

**YORK WATER DISTRICT
WATERSHED MANAGEMENT PLAN 2024
EXECUTIVE SUMMARY**

CHAPTER 1 GOALS AND OBJECTIVES

This watershed management plan articulates the goals and objectives of the district as they relate to the watershed, describes the context within which management will occur, and prescribes management activities related to the water and forest resources that will achieve those goals and objectives. The primary goal of the York Water District is to provide abundant, affordable, high-quality water from Chase's Pond, the impoundment that is the source of the district's water, to its customers. To accomplish this goal, the district owns and manages 1812 acres of forestland, 1648 acres of which are in the Chase's Pond watershed, accounting for nearly 92 percent of that watershed.

The goals and objectives are as follows:

1. ***Provide abundant, affordable, high-quality water to the district's customers.*** This will be accomplished by maintaining high-quality water in Chase's and Welch's Ponds, controlling invasive aquatic plant species and problematic populations of geese and beaver, mitigating human impacts, and acquiring additional land within the watershed.
2. ***Maintain a healthy forest ecosystem to complement water quality goals and objectives through sustainable forest management, with attention to forest health, biodiversity, and wildlife.*** Objectives include sustainably harvesting timber, maintaining certification as a Tree Farm, and maintaining diversity of forest types, tree and shrub species, and structural diversity of wildlife habitats. Additional objectives include protecting and managing habitats of rare, threatened, and endangered species, mitigating the presence of invasive plant species, and managing natural hazard risks.
3. ***Conserve and protect lands which are either sensitive to disturbance, subject to legal requirements, or are not common in Maine.*** Objectives include Identifying and delineating areas for unmanaged status, protecting water bodies, wetlands, and soils in accord with legal requirements and Best Management Practices, and identifying, protecting, and managing exemplary and uncommon natural communities.
4. ***Manage public use of the district's lands to protect water quality and the health of the forest ecosystem.*** The associated objectives are to manage recreation opportunities consistent with water quality and other natural resources goals, educate users and the public about the district and its management activities, and allow safe hunting opportunities.
5. ***Mitigate impacts of climate change on the district's forests and sequester and store carbon via natural climate solutions.*** Management objectives include mitigating impacts of climate change on forest composition and providing access to district's land for controlling natural hazard risks exacerbated by climate change. Additionally, the district will contribute to climate change mitigation by sequestering and storing carbon on the district's land and in long-lived wood products.

6. *Collaborate with local, regional, and state agencies and organizations and provide community education in accord with water quality and natural resources goals and objectives.* Associated objectives include collaborations with the Town of York, Kittery Water District, various regional conservation organizations and state agencies, and local schools.

CHAPTER 2 RESOURCE ASSESSMENT & MANAGEMENT CONTEXT

The York Water District's watershed management plan depends on natural resource conditions and the social and legal framework that governs the district's actions.

The district's lands are accessible from paved public roads and are internally accessible via a network of gated management roads as well as management trails. External property lines are generally well-marked and are shared mostly with landowners having goals and objectives similar to those of the district.

The topography of the watershed is highly variable. The maximum elevation is approximately 690 feet above sea level, near the peak of Mount Agamenticus. The minimum elevation is approximately 165 feet above sea level, near the outlet dam on Chase's Pond Road. Much of the property features rolling terrain. There are extensive areas with steep to very steep slopes encompassing nearly all of Mount Agamenticus, ravines between Welch's Pond and Mountain Road, and much of the northernly shore of Chase's Pond. Steep slopes limit harvesting as well as protective management actions. There are also several large flat areas and many small wetlands.

The dominant soil types on the York Water District's property are in the Lyman series, accounting for about 93 percent of all soil types. Such soils will support commercial forest stands. Peats and silt loams account for the rest of the soil types and are associated with wetlands.

The primary hydrologic features of the district's ownership are Chase's Pond (171 acres), Welch's Pond (11 acres), small wetlands, and perennial streams. Secondary features are intermittent streams and vernal pools. The Chase's Pond reservoir is 41 feet deep at its deepest point and holds about 1.1 billion gallons of water.

Water quality in Chase's Pond is monitored regularly at multiple sampling points. In general, the water quality in the pond is good to very good, but not good as it had been, with declines in water clarity, water color, and turbidity and increases in iron and manganese which are being addressed at the treatment plant during treatment. In response to algae blooms, the York Water District installed an aeration system in the 15 acres of Chase's Pond nearest the treatment plant intake and dam outlet.

The watershed lands of the York Water District and adjacent Kittery Water District lie within the Mount Agamenticus Conservation Region as envisioned by the Mount Agamenticus to the Sea Conservation Initiative (MtA2C). MtA2C, formed in 2002 by seven local, state, and national conservation groups and three government agencies, seeks to conserve 19,000 acres of conserved natural lands and protected watersheds within a larger (48,000 acres) focus region. The district is

a member of the Mount Agamenticus Steering Committee, comprised of seven major landowners that collaborate in managing public use of lands associated with Mt. A.

The York Water District is a Maine quasi-municipal corporation “constituted for the purpose of supplying persons of the standard district with potable water for domestic, sanitary, commercial, industrial, agricultural and municipal purposes” (MRSA, Chapter 64). It is responsible for the management of its watershed lands in support of its legislative charge to supply potable water and such lands are the property of the district rather than public lands. In managing its lands, the district conforms to applicable state and federal laws and regulations as well as recommended Best Management Practices.

CHAPTER 3 WATER QUALITY MANAGEMENT

Because the York Water District owns nearly 92% of the Chase’s Pond watershed, most of the water quality parameters are determined by the natural character of the geology, topography, soils, weather, and climate. To a lesser extent, water quality is influenced by human activity. The district endeavors to meet or exceed federal and state standards, recommendations, and guidance for surface water quality in terms of chemical, biological, and physical contamination relevant to community water supply.

Based on analysis of test results, there has been a decline in the overall water quality of Chase’s Pond as evidenced by reduced transparency (Secchi disc), decreased dissolved oxygen, increased frequency of higher colored water, increased turbidity, and increased metals concentrations. There has also been increasing variability in many water quality indicators such as total organic carbon (TOC). Counterbalancing these negative trends, water quality parameters such as chlorophyll-a /plankton biomass, nitrogen concentrations, and phosphorus concentrations have remained low and stable. The decline of water quality in Chase’s Pond is largely driven by natural processes but human activity can exacerbate problems.

Extreme precipitation events, perhaps due to climate change may be driving increased transport of sediment/silt, metals, debris, decaying plant and animal matter, and residual particles. This may explain the significant variability in organic material, measured as TOC, metals, color, and reduced transparency. Test results show that the aeration system installed at the plant intake/dam outlet area of Chase’s Pond in 2015 has been effective in maintaining oxygen at all monitored sites.

To date, the water bodies in the York Water Districts do not have any record of infestation by the 15 aquatic invasive plant species listed by the Maine Department of Environmental Protection. Because most introductions are via water-based human activities such as fishing and boating which are prohibited on the district’s waters, the risk of invasion is moderately low.

There were blooms of the native golden algae on Chase’s Pond in 2010, 2011, and 2024 and algal populations were at concerning levels in 2013 and 2014. The aeration system was designed to prevent low oxygen levels (anoxia), minimize the release of metals, and disrupt the growth cycle of the golden algae. In 2020, during drought conditions, there was a blue-green algae

bloom in the aeration area that fortunately passed quickly and did not affect our intake as they rose to the sunlight at the top of the water column during the day when the plant was online and then dropped to the bottom of the column at night when the plant was offline.

Periodically, Canada geese have become a water quality concern, and the district has taken steps to remove geese from the reservoir. Beavers can also pose health hazards to humans by contaminating drinking water. To manage beavers as well as geese, the district annually contracts with US Fish & Wildlife Service's Animal Plant Health Inspection Service.

Human activities do not appear to be an important water quality factor in the case of Chase's Pond. However, public recreation on district land has been increasing and will continue to do so. Dog walking activities pose some risk of fecal contamination. Silvicultural activities do impact harvesting sites, temporarily releasing nutrients, and exposing soils that could erode and introduce sediments into streams and ponds. However, erosion control measures (BMPs) limit sedimentation and movement of contaminants into water bodies. The district has begun water quality sampling in conjunction with harvesting operations. Management roads and trails can also be a source of sediments and other contaminants. Again, BMPs provide guidance on construction and maintenance. Finally, there is some risk of contamination from non-YWD residential land uses, especially in the area around Eber Drive.

Climate change research suggests that precipitation in southern Maine, while only increasing slightly in total amount, has come as more intense storms. Increased intensity is expected to continue, and will vary seasonally, with more storm events in winter and spring and dryer conditions in the summer and fall. Such patterns may increase flushing of nutrients, sediments, and other contaminants from wetlands that drain into Chase's Pond, contributing to decreased water quality. Therefore, it is important that wetlands are protected from unnecessary disturbances that might decrease their absorption capacity. This is done via implementing BMPs for silvicultural activities, and road and trail construction and maintenance.

Longer growing seasons and decreased summer and fall precipitation may foster algae blooms such as the November 2020 blue-algae bloom in Chase's Pond. Increased aeration may be required to mitigate the impacts of such changes to lower the risk of algae blooms.

To protect water quality and respond to impairments, the district will continue sampling as described in the 2024 Source Water Monitoring Plan. Sampling will include Chase's Pond, Welch's Pond, important perennial streams, and silvicultural sites. The district will also monitor ponds for invasive aquatic plants, as well as problematic native plant and animal species. To ensure they are adequate for potential maximum flow events associated with climate change, the district will evaluate culverts, ditches, water bars, and other installed water volume and velocity control measures.

CHAPTER 4 FOREST MANAGEMENT

Because the York Water District's watershed is approximately 90% forestland, how that forest is managed is important to achieving the district's water quality and other goals. The district's

forest management goal is to maintain a healthy forest ecosystem to complement water quality goals through sustainable forest management, with attention to forest health, biodiversity, and wildlife.

The district's forest is comprised of mixed forest types. The 2023 inventory indicates that, in terms of commercial timber volumes, the forest is dominated by eastern white pine (45%), northern red oak (22%) and eastern hemlock (22%). White oak (4%) and red maple (3%) are important secondary species. The average basal area per acre, a measure of density, for the compartments which were sampled was 107 ft². Average volume per acre for all products is nearly 36 cords, indicating a well-stocked forest. Detailed descriptions and prescriptions for each compartment are provided in the management plan.

The recommended silvicultural system is uneven-aged management, focusing on a diversity of ages, heights, and tree species using single tree and small group selection, and removing undesirable trees not suited for optimal growth, as well as mature trees and those with poor form, injury, and/or disease. Silvicultural prescriptions are implemented on a compartment basis. For the 2024-2033 period, the recommended prescription for 24 of 36 compartments is to let the forest grow at least one decade before treatment. Eight compartments are recommended for treatment during the 2024-2033 period.

Implementing prescriptions is more than designating trees for removal or retention. Trees must be evaluated for economic and ecological values. Unhealthy trees designated for removal may reduce threats from insects, disease, and fire, and a healthy forest better mitigates climate change. Locally uncommon trees species such as chestnut oak, black spruce, shagbark hickory, black gum, yellow birch, sugar maple, and bigtooth aspen may be retained to enhance diversity and climate resilience regardless of quality. Inclusions (small areas with an atypical species mix for the compartment) may be retained to protect specific plant communities (e.g., chestnut oak, or black spruce/black gum) or areas of large trees which may be useful for carbon storage. Wildlife habitat issues to be addressed include retaining and recruiting dead wood for snags and coarse woody debris and providing horizontal and vertical structural diversity. Vernal pools will be identified and buffered from disturbance.

All forest operations will conform with applicable state regulations and the district will continue to have its harvest plans reviewed by a third-party professional forester. Forest operations will be conducted so as to protect rare, threatened, and endangered plant and animal species, and unique natural communities. Practices may include buffer zones, altering the time of year of operations, and avoiding changes in the composition or condition of habitats important to those species. Additional considerations include aesthetics, and managing the risks associated with forest fire, insect and disease infestations, invasive plants, and climate change.

CHAPTER 5 WILDLIFE, ENDANGERED SPECIES, SENSITIVE AREAS

To support a healthy forest ecosystem, the district's management approach is to provide diverse wildlife habitats, protect endangered species and special habitats, and conserve sensitive areas.

Among the best actions for providing wildlife habitat is to maintain a forest as forest. Beyond that, the district aims to support the wildlife habitat functions of cover, food, and connectivity.

Structural diversity in both horizontal and vertical dimensions fosters wildlife species diversity. Horizontal structural diversity is achieved via early, mid-, and late successional forest stands. At the landscape level, there is very little early successional habitat in the region. However, because the primary goal of the district's watershed management is to protect water quality, the focus on uneven-aged silviculture will limit the amount of early successional habitat on district lands. About 20% of the district's holdings will be unmanaged, thereby promoting late successional habitat. Vertical diversity will be provided by silviculture practices that maintain trees of several age classes in each compartment and by retaining and recruiting coarse woody debris, cavity trees and snags, shrub and herbaceous layers associated with canopy openings, and soft edges near buffers, landings, and roads.

The district's focus on sawlog production ensures that mature, mast-producing trees will be available throughout the property. Planned silvicultural treatments favor oaks whenever they are present as well as pine and quality hemlock. The district will also manage overstory inclusions (small patches of trees which differ from the surrounding forest, but which are generally too small to be mapped or treated separately), especially those with unusual species mixes or large trees with wildlife value.

In northern regions, deer wintering areas (DWA) provide a core area of dense, mature softwood and accessible winter forage in areas adjacent to the core. There are two candidate DWAs on district lands, as determined by the Maine Department of Inland Fisheries and Wildlife (MDIFW). At the time of planned silvicultural treatments, the district will contact the appropriate state wildlife biologist for recommendations.

The district's watershed lands have several species of animals and plants that are either endangered, threatened, or of special concern according to a November 2023 MDIFW analysis of the property. All such species discussed in the MDIFW report are associated with ponds, streams, wetlands, and their riparian zones which the district protects in its management approach. The district's management plan follows the recommendations and requirements described in the MDIFW report. There are areas of designated significant wildlife habitat such as candidate DWAs, vernal pools, and one or two areas containing chestnut oak. The district's forest also contains a variety of sensitive areas including seeps, vernal pools, steep slopes, and cultural resources. All of these will be identified in the field and buffered appropriately prior to forest operations.

CHAPTER 6 MANAGING PUBLIC USE

York Water District allows public uses of its watershed property which are compatible with its primary goal of providing high quality drinking water. Because its lands are not public lands but are owned by the district as a quasi-municipal entity, the district controls what public activities are allowed and not allowed on the property.

YWD's lands and the greater Mt. A region are magnets for public recreation activity. These recreation opportunities are widely promoted by conservation organizations, public agencies, and

various private entities. The primary attraction is Mt A itself and its network of trails. While this trail network is located largely to the north of the district's ownership, many of the access points are trailheads and parking areas on YWD land on the south-facing slopes of Mt. A.

The Mount Agamenticus Steering Committee, comprised of the seven major regional landowners, coordinates management activities across the ownerships; the district is represented by its Resource Protection Manager. The Steering Committee has adopted rules for the public to follow when using lands overseen by the committee. The district also collaborates with the Town of York in managing parking and trails on the slopes of Mt. A.

To help control public use of its lands, the district has installed gates at several access points. The typical installation features a small parking area, boulders to prevent unauthorized use, a small gap to permit access for foot traffic, mountain bikes, and ATVs, and signage indicating prohibited and permitted uses. The district has a system for providing ATV permits to residents and property owners in towns served by the York and Kittery Water Districts.

The district partnered with the York Police Department to establish a Watershed Enforcement Agreement under which a district employee was trained and sworn in as a York Police Department Reserve Officer or a Watershed Patrol Officer (WPO). This patrol officer's duties were to protect the watershed lands and enforce rules and laws that pertain to water quality protection. The patrolling effort was later expanded to include the lands of the Kittery Water District and, more recently, to include areas on Mount Agamenticus and surrounding conservation lands. Due to the retirement of the WPO, the district is working with partners on the future scope and staffing of patrols.

The WPO's collected observational data regarding public use and other management concerns. This data indicates that patrol efforts have been effective in reducing the negative impacts of public use. The data also indicate trends in public recreation activities for 2004-2023. ATV use, walking/hiking/running, and dog walking have been trending upwards, and experienced a spike in activity during the 2020 COVID pandemic. Mountain biking, hunting, winter sports, and trash collections have been trending downwards. According to the data, many other undesirable human activities have decreased (water contact, drugs, vandalism, etc.), likely because of patrol activities that included enforcement as well as education. With the risk of damage to the forest, the road and trail network, and water quality with increasing public use, the patrol should be continued.

Public use of district lands is largely associated with its roads and management trails. Due to high demand for recreation access, the parking lots associated with Mt. A were expanded and upgraded in 2022 by the Town of York as part of the extension of the access lease between the district and the town.

Over the last decade, YWD has invested in upgrading and expanding its management roads. It is now possible to drive vehicles, including logging trucks and fire apparatus from Chase's Pond Road to Mountain Road following the north side Chase's Pond, and from Scituate Road to Mountain Road following the south side of the pond. Bridges, culverts, ditches, and other water control measures have been installed to protect water quality. While water control measures on

roads and trails meet Best Management Practices, these measures will be re-evaluated considering increasing precipitation intensities related to climate change to ensure protection of water quality and other natural resources.

The district will continue to coordinate with the Town of York, Kittery Water District, and other members of the Mt. A. Steering Committee on matters of mutual interest regarding public recreation. This will include coordination related to timber harvesting and associated road and trail closures on district lands. The district will also cooperate with the York Police Department as the WPO is transitioned to an employee of the YPD.

CHAPTER 7 CLIMATE CHANGE IMPACTS AND MITIGATION

The York Water District recognizes that climate change due to natural and anthropogenic factors will impact water quality and its forested watershed. The district's climate change goals are to mitigate impacts of climate change on the district's forests and sequester and store carbon via natural climate solutions. Data analysis indicates that the average annual temperature and total precipitation in southwestern Maine have been rising and are expected to continue to do so. The growing season has lengthened, and precipitation events have become more intense. Winters and springs are expected to be wetter, and summer and falls are forecast to be dryer.

Given the expected warmer temperatures and potentially longer, but dryer, growing season, the forest types in southwestern Maine are expected to slowly drift towards greater representation of oak and less of eastern white pine and eastern hemlock. With these climate changes, there is also potential for higher risk of damaging insect and disease outbreaks, facilitated by the lack of severe cold winter weather. Changing climate also increases the vulnerability of the forest to invasive plants and animals and increases the risk of wildfire.

The district will implement a battery of natural climate solutions in managing its forests, including designating unmanaged areas, protecting legacy trees, maintaining tree species diversity, promoting vertical and horizontal structural diversity, ensuring a dead wood component, and managing for long-lived forest products. The district's forest stores approximately 12,000 metric tons of CO₂ equivalent and that amount is expected to increase significantly over the next decade because 75% of the forest is not scheduled for harvesting.

CHAPTER 8 COLLABORATION, OUTREACH, AND COORDINATION

Although the district manages its watershed lands in accordance with its own goals and objectives, its lands are part of a larger landscape with other landowners and stakeholders. In this context, collaborating with other entities and agencies is important to achieving the district's goals and objectives and for mutually beneficial outcomes. The district can also further public understanding of the importance of high-quality water and of scientific forest management in managing its lands through outreach activities with public users of those lands and with the general public.

The district will continue to collaborate with the Town of York, the York Police Department, the Kittery Water District, and the Mount Agamenticus Steering Committee. As appropriate, the district will work with state agencies including the Maine Forest Service and the Department of Inland Fisheries and Wildlife. When consistent with its goals and objectives, the district will allow access to its lands for teaching and research activities of universities as well as state and federal agencies. The district will also continue working with local schools and, if appropriate, provide opportunities for volunteer work projects.

The York Water District's Resource Protection Manager (RPM), under the supervision of the district's superintendent, is responsible for implementing the management activities described in this plan.