. Atlantic Shorefront	120	2	None	N/A
Total	**5,978**	**100**		

Source: 2000 Master Plan, US Geological Survey

Ponds

Seabrook has fourteen (14) ponds that range in size from approximately five (5) acres to 0.25 acres. The largest of these ponds are Cains, Cains Mill and Secord's Pond all within the Cains Brook Watershed. A more thorough discussion of these ponds and the other ponds on the Cains Brook Watershed can be found in the *Cains Brook/Mill Creek Watershed Plan*, updated 2006. Cains Mill Pond has lost a significant portion of its volume and surface as a result of the Noyes Pond dam breach during the Mother's Day storm of 2005. Both Cains Pond and Cains Mill Pond are to be dredged in the near future in order to achieve depths up to ten (10) feet allowing greater recreational opportunity. Both are now only 2-3 feet deep. All of these ponds provide an aesthetic quality to the town, while those associated with the Cains Brook Watershed have high recreational value for boating and fishing. **Table 2-2** below provides a summary of key data for each of these water bodies.

Table 2-2
Seabrook's Ponds

Pond	Location	Acres
Cains Pond	Cains Brook @ Lafayette Rd.	5
Cains Mill	Cains Brook @ Lafayette Rd.	3
Secords	Cains Brook off Folly Mill Rd.	3
Perkins (AKA Benny's)	Off Perkins Ave.	2
Marys	Marys Brook @ Lakeshore Dr.	2
Noyes	Cains Brook off Walton Road	1
Chase	Off Evergreen Drive	1
Knowles (AKA Willy's)	Rocky Brook off Dows Ln.	1
Brook Pond (AKA Partridge)	Off Wortherly Ave.	1
Beckman's Pond	West of Causeway St.	1
Ellsworth Pond	Off South Main St.	.5
Stard Pond	Off Stard Rd.	.25
Small's Pond	Off Walton Rd.	.25
Small's (other) Pond	Off Walton Rd.	.5

Source: 2000 Master Plan, US Geological Survey

Wetlands

Wetlands form a significant part of Seabrook's surface water resources. They generally are contiguous with wetland or hydric soils discussed previously in the Soil Section. However, for purposes of this discussion, wetlands also include vegetation and hydrologic characteristics that might not be incorporated into the definition for hydric soils. These areas include shallow tidal marshes, ponds, fresh water marshes, swamps, bogs, and seasonally flooded lands. Wetlands are usually areas of low topography and poor drainage with standing water for all or part of the year. Wetlands possess a number of major resource values: maintenance of water quality, flood control, groundwater recharge for water supply, wildlife habitat and vegetative diversity. **See Surface Water Resources Map.**

The definition and mapping of wetlands varies from agency to agency within New Hampshire and the federal government. The most widely used soil definition used for community planning is employed by the US Natural Resource Conservation Service and comprises the hydric soil category of the poorly and very poorly drained soils as discussed in the Soil Section of this chapter. This classification relies only on soil and does not distinguish between wetland types. By quantifying wetland values, a hierarchy of wetland types can be established and appropriate measures for protection and management can be employed.

Wetlands have also been defined and mapped statewide on the GRANIT System using the criteria of the US Fish and Wildlife Service through the National Wetland Inventory Program. These include marine, emergent and palustrine wetland types. The marine wetlands are related to the subtidal and intertidal environment and in Seabrook are primarily tidal marsh. Emergent wetlands are often transitional wetlands that include such vegetation as bulrushes or salt marsh cord grass between the estuarine and riverine wetlands and may be submerged frequently during the year. Palustrine wetlands include all non-tidal wetlands dominated by trees and shrubs.

In addition, for purposes of managing and permitting activities in wetlands that are of state interest, the New Hampshire Wetland Bureau has adopted the 1987 US Army Corps of Engineers publication *Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1*. In an attempt to assist local planning boards to determine the appropriate soil and wetland data for development review, the Office of State Planning issued in November, 1998, a guidance document*, Data Requirements for Site Review, Guidance for Planning Boards*.

The Seabrook Zoning Ordinance has a limited Wetland Article that addresses setbacks, vegetative cutting and setbacks to streams and ponds.

Item	Standard
Minimum Lot Size	Wetlands no more than 20% included in ordinance minimum lot size.
Buildings/paved parking setback & buffer	a. < 5,000 sf = no buffer; setback no closer than 10 feet b. > 5,000 sf = 25 foot limited cut buffer/setback
Buffer/setback to ponds and streams	25 feet limited cut in all zoning districts. No structure/building constructed within 50 feet of pond or stream
Vegetation	No natural herbaceous vegetation; no 50% trees, saplings, shrubs removed from wetlands; removed only during dry season or frozen conditions.

Source: Town of Seabrook Zoning Ordinance, 2009

Hampton-Seabrook Estuary & Salt Marsh

The Hampton-Seabrook Estuary forms the largest contiguous area of salt marsh and tidal flats in New Hampshire and is at the northern edge of a salt marsh complex that extend as far south as Cape Ann in Massachusetts. **See Map 2, Natural Resources**. It is estimated to comprise over 5,000 acres with approximately ½ of that in Seabrook. The salt marsh has been estimated by New Hampshire Department of Environmental Services (NH DES) to be approximately 3,500 acres of which there is about 1730 acres in Seabrook. The 2000 Master Plan has an extensive discussion of this resource and its value to the Seabrook and the state of New Hampshire. It is rich in marine aquatic life including shellfish and a variety of finfish.

Shellfish

There is a variety of shellfish in the estuary especially at the edge of the salt marshes and within the exposed mudflats. Softshell clams and blue mussels were historically taken on a commercial basis but more recently on a recreational basis. For a period during the 1980's and 1990's these beds were closed due to high coliform counts. The state has made a significant effort to address the coliform contamination and now the beds have been opened up on a periodic basis depending on the bacterial level and abundance of shellfish. Other shellfish within the estuary include lobsters, rock crabs, hermit crabs, starfish and numerous snail species.

Marine Finfish

According to the 2000 Master Plan, the Seabrook Estuary including the tidal streams are an important breeding ground for many species of marine finfish. The NH Fish & Game Department and Public Service of New Hampshire (PSNH) have documented forty different species. These include blueblack herring, smooth flounder, white perch, rainbow smelt, winter flounder and hake. Both NH F&G and PSNH do limited sampling of these marine species and consequently there tends to be only anecdotal evidence of the decline of some key indicator species such as winter flounder.

The Department of Biological Sciences at UNH undertook a limited research study from July through October of 2004 that involved sampling and analysis of fish and macro-invertebrates in the Hampton Seabrook Estuary. The study concentrated on winter flounder. Since there were no previous baseline studies of a similar type, the study did not address the relative size of the marine life and winter flounder populations. However, it did determine that the most populous grouping by age of this finfish species was the young juvenile group in their first two years. The study concluded that:

> *Although all size classes of winter flounder utilize the Hampton Seabrook Estuary, it is primarily occupied by (YOY) Young of the Year in the summer and fall, indicating that the estuary functions as a nursery ground. It is imperative for the sustainability of this important demersal food fish that these essential fish habitats are recognized and protected.*

Birds

In a more recent study the NH Audubon produced a report—*Avian Use of the Hampton-Seabrook Estuary: 2006-2007*—for the NH F&G. The study was divided into investigation of two major groups of birds that use the estuary:

- Shorebirds that tend to use the marsh as a stopover habitat during migration and
- Salt Marsh Breeding Birds

Key findings include:

- Two-thirds of the shorebirds are of only two species—Semiplamated Plover and Semipalmated Sandpiper with over 1000 individuals each
- Shorebirds preferententially use two areas of the estuary for foraging—1) the extensive mudflats at the southern end of Hampton Harbor and at the mouths of Mill Creek and Brown's River; 2) the freshwater or brackish pools along the northern end of the estuary.

Although the estuary and marsh complex are surrounded by development and subject to extensive habitat alteration from ditching and tidal restriction, it is an extremely valuable and productive resource, supporting a diversity of wildlife habitat. However, it still remains vulnerable to man's impact both direct and indirect. There are both local and state regulations that protect this resource from direct impacts, however this resource is also vulnerable to indirect impacts of sediment and pollutants carried by streams in the watershed that discharge into the marsh.

This study recommends the following conservation strategies:

- Restoration of currently ditched portions of the salt marsh,
- Preservation of marsh pools used by roosting or foraging shorebirds, and
- Protection of both marsh and adjacent upland to maintain habitat connectivity, minimize external man-made impacts and allow for adaption to sea level rise. [2]

Floodplains

Floodplains are areas adjacent to rivers, streams and surface water bodies, which are susceptible to flooding during periods of excessive stormwater runoff. The Federal Emergency Management Agency (FEMA) has prepared Special Flood Hazard Area maps for Seabrook for the purpose of identifying the 100-year flood areas within the town that may be eligible for federally subsidized flood insurance. The FEMA maps were revised on April 15, 1980, as Flood Insurance Rate Maps (FIRM). These 100-year flood boundaries are for the most part associated with low-lying areas near streams, ponds and the Seabrook harbor/estuary. **See Surface Water Resources Map**. In recent years there have been several instances of extreme flood conditions including the "Mother's Day" Storm of May, 2006 and the "Patriots Day" Storm of 2007. These storms had dramatic effects including:

- Significant sediment loading into Secord's Pond,
- Significant sediment deposition in the upper reaches of Cains Brook,
- Elimination of a beaver dam below Noyes Pond on Cains Brook, and
- Serious erosion along the emergency spillway of Noyes Pond.

[2] Avian Use of Hampton-Seabrook Estuary: 2006-2007, Report to the NH Fish & Game Department, 2008, by Peter McKinley and Pamela Hunt, NH Audubon

Adaptation Strategies Pilot Project

The Rockingham Planning Commission (RPC) recently provided technical assistance to the Town of Seabrook to prepare a report—*Adaptation Strategies to Protect Areas of Increased Risk from Coastal Flooding Due to Climate Change*. This report recommended adaptation strategies and methods to identify and protect areas of increased risk from coastal flooding due to climate change. The RPC reviewed mapping methodologies used to map areas of increased risk and developing flood inundation maps. In addition, the RPC researched and reviewed regulatory options to address increased risk to development, including revisions to the town's zoning ordinance, subdivision and site plan review regulations, building codes, road elevation and construction standards, retaining wall permitting, hazard mitigation planning, emergency response and emergency operations planning, and land conservation. This project was completed in July of 2009. Funding for this project was provided by the NH Coastal Program. **A copy of this report is included as an attachment to this Master Plan.**

The town has a Floodplain Development Ordinance to regulate development in the flood hazard areas, although this regulation has not contemplated the potential for continued extreme flooding and the increased risk from coastal flooding due to climate change. By policy the Planning Board discourages any development in Seabrook's floodplains.

Dams

There are currently fourteen (14) dams in Seabrook based on current NH Dam Bureau Records. Because of the manner in which the state dam bureau defines dams some of these are for stormwater detention associated with recent developments which discharge into Seabrook's streams or their tributaries. **See Table 2-3** for dam data provided by NHDES Dam Bureau. These sites are permitted and inspected by the New Hampshire Water Resources Board (the Board). The Board is responsible for regulating all structures in waterways that are four or more feet high. Consequently, some storm water detention ponds in recent developments are included within the Board's jurisdiction. The dams associated with the Home Depot and Lowes developments are for detention ponds.

As noted in the table below, each dam is rated by the Dam Bureau for potential hazard based upon the most recent inspection. A Non-menace (NM) structure means that a dam failure would not result in probable loss of life or property. A Low Hazard (LH) structure means a dam with low hazard potential the failure of which would not result in possible loss of life and low economic loss to structures or property. A Significant Hazard (S) structure means that a failure or improper operation would result in no probable loss of lives, but major economic loss to structures or property. High Hazard means that a failure or improper operation would result in probable loss of human life and major economic loss to structures or property. There are no such dams in Seabrook. Further discussion of Classification of Dams in New Hampshire is contained in an NHDES Fact Sheet found at:

http://des.nh.gov/organization/commissioner/pip/factsheets/db/index.htm

This table also identifies the type of dam structure, the size of the impoundment and the height of the dam. The heights for currently active dams range from 10 feet for the Secord Pond Dam to 2.5 feet for the Cains Pond Dam at US Route 1. The Noyes Pond dam was seriously damaged along the emergency spillway during the Mother's Day storm of 2006 and has not yet been repaired. The Cains Brook Watershed Plan recommends that the town fund and install a nature-friendly spillway that retains the pond's integrity while allowing for fish passage upstream.

Table 2-3
Seabrook Dams

Dam Name	River/Brook	Haz Cl	Type	Impnd. Ac. Ft.	Height Ft	Owner
1. Noyes Pond Dam	Cains Brook	NM	Concrete	0.9	8	Stanley Hamel
2. Secord Pond Dam	Branch Cains Brk	L	Earth	2.5	10	Town of Seabrook
3. Cains Brook Dam	Branch Cains Brk—Folly Brook	*	Stone/ Earth	0.33	11.5	Salisbury Water Co.
4. Cains Brook-Mary's Pond-Lakeshore Dr.	Trib. to Cains Brk	L	Earth	1	7	Town of Seabrook
5.Cains Brook @ US Route 1	Cains Brook	S	Concrete/Earth	2.4	7	Town of Seabrook
6. Home Depot Det. Pond Dam	Stormwater runoff	NM	Earth	0.57	5	Seabrook Ventures LLC
7. Lowes Det. Pond Dam	Stormwater runoff	NM	Earth	1.05	5	Mark Investments Inc.
8. McWashby Pond Dam	Farm Brook	*	Earth	3	5	PSNH
9. Seabrook Investment	Stormwater runoff	NM	Earth	3	5.25	Seabrook Investment
10. Poland Spring Dam 1	Stormwater runoff	*	Earth	6.7	0.46	Michael P. Connelly
11. Poland Spring Dam 2	Stormwater runoff	*	Earth	4.2	0.97	Michael P. Connelly
12. Poland Spring Dam 3	Stormwater runoff	*	Earth	7.5	1.4	Michael P. Connelly
13. Poland Spring Dam 4	Stormwater runoff	*	Earth	4.3	0.54	Michael P. Connelly
14. Poland Spring Dam 5	Stormwater runoff	*	Earth	3.8	0.38	Michael P. Connelly

* in ruins, breached, not built, exempt or removed
Source: New Hampshire Dam Bureau, February, 2006 Note: Impoundment in acre-feet; dam height in feet

Groundwater Resources

Groundwater occurs in openings in bedrock or pores in surficial materials. Although water can be withdrawn from bedrock, glacial till or stratified drift deposits, the most significant amounts of groundwater in New Hampshire and Seabrook are usually found in stratified drift. A 1992 report by the US Geological Survey (USGS) on hydrogeologic investigations identified one primary stratified drift aquifer located within Seabrook—in the western portion of town.

Groundwater yield is rated by the transmissivity of the stratified drift. Transmissivity is measured in feet squared per day and the USGS has classified yield into four categories: less than 1000, 1000 to 2000, and 2000 to 4000 and greater 4,000. There is a relatively large area west of I-95 that is rated at between 2000 to 4000 square feet per day with much of the aquifer rated at 1000-2000 square feet per day. This area is noted on **Map 1**, **Topography and Water Resources Map**. There are several pockets of secondary groundwater resources in southern Seabrook near the Massachusetts border that are rated at 1,000 to 2,000 square feet per day per day.

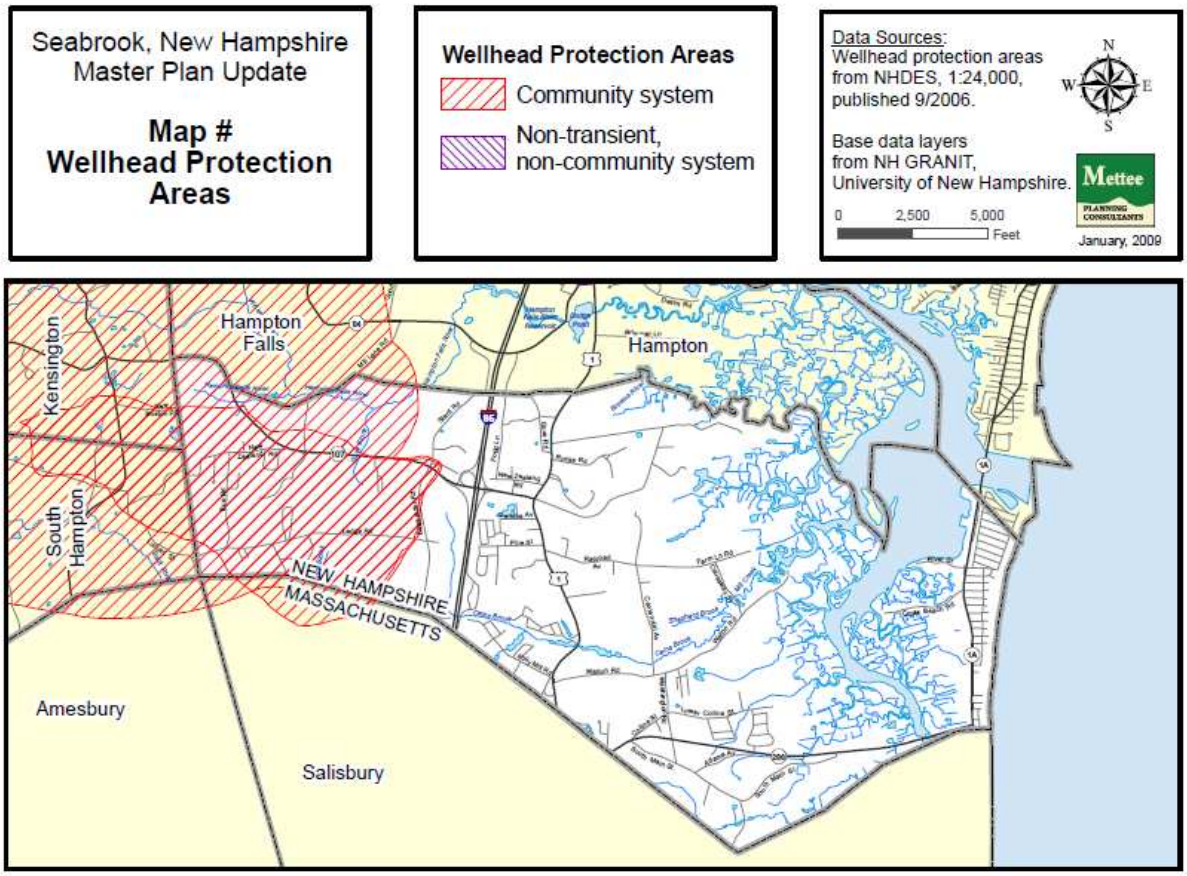
These groundwater resource areas are Seabrook's sole aquifer areas for its municipal water supply. The long-term protection of this resource is critical to the Town's future. The NH DES has designated a wellhead protection area around the community's wells that are located west of I-95 in an effort to protect the groundwater from inappropriate land uses. **See the Wellhead Protection Map, Figure 2-1** below. A similar map with more

detail, including location of the town wells is found in **the 2000 Seabrook Master Plan in the Water Resources Section, p. 215.**

In addition, in 2007 the town adopted an Aquifer Protection Ordinance with an overlay district that encompasses all the land within the town's boundaries west of I-95. This ordinance prohibits such activities as:

- handling, disposal, storage, processing or recycling of hazardous or toxic materials;
- disposal of solid waste;
- disposal of liquid or leachable wastes without approval from NHDES;
- dumping of snow containing de-icing chemicals brought from outside the Aquifer Protection Overlay District;
- subsurface storage of petroleum and other refined petroleum products, except as regulated by the NHDES; and
- automotive service and repair shops, filling stations, car washes and junk and salvage yards.

Figure 2-1, Well Head Protection Areas



Surface Water Quality

The State of New Hampshire establishes water quality classification for all rivers in the state, both freshwater and tidal. These classifications range from Class A, the highest water quality, to Class D, the lowest. Seabrook's rivers are all rated Class B. The description of Class A and Class B are as follows:

Class A *Potentially acceptable for water supply use after disinfection. No discharge of sewage, wastes or other polluting substance into waters of this classification. (Quality uniformly excellent.)*

Class B *Acceptable for swimming and other recreation, fish habitat and, after adequate treatment, for use as water supplies. No disposal of sewage or wastes unless adequately treated. (High aesthetic value.)*

Associated with each of these classifications are standards for chemical and biological constituents. The surface waters of Seabrook, and in particular Cains Brook, do not meet all of the standards of these two classifications.

In order to determine how well each water body compares to the standard, the NHDES has identified seven designated use categories, such as fish consumption, wildlife, recreation, and drinking water. For each of these categories NHDES has specified a particular indicator to measure the adequacy of the water body to support the use. In the case of fish consumption for example the indicator is mercury, while for shellfish it is fecal coliform. NHDES divides the waters of a given watershed into assessment units for purposes of water quality sampling and assessment. There are 21 assessment units in Seabrook in both fresh and salt water. Of these there are eight (8) units in freshwater streams seven (7) of these are in the Cains Brook/Mill Creek Watershed), four (4) freshwater impoundments (all of which are in the Cains Brook/Mill Creek Watershed) and nine (9) in estuarine waters.

Each of these parameters is suppose to be assessed on a periodic basis through sampling and analysis to determine if the quality of the water can support a given use. For example, Cains Pond and Cains Mill Pond do not support fish consumption. At present, NH DES is considering a second impairment that would have these water bodies not support secondary contact recreation. This category relates to such activities as boating, but not swimming. In general, the estuarine waters within Seabrook are impaired and do not support fishing and shellfishing. In **2C, Summary of Water Quality Assessment Units,** there is a summary of the results of the general NHDES water quality assessment for each of the assessment units in the watershed area. The results were complied in an NHDES publication*: Final Section 305 (b) and 303(d) Surface Water Quality Report, NHDES, December, 2008.* None of the waters (both fresh and tidal) that were under NHDES sampling support fish consumption and the tidal waters do not support shell fishing. For the other use categories, such as primary/secondary contact recreation, wildlife and aquatic habitat, in general the data necessary to determine an assessment has either not been gathered by NHDES or it is insufficient.

For further discussion of the water quality assessments, terms and definitions related to the sampling program see *Cains Brook/Mill Creek Watershed Management Plan,* rev. 2007.

Recent Water Quality Sampling

In addition to the overall water quality assessments conducted by the NHDES, there have been a number of specific efforts to undertake water quality assessments targeted to contaminants associated with shell fishing. In recent years Cains Brook and Mill Creek have been sampled for various constituents to determine water quality levels for such contaminants as fecal coliform and enterococcus. Sampling has been conducted at several stations by the NH Department of Environmental Services (NHDES) and the Great Bay Coast Watch. Much of this sampling has been related to measurement of bacteria for the state's shellfish program for Hampton-Seabrook Harbor. Cains Brook/Mill Creek and its watershed streams, as tributaries to the harbor, have been prime sampling locations for this work. The most recent water quality sampling took place in the summers of 2007-2008 as part of the NHDES Volunteer River Assessment Program (VRAP).

Future Sampling and Studies

Continued sampling of the waters of Seabrook by NHDES is expected to continue although contingent upon staff availability and funding. Annual sampling of the freshwater section of Cains Brook is expected to continue. It is also expected that NHDES will undertake Total Maximum Daily Load (TMDL) studies for all assessment units in the coming years to determine the acceptable pollutant loads. Such a study was undertaken in 2003 for Hampton-Seabrook Harbor. As a base line

for this study, NHDES monitored the seven (7) major tributaries to the harbor during two storm events in 2002. Loading from the two storms sampling dates ranged from 9.75 to 25.6 billion organisms per storm. Post-storm fecal concentrations were particularly high at Mill Creek, indicating a chronic source of bacteria within the Cains Brook/Mill Creek tributary. Based on the TMDL study NHDES established a TMDL for the entire harbor at 1891 million organisms per day. In order for the Mill Creek to meet the TMDL water quality standard for fecal coliform, it would require a reduction of 65% from the current situation. With the results of these studies it is expected that more rigorous water quality protection practices will be required.

Potential Threats to Water Resources

Non-Point Source Pollution

Non-point source pollution is a threat to Seabrook's surface and groundwater resources where storm water runoff from developments and roadways is not properly managed or treated. This runoff may contain sediment and other pollutants such as fertilizer and herbicides from lawns and gardens, as well as oils, greases and heavy metals from parking areas which enter the ponds, lakes, streams and groundwater aquifers of the town. Non-point source contamination may also come from individual septic systems that may discharge E. coli bacteria.

Hazardous Materials

The Bureau of Hazardous Waste in the NHDES maintains a statewide inventory by community of all sites that may have hazardous waste or petroleum products associated with them that may pose a threat to water resources. In Seabrook, the NH DES has listed numerous such sites, although a number of these are closed and do not pose a problem. Included in this list are above ground and underground storage tanks. **See Map 7, Potential Pollution Threats Map** for the location of these threats. Some of these are properly registered with the state and do not pose a threat. There are a number of additional sites that are not active and are of low priority to NH DES. These usually involve underground storage tanks or fuel facilities. At present there are 28 sites in Seabrook that have above and underground storage tanks as shown on **Table 2-4.**

Table 2-4
Above Ground & Underground Storage Tanks

	ID	Site Owner	Program Interests
1	200703005	AERODYNAMICS	Above Ground Storage Tanks
2	199706035	A L PRIME ENERGY	Underground Storage Tanks
4	198605683	BELL ATLANTIC	Underground Storage Tanks
5	198602019	BENOIT DEVELOPMENT CO	Underground Storage Tanks
6	198604014	CAPTAINS QUARTERS	Underground Storage Tanks
7		D. G. O'BRIEN INC.	Underground Storage Tanks
9	198405039		
8	198705069	DDR SEABROOK LLC	Underground Storage Tanks
9		FRANCES EATON	Underground Storage Tanks
	199804020		
10	199209009	ALIN REALTY TRUST	Underground Storage Tanks
11		FPL ENERGY SEABROOK LLC	Underground Storage Tanks
	199309008		Above Ground Storage Tanks
12		GETTY PETROLEUM M--STATION 526	Underground Storage Tanks
	199106013	S PORTLAND ME 04106-2622	
13	198906034	GETTY STATION 55252	Underground Storage Tanks
14		HENKEL CORP	Above Ground Storage Tanks
	199206005	167 BATCHELDER RD	Underground Storage Tanks
15		HOWARD WOLPERT	
	199606023	SALISBURY MA 01952	Underground Storage Tanks
16		JIFFY LUBE INTERNATIONAL INC	Above Ground Storage Tanks
21	199407063		
17	199705024	OBRIENS GENERAL STORE	Underground Storage Tanks
18	199509030	OKEEFES GENERAL STORE	Underground Storage Tanks
19	198904031	RICHDALE STORES, INC.-STORE 90	Underground Storage Tanks
20		ROBERT PRESTON REALTY	Underground Storage Tanks
	199409075	63 OCEAN BOULEVARD	
21	198709030	SEABROOK ELEMENTARY SCHOOL	Underground Storage Tanks
22		SEABROOK FIRE STATION	Underground Storage Tanks
	199809102	87 CENTENNIAL ROAD	Above Ground Storage Tanks
23	200010047	SEABROOK ONE STOP LLC	Underground Storage Tanks
24	200107059	SEABROOK RTE 1 CIRCLE K	Underground Storage Tanks
25	198603047	COCA-COLA BOTTLING CO - NE	Underground Storage Tanks
26	199505047	SPHEREX	Underground Storage Tanks
27		HERITAGE VILLAGE REALTY XTRA MART	Underground Storage Tanks
27	198910013	34 GOODWIN ROAD	
28		YANKEE GREYHOUND RACING INC	Above Ground Storage Tanks
	199708035		Underground Storage Tanks

Source: NH DES One Stop Files, March, 2009

Protected Lands

Protected land includes land that is held in fee simple ownership or conservation easement by the town, state, federal agency or a non-profit conservation agency for the purpose of preservation or conservation. In Seabrook there are a total of 450.6 acres of protected lands of which 316 is in fee ownership, while 23.2 acres is in conservation easement and 111.4 acres are deed restricted or in a protective easement. Much of the protected land includes Seabrook Beach and the associated dunes as well as parcel west of I-95 associated with the protection of Seabrook's groundwater resources as seen on **Map 2, Natural Resources and Map 8, Natural Resources Composite.**

Recent Related Natural Resource Studies

Seabrook/Sun Valley Beach Long-Term Management Plan

In 2004 the town completed a beach management plan to provide a "comprehensive long-term restoration and management plan for the entire town-owned area of Seabrook Beach". The plan undertook a comprehensive inventory and analysis of beach and dune resources and reviewed numerous strategies for the long-term management and maintenance of this valuable resource. The Plan provides strategies and guidance for local planners in both Seabrook and Hampton and regulators with New Hampshire DES Wetlands Bureau to manage the beach and dune environment in a responsible manner. These include:

- Installing sand fencing during the winter season to minimize windblown sand onto shorefront homes;
- Removal and regradng of dune sand that has seriously encroached on certain properties;
- Using harbor dredging material to replenish the beach and
- Continuing to implement the piping plover protection program.

With final local approval for the plan the DES Wetlands Bureau can issue a general permit that will allow for activities to occur that are consistent with the management plan.

Cains Brook/Mill Creek Watershed Management Plan

In 2006 the Seabrook Conservation Commission adopted the *Cains Brook/Mill Creek Watershed Management Plan.* The Plan is intended to achieve a vision for the watershed that provides for:

- protecting land and water resources,
- appropriately managing growth and development, and
- ensuring opportunities for public use and recreation.

Since the adoption of the plan, the Commission has established a watershed planning process in concert with the NH DES consistent with EPA's nine (9) criteria for watershed planning. This process has provided the opportunity for additional funding through the EPA 319 program to help restore the natural resource and recreational values of the watershed, including the dredging of Cains and Cains Mill Pond.

Watershed Action Plan

The Cains Brook Watershed action plan provides a "blueprint" for managing the use of the watershed in manner that allows for development that is sensitive to the natural resources of the watershed while protecting and enhancing its critical resource areas and recreational opportunities.

These actions are aimed at achieving the following goals.

- Improve the water quality of Cains Brook/Mill Creek to meet New Hampshire water quality standards including shellfish standards for E.coli bacteria.
- Improve the management of stormwater runoff in an effort to protect storm water quality and reduce peak stormwater flows.
- Provide suitable recreational opportunities that are directly related to the waters of Cains Brook.
- Build community support for the protection and enhancement of the land and water resources of the Cains Brook Watershed.
- Preserve, protect and restore critical anadromous and freshwater fisheries, wildlife habitat and migration corridors, and rare and endangered species.
- Provide for long-term health and environmental quality of Cains Brook and Mill Creek by ensuring that the Watershed Plan's goals are continually met.

As part of plan implementation, the Conservation Commission has sponsored annual monitoring of Cains Brook, the placement of storm drain plates with a fish image discouraging dumping into the storm drain and in the fall of 2009 the installation of a stormwater treatment device near the pond to capture pollutants from US Route 1and in the spring of 2010 the dredging of Cains Pond.

Conservation of Salt Marsh and Transition Zones Program

The Rockingham Planning Commission (RPC) is also providing technical assistance to the Town of Seabrook to develop a land conservation strategy for salt marsh and uplands abutting salt marsh (called transition zones). The areas selected for conservation provide critical habitat for wildlife and provide flood storage and hazard mitigation for landowners. Sixty two (62) parcels totaling approximately 993 acres have been identified and the RPC is working with land conservation organizations to identify conservation opportunities. The parcels are also identified in several reports as important habitat areas, including the *Land Conservation Plan for NH's Coastal Watersheds* (2006 TNC), the *NH Fish and Game Wildlife Action Plan* (2005), and the NH Audubon report *Avian Use of the Hampton Seabrook Estuary* (2008). Funding for this project is provided by the NH Coastal Program.

Summary and Observations

While much of Seabrook has become developed and currently has one of the highest percentages of impervious cover in the Seacoast, there are a numerous valuable resources areas that remain although they continue to be under threat from man-made impacts. These areas include the beach and dune area, the Hampton-Seabrook estuary and tidal marsh, the various fresh and tidal surface waters including floodplain areas and the groundwater aquifers in western Seabrook. These are identified on **Natural Resources Composite Map**. In order to maintain and protect these resource areas, proper management through regulatory and non-regulatory means is necessary.

Since the last Master Plan a number of zoning ordinance amendments have been put into place to protect the town's natural resources, such as the town's wetlands and groundwater resources. These include:

Article VI. Dimensional Requirements

The following dimensional requirements were added in 2006.

Zoning District	1	2	2R	3	4	5
Limited cut, no disturb buffer adjacent to ponds and streams	25'	25'	25'	25'	25'	25'

Article XV. Surface Water Protection

This article was updated as of the 2006 and 2008 Town Meeting with new provisions for buffer setbacks for wetlands and water bodies, including a 25-foot buffer adjacent to ponds and streams. In addition, there are specific guidelines with respect to removal of vegetation from wetlands.

Article XVI. Aquifer Protection

In 2007, the Planning Board developed an Aquifer Protection Overlay District which was approved by the 2008 Town Meeting. This district extends over all the land within Seabrook west of I-95. It prohibits a number of uses such as activities involved in hazardous or toxic materials, storage of road salt, and automotive repair, filling stations, car washes and salvage yards.

Subdivision Regulations

The Seabrook Planning Board amended the Subdivision Regulations in December of 2007 by adding a new Section N to Article V that requires any development with a stormwater management system to prepare an operation and maintenance manual to ensure that the system functions as designed. The manual must include a schedule for inspection and maintenance and the inspection reports shall be submitted to the Code Enforcement Officer and the Department of Public Works. In addition, the Planning Board amended the Subdivision Regulations by adding a new Section U to Article VI – Shoreland Vegetation requiring that shoreland vegetation be consistent with the recommendations specified in the NH DES document Native Shoreland/Riparian Buffer Plantings for New Hampshire.

The Seabrook Code of Land Use Regulations is cross-referenced so that provisions of the Subdivision Regulations are incorporated by reference in the Site Plan Regulations. Thus, the above amendments would also apply to multi-family and non-residential development.

A full discussion of the Current Regulatory Programs for natural resource protection can be found in the *Cains Brook and Mill Creek Watershed Management Plan*, revised 9/6/08. Further regulatory efforts may be required to ensure the long-term viability of Seabrook's valuable natural resource areas. Such efforts include:

- Continuing to implement the recommendations of the *Cains Brook and Mill Creek Watershed Management Plan.*
- Continue to implement the recommendations of the Seabrook/Sun Valley Beach Long-Term Management Plan.
- Consider the adoption of recommendations from the recently completed study by the RPC, *Adaptation Strategies to Protect Areas of Increased Risk from Coastal Flooding Due to Climate Change*.
- Adopting regulatory changes to better balance the growth of residential activities and open space such as reconsidering a cluster-type ordinance such as an Open Space Development overlay option or Village District ordinance that would allow higher density in the village in exchange for additional lands devoted to conservation.
- Adopt a Shoreland Protection Overlay District for areas not covered by the state's Comprehensive Shoreland Protection Act to protect water quality.
- Review the town's Wetland Regulations to determine if they are properly protecting the town's wetland resource areas.

Action Plan

Vision Goal for Natural Resources

Preserve and protect Seabrook's natural and beach/estuarine environment in balance with recreational, economic, business and employment opportunities for its citizens.

Beach, Dunes and Estuary

Objective1: Balance the competing demands for the use of Seabrook's beach, dune and estuarine system in a manner that protects the physical integrity and sensitive habitats of the beach and dune system while providing for appropriate recreational uses.

Actions

NR1.1: Obtain a General Permit from the NH DES to implement the recommendations for beach and dune management consistent with the *Seabrook/Sun Valley Beach Long-Term Management Plan, 2004*.

NR 1.2: Continue to coordinate with state agencies and natural resource non-profit entities such as NH Audubon to support fish and wildlife assessment and monitoring projects.

NR 1.3: Continue to coordinate with the US Fish and Wildlife Service on the plover nesting protection program. (Consistent with *Seabrook/Sun Valley Beach Long-Term Management Plan, 2004)*

NR 1.4: Ensure that Seabrook Beach is a high quality recreational asset by:

- Maintaining designated public access ways.
- Provide sitting benches in strategic locations and barrels for litter disposal.
- Continue to provide spring and fall clean-up and beach regrading programs.
- Work with state to have dredge materials from periodic dredging of Hampton-Seabrook Harbor placed on Seabrook Beach.

(Consistent with *Seabrook/Sun Valley Beach Long-Term Management Plan, 2004)*

Objective 2: Minimize storm and flood damage to existing developed properties in the dune and estuarine area.

Actions

NR 2.1: Adopt the recommendations of the study on adaptation strategies for coastal flooding prepared by the Rockingham Planning Commission in 2009.
(Adaptation Strategies to Protect Areas of Increased Risk from Coastal Flooding Due to Climate Change, Seabrook, NH)

NR 2.2: Protect key municipal infrastructure to the greatest extent possible.

NR 2.3 Review the Floodplain Development Ordinance in concert with any other regulatory changes that may be considered in Action 2.1 above. As part of this review consider the following:

- Establishing the floodplain area as an overlay district with permitted, non-permitted and conditional uses. (See Innovative Land Use Planning Techniques,

October, 2008). The aim would be to encourage those uses within the floodplain area that are either enhanced or unharmed by flooding.
- Amending the current ordinance to establish the lowest floor elevation at least one foot above base flood elevation.
- Extending the geographic area of flood hazard zone to account for the potential increase in sea level as identified in the Adaptation Strategies Study.

Tidal and Fresh Water Wetland Protection

Objective 3: Protect and maintain the valuable functions of both tidal and fresh water wetlands and associated buffer areas by minimizing the impact of development and allowing appropriate multiple use of these resources for recreation, wildlife habitat and limited timber harvest.

Actions

NR 3.1: Continue to work with landholders in the upland buffer areas of tidal wetlands to preserve and protect these resource areas.

NR 3.2: Amend the Zoning Ordinance under Article XV, Wetlands, to:

- Incorporate protection of vernal pools,
- Define permitted, prohibited and conditional uses,
- Include provision for a buffer area adjacent to tidal wetlands that limits allowable uses and activities to minimize any impact to tidal wetlands and salt marsh. One example might be a limitation on the use of fertilizers within 50 feet of such surface waters.

Fresh and Tidal Water Quality

Objective 4: Maintain and upgrade the water quality of Seabrook's streams in order to meet the state standards for water quality.

Actions

NR 4.1: Continue to implement the recommended actions of the *Cains Brook/Tide Mill Creek Watershed Management Plan.* Where appropriate apply similar actions to other small watersheds in Seabrook such as the Gove Brook/ Hampton Falls River and the Browns River Watersheds.

NR 4.2: Ensure that structural elements of the municipal stormwater system is managed and maintained in a manner that meets the EPA MS4 program.

NR 4.3: Adopt a local Shoreland Protection Overlay District that is consistent with the State of New Hampshire's Comprehensive Shoreland Protection Act (CSPA).

- Such an ordinance will contribute to the long-term quality of Seabrook's surface waters. It will also help to preserve the aesthetic qualities of these shoreline areas, protect aquatic habitat and upland wildlife, and promote recreational opportunities for Seabrook residents.

- This ordinance should include provisions requiring all structures to be set back a minimum of fifty (50) feet from all surface waters through the designation of a Riparian Buffer. The ordinance should also limit impervious cover, minimize vegetative disturbance and prohibit certain uses that may cause significant pollution to the town's ground and surface waters.

NR 4.4: Encourage Town of Seabrook DPW, NH Department of Transportation, key businesses and landowners to employ Best Management Practices to treat stormwater runoff.

NR 4 5: Continue to monitor water quality at appropriate locations along Seabrook's streams and within the estuary in cooperation with personnel from NHDES. *(Consistent with Cains Brook and Mill Creek Watershed Management Plan, 2006).*

NR 4.6: Amend the definition for Best Management Practices in Subdivision Regulations to replace the reference to the 1992 Stormwater Management publication by the RCCD in 1992 to *New Hampshire Stormwater Manual Volumes 1-3,* (2009, as amended).

Groundwater Protection

Objective 5: Protect Seabrook's groundwater aquifers to ensure a long-term supply of potable drinking water.

Actions

NR 5.1: Strengthen the Aquifer Protection Overlay District provisions to include specific requirements and standards for activities within the district. Such standards could address impervious cover, infiltration, storm water treatment, setbacks from known producing wells and provision for Planning Board option to require a hydrogeologic study.

NR 5.2: Amend the earth excavation regulations to be more consistent with New Hampshire's *Earth Materials Removal* law (*RSA 155-E). (Consistent with Master Plan Recommendation from 2000 Master Plan*.)

Open Space and Conservation

Objective 6: Protect and manage Seabrook's valuable open space resources by providing an integrated network of open space areas and recreation facilities.

Actions

NR 6.1: Develop a Comprehensive Open Space Protection Plan that would reserve key natural features such as ponds, streams, rivers, quality viewscapes, freshwater and tidal wetlands, and other valuable open space areas that contribute to Seabrook's character.

This plan would include:

- All community owned and managed recreation properties as well as conservation lands that are owned for conservation purpose or have conservation easements in place.
- Regulated natural resource lands such as wetlands, floodplains, wildlife corridors and shorelands.
- Newly acquired conservation and recreation lands.

NR 6.2: Improve, protect, and encourage public access to Seabrook's surface waters and open space lands.

NR 6.3: Establish a list of key properties and areas suitable for purchase or easement to protect shoreline areas. When funds become available (such as the Seabrook Conservation Fund), the priority properties could be acquired or easements

obtained. *(Consistent with Cains Brook and Mill Creek Watershed Management Plan, 2006).*

NR 6.4: Re-establish Cains Pond and Cains Mill Pond as high quality open space and recreation areas consistent with the recommended actions of the Cains Mill/Tide Mill Creek Watershed Management Plan such as pond dredging. *(Consistent with Cains Brook and Mill Creek Watershed Management Plan, 2006).*

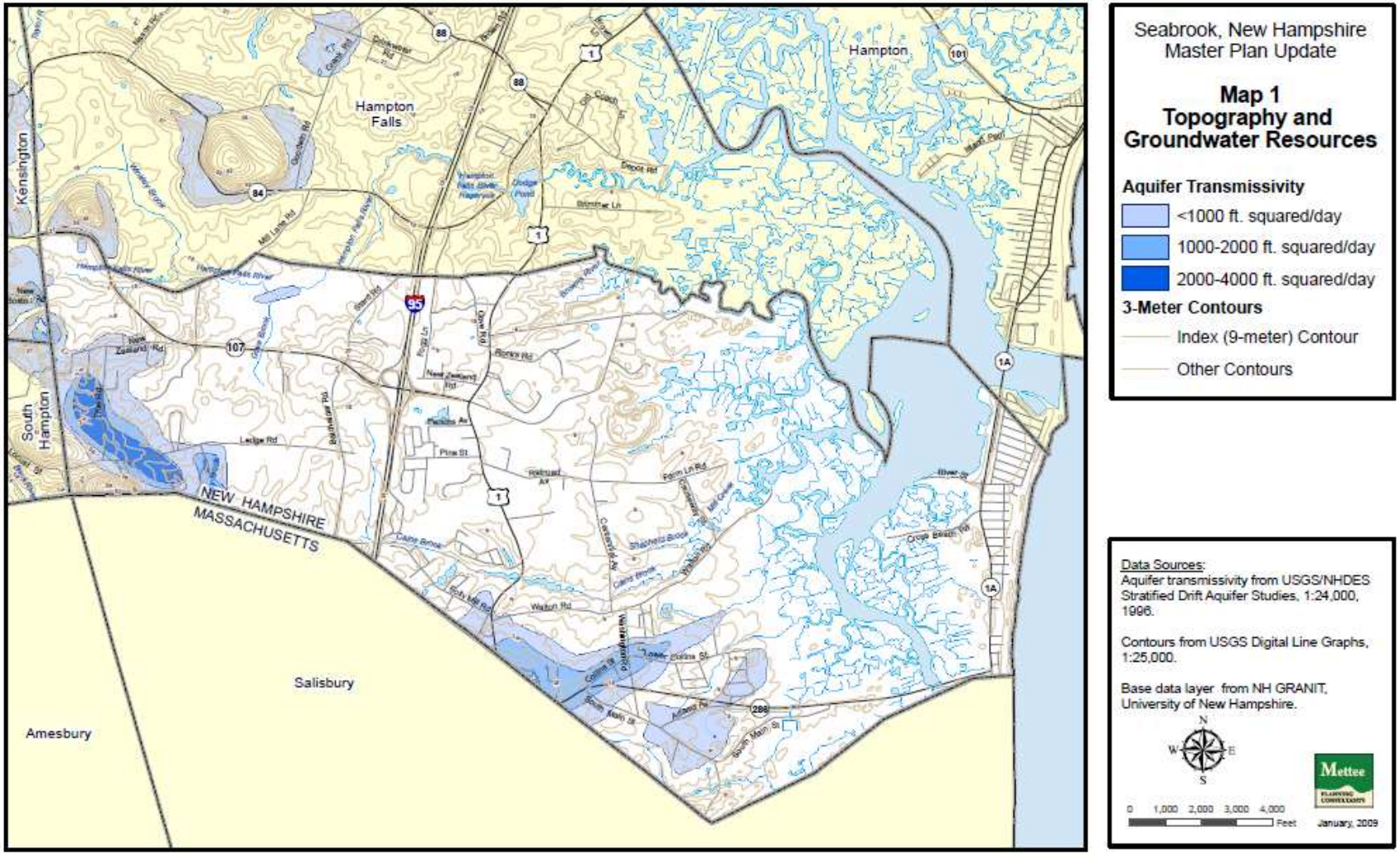
Objective 7: Encourage new developments to protect and, where possible, enhance valuable natural and open space resources.

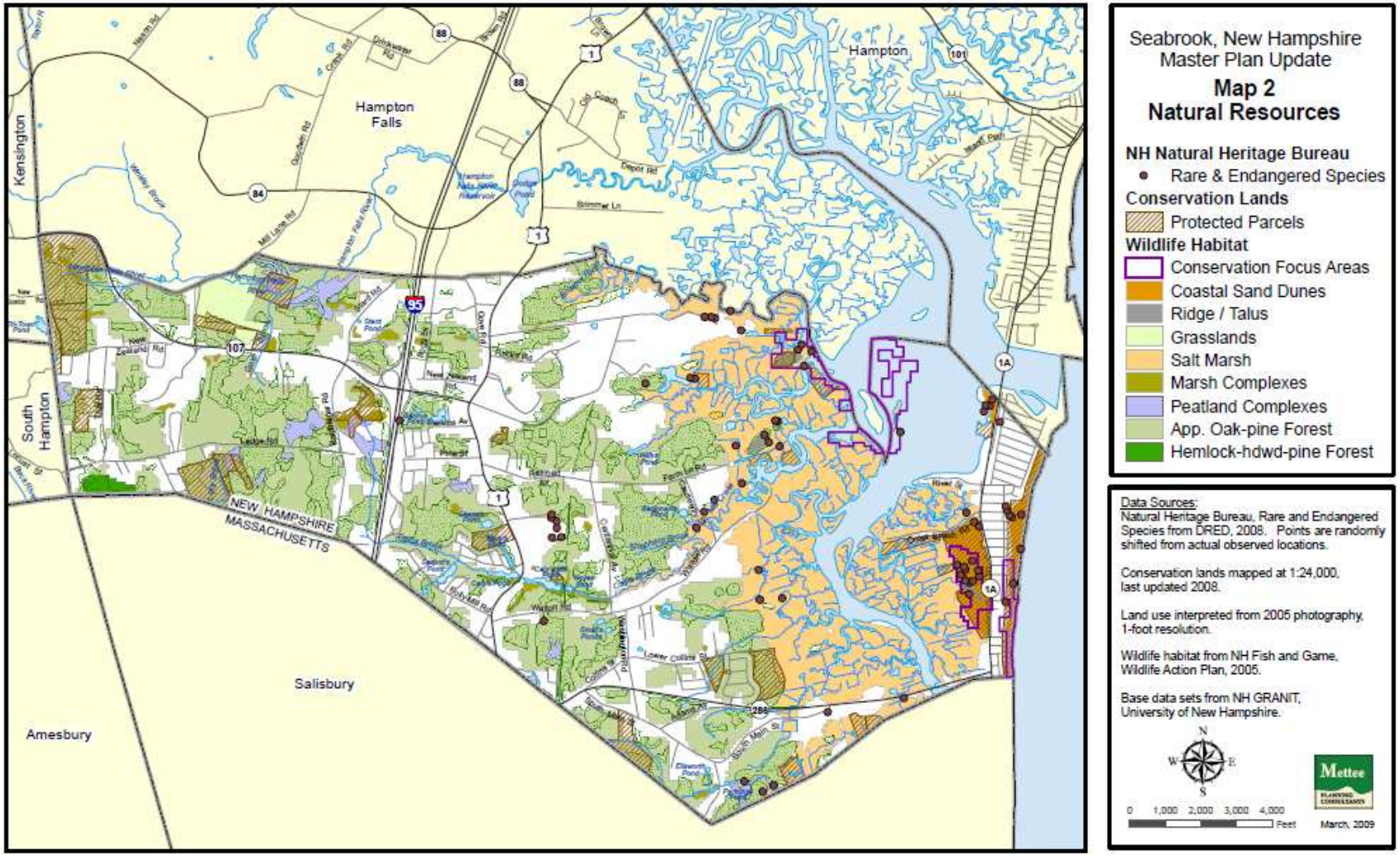
Actions

NR 7.1: Establish an Open Space Development Regulation that would allow an option for increased density while legally protecting a significant portion of open space for both natural resource protection and recreational opportunities

NR 7.2: Consider establishing a Density Transfer System that would encourage a developer to transfer development rights from a more rural portion of the town to an area that would allow for higher density such as a village district or higher density residential area. The developer would place the rural land area in permanent open space.

Appendix 2A
Natural Resources Maps
Seabrook Master Plan Update-2011




Seabrook, New Hampshire
Master Plan Update
Map 2
Natural Resources
NH Natural Heritage Bureau
Rare & Endangered Species
Conservation Lands
Protected Parcels
Wildlife Habitat
Conservation Focus Areas
Coastal Sand Dunes
Ridge / Talus
Grasslands
Salt Marsh
Marsh Complexes
Peatland Complexes
App. Oak-pine Forest
Hemlock-hdwd-pine Forest
Data Sources:
Natural Heritage Bureau, Rare and Endangered Species from DRED, 2008. Points are randomly shifted from actual observed locations.
Conservation lands mapped at 1:24,000, last updated 2008.
Land use interpreted from 2005 photography, 1-foot resolution.
Wildlife habitat from NH Fish and Game, Wildlife Action Plan, 2005.
Base data sets from NH GRANIT, University of New Hampshire.
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Amesbury
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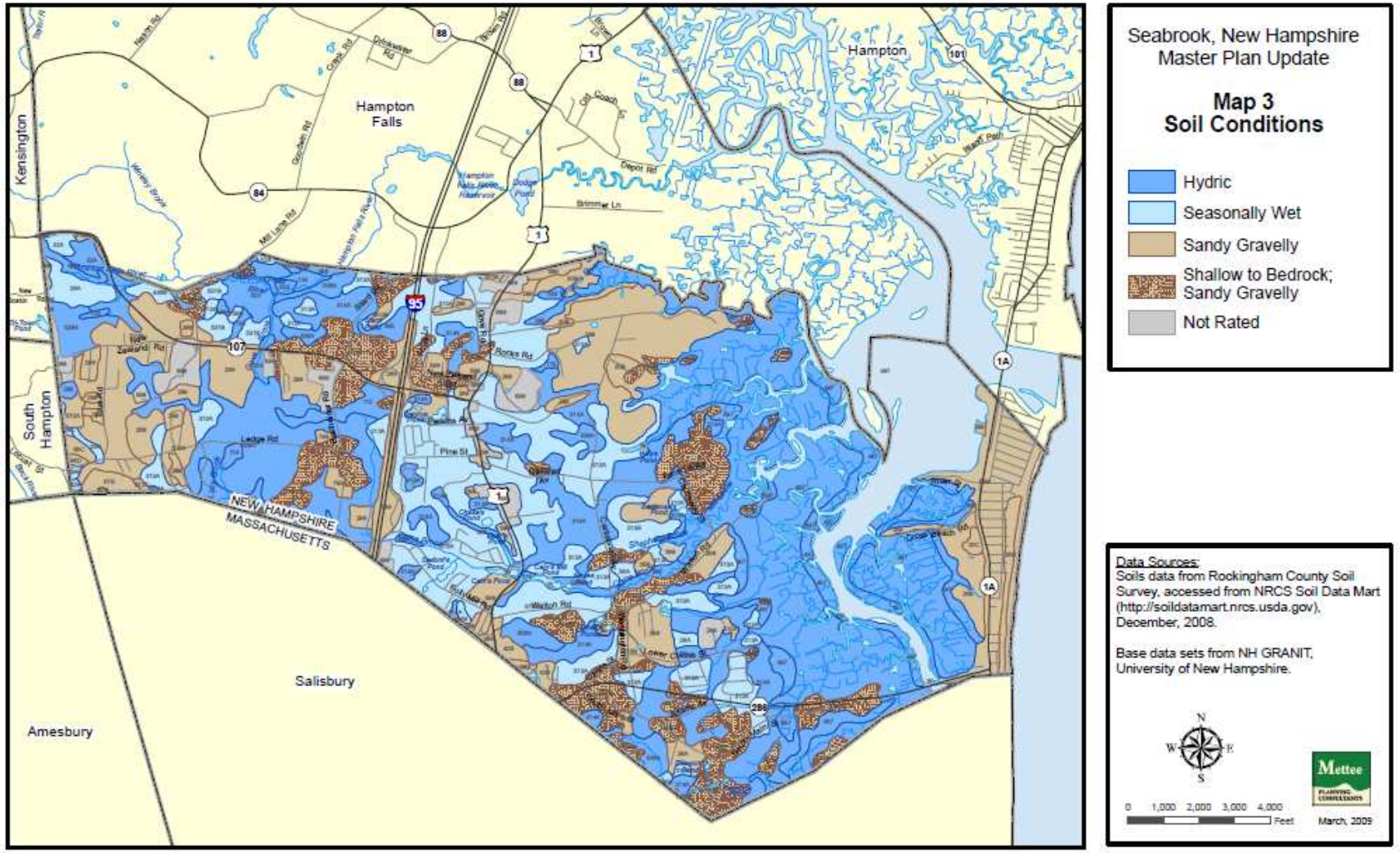
MASSACHUSETTS


Seabrook, New Hampshire
Master Plan Update
Map 3
Soil Conditions
Hydric
Seasonally Wet
Sandy Gravelly
Shallow to Bedrock; Sandy Gravelly
Not Rated
Hampton
Hampton Falls
Kensington
South Hampton
Salisbury
Amesbury
NEW HAMPSHIRE
MASSACHUSETTS
Data Sources:
Soils data from Rockingham County Soil Survey, accessed from NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov), December, 2008.
Base data sets from NH GRANIT, University of New Hampshire.
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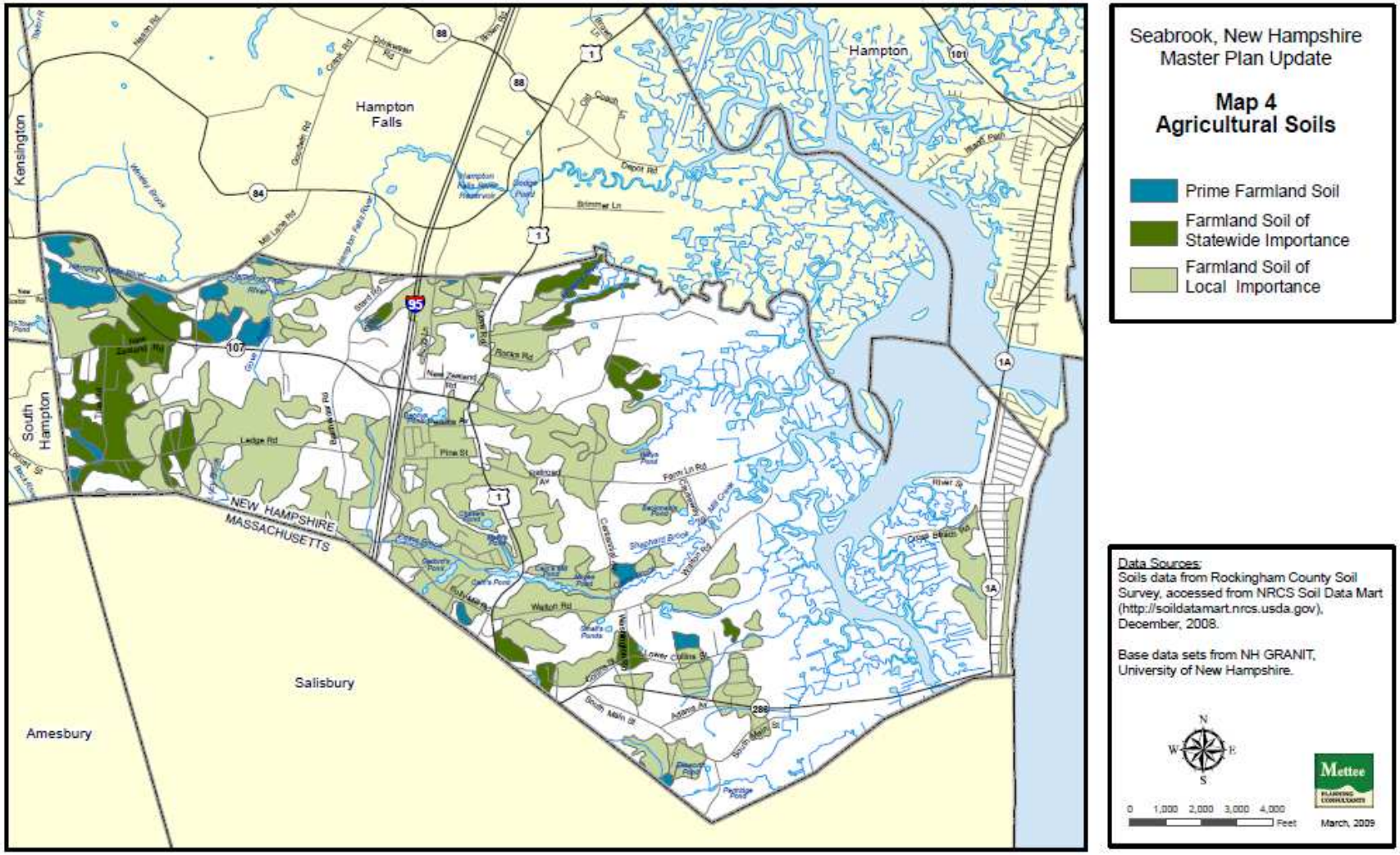
Seabrook, New Hampshire
Master Plan Update
Map 4
Agricultural Soils
Prime Farmland Soil
Farmland Soil of Statewide Importance
Farmland Soil of Local Importance
Hampton
Hampton Falls
Kensington
South Hampton
Salisbury
Amesbury
NEW HAMPSHIRE
MASSACHUSETTS
Data Sources:
Soils data from Rockingham County Soil Survey, accessed from NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov), December, 2008.
Base data sets from NH GRANIT, University of New Hampshire.
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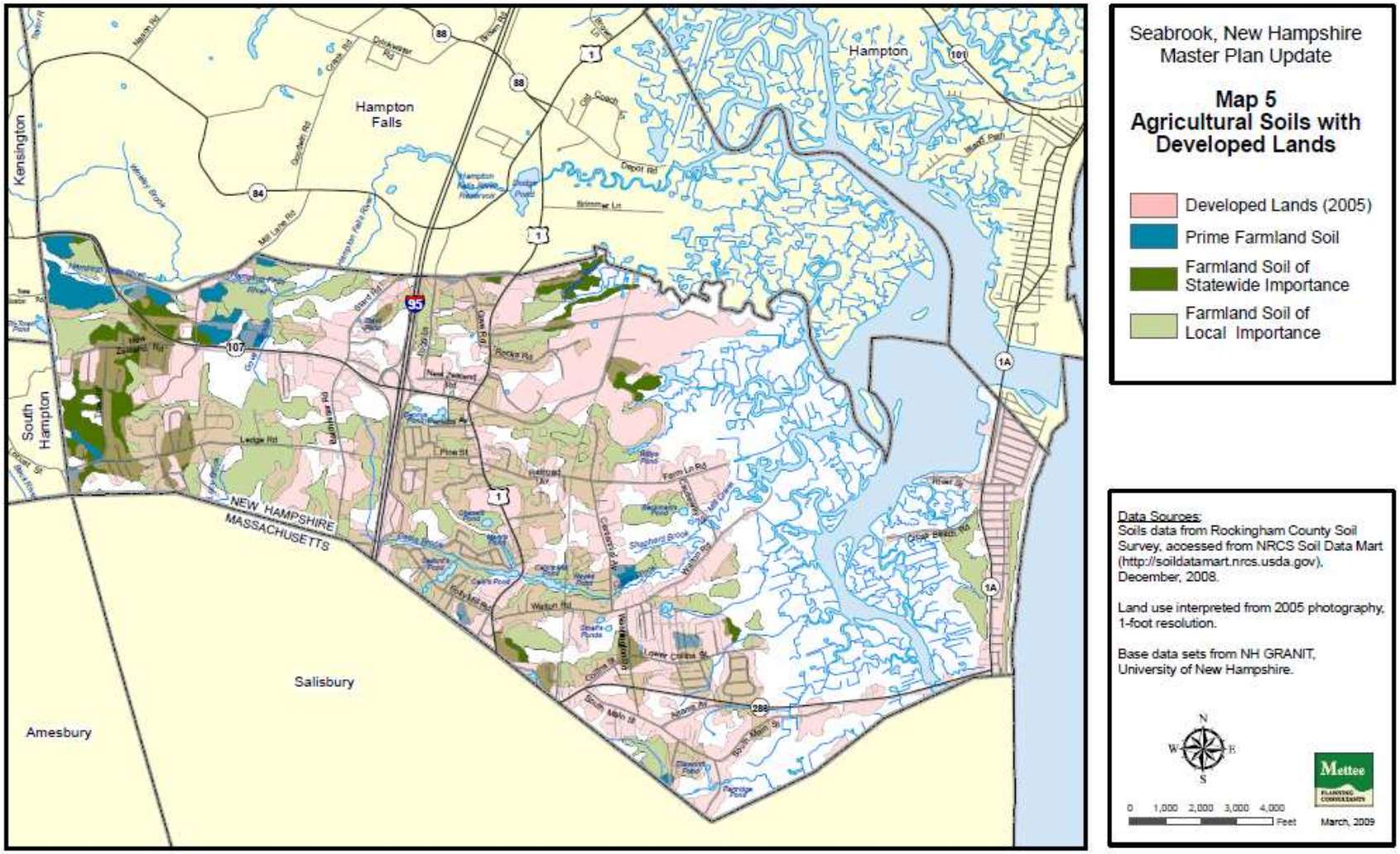
Seabrook, New Hampshire
Master Plan Update
Map 5
Agricultural Soils with
Developed Lands
Developed Lands (2005)
Prime Farmland Soil
Farmland Soil of
Statewide Importance
Farmland Soil of
Local Importance
Hampton
Hampton
Falls
Kensington
South
Hampton
Salisbury
Amesbury
NEW HAMPSHIRE
MASSACHUSETTS
Data Sources:
Soils data from Rockingham County Soil
Survey, accessed from NRCS Soil Data Mart
(http://soildatamart.nrcs.usda.gov),
December, 2008.
Land use interpreted from 2005 photography,
1-foot resolution.
Base data sets from NH GRANIT,
University of New Hampshire.
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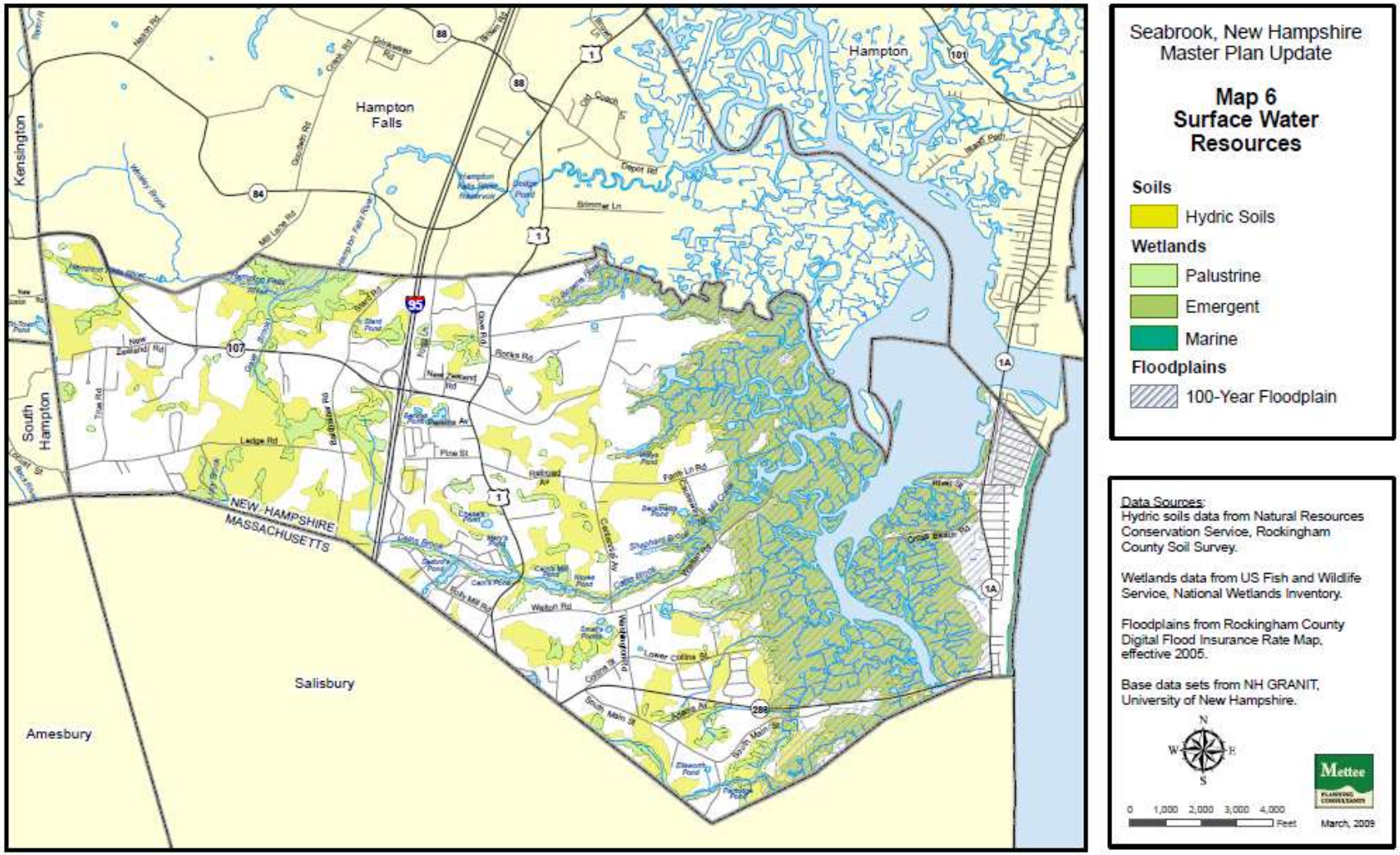
Seabrook, New Hampshire
Master Plan Update
Map 6
Surface Water Resources
Soils
Hydric Soils
Wetlands
Palustrine
Emergent
Marine
Floodplains
100-Year Floodplain
Data Sources:
Hydric soils data from Natural Resources Conservation Service, Rockingham County Soil Survey.
Wetlands data from US Fish and Wildlife Service, National Wetlands Inventory.
Floodplains from Rockingham County Digital Flood Insurance Rate Map, effective 2005.
Base data sets from NH GRANIT, University of New Hampshire.
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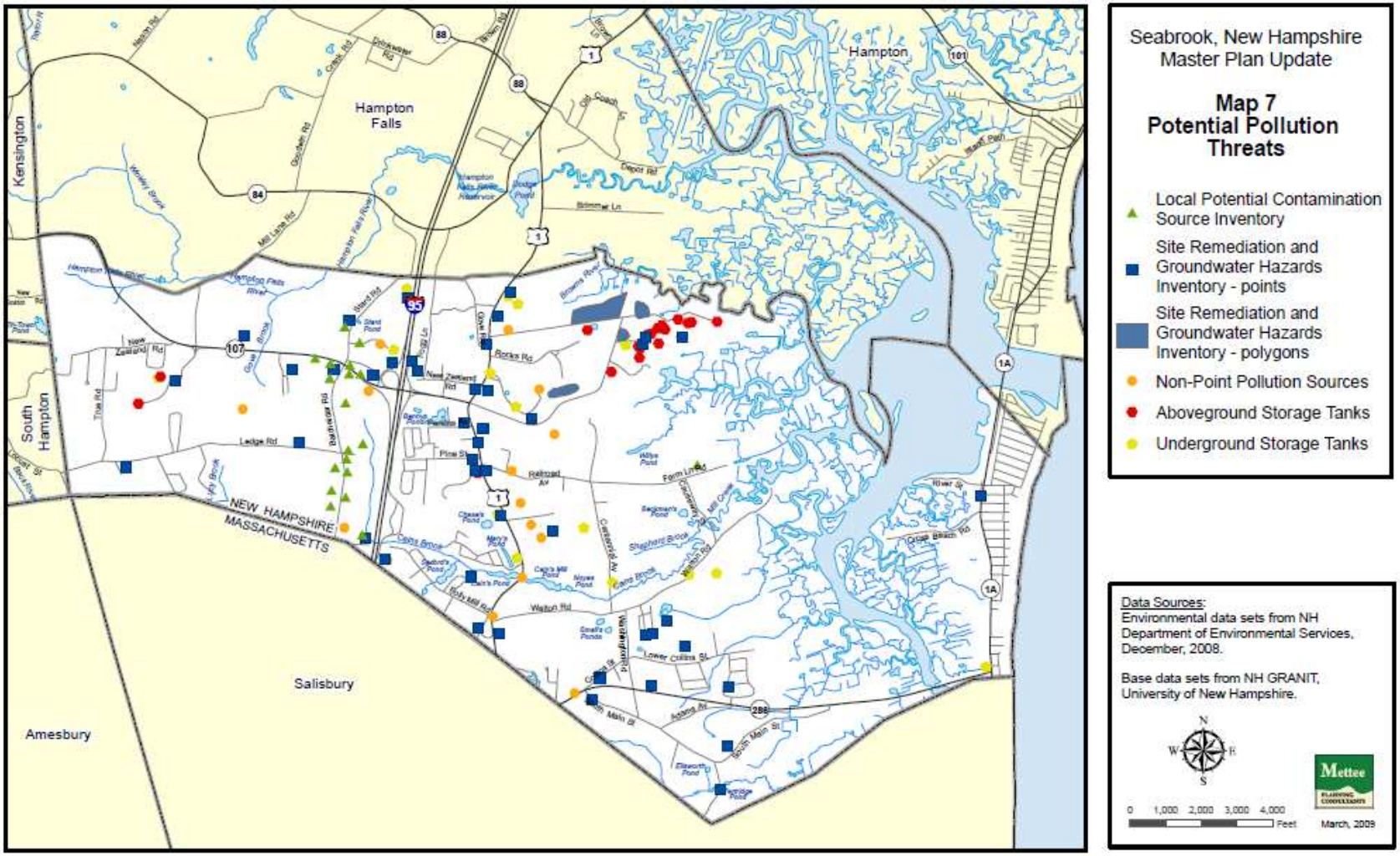
NEW HAMPSHIRE
MASSACHUSETTS


Seabrook, New Hampshire
Master Plan Update
Map 7
Potential Pollution Threats
Local Potential Contamination Source Inventory
Site Remediation and Groundwater Hazards Inventory - points
Site Remediation and Groundwater Hazards Inventory - polygons
Non-Point Pollution Sources
Aboveground Storage Tanks
Underground Storage Tanks
Hampton
Hampton Falls
Kensington
South Hampton
Salisbury
Amesbury
NEW HAMPSHIRE
MASSACHUSETTS
Data Sources:
Environmental data sets from NH Department of Environmental Services, December, 2008.
Base data sets from NH GRANIT, University of New Hampshire.
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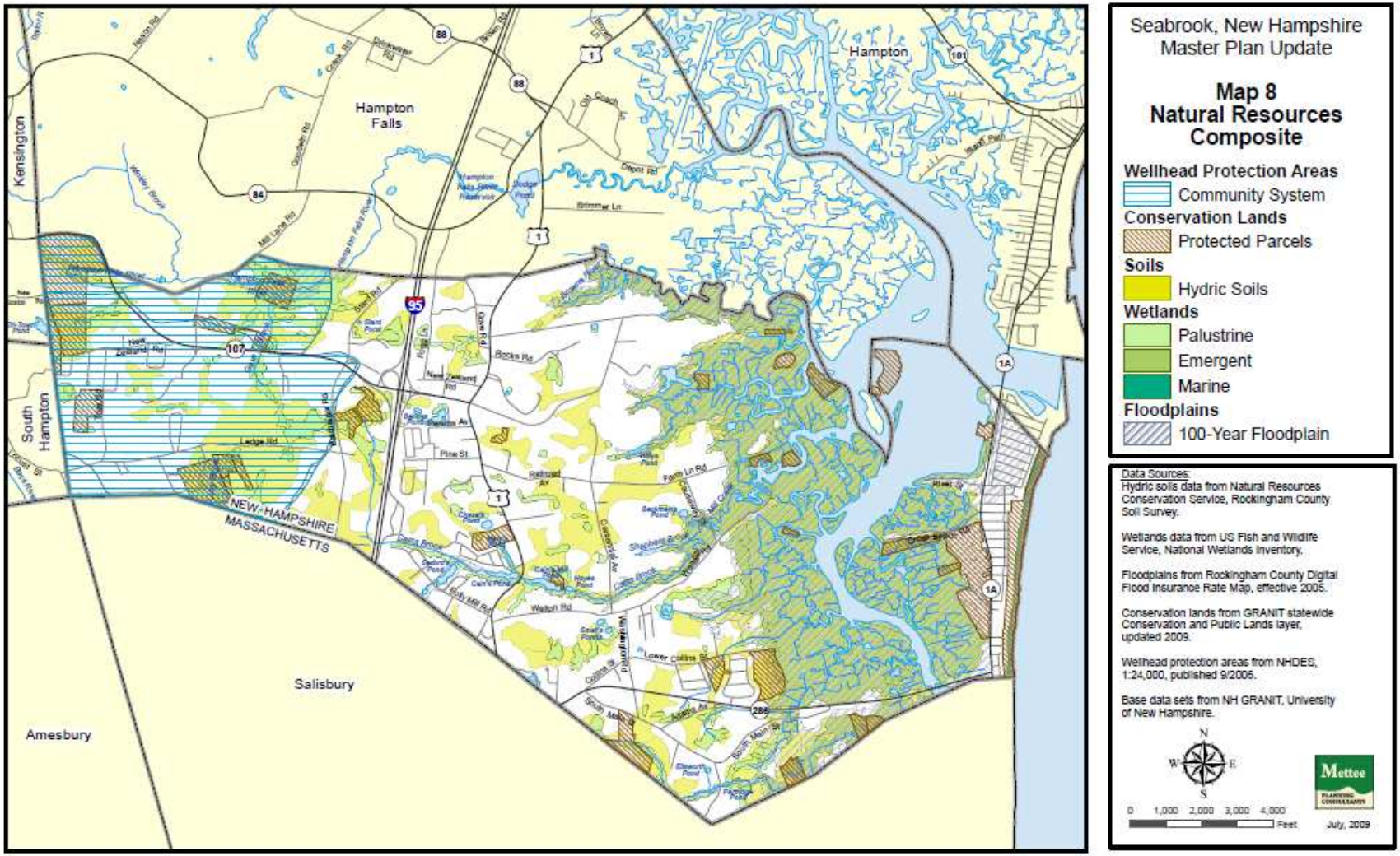
March, 2009


Seabrook, New Hampshire
Master Plan Update
Map 8
Natural Resources
Composite
Wellhead Protection Areas
Community System
Conservation Lands
Protected Parcels
Soils
Hydric Soils
Wetlands
Palustrine
Emergent
Marine
Floodplains
100-Year Floodplain
Data Sources:
Hydric soils data from Natural Resources Conservation Service, Rockingham County Soil Survey.
Wetlands data from US Fish and Wildlife Service, National Wetlands Inventory.
Floodplains from Rockingham County Digital Flood Insurance Rate Map, effective 2005.
Conservation lands from GRANIT statewide Conservation and Public Lands layer, updated 2009.
Wellhead protection areas from NHDES, 1:24,000, published 9/2006.
Base data sets from NH GRANIT, University of New Hampshire.
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MASSACHUSETTS

Appendix 2B

Rare Plants, Rare Animals, and Exemplary Natural Communities

Seabrook, New Hampshire

Flag	Species or Community Name	Listed? Federal	State	# reported last 20 Town	State
	Natural Communities - Terrestrial				
*	Bayberry - beach plum maritime shrubland	--	-	1	2
*	Beach grass grassland	--	-	3	4
**	Dry Appalachian oak - hickory forest	--	-	1	15
*	Hudsonia maritime shrubland	--	-	1	1
*	Maritime wooded dune	--	-	1	1
	Natural Communities - Palustrine				
*	Coastal interdunal marsh/swale	--	-	1	1
	Natural Communities - Estuarine				
**	Brackish marsh	--	-	2	13
*	Coastal shoreline strand/swale	--	-	1	1
***	High salt marsh	--	-	1	14
***	Low salt marsh	--	-	1	6
***	Saline/brackish intertidal flat	--	-	1	6
***	Saline/brackish subtidal channel/bay bottom	--	-	1	6
***	Tidal creek bottom	--	-	1	6
	Plants				
*	American Plum (*Prunus americana*)	--	E	1	7
	Arethusa (*Arethusa bulbosa*)	--	T	Historical	21
***	Beach Grass (*Ammophila breviligulata*)	--	T	3	10
	Bulbous Bitter Cress (*Cardamine bulbosa*)	--	E	Historical	5
	Climbing Hempweed (*Mikania scandens*)	--	T	Historical	10
	Coast-blite Goosefoot (*Chenopodium rubrum*)	--	E	Historical	6
	Common Sandbur (*Cenchrus longispinus*)	--	E	Historical	11
	Cross Polygala (*Polygala cruciata var. aquilonia*)	--	E	Historical	3
**	Dwarf Glasswort (*Salicornia bigelovii*)	--	E	2	7
	Engelmann's Quillwort (*Isoetes engelmannii*)	--	E	Historical	15
	Erect Knotweed (*Polygonum erectum*)	--	E	Historical	3
**	Gray's Umbrella Sedge (*Cyperus grayi*)	--	E	3	1
*	Hackberry (*Celtis occidentalis*)	--	T	1	15
**	Hairy Hudsonia (*Hudsonia tomentosa var. tomentosa*)	--	T	3	5
	Inkberry (*Ilex glabra*)	--	E	Historical	1
	Long-fruited Anemone (*Anemone cylindrica*)	--	E	Historical	1
**	Missouri Rock Cress (*Arabis missouriensis*)	--	T	1	10
	Netted Chain Fern (*Woodwardia areolata*)	--	E	Historical	4
	Nuttall's Reedgrass (*Calamagrostis cinnoides*)	--	E	Historical	5
**	Orange Horse-gentian (*Triosteum aurantiacum*)	--	E	2	2
	Prolific Knotweed (*Polygonum prolificum*)	--	E	Historical	9
	Robust Knotweed (*Persicaria robustior*)	--	E	Historical	6
*	Salt Marsh Fleabane (*Pluchea odorata var. succulenta*)	--	E	1	1
**	Salt-loving Spike-rush (*Eleocharis uniglumis*)	--	T	2	11
***	Salt-marsh Gerardia (*Agalinis maritima*)	--	T	4	10
	Salt-meadow Grass (*Leptochloa fusca ssp. fascicularis*)	--	E	Historical	1
**	Sand Dropseed (*Sporobolus cryptandrus*)	--	T	1	4
**	Sea-beach Needle Grass (*Aristida tuberculosa*)	--	E	3	2
	Sea-chickweed (*Honckenya peploides ssp. robusta*)	-- -		Historical	1
**	Small Spike-rush (*Eleocharis parvula*)	--	T	1	20
**	Tall Wormwood (*Artemisia campestris ssp. caudata*)	--	T	3	4
	Tubular Thoroughwort (*Eupatorium fistulosum*)	--	E	Historical	7
	Tundra Alkali Grass (*Puccinellia tenella ssp. langeana*)	--	E	Historical	3
	Woody Glasswort (*Sarcocornia perennis*)	--	E	Historical	4
	Yellow Thistle (*Cirsium horridulum*)	--	E	`Historical	3

Vertebrates - Birds				
** Common Tern (*Sterna hirundo*)	--	T	1	9
** Piping Plover (*Charadrius melodus*)	T	E	1	1
** Willet (*Catoptrophorus semipalmatus*)	--	-	1	5
Vertebrates - Reptiles				
** Blanding's Turtle (*Emydoidea blandingii*)	--	E	1	119

Listed? E = Endangered T = Threatened W = Special concern (watch list) M = Monitored

Flags

**** = Highest importance
*** = Extremely high importance
** = Very high importance
* = High importance

These flags are based on a combination of (1) how rare the species or community is and (2) how large or healthy its examples are in that town. Please contact the Natural Heritage Bureau at (603) 271-2214 to learn more about approaches to setting priorities.

Adapted from: Rare Plants, Rare Animals, and Exemplary Natural Communities in New Hampshire Towns, prepared by NH Natural Heritage Bureau, January 2009

Plants, Animals, and Natural Communities Tracked by the NH Natural Heritage Bureau Explanation for Listing

The above list notes the rare plants, rare animals, and exemplary natural communities that the NH Natural Heritage Bureau has on record for Seabrook. This document may not be used as a substitute for NH Natural Heritage Bureau reviews that are required by the Department of Environmental Services, Federal Energy Regulatory Commission or any other local, state, or federal government agency. *A few species that are highly vulnerable to collection are not included in the town lists.* In addition, the list is dynamic as new populations and natural communities are reported to our office, the list grows. Planners and interested residents should therefore contact the NH Natural Heritage Bureau directly if they need up-to-date information or have questions.

Exemplary Natural Communities
Natural communities are basically different types of forests, wetlands, grasslands, etc. formally defined as assemblages of plants and animals that recur in predictable patterns across the landscape under similar physical conditions. Most of the New Hampshire landscape is covered by relatively common natural community types. Scattered throughout the state, however, and usually in predictable areas, are distinctive communities found in few other places. Particular sets of natural communities tend to co-occur in the landscape and are linked by a common set of driving forces, such as landforms, flooding, soils, and nutrient regime. These are referred to as natural community systems. Systems are at an appropriate scale for many conservation applications, including mapping and predictive modeling, correspondence to wildlife and wildlife habitats, and as direct conservation targets in conservation planning.

The NH Natural Heritage Bureau tracks "exemplary" natural community and system occurrences. To qualify as exemplary, a natural community or system in a given place must be of a rare type, such as a calcareous riverside seep, or must be a very old occurrence of a common community in good condition, such as an old-growth spruce - fir forest.

Rare Plant Species
The NH Natural Heritage Bureau tracks the state's rarest and most imperiled plant species. We have identified these plants in cooperation with researchers, conservation organizations such as The Nature Conservancy, and knowledgeable amateur botanists. We obtained plant locations from sources including herbarium specimens (some dating from the late 1800s), personal contacts, the scientific literature, and through extensive field research. The NH Natural Heritage Bureau undertakes surveys on private property only with landowner permission.

Rare Animal Species

The NH Natural Heritage Bureau tracks rare animal species in cooperation with the Nongame & Endangered Wildlife Program of the NH Fish & Game Department. The Nongame Program has identified these species in cooperation with researchers, conservation organizations such as the Audubon Society of New Hampshire, knowledgeable amateur biologists, and the NH Natural Heritage Bureau. Wildlife locations were obtained from sources including museum specimens, personal contacts, the scientific literature, and through extensive field research.

Appendix 2C

Summary of Water Quality Assessment Units

Location of Assessment Unit	Use Assessment	Contaminant Causing Impairment
River (stream) Units		
Browns River—NHRIV600031004-7	Does not support fish consumption. Other uses not assessed.	Mercury
Cains Brook—NHRIV600031004-10	Does not support fish consumption or primary/secondary contact recreation. Other uses not assessed.	Mercury and E. coli.
Cains Brook—NHRIV600031004-11	Does not support fish consumption. Other uses not assessed.	Mercury.
Cains Brook—NHRIV600031004-12	Does not support fish consumption or primary and secondary contact recreation. Other uses not assessed.	Mercury and E. coli.
Cains Brook—NHRIV600031004-14	Does not support fish consumption. Other uses not assessed..	Mercury
Unnamed Brook to Cains Brook—NHRIV600031004-09 (Unnamed brook is known locally as Folly Brook)	Does not support fish consumption. Marginally impaired for aquatic life. Other uses not assessed.	Mercury.
Mary's Brook—NHRIV600031004-17	Does not support fish consumption. Other uses not assessed	Mercury
Unnamed Brook to Morrill's Creek NHRIV600031004-13	Does not support fish consumption. Other uses not assessed	Mercury
Impoundment (pond) Units		
Secord's Pond—NHIMP600031004-04	Does not support fish consumption. Other uses not assessed.	Mercury.
Cains Pond—NHIMP600031004-05	Does not support fish consumption. Other use under consideration—secondary contact recreation.	Mercury.
Cains Mill Pond –NHIMP600031004-06	Does not support fish consumption. Other use under consideration—secondary contact recreation.	Mercury.
Mary's Pond–NHIMP600031004-06	Does not support fish consumption. Does support primary and secondary contact recreation. Other uses not assessed.	Mercury
Estuary Unit		
Mill Creek-NHEST600031004-07	Does not support fish consumption or shell fishing. Recreation was not assessed or there was insufficient information to make an assessment. Other uses not assessed	Due to mercury, PCB's, fecal coliform, and dioxin.
Blackwater River-NHEST600031004-08-04	Does not support fish consumption or shell fishing. Recreation was not assessed or there was insufficient information to make an assessment. Other uses not assessed	Due to mercury, PCB's, fecal coliform, and dioxin
Blook Creek-NHEST600031004-08-05	Does not support fish consumption or shell fishing. Recreation was not assessed or there was insufficient information to make an assessment. Other uses not assessed	Due to mercury, PCB's, fecal coliform, and dioxin.
Seabrook Harbor Beach NHEST600031004-0-05	Does not support fish consumption, shell fishing or primary contact recreation. Supports secondary contact recreation. Other uses not assessed or insufficient information to make an assessment	Due to mercury, PCB's, fecal coliform, and dioxin.

Fish Coop--NHEST600031004-09-07	Does not support fish consumption or shell fishing. Recreation was not assessed or there was insufficient information to make an assessment. Other uses not assessed	Due to mercury, fecal coliform, PCB's and dioxin.
Hampton-Seabrook Harbor--NHEST600031004-09-09	Does not support fish consumption or shell fishing. Primary & Secondary Recreation & aquatic life supported. Wildlife not assessed.	Due to mercury, fecal coliform, PCB's and dioxin.
Hunt's Island Creek (upper)--NHEST600031004-06-02	Does not support fish consumption or shell fishing. Recreation was not assessed or there was insufficient information to make an assessment. Other uses not assessed	Due to mercury, fecal coliform, PCB's and dioxin.
Hunt's Island Creek (lower)--NHEST600031004-06-01	Does not support fish consumption or shell fishing. Recreation was not assessed or there was insufficient information to make an assessment. Other uses not assessed	Due to mercury, fecal coliform, PCB's and dioxin.
Brown's River (upper)--NHEST600031004-05-04	Does not support fish consumption or shell fishing. Recreation was not assessed or there was insufficient information to make an assessment. Other uses not assessed	Due to mercury, fecal coliform, PCB's and dioxin.

Source: Final Section 305 (b) and 303(d) Surface Water Quality Report, NHDES, December, 2008