

Water and Natural Resources

State Goal:

Water Resources: To protect the quality and manage the quantity of the State's water resources, including lakes, aquifers, great ponds, estuaries, rivers, and coastal areas

Natural Resources: To 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.

Introduction:

This chapter provides a comprehensive inventory of Windham's natural and water resources. Understanding these systems and assets is essential to encouraging both environmentally and economically sustainable land use decisions that insure the enjoyment and protection of these resources for future generations.

Watersheds

A watershed is defined generally as an area that drains into a waterway, such as a stream, river, surface water body or aquifer, and is delineated by both natural and man-made features. Watersheds are interconnected such that action taken in one part of a system can affect water quality further downstream in that system.

All of Windham lies within the Casco Bay Watershed, which includes 945 miles and about a quarter of a million people. The town is also comprised of many smaller sub-watersheds associated with its lakes, ponds, wetlands, streams, and rivers. Some of these are located wholly within municipal boundaries and some are shared with neighboring communities. Windham also lies partially within the Sebago lake watershed, comprised of approximately 300,000 acres (450 square miles) across 23 towns. Sebago Lake is the public water supply for 11 towns within the Greater Portland area including Windham. [A map displaying Windham's watersheds and wetland systems is located below.](#)

Many watersheds extend beyond municipal boundaries, so managing water quality efforts on a watershed model often requires regional cooperation to be truly effective. Windham values the quality of life its natural and water resources provide to its residents and visitors and appreciates the responsibility of all towns in the region to protect the water quality of watershed resources. Over the years Windham has actively participated in several regional planning efforts involving neighboring communities and regional entities related to these critical resources. Most recently these efforts have involved cooperation with the Town of Gray for work within the Pleasant River watershed (2012-2013) and the Little Sebago Lake watershed (2014). These cooperative efforts have been initiated and managed by the Cumberland County Soil & Water Conservation District (CCSWCD).

Topography & Steep Slopes

The topography of a place directly shapes its watersheds and Windham's elevation changes tend to lead water from a northeast to southwest direction, draining towards the Presumpscot River.

The lowest land elevations, below 100 feet are found along the Presumpscot near the southern end of town. The highest elevations, measuring between 500-600 feet are located on Mount Hunger, west of Little Sebago Lake and Atherton Hill, southwest of Forest Lake. Between Mount Hunger and Atherton Hill lies the Pleasant River watershed, which includes the wide drainage area of Little Sebago Lake, Mill Pond, Collins Pond and Ditch Brook, as well as the Pleasant River itself towards the confluence of the Presumpscot.

Very steep slopes are not generally an issue in Windham, with only a few areas where the slope exceeds 15%. However, more moderate slopes between 8% and 15% can also be an issue by creating sediment and nutrient runoff which can threaten water quality in lakes and rivers.

[Insert chart showing relative steepness of these slope classes]

Areas of steep slopes measuring 15-25% are located along the western and southeastern shore of Little Sebago lake, and along the southern shore of Forest lake. Areas of more moderate slope measuring between 8- 15% are found in several areas throughout Windham, although commonly adjacent to water bodies. Fortunately, there are only a few areas where slopes exceed 25% and few are located near water bodies. However, of most concern is an area located to the east of Sebago Lake.

In Windham, runoff generated from dense development around the lakes is more of a threat to water quality than runoff resulting from slope. These once seasonal, now year round homes rely on individual septic systems (many are aging), and have limited access along old gravel roads originally constructed to support seasonal camps.

Surface Water

Lakes and Ponds

There are six waterbodies classified by the state as "great ponds." This classification means that the lake or pond is a public resource, owned by the people of Maine. By size, these waterbodies are:

- Sebago Lake – approximately 30,000 acres. Shared frontage with Standish, Sebago, Naples, Casco, Raymond and Frye Island.
- Little Sebago Lake – 2009 acres. Shared with Gray.
- Highland Lake – 640 acres. Shared frontage with Falmouth and Westbrook.
- Forest Lake – 198 acres. Shared frontage with Cumberland and Gray.
- Collins Pond – 42 acres
- Little Duck Pond – 43 acres
- Pettingill Pond – 42 acres

Sebago Lake

As discussed above, although each town must implement and maintain standards on an individual level, coordinating these policies on a regional level is essential in order to insure they are effective. The success of the Sebago Lake Watershed highlights the importance of coordinated regional policies and planning among many communities and organizations.

In 1913, the Maine Legislature recognized Sebago Lake as the water supply for 11 towns within Greater Portland including Windham. To date, the water quality is still considered excellent and requires very little treatment for use as a public water supply. The Portland Water District (PWD) maintains an intake in the Lower Bay, upstream from Windham's lake frontage. PWD maintains a 3000ft. "no trespassing zone", and a two mile no contact zone, as well as almost 2500 acres of conservation land adjacent to the intake in the lower bay area.

Of the 23 towns in the Sebago Lake Watershed, only Standish, Sebago, Naples, Casco, Raymond, Frye Island, and Windham have frontage along the Lake, and therefore development in these communities has the potential to directly impact Sebago's water quality. Windham maintains 1900 acres of land in the Sebago Lake Watershed. Only the very northern part of North Windham is within the lake's watershed. The small watersheds of Hyde Brook, Outlet Brook flowing out of Chaffin Pond and two other unnamed tributaries drain into the Lake..

Smaller Lakes

Highland Lake, Forest Lake and Little Sebago lakes are considered Great Ponds (larger than 10 acres) and are shared with several towns. All three lakes are the focus of regional watershed planning efforts managed by Cumberland County Soil and Water District (CCSWCD). The purpose of these projects is to significantly reduce soil erosion and polluted runoff sources, foster long-term stewardship, and ultimately improve water quality. As part of these efforts, CCSWD offers free technical assistance to landowners, towns and private road associations in order to address erosion problems.

Highland Lake is a 623-acre lake located in the municipalities of Falmouth, Windham, and Westbrook. The watershed area is 8.5 square miles with a maximum depth is approximately 67 feet. It has undergone periodic water quality monitoring since the mid-1970s, conducted by volunteers at the Highland Lake Association (HLA), and with assistance from CCSWCD. In 1999, these groups conducted the Highland Lake Watershed Survey and Implementation Plan. The plan identified that oxygen levels in the lake had been declining since 1978 due to increases in algae, phosphorous, and sedimentation associated with increased sprawling development and individual septic systems. Although no issues were identified with 98% of the systems surveyed, the report indicated that the reliance on individual septic systems was not sustainable and would eventually become a major threat to water quality. 30% of the septic systems surveyed were approaching the end of their lifespan. Following this effort, a watershed management plan was developed for the Lake outlining specific goals and implementation strategies focused on reducing existing and potential non-point sources of pollution over a 10-15 year period.

Rivers and Streams

The Presumpscot River runs almost 26 miles from Sebago Lake Basin to Casco Bay. Six communities have frontage on this river. The river has had several dams over the years in different areas along the Windham/Gorham line for power generation resulting in the creation of several newer water bodies including Sebago Lake Basin, North Gorham Pond, and Dundee Pond. In 2003, the Casco Bay Estuary Partnership (CBEP) assembled a broad group of stakeholders including all five municipalities and facilitated the development of a plan for the Presumpscot River. Several businesses, including SAPP Fine Paper (formerly S. D. Warren Company), located in Westbrook and owner of seven of the dams on the river, participated on the steering committee for the Plan.

The Pleasant River, which includes Ditch Brook, an outlet from Little Sebago Lake, is the town's largest sub-watershed area. However, much of the contributing flow into Pleasant River comes from neighboring Gray. Unfortunately, the Pleasant River does not currently meet the Maine DEP's criteria for a Class B river as it is considered to be impaired due to high bacteria counts, and low levels of dissolved oxygen. In response to this issue, MaineDEP has required the creation of a watershed-based management plan outlining the steps needed for the Pleasant River to improve its water quality to acceptable levels. The EPA also requires such a plan prior to releasing any federal funds for clean-up. In the spring and summer of 2008, a watershed survey that focused on polluted runoff was conducted throughout the Pleasant River Watershed. Results from the 2008 Watershed Survey identified 95 non-point sources (NPS) of pollution. Most of the sites documented were associated with town roads (35%), private roads (15%) and residential areas (13%). Other NPS sites documented included state roads, agriculture sites, businesses/commercial properties, trails/paths or boat access, and construction sites. In 2011, the [Pleasant River Watershed Management Plan](#) (fix link) was developed through a grant from the Casco Bay Estuary Partnership (CBEP). The report identifies polluted runoff as the greatest potential threat to water quality in the Pleasant River.

Groundwater/ Aquifer Resources

Groundwater is water found below ground in soil and rock formations. Groundwater occurring in sufficient quantities to supply a well is called an aquifer. The state has mapped "high yield aquifers" that are significant because of the amount of water they contain and the amount of water that can be extracted from these formations. The highest concentration of high yield aquifers is located around Little Sebago Lake, extending toward Sebago Lake and the Presumpscot River. This area is the largest mapped high yield aquifer in southern Maine. Other smaller areas have been identified around Windham Center, River Road, and Forest Lake. Only the aquifer adjacent to Little Sebago Lake has the capacity to yield more than 50 gallons per minute.

Water Quality and Protection

Point Source Pollutants

Point source pollutants can be traced to one location, or point, such as a factory or treatment plant. The Windham School Wastewater Treatment Facility currently has a permit for a point-source discharge on the main stem of the Pleasant River about a half mile downstream from the Windham Center Road crossing. Since 2000, this treatment facility has experienced sporadic non-compliance of Total Suspended Solids (TSS) and Biological Oxygen Demand (BOD). MEDEP is currently working with the treatment facility to develop solutions to reduce the number of non-compliance violations. The Town of Windham has also considered a wastewater sewer system for the North Windham business district to which this School Treatment Facility could connect.

Non-point sources

Unlike pollution from industrial and sewage treatment plants, nonpoint pollution sources do not originate from a centralized source. Rainfall or snowmelt travels over and through the ground, bringing with it natural and human-made pollutants, with the potential of depositing them into lakes, rivers, wetlands, streams and other waterbodies. In Windham, a large amount of this pollution comes from stormwater runoff associated with the improper construction and maintenance of old gravel camp roads. Proper maintenance of these roads helps prevent this form of pollution. Phosphorous is the prime nutrient carried by these eroded sediments.

In Windham, runoff generated from densely settled seasonal housing around the lake is recognized as a potential threat to water quality. These once seasonal, now year round homes rely on individual septic systems (many are aging), and have limited access along old gravel roads originally constructed to support seasonal camps.

Windham relies on septic systems to provide treatment for its residential and commercial wastewater. If properly designed and maintained these systems can provide an effective long term treatment of nitrates, phosphorus, and pathogens for in wastewater. Unfortunately, these systems can suffer from a lack of maintenance that results in failure and ultimately threatens water resources. In response to this risk, the Town contracted with Woodard & Curran in March 2010 to provide an update to its 2003 Wastewater Facilities Plan. The study recommended collecting and transporting wastewater generated in North Windham and treating and disposing it at the Westbrook-Gorham Regional Water Pollution Control Facility (WGRWPCF) owned and operated by the Portland Water District. This treatment concept was endorsed by the Windham Town Council in a 7-0 vote in spring 2010. At the direction of the Council, the consultant developed a design of the collection and transport system, budget for increasing capacity of the facility, and identified options for upgrades to the WGRWPCF to treat the roughly 700,000 gallons per day of wastewater from the first phase of the project. The Phase 1 Capital Cost Estimate for this project was estimated at \$67.8M with an annual additional operation and maintenance budget at \$460,000. On September 14, 2010 the Town Council voted unanimously to approve this Plan, but the project was overwhelmingly voted down by residents, 6,513 to 2,036, in 2012.

Comment [BS1]: Are these dates from 2010 correct? I am sure the vote was in 2012...

The issues that prompted the renewed look at how to treat wastewater in North Windham – environmental concerns, economic development and community development goals – did not go away after the vote.

Wildlife and Plant Habitats

The type, location and scale of development can have a significant effect on wildlife habitat. Larger natural areas or corridors are often broken up as a result of development patterns. Documenting and protecting these natural resources is essential to maintaining their abundance and diversity, and to insuring natural places play an important role in our communities.

Maine Department of Inland Fisheries and Wildlife (IF&W) has identified various habitats in Windham as *Threatened, Endangered, or Species of Special Concern*. Brook Floater, a freshwater mussel has been identified as a threatened species throughout Windham. New England Cottontail, and the Great Blue Heron were also identified as a species of special concern. In the northern segment of Windham, several plant habitats have been identified as *Natural Communities* including Pine Pitch Bog, Red Maple Swamp. A summary of each data set is outlined below along with a map of the habitat for these species provided by IF&W.

Large undeveloped habitat blocks

Contiguous unbroken habitat blocks are essential to fostering healthy wildlife habitats. Wildlife requires blocks ranging from 50 acres (for some grassland birds) up to 5000 acres (black Bears), depending on the species. Windham currently contains many such habitat blocks, although they appear evening dispersed between development areas. Maintaining this network of habitat blocks should be an important consideration in managing the town's land uses and future development.

Deer Wintering Areas

Deer wintering areas have been identified west of Lake Suzanne, along the northern portion of Route 115 east of Hunger Bay. Areas have also been identified east of Ditch Brook, southeast of the North Windham commercial area, and northeast of Little Duck Pond, west of Forest Lake and the Gray/Cumberland boarder.

Waterfowl and Wading Birds

Several areas of waterfowl and wading bird habitats have been identified around the Highland Lake area of Windham, as well as the northwest tip of Windham between the Sebago and Little Sebago Lakes.

Wetlands

Wetlands include swamps, marshes, bogs and other similar areas and support a variety of species such as frogs, salamanders, turtles, fish, insects, birds, deer and moose for food, shelter and/or breeding habitat. They are not only critical to supporting many species of plants, animals and insects but they also reduce the impacts or risk of flooding, slowing down and absorbing water heading inland to our communities.

The Maine Department of Environmental Protection, through its authority under the national Resources Protection Act (Title 38, Section 480-A), regulates activities in "wetlands of significance." The rules

govern activities in or adjacent to coastal wetlands, freshwater wetlands (including wetlands associated with great ponds or wetlands that are in the floodplain of any river, stream, or brook). Wetlands are located throughout Windham with the most concentration existing along the far northern area bordering Gray and Raymond, and on the southern tip of Highland lake. **A map showing the type and location of wetlands using data provided by Beginning with Habitat is located below.**

Vernal Pools are a specific type of smaller wetland that usually only stays wet for part of the year, typically drying out in the summer months. Vernal Pools provide habitat for many species on a seasonal basis, usually filling with water from melting snow and rain in the springtime. Although they most likely exist in Windham, they have yet to be mapped comprehensively.

Scenic Resources

As noted in the Values and Vision Statement in this Plan, Windham is a beautiful place. There are many special views from public roads and places that epitomize the rural character that long-time residents love and attract new residents, too. Specific examples, like the Covered Bridge, and more general areas like the open fields on Route 202 between the rotary and Gray have been called out in past comprehensive plans. No work has been done yet to identify or prioritize specific properties that have the most value and meaning to the public, though. Such a task would provide important guidance to the Windham Land Trust and the Town Council when setting conservation priorities in the future.

Regulatory Protection

Windham's regulatory framework is strong and supports its commitment to the protection of its natural and water resources. The Town of Windham had adopted Shoreland Zoning protection that has been deemed consistent with state's mandatory shoreland requirements. The town also has adopted a Surface Water Protection Ordinance, Chapter 142 of its Land Use Ordinance. Originally adopted in 2002, this ordinance expands erosion and sedimentation control measures to encompass all of the Town's watersheds. Additionally, both Windham's subdivision and site plan review standards require an erosion control plan that adheres to the requirements outlines in these guideline.

The Town of Windham has adopted a floodplain ordinance consistent with the Federal Emergency Management Agency (FEMA) flood management codes used to assess and manage floodplains, and requires a permit for any development proposed in these areas. FEMA maintains detailed maps of all 100-year flood plains throughout the country (a 100-year floodplain is a designated area that has a one percent chance of being flooded in any given year). In 2004, FEMA began a project to update the floodplain maps for Cumberland County. To date, the final maps have not been introduced, though they are expected to be adopted in the coming year.

Much of the Town is within the urbanized area defined by the EPA for compliance with Municipal Storm Sewer System (MS4) regulations. This program makes certain that the Town's operations meet federal standards for the quality of the water that runs off Town property and requires new private

development of over an acre in size to inspect and report on the maintenance status of all stormwater infrastructure on an annual basis. These reports must detail the condition of ditches, storm drains, detention ponds, stormwater filters and any other ways to handle water that runs off the site. These inspections are meant to ensure that projects in Windham are not just built properly, but function as they were designed over time. Compliance with stormwater requirements is being lead by the Public Works Director, and many departments are involved.

In addition to regulatory protections, the Public Works staff attends regular state trainings related to best practices in road construction and maintenance activities.

Policies and Strategies:

Policy 1: To protect current and potential drinking water sources

Policy 2: To protect significant surface water resources from pollution and improve water quality where needed.

Policy 3: To protect water resources in growth areas while promoting more intensive development in those areas.

Policy 4: To minimize pollution discharges through the upgrade of existing public sewer systems and wastewater treatment facilities.

Policy 5: To cooperate with neighboring communities and regional/local advocacy groups to protect water resources.

Policy 6: To conserve critical natural resources in the community.

Policy 7: To coordinate with neighboring communities and regional and state resource agencies to protect shared critical natural resources.

Strategy 1.1: Adopt or amend local land use ordinances as applicable to incorporate stormwater runoff performance standards consistent with:

- a) Maine Stormwater Management Law and Maine Stormwater Regulations (Title 38 MSRA 420-D and 06-096 CMR 500 and 502).*
- b) MaineDEP allocations for allowable levels of phosphorous in Lake/Pond watersheds.*
- c) Maine Pollution Discharge Elimination System Stormwater Program*

Strategy 1.2: Consider amending local land use ordinances, as applicable, to incorporate low impact development standards.

Strategy 1.3: Where applicable, develop an urban impaired stream watershed management or mitigation plan that will promote continued development or redevelopment without further stream degradation.

Strategy 1.4 : Maintain, enact or amend public wellhead and aquifer recharge area protection mechanisms, as necessary.

Strategy 1.4 : 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.

Strategy X.X: Adopt water quality protection practices and standards for construction and maintenance of public and private roads and public properties and require their implementation by contractors, owners, and community officials and employees.

Strategy xx: Participate in local and regional efforts to monitor, protect and, where warranted, improve water quality.

Strategy Xx: Provide educational materials at appropriate locations regarding aquatic invasive species.

Strategy xx: Ensure that land use ordinances are consistent with applicable state law regarding critical natural resources.

Strategy xx: Designate critical natural resources as Critical Resource Areas in the Future Land Use Plan.

Strategy xx: 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.

Strategy xx: Through local land use ordinances, require the planning board (or other designated review authority) to include as part of the review process, consideration of pertinent BwH maps and information regarding critical natural resources.

Strategy xx: Initiate and/or participate in interlocal and/or regional planning, management, and/or regulatory efforts around shared critical and important natural resources.

Strategy xx: Pursue public/private partnerships to protect critical and important natural resources such as through purchase of land or easements from willing sellers.

Strategy xx: 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.

