Chapter 8 - Natural Resources DRAFT

Introduction

The Town's natural resources provide wildlife and fisheries habitat, recreational opportunities, drinking water supplies and scenic values. They are an essential part of South Berwick's rural character and established historical land use patterns which are still evident today. Proper land management and development regulations can mitigate the impacts of development on sensitive areas, and ensure that these resources are protected into the future.

Specifically, this chapter will:

a) describe South Berwick's critical natural resources, including water and land;
b) assess whether these resources will be threatened by the impacts of future growth and development; and
c) assess the effectiveness of existing efforts to protect and preserve these resources.

Community Survey Results

PLACEHOLDER

Current Conditions

Topology

Topographical features have a strong influence on the way a town develops. Steep slopes affect the feasibility of development, water drainage, and scenic views.

Like most of New England, the Town's topography is a result of events that occurred during the last ice age at a time when ancient oceans extended over parts of Southern Maine and glaciers scraped, scoured, and coated other areas with glacial tills, sands and clays. The topography in the southwestern part of town is generally flat to gently sloping, except where crossed by streams. The steepest slopes, over 15 percent, occur on formations called glacial drumlins, Powderhouse & Cummings Hills, south of Hamilton Brook on the Salmon Falls River and the western side of Rocky Hills along Route 236.

The north and eastern half of the Town consist of glacial till, a mixture of sand, silt, clay and stones. In the Tatnic Hills, this till also includes large boulders known as glacial erratics. These sections of South Berwick tend to have steeper slopes and contain more streams and pocket wetlands. The steepest slopes occur around Welch, Brown and Spring Hills, around Warren Pond, and associated with brook drainages from Tatnic. Orris' Falls is a small brook which drops 100 feet in elevation over a 500-foot run. Chick's Brook also has a gorge type feature. Both have been permanently conserved as open space as have the Spring Hill Cliffs and the Balancing Rock, a unique glacial erratic. The overall patterns can be seed in the ***Topography*** map.

Land Cover

South Berwick is a generally forested community, and despite continued growth over the decades, many large areas of contiguous forest still remain. Much of the open land is found within one to two miles of the Salmon Falls River and the Great Works River corridors. Other open areas are interspersed along roadways of the Town that lies near/within the Mount Agamenticus region, which is heavily forested.

Beginning with Habitat also designates Focus Areas of Statewide Ecological Significance, which are determined by overlapping critical habitat, rare plants and species, and land cover that should be considered a top priority for conservation. 10,287 acres, or almost 50% of South Berwick's total land areas falls within the Mount Agamenticus Focus Area. This 34,000+ acre region is the largest Focus Area identified in York County, and is significant given that it is one of the largest remaining expanses of undeveloped forest in coastal New England. It is also an ecological transition area, meaning that for some species, this is the northernmost reaches of their habitable area. South Berwick makes up the second largest areas of the region, second to York. See ***Beginning with Habitat Natural Resources Cooccurrence*** Map.

Soils

Since soils can have an impact on most land use activities, it is important to understand their characteristics, capacity, and limitations. Many of South Berwick's soils have limitations for development. Often these limitations can be overcome through special planning, design, construction and/or maintenance. In other cases, the soils are entirely unsuitable for particular uses.

The Natural Resource Conservation Service has published a Soil Survey for York County, which includes a map of the different soils and information on their characteristics. Soil survey information is useful for town-wide planning, However, higher intensity soil survey is necessary for site specific planning and development. According to the Soil Survey, there are seven soil associations located in South Berwick. Associations are groups of different soil types that usually occur together, and each association has major and minor soils within it. The following table describes each of South Berwick's seven associations.

Soil Association	Location	Limitations
Adams-Colton Association	Outwash plains, kane terraces and eskers (ridges). Village area.	Have slight to moderate limitations for on-site sewage disposal; groundwater contamination can be a hazard. Slope is the major limitation for septic systemsand construction.
Naumburg-Croghan Association	Outwash plains, Northwestern andextreme southernportions of Town.	Somewhat poorly drained topoorly drained. Croghan soils are moderately well drained. Limitations are wetness due to seasonal high-water tables and droughtiness insummer due to rapid permeability. Naumburg soils are generally not suitable for on-site sewage disposal or construction.
Marlow-Bray ton-Peru Association	Drumlins (low elongatedhill) and glaciated uplands. An area just north of the village and central and southern portions of Town.	Slow permeability in substratum and a seasonal perched water table are major limitations for most uses. Slope is limitation in moderately step areas.
Hermon-Lyman Association	Plains, hills, and ridges. Large portion of centraland eastern South Berwick.	Poorly suited for on-site septic systems and construction. Limitations are bedrock exposures, shallow soil depth of the Lyman soils, and the high-water table and low strength of Sebago soils.
Lyman-Rock Outcrop-Sebago Association	Lyman and rock outcropson hills and ridges; Sebago soils in depressions. Tatnic and Rocky Hills section of Town.	Poorly suited for on-site septic systems and construction. Limitations are bedrock exposures, shallow soil depth of the Lyman soils, and the high-water table and low strength of Sebago soils.
Scantic-Raynham-Buxton Association	Marine Plains and lake plains. Area surroundingthe village and small section in northern part of Town.	Slope, the high water table in the Scantic and Raynham soils, and slow permeability in the Scantic and Buxton soils are the main limitations for most uses.
Lyman-Rock Outcrop-Scantic Association	Lyman soils and Rock Outcrop on ridges and hills; Scantic on marineplains.	The major soils are not suitable for on-site septic systems or construction. Limitations are bedrock exposures, droughtiness, shallow depth to bedrock in the Lyman soils, and high-water table in Scantic soils. Slope is a limitation in steeper areas.
Source: Soil Survey of York County, USDA		

Soil Suitability

Various soil characteristics, such as depth to water table, depth to bedrock, flooding potential and erosion potential can present serious limitations to development. For example, roads, utilities, and cellar foundations are difficult and expensive to build when bedrock is present.

Perhaps one of the most limiting characteristics is depth to water table. Wet, very poorly drained soils where the water table is at or within nine inches of the surface for some part of the year are inherently unusable for septic system use and house building. Poorly drained soils (9-18 inches depth to water table) also place severe limits on the use of the land. Frequent fluctuations in water level as well as frost heaving can be damaging to buildings, roads, and the proper functioning of septic systems. These limitations can sometimes be overcome through special design and maintenance.

Moderately well drained soils (18-30 inches to water table) have less severe limitations on land uses, and deep, well drained soils present few problems. The latter have a depth greater than 30 inches to water table.

Areas with poorly drained and very poorly drained soils have been mapped for South Berwick. Poorly drained soils include Brayton, Naumburg, Raynham, Scantic, and Rumney soils. Very poorly drained soils include Biddeford, Saco, Waskish, Vassalboro, Sebago and Chocorua.

Areas with poorly drained and very poorly drained soils can be found throughout South Berwick. The largest concentration of poorly drained soils in located just northeast of the village area and extends beyond Agamenticus Station. This information is available in the ***Soil Suitability for Low Density Development*** map.

Soil Suitability	Total Acres	Percent of Town Area
High	2,783	13.4%
Medium	5,762	27.8%
Low	3,403	16.4%
Very Low	8,400	40.5%
Source: Natural Resources Conservation Service Data		

Wetlands/ Wetlands Classification

Wetlands are an important natural resource, often identified by non-permeable soils, water table at or near the surface, and the presence of certain vegetation. Wetlands are very difficult areas to develop, given the need for expensive infill and engineering. At the same time, it is important to keep these areas undisturbed due to their many important environmental functions.

Key Environmental Functions of Wetlands:

1) Act as groundwater recharge and cleansing areas
2) Provide habitats for rare and endangered plants and animals
3) Maintain lake and river quality by controlling runoff of nutrients
4) Store and slowly discharge high water, thus reducing the potential for floods
5) Sediment retention areas controlling agricultural runoff
6) Provide visual and open-space value

Several laws regulate the activities that take place in or around wetlands. On the national level, the Clean Water Act gives authority to the Army Corps of Engineers to regulate the dredging and filling of

wetlands. Maine has two laws that provide protection for wetlands. The first is regulated by The Maine Department of Environmental Protection, and monitors the dredging, filling, draining, and construction in or over, or within 100 feet of any wetland. There is also a requirement under the Maine State Subdivision Law that states that all wetlands are to be shown on subdivision plans.

The Maine Beginning with Habitat Program has a general wetlands characterization map which identifies areas of wetland and information about size and significance. These maps are not a replacement for individual wetland surveys but can direct resource management efforts to areas of highest probability for occurrences.

The location of wetlands is important to keep in mind when the town considers growth and future development. Zoning and appropriate uses should be considered in areas of high wetland density, or wetlands noted for significant importance. The wetlands located within town can be seen on the ***Beginning with Habitat Wetlands Characterization*** map.

Wetland Regulations

The Mandatory Shoreland Act, Title 38 MRSA Sections 435-448, requires that municipalities regulate the area of land around wetlands. Currently, only high value wetlands of 10 or more acres are offered Resource Protection Zoning. This provides a 250-foot setback for dwellings and septic systems. Other land uses such as parking lots and clearing of vegetation is reviewed at time of subdivision within a buffer of 250 feet. Wetlands under two acres are given a 25-foot setback. Currently, the Department of Environmental Protection (DEP) allows up to 10,000 feet to be filled in wetlands with a permit by rule. They do not recognize Town data or rules in their permit system. Wetlands of 10 acres or more, which are not part of a great pond or river, are protected by the state's Natural Resource Protection Act, Title 38 MRSA Sections 490-A through 480-S. The Town of South Berwick now regulates land use activities within 250 feet of wetlands of 2 acres or more in size. **(Is this accurate?)**

Threats to South Berwick's Natural and Scenic Resources

South Berwick has uniquely intact natural resources. A wide variety of natural ecosystems exist. The coastal to upland forests host extensive wildlife resources and recreational opportunities for people. The capacity of these systems depends upon their being buffered from the effects of development. This is particularly the case in those areas not protected by shoreland zoning or designated by the state as essential habitat.

See Maps *Topography, Soil Suitability for Low Density Development, BWH Natural Resource Cooccurrence Map and BWH Wetlands Characterization.*

Water Resources

Community Survey Results

PLACEHOLDER

Current Conditions

Surface Water

The Town's surface water resources include two rivers, five ponds and numerous brooks, streams and wetlands. The ***Water Features*** map shows the significant surface water resources and wetlands of South Berwick.

The Salmon Falls River forms the southwesterly boundary between South Berwick and the State of New Hampshire. It is the Town's link environmentally and historically with the Atlantic Ocean. At it's confluence with the Cocheco River, it becomes the Piscataqua River, which in turn flows past Portsmouth and into the Atlantic. The water of the Salmon Falls River is tidal up to the Route 4 Rollinsford/ South Berwick bridge.

Most of South Berwick lies within the Salmon Falls River watershed. A portion of the northeasterly corner of the Town lies within the Ogunquit River watershed, and a portion of the easterly side of town lies in the York River watershed through two sub-shed systems; Belle Marsh and York Pond.

The Great Works River, Driscoll Brook, Hamilton Brook, Lord's Brook, Quamphegan Brook and Shorey's Brook all drain directly into the Salmon Falls River. The Great Works River watershed, which is a sub-watershed of the Salmon Falls River, has a total drainage area of 86 square miles, of which about 40 are in South Berwick. Tributaries of the Great Works River in South Berwick are: Boyd Brook, Chick's Brook, Hussey Brook, Hooper's Brook, Lover's Brook, White Marsh Brook, Knight's Brook and numerous other unnamed streams. The ***Watersheds*** map shows the divides between drainage areas throughout town.

Rivers & Streams

The state of Maine has had a water classification system since the 1950's, which helps to designate potential uses of waterbodies, and therefore the corresponding water quality that should be maintained for each body based on those uses. An overview of the surface water classifications is below.

<u>Maine DEP Surface Water Classification</u>

Class A: Water at the highest quality potentially acceptable for water supply after filtration.

Class B: Water of the second highest quality acceptable for swimming and other recreational uses and is potentially a water supply after treatment.

Class C: Water of the third highest quality potentially acceptable for boating or industrial water supply following treatment.

Most rivers and streams in South Berwick are classified as Class B for water quality, including the entire length of the Great Works River. The only body classified as Class A is Chick's Brook, both in South

Berwick and York. Some sections of the Salmon Falls River are as classified as Class C, including one which extends from the Market St bridge in Berwick to the Route 4 bridge in South Berwick. This covers only a short section within South Berwick town boundaries alongside the village downtown. From that point south, the river is classified as a marine or estuary waterbody, and falls into class SB, the 2nd highest class for this type. For more information on the classification system, visit the Maine Department of Environmental Protection website.

Lakes and Ponds

A great pond is considered any inland waterbody greater than 10 acres. These waterbodies have stricter protections in terms of development regulation, under the Natural Resources Protection Act. These regulations seek to minimize the activities which pose a risk to the overall health of the waterbody, including runoff, pollution, etc. Towns can consider enacting proper control around waterbodies of significance, such as lot size, shoreland setbacks, buffers, water access, and road maintenance. South Berwick's five ponds all lie within the Great Works River watershed. The table below contains information on the physical characteristics of these water bodies.

Name	Area (acres)	Perimeter (miles)	Mean/Max Depth	Fishery Type	% 500-m buffer in developed land cover
Cox Pond	19	0.9	9/16	Warmwater	2%
Knight Pond	49	0.3	9/18	Coldwater & Warmwater	9%
Leigh's Mill (Great Works) Pond	36	1.2	10/23	Coldwater & Warmwater	24%
Round Pond	1	0.2	N/A	N/A	N/A
Warren Pond	25	0.9	13/32	Coldwater	0%
Source: Lakes of Maine, Lake Stewards of Maine					

(Waiting for information about vulnerability & Phosphorus allocations from the Maine DEP)

Threats to Surface Water Resources

Rivers, streams, lakes, and ponds are not bound by town boundaries, so land use planning along rivers and streams can affect downstream communities.

There are two types of pollution that threaten surface water: point and non-point. Point pollution is from a known single source, such as a pipe discharging into a stream. Non-point pollution comes from a general source such as stormwater runoff that carries erosion into a stream. The only regulated source of point pollution in South Berwick is the Town wastewater treatment facility which discharges treated wastewater into the Salmon Falls River. **(Still true?)**

Non-point sources of pollution are difficult to study and monitor. They are likely to occur where there are large areas of impervious surfaces and development, or where land use is being converted from rural or open space to developed areas. These effects could be minimized with good planning of development with use of best management practices (BMP's) before, during and after construction throughout the watershed.

The major non-point source threat to water quality for most lakes and ponds are increased nutrient levels, namely phosphorus. Excess nutrient levels can cause eutrophication, or the overgrowth of plants and algae which decreases oxygen, degrading water quality and killing off other wildlife. The per acre phosphorus allocation defines how much phosphorus each acre of land in a lake's watershed is allowed to discharge in stormwater runoff when developed. Phosphorus allocations range from about 0.02 lb/acre/year for very sensitive lakes in high growth areas to 0.15 lb/acre/year for less sensitive lakes in very low growth areas. The total phosphorus exported by a development can be limited by limiting impervious surfaces in areas near lakes and ponds, and implementing Low Impact Development (LID) Practices.

Another common threat posed to waterbody health is the spread of invasive species. There are no known invasive species in the five ponds. The Salmon Falls River Reservoir has had a confirmed variable leaf milfoil investigation for several years. It is not clear if there is an organization leading any removal efforts.

Ground Water

Aquifers are underground geologic formations which contain usable amounts of water. Typically, aquifers are in areas of saturated sand and gravel, or cracks in bed rock. Groundwater aquifers are generally the source of potable drinking water for individual private wells. Continued assurance of plentiful, clean water is dependent on wise management of the resource.

Four sand and gravel aquifers have been identified in South Berwick. These are aquifers that have the potential to produce significant (greater than 10 gallons per minute) quantities of groundwater.

The aquifer that underlies the village portion of the Town supplies the Water District's seven wells off Agamenticus Road and Willow Drive. The aquifer located in the most southerly part of Town is a source for individuals and Marshwood High School. Studies in the late 1980's showed that the water quality in this area is lower than the village aquifer due to iron and manganese content.

Another aquifer is located on the Hooper Sands Road just southwest of Great Hill. Approximately 9 individual wells along Hooper Sands Rd. and Knight's Pond Rd were contaminated with volatile organic compounds. These wells were believed to be supplied by the sand and gravel aquifer. The Hooper Sands Hydrogeological Study performed by the US EPA and the MEDEP outlined the source, extent and type of contamination. The South Berwick Water District has run a 12" water main along Knight's Pond Rd to service households in the area. Since a public water supply has now been provided the MEDEP has discontinued the monitoring of the test wells drilled to perform the study. Contamination of the aquifer and movement of the contamination plume still exists, and is no longer being monitored**.** The aquifers located in town are displayed in the ***Water Features*** map.

Ground Water Quality

Though overall, the quantity and quality of South Berwick's ground water is good, there are issues with iron and manganese for both private well owners and the South Berwick Water District. A few areas in Town experience issues with sulfur in private wells.

Threats to Ground Water

Groundwater can be contaminated by many types of land uses that discharge pollutants into or onto the ground. The primary sources of ground water contamination in Maine are malfunctioning septic tanks, leaking underground fuel storage tanks, salt leachate from salt/sand stockpiles, and leachate from landfill refuse. Certain land uses such as automobile graveyards/ junkyards, agricultural use of pesticides and herbicides and certain industrial activities also have potential for contaminating ground water.

Polluted aquifers in the Hooper Sands area continue to pose a threat as the plumes slowly migrate. This area and others documented should continue to be monitored. Future residential, commercial, and industrial development can impact ground water through onsite wastewater treatment, improper storage of hazardous materials and improper ground surface treatments.

In Maine, PFAS is an emerging issue and threat to ground water. “PFAS” refer to a group of man-made chemicals known as Per- and Polyfluoroalkyl Substances. PFAS have been widely used in household products and industrial settings for decades. PFAS have been found in Maine in a number of places including agricultural sites, drinking water supplies, surface waters, landfills, wastewater, sludge and septage spreading sites, and remediation and cleanup sites. In general, PFAS can enter the environment through direct releases from specific PFAS-containing products (e.g., certain firefighting foams), from various waste streams (sludge and septage when land applied, leachate from unlined landfills), and other pathways still being researched. In Maine, sludge and septage that may contain PFAS was applied to various places for nutrient value. This activity was licensed because at the time little was known about PFAS as an emerging contaminant. Research at the state level continues, as several laws have been passed in recent years to investigate the extent of the issue.

Marine Resources

South Berwick has approximately 4.5 miles of tidal shoreline on the 3.7 miles of Salmon Falls River from head tide at the Route 4 bridge, south to the mouth of Shorey's Brook and the Eliot town line. Rather than a marine ecosystem, this area comprises an estuarine ecosystem. As such, it provides habitat for anadromous fish species such as smelt, blue backed herring and occasional Atlantic sturgeon (listed as a threatened species). Harvesting of these species is regulated by the Maine Department of Marine Resources and is adopted and posted annually by the South Berwick Town Council. Other fish species found in the river are menhaden, blue fish, and striped bass. It also provides seasonal habitat for species feeding on these fish from harbor seals to osprey and bald eagles. Migratory waterfowl and wading birds feed along high value marshlands adjacent to the river. This portion of the river is currently classified as Class SB, the second highest for marine and estuary waters.

Tidal water areas are closed to commercial shell fishing, but recreational fishing is a major use of the area fishery. Over the last few decades, there has been efforts by both the municipality and Great Works Regional Land Trust to conserve land and encourage landowner engagement to protect the resource.

These areas may become a concern as the risk of sea level rise and coastal storms becomes more prevalent. The Maine Climate Council has recommended that the State of Maine manage for 1.5 feet of relative sea level rise (SLR) by 2050 and 3.9 feet by 2100. Current predictions by the Maine Geological Survey do not show significant inundation risk in South Berwick for the scenario of 1.6ft of SLR. However, in the 3.9 feet SLR scenario, property around the South Berwick Wastewater Treatment plant

is at risk of flooding. For more information, visit the sea level rise viewer at the Maine Agricultural, Conservation and Forestry website.

See maps Water Features, Watersheds, and Flood Hazards.

Agricultural, Forestry, and Wildlife Resources

Community Survey Results

PLACEHOLDER

Current Conditions

Agricultural Values

Maine has a long history of small-scale farming and agriculture. This area of York County in particular has a tradition of part-time subsistence operations who sell their surplus and small-scale commercial farms who sell to local markets. Traditionally, farms occupied most of the area in South Berwick outside the village district. Their barns, stone walls, and old fences are still in evidence today. Active farms can be found scattered along most rural roads. From Old Fields Road in the south to Tatnic Rd in the north, most farms encompass 20 – 40 acre parcels, with a few owning 100 acres or more. They provide scenic value, wildlife habitat and economic benefits. Many provide passive recreational opportunities for area residents.

The most recent USDA Census of Agriculture was performed in 2017, and it shows that through a period of relatively rapid growth, the amount of land in farms and the value of farms stayed relatively consistent for statistics for York County.

York County Agriculture Statistics			
	2002	**2012**	**2017**
Number of Farms	685	779	735
Land in Farms (acres)	57,219	64,512	61,039
Average Size of Farm (acres)	84	83	83
Market Value of Production	18,750,000	27,451,000	28,551,000
Average Value of Production per Farm	27,372	35,239	38,846
Source: USDA Census of Agriculture			

However, this data doesn't reflect the rapidly changing value of land and real estate in York County, especially since the COVID-19 pandemic. As land values increase, farms and farmland throughout the region are more prone to development.

Farmland Soils

Understanding the general soil composition of the town is important for the continued preservation of agricultural uses. Soils recognized as Prime Farmland and Farmland of Statewide Importance by the State of Maine can be mainly found west of the Great Works River and along the Salmon Falls River. According to Beginning with Habitat, approximately 1,300 acres of the town consist of Prime Farmland, while over 4,500 acres are considered Farmland of Statewide Importance. Some of these soils are occupied by active farms today; including farms along Pond Road, Knight's Pond Road, Hooper Sands

Road and Agamenticus Road. **(Still hold true?)** The ***Farmland Soils*** map displays both significant soil types in South Berwick.

Type	Prime Farmland	Farmland of Statewide Importance
Total Acres	1,363	4,699
Percent of Town Area	6.5%	22.6%
Source: Maine Beginning with Habitat Data		

One way to estimate the total agricultural land in use is through the acreage in town held under the Farmland and Open Space Act. This act allows owners of farmland property tax relief for parcels over five contiguous acres if they meet certain conditions such as a minimum farm-derived income. Only 8 of South Berwick's approximately 30 farms (not including backyard stables) are currently enrolled. **(Waiting on data from planning office)**

Forest Resources

Most open lands in South Berwick are forested, peak among them being the extensive forests of the Greater Mount Agamenticus region. While tree growth and forestry are not as public-facing agriculture as local farms, they are valued as a traditional industry statewide. South Berwick has some interspersed areas of Prime Forestry Soils, primarily northwest of the Great Works River. These are mapped by the USDA, and displayed on the ***Forestry Soils*** map.

Type	Prime Forestry Soils
Total Acres	1,402
Percent of Town Area	6.7%
Source: Natural Resources Conservation Service Data	

The Tree Growth Taxation Law has been successfully employed by landowners in Town. A total of __ properties and __ acres are enrolled in the Tree Growth program. **(Waiting on data from planning office)**

Threats to Farm and Forest Land

The primary threat to farm and forest land is extensive development. Both the Farmland and Open Space tax relief and the Tree Growth taxation law create incentives for landowners to protect their land by keeping it in open uses, and the town may consider continued education and awareness of these opportunities.

As mentioned in the groundwater section, the discovery of PFAS is a new and evolving threat to soils and water resources. One of the major sources of PFAS contamination is the spreading of sludge on

farmlands for fertilizer, which was unknown at the time to cause contamination. Further study at the state level may determine whether this is a threat for South Berwick farmlands or not.

Wildlife Lands

In 1979, a Tri-Town coalition of Eliot, York and South Berwick identified lands in their Towns which warranted conservation. This region became known as the Greater Mount Agamenticus Region and incorporated 33,000 acres of Eliot, South Berwick, York, Ogunquit and Wells. In South Berwick, this area encompasses the eastern and northern side of Town. It is bounded by Rt. 236, Witchtrot Road, Emery's Bridge Road to Rodier Road, and Thurrell Road. These 33,000 acres create the largest block of unfragmented habitat on the coastal plain between Acadia National Park to the north and the New Jersey Pine Barrens to the south giving it a regional, if not nationwide significance. These acres are not only recognized for their vastness, but also for their productivity and diversity for wildlife. Two forest types intermingle here; Northern Boreal (softwoods) and Southern hardwoods. As a result, the animal species depend upon these habitat types, and also intermingle here. It is home to endangered plant and animal species as well as broad ranging species (moose, black bear and bobcat) and contains one of the highest concentrations of productive vernal pools in New England.

Conservation efforts have been the result of a collaborative approach by many partners and supported by grants from the Land for Maine's Future Program, the Maine Outdoor Heritage Fund, the Town of York and Wells and many private donors. The Mount Agamenticus Steering Committee helps manages the public use of these lands and minimize the impacts of recreation on wildlife and water quality.

The other wildlife focal area is the Salmon Falls River Estuary. This area received Resource Protection Zoning in the early 1990's to protect this wildlife corridor and water quality. The estuary is used by anadromous fish species, which access the freshwater above head tide, due to the construction of a fish ladder at the Route 4 dam. It is essential habitat for waterfowl and wading birds, osprey and over-wintering bald eagles. Endangered Atlantic sturgeon and oysters also inhabit these waters. The Vaughan Woods State Park is a 165 acre parcel of conserved land along the estuary, managed by the Maine Bureau of Parks and Lands.

In addition to Mount Agamenticus and the Salmon Falls River, the Great Works River provides a meandering wildlife corridor through town. Resource Protection extended to the river upstream from Emery's Bridge Road and the river's major tributaries provide connecting corridors for wildlife from one area to the other. The undeveloped nature of the Town's great ponds make them important habitat for migratory waterfowl as well as broad ranging species such as moose and black bear.

The Beginning with Habitat program also provides maps of habitat blocks and endangered species habitat, as well as identified rare natural communities of plants and animals- of which South Berwick has many.

South Berwick Open Space Plan

In 2012, the South Berwick Open Space Committee and the town completed a Conservation and Open Space Plan. The plan was intended to inventory natural resources which were significant for wildlife and biodiversity as well as cultural and scenic reasons. The plan consisted of a GIS analysis which layered several priorities for conservation to identify areas for conservation in the future.

The following goals were identified as part of the plan, which were also paired with several actions and parties responsible for implementation.

1. Use this plan to build bridges between groups dedicated to the conservation of natural resources and open space protection in South Berwick and those who make decisions on these same resources
2. Maintain the natural resource values that currently exist on town and non-profit owned conservation related parcels or other parcels of land in town.
3. Set-up an Open Space Fund and seek methods to maintain and expand upon the Open Space Fund, with such funds to be used for conservation purchases by the town, by non-profit groups, and to be used as matching funds for purchases through grant programs and other sources.
4. Build bridges to regional conservation groups who may provide financial and technical assistance to South Berwick regarding implementation of this plan and other conservation initiatives.
5. Ensure that the work done as part of this plan is maintained and institutionalized as part of the town's long-term planning focus.
6. Begin a process for encouraging a network of trails and/or sidewalks throughout the community.

Several maps were created as part of the Open Space Plan, to incorporate regional priorities and guide future conservation work.

See Maps *Farmland Soils, Forestry Soils, BWH Undeveloped Habitat Blocks & Conserved Lands, BWH High Value Plant and Animal Habitat, and Open Space Cooccurance Map.*

Adequacy of Existing Protection Measures for Natural Resources, Water Resources, and Farm, Forest & Wildlife Lands.

South Berwick is a Municipal Separate Storm Sewer System (MS4) Community. As an MS4 Community, the town is subject to an MS4 Clean Water Act Permit. The Permit applies to the "Urbanized Area" of the Town and is designed to reduce the discharge of pollutants from the Town's regulated, separated storm drain system, to protect water quality, and satisfy appropriate requirements of the Clean Water Act. Urbanized areas are determined by the US Census Department, based on population density and impervious surface cover. The Permit requires that the Towns conduct public education and outreach activities related to stormwater pollution prevention, inspect the storm drain system regularly for pollutants, and maintain the storm drain system and municipal properties. The Town also teams with four other MS4 communities in York County, in a group called the Southern Maine Stormwater Working Group (SMSWG).

South Berwick's other measures to protect water resources consist of the shoreland zoning ordinance, resource protection ordinance, subdivision and site plan review standards; including standards for maximum impervious surface, drainage provisions and storage of pollution-causing materials. In many ways, the resource protection ordinance in South Berwick is stricter than surrounding communities, including scenic and cultural resources in some cases. Continued conservation and protection of open space also serves as a protection against stormwater and non-point source pollution concerns.

South Berwick had the first cluster development ordinance in the state, which along with several other benefits, is in part intended to reduce sprawl and encourage large areas of open space. The town also has a specific Agamenticus Resource District to regulate land use around this valuable resource. For example, it requires a permit for forest harvesting, and certain high intensity land uses are restricted.

Tree Growth taxation and Farmland and Open Space taxation are also current measures in effect to conserve farm and forest lands and encourage continued conservation in the future.

Regional Issues

All natural resource issues are inherently regional issues. Ecosystems do not follow jurisdiction boundaries, making it essential for regional collaboration and communication when it comes to protecting our valuable natural resources.

The Greater Mount Agamenticus Area and Salmon Falls River corridor are two areas where regional efforts will be especially important for protecting natural resource values. The town also shares sand and gravel aquifers with several surrounding communities, and a significant surface water resource, the Salmon Falls River, with other communities in both Maine and New Hampshire.

Regional efforts should address the continued protection of both surface and ground water resources held in common. Regional approaches to natural resource priority issues will have a greater positive impact on protecting water quality, wildlife habitat, and recreational opportunities for the future of the region.