

Town of Wells 2021 Comprehensive Plan Update

Chapter 3 Update – Natural Resource Policies and Strategies*

Appendix A Inventory and Analysis

Section 3 Update – Critical Natural Resources

**Note: The Water Resources sections have already been edited and reviewed – those changes are shown here in addition to new changes corresponding with Critical Natural Resources.*

How to Read this Document:

The consultants hired to work with the Town of Wells are committed to a transparent planning process and aim to comply with the Town of Wells Chapter 12 Ordinance and other state requirements. To clearly show what has been updated from the 2005 Comprehensive Plan, “tracked changes” was used to show what has been deleted from the 2005 section, new information that has been added, and clarifying questions and comments. New language and data are shown in **red**. Deleted language is shown with a **strikethrough in red**. Old tables are shown with a **red-strikethrough** and new tables of information were inserted. Questions and comments are shown in **purple**. Please note that the analysis sub-section at the end of each updated Appendix section will be reviewed again once all sections are updated. Cross-referencing sections will help the consultants better revise these analysis findings.

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22. Maine Floodplain Management Program

Key Findings:

- Wells has an extensive inventory of significant wildlife habitat, notably in its tidal and freshwater marsh systems. This includes inland and tidal waterfowl and wading bird habitat, shorebird nesting, feeding, and staging areas, and habitat for rare, threatened, and endangered plant and animal species. This existing conditions update has identified new mapped areas of significant wildlife habitat.
- There are three focus areas of statewide ecological significance identified by the Maine Natural Areas Program and Maine Department of Inland Fisheries and Wildlife within Wells. These areas, the Wells and Ogunquit Marsh System, the Wells Barrens and Kennebunk Plains in northwestern Wells, and the Mount Agamenticus areas in southern Wells, are identified based on exceptionally rich concentrations of rare species and natural communities and high quality common natural communities, significant wildlife habitats, and their intersection with large blocks of undeveloped habitat.
- Town, state, and federal land protection exists for much of the habitat found in the coastal marsh system east of Route 1 (mainly the Wells National Estuarine Research Reserve). However, this tidal marsh system is largely surrounded by development and built infrastructure (with the exception of the Rachel Carson National Wildlife Refuge Upper Wells Division). Under increasing coastal flooding and rising sea levels, the marsh and dune systems will be inundated and disappear. Protecting land adjacent to existing tidal marshes should be a priority.
- We recommend incorporating a more robust section on threats to wetlands, which discusses coastal flooding effects on marsh inundation, marsh migration, and effects on wetland habitat. This text has been drafted.
- Account for forthcoming Flood Insurance Rate Map (FIRM) in description of regulatory floodplain. Wells is expected to receive a new preliminary FIRM from FEMA in early 2022. The information describing the regulatory floodplain will be updated accordingly when the new FIRM is issued, dependent on timing of FIRM issuance and the Comprehensive Plan timeline.
- Incorporate sea level rise and other climate change considerations. No mention of climate change impacts (sea level rise and more intense and frequent storm events) on flood hazards.

- Highlight Wells' recent flood hazard planning efforts. The Town has participated in several climate change and coastal flood assessment projects and planning initiatives in the recent past. Those efforts should be noted in this section.

Chapter 3 - Natural Resources Policies and Strategies

Introduction

The Comprehensive Plan's Natural Resources Policies and Strategies describe goals, policies, standards, and implementation strategies related to the protection, conservation and development of Wells' natural resources.

Natural resources contribute to defining a community's unique character. Wells' natural resources provide residents with a rich quality of life and many recreational opportunities. Natural resources are also an important consideration in estimating the Town's capacity for growth and development potential. Natural resources can provide both opportunities and constraints for growth. For example, steep slopes and wetlands are inappropriate for development while better drained, flatter areas are generally considered more suitable for development. The natural resource base of Wells is an important factor in determining local land use decisions. Critical natural resources are those with unusual and/or significant geological, biological, or hydrological features (Comprehensive Planning Manual: A Manual for Maine Communities). Under federal and/or state law, critical natural resources warrant protection from the negative impacts of development. See Appendix A for an analysis of Wells' critical natural resources.

Goals

State Goal:

1. Protect the quality and manage the quantity of the State's water resources, including lakes, aquifers, great ponds, estuaries, rivers, and coastal areas. (Growth Management Act)
2. Protect the State's other critical natural resources, including without limitation, wetlands, wildlife and fisheries habitat, sand dunes, shorelands, scenic vistas, and unique natural areas. (Growth Management Act)

Regional Goals:

1. Maintain and, where possible, improve the quality of our natural environment through actions that manage resources as a system rather than as local segments.
2. Work in collaboration with the Wells National Estuarine Research Reserve Management Plan to address pressing local and regional management issues, including climate change and its impacts on coastal ecosystems and communities, development pressures, land use change impacts on coastal habitats, and water quality degradation. At the time of this comprehensive plan update, the current management plan is for

2019-2024, and will be updated regularly.

Wells Goals:

1. Assure the Town's natural features, including the marshes and wetlands, beaches, aquifers, critical wildlife habitats, and floodplains, that are truly environmentally sensitive areas and create a truly outstanding, but fragile, environment are protected from damage and preserved for future generations.
2. Enhance the Town's programs for protecting sensitive, natural resources through regulatory and non-regulatory mechanisms.
- 2.3. Identify areas susceptible to the negative effects of climate change such as sea level rise, storm surge flooding, etc., as well as areas of flood mitigation and floodwater storage.
- 3.4. Support programs for acquiring key land areas of environmental concern to provide for the protection of these resources, while compensating the property owner.
- 4.5. Work cooperatively with federal and state environmental regulators to enforce regulations that protect the Town and region's natural resources.
- 5.6. Develop land use controls that encourage these areas to be protected and permanently set aside as land development occurs.
- ~~6.~~ Protect the Branch Brook aquifer from potential sources of contamination by controlling land use in this area and maintaining the availability and quality of other existing and potential water supplies.
7. Allow the removal of mineral resources such as sand and gravel in a manner which minimizes the impact on these areas and surrounding neighborhoods, provides for the reclamation of these sites, and protects the groundwater from contamination.
8. Protect, manage, and support natural ~~resource-resource~~-based enterprises such as agriculture, forestry, and mineral extraction.
9. Place high value on the protection and long-term management of and education about the Town's ecological systems including soils, surface and ground water, wetlands, beaches, natural vegetation, and wildlife. The natural environment should be used as a guide to manage future growth recognizing that Wells' natural systems provide opportunities and constraints for both conservation and development.
10. Assure ocean beaches continue to be a community resource.

Note: We recommend considering this goal or similar to project the critical natural resource of the coastal marsh system east of Route 1. This marsh system is largely bound by built infrastructure which will prevent the marsh from migrating inward with sea level rise (with the exception of the marsh adjacent to the Rachel Carson National Wildlife Refuge –

Upper Wells Division).

11. Protect the Wells coastal marsh system from inundation through coastal flooding and sea level rise by protecting adjacent land to allow for marsh migration.

Policies

To achieve these goals, it is the policy of the Town of Wells to:

General

1. Encourage the use of environmentally sensitive areas and critical habitats in a manner that does not jeopardize the environmental value of their resource.
2. Allow the removal of mineral resources such as sand and gravel in a manner that minimizes the impact on these areas and surrounding neighborhoods, provides for the reclamation of these sites, and protects the groundwater from contamination.

Beaches

1. Assure public access to the beaches for both residents and tourists while protecting the livability of the beach neighborhoods.
2. Manage the beaches in cooperation with property owners to control overuse, provide necessary facilities, and promote a wholesome family environment.
3. Maintain and protect the physical quality of the beach systems through activities such as cleaning, stabilization, and sand replenishment.
4. Improve pedestrian, bicycle, and local transit access to the beaches.
5. Create transportation links (e.g. ferryferries, bridges, etc.) between the Harbor, Wells Beach, and Drakes Island.

Groundwater

1. Protect the quality of the groundwater in the Branch Brook Aquifer and in the Town's othersand and gravel aquifer areas that can be used for high volumes of domestic use by implementing and enforcing regulations that control the use, handling, and storage of hazardous materials.
2. Protect the quality of the groundwater in areas not served by public water and sewer by ensuring existing nitrate standards set by the Maine Department of Environmental Protection are enforced and ensuring proper inspections of all septic system installations.

Surface Waters

1. Protect surface water quality by aggressively managing point and non-point source pollution including stormwater discharge.

2. Cooperate with surrounding communities and environmental non-profit groups to minimize the potential for surface water pollution by inappropriate uses or activities.

2.3. Establish a long-term monitoring program of surface waters in the Town with monitoring sites along Branch Brook, Depot Brook, Green Brook, Merriland River, Stevens Brook, and Webhannet River.

Wetlands

1. Protect and maintain the valuable functions of tidal and freshwater wetlands by minimizing the impact of development and allowing appropriate uses such as low impact recreation, wildlife habitat, and limited, controlled timber harvest.
2. Ensure protection of high value wetlands including vernal pools, through regulatory and non-regulatory implementation programs and place high value on these resources when designating growth and rural areas in Wells.
3. Protect land adjacent to wetlands, especially coastal wetlands, to allow marsh migration due to increased coastal flooding and sea level rise.

Soils

1. Base the density of development in areas outside public water and sewer service on the assimilative capacity of soils to accommodate onsite ~~waste water~~wastewater systems. No lot size shall be less than 20,000 square feet if not on sewer and water if the Maine State Code changes.

Wildlife and Fisheries

1. ~~1.~~ Ensure the long-term protection and enhancement of Wells' valuable wildlife habitat and fisheries through the use of regulatory strategies and ~~out reach~~outreach to governmental and non-profit organizations involved with natural resource protection and management.
2. Protect large habitat blocks to provide core habitat blocks that provide undisturbed habitat conditions required by many of Maine's species.

Floodplains

1. Manage floodplain areas to ensure the safety and welfare of those individuals with properties in such areas.
2. Maintain and update comprehensive community flood hazard management policies and strategies. (sSee Chapter 15 and the Appendix).
3. Ensure the long-term protection and enhancement of Wells through the use of regulatory strategies and ~~out reach~~outreach to governmental and non-profit organizations involved with natural resource protection and management.

Education

1. ~~4.~~ Work with schools and the community to promote education of environmental sciences and ecology.
2. Use the Fenderson Wildlife Commons and other locations for environmental education opportunities for students and the public in conjunction with the Wells Conservation Commission.

Standards

To achieve these policies, the following are Town of Wells' standards to guide development:

1. Existing Land Use, ~~and~~ Subdivision, Floodplain Management, Hazardous Waste, Septage Effluent Disposal, and Solid Waste Ordinances.

Implementation Strategies

General

Note: The implementation strategies identified here for Natural Resources are sourced from the Maine Comprehensive Plan Review Criteria Rule (07 105 Chapter 208).

1. Through local land use ordinances, require subdivision or non-residential property developers to look for and identify critical natural resources that may be on site and to take appropriate measures to protect those resources, including but not limited to, modification of the proposed site design, construction timing, and/or extent of excavation.
2. Through local land use ordinances, require the planning board (or other designated review authority) to include the consideration of information regarding critical natural resources as part of the review process.
3. Initiate and/or participate in interlocal and/or regional planning, management, and/or regulatory efforts around shared critical and important natural resources.
4. Pursue public/private partnerships to protect critical and important natural resources such as through purchase of land or easements from willing sellers.
- ~~4.5.~~ Distribute or make available information to those living in or near critical or important natural resources about current use tax programs and applicable local, state, or federal regulations.

Beaches

1. Appoint a Committee to recommend specific implementation programs to assure public access to beaches, manage beach use, protect the physical quality and create transportation links.
2. Establish a graphic inventory of all sand dunes ~~on the Town's Geographic Information System (GIS)~~ to accompany the state sand dune boundaries file and update as new data becomes available. Ensure that any landowner with property on a sand dune obtain any necessary State permits prior to obtaining any local permits.

Groundwater

1. Revise the Aquifer Protection District of the Land Use Ordinance to incorporate a two-tiered zone for the Branch Brook Aquifer based on maps prepared by the Kennebunk, Kennebunkport, and Wells Water District (KKWWD) and adopt use and quality standards as identified in the Aquifer Protection section of the Land Use Policies and Strategies.
2. Continue to work with the KKWWD to acquire key parcels of land with high value for ground water protection and aquifer recharge through fee simple acquisition or conservation easement.
3. Review/Amend the Aquifer Protection provisions of the Town's Land Use Ordinance to ensure that~~determine whether or not there~~ there is sufficient protection of the groundwater in the Town's sand and gravel aquifer areas. Where appropriate implement and enforce regulations that control the use, handling, and storage of hazardous materials in these areas.
4. Establish a program to ensure there is proper inspection of all septic system installations and monitor the performance of septic systems in/or adjacent to Resource Protection and Conservation Areas.
5. Maintain the current buffer around surface water bodies and wetlands in the Land Use Ordinance to prohibit septic systems and other uses with the potential to contaminate both the groundwater and the groundwater/surface water interface.
6. Enact public wellhead and aquifer recharge area protection mechanisms as necessary.

Surface Waters

1. Continually integrate the State of Maine Guidelines for Municipal Shoreland Protection, as may from time-to-time be revised, into the local land use regulations.
2. Ensure the Town shoreland zoning ordinance complies with Maine DEP guidelines.
3. Revise local subdivision and site plan review regulations, where necessary, to require low impact development standards, stormwater management, erosion and sediment control and landscaping, ~~including a reference to a suitable guidance document that requires currently accepted Best Management Practices such as the *Maine Erosion and Sediment Control Handbook for Construction: Best Management Practices* by the Cumberland County Soil and Water Conservation District, 1991 or or *Better Site Design: A Handbook for Changing Rules in Your Community* by the Center for Watershed Protection, 1998.~~ Standards consistent with: (1) Maine Stormwater Management Law and Maine Stormwater regulations (title 38 M.R.S.A §420-D and 06-096 CMR 500 and 502). (2) Maine Department of Environmental Protection's allocations for allowable levels of phosphorus in lake/pond watersheds. (3) Maine Pollution Discharge Elimination System Stormwater Program.

4. Continue local subdivision and site plan review regulations to provide for municipal inspection and enforcement of:
 - Erosion and sediment control plans.
 - Post-construction maintenance and operation plans, particularly for major developments or developments deemed by the Planning Board to have potential negative impacts to valuable natural resource or Resource Protection Areas.

4. When and where applicable, develop an urban impaired stream watershed management or mitigation plan to promote continued development or redevelopment without further stream degradation.

4.5. Continue the cooperative relationship with the Wells National Estuarine Research Reserve to expand the water quality monitoring program with annual monitoring results and analysis made available to the Town.

5.6. Establish a process with adjacent communities to ensure the maintenance of water quality standards for surface waters that occur in more than one community such as Branch Brook, ~~and~~ the Merriland River, and the Ogunquit River.

6.7. Ensure that the water quality of Ell Pond is not degraded by working with the Town of Sanford to implement a consistent set of standards for water quality protection.

8. Amend Town ordinances to require a timber-cutting plan and permit.

9. Work with the DPW to integrate water quality protection into their daily operations including the storage of sand and salt, culvert replacement, street sweeping, and garage operations.

7.10. Adopt or enhance water quality protection practices and standards for construction and maintenance of public and private roads and public properties that require their implementation by contractors, owners, and community officials and employees.

8.11. Obtain a description of each pond, river, and drinking water supply with the description of ecological value, threats to water quality or quantity with specific location(s) of threats, and documented water quality, a summary of present and past monitoring activities, and/or invasive species problems from the Department of Inland Fisheries and Wildlife and/or the Department of Environmental Protection.

9.12. Minimize pollution discharges through the upgrading existing public sewer systems and the wastewater treatment facility.

10.13. Encourage landowners to protect water quality. Provide local contact information at the municipal office for water quality best management practices from resources such as the Natural Resource Conservation Service, University of Maine Cooperative Extension, Soil and Water Conservation District, Maine Forest Service, and/or Small Woodlot

Association of Maine. Provide educational materials at appropriate locations regarding aquatic invasive species if applicable.

Wetlands

1. Establish a committee to review and assess the quality of current wetland management within Wells and, if deemed appropriate, establish guidelines for a local wetland regulation. If appropriate, base the regulation upon a classification system that incorporates hydrology, vegetation and wildlife and a definition that is consistent with current state and federal wetland regulatory programs. Report findings to the Board of Selectmen within six months of establishing such committee. Wetland guidelines should ensure that any definition be consistent with current state and federal wetland regulatory programs.
2. Establish a program to identify, prioritize and protect high value freshwater wetlands and land containing vernal pools. Protection should occur through regulation, education and cooperation, purchase, or conservation.

Wildlife and Fisheries

1. Identify and protect through the timber harvesting plan and permit, site plan and subdivision approval process, those areas of land designated by the Maine Department of Environmental Protection (MDEP) as “significant wildlife habitat. These areas should be revised based on MDEP updates and revisions of these habitat areas and performance standards.
2. Retain the currently designated buffers along rivers and streams in the Town’s Land Use Ordinance to maintain the quality of these areas for wildlife and fishery habitat.
3. Within areas of Wells designated as Rural Use, seek to maintain large parcels of unfragmented lands and to ensure that wildlife habitats are connected by travel corridors through both regulatory and non-regulatory means.
4. Require all applications for subdivision, site plan review and timber harvesting to investigate and map the presence of any significant wildlife habitat and habitat for state rare or endangered species that may not have been previously mapped, such as vernal pool areas of the Tatnic Hills that provide habitat for Blanding’s and spotted turtles and as established by the State of Maine on the site. Obtain necessary state approvals as a condition of subdivision plan and /or site plan approval.
5. Work cooperatively with Maine Inland Fisheries and Wildlife, Natural Resource Conservation Service, and Wells National Estuarine Research Reserve to manage and protect high value habitat and areas for significant habitat and rare and endangered species.
6. Work with landowners with high value habitats on their property to protect these areas through education and cooperation, conservation and easements or purchase through a land holding entity.

Forest and Farmland Resources

1. ~~4.~~ Amend Town ordinances to ensure a timber-cutting permit is obtained prior to cutting.
2. Work with forest and agricultural landowners to improve adaptive capacity and ability to respond to fluctuating water demands.
3. Amend Town land use ordinances to protect critical prime farmland soils.
4. Include agricultural and forestry operations into Town economic development planning efforts.

Floodplains --See Chapter 15-Flood Hazard Mitigation Policies and Strategies

1. Continue to manage the use and development of the Town's inland flood hazard areas in accordance with state and federal standards.
2. Update current flood hazard standards and maps to be consistent with federal guidelines and the recommendations of the Flood Hazard Mitigation Policies and Strategies.

Section 3 – Critical Natural Resources

A. TOPOGRAPHY, SLOPE AND SOILS

Topography

Wells is part of the coastal plain of the New England physiographic region, which is characterized by low relief, poorly developed drainage systems and a mantle of glacial materials in the form of till and large quantities of sand and gravel. The Town rises gently and gradually from east to west. Elevations rise from sea level to approximately ~~360~~⁴⁴⁰ feet. The marsh systems along the coast within the Wells National Estuarine Research Reserve are at or near mean sea level. The Tatnic Hills near the South Berwick border are the highest elevation at approximately 360 feet.

SLOPE

Slope affects the capability of land for development. The slope or steepness of the land is defined by the change of elevation over horizontal distance. For example, a ~~10-foot~~^{10-foot} rise within 100 feet is a 10% slope. Slopes in the 3% to 8% range are generally considered to offer the fewest restrictions to development. Typically, construction costs of development increase with slope. Slopes of 0-3% may present drainage problems.

Slope is important for planning purposes for several reasons. The increase in slope corresponds to the potential increase for surface runoff and erosion. The soil depth is also thinner as slopes increase, thereby decreasing the capacity of the land to filter septic system effluent in areas that lack public sewer services. The Maine State Plumbing Code does not allow installation of septic systems on slopes greater than 20%. Private septic systems are most common within the Town of Wells, as many homes are not served by public sewer. The sewer system services coastal areas located east of the Turnpike.

In Wells, like the other coastal communities in Southern Maine, the slope is generally between 0% and 8%. The few areas with slopes steeper than 15% primarily occur along river and stream corridors, such as along Branch Brook in the northern edge of the Town, in areas around the Tatnic Hills in the northwestern area of the Town near South Berwick, or coastal waterfronts. There are approximately ~~1,163 acres~~^{1,046 acres} of ~~steep~~ slopes greater than 15%, or about 3% of Wells' land area. Although these steep slope areas may present limitations, lack of adequate slope to promote proper drainage is of more concern.

SOILS

The soils in Wells have developed over time from the interaction of climate, vegetation, topography and surficial materials. Since much of the surface materials of Wells are underlain by marine clays and glacial till, many of the soils tend to be moist and/or stony with areas of ~~high water-~~

high-water table, shallow ledge or ledge outcroppings. Where there is sand and gravel or stratified drift, the soils tend to be more sandy and gravelly and better drained. Hydric soils (also referred to as wetland soils) tend to be found in low spots associated with surface water features or in areas underlain by silt and clay deposits throughout the Town. Soil types are from the Soil Survey Geographic Database from the United States Department of Agriculture Natural Resource Conservation Service (spatial version 5, Sep 16, 2019). This database identifies 36 soil series in Wells, derived from the York County Soil Survey produced by the USDA Soil Conservation Service (SCS) in 1982. The SCS has identified over 36 soil series in Wells. In the last several years, the SCS has become the Natural Resources Conservation Service (NRCS).

SOIL ASSOCIATIONS

There are six general soil associations in Wells. A soil association is a group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern, inventoried in the U.S. General Soil Map (last updated in 2016). The general characteristics of each association are described below. It should be noted that the soil associations for Wells describe very broad geographic regions that have similar soil-landscape relationships and should only be used to gain a general idea of the nature of soils and landscapes within the Town. The smallest delineation is typically several hundred acres in size and has only minimal value for making land use decisions at the Town wide level.

1. The Ipswich-Groveton-Beaches Association, located along the coast area of Wells.
 2. The Naumburg-Croghan-Adams Association, located throughout central Wells.
 3. The Scantic-Lamoine-Buxton Association, located in north central Wells.
 4. The Sebago-Croghan-Colton-Adams Association, located in central Wells and along the town northern border.
 5. The Skerry-Lyman-Hermon Association, located on the southern border of Wells (minimally present within the Town).
 6. The Tunbridge-Lyman-Abram Association, located in south central Wells.
1. The Adams-Colton Association consists of deep, nearly level to steep, excessively drained soils. Located primarily south of Route 109, especially along sections of Route 9 and the western corner of Town near the Sanford/North Berwick borders.
 2. The soils of the Naumberg-Croghan Association have a high water table in the spring and fall, and both have rapid or very rapid permeability. The high water table and rapid permeability make groundwater contamination a major concern. These soils are interspersed throughout Wells with concentrations along Route One, the railroad and the western section of Route 109.
 3. The Hermon-Lyman Association consist of shallow and deep, gently sloping to very steep, well, drained to somewhat excessively drained soils formed in glacial till. These are scattered in areas west of the Turnpike just north and south of Route 109.
 4. The Scantic-Raynham-Buxton Association consists of deep, nearly level to moderately steep and hilly, poorly drained to moderately well drained soils formed in marine and lacustrine (ancient lake) sediments. These areas are west of the Turnpike and associated with areas adjacent to the Merriland River.

5. ~~Lyman Rock Outcrop Scantic Association. Lyman soils consists of glacial till that are shallow, gently sloping to very steep, and somewhat excessively drained. Rock outcrop consists of areas of bedrock exposures. The Scantic soils are deep, nearly level and poorly drained. The shallow depth, steep slopes, bedrock exposures, and the poor drainage of of this association limit its suitability for development with on site water supply and sewage disposal. This association tends to be located near the border with South Berwick in the Tatnie Hills area.~~
6. ~~The Sulphemists Udipsamments Association consists of deep, level, very poorly drained soils formed in organic deposits and deep, undulating to rolling, excessively drained to moderately well drained soils that are associated with tidal marshes.~~

PRIME FARMLAND SOILS

The U.S. Department of Agriculture defines prime farmland as the land that is best suited to producing food, feed, forage, fiber, and oilseed crops. It has the soil quality, growing season, and moisture supply needed to produce a sustained high yield of crops while using acceptable farming methods. Farmland of statewide importance is land for the production of food, feed, fiber, forage, and oilseed crops that does not meet criteria for prime farmland. Although potentially important for agriculture, farmland of statewide importance tends to have more limitations, such as slope or the need to be irrigated or drained in order to be suitable.

Prime farmland produces high crop yields with the least amount of external input. Prime farmland is a valuable, limited commodity not only in Wells, but in many southern Maine communities. The characteristics that make these soils suitable for agriculture also make them suitable for development.

The Town of Wells has approximately 412 acres of sSoils series rated as prime farmland soils by the Natural Resource Conservation Service of York County in Wells, including: Allagash very fine sandy loam, Becket fine sandy loam, Buxton silt loam, Colton bgravelly loamy coarse sand, Elmwood fine sandy loam, Madawaska fine sandy loam, Marlow fine sandy loam, Ondawa fine sandy loam, Peru fine sandy loam, Podunk and Winoski soils, and Skerry fine sandy loam. The Town of Wells has approximately 10,520 acres of soil series rated as farmland of statewide importance, including Adams loamy sand, Allagash very fine sand loam, Buxton silt loam, Colton gravelly sand loam, Croghan loamy fine sand, Elmwood fine sandy loam, Hermon sand loam, Lyman loam, Podunk and Winooksi soils, and Scio silt loam (soils classified as both prime farmland and farmland of statewide importance are differentiated based on slope).

~~The NRCS of York County also rates farmlands of statewide and local importance that are identified in the 1991 Master Plan. Although potentially important for agriculture, they tend to have more limitations, such as slope or the need to be irrigated or drained in order to be suitable.~~

Prime farmland soils are found in small concentrations west of Route 9A in Wells Branch, ~~and~~ along West Brook near Roger Bragdon ~~Road and Road and~~ extending to the town line with North Berwick and Sanford. Farmland of statewide importance is also present in these areas, as well as along the costal marsh area along Route 1, and along Branch Brook in northern area of the town. This same area has small concentrations of soils of statewide importance. A larger area of the

~~Town has~~ Naumberg ~~soils~~ sand is also present in large areas of the town, which~~that~~ can be productive, but requires draining and irrigating. ~~This soil series is ese~~ are located in the following areas—between Route 1 and the Turnpike, the Burn Mill area west of the Turnpike, along Branch Brook and near the Sanford town line.

~~Prime Forestry~~ ***FORESTLAND PRODUCTIVITY BY SOILS***

Note: The current Soil Survey Database uses forestland productivity to indicate potential productivity of the soils for wood crops. A “prime forestry rating” is no longer displayed in the database. This section has been updated accordingly.

The ~~Soil~~ **Natural Resource** Conservation Service defines prime forest land as having soils which are capable of growing wood at the economic productive growth rate for a given tree species. ~~Forestland p~~Productivity is based on the total yield of wood per hectare of mature trees and indicates the potential productivity of the soils for wood crops. The volume of wood fiber is the yield likely to be produced by the most important tree species. This volume is expressed for the most important tree species in each soil series as cubic feet per acre per year, and indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand. In the Town of Wells, 20 soil series have forestland productivity ratings, indicating these soils have the potential productivity for wood crops. ~~Soils with a productivity rating of medium, high, or very high are considered prime forestry soils.~~ Management problems such as erosion hazard, equipment limitations, or seedling mortality are not factored in when calculating the productivity of a soil. ~~Productivity is based on the total yield of wood per hectare of mature trees.~~

~~All of the soils identified as prime farmland in Wells are also rated as prime forestry soils. The Scio soil group has the highest tree growth productivity rating of all York County soils. Much of the land in Wells consists of prime forestry soils. The exceptions include the peat soils (Biddeford mucky peat, Choicura peat, Seao mucky silt loam, Vassalboro peat and Waskish peat), beaches and very shallow soils.~~

SOIL SUITABILITY FOR DEVELOPMENT

The characteristics of an individual soil are important in determining its suitability for various types of uses. The soils in Wells have been rated by the ~~SCS~~ **Natural Resource Conservation Service** for suitability for development and installation of septic systems. One class of soils is highly unsuitable for either activity—hydric soils. All of the information in this section was compiled by a countywide survey and presents an incomplete picture of soil suitability. This information should therefore not be used for site planning purposes. However, it does provide the best available overview of soil suitability in Wells.

Hydric Soils

Hydric soils ~~are soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (as defined by the National Technical Committee for Hydric Soils). Hydric soils are one of the three essential characteristics of wetlands (along with hydrophytic vegetation and wetland hydrology). have very similar characteristics to those wetlands as defined by the Army Corps of~~

~~Engineers. These Hydric soils~~ include all poorly and very poorly drained soils often associated with marine silts and clays including muck, peat, swamps and marshes. ~~Within Wells, soil series classified as hydric~~ They include ~~such soil types as the~~ Biddeford mucky peat, ~~Brayton and Westbury fine sandy loams,~~ Chocorua peat, ~~Naumburg sand, Raynham silt loam,~~ Rumney ~~fine sandy loam,~~ Saco mucky silt loam, Sebago peat, Pemaquid, Todds point, and Damariscotta soils, ~~and eantie silt loam and~~ Vassalboro peat. The water table is at or near the surface 5 to 9 months of the year. ~~Wetland soils are associated with low lying areas in Wells, such as~~ Hydric soils in wells are located in the following general areas:

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- the tidal marshes east of Route One;
- large portions of the freshwater wetland area west of 9B running northerly to the railroad;
- a large portion of the area bounded by Route 9, Route 109 and Bragdon Road, including the Heath;
- the area west of the CMP right-of-way south of Route 109 and running to the Sanford town line; and
- along watercourses such as the Ogunquit River, Merriland River, Hobbs Brook, and the Little and Webhannet Rivers.

Hydric soils in Wells comprise a large portion of the Town—15,696-997 acres or 43% of Wells. The large area of hydric soils is a major limiting factor for growth and development in Wells.

Building Site Development Suitability for Low Density Residential Development

Note: The current Soil Survey Database uses a Building Site Development rating, and no longer uses suitability for low density residential development. The section has been updated accordingly.

~~The SCS-National Resource Conservation Service~~ has developed a rating system for (1) dwellings and small commercial buildings, and for (2) roads and streets, shallow excavations, and lawns and landscaping low density residential development suitability based upon the capability of each soil type for septic systems, home construction and road/utility construction. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development, such as slope, flooding, depth to saturated zone, and shrink-swell. Ratings range from “not limited” to “very limited”. ~~The capability ratings are based upon the potential for environmental degradation and the costs for corrective measures and long term maintenance. Suitability is ranked from very high to very low.~~

In Wells, soil series ranked as “very limited” for dwellings and small commercial buildings include soils that are greater than 15% slope, hydric soils such as Biddeford mucky peat or Chocorua peat due to ponding, rocky soils that have short depths to bedrock such as Lyman loam, and silt-loam soils that experience shrink-swell, such as Scantic silt loam or Buxton silt loam. Soils series ranked as “very limited” for lawns and landscaping, local roads and streets, and shallow excavations include sloped land greater than 8% for shallow excavations due to unstable excavation walls, drought-likely soils for lawns and landscaping such as Adams loamy sand, soils that experience frost action for roads (many soils series experience frost action), and soils with low

~~depths to saturated zones. there are no soils in the very high suitability class. There are some small areas in the high category, particularly between Route 109 and the Wire Road in the northwestern part of Wells and south of Branch Brook on either side of the Maine Turnpike. Most of Wells is rated as having medium suitability or very low suitability for low density residential development. The areas with medium rating tend to be non-hydric soils in the northern and central parts of the community. Low ratings occur in the areas between Routes 9 and 9A and the Ogunquit River due primarily to soils with shallow bedrock and areas with steep slopes.~~

B. WETLANDS

Wetlands are found throughout Wells. Wetlands have the ability to control erosion, store flood waters, recycle nutrients, filter pollutants, and recharge ground water. They provide open space and wildlife habitat. They are some of Maine's most productive areas, providing food and habitat for a wide variety of fish, animal and bird species.

Wetlands are defined by the Environmental Protection Agency (EPA), Army Corps of Engineers (COE), and the State of Maine as:

Those areas that are inundated or saturated by surface groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands usually include swamps, marshes, bogs, and similar areas. (EPA, 40CFR 230.3 and COE, 33 DFR 328.3)

Most wetlands can be identified by three characteristics—the presence of: 1) ~~hydrophitic~~hydrophytic plants, 2) hydric soils, and 3) ~~a very high water table for at least part of the year~~wetland hydrology (hydrologic characteristics of areas that are inundated or have soils saturated to the surface at some time during the growing season (U.S. Army Corps of Engineers, 2012). Hydric soils are defined by the NRCS National Technical Committee for Hydric Soils as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part.~~poorly and very poorly drained soils.~~ Wetlands also have water present at or near the surface for one week or more during the growing season. Wetlands perform valuable natural functions and should be considered a severe constraint to development.

TYPES OF WETLANDS

Note: The wetland types have been updated to reflect those identified in the Wells GIS map.

There are a number of types of wetlands in Wells. Although there are several wetland classification systems, the State of Maine has identified and mapped wetlands through the National Wetland Inventory, which includes the Town of Wells. Under this system the most common types of wetlands in Wells are:

<u>Wetland Type</u>	<u>Area (acres)</u>
<u>Estuarine and Marine Deepwater</u>	<u>9,884*</u>
<u>Estuarine and Marine Wetland</u>	<u>1,837</u>
<u>Freshwater Emergent Wetland</u>	<u>357</u>
<u>Freshwater Forested/Shrub Wetland</u>	<u>6,849</u>
<u>Total**</u>	<u>18,927</u>
<i>*Estuarine and marine deepwater wetland acreage includes ocean deepwater classified as wetland, which includes coastal ocean waters within the Wells town boundary that extends approximately three miles from the inland boundary.</i>	
<i>**This table does not include freshwater pond, riverine, or lake wetland types, which are included in the National Wetland Inventory but are discussed in the Surface Waters section of this appendix.</i>	

Palustrine-Freshwater Forested/Shrub Wetland

Freshwater Forested and Shrub Wetlands include palustrine forested and palustrine shrub wetlands, and can be characterized generally as woody wetlands, forested swamps, and shrub bogs. Comprising approximately 6,849 acres within Wells, tThis category is by far the largest in Wells, and is found throughout the town, and in large areas between the turnpike and south of Route 109 and north of Route 9B. More specifically, palustrine forested wetlands These are wooded swamps that generally occur along sluggish streams, on flat uplands, and in shallow lake basins or potholes. Tree species common in Maine’s wooded swamps include tamarack, arborvitae, black spruce, balsam fir, red maple, and black ash. The floor of coniferous swamps usually have a thick carpeting of mosses. Deciduous swamps often support duckweeds, smartweeds, and other herbaceous vegetation. These areas tend to be located south of Route 109 between the Maine Turnpike and the Sanford town line. The palustrine shrub wetland type is usually characterized by dense growth of alders, winterberry, highbush blueberry and species of viburnum. Shrub swamps occur primarily along sluggish streams, or as inclusions within forested wetlands. Alder and dogwood predominate in the drier areas; willow, buttonbush, and sweet gale characterize wetter sites.

Palustrine-Freshwater Emergent Wetland

Freshwater emergent wetlands are herbaceous marsh, fen, swale, or wet meadow wetlands, and include pPalustrine wetlands. There are approximately 357 acres of freshwater emergent wetlands in the Town of Wells. More specifically, palustrine emergent wetlands are non-tidal marshes characterized as non-woody plants that may be at least temporarily flooded at the base. Bulrushes and sedges are examples of this type of vegetation. Much smaller in area theyPalustrine emergent marshes tend to be adjacent to the palustrine forested wetlands.

Palustrine-Scrub Shrub

This wetland type is usually characterized by dense growth of alders, winterberry, highbush blueberry and species of viburnum. Shrub swamps occur primarily along sluggish streams, or as inclusions within forested wetlands. Alder and dogwood predominate in the drier areas; willow, buttonbush, and sweet gale characterize wetter sites. There is a large area in the He
Estuarine and Marine Wetland

Estuarine and Marine Wetland includes vegetated and non-vegetated brackish and saltwater marsh, shrubs, beach, bar, shoal, and flat wetland type. There are approximately 1,837 acres of estuarine and marine wetland within Wells, located east of Route One. This wetland type is dominated by salt marsh and is an extremely productive ecosystem. These marshes are generally flat with often intricate drainage channels and creeks, lined by small cliffs or ridges and dotted with pools and salt pannes. The marshes provide a high quality habitat for many species of birds including migratory raptors, shorebirds, wading birds, gulls, terns and ducks.

Estuarine and Marine Deepwater Wetlands

Estuarine and Marine Deepwater wetlands are open water estuary, bay, sound, or open ocean wetlands. Within the Town of Wells, there are approximately 9,884 acres of this wetland type. This includes ocean deepwater classified as wetland, which includes coastal ocean waters within the Wells town boundary that extends approximately three miles from the inland boundary. Eelgrass meadows form in marine and estuarine coastal aquatic areas and provide an important habitat for juvenile fish, invertebrates, and settlement of some shellfish larvae. Eelgrass is not currently mapped in Wells.

~~This wetland type is dominated by salt marsh and is an extremely productive ecosystem. These marshes are generally flat with often intricate drainage channels and creeks, lined by small cliffs or ridges and dotted with pools and salt pannes. The marshes provide a high quality habitat for many species of birds including migratory raptors, shorebirds, wading birds, gulls, terns and ducks. In Wells these wetlands are located east of Route 1.~~

WETLANDS OF SPECIAL SIGNIFICANCE

Note: We recommend including the following section on wetlands of special significance.

Wetlands of special significance include: any coastal wetland or wetland within 250 feet of a coastal wetland, a wetland within 250 feet of a great pond, a wetland with at least 20,000 square feet of aquatic marsh vegetation or open water, a wetland located within 100-year flood zone, or a wetland that contains significant wildlife habitat, any wetland part of peatlands not previously mined, and any wetland within 25 feet of a river, brook, or stream.

Within the Town of Wells, mapped wetlands with characteristics of Wetlands of Special Significance include:

- The town's extensive coastal wetlands, including the approximately 1,343 acres of estuarine and marine wetlands located within between the coast and Route 1.
- Approximately 3,193 acres of wetland within the 100-year flood zone, located primarily within the coastal wetlands east of Route 1 and within the large wetland complex between Route 9 and Bragdon Road, between Bald Hill Road and the Sandford town border, and in the wetland complex in the upper reaches of the Webhannet River. **Note: The area within the 100-year floodplain will be revisited in January 2022 when the new preliminary Flood Insurance Rate Maps for Wells are released.**
- Wetland areas within Wells that co-occur with mapped significant wildlife habitat including candidate deer wintering areas, inland waterfowl and wading bird habitat, shorebird

areas, tidal waterfowl and wading bird habitats, significant vernal pools, and other valuable wetland habitat for wildlife.

In Maine, wetlands and other natural resources are regulated under the Natural Resources Protection Act [38 MRSA, Sec. 480-A-S] and the State's Mandatory Shoreland Zoning Act). These Natural Resources Protection Act, which is administered by the Maine Department of Environmental Protection (MDEP), also regulates activities in or adjacent to surface water bodies, coastal sand dunes, significant wildlife habitat and fragile mountain areas. The level of regulation is based upon the amount of the resource area that may be impacted by any given activity—the more the impact, the higher level of regulatory review and scrutiny. At present, the Town has identified certain large wetland areas as part of its Resource Protection District and defined them in the Land Use Ordinance for purpose of regulation. A more thorough documentation of wetland location, type and value would provide the basis for a more systematic approach to wetland management and protection.

Note/Question for town: It appears that the Resources Protection District does take wetlands into account by looking at the zoning map, but there is no mention or confirmation of this in the Town Land Use Codes. Can the town confirm that this is true? Are wetlands factored into any other zoning ordinances?

THREATS TO WETLANDS

In addition to their value for flood storage, wildlife habitat and groundwater recharge, wetlands also filter pollutants and sediment from the environment. However, their filtering capacities can be exceeded. Pollution and sediments that discharge into productive wetlands or estuaries can have an adverse impact on habitat and shellfish beds. Since wetlands are often part of a larger ecosystem, if their functional values are impacted, the effect may be felt in other parts of the ecosystem. In Wells, coastal flooding, sea level rise, failing septic systems, storm water from impervious surfaces and non-point pollution from roads, parking lots, lawns, and fields pose the greatest threat to wetlands.

Note: We recommend including the following information on how wetlands will be affected by current and increasing coastal flooding and sea level rise.

Coastal Flooding and Sea Level Rise

Coastal flooding heavily impacts tidal wetland systems and freshwater wetlands. Estuarine wetlands, marine wetlands, and adjacent freshwater wetlands will be increasingly impacted by coastal flooding as there is increased daily tidal flooding of tidal marsh systems. Increased flooding may reduce Well's extensive coastal marsh system's flood storage capacity during storm events, which may be partially offset by inundation of freshwater wetlands.

Changes in daily tidal condition and seasonal high tides from sea level rise will also affect the stability of marsh systems and their ability to sustain surface elevations that keep pace with rising water levels. Marsh systems can either disappear under rising sea levels or migrate inland, or both. In developed areas where there is no space for natural habitat to retreat or migrate inland,

marshes may disappear. With the exception of the Rachel Carson National Wildlife Refuge Upper Wells Division, the coastal marsh system in Wells is in close proximity to development and built landscapes such as roads, buildings, and utilities that will prevent the marsh system from migrating inwards.

High water levels from sea level rise will drown salt marshes, convert salt marshes into mudflats, and convert mudflats into subtidal zones. Sedimentation from storms may affect habitat that lies behind beaches and smother shellfish beds. Saltwater intrusion may change freshwater wetlands to brackish wetlands, which may impact the surrounding habitat as well as the Webhannet River, Pope Creek, Depot Brook, and Blacksmith Brook that outlet into the estuary. Changes in salinity will affect coastal plants and animals. Furthermore, changing water levels may impact where fish and waterfowl breed. Along with sea level rise, groundwater levels will rise and cause freshwater inundation at topographic low points that are currently dry.

Furthermore, wetlands provide a wealth of habitat that may be compromised by coastal flooding. Habitat and species loss in wetlands and marsh systems due to coastal flooding will likely be greater in developed areas where there is no space for natural habitat to retreat or migrate inland. Hardened structures built to defend buildings will alter natural systems and prevent habitat and species from migrating inward, affecting near shore ecosystems. For example, dunes will disappear when they do not have a natural path to retreat, and rare species such as Piping Plover may be affected by habitat loss. Sea level rise will also alter the function of coastal habitats such as salt marshes and estuaries, habitat availability, and timing of nesting and migration for seabirds.

C. SIGNIFICANT WILDLIFE AND FISHERIES HABITAT

The availability of ~~high-quality~~high-quality habitat for fish and wildlife is essential to maintaining an abundant and diverse population for both ecological and sporting purposes. Wells has a number of areas that offer quality habitat for a variety of species. ~~The previous Master Plan identified four types of habitat area including riparian habitat, wetlands and waterfowl wintering habitat, deer wintering areas and nongame habitat. The plan also identified locations for each of these habitat types that are located in Appendix B.~~

The Maine Department of Inland Fisheries and Wildlife (IF&W) is responsible for assessing the value of, and monitoring, wildlife habitats in Wells. IF&W has identified areas of special concern because of their importance as wildlife and fish habitat and as recreational resources. The Maine DEP is responsible for regulating activity in or adjacent to areas that contain significant wildlife habitat.⁴

Beginning with Habitat (BwH), a collaborative program of federal, state, and local agencies and non-governmental organizations, is a habitat-based approach to conserving wildlife and plant habitat on a landscape scale. The goal of the program is to maintain sufficient habitat to support all native plant and animal species currently breeding in Maine.

SIGNIFICANT WILDLIFE HABITATS

The State of Maine has two programs for the direct protection of wildlife habitat—the Natural Resources Protection Act (38 MRSA, Sec. 480-A-S) and Maine Endangered Species Act (MESA, 12 MSRA, Sec. 7751-7758). ~~Wells does not have any upland areas characterized as “Essential” Wildlife Habitat under MESA. Such habitats are considered critical for the survival of Endangered and/or Threatened species. Wells has Essential Wildlife Habitat that are currently or historically providing habitat essential to the conservation of endangered or threatened species as directed by MESA. Mapped Essential Wildlife Habitat within Wells includes approximately 181 acres of Piping Plover habitat, located in the coastal areas of the town at the mouth of the Little River and Laudholm Beach, as well as at Ogunquit Beach and the mouth of the Ogunquit River.~~

~~However,~~ The Town of Wells also has~~does have~~ Significant Wildlife Habitats, as defined by the Natural Resource Protection Act, including:

- habitats for State or Federally listed Endangered and/or Threatened species;
- high and moderate value deer wintering areas and travel corridors;
- high and moderate value waterfowl and wading bird habitats, including nesting and feeding areas;
- shorebird nesting, feeding, and staging areas;
- significant vernal pools; and
- shellfish areas

These are further described below.

1. *Habitat for State or Federally Listed Endangered or Threatened Species*

~~This includes~~ are habitats for Endangered or Threatened Species, other than bald eagle, ~~nesting sites and~~ roseate tern, piping plover, and least tern nesting areas that are ~~single~~ out for separate protection identified as “Essential” Wildlife Habitat”, discussed above. Habitat for Endangered and Threatened Species within Wells ~~Such areas~~ include the coastal marsh system east of Route 1, areas where Stevens Brook, and Bragdon Brook enter the coastal marsh system in the southeast area of Wells, the area between Green Brook and the South Berwick town border in the southwest of Wells, Ogunquit River, Ogunquit Beach (Piping Plover and Least Tern), Laudholm Beach and the Little River Area in the northeast of Wells, (Piping Plover and Least Tern) and the Wells Beach/Drakes Island Beach Plover Nesting aArea.

2. *Deer Wintering Areas*

During the winter months deer herds tend to migrate to wintering yards that are typically composed of softwood forests. Deer Wintering Areas in Wells are located in the four following areas of Wells:

- northwest of Bald Hill at the Sanford town line;
- along the Webhannet River between the railroad and Route 9B west of the Turnpike;
- The Heath bounded by Bragdon Road, Swamp John Road, Route 9, and Route 109; and
- in the Coles Hill Road area parallel to the Turnpike.

- ~~Their locations and approximate sizes are shown in the attached map. IF&W has not rated the habitat value of these yards.~~

3. *Waterfowl and Wading Bird Habitat*

Waterfowl habitat includes areas used for breeding, migration, and wintering. Nesting habitat includes dense, emergent, herbaceous or shrubby cover for seclusion, concealment, and protection from predation. The Natural Resources Protection Act identifies both inland waterfowl and wading bird habitat and tidal waterfowl and wading bird habitat as Significant Wildlife Habitat. Inland waterfowl and wading bird habitat includes freshwater breeding, migration, feeding, and wintering waterfowl or wading bird habitat and documented habitat locations are mapped by the Department of Inland Fisheries and Wildlife. Mapped areas are present in Wells in the wetland area of West Brook between Quarry Road and Bragdon Road, off of Bragdon Road adjacent to Sherridge Lane, and in a wetland complex between Hiltons Lane and Green Road. There are approximately 360 acres of inland waterfowl and wading bird habitat within the Town of Wells.

Tidal waterfowl and wading bird habitat includes breeding, migrating/staging, or wintering areas for coastal waterfowl or breeding, feeding, loafing, migrating, or roosting areas for coastal wading birds, and documented habitat locations are mapped by the Department of Inland Fisheries and Wildlife. Tidal waterfowl and wading bird habitats include aquatic beds, eelgrass, emergent wetlands, mudflats, seaweed communities, and reefs. Within Wells, there are approximately 3,951 mapped acres of tidal waterfowl and wading bird habitat, located in the coastal marshes east of Route 1 and along the coastline. Wells has two wetland areas classified as “Significant” Waterfowl and Wading Bird Habitat both of which are located in the waters area of West Brook between the CMP right-of-way and Quarry Road. They are located primarily in palustrine scrub shrub and palustrine emergent wetlands as classified in the National Wetlands Inventory. IF&W has not rated the value of these habitats as moderate.

4. *Shorebird Nesting, Feeding and Staging Areas*

Shorebirds are a closely related group of species including sandpipers, plovers and dowitchers. Shorebird habitat includes coastal staging areas that provide feeding habitat like tidal mud flats or roosting habitat like gravel bars or sand spits for migrating shorebirds. Documented habitat locations are mapped by the Department of Inland Fisheries and Wildlife. In Wells, mapped Shorebird areas are located along the coastline, including at along Moody and Ogunquit Beach, Wells Beach, Wells Beach South near Fisherman’s Cove, Laudholm Beach, and the Webhannet River salt marsh pannes adjacent to Harbor Road. There are approximately 316 acres of identified shorebird areas within the Town of Wells.

5. *Significant Vernal Pools*

Vernal pools are characterized by a pool or depression used for breeding by amphibians and other indicator species and 250 feet of critical terrestrial terrain beyond the spring or fall high water mark. These vernal pools lack predatory fish and a permanently flowing inlet or outlet and are of natural origin. There are 21 mapped significant vernal pools within the Town of Wells, all of which are located inland of Route 1. The majority of the

mapped pools are located in the northern area of the town, in the general vicinity of Branch Brook, Hobbs Brook, and the upper Merriland River.

6. *Shellfish Areas*

Shellfish areas include softshell and hard clam resources and are presently mapped in Wells estuary where the Webhannet River, Pope Creek, Depot Brook, and Blacksmith Brook outlet into estuarine waters. Shellfish areas are also mapped on the coastline off of Moody Beach and Drakes Island Beach. Section 4, Marine Resources, provides additional information on shellfishing areas.

COASTAL WILDLIFE CONCENTRATION AREAS NATURAL RESOURCE CO-OCCURRENCE

Note: This inventory and ranking system is no longer used or available. We have updated it with natural resource co-occurrence data summaries which take into account rare and exemplary natural communities, rare plants, endangered species, significant wildlife habitat, riparian zone and water resources, and undeveloped habitat blocks.

The co-occurrence of natural resources represents the concentration of selected environmental asset data layers overlaid on the Town of Wells. The purpose is to highlight relative conservation values which can aid in planning efforts. Natural resource layers accounted for include rare and exemplary natural communities, rare plants, endangered species, significant wildlife habitat, riparian zone and water resources, and undeveloped habitat blocks. Areas within Wells that are valued highest in co-occurrence of natural resources, generally indicating high natural resource value, include (but isare not limited to):

- The coastal marsh system east of Route 1
- The outlet and associated marsh system of the Little River along the Wells town boundary with Kennebunk
- The Heath, located between Route 9, Route 109, and Bragdon Road,
- The Wells Barrens, located in the north of Wells adjacent to the Kennebunk Plains.

~~HF&W conducts periodic resource inventories for marine wildlife along Maine's shoreline. These areas offer an abundance of food and protection from weather and predator, often supporting a large number of marine birds and seals. While these areas are not "Significant Wildlife Habitats" per se, they may contain within their boundaries designated or candidate Essential Habitats and/or Significant Wildlife Habitats.~~

~~The abundance and diversity of species using these concentration areas is an indicator of an area's value to wildlife. Areas of significance are ranked into three classes: Class A (very high species abundance or diversity or importance to federal or state listed Endangered or Threatened species); Class B (high species abundance or diversity, species of regional significance); and Class C (moderate species abundance or diversity).~~

~~In Wells there are four Class A areas including Little River/Crescent Surf Beach, the Webhannet River, Ogunquit/Moody Beaches and the Ogunquit River. There are three Class B areas — Drake's Island Beach, Fisherman's Cove and Wells Beach. Bibb Rock is the only Class C area.~~

~~Other~~ **HABITAT BLOCKS AND EXEMPLARY NATURAL COMMUNITIES**

Note: We have updated this section to include habitat blocks and wildlife corridors, as is represented in state Beginning with Habitat data. We have removed the mapping results discussed here, as those are no longer available as state data.

Habitat Blocks

~~Within Wells, there are approximately 20,637 acres of undeveloped habitat spread over 60 blocks of land. Undeveloped habitat blocks are considered land outside of a 250-500 foot buffer around roads and developed areas. Undeveloped natural areas are likely to provide core habitat blocks that provide relatively undisturbed habitat conditions required by many of Maine's species.~~

~~The U.S. Fish and Wildlife Service has mapped "Important Fish and Wildlife Habitats in Southern Maine." Forty-three endangered species were included in the study. All are migrating birds or fish. The species included in the mapping have seriously reduced populations on a national, Gulf of Maine watershed, or State of Maine basis. Habitats mapped include areas that historically have been used by a species, as well as areas identified through a comprehensive screening process that have high habitat values for a given species.~~

~~Areas of Wells identified on a composite map of high value habitat for the 43 species include significant contiguous acreage and the Rachel Carson National Wildlife Refuge. The high value habitat areas are closely associated with wetlands in these areas.~~

~~Unique Natural Areas~~ Rare Plants and Exemplary Natural Communities

The Maine Natural Areas Program (MNAP), a program of the Maine Department of Conservation, maintains information on the status and location of rare plants and exemplary natural communities in Maine. Because of the rarity and sensitive nature of many of the plants and natural communities the MNAP keeps records on, information on the location of the resources is general in nature. MNAP encourages landowners considering development in areas identified as containing rare plants to check with MNAP for more specific site locations, or to conduct a field survey. In many instances, the plant or community will not be present where the development is contemplated, or the proposed development will not impact habitat and no change of plans will be necessary.

MNAP ranks the rarity of a plant or natural community on a scale of 1 to 5 (based on the frequency of sightings or occurrences), on both a state and global basis with 1 being the **most rare-rarest and consisted critically imperiled in Maine**. ~~Plants or communities that have obtained status as an endangered or threatened species at either the state or federal level are also noted.~~ Within t~~The Town of~~ Wells, rare plants ranked as 1 include the Beach Plum, Chestnut Oak, Dwarf Glasswort, Flowering Dogwood, Hair Boneset, Indian Grass, Northern Blazing Star, Pitch Pine, Sandplain Grassland, White-topped aster, and Wild Coffee. Plants or communities that have obtained status as an endangered or threatened species at either the state or federal level are also noted. Within Wells, this includes American Sea-bite, Beach plum, Blunt-loved grapefern, Chestnut Oak, Creeping Spike-moss, Flowering Dogwood, Hairy Boneset, Indian Grass, has a number of plants in these categories including the Pale Green Orchis, Sweet Peeper Bush, Small

~~Red Grass, Slender Blue Flag, Northern Blazing Star, Star, Slender Blue Flag, Spotted Wintergreen, Spreading Sedge, Summer Grape, Upright Bindweed, White-topped Aster, and Wildlife Coffee. Spicebush, Hollow Joe Pyeweed, Saltmarsh False Foxglove, and Dwarf Glasswort. See attached Inland Fisheries and Wildlife map.~~

~~Rare plants and exemplary natural communities are located throughout Wells, especially in the coastal marsh system east of Route 1, the Heath, and the Wells Barrens. All of the plants and natural communities identified above that have varying degrees of rarity in Maine are considered “demonstrably widespread, abundant, and secure globally.”~~

~~*Perkins Cove/Mousam River Heritage Coastal Area*~~

~~The Maine Coastal Program has identified locations along the coast of Maine that represent significant areas of coastal heritage. In Wells Perkins Cove/Mousam River area extends from Ogunquit River to the Little River. The 1991 Comprehensive Plan documents the scenic, historical and natural phenomena that constitute this heritage area that incorporates large areas of the Rachel Carson Wildlife Refuge and the Wells National Estuarine Research Reserve.~~

~~*Focus Areas of Statewide Ecological Significance*~~

~~Focus areas of statewide ecological significance have been designated based on exceptionally rich concentrations of rare species and natural communities and high quality common natural communities, significant wildlife habitats, and their intersection with large blocks of undeveloped habitat. These non-regulatory areas were identified by MNAP and the IF&W biologists and are intended to draw attention to these special places and for use as a planning tool for landowners, conservation entities, and towns. Focus areas, unlike some other habitat values, are tied to specific environmental settings and are not geographically transferable. They warrant place-specific conservation attention through a variety of methods ranging from conservation land acquisition to focused implementation of best management practices. There are three Focus Areas in Wells:~~

- ~~• The Wells and Ogunquit Marsh system is the second largest salt marsh complex in Maine, and includes large areas of undisturbed habitat that supports rare and exemplary natural communities. In addition, it is home to several rare, threatened, and endangered species.~~
- ~~• The Kennebunk Plains and Wells Barrens in northwestern Wells is a unique barrens complex that was formed by the melting glaciers about 14,000 years ago. This area supports high-quality examples of natural communities including sandplain grassland, pitch pine-scrub oak barrens, pitch pine-heath barrens, and red maple alluvial swamp forests.~~
- ~~• Mount Agamenticus in southern Wells is one of the largest remaining expanses of undeveloped forests in coastal New England. The uplands and wetlands around Mt. Agamenticus are home to 12 animal species and 21 plant species considered rare in Maine.~~

D. SCENIC AND COASTAL AREAS

Note: These sections will be updated during the Existing Conditions Review of the Marine Resources section and the Land Use section. At that time, we may recommend a reorganization of those sections to include any additional information in the critical natural resources report.

Scenic and Coastal Areas are described in two other places in the Inventory:

- Section 4, Marine Resources
- Section 8, Land Use

E. FLOOD HAZARDS

Flooding is the most significant natural hazard facing Wells. The Town's dense development along its thin barrier islands, low-lying coastal areas, and extensive tidal wetlands and tidal rivers make it especially vulnerable to flooding. Coastal flooding threatens public health and safety, putting transportation corridors, evacuation routes and provision of emergency services at risk; disrupts economic activity through lost business and reductions in tourism; reduces property values; and imperils municipal revenue and budgets.

Floodplains are defined as any land area susceptible to being inundated by floodwaters from any source. They are usually the low-lying, mostly flat areas adjacent to rivers, streams, ponds, and the ocean that are periodically covered by rising water or waves during periods of rain, high winds, storm surge, or snowmelt. Coastal flooding is generally attributed to high wind and wave action caused by storm activity. Coastal flooding is also impacted by episodic and long-term increases in relative sea level. In the last decade, high tide flooding, or nuisance flooding, in southern Maine occurred 4 times more frequently than the 100-year average as a result of higher sea level. The Federal Emergency Management Agency (FEMA) has produced a maps, called Flood Insurance Rate Map (FIRM), of the 100-year floodplains in Wells. Shown on the maps is the area that has a 1% chance of being flooded during any year. Also plotted are the 500-year, or 2% annual chance, floodplains and "V" or velocity zones that are subject to ocean flooding inundation by the 1%-annual-chance flood event with additional hazards due to storm-induced velocity wave action.

***State Consistency Element: Ensure that the plan (perhaps the land use chapter) includes a brief description of the floodplain management ordinance and other existing land use regulations utilized to manage land use in the floodplain**

Improper use, filling, and development within the floodplains creates the potential for property damage, increased flooding, and downstream contamination. Although Wells's proximity to the ocean reduces downstream impacts from flooding, The floodplains should be considered a severe constraint to development. The likelihood of severe property damage is high in floodplains of rivers and ponds with large drainage areas as well as along coastal areas exposed to storm surge, waves, and increases in sea level.

Following is a brief description of the location and size of the floodplains or flood hazard areas in Wells as delineated on the FEMA floodplains maps FIRM. The FEMA maps shows the boundaries of those flood hazard areas that have been identified by detailed study and/or field observation. FIRM flood hazard areas are based on historical precipitation and flooding data and do not account for future climate change impacts, such as increased precipitation and sea level rise.

***Note: Wells is expected to receive a new preliminary Flood Insurance Rate Map (FIRM) from FEMA in early 2022. The information below will be updated accordingly when the new FIRM is issued.**

Most of the Town's 100-year floodplain is east of Route 1 associated with the harbor and ~~low-lying~~ inglow-lying marsh areas. In addition, there are areas associated with various rivers and streams that discharge into the Atlantic such as the Webhannet and Merriland. There are also two low lying upland areas—the Heath and the headwaters of West Brook near Sanford. There is a narrow Zone V along the Atlantic beach areas.

~~Also of note is that the~~ The Town of Wells ~~has also~~ adopted a Flood Hazard Mitigation Plan as part of its 2005 Comprehensive Plan. In recent years, the Town has also been involved with several projects and planning efforts aimed at improving understanding of coastal flood hazards, assessing local impacts of coastal flooding, evaluating vulnerability to sea level rise and storm surge, and planning for flood mitigation and resilience. ~~that should become an integral part of this Comprehensive Plan Update. In addition, the Town will be voting in 2004 on adoption of the York County Hazard Mitigation Plan, an all-hazards regional plan. Recommendations of this plan should be considered in the Wells Comprehensive Plan Update as well.~~

Future sea level rise and more intense and frequent precipitation events driven by climate change will increase the severity of local flood hazards. In Maine, sea level has been rising in the long-term, but since the early 1990s, the rate of rise has accelerated. In the future, the rate of rise is expected to continue increasing. According to an assessment conducted in 2020 as part of the Maine Climate Council process, there is a 67% probability that sea level will rise between 1.1 and 1.8 feet by 2050 and 3.0 and 4.6 feet by the year 2100 under intermediate global greenhouse gas emissions scenarios, with higher sea level rise amounts possible. With that rate of sea level rise, not accounting for increased intensity and frequency of storms, southern Maine would see a 15-fold increase in coastal flooding by 2050. Those scenarios do not account for more intense rainfall that climate change is bringing to the region. Based on those projections, the 4-year state climate action plan *Maine Won't Wait* recommends that the state commit to manage for 1.5 feet of relative sea level rise by 2050, and 3.9 feet of sea level rise by the year 2100, but prepare to manage for 3.0 feet by 2050, and 8.8 feet by 2100, all in relation to 2000 local sea level.

Rising seas and storms are expected to cause substantial damage and costly losses. In Wells, future sea level rise will cause high tides to regularly inundate low-lying coastal areas, contamination of groundwater aquifers and wells from saltwater intrusion, and increased erosion of the region's sandy beaches, dunes, and salt marshes. Areas and neighborhoods along the coast of Wells, including Wells Beach, Moody Beach, Drakes Island, and Wells Harbor, are projected to experience the greatest damages from future tidal and surge flooding due to sea level rise. Inland areas, such as the Little River, may see increased flooding from more frequent extreme precipitation events and greater tidal and surge inundation. A coastal flooding vulnerability assessment completed for the Town in 2021 estimated that Wells has 2,077 parcels with a 2019 assessed value of over \$433 million at-risk from 1.6 feet of sea level rise or storm surge. That study also estimated that 2,611 and 2,789 parcels having an assessed value of almost \$755 million and over

\$1.08 billion are at risk of 3.9 feet and 6.1 feet of sea level rise, respectively. The Town's roadways and municipal infrastructure along the barrier beach and low-lying coastal areas are also vulnerable to rising seas and storm surge.

Amplifying climate impacts, changes in Wells' landscape may increase flood risks. Expansion of impervious surfaces resulting from future development will exacerbate flooding by decreasing the infiltration capacity of the land and increasing stormwater volumes. Further, the submersion of beaches and marshes due to sea level rise represents an elimination of natural defensive barriers, which makes coastal habitat and human settlement even more vulnerable to storm surges.

Integrating flood risk, climate change considerations, and coastal flood resilience strategies into municipal infrastructure planning, policies, and expenditures will help to protect physical infrastructure and investments. Future development should be guided away from flood-prone areas and redevelopment should incorporate flood risk reduction measures to protect people and property.

Analysis

Wells is blessed with an abundance of natural resources of high value. To maintain the ecological integrity of such resources and to ensure the health and safety of Wells residents, these resources need to be managed in a manner that maintains or enhances their natural value. The following observations need to be considered for recommendations and strategies to achieve the Town's goals for natural resources.

1. Much of the coastal area and low-lying uplands are susceptible to flooding. Although most of these areas are in the Resource Protection Zone, the Town should continually reexamine its need to take urgent climate resiliency measures, such as the use of living shorelines to protect beaches, marshes, and coastal development from erosion and flooding, land conservation adjacent to marshes, residential development buyback programs, and strengthening of the town's Floodplain Ordinance to strengthen the resiliency of vulnerable areas and buildings.

~~1.2. Wells is a growing coastal community with poorly drained topography. As a result of this conflicting situation, there has been substantial development in the Town's wetlands, some of which has occurred on large wetlands. The town should continually revisit their Resource Protection Zone and Shoreland Overlay Zones to ensure the appropriate protection of the town's wetland resources. Wetland restoration efforts should be prioritized and undertaken where the opportunity arises. Although the Town has a Natural Resource Protection Zone additional regulation should be considered in order to provide appropriate protection of these resources. Much of the coastal area and low-lying uplands are susceptible to flooding. Although these areas are in the Resource Protection Zone, the Town needs to reexamine the recommendations of the Flood Hazard Plan as part of the Comprehensive Plan Update.~~

3. Wells has an abundance of wildlife and fishery resources in the tidal marshes, beaches/dunes and harbor area. Much of this area is protected through state and federal ownership and management. In addition, there are several significant wildlife habitats in the upland area of the community associated with large wetland areas, ~~or~~ valuable forest stands, —waterfowl habitat and deer wintering yards. The Wells Ogunquit Marsh system, Kennebunk Plains and Wells Barrens, and Mount Agamenticus area extending into southern Wells have been identified as Focus Areas of Statewide ecological Significance through by MNAP and IF&W. These focus areas should continue to be protected. In addition, hHaving contiguous parcels of undeveloped land is critical for maintaining Wells' biological diversity. Some of these areas are zoned resource protection and covered by Shoreland Zoning, but beyond these protections, undeveloped habitat block protection should be a priority for land conservation efforts.
- 2.4. The Town should protect the ~~long-term~~long-term viability of other resources that are not currently protected from indirect and direct impacts of climate change human impacts.
- 3.5. The Town contains a number of rare plant and exemplary natural communities. ~~These are in a number of locations~~ throughout the community. The Town should protect these resources.
- 4.6. Data from the ~~York County~~Natural Resources Conservation Service Soil Survey show that Wells has many areas that are not necessarily suitable for development. There are several large, contiguous areas with limiting factors and there are no high suitability locations within the town. However, the county's data may miss some smaller suitable areas for development and are not detailed enough to be used for site planning purposes.