Natural Resources Chapter

Comprehensive Plan
Inventory & Analysis

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ENACTMENT BY THE LEGISLATIVE BODY

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TABLE OF CONTENTS

NATURAL RESOURCES

I. INTRODUCTION

This Chapter is a portion of the Inventory and Analysis section of the York Comprehensive Plan. Its purpose is to provide information about York's natural resource base. These are the physical foundations upon which municipal policies elsewhere in the Comprehensive Plan will be constructed.

By law, comprehensive plans must contain an inventory and analysis of the town's natural resources. Natural resources form a complex, interrelated system that is far more than the sum of the parts. The natural resources system includes living and inanimate components—from water and soils to plants and animals. The natural resources system includes components that go unnoticed and those that are obvious—from air and microscopic organisms to forests and the sea.

This chapter must accomplish two distinct objectives. First, it must contain an inventory of the community's natural resources. Second, it must analyze the natural resource. It is important to consider the meaning of each of these objectives.

The inventory is simply a listing and description of all the resources in the Town, usually accompanied by maps. Topics are typically grouped by subject matter—geology, water, flora, fauna, and so on. The range of natural resources to be included in the inventory is specified in state law, although this can be expanded if desired. The level of detail of the inventory can range from quite simple to extremely detailed, and it will vary from one natural resource to another, as there is unequal information about all natural resources. The inventory is relatively static, as the natural resources typically do not change rapidly over time.

The natural resources analysis must accomplish 3 tasks:

1. Describe the functions of the entire, inter-related system.
2. Identify and explain the inter-relationships between the various parts of the system.
3. Assess the susceptibility of component parts and the system as a whole to damage and degradation.

To provide a framework for the analysis, the natural resources are considered from the point of view of the *ecology*. The key concept in ecology is the inter-relationships between all the component parts of the system. While an assessment of the ecology may not include all aspects of the natural resource systems at this time, the ecological framework allows for more specific information to be added when it becomes available.

Development of this chapter begins with the inventory and proceeds to the analysis. Its presentation in the text, however, is reversed—analysis first and inventory second. The

reason for the reverse order is that the analysis focuses on the big picture, not the details, so that we do not focus unnecessarily on the details and lose sight of the whole. This is especially important because information about a community's natural resources and ecology may be incomplete or changing. With a good understanding about the overall system, however, it is possible to move beyond imperfect data. As an example, there may not be a detailed list of all insect species in York, yet we know that York does have the greatest known biodiversity of any town in Maine. It would be inappropriate to focus on the lack of complete data when, in fact, it's the great biological diversity that is so highly important and which is at great risk of damage or degradation from inappropriate development. Armed with an understanding of the whole, the Town will be in the best position to understand the impact on the whole that would result from changes to any particular component.

Natural Resource information is presented in this inventory and analysis in text and graphic form. This chapter includes some large (22" by 34") maps that help us relate the resources to the land. These large maps are essential to communicate information about York's natural resources, and this text, without the maps, will not present a complete picture. A complete citation, with map title and date of preparation, is provided in the appropriate section of the text, and these maps are incorporated into the Chapter by reference. Paper copies can be viewed at the Town Hall during normal business hours. To the extent these maps can be maintained on the Town's web site, copies will be made available for viewing and downloading there as well. Some maps, published by the State of Maine, are incorporated into this Chapter by reference and may be obtained directly from the State of Maine.

Comprehensive Plans in Maine must comply with the legal requirements of state law, specifically Title 30-A §4326. The law establishes that land use policy must be based on information and analysis, and accordingly the law establishes that comprehensive plans must contain an Inventory and Analysis section. This Chapter is one part of the Inventory and Analysis section of the York Comprehensive Plan. This Chapter, and others adopted since November 2004, follows a new format for the Plan. The Inventory and Analysis section is being converted to a series of technical reports on individual subjects (population, housing, land use, natural resources, etc.). Each is complete as a stand-alone report on its specific subject, but taken as a set they comprise the complete Inventory and Analysis section. This new format should encourage the Town to keep its Plan up to date, and should increase public access to information contained in the Inventory and Analysis. During the transition from a single Inventory and Analysis section to a series of single-subject reports, some degree of overlap of content and information is expected. For purposes of interpretation, the most current document shall supersede any earlier version or chapter of the Inventory and Analysis section.

II. ANALYSIS

This section is intended to provide a very high-level look at issues of concern to the Town's natural resource base. It is not feasible to get down into the details of all levels of concern in this type of document. Readers are forewarned – while this Analysis Section can stand alone, it is most useful in conjunction with the information contained in the Inventory Section.

A. A GIFT FROM THE ICE AGE

Even 10,000 years after the last glaciers retreated, the landscape of York is a gift shaped surficially in large part during the Ice Age. The topography is generally flat to gently sloping, sheared off by the ice.

1. Physical Resources

The land in York is rugged. The surficial geology of York shows that the vast majority of Town is either glacial till or marine clay, and both these are a generally poor base for land development. Soils tend to be shallow, and either poorly drained or excessively drained.

Small-scale forestry and farming are still being practiced, but the traditional working landscape is under severe development pressure.

There are significant areas of contiguous undeveloped lands in York and the neighboring communities, centering on the Mount Agamenticus region. Much of this land is protected in some manner from development pressures—about 6,000 acres in York and about 12,000 in the Mount Agamenticus to the Sea region (parts of Wells, Ogunquit, South Berwick, Eliot, Kittery and York). Overall, these unfragmented blocks of land are the largest along the Atlantic coast between the Pine Barrens in NJ and Acadia National Park in Maine—an area that grossly corresponds to the Megalopolis. From the perspective of the ecosystems of the Northeastern United States, this resource is unique and important.

2. The Water

York is located on the coast of the Atlantic Ocean, in the Gulf of Maine drainage basin. Because of its topography, York is divided into a series of relatively small watersheds that drain directly to the Ocean in or near York.

Surface waters in York, including the 6 reservoirs, provide the municipal water supplies for portions of both York and Kittery. There are no major stratified drift deposits (underground piles of sand and gravel that hold and yield large quantities of water) in York, so there is virtually no opportunity for development of

municipal-size water supplies from groundwater. Water for consumption outside these service areas is provided primarily by bedrock wells.

There is a functioning harbor at the York River and limited coastal access at the Cape Neddick River.

Historical development patterns in York have led to wide-spread development in environmentally unsuitable areas, as on coastal dunes and in the former marshlands behind the dunes. Many of the current land use problems faced in York are a result of uninformed decisions over 100 years ago. Sea level rise will worsen these problems, and will create others.

3. The Air

Air quality in York is generally good, but does not currently comply with all Federal air quality standards. The primary problem is ground-level ozone pollution (smog) blown in by prevailing winds from the urban centers from Washington, D.C., through Boston on hot summer days. There is little York can do about this problem as the pollution comes from external upwind sources.

4. Living Resources

The ecosystems in York are generally healthy. There is a high degree of biodiversity in York—reportedly the highest of any single town in the State of Maine. This is due to its location on the coast, at a point where the northern and southern forest ecosystems meet, and the continued presence of large tracts of undeveloped, unfragmented land. There are many rare or threatened species in York, but this is partly due to York being on the extreme southern end of the State—species that are common to the south may occur only infrequently in the southern tip of Maine.

Healthy estuaries are vital to the health of the oceans. The York River, in particular, but also the Cape Neddick River and Brave Boat Harbor areas, are important contributors to the Gulf of Maine.

B. NATURAL RESOURCE VALUES WE ENJOY

Beyond the mechanics of identifying and understanding the natural resource base in York, there are many values the public places on natural resources.

The environment in York is healthy and clean. The water and air are clean. The ecosystems are healthy and biodiversity is high. There are no significant brownfields—older contaminated sites typically associated with bygone industrial uses. Environmental indicators point to a healthy and clean environment at this time.

The natural resource base in York is an important component in the community's vitality. People make use of the resources every day. Property owners still harvest timber in York. There are still a few working farms growing produce and raising animals. There is an active commercial fishing fleet operating from York Harbor and Cape Neddick Harbor. The natural resource base provides more than just economic land uses. It contributes to community uses such as hunting, fishing, walking, hiking, bicycling, cross-country skiing, swimming, sunbathing, and birdwatching, to name a few.

Compared to the relatively homogenous landscapes characterized by suburban sprawl, York's landscape is diverse and interesting. There is a wide range of landscape types—undeveloped lands, rural working lands, villages, and commercial areas.

There is an aesthetic value associated with the great natural beauty we find in York. There are many scenic views, not only along the beaches and coastline but throughout York. There are vast expanses of forest. There is peace and quiet and tranquility. The stars are clearly visible at night. York is a place where you can find tranquility and solitude close to the amenities of the community.

C. THREATS TO OUR NATURAL RESOURCES

York is a relatively small community on the northern end of the Megalopolis. The primary threat to the natural resources is from continuing growth pressures. In the grand scheme of things, the buildout of York is infill in the Megalopolis—filling up seems to be a question of "when" rather than "if."

In a build-out analysis completed by the Open Space Committee in 2001, there is enough room in York for about a total increase in population of roughly 50% if the Town builds out under then-existing zoning controls. Land development—the continued dividing of tracts of land into smaller and smaller islands, and the continued increases in impervious surfaces—will continue to place ever-greater pressures on the resource base.

The following is a short list of the issues York faces, and what's at risk as growth continues to exert continuing pressure:

- groundwater pollution from development on poor soils without public sewer collection and treatment;
- non-point water pollution from road maintenance policies, and new development with inadequate erosion/sedimentation control;
- reduction in surface water quality from increasing impervious surfaces in each watershed (some already at risk, others approaching);
- loss of biodiversity by habitat loss and fragmentation from new roads and development;

- worsening of flooding problems from more than a century of unplanned development, continued development, and sea level rise;
- loss of native species by infestation of invasive species;
- loss of the working landscape by escalating land values and neighborhood concerns about impacts;
- loss of night sky by uncontrolled lighting of new and existing development;
- reduction in air quality and loss of quiet because of increasing traffic (more people driving more miles because of poor patterns of LU and few alternative transportation modes) and because of smog generated up-wind;
- loss of opportunities for solitude and recreation by reduction in size and loss of unfragmented blocks;
- stability of beaches and coast due to past encroachment in dunes and shorelines, combined with sea level rise;
- decline in the health of the Gulf of Maine and the Atlantic Ocean resulting from continued overdevelopment of the coast and along the estuaries; and
- overcrowding of harbor and other waters as more people compete to use finite shore resources.

It is not realistic to try to capture all the threats and all the risks within this Comprehensive Plan Chapter. The reader should take away the message that there is much of value at stake, and that issues faced by the Town must each be evaluated to develop an understanding of the specific resource threats and opportunities it may present.

D. INTER-RELATED SYSTEMS, NOT ISLANDS

As one of the great ecologists concluded, everything is related to everything else (Barry Commoner. The Closing Circle. Knopf, New York, NY. 1971). It is not reasonable to expect that an action will affect only one aspect of our natural systems. For example, excessive runoff from a large parking lot can cause soil erosion of a drainage ditch, which results in siltation in the downstream waterbodies, thereby degrading habitat. Understanding inter-relationships provides a context for evaluating the importance of singular activities such as controlling soil erosion, regulating building density, or eradicating invasive plants. This concept is vital as the Town uses this Chapter and others of the Inventory and Analysis to formulate a rational basis for its land use controls.

Assuming that York seeks to sustain its quality of natural resources, understanding natural resources as a system full of complex inter-relationships is vital in understanding how to achieve a sustainable community. Consider a few examples.

- Erosion along roads generates non-point pollution: river water quality degrades; fish spawning beds silt in, reducing the habitat value; and less biological integrity contributes to a reduction in ocean's food supply.
- Sea level rises: saltmarsh will change to mud flats; shorelines will destabilize, especially in areas currently at risk for coastal landslide; and flooding will

impact buildings currently out of the floodplain, and will force alteration of the road network in flood-prone areas.

- Dividing a large unfragmented block in half with a new subdivision and road: biodiversity will decline; recreation opportunities will decline; and houses will encroach on former hunting areas, restricting firearms discharge and resulting in smaller areas for hunting, and reducing the opportunity for finding solitude.

In conclusion, the maintenance of a sustainable community depends on the ability of the community to recognize that one action can easily affect multiple resources and can start a chain reaction of effects. Research and careful thought before action is prudent.

III. INVENTORY

This section provides extensive information about the natural resource base of the Town of York. Much of the information is communicated through a series of over two dozen maps, each of which is referenced in the text. Where it makes sense to do so, the Town-generated maps present resource information (surficial geology, soils, conservation lands, etc.) in the broader context of watersheds—the maps show resources in their relationship to watersheds. This allows information to be evaluated in naturally-occurring areas rather just politically-defined areas. Readers are forewarned – while this Inventory Section can stand alone, it is most useful in conjunction with the information contained in the Analysis Section.

A. TERRESTRIAL RESOURCES

Terrestrial resources are the very foundation of the Town of York—geology, topography, soils, and hydrology. They are grouped together because of the inseparable interrelationship among each of these resources, and because of the interdependence of each on the others. Most important from a planning perspective, however, is the role these resources play in the water cycle. Water is perhaps the most significant driving force in our natural systems. As the Town continues to grapple with intensive growth pressures, its policies must be based on a sound understanding of the hydrology. The Town needs this information to solve problems faced today, such as flooding in the bowl behind Long Sands Beach and failed water quality tests at the beaches. The Town needs this information to ensure actions it takes today do not cause additional problems in the future.

1. Geology

Understanding the geology of York is important because of the relationship between the bedrock, the surficial deposits, the soils and the water cycle. The three most immediate areas of interest with respect to geology are its influence on public water supplies, its relationship to radon, and its influence on the ability to treat septic wastes on-site.

Regarding public water supplies, the towns of York and Kittery both have surface water supplies located in York. The nature of geologic materials and their physical configuration affect the recharge of the public water supply reservoirs.

Regarding radon, the presence of radon in groundwater (well water) and in air (in basements) is a public health concern. Granitic rocks are the most significant source of radon in groundwater. Radon moves very slowly in saturated soils, but is more mobile in permeable materials, such as sand and gravel. For these reasons, areas above coarse glacial till or coastal sand deposits that are on steeper slopes and above fractured bedrock (especially granite) have a higher chance of radon problems than other areas. Both the bedrock and surficial geology of York

are relevant to this issue. The U.S. Geological Survey has a good Web site (www.usgs.gov) for further information about radon.

Regarding septic wastes, the surficial geologic deposits are closely related to soils in importance for septic treatment. Surficial deposits are, in fact, the parent materials for most of the soils. Areas underlain by poorly drained materials, especially glacial marine or swamp deposits, do not permit septic wastewater to move quickly enough away from leach fields, and in general these areas are more prone to septic failures and related problems.

The map entitled, "**Bedrock Geology**, York Comprehensive Plan, Inventory and Analysis, Natural Resources Chapter" with a date of January 25, 2006, is hereby incorporated into the Comprehensive Plan by reference. The map entitled, "**Surficial Geology**, York Comprehensive Plan, Inventory and Analysis, Natural Resources Chapter" with a date of February 10, 2006, is hereby incorporated into the Comprehensive Plan by reference. Users should note that the information for both geology maps was created to define general information for state-level analysis, and as such the geologic boundaries shown on the map are nowhere near as accurate as other available local data (roads and soils, for instance).

The map entitled, "**Estimated Overburden Thickness in the Kittery 30X60-minute Quadrangle**" compiled by Marc Loiselle in 2002 (Maine Geological Survey, Open-File No. 02-3) is adopted by reference into this Plan. This map provides supplemental information regarding surficial deposits.

a. Bedrock Geology

Bedrock in York is a combination of igneous and metamorphic rock. Igneous rock is formed when molten rock, or magma, cools and solidifies. Metamorphic rock is formed from either igneous or sedimentary rock that is transformed by immense heat and pressure to form a new type of rock. The metamorphic rocks of the York area are part of a large structure called a syncline, formed when sedimentary layers were folded into a basin-like feature. Geologic mapping of the area reveals no apparent faults. The folding occurred before the intrusion of the igneous rock. Subsequent glaciation re-shaped the surface of the bedrock to its current configuration.

Map information for this section of the Chapter was obtained primarily from the Maine Geological Survey. Interpretation of this information was based on the book, The Geology of Southern York County, Maine (Arthur M. Hussey, II, for the Maine Geological Survey, December 1962) and the help of Dr. Jeanette Sablock of Salem State College.

1) Igneous Bedrock. In York the igneous bedrock is comprised of 3 major formations, listed from youngest to oldest:

Cape Neddick Complex. The Cape Neddick Complex is a small outcropping of harder, granitic rock on the outer end of the Cape Neddick peninsula (the Nubble) that has shielded softer, inland metamorphic rock. This is the reason this peninsula exists. At roughly 116 million years old, the Cape Neddick Complex is the youngest rock formation in Maine.

Agamenticus Complex. The Agamenticus Complex is a large circular complex of granite and related rock, over 5 miles in diameter, extending from Short Sands Beach to the east, Boulter Pond to the south, South Berwick to the west, and Ogunquit to the north.

Webhannet Pluton. The Webhannet Pluton is an elongated mass running from Eliot to Wells parallel to the York/South Berwick boundary. This formation directly adjoins the Agamenticus Complex. Through time it has effectively been a dam that has prevented any major rivers west of York from running through the Town to the coast.

2) Metamorphic Bedrock. In York the metamorphic bedrock is comprised of 2 formations, listed from youngest to oldest:

Eliot Formation: The Eliot Formation is a relatively small area running from the Cider Hill and Scotland Bridge area to the Piscataqua River in Eliot. The formation lies above the Kittery Formation. In York, the glaciers scoured off most of this formation, with this one area remaining because it lies in a depression in the underlying materials. That depression is known as the Eliot Syncline.

Kittery Formation: The Kittery Formation is the primary metamorphic formation in York, underlying most of York's coastline, the entire area of York Harbor and York Village, and the area around Brixham.

b. Surficial Geology

York has several different types of surficial geologic deposits which overlie the bedrock. The vast majority of these deposits (till, glacial marine clays, and ice-contact deposits) are the byproducts of glacial action. Table 1, Characteristics of Surficial Deposits, gives a brief description of the most common types of deposits and a general description of the usefulness these materials should have for planning purposes.

TABLE 1: Characteristics of Surficial Deposits

Type & Origin of Deposit	Characteristics	Relation to Groundwater	Relation to Development	Distribution
Glacial Till	Low permeable mixture of small-sized (silt & clay) to large-sized (gravel) material	Contains water, but low permeability makes recovery difficult and inadequate for municipal needs	Low permeability could slow vertical flow	Extensive, especially in upland areas
Glacial Marine	Very low permeability dark silts and clays with inter-bedded layers of sand	These materials typically prevent the vertical flow of water and often underlie marshes and wetlands	Unsuitable for most uses, but historical resource for local brick-makers	Extensive, esp. along York River, Cape Neddick River, the coastal area.
Ice-Contact	Usually permeable mixture of sand, gravel, cobble & boulder-sized sediment	Best source of groundwater in southern Maine, excess iron content can be an issue, high permeability means easy contamination from land use	High permeability allows rapid vertical flow of water, but fast flow could affect nearby ponds if any	Along Witchtrot Road in western York, and north of Chases Pond Reservoir
Swamp Deposit	Organic material with some silt, sand & gravel, up to 2' thick	Groundwater discharge areas, often the site of springs	Unsuitable for most uses	Upper reaches of York River
Coastal Dune & Beach Deposits	Fine to medium sand, some coarse sand & gravel, up to 25 feet thick	Moderate permeability, water table close to surface & prone to contamination from land use	Vulnerable to wave erosion, these deposits require protection from harmful uses that may speed up erosion processes	Long Sands Beach and Short Sands Beach

2. Topography and Slope

Topographic information is about the changes in elevation of the surface of the ground, which is of obvious importance to planning. Elevations in York range from sea level to 691 feet atop Mount Agamenticus. Elevations are low along the Atlantic coast and rise inland. East of the Turnpike there are a few hilltops above 200' in elevation, the highest of which is Gulf Hill (elevation about 240') located west of Route One near Dixon's Campground. A significant portion of the area west of the Turnpike and north of the York River is above 200' in elevation. Only Mt. Agamenticus (691'), Second Hill (555') and Third Hill (526') rise above 400'. The Horse Hills, located to the southwest of Mt. Agamenticus, is a large hilly complex just under 400' in elevation.

At this time the best available town-wide topography data comes from the USGS 7.5 Minutes Series Topographic Maps. Anyone interested in contour data is referred to the source maps: York Harbor (ME); York Beach (ME); North Berwick (ME); Dover East (NH); and Kittery (ME).

Slope is a measure of elevation change over distance. York has extensive areas of steep slopes associated with the hills to the west and north of Town, and along certain stretches of river, stream and ocean shoreline. In general terms, the suitability of land for development declines with slope. In general, the slopes are most gentle along the coast in York Beach and up through the tidal headwaters of the York River. North of the York River and west of Route One, slopes tend to be steeper. The slopes of Mount Agamenticus and the nearby hills are by far the steepest slopes in York.

The map entitled, "**Elevation Contours**, York Comprehensive Plan, Inventory and Analysis, Natural Resources Chapter, November 6, 2007," is hereby incorporated into the Comprehensive Plan by reference. The map entitled, "**Slopes**, York Comprehensive Plan, Inventory and Analysis, Natural Resources Chapter, November 6, 2007," is hereby incorporated into the Comprehensive Plan by reference. These maps are based on Town-wide 2' contour data acquired by the Town for its GIS in 2006.

3. Soils

Soil is an element of the surficial geology. Surficial deposits are the loose sedimentary (parent) materials that overlie bedrock. These parent materials, glacial and postglacial sediments such as sand, gravel, and clay are the materials from which most Maine soils have developed. Many types of soil form by surface weathering of parent material, though other factors such as slope, drainage and the decaying remains of plants and animals also determine soil type.

The following soil description comes from the Maine Forest Service website.

> The basic ingredients of soil fall into two categories: mineral soil (made up of clay, silt, and sand) and organic soil (made up of decomposing leaves and other organic matter as well as small invertebrates and other organisms). Soil moisture and air spaces in the soil also factor in to the kinds of plant or tree life a certain location can support.
>
> The amount of sand, silt, and clay varies from place to place. Soils with a heavy clay content tend to be sticky and not well drained, though they can be quite fertile. Soils with a lot of sand tend to be gritty, not hold water very well, and usually are not very fertile. Silt laden soils feel smooth and tend to have good drainage. Loam is a fairly even mix of all three.
>
> Decomposing trees and leaves form the organic layer (also called the O horizon). As the organic layer breaks down, it mixes with mineral soil from below to form the nutrient-rich topsoil (the A horizon) beneath the O horizon.

If you have ever dug a hole on your property, you probably noticed different colors of soil layers as the hole got deeper. The dark organic soil layer on top is usually about an inch thick. The organic layer and the layer below it (the topsoil) contain most of the nutrients that nourish a growing woodland. These rich soil layers are not easily replaced; it takes between 100 to 600 years to form an inch of topsoil.

Unfortunately, wind and water can erode away an inch of topsoil in a single year if the there are no trees, shrubs, plants, downed logs or other material to hold it in place. Once the topsoil washes away, it is much harder for plants and trees to grow at all and a cycle of erosion leaves the land nutrient poor. Soil sediment also is likely to end up in waterways, where it affects fish and other aquatic life.
(Source: Maine Forest Service: ww.maine.gov/doc/mfs/woodswise/soil.html)

There are many different types of soil in York and each has a unique combination of characteristics of critical importance, not only to the natural environment, but to planning and development. For example, some soils tend to heave excessively, not all soils are suitable for subsurface wastewater disposal systems, and contaminants travel better through some soils and pose threats to groundwater. Therefore it is important to understand the patterns of soils because it represents a concurrent pattern of limitations and opportunities.

a. Generalized Soil Associations

The USDA's Natural Resources Conservation Service (NRCS, formerly the Soils Conservation Service) has mapped the soils for York County. The detailed soils map for the Town of York has more than fifty unique map units. A map unit represents an area on the landscape and consists of one or more soils for which a map unit is named. Later in this section map units will be used to discuss soils in York, however, to give an overview of soil patterns it is easier to start with the General Soil Map. The Soil Survey of York County (SSYC), Maine, June 1982 contains a map entitled General Soil Map. The general soil map, as described in the SSYC, shows broad areas that have a distinctive pattern of soils, relief and drainage. Each association on the general soil map is a unique natural landscape. Typically an association consists of one or more major soils and some minor soils. The general soil map can be used to compare the suitability of large areas for general land uses.

The map entitled, "**General Soil Map; York County Maine**," contained within the Soil Survey of York County Maine (USDA, Soil Conservation Service, June 1982) is hereby incorporated into the Comprehensive Plan by reference.

The soil associations present in the Town of York include the following:

1) Lyman-Rock Outcrop-Sebago (Map Legend Key #6). This is the most prevalent soil association in the Town of York. The association

covers all of coastal York and much of the area inland, north of Route 91 to the South Berwick border. The Lyman soils and Rock outcrops are on the ridges and hills and the Sebago soils are in depressions. The Lyman soils are shallow, gently sloping to very steep and somewhat excessively drained soils formed in shallow glacial till. The Sebago soils are deep, level, and very poorly drained soils formed in organic material. Rock outcrop consists of areas of bedrock exposure. The main limitations of the association for non-farm uses are the bedrock exposures on the surface, the shallow soil depth of the Lyman soils, and the high water table and low strength of the Sebago Soils.

2) Scantic-Raynham-Buxton (Map Legend Key #7). A swath of this soil association surrounds the upper York River Valley. The Scantic and Raynham soils are poorly drained and nearly level and have a seasonal high water table. The Buxton soils are moderately well drained to somewhat poorly drained and are gently sloping to moderately steep and hilly. The slope, high water table in the Scantic and Raynham soils and the slow permeability of the Scantic and Buxton soils are the main limitations for non-farm use.

3) Marlow-Brayton-Peru (Map Legend Key #4). There are three pockets of the Marlow-Brayton-Peru association along the west side of Interstate 95. One pocket is on the northern end of town at Clay Hill and two towards the southern boundary at Cider Hill and Beech Ridge. The Marlow soils are well drained, the Brayton soils are somewhat poorly drained to poorly drained, and the Peru Soils are moderately well drained. Slow permeability in the substratum and a seasonal perched water table are the main limitations for most uses of these soils. Slope can also be a limitation.

4) Hermon-Lyman (Map Legend Key #5). These soils cover the entire Cape Neddick Peninsula. This association is described as shallow and deep, gently sloping to very steep, well drained to somewhat excessively drained soils formed in friable glacial till. The main limitations for most non-farm uses are rapid permeability, and the shallow depth to bedrock in the Lyman soils.

5) Lyman-Rock Outcrop-Scantic (Map Legend Key #8). There are two patches of this association in York. At the Kittery border in the area of Dolly Gordon Brook and at the Ogunquit Border. The Lyman soils and Rock outcrops are on the ridges and hills and the Scantic soils are in marine plains. The Lyman soils are shallow gently sloping to very steep, and somewhat excessively well drained. The Scantic soils are deep, nearly level and poorly drained. The main limitations for all uses are the bedrock exposures, droughtiness, the shallow depth to bedrock in the Lyman soils and a high water table in the Scantic soils.

6) Sulfihemists-Udipsamments (Map Legend Key #10). These soils are found around the lower reach of Smelt Brook before it meets with the York River. Sulfihemists soils are very poorly drained and level and are flooded by tidal waters. The soils dominantly consist of organic material more than 51 inches deep. Udipsamments are excessively drained and moderately well drained soils and are undulating to rolling. Sulfihemists soils make for good wildlife habitat.

b. Soils By Erodibility

The Soils Survey Data for Growth Management, York County, describes soil erosion as follows: When surface vegetation is removed from large areas of land, soil erosion often results. Sediment, the result of erosion, has a number of adverse effects as a pollutant. In suspension it reduce the amount of sunlight available to aquatic plants, covers fish spawning areas and food supplies and clogs gills of fish. Phosphorus moves into receiving waters attached to soil particles. Excessive quantities can cause algae blooms. Sediment fills drainage ditches, road ditches and stream channels and shortens the life of reservoirs. Highly erodible soils are those soils that have a potential to erode at a rate far greater than what is considered tolerable soil loss. The potential erodibility of soil takes into consideration a) rainfall and runoff, b) the susceptibility of the soil to erosion, c) the combined effects of slope, length and steepness. A highly erodible soil has a potential erodibility that would cause a considerable decline in long term productivity of that soil as well as possible negative effects on water quality.

The map entitled, "**Soils By Erodibility"**, York Comprehensive Plan, Inventory and Analysis, Natural Resources Chapter" with a date of February 10, 2006, is hereby incorporated into the Comprehensive Plan by reference.

c. Soils On Steep Slopes

The Soils Survey Data for Growth Management, York County, describes slope as follows: slope gradient influences the retention and movement of water, potential for slippage and accelerated erosion, ease with which machinery can be used and engineering uses of the soil. Generally the steeper the slope, the more potential hazard exist. Development on slopes greater than 15 percent require more fill and grading as well as more sophisticated sediment and erosion control planning to minimize erosion and protect water quality. On very steep areas the design of buildings, roads and other structures may need to be altered to ensure satisfactory performance.

The map entitled, "**Soils by Slope"**, York Comprehensive Plan, Inventory and Analysis, Natural Resources Chapter" with a date of February 10, 2006, is hereby incorporated into the Comprehensive Plan by reference. When the Town's contour data is developed, a slope map should be generated to replace this more generalized representation of slopes.

d. Farmland Soils

Prime farmland is defined by the U.S. Department of Agriculture as the land that is best suited for the production of food, feed, forage, fiber, and oilseed crops. It has the soil quality, growing season, and moisture content to produce a sustained yield of crops while using acceptable farming methods. Since farming prime farmlands produces the highest yields and requires minimal amounts of energy and economic resources, it results in the least damage to the natural environment. Prime farmland in many communities is considered a very important, scarce natural resource. Secondary soils, which are not prime farmland but still important for farming, are known as "additional farmland of statewide significance." A very small percentage of the soils in York are identified as prime farmland or additional farmland of statewide significance. The prime farmland and statewide significance soils are found mainly along the York River.

The map entitled, "**Farmland Soils**, York Comprehensive Plan, Inventory and Analysis, Natural Resources Chapter" with a date of February 10, 2006, is hereby incorporated into the Comprehensive Plan by reference.

e. Hydric Soils

Hydric Soils are defined by the SCS as those that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic (lack of oxygen) conditions in the upper part. Hydric soils are usually sufficiently wet to support the growth and regeneration of wetland vegetation. Hydric soils are one of the indicators of wetlands, along with vegetation and hydrology. The location of hydric soils on the soils map of the town should be taken as an indicator that wetlands may be present and that further investigation may be required.

The map entitled, "**Hydric Soils**, York Comprehensive Plan, Inventory and Analysis, Natural Resources Chapter" with a date of February 10, 2006, is hereby incorporated into the Comprehensive Plan by reference.

f. Soils By Potential For Low-Density Development

The Soil Conservation Service has developed a method for evaluating and rating soils for the feasibility of use and development, particularly in areas of low density development. The ratings indicate the relative quality of a soil when compared with other soils in York County. This method takes into consideration both soil conditions and the costs of corrective measures and maintenance which may be necessary if development takes place. Soil potential ratings reflect the potential for use based on local conditions and regulations, rather than on the limitations of use. Evaluating soils within a community using this approach can be a valuable tool in conjunction with the previously described method which looks at soils on the basis of their capability to handle safely on-site domestic wastewater disposal.

Soils are evaluated for properties including texture, permeability, slope, drainage, water table, flooding and depth to bedrock. Each soil unit is evaluated independently for three uses: septic tank absorption fields, dwellings with basements, and local roads and streets and then given a composite rating of very high potential to very low potential for development.

Throughout the Town of York there are no soils that merit a "very high" rating, and very few which fall into the category of "high." These are mostly isolated patches of Elmwood, Marlow, Skerry, Peru, and Hermon soils with slopes no greater than 15%, which unfortunately are also the best farm soils.

The map entitled, "**Soils By Potential For Low-Density Development**, York Comprehensive Plan, Inventory and Analysis, Natural Resources Chapter" with a date of February 10, 2006, is hereby incorporated into the Comprehensive Plan by reference.

4. Hydrology

The properties, location and movement of water on the surface of the land and within the soils, surficial deposits and bedrock are of great importance to community planning. This section begins with an overview of the water cycle, and then provides more detailed information about watersheds, groundwater, water quality and flooding. Because Coastal Resources are addressed elsewhere in this Chapter, this section is focused primarily on fresh water resources.

a. The Water Cycle

As rain or snow falls to the earth's surface some water runs off the land to rivers, lakes, streams and the ocean (surface water). Water also can move into those bodies by percolating through the soil below ground and return to the surface through wells, springs and marshes. Water that seeps into the soil can also infiltrate deeper to reach groundwater. Surface water is subject to evaporation and the process begins again. This is referred to as the water cycle. The water cycle is continuous. The quality of the watershed environment (natural and manmade), the quality of the surface and ground waters, and the overall health of the ecological system is interconnected.

This chapter does not establish policy directions. However, it establishes the baseline information and analysis on which policy will be created and evaluated in the future. With this function in mind, surface water resources are most appropriately evaluated by watershed, and it is anticipated that watershed-based policies will become more prevalent in the future, both at the town and regional levels.

b. Watersheds

The land area from which water drains to a given point is known as a watershed. Watershed boundaries follow naturally-existing physical

boundaries of the topography such as ridges and high ground. Identifying watershed boundaries helps to clarify and emphasize the pattern and direction of drainage flows to surface water bodies.

In York there is increasing attention to watersheds as useful geography for issue evaluation and resulting policy development. Consider the following four examples:

- Flooding—the Town has embarked on a study of drainage problems in the area between the York and Cape Neddick rivers, especially in the area behind the dunes along Long Sands and Short Sands beaches where extensive flooding occurs on a regular basis.
- Pollution—the Wells Reserve and the York Rivers Association have mapped non-point pollution sources in the York River watershed.
- Ecology—the Town, in coordination with a multitude of partners, has assisted and supported extensive scientific research into the fish populations of the York River estuary.
- Community Infrastructure—the York and Kittery water districts have conserved significant lands in the watersheds that feed their drinking water reservoirs, and the Town has imposed strict development controls in these areas in support of their protection.

There is an unequal level of information available for each watershed. The York River has been studied extensively; the Little and Cape Neddick rivers to a lesser extent, and other rivers and streams have been studied even less. This is reflected in the description of each watershed.

A description of the Town's hydrology is best communicated with maps. A series of maps, listed below, provides the inventory. This is followed up with text that briefly describes each of the watersheds.

The map entitled, "**Surface Waters and Watersheds,** York Comprehensive Plan, Inventory and Analysis, Natural Resources Chapter" with a date of February 10, 2006, is hereby incorporated into the Comprehensive Plan by reference. This map shows the 6 major watersheds in York: York River, Cape Neddick River, Josias River, Ogunquit River, Great Works River, and Coastal Streams. This map identifies the 6 great ponds: Bell Marsh Reservoir, Folly Pond, Middle Pond, Boulter Pond, Scituate Pond, and Chases Pond. This map identifies 11 known dams. Other dams may exist, but at this time the Town and State lack a central inventory of dams.

The map entitled, "**Stream Order,** York Comprehensive Plan, Inventory and Analysis, Natural Resources Chapter" with a date of February 10, 2006, is hereby incorporated into the Comprehensive Plan by reference. This map shows streams denoted by their "order." A first-order stream is one that has no tributaries. When two or more first-order streams join, they create a second-

order stream. When two second-order streams join, they become a third-order stream, and so forth. Stream order is important because much of the science about the impact of land development on water quality is applicable in the smaller sub-watersheds of first- and second-order streams. This science may not necessarily be applied to watersheds of third- or fourth-order streams. Watershed-based land use policies will probably need to be applied in each second-order stream watershed rather than on the larger watersheds depicted in the maps of this Chapter.

The map entitled, "**Existing Land Use By Watersheds**, York Comprehensive Plan, Inventory and Analysis, Natural Resources Chapter" with a date of February 10, 2006, is hereby incorporated into the Comprehensive Plan by reference. This map shows the 2004 existing land use information from the Existing Land Use Chapter, but divided by watershed.

A map of wetlands is not included with this Chapter. Maps of wetlands are available from several sources. The most complete Town-wide wetland data is derived at this time from the National Wetlands Inventory (NWI). Mapping from the 1979 NWI aerial photographs forms the basis for the wetlands shown on the Town's current Shoreland Overlay District Map. NWI data is also utilized in many other maps of wetlands, such as the map entitled, "Town of York Wetlands Characterization and Riparian Zones," from Beginning With Habitat. The NWI data is general and outdated, and is best used for coarse-level analysis. To get better information, the Town also generated more detailed wetlands assessments and maps for about 20% of the area of York in the late 1990s. This work was led by the consultant, Woodlot Alternatives. Unfortunately, continuation of this inventory work has not been funded. In lieu of completion of the local inventory, the Planning Department is working on development of a refined wetland layer for its GIS. This layer will be based on 1979 and 2005 NWI mapping, as well as the 2005 aerial photography. When work on this layer is complete, a wetland map should be added to this Chapter.

1) York River Watershed

- Total area: 33 square miles
  - 70% of the watershed is located in York
  - The watershed encompasses 41% of the area of York

- Major features:
  - York River, an exceptionally healthy coastal river and critically important estuary system. Among the widest diversity of fish and bird habitats in Maine. York's primary harbor is located at the mouth of the River.

  - Kittery Water District's four public water supply reservoirs, from which about 2.8 million gallons of water is withdrawn daily:
    - Bell Marsh Reservoir: 280 acres, 1 billion gallon storage capacity
    - Boulter Pond: 88 acres, 782 million gallon storage capacity
    - Folly Pond: 59 acres, 378 million gallon storage capacity
    - Middle Pond: 49 acres, 290 million gallon storage capacity

- State designations:
  - York River: Nonpoint Source Priority Watershed
  - Boulter Pond: Nonpoint Source Priority Watershed and Lakes Most at Risk from New Development (per Maine Stormwater Law)
  - Middle Pond: Nonpoint Source Priority Watershed
  - Scituate Pond: Lakes Most at Risk from New Development (per Maine Stormwater Law)

- Published references and studies:
  - York River Watershed Nonpoint Pollution Survey and Watershed Management Plan, Wells National Estuarine Research Reserve, January 2005.
  - Watershed Conservation Strategies: York River Watershed, Wells National Estuarine Research Reserve, April 2003.
  - York River Watershed Evaluation and Management Recommendations, York County Soil & Water Conservation District, January 1996.
  - A Watershed Management Plan for the York Water District, York, Maine, David Parker Associates, May 1997.
  - York River Watershed Developable Lands Analysis: Development Constraints, undated map by Southern Maine Regional Planning Commission.
  - Benthic Habitat Mapping Project, Webhannet and York River Estuaries, Wells National Estuarine Research Reserve, Final Report, May 2005.
  - A Conservation Plan for the Mount Agamenticus to the Sea Conservation Initiative, Mt. Agamenticus to the Sea Conservation Initiative, Draft 2005. (Includes an area larger than this watershed, including others in York.)
  - Aquatic Communities and Habitats of the York River Watershed: A Fisheye Perspective, Wells National Estuarine Research Reserve, Final Report, February 2003.

2) Cape Neddick River Watershed

- Total area: 9 square miles
  - 100% of the watershed is located in York
  - The watershed encompasses 16% of the area of York

- Major features:
  - Cape Neddick River, a significantly altered river because its headwaters are impounded at Chases Pond for public water supply. A harbor of limited capacity is located at the mouth of the river.
  - York Water District's reservoirs:
    - Chases Pond: 134 acres, 600 million gallon storage capacity
    - Welch's Pond: 10 acres, minor storage capacity
  - York Sewer District treatment plant outfall, which discharges treated wastewater in the mouth of the River. This automatically causes the River's clam flats to be closed, and concern has been expressed about other biological impacts the outfall may cause.

- State designations:
  - Chases Pond: Nonpoint Source Priority Watershed and Lakes Most at Risk from New Development (per Maine Stormwater Law)

- Published references and studies:
  - Watershed Conservation Strategies: Cape Neddick River Watershed, Wells National Estuarine Research Reserve, April 2003.
  - E.coli Riotyping for Identifying Sources of Fecal Contamination in Cape Neddick, ME, Dr. Stephen Jones, UNH, June 2003.

3) Josias River Watershed

- Total area: 8 square miles
  - About 95% of the watershed is located in York
  - The watershed encompasses 14% of the area of York

- Major features:
  - Josias River, a 3rd order stream in York that discharges into Perkins Cove in Ogunquit.

- State designations: none known.

- Published references and studies: none known.

4) Ogunquit River Watershed

- Total area: 24 square miles
  - 4% of the watershed is located in York
  - The watershed encompasses 2% of the area of York

- Major features:
  - Ogunquit River
  - Two tributaries of the Ogunquit River in York have Class A water quality ratings.

- State designations: none known.

- Published references and studies:
  - Ogunquit River Watershed: Shoreland Survey of Non-Point Source Pollution, Wells National Estuarine Research Reserve, March 2005.

5) Great Works River Watershed

- Total area: 42 square miles
  - 7% of the watershed is located in York
  - The watershed encompasses 5% of the area of York

- Major features:
  - Chicks Brook has a Class A water quality rating.
  - This watershed is the only area of York that drains into the Salmon Falls/Piscataqua River basin. In York the watershed is relatively undeveloped, has sensitive resources, and much of the land is conserved.

- State designations: none known

- Published references and studies: none known

6) Coastal Streams Watersheds

The Coastal Streams Watersheds are the area along the Atlantic Coast in York. There are three distinct areas: Southern (south of the York River); Central (between the York and Cape Neddick rivers), and Northern (north of the Cape Neddick River).

- Combined total area: 13 square miles
  - The combined watershed encompasses 21% of the area of York

- Southern Coastal
  - Total area: 2 square miles in York
  - The sub-watershed encompasses 4% of the area of York
  - Major features:
    - Godfrey Cove
    - Coastline along the Atlantic, including Brave Boat Harbor to the south and York River to the north
  - State designations: none known
  - Published references and studies: none known

- Central Coastal
  - Total area: 7 square miles in York
  - The sub-watershed encompasses 13% of the area of York
  - Major features:
    - Coastline along the Atlantic Ocean, including Harbor Beach, Long Sands Beach, Short Sands Beach, and the Nubble, from York River to the south to Cape Neddick River to the north
  - State designations: none known
  - Published references and studies: none known

- Northern Coastal
  - Total area: 3 square miles in York
  - The sub-watershed encompasses 5% of the area of York
  - Major features:
    - Phillips Cove, a designated Coastal Barrier Resource System
    - Coastline along the Atlantic, including Cape Neddick River to the south.
  - State designations: none known
  - Published references and studies: none known

c. Groundwater

Technically ground water is part of the watershed and is tightly linked to the hydrologic cycle within the watershed. However, groundwater basins are defined by the geology underneath watersheds so they do not always have the same boundaries as their overlying watersheds. In addition watersheds have traditionally been defined and managed with respect to surface water and the network of channels and streams that connects to the surface outlet of the watershed. Although the groundwater discussion will not be specifically linked to the major watersheds of the Town of York it's important to remember that what happens within a watershed can have an impact on ground water quality and quantity.

Groundwater occurs in Maine in two primary kinds of aquifers, (1) sand and gravel, and (2) bedrock. York does not depend on groundwater for municipal water district supplies, but many home owners get their water from individual fractured bedrock wells.

1) Sand and Gravel Aquifers. These are unconsolidated sand and gravel deposits, most of which were deposited during the last glacial episode which ended about 14,000 - 11,000 years ago in Maine. These deposits have excellent porosity (spaces between grains) and permeability (connection of spaces) that make them significant groundwater resources in the state.

   The series of maps entitled, "**Gravel Aquifers**," compiled by Craig D. Neil in 1998: York Harbor Quad, Maine (Open File No. 98-132); Dover East Quad, Maine (Open-File No. 98-127); North Berwick Quad, Maine (Open-File No. 98-129), are hereby adopted by reference into this Plan.

   By this mapping of gravel aquifers, York has only one small "significant aquifer" zone in the area of Cider Hill. The Cider Hill sand and gravel aquifer has been designated by Maine Geological Survey as a surficial deposit with moderate to good potential groundwater yields greater than 10 gallons per minute to a properly constructed well. It is interesting to note that this sand and gravel deposit does not show up on the State's surficial geology map—which shows a few other ice-contact deposits but not this one.

2) Bedrock Aquifers. Much of York's groundwater resources consist of fractured bedrock aquifers. The entire state of Maine is underlain with hard ledge (bedrock) composed of igneous (granite, etc.) and metamorphic (gneiss, etc.) rock. Almost everywhere, this bedrock is fractured due to the many geological processes the rocks have endured since they formed between 360 and 650 million years ago. The fractures in the rock provide the open space (porosity) through which groundwater flows. Fractured bedrock in Maine is recharged locally. The usage of groundwater from drilled wells affects the water table only locally. The average depth for a drilled well in Maine is about 250 feet.

   The map entitled, "**Bedrock Well Yields in the Kittery 30X60-minute Quadrangle**" compiled by Marc Loiselle in 2002 (Maine Geological Survey, Open-File No. 02-1) is adopted by reference into this Plan. The map entitled, "**Bedrock Well Depths in the Kittery 30X60-minute Quadrangle**" compiled by Marc Loiselle in 2002 (Maine Geological Survey, Open-File No. 02-2) is adopted by reference into this Plan.

d. Water Quality

Direct discharges of pollutants from point sources have been greatly reduced over the past 30 years as a result of the Clean Water Act and other federal statutes. Today, most of our water pollution comes from stormwater. Every time it rains, the rainwater washes off driveways, roofs, parking lots, roads, agricultural fields, construction sites, forestry operations, and other surfaces carrying with it contaminants to our streams, lakes, ocean and groundwater. This type of pollution is known as nonpoint source pollution (NPS). NPS is the number one threat to the waters of the Town of York and the state of Maine. Maine has 2,500 Great Ponds, and almost 10%, or 234 lakes, are known to have water quality problems. Many of these lakes are experiencing "cultural eutrophication", or increased algal growth, that reduces water clarity and dissolved oxygen for fish habitat. There are 230 closed shellfish areas (269,387 acres "off limits" to harvesting) and 724.5 miles of rivers, streams and brooks that fail to support fully all their designated uses. NPS pollution is the major reason for most of these water quality problems. Thought the surface waters of York currently meet state water quality standards, residential growth, at the pace it is occurring in southern Maine, can have a detrimental impact on water quality.

1) Surface Water Quality. The state's water quality classification system allows the state to manage its surface waters based on water quality standards. The systems designate uses, such as drinking water supply, fish habitat, and recreation, and minimum levels of quality necessary to support such uses. The classifications range from AA to D for fresh surface waters, with AA being the highest water quality conditions. Estuarine and marine waters are classified from SA (highest classification) to SC, and all lakes and ponds are classified GPA.

   All of York's rivers and streams have been designated class B, except for two tributaries of the Ogunquit River and Chicks Brook, which have class A designations. York's marine and estuarine water are all designated class SB.

   In 1998, The Maine Land and Water Resources Council adopted the "Nonpoint Source Priority Watersheds List." The list identifies priority coastal waters, rivers, streams, and lakes based on specific criteria for the purpose of directing resources to local groups that are implementing watershed management plans. The watersheds in York that have been listed include the York River Watershed and the Ogunquit River Estuary. The lakes in York that have been listed include Boulter Pond, Chases Pond, and Folly Pond. (For more information see 5 MRSA §3331 (7))

   Another DEP priority list is the result of rules enacted under the Stormwater Management Law (DEP Rules Chapter 500 and 502), which focuses on impacts from new development. The law establishes general

stormwater standards for all watersheds to increase protection for both pristine and threatened water resources, while minimizing incentives for sprawl. Under this law, new developments in these watersheds are required to install additional pollution control measures. The stormwater lists Chapter 502 of DEP's rules include a lists "urban impaired streams" and "lakes most at risk from new development." There are no "urban impaired streams identified in the Town of York. However, Boulter Pond, Chases Pond and Scituate Pond are each listed as "lakes most at risk from new development", though not of highest priority.

According to DEP, as of January 2006, it appears that all of York's rivers and streams currently meet state water quality standards. However, several of the town's estuaries and harbors do not meet state standards due to bacteria levels from outfalls, overboard discharges and nonpoint source pollution. These include the York River Estuary, Lobster Cove, Cape Neddick and Brave Boat Harbor. Also, it appears that there is insufficient data to determine if Perkins Cove (Josias River Watershed) and York Harbor meet state standards. The ponds in York currently meet state standards however the state has very little monitoring data on them. Data indicates that Scituate Pond has relatively poor water quality with high potential for nuisance algal blooms. See Appendix E – Water Quality Summary Scituate Pond, York. It should be noted that State data may be out of date as their mapping shows licensed overboard discharges in the York River even though these were successfully removed by 2002.

Because watersheds (or "sub-watersheds") of first-, second-, and even some third-order streams typically are small, they can be especially vulnerable to large impervious areas, like commercial parking lots. Many of the "urban impaired streams" on DEP's list are lower order streams that drain small areas: one or two square miles of land or less. Though York has no urban impaired streams at this time it may be useful in the future to assess low order stream sub-watersheds that are experiencing significant commercial, industrial, or residential growth.

2) Groundwater Quality. Groundwater quality information was obtained from the Maine Department of Environmental Protection (DEP). Their data is stored in the Maine Environmental and Groundwater Analysis Database (EGAD). EGAD is designed to store site and water quality information including spatially located data for 37 different types of potential and actual sources of groundwater contamination in Maine.

The map entitled, "**Potential or Actual Threats of Groundwater Contamination on EGAD, Town of York**, with a date of January 5, 2006, is hereby incorporated into the Comprehensive Plan by reference. This DEP map shows the locations in the town of York that are sources or potential sources of groundwater contamination. These sites include town

dumps, landfills, industrial subsurface wastewater disposal and hazardous waste facilities. It is noted, however, that this map is included in the Plan to demonstrate the range of possible issues and problem spots, but the Town disputes the accuracy of certain specific attributes shown on the map, such as overboard discharges along the York River. Pollutants indicated on the map are listed in Table 2.

TABLE 2: Types of Nonpoint Pollutants and Their Impacts

Pollutant	Nonpoint Source	Impacts
Bacteria	Livestock, pet waste, septic systems, and boat discharge	Introduces disease bearing organisms to surface water and ground water, resulting in shellfish bed closures, swimming restrictions, and contaminated drinking water
Nutrients (phosphates & nitrates)	Fertilizers, livestock, pet waste, septic systems, suburban & urban development, and soil erosion	Promotes algae blooms and aquatic weed growth which can deplete oxygen, increase turbidity, and alter habitat conditions.
Sediment (Soil)	Construction, driveways, ditches, earth removal, dredging, mining, gravel operations, agriculture, road maintenance, and forest operations.	Increases surface water turbidity which in turn reduces plant growth and alters food supplies for aquatic organisms, decreases spawning habitat and cover for fish, interferes with navigation and increases flooding risk.
Toxics & Hazardous Substances	Landfills, junkyards, underground storage tanks, hazardous waste disposal, mining, pesticides and herbicides, auto maintenance, runoff from highways & parking lots, boats and marinas	Accumulates in sediment posing risks to bottom feeding organisms and their predators, contaminates ground and surface drinking water supplies; some contaminants which may be carcinogenic mutagenic and/or teratogenic can bioaccumulate in tissues of fish and other organisms including humans.
Airborne Pollutants (i.e., acid rain, nutrients & metals)	Automobile and industrial emissions	Reduces pH in surface water which alters habitat and reduces natural diversity and productivity; increased nitrogen may enhance eutrophication of coastal waters. Mercury accumulates in fish tissue threatening bald eagles and people.

SOURCE: Maine Department of Environmental Protection

e. Floodplains

loodplains are the low, mostly flat areas adjacent to rivers, streams, ponds and tidal water, which are periodically flooded by these waters. Although flooding can have beneficial effects in the natural environment, in a developed area flooding causes damage to private property and public infrastructure, degrades the environment, and poses risks to public health and safety.

Floodplains have been mapped by the Federal Emergency Management Administration (FEMA). These maps delineate the boundaries of the 100-year and 500-year flood levels for all the major waterways, tributaries and coastal areas. Mapping in York was most recently updated in 2002.

The map entitled, "**100-Year Floodplains**, York Comprehensive Plan, Inventory and Analysis, Natural Resources Chapter" with a date of February 10, 2006, is hereby incorporated into the Comprehensive Plan by reference.

With a number of surface water bodies in York, the chance of frequent flooding is high, although water supply ponds can be regulated in an attempt to lessen the impact of flooding. Wetlands are also able to absorb a significant amount of flood waters. Of the 1,172 acres of wetlands in York, fifty percent have been found by the state to have "Values at a Significant Level" for flood flow function**.**
The Town has embarked on a study of drainage problems in the area between the York and Cape Neddick rivers, especially in the area behind the dunes along Long Sands and Short Sands beaches where extensive flooding occurs on a regular basis.

B. AIR RESOURCES

Air quality is an issue of obvious importance. Air pollution adversely affects public health, the environment, and the economy. York is located in a non-attainment region per the standards of the Clean Air Act. This means the air quality in York is poor at times and action is required to make improvements. In general, ground-level ozone, one of the components of smog, has exceeded threshold standards on certain days each summer. Typically this is a result of winds pushing a pollution plume up the coast from the metropolitan region of Boston and cities farther south, not a result of activities in York.

Non-attainment for ground-level ozone is ranked on a 5-tier series. On a scale of 1 to 5, where 1 is the closest to good-quality air and 5 is the smog in Los Angeles, California, air quality along the York County coast is classified as a 2. Technically, this is classified as *moderate* non-attainment.

The State has included the Town of York in the Metropolitan Portland Air Quality Region (Title 38 §583). Responsibility for improving and maintaining air quality problems rests with the state government (primarily Maine Department of

Environmental Protection), the federal government (primarily the U.S. Environmental Protection Agency), and regional transportation planning agencies (Southern Maine Regional Planning Commission and Portland Council of Governments). Generally, each state with non-attainment areas is required to budget for emissions of mobile sources (vehicles, etc.), stationary sources (factories, power plants, etc.), and area sources (lawn mowers, b-b-q grills, trains, etc.). They are then required to pursue policies to achieve these emission budgets.

As a local government, the Town of York is not directly responsible for air quality compliance. That said, the Town's policies have an impact on air quality because of the relationship between air quality and driving, sprawl, availability of transit, and so forth.

C. COASTAL RESOURCES

The Town's coastal resources are of obvious importance to the Town, the state and the nation. Beyond this parochial concept, the Gulf of Maine is a resource shared with Canada, and the oceans are shared by all countries. As such, the State has adopted coastal management policies (Title 38 §1801) that direct all communities along the coast to plan for appropriate use of coastal resources. The State's goals under the Growth Management Program expressly require communities to address coastal resources, including rivers, estuaries, coastal areas, wetlands, shorelands, dunes and the marine resources industries (Title 30-A §4312.3). This is followed by express requirements to address these same resources in the Inventory and Analysis section of the Comprehensive Plan (Title 30-A §4326.1).

Before getting into the details of the coastal resources in York, it is worth stepping back and considering the big picture first. The Pew Oceans Commission released a report entitled, "America's Living Oceans; Charting a Course for Sea Change" (Pew Oceans Commission, May 2003). The Commission was established as a non-partisan, independent group of American leaders whose mission was "to identify policies and practices necessary to restore and protect living marine resources in U.S. waters and the ocean and coastal habitats on which they depend" (Executive Summary, page ix). They concluded that the World's oceans are in crisis. While there are many issues tackled that are beyond the control of any community, the report does place a significant focus on land use practices along the nation's coasts. Inappropriate development, habitat loss, and non-point pollution are among the types of problems that communities cause. With a productive estuary like the York River contained primarily in the Town of York, the Town's responsibility to protect resources vital to the oceans is clear.

1. Extent of Marine Influence

The State has identified the extent of marine influence in a series of maps called the Coastal Marine Geologic Environment maps. These maps identify all coastal resources by their relationship to tidal waters: subtidal, intertidal, and supratidal environments. The following definitions are taken from this map series. Subtidal

environments are defined as, “environments existing below low water and subject to tidal current forces and wave-generated current forces.” Intertidal environments are defined as, “environments between the highest high water datum and the lowest low water datum subject to twice daily tidal flooding and all other marine forces.” Supratidal environments are defined as, “environments just above the highest high water datum, but under the partial influence of marine processes and forces.”

This series of Maine Geological Survey maps entitled, “**Coastal Marine Geologic Environments**,” prepared by Barry S. Timson in 1976, are hereby adopted by reference into this Plan: Dover East Quadrangle, Maine (Open-File No. 76-85); Kittery Quadrangle, Maine (Open-File No. 76-101); York Beach Quadrangle, Maine (Open-File No. 76-145); and York Harbor Quadrangle, Maine (Open-File No. 76-146).

What these maps show is that there are 4 primary areas where the coastal marine environment extends inland significantly.

- The first area is Brave Boat Harbor. South of the York River, this is the only place where intertidal resources extend west across Route 103.
- The second area is the York River, which extends as an intertidal environment all the way through York and into Eliot. Off the main course of the York River, tidal environments extend significantly away from the River at the following locations: Barrells Mill Pond (intertidal up to Indian Pond); Cider Hill Creek (intertidal north of Route 91); the outlet of Boulter Pond (intertidal to Route 91); Smelt Brook (intertidal and supratidal north of Route 91); Rogers Brook (intertidal to Birch Hill Road); and Gordon Brook (intertidal south of Beech Ridge Road, under the Maine Turnpike, but not to Route One).
- The third area is the Cape Neddick River, which has an estuarine channel (subtidal environment) that extends upstream of the Clark Road bridge, but does not extend to Route One.
- The fourth area is at Phillips Pond. North of the Cape Neddick River, this is the only place where intertidal resources extend west across Shore Road.

2. Marine Resources & Public Access to Coastal Waters

Marine resources play an important role in York's way of life. Marine-oriented businesses contribute to the local economy and York's coastal resources provide numerous recreational, public access, and scenic opportunities. These resources, which include three harbors, several beaches, and many rocky coastline areas, have been prominent in York's history and all indications are that the Town's maritime activities will continue to flourish.

There are two major concerns regarding York's marine resources: (1) maintaining the environmental quality of the ocean and coastline; and (2) balancing the multiple, and often competing, uses of the Town's coastal areas. The specter of water pollution from both land-based and oriented sources, which would result in

a lowering of water quality, is a looming threat to the long-term commercial and recreational use of York coastal areas.

The second issue regards the need to balance the needs of the many different users of York's harbors and coastal waters. Mooring space for fishermen and recreational boaters is already at a premium. There may also be a potential conflict between the water-dependent and non-dependent users of York's waterfront. Lessening traffic congestion in waterfront areas and equitably allocating parking spaces between these two different user groups are just some of the many issues that must be resolved in order to strive towards finding the appropriate balance between the various waterfront users.

There have been only minor changes in York's facilities and marine resource management activities since 1991. The most significant change accomplished during this period was the completion of the maintenance dredging of York Harbor in 1996. Regarding public access to waters, the Town has a purchase and sale agreement on Strawberry Island, which will provide carry-in access, shorefront fishing, and an opportunity to expand Town Dock #1. The public has used the land in the past, but only on an informal basis. This parcel is a good location for a boat launch and has land suitable for dinghy storage. The future growth of any water dependent activities is limited by the lack of facilities such as parking and restrooms. Finally, the comprehensive planning and management of York's marine resources, including the York and Cape Neddick rivers in particular, have been supplemented by non-governmental organizations in the past several years.

While the actual management and regulation of municipally owned and controlled resources and facilities such as shellfish beds, moorings and public wharves remains the responsibility of municipal agencies, a coalition of non-profit environmental groups has formed the York Rivers Association to represent their interest before municipal and Federal agencies responsible for marine resource planning and management. Among the activities conducted by the Rivers Association have been:

- publication of periodic newsletters dealing with critical rivers and land use policy and management.
- interactive public forums dealing with rivers history, conflicting usage and management/protection option
- sponsorship of comprehensive inventory and planning guidelines
- research into public access ownership and protection

Most recently, the Rivers Association has been successful in obtaining a two-year commitment from the National Park Service to provide assistance in the development and implementation of a York River Watershed Conservation Program. This program will include the establishment of a river trail, resource

protection component, and will facilitate access to other governmental assistance and funding.

Another significant marine resource related action undertaken by the Federal government has been the formal designation of the Upper York River as a Division of the Rachel Carson National Wildlife Refuge. There is no specific geographic boundary delineating which parcels will be acquired to augment this Southern Maine Wildlife Sanctuary, however, the U.S. Fish and Wildlife Service is now able to budget Congressional appropriations to acquire land in the area. Another initiative conducted in 2004 by the U.S. Fish and Wildlife Service through the Rivers Association was the potential restoration of the dredge spoils area adjacent to Harris Island.

The State has established as public policy that continued public access to the coastal shore is of great public interest (see MRSA Title 38 §1801.3). As opposed to private access, which is available only by permission of the property owner, public access is available to everyone. In York, public access takes multiple forms.

In this section, York's marine resources, harbor facilities, and coastal land uses will be described and analyzed.

a. Port and Harbor Locations

There are three harbors in York, which are York Harbor, Cape Neddick Harbor, and Brave Boat Harbor. According to the York Harbor Master, there are only "one and three-fourths [completely functional] harbors" in the Town of York due to boat access limitations caused by the tide. York Harbor is the only harbor in York that is truly passable at all tides. Cape Neddick Harbor is considered by the Harbor Master to be “one half” accessible because it is not passable below half tide and Brave Boat Harbor is being considered to be only "one quarter" accessible as it becomes primarily dry land at low tide.

York Harbor is located in the southerly section of York's coastline. It has depths of 8 to 20 feet at the mean low water (MLW) mark in the Harbor itself and depths of 11 to 18 feet at MLW in the York River channel between the bridges. York Harbor's normal mean high water (MHW) is 8.6 feet above the MLW. The York River begins at the Route 103 bridge with a fixed height of 15 feet at MHW and a channel width of 50 feet. Watercraft with high masts are restricted from going upriver because of the bridge's low height. “Rock’s Nose” and “Stage Neck” protect York Harbor from heavy sea conditions. Because of this protection, there are a large number of boat moorings in York Harbor. York Harbor does not freeze in the winter, which allows these moorings to be kept in the water on a year-round basis.

There are sections of York Harbor that have been dredged, such as the North Basin and the South Basin. The North Basin is located adjacent to Town Dock

#1, north of Bragdon Island, while the South Basin is located adjacent to Town Dock #2, north of Harris Island and east of Harris Island Road. The York Harbor dredging spoils were placed in a location west of the Harris Island Road.

Cape Neddick Harbor is situated in the northern section of York, and has depths of 1 to 17 feet at the mean low water mark. This Harbor is exposed from the south, and is particularly affected by winds from the ' east and the south. In the winter, however, it is generally ice free. There are a small number of moorings in Cape Neddick Harbor, which are kept in the water on a year-round basis. Before the bridge was constructed, the harbor was used for large sailing vessels.

Brave Boat Harbor is located along the Kittery/York Town line. It has harbor depths of 1 to 4 feet at MLW. There are no public moorings situated in Brave Boat Harbor, since it is generally inaccessible to the general public for mooring purposes. The harbor is bounded by the Rachel Carson National Wildlife Refuge and privately owned land.

b. Shellfish Areas

There are three major shellfish areas in York Harbor. One of these shellfish areas is in Barrell's Mill Pond, with access available from Route 103, Barrell Lane, and the Conservation area. No lobstering is allowed west of Rock's Nose because this part of the Harbor is a breeding area. The second and third shellfish areas have clam beds. The Clam seeding program has focused on two areas in York Harbor: (1) the southerly side of the York River, west of Sewall's Bridge (which is accessed from Southside Road), and (2) the southerly side of the York River, between Harris Island, the Wheeler Marsh and Harris Cove (with access from Route 103 and Western Point Road). There has been an active clam seeding program since 1988. Complimenting the seeding program is another initiative to remove all licensed overboard discharges from the York River Watershed. By 2003, the Planning Department and Code Enforcement Department had successfully worked with property owners to eliminate these discharge systems, thereby removing a major source of contaminants from the River.

When shellfishing areas are open, the Town issues 125 recreational adult clamming licenses annually on a first-come, first-served basis; we also issue 25 junior licenses. Licenses must be obtained from the Town Clerk by anyone who digs clams in Town. The Town Shellfish Warden is charged with ensuring that shellfish harvesting is conducted within the Town. When the Town's clam flats are open, many of the Town's shellfishing licenses are obtained very soon after they become available. The people who receive Town licenses harvest shellfish for recreation, not as a commercial venture.

c. Waterfront Users

York's waterfront users can be divided into two categories: commercial and recreational. It is estimated that total marine employment in York is between 125 and 150 people. On the commercial side there is a broad range of users, such as: fishermen and lobstermen (28 full-time lobstermen, 12 part-time lobstermen, three ground-fishing boats with two persons per boat); 5 charter fishing operations; 9 tuna boats and 11 marina or boat docking facilities, residential and commercial; whale watching tour boats; wholesale and retail seafood dealers; bait vendors; a marina with storage and repair facilities; a 60 ton marine railway; a boat building facility; a ship chandlery; a boat and motor sales business; and a boat fuel station. There are several types of land uses and people who utilize York's coastal waterfront for recreational purposes, including the following: restaurants; lobster pounds; lodging facilities; seasonal and year-round housing; boaters (on both sail and power boats); beach visitors; swimmers and surfers; skin divers; and tourist-oriented businesses.

The current level of use for all of the private and public marine resources is very high. The York harbors offer both commercial and recreational opportunities for both residents and non-residents. Given its proximity to Boston and to Southern New Hampshire, York's harbor attracts many non-resident visitors and users.

d. Public and Privates Facilities Providing Access to the Water

York has extensive amount of public access to the water provided by its existing municipal facilities and public improvements. This public facility inventory consists of: two Town docks in the York Harbor area, one of which was enlarged in 1988; seven Town moorings; Fisherman's Walk, which extends from Mill Dam Road to Stage Neck; the Route 103 Bridge and the Sewall’s Bridge, both of which are used for bottom fishing; York Harbor Beach; the Hartley-Mason Reservation; Long and Short Sands Beaches; Cape Neddick Beach; Sohier Park; Nubble Light; the gazebo at York Beach; Wiggly Bridge at Mill Pond, and the Cliff Walk, a scenic shoreline pedestrian trail in York Harbor. Acquisition of Strawberry Island, adjacent to Town Dock #1, will provide important additional areas for carry on and fishing.

Public boat launches are limited to two locations along the tidal portion of the York River. For powerboat launching, the only public option is the launch at Scotland Bridge on the York River. This launch is suitable for canoes and kayaks, as well as small, trailered boats. Boat size is limited because this site is located upstream of several low bridges that significantly limit the height of boats launched here. Parking is extremely limited, and there is little room to maneuver vehicles and trailers off of the travel lanes of Scotland Bridge Road. Accesses for larger boats in the York River and onto the Cape Neddick River are available only via private facilities.

For launching canoes and kayaks, there are several options. The only formal public access is at Strawberry Island, adjacent to Town Dock #1. This is a recently acquired property (leased in 2004, with an option to purchase) to be used expressly for canoe and kayak launching. Other options are all informal. There are many informal access points along various roads where they cross or run adjacent to tidal waters. Access can be obtained at Goodrich Park, although the site is poorly configured for carry-in access. Access from Route 103 at Wiggly Bridge is also possible.

For the boating public, the Town maintains 2 public docks. Town Dock #1 is located on Harris Island Road adjacent to Route 103. Town Dock #2 is also located on Harris Island Road, but farther from Route 103.

The private facilities with access to the York River include: the Stage Neck Inn; Dockside; the York Harbor Marina; the Agamenticus Yacht Club; the Harborside (with pier and dock); Donnell's dock (water and electricity) and launching ramp facility; John Hancock Wharf (a.k.a. Marshall Wharf); Leighton's Pier and the York River Yacht Pier on the north side of the York River; and Sewall's Bridge Wharf and Cadwalader's Wharves on the south side of the York River near Bridge, McIntire and White Wharves next to Route 103. On the Cape Neddick River, a private boat launch is located at the Cape Neddick Lobster Pound.

e. Mooring and Berthing Facilities

There are boat moorings located in both York Harbor and Cape Neddick Harbor. The total number of moorings in York River is approximately 350, with a waiting list of 354, according to the Harbor Master's Secretary in May 2004. Of the 354 on the York Harbor waiting list, 228 are for powerboats, 126 are for sailboats. In addition to these mooring facilities, there are short-and long-term berthing spaces available at the Town Docks (short-term), Donnell's Wharf, Edwards Wharf, York Harbor Marine Service, and Marshall Wharf. Both commercial and recreational boaters use all of these berthing facilities. Public off-street parking areas in York that facilities include 25 spaces at Town available adjacent to the harbor facilities, but these spaces are in high demand during the summer months. The parking spaces associated with private mooring and berthing locations have not been inventoried, but most of these private facilities do provide off-street parking. The availability of parking at berthing, mooring, and launching facilities is a concern in York.

The Town currently does not regulate moorings in Cape Neddick Harbor, although there is informal control by the users at this time. Most moorings in the Cape Neddick River are west of the Shore Road Bridge, but there is an increasing trend to establish moorings on the ocean side of the bridge.

f. Existing Municipal Fees and Revenues

An annual "harbor usage" fee is charged to all boat owners with moorings berthing spaces within the Town of York. The amount of the yearly fee is based on a boat's size and age. The monies generated by the harbor usage fee are earmarked for a dedicated municipal fund, which is used to pay for the upkeep of the Town docks and other necessary harbor improvements such as dredging.

g. Public Beaches

York has 4 major swimming beaches: Harbor Beach, Long Sands Beach, Short Sands Beach, and Cape Neddick Beach. Long Sands and Short Sands beaches are extensive sand beaches, each attracting a large number of visitors during the summer. Harbor and Cape Neddick beaches are smaller, and tend to be used more by the community. During the summer, lifeguards are stationed at Harbor, Long Sands and Short Sands beaches. A recent trend is public use of the Steadman Woods/Wiggly Bridge area as a beach. This is of concern because the area is predominantly mudflat and salt marsh, which is extremely sensitive and fragile. The small stony area may be able to accommodate a very limited amount of use, but further analysis should be undertaken before establishment of any public policy regarding use of this area.

h. Public Parks

There are 6 parks where the public can have access to the coast: Rachel Carson National Wildlife Refuge, Hartley Mason Reserve, Sohier Park, Ellis Park, Goodrich Park, and Steadman Woods.

- The Rachel Carson National Wildlife Refuge in York is part of a larger complex of lands managed for wildlife purposes, but there are walking paths within the Refuge that provide for visual access to the coast.
- The Hartley Mason Reserve is a privately held property made available to the public for passive recreation. It is located adjacent to the Harbor Beach, and is crossed by the Fisherman’s Walk.
- Sohier Park is a Town-owned park at the end of the Nubble, and includes the Cape Neddick Light Station (a.k.a. Nubble Lighthouse). This park is heavily visited because Nubble Lighthouse is a nationally recognized attraction along Maine’s coast. August 2004 traffic counts indicated an average of about 1,500 vehicles entering the park daily.
- Ellis Park is privately held property that is dedicated to public use. It is located adjacent to the Atlantic Ocean at Shorts Sands Beach. The Park includes dunes, lawns, a playground, a parking lot, and a bathhouse.
- Goodrich Park is a Town-owned park located on the banks of the York River, between U.S. Route One and I-95. The Grant House is located on this property. Mrs. Mary Patterson donated Goodrich Park and the Grant House to the Town for public use and resource conservation in December 1971.

- Steadman Woods is owned by the Old York Historical Society, and is located along the York River just upstream of Route 103. This property contains walking paths on the west end of Wiggly Bridge and, as such, forms the southerly end of the Fisherman's Walk.

i. Scenic Opportunities

Visual access to the coast is widely available. Most people view the ocean and tidal waters from public roads. Route 1A, which runs along Long Sands and Short Sands beaches, is the most traveled. Shore Road, which connects York Beach with Ogunquit to the north, follows the coast and has several significant vantage points, particularly in the vicinity of Phillips Cove. Route 103 crosses the York River at York Harbor and has a sheltered view of Brave Boat Harbor. Cider Hill Road (Maine Route 91) and Birch Hill Road have magnificent views of the tidal marshes near the headwaters of the York River. All these roads serve both vehicle and bicycle traffic, and Route 1A has a sidewalk along both beaches for pedestrian views. The Fisherman's Walk, also known as the Cliff Path, is a public walkway that begins in Steadman Woods that follows the York River downstream to Harbor Beach and the Hartley Mason Reserve, and then follows the rocky coastline around Eastern Point to Cow Beach. Walkers on this path have spectacular views of the River and Ocean. Finally, one can have a broad view of the Atlantic Ocean, out to Boon Island and the Isles of Shoals from the summit of Mt. Agamenticus. There are too many viewpoints to list, but the social value of these vistas is without question. More detailed coverage of scenic resources is provided elsewhere in this report.

j. Analysis and Summary

York has maintained a stable marine waterfront, which is used by both residents and nonresident visitors. The Town has managed its harbors and waterfront areas, such that they are heavily used but not completely overcrowded.

One emerging trend in York is that public access to the shore over private property may become increasingly scarce. There has been customary usage by the public of several privately owned access points, such as the Newick land on Strawberry Island, which is in the process of being purchased by the Town, and Donnell's Wharf. Boat launching is currently allowed on Donnell's Wharf for a nominal fee. There is no guarantee that this boat launch facility will remain open to the public indefinitely.

A second trend is the desire of waterfront property owners to install new or expand existing float systems, to increase their existing dockage or to obtain new pier access. The community needs to assess the capacity of the harbors in York to handle any additional dockage and consider revision of the regulations governing docks, to ensure that rational decisions are made about the expansion of harbor facilities. The Town is proposing to conduct a

waterfront master plan to identify areas suitable for water dependent uses and this plan should be a high priority.

The maintenance of good water quality and the long-term use of the Harbor as fishing and shellfish harvesting areas are related and important issues that need to be addressed in York. Fishing and shellfish harvesting provides jobs for York residents, which provides both direct and indirect economic benefits the Town of York. The temporary or permanent loss of the Town's shellfish areas, for example, would negatively impact the local economy, and would also adversely affect a part York's traditional and historic community character.

A major consideration in determining harbor capacity is the landside impacts. Vehicular traffic on roads near the water is likely to increase, as recreational boating becomes more popular and as nonresident users increase in number. Parking is another major issue in York, especially since the current amount of parking is limited in waterfront areas. Efforts to control this parking situation could include the use of parking meters, "parking on one side only" restrictions, resident only areas and two hour parking limits. The Town may also want to consider allowing parking at the high school with a shuttle bus system, in order to reduce the current summertime parking pressures and traffic congestion near York's beach and other waterfront areas. Multiple ticketing of parking violators may also deter long-term users who are, in effect, paying only $20.00 for a parking ticket that allows them to stay parked in one spot all day. Resident parking permits may also be effective in allocating priority parking spaces to residents, as long as other adequate provisions are also made to meet the non-residents' parking needs.

The demand for moorings may be another source of conflict in the Town. The current waiting list may result in a boater waiting ten to twenty years to obtain a mooring. Such a waiting list, which is more than double the number of available moorings, is an obvious sign that the demand for moorings is not being met in the harbors. Given this large backlog, the Town may want to consider reorganizing York Harbor's current placement of moorings and be able to assign a few additional moorings. The Town has established a fee for those people desiring be on the waiting list for mooring space. This fee has helped to trim the list down to a realistic number of names, which could be used to assess the true demand for mooring space. Depending on this "true" demand for moorings, the Town could then consider reorganizing the moorings to create additional mooring space. If the moorings are reorganized, a balance between a more efficient mooring allocation pattern and a safe harbor congestion level will need to be sought. One question the Town needs to determine is the market for which they are aiming. Is it the local market, or does the Town of York also want to attract boaters from neighboring areas?

Maintaining an adequate amount of berthing or mooring space for commercial fisherman is another consideration. The Town may want to consider allocating a certain number of mooring spaces for people who depend on the water for a living. One possibility is that when new floats or docking space is approved, a certain percentage would have to be dedicated to commercial fisherman.

Dredging is another issue that will become more pressing as the Basin areas and Harris Island fill in with silt. Dredging could open up more mooring or berthing area, but might also have a negative effect on the marine environment. Also, obtaining federal and state permits for coastal dredging is also very difficult, unless a strong need and the ability to minimize environmental damage can be proven by the applicant. Federal financial assistance for harbor dredging is extremely competitive.

In order to preserve the municipal investment of York's marine facilities and to preserve the long-term viability of marine uses, the Town may wish to consider establishing specific waterfront zones. The primary uses in these zones would be water dependent activities. The security of ensuring that development, which needs to be on the water, can be developed on the water may override potential concerns of exclusive waterfront zones. The advisability of these actions can more closely be examined through preparation of the recommended harbor management plan.

Appendix A includes an inventory list of marine resources as of May 2005.

A map entitled, "**Public Access to Coastal Waters**, York Comprehensive Plan, Inventory and Analysis, Natural Resources Chapter" with a date of March 1, 2006, is hereby incorporated into the Comprehensive Plan by reference.

3. Coastal Sand Dune Systems

In York the State has identified two coastal sand dune systems: along Long Sands Beach; and along Short Sands Beach. While dunes comprise only about 2% of Maine's coastline, they comprise a significantly larger percentage of York's coastline. The Maine Geological Survey (MGS) has mapped dunes throughout the State. Five of these maps reference dunes in York. This series of MGS maps entitled, "**Beach and Dune Geology**," prepared by Stephen M. Dickson in 2001, is hereby adopted by reference into this Plan: Long Beach, Lobster Cove, York, Maine (Open File No. 01-433); Long Beach, Prebbles Point, York, Maine (Open-File No. 01-434); Long Beach, York, Maine (Open-File No. 01-435); Long Beach, Railroad Ave., York, Maine (Open-File No. 01-436); and Short Sands Beach, York, Maine (Open-File No. 01-437).

The State has adopted definitions of dunes (see Title 38 §480-B, and Coastal Sand Dune Rules §3), but in short, dunes are inland areas of sand and gravel deposits associated with a coastal beach. Frontal dunes are closer to the ocean, and back

dunes are tucked behind the frontal dunes. Dunes are an important component of the natural environment along the coast. Dunes fulfill a multitude of functions. Most notably, they buffer inland areas from storms, provide important wildlife habitat, and enhance the scenic beauty of the coastline. The State, through MRSA Title 38, §480-A through §480-Z, has enacted legislation to require protection of dunes. This statutory protection is implemented, in part, through the Department of Environmental Protection's Coastal Sand Dune Rules (Chapter 355). The State's Coastal Management Policies (Title 38 §1801) do not expressly address dunes, but clearly values associated with dunes are covered in these policies. Further, the goals established by the Legislature for the Growth Management Program include call for protection of critical natural resources, including sand dunes (Title 30-A §4312.3.F).

The dunes in York have been heavily developed, and have been so for over a century in many places. Despite the heavy impacts already imposed on most of the dunes in York, their natural function and values can readily be expected to increase if the State is correct in its projection that sea level will rise 2' in the coming century. The buffering function will become more vital, and it is likely that much of the development on the frontal dunes will be subject to increasingly frequent and more severe damage during storm events. Development of municipal policies regarding dunes must occur in conjunction with a response to the issues of sea level rise and beach erosion.

a. Long Sands

At Long Sands, there are a combination of gravel beaches and sand beaches, interrupted by two areas of ledge (one at Lobster Cove and the other across from the Anchorage Motor Inn). In total, this beach is over 2 miles in length. From the south, gravel beach extends about 2,300 feet north (to the vicinity of the York Harbor Motel), and from here to the northern end it is a sand beach.

There are 2 sections of frontal dune along Long Sands. The first frontal dune is located at Lobster Cove. It is a short dune, about 400' in length, that extends inland only about 50' from the beach. This area remains in its natural, undisturbed condition. This is significant because it is the only undisturbed frontal dune remaining in York. The second frontal dune is very large, beginning just north of Libby's Campground and running north approximately 1.7 miles to point where the beach ends at the Cape Neddick peninsula. It extends between 100' and 200' inland from the beach. Practically the opposite of the pristine condition of the frontal dune at Lobster Cove, the entire length of this frontal dune is separated from the beach by Route 1A (York Street and Long Beach Ave) and the associated seawall. Inland it encompasses the buildings that front on these roads, and a few that are farther back as well.

There are no back dunes identified along Long Sands. There are two areas on the southern end identified as back dune washover fans, which are areas

behind frontal dunes that contain deposits from large waves and high tides during severe storms.

b. Short Sands

At Short Sands, there is a sand beach (about ¼ mile in length), a frontal dune behind the sand beach, and a back dune behind the frontal dune. The sand beach is relatively undisturbed, although there are development-impacts at both ends (walkway, drainage culverts, and a parking lot (for the Union Bluff). Along the back of the beach is a seawall with a sidewalk along its top, which separates the beach from the frontal dune. Except in the vicinity of the parking lot, the beach is within Ellis Park.

The frontal dune extends from Ocean Ave to the south to Beach Street to the north. It extends about 175' inland from the seawall at the sand beach. The majority of the frontal dune is part of Ellis Park. The southern half of the frontal dune is comprised of two equally-sized areas of relatively undeveloped dune, split by a sidewalk and an open shelter along the seawall sidewalk. At about 300' in length each, these two areas represent a significant stretch of relatively undeveloped dune, even if they are separated from the beach by a seawall and sidewalk.

The northern half of the frontal dune is fully developed. From the center to the north, there is a large playground, a paved parking lot, a public bathhouse, and 4 major commercial buildings (Fun-O-Rama, York Beach Bowling, etc.). The commercial buildings and a narrow stretch of the parking lot are privately owned, but the majority of the parking lots, including the bathhouse, are within Ellis Park.

The back dune extends from Long Beach Road to the south, to Railroad Ave to the north. From the frontal dune, the back dune extends between 250' and 350' inland. The back dune includes all of Ocean Ave, and continues inland for a couple hundred feet. The area inland includes houses, the Ocean House condominiums, and large commercial buildings (The Sands Motel, Inn On The Blues, Sheltons, Goldenrod, etc.). Also, about 1/3 of the upland area of Ellis Park is located in the back dune, developed on the northern end (parking lot and basketball courts) and mown lawns and the gazebo to the south.

4. Coastal Island Registry

The Department of Conservation's Bureau of Parks and Lands maintains a listing of all coastal lands that are surrounded by water at high tide, and this is called the Coastal Island Registry (see MRSA Title 33 §1201 et seq). The list includes the island name, owner information, and location (municipality and county). The Registry does not include larger, developed islands such as Harris Island. In the 1970s the State required registration of private property ownership of such islands. Any islands not registered within the specified time limit have been placed under the stewardship of the State, though they are not necessarily State-

owned. Of the approximately 3,600 such islands along the Maine coast, about 1,300 are held by the State. The State was not able to generate a map showing the coastal islands in York—all data is available in table format only.

However, there are 12 islands in York listed in the Coastal Island Registry. This number accounts for Boon Island and Boon Island Ledge, which were not listed under any community because of their distance from the shore. Of the 12 islands:

- 7 are held by the State—the only named island in this group is Boon Island Ledge;
- 2 are Federally-owned—Boon Island, and one island in the Rachel Carson Wildlife Refuge;
- 1 is Town-owned—The Nubble; and
- 2 are privately owned—Bragdon Island and Pine Island, both of which are located in the York River. (The Registry lists the names Prebble, Bragdon and Pine for these 2 islands.)

5. Coastal Barrier Resource System

The State of Maine designated 32 areas along the coast as the state's Coastal Barrier Resource System. This occurred in response to the federal Coastal Barrier Resources Act of 1982. The areas designated included coastal barriers, and adjacent wetlands, marshes, estuaries, inlets and nearshore waters. The laws acknowledge the scenic, scientific, recreational, natural, historic, archeological and economic values of these barriers. Both laws aim to protect these resources from irreversible damage or loss by development on or adjacent to these barriers by strictly limiting the expenditure of state and federal funds in these areas for incompatible purposes, although some expenditures such as maintenance of existing roads may still be funded. The only implication of this designation for private property owners is that flood insurance from the National Flood Insurance Program is not available for an new construction or structures substantially improved on or after November 16, 1990. This program is controlled by MRSA Title 38 §1901-1905.

There is one designated coastal barrier resource system in York: Phillips Cove. This system is located on along Shore Road, beginning just north of Wadleighs Head to the south and ending just north of Phillips Pond. Within this system there are 37 parcels and 8 structures (7 houses, 1 outbuilding). The map and lot number for each parcel with a structure are as follows: map 8/lot 3; map 8/lot 3A; map 9/lot 7A; map 9/lot 7B; map 9/lot 7F; and map 11/lot 3.

The following map is hereby incorporated by reference into this Plan: "**Coastal Barrier Resource System; Phillips Cove Unit ME-23**" by U.S. Fish and Wildlife Service, October 24, 1990. The boundary of the designated coastal barrier resource system is also shown on the Town's Flood Insurance Rate Map (FIRM), specifically on Community Panel Number 230159-0013 D (revised through June 17, 2002), available for public inspection in the Code Enforcement Office.

6. Heritage Coastal Areas

The Town is required by MRSA Title 30-A §4326.1.C to address Heritage Coastal Areas in this Inventory and Analysis section of the Comprehensive Plan. The State's Heritage Coastal Areas Program was created by the Legislature in 1986. The intent of the program was to identify and seek voluntary protection of areas along the coast that are of natural, historic and scenic importance. Despite the statutory requirement for towns to address Heritage Coastal Areas in their comprehensive plans, the State repealed the Heritage Coastal Areas Program in 1993.

Technically there is nothing to address because the program no longer exists, but a review of the historical records in Town files highlights something very important about York. In a letter from Richard D. Kelly Jr., Planner with the State Planning Office, to David Linney, York Planning Board Chairman, dated January 7, 1988, there were 11 areas that potentially qualified to be included in the Heritage Coastal Areas Program in the region from Kittery to Scarborough. Of these 11 areas, 5 were in York:

1. Brave Boat Harbor
2. York River/Harbor
3. Cape Neddick
4. Mt. Agamenticus/Chases Pond
5. Cape Neddick River

Two of these areas, the York River/Harbor and the Mt. Agamenticus/Chases Pond areas, were eventually nominated for formal inclusion in the Program. Regardless of the demise of this Program, the concentration of so many significant resources in a single town is unique, and demonstrates the great value of the Town's natural resource base.

7. Sea Level Rise

See "Adaptation to Sea Level Rise" Chapter.

8. Beach Erosion

See "Adaptation to Sea Level Rise" Chapter.

9. Coastal Bluffs and Landslide Hazards

Maine's coastal bluffs, defined as steep shoreline slopes of sedimentary materials at least 3' tall, are common. They occur in areas that are not our classic rocky coast, and that are not part of a beach/dune system. Because these bluffs are sedimentary materials such as marine clays, they can be unstable, and as such it is important for the Town to understand them.

The Maine Geological Survey (MGS) has identified coastal bluffs and evaluated coastal landslide hazards at a regional level. Their mapping is not adequate for making site-specific land use decisions, but they are adequate to identify areas of

general concern. They have produced 2 sets of maps, Coastal Bluff maps, and Coastal Landslide Hazard maps.

These maps unfortunately do not cover the entire area of York. The area of available coverage includes Brave Boat Harbor, the Atlantic coast north to the York River, and the York River itself up to Scotland Bridge. While much of York's remaining coastline is beach or rocky, there is an obvious area of concern at Dover Bluffs on the Nubble. Dover Bluffs are very tall, show visible signs of erosion of the bluff face, and are topped by a row of valuable homes. Less clear is the presence of other areas of coastal bluffs in other unmapped areas, such as upstream of Scotland Bridge in the York River, and along the Cape Neddick River. The Board of Selectmen should request the MGS to complete coastal bluff and landslide hazard mapping along the entire coast of the Town.

The Coastal Bluff maps that cover a portion of York, prepared by Brandes, Dickson, Kelley and Hildreth in 2002, entitled, "**Coastal Bluffs**," are hereby adopted by reference into this Plan: Dover East Quadrangle, Maine (Open-File 02-186); Kittery Quadrangle, Maine (Open-File 02-193); and York Harbor Quadrangle, Maine (Open-File 02-224). Additionally, the map prepared by Miller, Rainealut, Dickson and Kelley in 2006, entitled, "**Coastal Bluffs**," is hereby adopted by reference into this Plan: York Beach Quadrangle, Maine (Open-File 06-59).

The Coastal Bluff maps identify sedimentary bluffs of 3' or greater height above the high tide elevation, then classify each segment of bluff by shoreline type (ledge, armored, salt marsh, beach/flat) and bluff face stability (stable, unstable, highly unstable). At Brave Boat Harbor, there is a small area of coastal bluff classified as unstable. The remaining bluffs in this Harbor and along the Atlantic coast to the north are classified as stable. Along the York River, there are many segments of bluff classified as unstable or highly unstable.

The Coastal Landslide Hazard maps that cover a portion of York, prepared by Stephen M. Dickson in 2001, entitled, "**Coastal Landslide Hazards**," are hereby adopted by reference into this Plan: Dover East Quadrangle, Maine (Open-File No. 01-515); Kittery Quadrangle, Maine (Open-File No. 01-522); York Beach Quadrangle, Maine (Open-File 06-60); and York Harbor Quadrangle, Maine (Open-File No. 01-553).

The Coastal Landslide Hazard maps classify bluff areas based on the stability of the core materials. This is an important distinction from the stability of the bluff face because it identifies risk based on clues that may not be outwardly visible to the untrained eye, and because face stability does not always indicate low landslide risk. Of the mapped areas, the only bluff segments classified as landslide risk areas occur along the York River. There are 10 such segments. The lack of complete mapping, however, must be considered because it is likely that other areas of landslide hazard exist in York.

Because bluff erosion and landslides can pose a significant risk to properties and potentially to people's safety, the Town should use this information to develop appropriate land use policies in the policy chapter of the Comprehensive Plan, and to enhance emergency response planning. Policies must also take into account related issues such as sea level rise, which will likely affect the stability of coastal bluffs.

D. HABITAT

From a perspective of land use planning and regulation, management of habitat is an important consideration. Every place is habitat for something, whether for desirable species such as deer and trout, or for undesirable species such as mosquitoes and skunks. The natural patterns of the landscape, in combination with land development patterns, determine the habitat available today. Further development will continue to alter the landscape, and thus the habitats, thereby affecting all living things in York. This section provides an overview of important habitat types and some of the habitat-related issues which should be addressed in the Policy Section of the Comprehensive Plan.

This section is divided into 4 parts:

- plants;
- animal habitat;
- invasive species; and
- arthropod-borne diseases (West Nile Virus, Eastern Equine Encephalitis, and Lyme Disease).

It is important to note that these divisions are artificial. These are integrated components of a single system, so there is some overlap in the text.

Much of the information in this section of the Chapter is also compiled in the State's Beginning With Habitat (BWH) materials. The document entitled, "**Beginning With Habitat: An Approach to Conserving Open Space**," prepared originally for York in 2001 and subsequently updated, is hereby adopted by reference as part of this Chapter. This document includes supplemental reports and a series of maps, and these are expressly included in the adoption by reference. The text includes citations for specific maps where appropriate. It should be noted that some of these materials are not necessarily as detailed or current as some locally-generated materials, but they are useful just the same. The BWH materials were prepared by: Maine Department of Inland Fisheries and Wildlife (IF&W); Maine Natural Areas Program (MNAP); Maine State Planning Office (SPO); Wells National Estuarine Research Reserve (WNERR); Maine Audubon Society; Southern Maine Regional Planning Commission (SMRPC); United States Fish and Wildlife Service (USF&W); and Maine Cooperative Fisheries and Wildlife Research Unit.

1. Plants

Throughout York are a wide variety of natural communities including great ponds, wetland complexes, vernal pools, salt marshes, dune grasslands, and cobble beaches. Two forest types—northern softwood (pine, hemlock, larch, spruce, fir, and juniper) and southern hardwood (sugar maple, red maple, yellow birch, hemlock)—overlap in the Town of York. The overlap of these two forests creates a habitat range that supports the richest diversity and the largest number of plant and animal species in the entire state of Maine. At least twenty plant and three animal species are at their northern range here in York, occurring only sparingly further northward.

a. Rare or Exemplary Natural Communities

MNAP tracks habitat communities that are either rare types, or outstanding examples of more common types. The Town of York has seven types of Rare or Exemplary Communities that have been field verified between 1985 and 2002, as indicated in Table Three. Each of these plant communities is specifically located on the BWH map entitled, "**Town of York: High Value Plant and Animal Habitats**."

TABLE 3: Rare or Exemplary Communities in York

Community Type	General Location	State Rank
Chestnut Oak Woodland	Mt. Agamenticus	Critically Imperiled in ME
Hemlock-Hardwood Pocket Swamp	Mt. Agamenticus	Imperiled in ME
Atlantic White Cedar Swamp	Mt. Agamenticus	Imperiled in ME
White Oak-Red Oak Forest	Mt. Agamenticus	Rare in ME
Brackish Tidal Marsh	Godfrey's Cove	Rare in ME
Coastal Dune Marsh	Brave Boat Harbor	Rare in ME
Red Maple Alluvial Swamp	Mt. Agamenticus	Apparently secure in ME

b. Rare Plant Species

In addition to Natural Communities, MNAP also tracks plant species that are rare in Maine. Rare plants may be located either inside or outside of an identified Natural Community. Nineteen rare plant species have been field verified in the Town of York between 1985 and 2002, as indicated in Table Four. The general area in which each of these plants has been found in York is identified on the BWH map entitled, "**Town of York: High Value Plant and Animal Habitats**."

TABLE 4: Rare Plants in York

Common Name and State Rank		
Alga-like Pondweed (T)	Featherfoil- (E)	Spotted Wintergreen
American Sea-blite	Flowering Dogwood (E)	Summer Grape (T)
Atlantic White-cedar	Saltmarsh False-foxglove	Sweet Pepper-bush (T)
Broad Beech Fern	Sassafras	Tall Beak-rush
Chestnut Oak (E)	Sharp-scaled Manna-grass	White Wood Aster
Dwarf Glasswort	Smooth Winterberry Holly	
Eastern Joe-pye Weed (E)	Spicebush	

Status:(E) Endangered- rare, in danger of being lost from Maine in the foreseeable future, or federally listed as endangered; (T) Threatened- rare and, with further decline, could become endangered, or listed as threatened.

2. Animals

York has a broad range of animal habitat types.

a. Unfragmented Blocks of Habitat

Perhaps the single most striking wildlife feature in York is the presence of many large blocks of unbroken habitat. These are areas without roads and buildings, although there may be woods roads and a few scattered buildings. Unfragmented blocks are important because the size of block generally limits the diversity of animal species. Blocks less than 250 acres in size are very limited in terms of wild species that can be supported. Between 250 and 500 acres, diversity starts to increase, especially with respect to smaller birds. Between 500 and 2,500 acres, a wider range of animals and birds are present. At 2,500 acres and above, the block size does not generally restrict species.

The Town adopted a map of unfragmented blocks as part of the Comprehensive Plan's Existing Land Use Chapter. There is also a map of unfragmented blocks that extends beyond York's boundaries included in the BWH report ("Town of York: Undeveloped Habitat Blocks"). However, the most striking map is one prepared by The Nature Conservancy (TNC). The map entitled, "**North Atlantic Coast Ecoregion Block Size**" (TNC, MEFO

Map #3-04.2, April 30, 2004) is adopted by reference into this Plan. This maps depicts the Atlantic coast from the Pine Barrens of New Jersey to Lincoln County in Maine, and it shows the unfragmented blocks in York are among the most prominent along the northern Atlantic Coast. Only 2 unfragmented areas of 500+ acre blocks are identified between Cape Cod and Portland—one being the Mount Agamenticus region and the other being the area in New Hampshire around Pawtuckaway State Park (about 20 miles inland). This map is one of the most striking depictions of the unique situation of the Mount Agamenticus region.

Within York there are 2 blocks in excess of 2,500 acres—one just to the north of Mountain Road and the other just to the south of Mountain Road. Including land area outside of York but still within the blocks, BWH approximates their sizes in 2001 at 5,643 and 6,516 acres, respectively. By the Town mapping, there are 4 blocks larger than 500 acres, three of which are east of the Maine Turnpike.

b. Connections Between Blocks

While block size is important, so to is connectivity between the blocks. Lacking connections, each block becomes a relatively isolated island. It is important to reserve corridors connecting the blocks to the extent this can be accomplished. Wildlife tends to travel along riparian (stream bank) corridors, along ridges, and in undeveloped areas. The Policy Section of the Comprehensive Plan should identify areas of potential wildlife corridors connecting the unfragmented blocks and develop Town policies regarding protection of these important connections.

c. Habitat Areas of Interest

There are a number of overlapping classifications made in describing wildlife habitat. These result from diverse ownership, different public policies, and a variety of other reasons. There is a high degree of overlap in the following descriptions, but each offers a distinct perspective on habitat issues.

1) Rachel Carson National Wildlife Refuge. The Rachel Carson National Wildlife Refuge (NWR) is series of protected habitat areas along the southern coast of Maine, from Kittery to Cape Elizabeth. The majority of this Refuge is located to the north, but a small portion is located in York. The Brave Boat Harbor Division is comprised of estuarine habitat in Kittery and York. The Refuge is federally owned, and is managed by the U.S. Fish & Wildlife Service (USF&W) of the Department of the Interior specifically for habitat.

   The purpose of the Rachel Carson NWR is to, "provide waterfowl and other migratory birds with high quality feeding, nesting and resting habitat" (*Rachel Carson National Wildlife Refuge*, brochure by U.S. Fish & Wildlife Service, October 1999). The focus in this refuge is on tidal salt

marshes, but other habitat types are included as well. The refuge exists in concert with over 500 other refuges in the national system.

Ward Feurt, Refuge Complex Manager in charge of the Rachel Carson NWR, has indicated an interest on the part of the USF&W to acquire additional habitat areas in the upper reaches of the York River. The mission of USF&W is to protect "trust species", those being a series of endangered species, migratory birds and anadromous fish (those that breed in fresh water but live in salt water the rest of their life cycle). The upper reaches of the York River have extraordinary opportunity to protect habitat areas valuable to anadromous fish and as well as other wildlife species.

2) Wells and York Game Sanctuary. The Wells and York Game Sanctuary is established by State law (Title 12 §7651) as one of 37 game sanctuaries in Maine. These sanctuaries are established to provide areas with alternative hunting and trapping regulations. There is no State ownership, nor is there any restriction on development within this area. The Sanctuary is mentioned in the Town's Firearms Discharge Ordinance to help ensure hunters are aware of its presence.

3) Mount Agamenticus Wildlife Management Area. The wildlife management area in York and South Berwick is established by State law (Title 12 §7652.3) as one of 44 wildlife management areas in Maine. The greater Mt. Agamenticus area extends from York Pond in Eliot northeast through the Tatnic Hills area in Wells. The greater Mt. Agamenticus area includes rugged terrain, several lakes and ponds, and numerous small wetlands that together comprise the largest contiguous block of lightly developed land in southern York County. Mt. Agamenticus is the most outstanding feature at the site, both topographically and ecologically. Other prominent physical features are Horse Hill, Second and Third Hills, the Chick's Brook watershed, Chase's Pond, Folly Pond, Middle Pond, Bell Marsh, Warren Pond, Welch's Pond, Round Pond, and York Pond.

The area's numerous upland and wetland complexes are ecologically significant because they contain plant and animal assemblages that are at their northern range limits. For example, at least three animal and 20 plant species are restricted to this extreme southern portion of Maine, and many other common species in this area occur only sparingly further northward. This pattern extends to natural communities as well. The Atlantic white cedar swamp, hemlock – hardwood pocket swamp, and pitch pine bog that occur in this area are all restricted to southern Maine, and the oak-pine-hickory forest that extends from Mt. Agamenticus north through Third Hill includes the only remaining intact Chestnut oak woodland community in the entire state.

4) Essential Wildlife Habitat. The Maine Endangered Species Act was adopted in 1975 to protect threatened and endangered animals. The Act primarily protects designated animals directly from hunting, trapping, and trading. The Act does offer IF&W the opportunity to protect habitat of threatened and endangered species under certain circumstances by designation of Essential Wildlife Habitat. IF&W can designate an area as essential habitat through a public rulemaking process, and once designated, no state agency or municipal government may permit, license, fund or carry out projects that would significantly alter the habitat or violate protection guidelines adopted for the habitat without prior approval of IF&W. Since 1989, IF&W has designated four Essential Habitat categories: bald eagle, roseate tern, least tern, and piping plover. Additions of newly qualified areas, as well as deletions of sites no longer eligible, are ongoing for these four species. In the future, additional listed species may receive attention under the Essential Habitat rule, however, not all endangered species require Essential Habitat designation to ensure their survival.

   As of March 16, 2005, there are no designated Essential Habitats within the Town of York. However, the Bald Eagle and the Piping Plover are suspected to have nesting areas in the town. Since there are no Essential Habitat areas identified in York, there are no mandatory actions required by the town to protect endangered species other than to protect endangered and threatened species from being killed, taken as pets, transplanted or otherwise harassed.

5) Significant Wildlife Habitat. Significant Wildlife Habitats are depicted on the map entitled Town of York High Value Plant and Animal Habitats. These are habitat areas designated by IF&W. The Maine Natural Resources Protection Act (NRPA), passed in 1988, led to the identification and mapping of animal habitats based on specific requirements. To date, the only formally designated Significant Wildlife Habitat areas are Seabird Nesting Islands. There is no State-designated Significant Wildlife Habitat in York.

6) High Value Habitat. In March of 2001 the Gulf of Maine Coastal Program (GOMCP) completed the USF&W Gulf of Maine Watershed Habitat Analysis. This watershed-wide study is intended to provide a comprehensive analysis, narrative descriptions, and display of habitats based on environmental characteristics and available occurrence information, including that from the scientific literature and from unpublished surveys. Habitat maps for individual species have been further processed into composite maps highlighting areas of highest resource value.

As part of the study the GOMCP mapped habitats of 64 Trust Species. Trust Species include: federally endangered, threatened and candidate species; migratory birds, anadromous and estuarine fish that are significantly declining nationwide; or migratory birds, anadromous and estuarine fish that have been identified as threatened or endangered by two or more of the three states in the Gulf of Maine watershed. There are 48 bird, 9 fish, 4 plant, 1 mammal, 1 invertebrate and 1 reptile species. A composite map of habitat for these Trust Species is included in BWH, and it is entitled, "Valuable Habitat for U.S. Fish and Wildlife Service Priority Trust Species for the Town of York, Maine."

The most important (top 25 percent) habitats for these 64 species are shown on another BWH map, entitled, "Town of York: High Value Plant and Animal Habitats." These are represented in four basic habitat types (forested, grassland, wetland and salt water environments). Areas less than 5 acres are not shown.

7) Other Designations of Interest. The following types of habitat are of importance and are included in the BWH mapping:

- *Deer Wintering Areas* – Defined as a forested area used by deer when snow depth in the open hardwoods exceeds 8 inches, and mean daily temperatures are below 32 degrees Fahrenheit. In York, Deer Wintering Areas are found within the unfragmented blocks surrounding York's great ponds and another along Chicks Brook between Second and Third Hill. See BWH map entitled, "Town of York: High Value Plant and Animal Habitats."

- *Shorebird Habitat* – Includes migratory shorebird coastal staging areas defined as areas that meet shorebird feeding and roosting requirements during migration. These habitats consist of coastal areas, which provide both tidal mud flats rich in invertebrates for feeding, and areas such as gravel bars and sand spits for roosting. In York, Shorebird Habitat areas have been identified at Phillips Pond , Phillips Cove, Lake Caroline, Cape Neddick Harbor, the northern stretch of Long Beach, Barrell Mill Pond, the tidal flat along the York River west of Sewall Bridge, the tidal flat surrounding Harris Island, Godfrey's Cove, and Brave Boat Harbor. See BWH map entitled, "Town of York: High Value Plant and Animal Habitats."

- *Waterfowl/Wading Bird Habitat* – Waterfowl habitat is characterized both seasonally and behaviorally as: breeding habitat; migration and staging habitat and wintering habitat. Wading bird habitat consists of breeding, feeding, roosting, loafing, and migration areas. In York, Waterfowl/Wading Bird Habitat has been identified at Phillips Pond, Bell Marsh Reservoir, Scituate Pond, Godfreys Pond, and along Dolly

Gordon Brook. See BWH map entitled, "Town of York: High Value Plant and Animal Habitats."

- *Tidal Waterfowl/Wading Bird Habitat* – Waterfowl habitat is characterized both seasonally and behaviorally as: breeding habitat, migration and staging habitat, and wintering habitat. Wading bird habitat consists of breeding, feeding, roosting, loafing, and migration areas. Habitats can include seaweed communities, reefs, aquatic beds, emergent wetlands, mudflats, and eelgrass beds. In York, Tidal Waterfowl / Wading Bird Habitat areas have been identified along most of York's coastline and harbors, Barrells Mill Pond, the banks of the York River and its tributaries such as Smelt Brook and Cider Hill Creek. See BWH map entitled, "Town of York: High Value Plant and Animal Habitats."

- *Riparian Habitat* – The edge along waterbodies, streams and wetlands is important habitat for wildlife as an area of transition to upland habitats. Many species require a mix of upland and riparian habitats to feed, rest, travel, and reproduce. See BWH map entitled, "Town of York: Water Resources and Riparian Habitats."

8) Rare Wildlife Sightings. In addition to Essential and Significant Habitat, IF&W also tracks the status, life history, conservation needs, and occurrences for Endangered and Threatened species habitats, other rare animal habitats, and the locations of the rare animals themselves. These rare animals include "species of special concern" that may be very rare or vulnerable, for which biologists are gathering more information.

In the Town of York, IF&W has tracked approximately 54 separate habitat areas since 1986. These identified species and habitat sitings are depicted on the BWH map entitled "Town of York: High Value Plant and Animal Habitats." Though many of the field observed sitings are concentrated around the great ponds and Mt. Agamenticus area, there are sitings all around York. Of particular note, however, are the multiple sightings of Blanding's Turtles and Spotted Turtles. York has exception habitat for these turtle species.

9) Focus Areas. The Maine Landowner Incentive Program is a State initiative to work with landowners to conserve important wildlife habitat, plant habitat, and natural communities. The program, administered by IF&W, pays property owners for conservation actions through mechanisms such as conservation easements, conservation management agreements, and habitat management activities. This program is limited to 15 areas of Focus Areas identified by the State. These 15 Focus Areas represent an initial sampling of the State's habitats with rare species and

high quality natural habitats. Two of these occur in York—the Mount Agamenticus area and the Brave Boat Harbor area.

The Mt. Agamenticus area, located in Eliot, South Berwick, Wells, Ogunquit and York, includes rugged terrain, several lakes and ponds, and numerous small wetlands that combined, comprise the largest contiguous block of lightly developed land in southern York County. Also found in the greater Mount Agamenticus area are natural communities such as the Atlantic White Cedar Swamp, the Hemlock-Hardwood Pocket Swamp, the Pitch Pine Bog and the Oak-Pine-Hickory Forest with the only remaining intact Chestnut Oak Woodland community in Maine.

The Brave Boat Harbor/Gerrish Island area, located in York and Kittery, includes dune grasslands, spartina saltmarshes, oak forests, freshwater swamps, and vernal pools. Both of these focus areas provide high quality habit for a number of rare plant and animal species.

10) Vernal Pools. The following paragraphs are a description of vernal pools copied from the Web page of the Maine Department of Environmental Protection:

> Vernal pools or "spring pools" are shallow depressions that usually contain water for only part of the year. In the Northeast, vernal pools may fill during the fall and winter as the water table rises. Rain and melting snow also contribute water during the spring. Vernal pools typically dry out by mid to late summer. Although vernal pools may only contain water for a relatively short period of time, they serve as essential breeding habitat for certain species of wildlife, including salamanders and frogs. Since vernal pools dry out on a regular basis, they cannot support permanent populations of fish. The absence of fish provides an important ecological advantage for species that have adapted to vernal pools, because their eggs and young are safe from predation.
>
> Species that must have access to vernal pools in order to survive and reproduce are known as "obligate" vernal pool species. In Maine, obligate vernal pool species include wood frogs, spotted and blue-spotted salamanders (two types of mole salamanders) and fairy shrimp. While wood frogs and mole salamanders live most of their lives in uplands, they must return to vernal pools to mate and lay their eggs. The eggs and young of these amphibians develop in the pools until they are mature enough to migrate to adjacent uplands. Fairy shrimp are small crustaceans which spend their entire life cycle in vernal pools, and have adapted to constantly changing environmental conditions. Fairy shrimp egg cases remain on the pool bottom even after all water has disappeared. The eggs can survive long periods of drying and freezing, but will hatch in late winter or early spring when water returns to the pool.

At this time there the Town lacks comprehensive mapping of vernal pools, and has no policies relating to them. DEP is in the process of adopting

new rules regarding vernal pools under the Maine Natural Resources Protection Act (NRPA). If adopted these new rules could have a significant impact on development review.

3. Invasive Species

Invasive species can be plants, animals, insects, and other organisms (e.g., microbes) introduced to areas where they did not exist before. In addition to being transported by birds and mammals through their droppings, invasive species are also spread by human activities, including:

- transporting species between water bodies via watercraft, trailers, and other equipment;
- releasing invasive species into the wild from aquariums, water gardens, research and education projects, and illegal stocking;
- discharging untreated biological waste from aquaculture, seafood or other processing facilities that introduce pathogens and other organisms to marine waters;
- releasing ships' ballast water containing invasive species into marine waters; and
- transporting infested soils to be used for filling construction sites and wetlands.

As of 2003 at least 45 species of invasive plants and animals exist in Maine. The non-native species become naturalized in wetlands, lakes, woods, fields or roadsides. Once introduced, managing and controlling them is a significant challenge. They generally lack predators or other natural controls and can tolerate a wide variety of environmental conditions, which allows them to establish self-sustaining populations easily.

Invasive species threaten Maine's native ecology. They degrade habitat for native plants and animals, choking out native vegetation, diminishing the availability of food plants for wildlife, and altering the behavior of native animals such as pollinators, plant-eating insects and fruit-eating birds. Unchecked, invasion by non-natives could drive some species to extinction. For this reason, invasive plants are a major concern to people who want to protect native species and natural areas. Invasives also cause adverse economic impacts, including the cost of monitoring and control, loss of property value, and loss of tourism dollars due to fishing and water sport restrictions on infested waterbodies.

Most of the information gathered about invasive species in Maine pertains to plant species. However, there are many documented cases of non-native fish infestations degrading Maine's waterbodies and killing off native fish species. Both smallmouth and largemouth bass are widely established in southern Maine, primarily the result of illegal introductions.

The Maine Department of Environmental Protection (DEP) and the Maine Department of Inland Fisheries and Wildlife (IF&W) are currently focusing their

prevention, education outreach, and legislative efforts on aquatic invasive species rather than the terrestrial type. Boating activity is the primary way in which plants spread from one water body to another. Plant parts carried on boats, motors, trailers, and fishing gear from an infested water body to one that is not, can lead to disaster. Plants can survive out of the water for days. Once introduced to a water body they can spread rapidly and become a major nuisance. There is no known method of eradicating invasive aquatic plants once they have become established. Maine is now the only state where most of these plants have not been identified. The following aquatic species have been identified as invasive species in Maine:

Aquatic

1. Eurasian water milfoil (*Myriophyllum spicatum*)
2. Variable-leaf water milfoil (*Myriophyllum heterophyllum*)
3. Parrot feather (*Myriophyllum aquaticum*)
4. Water Chestnut (*Trapa natans*)
5. Hydrilla (*Hydrilla verticillata*)
6. Fanwort (*Cabomba caroliniana*)
7. Curly-leaf pondweed (*Potamogeton crispus)*
8. European naiad *(Najas minor)*
9. Brazilian elodea *(Egeria densa)*
10. Frogbit *(Hydrocharis morsus-ranae)*
11. Yellow floating heart *(Nymphoides peltata)*

In addition to their focus on aquatic invasives, the DEP monitors and provides information on three common terrestrial invasive species found in wetlands: Purple Loosestrife, Glossy Buckthorn and Common Reed. The following is a list of invasive plants that present threats to native Maine terrestrial habitats:

Terrestrial

1. Asiatic Bittersweet
2. Autumn Olive / Russian Olive
3. Black Swallowwort
4. Common Reed (Phragmites)
5. Garlic Mustard
6. Glossy Buckthorn
7. Japanese Honeysuckle
8. Japanese Knotweed/Mexican Bamboo
9. Japanese Stilt Grass (Chinese Packing Grass)
10. Lesser Celandine
11. Mile-a-Minute Weed (Devil's Tail, Tearthumb)
12. Multiflora Rose, Rambler Rose
13. Porcelainberry
14. Purple Loosestrife
15. Shrubby Honeysuckles

In 1999 the State of Maine enacted Title 38, §419-C regarding prevention of the spread of invasive aquatic plants. This statute addresses the transportation, cultivation, distribution and sale of invasives. In 2001, the State of Maine took additional action and enacted Title 38 §1864. This statute permits the Commissioner of IF&W may issue an emergency order to restrict access to or restrict or prohibit the use of any watercraft on all or a portion of a water body that has a confirmed infestation of an invasive aquatic plant.

The extent of invasive species in York is not currently understood, but certainly there are invasives present at this time. Asiatic Bittersweet, Common Reed, and Purple Loosestrife are widespread. As resources become available, the Town should inventory invasive species occurring in York, and should monitor changes of extent over time.

For more information on invasive aquatic plants regulations see Title 38 §1861-1864 and §1871-1872. Information is also available on the State's Web page, on the IF&W and Maine Natural Areas Program pages.

4. Arthropod-Borne Diseases

There are 3 diseases new to this region that relate to the area's ecosystem. Mosquitoes and ticks transmit these diseases, and management of these vectors will require management of our ecosystem.

a. West Nile Virus (WNV)

West Nile Virus is a mosquito- borne disease that is becoming endemic in North America. It is primarily a bird disease but humans and horses are also at risk. The CDC in Atlanta predicts that WNV will become a permanent component of our landscape. As of January 2005, WNV has been found in every state in the Union and in every Canadian Province. Its distribution each year is unpredictable and can be epidemic even in areas with few mosquito breeding habitats. In 1999, 2000 and 2001 the northeast had numerous epicenters. In 2002, the Midwest fell victim, especially Chicago. In 2003, Colorado had hundreds of human cases and many deaths. Phoenix, Arizona was the hot spot in 2004. The reality of WNV is that it can occur anywhere. WNV appears to explode in dry years with hot summers.

Maine is the only state in the United States not have a documented human case despite been detected annually in birds and mosquitoes. In reality, Maine probably has had non-fatal human WNV cases. Most human cases of WNV are not fatal. Historically, it is persons with weakened immune systems that are at high risk. There is no human vaccine, but a horse vaccine is available.

York and Cumberland counties have high risk factors for WNV. The human population density is higher than the rest of Maine. Many migratory birds pass through coastal wetlands on their northern and southern trips through our area. The prime mosquito vector species for WNV transmission between birds and

from birds to humans are common. The concentration of humans, birds and mosquitoes in a relatively small area accelerates the WNV transmission cycle and increases the likelihood of human cases.

b. Eastern Equine Encephalitis (EEE)

Eastern Equine Encephalitis is a mosquito-borne disease with high mortality in humans and horses. Previously, EEE was infrequently identified in New England. With states testing mosquitoes and dead birds for WNV, it is now common practice to also test for EEE. EEE has probably been present on an annual basis in Maine but has escaped detection due to limited testing. In September of 2001 the Maine Bureau of Health laboratory in Augusta positively identified EEE in a dead American Goldfinch in South Berwick. In 2003 and 2004, EEE was found in southeastern Massachusetts. In 2004, Exeter, New Hampshire, near the Maine border, had positive mosquito pools. Two confirmed cases of EEE occurred in York in 2005.

The primary mosquito vector species of EEE in the northeast is limited to breeding in red maple swamps and woodland pools. Mapping these wetland habitats is very important. York has many red maple swamps and suitable habitat for *Culiseta melanura,* the EEE vector.

c. Lyme Disease

The Maine Bureau of Health has identified Kittery Point and York as prime areas for Lyme Disease. The historical progression of Lyme Disease in Maine began in York County and moved along the coast to the Canadian border. The Deer Tick vectors Lyme Disease. Deer Ticks are very small and commonly misidentified as the American Dog Tick. Deer Ticks must remain on a human host for ten hours or more for successful transmission of the pathogen. Lyme Disease is found in dog populations and actually is responsible for a fatal kidney disease called nephritis. The high incidence of Lyme Disease in York is likely the result of York's rapid growth during the past twenty years. As deer habitat and residential development collide, humans and deer populations are in close proximity. Large deer populations provide large Deer Tick populations.

High risk areas should be identified in the Comprehensive Plan. Deer ticks are commonly found at the backyard/ woods edge interface. If the forest floor is cleared of underbrush, prime tick habitat can be reduced. Nursing homes and retirement communities should minimize tick habitat on their grounds and assure residents check themselves daily for deer ticks. Landscape plans for new homes and developments should be designed in a manner that does not increase deer tick habitat.

E. PROTECTED CONSERVATION LANDS

Within the Town of York there are nearly 7,000 acres of conservation land in public or private ownership. The vast majority of conservation land in York is located in the greater Mount Agamenticus area, although there are significant holdings throughout Town. For the past 30 years there has been a concentrated effort to acquire and protect lands in the Agamenticus. The Town initially acquired the old "Big A" ski area. Subsequent acquisitions were facilitated by the Land for Maine's Future program, and now are being pursued under the Mount Agamenticus Challenge.

The goal of the Mount Agamenticus Challenge is to protect one of Maine's most important ecosystems. Launched in 1999, the Challenge is a broad-based partnership led by The Nature Conservancy, the Great Works Regional Land Trust and the York Land Trust. The partners have protected more than 3,000 acres in York and surrounding communities since its inception. More recently, the Mount Agamenticus Challenge acquired nine separate parcels that total nearly 150 acres of wetlands, vernal pools, and rich forests. The partnership is making progress toward its goal of conserving 7,000 acres over five years.

The map entitled, "**Conservation Lands**, York Comprehensive Plan, Inventory and Analysis, Natural Resources Chapter" with a date of February 10, 2006, is hereby incorporated into the Comprehensive Plan by reference.

1. Publicly Held Lands and Easements

Government conservation land and easements are held by the Town of York, the York Water District (YWD), the Kittery Water District (KWD), the Maine Department of Inland Fisheries and Wildlife (IF&W), and the U.S. Fish and Wildlife Service (USF&W). The Town, state and federal holdings are held exclusively for conservation purposes. More than half of the land, that owned by the two water districts, is conservation land only to the extent it serves to protect the sources of their public water supplies. There are no conservation restrictions on these lands, and the districts are not obligated to keep them. Still, they are protected from development pressures in the short term and are shown as conservation lands.

2. Privately Held Lands and Easements

Private conservation land and easements are held by the York Land Trust, The Nature Conservancy (TNC), the Great Works Regional Land Trust, and the Old York Historical Society. The York Land Trust and TNC are the most active of the private conservation owners in York.

a. The York Land Trust

In partnership with others organizations and of its own accord, the York Land Trust provides stewardship for 36 individual properties representing almost 1,500 acres. The York Land Trust is dedicated to conserving and protecting lands of ecological, historic, scenic, agricultural and educational significance in the greater York, Maine area.

The Trust works to preserve York's natural resources in the following important ways:

- Permanently protects land through conservation easements, land donations, and direct purchases.
- Educates the community about the methods and benefits of land conservation.
- Rigorously monitors and manages conservation lands.
- Collaborates with state agencies, town government, and other conservation organizations to protect critical ecosystems and habitat for wildlife.
- Fosters an appreciation for the natural environment through educational programs, public presentations, walking tours and outings.

The York Land Trust envisions a community of citizens who understand the importance of maintaining a healthy natural environment while meeting the community's social and economic needs. This environment will support a high quality of life for its citizens, maintain the character of York and provide opportunities for public enjoyment of conserved lands and parks. Growth and development will be carefully planned and managed. Proactive land conservation will protect in perpetuity the natural resources, waterways, wildlife and scenic beauty with which our community is so generously endowed.

b. The Nature Conservancy

Since 1951, TNC has been working with communities, businesses and people to protect nearly 117 million acres around the world to preserve the plants, animals and natural communities that represent the diversity of life on Earth. These resources are protected to help ensure sustainability of the world's biodiversity. In southern Maine their efforts are focused on protecting the greater Mount Agamenticus area, which TNC identified as one of the hundred most significant habitat areas on the planet.

F. SCENIC RESOURCES

The Town of York has a wide variety of Scenic Resources, both natural and cultural. These resources provide the visual environment that helps makes York a unique experience for residents and visitors. This inventory is a starting point for the development of policies to address protection of scenic resources. As the Town develops more detailed contour data and its GIS capacity advances, viewsheds associated with these points and corridors can be evaluated for specific controls to ensure their protection in perpetuity.

1. Scenic Points

These are points accessible to the public having a view that encompasses an area, the viewshed, as seen from a particular location, the viewpoint, extending to the visual horizon and may be limited in direction to a particular horizontal sector. A geographical point and sector defines them along with descriptions of what makes the view scenic.

- Viewing platform near top of Mt. Agamenticus
- Balcony on Mt. Agamenticus Lodge
- Route 103 York River Bridge
- Sewalls Bridge
- Rice's Bridge
- Interstate 95 York River Bridge
- Scotland Bridge
- Cooks Bridge
- Chases Pond from Chases Pond Road
- Chases Pond from Situate Road
- Situate Pond from the boat launch
- Route 103 at Brave Boat Harbor
- South Side Road toward the York River
- York Harbor Beach
- Long Sands Beach
- Short Sands Beach
- Passaconaway (Cape Neddick) Beach
- Phillips Cove
- Hartley Mason Reserve
- Sohier Park
- All ocean views from public roads

2. Scenic Routes

These are public ways with views that encompass an area, the view corridor, as seen from multiple locations along the route, and are not generally limited to particular directions. The geographical route with starting and end points defines them along with descriptions of what makes the route scenic.

- Spur Road
- Shore Road
- Route 103
- Route 91
- Cliff Walk
- Fisherman's Walk
- York River, from the Atlantic Ocean to the head of tide
- Cape Neddick River, from the Atlantic Ocean to the head of tide
- Brave Boat Harbor, from the Atlantic Ocean to the head of tide

APPENDICES

A: INDEX OF MAPS

Town-Generated Maps

1. Bedrock Geology. January 25, 2006
2. Surficial Geology. February 10, 2006
3. Soils by Erodibility. February 10, 2006
4. Soils by Slope. February 10, 2006
5. Farmland Soils. February 10, 2006
6. Hydric Soils. February 10, 2006
7. Soils by Potential for Low-Density Development. February 10, 2006
8. Surface Waters and Watersheds. February 10, 2006
9. Stream Order. February 10, 2006
10. Existing Land Use by Watershed. February 10, 2006
11. 100-Year Floodplain. February 10, 2006
12. Public Access to Coastal Waters. March 1, 2006
13. Conservation Lands. February 10, 2006

Maps Adopted by Reference

1. Estimated Overburden Thickness in the Kittery 30X60-minute Quadrangle.
2. General Soil Map; York County, Maine.
3. Gravel Aquifers.
4. Bedrock Well Yields in the Kittery 30X60-minute Quadrangle.
5. Bedrock Well Depths in the Kittery 30X60-minute Quadrangle.
6. Potential or Actual Threats of Groundwater Contamination on EGAD, Town of York. January 25, 2006
7. Coastal Marine Geologic Environments.
8. Beach and Dune Geology.
9. Coastal Barrier Resource System: Phillips Cove Unit ME-23.
10. Coastal Bluffs.
11. Coastal Landslide Hazards.
12. North Atlantic Coast Ecoregion Block Size.

Note: all maps of Beginning With Habitat are adopted by reference.

B: INVENTORY OF MARINE RESOURCES

YORK HARBOR BOARD
INVENTORY OF MARINE RELATED RESOURCES & FACILITIES

***YORK HARBOR*- east of the Rte 103 bridge**

- Webber Wharf
- Strater Wharf
- York River
- All Recreational and Commercial moorings in the York River
- North and South dredged mooring basins
- Harris Island
- York Harbor Marine Service
- Town Dock #2 and approaches
- Harbormaster office building, Town Dock #2
- Parking lot south of Bragdon Island, west of Harris Island Road
- Bragdon Island
- Newick Wharf
- Parking lot north of Bragdon Island along the east side Harris Island Road towards Strawberry Island
- Strawberry Island
- Town Dock #1 and approaches
- 2 Bait sheds at Town Dock #1
- Parking along Rte 103 south of the Harris Island Rd and Rte 103 intersection
- Clam Flats- north of Western Point Rd and east of rte 103.
- Shore of the York River from the Tonge's/ Hoy dock east to Stage Neck including Varrell's Wharf, Donnell's Marina and boat ramp, the Agamenticus Yacht Club and Harborside Inn docks
- Garrett Wharf
- The Fisherman's walk

***YORK RIVER*- Rte 103 Bridge to Sewall's bridge**

- York River
- Clam flats along wiggly bridge walk
- Steedman woods
- Wiggly bridge and approaches
- Parking lot across from the Wiggly Bridge walkway
- Hancock wharf west to Sewall's bridge including Chase Wharf, Leighton Wharf, York River Yacht Club
- York River Lobster Company lobster car
- Sewall's Bridge Wharf
- Cadwalader Wharf
- Albright Wharf

- White Wharf on Pine Island Road
- Macintyre Wharf
- Pumpkin Cove mooring basin
- All Recreational and Commercial moorings in the York River

***YORK RIVER* Sewall's bridge to headwaters**

- York River
- Shorefront Property owners moorings
- Boat ramp at Brickyard Landing, Dock lane
- Shellfish flats
- Brickyard mooring basin
- Access ramp northeast of Rice's Bridge
- Boat launch at Scotland Bridge

C: SCITUATE POND WATER QUALITY SUMMARY

The Maine Department of Environmental Protection (ME-DEP) and the Volunteer Lake Monitoring Program (VLMP) have collaborated in the collection of lake data to evaluate present water quality, track algae blooms, and determine water quality trends. This data set does not include bacteria, mercury, or nutrients other than phosphorus. Water quality monitoring data for Scituate Pond has been collected since 1984. During this period, 5 years of basic chemical information was collected, in addition to Secchi Disk Transparencies (SDT). In summary, the water quality of Scituate Pond is considered to be below average, based on measures of SDT, total phosphorus (TP), and Chlorophyll-a (Chla). The potential for nuisance alga blooms on Scituate Pond is high and have occurred in the past.

Water Quality Measures: Scituate Pond is a colored lake (average color 73 SPU) with an average SDT of 1.7m (5.6ft). The range of water column TP for Scituate Pond is 30-26 parts per billion (ppb) with an average of 27 ppb, while Chla ranges from 5.2-12 ppb with an average of 9.1 ppb. Recent dissolved oxygen (DO) profiles show no DO depletion since the lake is shallow and wind mixing keeps the water column oxygenated. The potential for TP to leave the bottom sediments and become available to algae in the water column (internal loading) is low. Oxygen levels below 5 parts per million stress certain cold water fish, and a persistent loss of oxygen may eliminate or reduce habitat for sensitive cold water species.

The flushing rate is the amount of time required for the lake water to be renewed each year. The average flushing rate is about 1-1.5 flushes per year for Maine lakes. The flushing rate for Scituate Pond is 9.8 flushes per year.

The SDT trend, from 1984- 1999, in Pennesseewassee Pond shows a significant improvement or positive water quality trend, but this could easily change with increased development pressure and changes in regional weather patterns.

See ME-DEP Explanation of Lake Water Quality Monitoring Report for measured variable explanations. Additional lake information can be found on the World Wide Web at: pearl.spatial.maine.edu and/or state.me.us/dep/blwq/lake.htm, or telephone ME-DEP at 207-287-3901 or VLMP at 207-225-2070. Filename: scit5596, revised: 03/2001, by: ME.