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Land Conservation in the Lower Presumpscot Watershed: Vision, Values & Priorities

Vanessa Levesque

Matt Craig

University of Southern Maine, Casco Bay Estuary Partnership

Stephen Engle

Center for Community GIS

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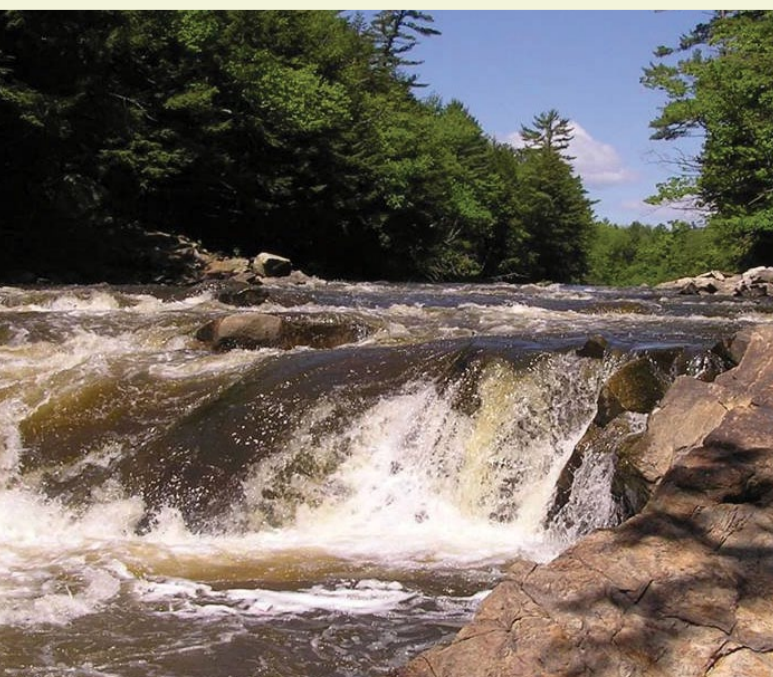
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Land Conservation in the Lower Presumpscot River Watershed

Vision, Values & Priorities





Land Conservation in the Lower Presumpscot River Watershed: *Vision, Values & Priorities*

NOVEMBER 2013

Developed through a collaborative effort between the following organizations:

Casco Bay Estuary Partnership
Chebeague & Cumberland Land Trust
Center for Community GIS
Town of Falmouth Conservation Commission
Falmouth Land Trust
Greater Portland Council of Governments
Beginning With Habitat
City of Portland Planning Department & Land Bank Commission
Portland Trails
Presumpscot Regional Land Trust
Presumpscot River Watershed Coalition
Southern Maine Conservation Collaborative
Windham Land Trust
Town of Windham Planning Department

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www.presumpscotcoalition.org/vvp.

PROJECT TEAM

Vanessa Levesque, Project Coordinator
Matt Craig, Casco Bay Estuary Partnership
Stephen Engle, Center for Community GIS

MAPS & REPORT DESIGN

Center for Community GIS

With support from Peter Taylor and Virginia Howe, Waterview Consulting

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To the Steering Committee and their respective organizations:

Jessica Burton, Southern Maine Conservation Collaborative
Richard Curtis, Presumpscot Regional Land Trust
Brooks Moore, Town of Windham
Tania Neuschaefer, Presumpscot Regional Land Trust
Will Plumley, Presumpscot River Watershed Coalition

FRONT & INSIDE BACK COVER PHOTOGRAPHS

Casco Bay Estuary Partnership, Center for Community GIS, Royal River Conservation Trust, Tin Smith, and Theo Willis

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Introduction

Purpose

Land protection efforts in Southern Maine are evolving. Increasingly, the region's conservation community—a collection of dedicated individuals, land trusts, towns, and conservation funders—is being faced with difficult choices about how to allocate limited resources to fulfill their missions and sustain the region's character. Meanwhile, development steadily continues. In most communities, the pace of conservation cannot keep up with the pace of development—a fact that can be discouraging to many of us who value the region's natural and cultural character. Recent development trends are permanently changing the landscape and degrading water quality, and local sources of food and wood are being lost.

Over the coming decades, the Greater Portland Area is projected to continue growing at a pace exceeding that of the rest of Maine. The relatively rapid rate of suburban sprawl will further increase impervious surfaces (paved areas), while fragmenting habitat. Research shows that stream quality deteriorates when more than 8% of a watershed is impervious. Over 7% of the Presumpscot River Watershed is currently covered by impervious surfaces, while less than 3% is permanently protected.

To meet these challenges, local land conservation organizations are adapting in a number of ways—with new, strategic approaches to conservation, by reaching out to neighboring communities and seeking economies of scale. These changes are not unique to our corner of the state. In other parts of Maine, and more broadly across the continent, the need for strategic use of limited resources has shifted conservation efforts towards, not just land protection, but landscape conservation. As residents, we know intuitively that our footprints on the landscape—our homes, our downtowns, our roads, our industries—must be balanced with the natural and cultural resources of the landscape itself, or those resources will be lost.

WE ARE INSPIRED TO CONSERVE IN ORDER TO:

- Develop a land ethic that includes creating a legacy for future generations;
- Raise awareness of the Presumpscot River and reconnect people to the land and water;
- Seek a balance between the built and natural environment that recognizes the river's inherent economic value; and,
- Emphasize the river's importance to Casco Bay and its native ecological communities.

Until recently, local conservation practitioners had not come together to talk about how to maintain this balance within our own backyard landscape: the Presumpscot River Watershed. After decades of turning our backs on the Presumpscot, we have a unique opportunity to protect a relatively undeveloped watershed close to Maine's fastest growing urban area.

Thus, the Presumpscot River Watershed Coalition (PRWC) launched a landscape scale conservation prioritization project—the *Presumpscot Land Conservation: Vision, Values and Priorities* initiative—with the following objectives:

1. Develop a common vision for land conservation in the lower Presumpscot River Watershed;
2. Identify a set of agreed upon conservation values to guide priority setting;
3. Create maps, geospatial data, and supporting information to anchor the values in the local geography;
4. Generate shared land conservation priorities; and,
5. Strengthen ties and on-going communication amongst the region's conservation partners.

This report showcases the cultural and ecological assets of the Presumpscot River Watershed as identified by the conservation practitioners that work and live here and aligns efforts to protect the extraordinary features within this landscape. Through the process of working together, developing this document, and setting the stage for continued collaboration, we aim to:

- Build capacity for regional land conservation;
- Find efficiencies in land conservation efforts;
- Promote proactive, rather than opportunistic, land protection;
- Protect ecologically and culturally significant areas that span institutional boundaries;
- Enhance communication and coordination across organizational and political boundaries in pursuit of limited funding resources; and,
- Expand influence and speak as a unified group by highlighting common interests across multiple constituencies.

This report is a first step. The enclosed maps and information provide a resource for the region's land conservation community when assessing potential lands for conservation, developing focus areas, or providing justification for requests for funding. More broadly, we hope that this report will initiate a dialogue about the future of the Presumpscot River Watershed amongst local communities, and that landowners, towns, land trusts, conservation groups, and agencies will align efforts to help conserve this landscape.



Location

The Presumpscot River connects Portland, Maine's largest urban hub and employment center, and Sebago Lake, which provides many Mainers with abundant, clean water while serving as a year-round recreation destination. For many of us, this proximity to two areas of statewide significance places the Presumpscot River Watershed high on the list of the most desirable places to live and work in the state. In the past, communities and industries were built around the river, and today, many businesses and individuals are revitalizing post-industrial assets along the river, while restoring the ecological communities within the river itself. Following a century of use as a disposal pathway for industrial and sewage waste, today, the Presumpscot is a river in recovery.

Overall, the water is cleaner than it has been in decades, and migratory fish are swimming back upstream, passing beyond barriers to their movement, which are steadily being removed. The Presumpscot River Watershed is, therefore, both a thread that weaves communities together, and an ecologically relevant way to think about 'place.' As such, the watershed offers a meaningful lens through which to view our landscape—a landscape we want to sustain.

Although in its entirety the Presumpscot River Basin includes Sebago Lake and its tributaries, this project focuses on the lower watershed, defined for our purposes as the Presumpscot's modern-day origin at the base of Sebago Lake Dam, running about 25 miles to the Presumpscot Estuary, and encompassing a corresponding watershed that includes parts of Buxton, Cumberland, Falmouth, Gorham, Gray, North Yarmouth, Portland, Raymond, Standish, Westbrook, Windham, and Yarmouth, as well as the Pleasant River, Little River, Mill Brook, and Piscataqua River tributaries (right).

Partners

The Presumpscot River Watershed Coalition served as the convening entity for this stakeholder-driven, consensus-based initiative, with Casco Bay Estuary Partnership (CBEP) serving as the lead within the Coalition. PRWC is an informal partnership of individuals, non-governmental organizations, municipalities, and agencies working together to restore and protect the lower Presumpscot River Watershed. PRWC is guided by recommendations outlined in the *Presumpscot River Management Plan*, which includes a significant focus aimed at furthering land protection efforts along the main stem of the river, and which also identifies the need to prioritize and coordinate land conservation efforts throughout the watershed.

Although municipalities and land trusts in the region actively engage in land protection, they have historically done so with little coordination. To address this gap, in 2009, PRWC convened a gathering of land conservation organizations and municipalities, who agreed upon the need to develop and articulate a shared conservation vision for the watershed. This conversation led to the formation of a stakeholder working group including staff and board members from: CBEP, Chebeague & Cumberland Land Trust, Center for Community GIS (CCGIS), Town of Falmouth Conservation Commission, Falmouth Land Trust, Greater Portland Council of Governments, Maine Beginning with Habitat Program, City of Portland Planning Department, City of Portland Land Bank Commission, Portland Trails, Presumpscot Regional Land Trust, PRWC, Windham Land Trust, and the Town of Windham Planning Department.

Primary funding for this project was granted by the Environmental Funders Network through the *Quality of Place Initiative*. Additional funding was provided by CBEP. Each participating organization provided significant time and energy over the span of several years to see this effort through to completion.



BABB'S BRIDGE BRENT DANLEY

Process

This initiative started from scratch. Stakeholders agreed to make decisions by consensus, defined as: “a decision that everyone could live with and support going forward.” The first year was spent forming and agreeing upon a process for how conservation vision, values, and priorities would be developed.

During the second year, stakeholders identified conservation values in a series of half-day, facilitated discussions. These qualitative, descriptive conservation values were grouped into eight themes (see opposite page). The conservation values helped the group to articulate a vision for the future of the Presumpscot River Watershed and guided all future mapping work. We identified, created, and mapped the best available Geographic Information Systems (GIS) data layers that aligned with each conservation value. Conservation values maps were reviewed by steering committee members and stakeholders at numerous meetings to ensure that they appropriately represented the underlying conservation values. Participants requested additional data, suggested corrections, and offered alternative strategies for presenting, combining, and visualizing data sets. More intensive GIS modeling work was also completed during the second year of the project to support the final selection of conservation priority areas (page 10).

Over the course of the third year, we used a ‘bottom-up’ approach to identify priorities for land protection. Based on the suite of maps that had been developed as well as local knowledge of the landscape, we delimited high priority areas for six of the conservation values, using a process described in more detail beginning on page 6. We also created a map showing areas where multiple priority areas overlapped (page 26). In the final meetings, we discussed initial next steps for the collaboration, a process that we anticipate will continue.

Acknowledging at the outset that single individuals could not speak on behalf of entire communities, we incorporated municipal priorities in multiple ways. At least four of the municipalities—Gorham, Falmouth, Portland, and Westbrook—actively partner with land trusts to protect land,

and we benefitted from participation by representatives from these and other communities at various stages of the initiative. In addition, we gathered data from several municipal sources. We incorporated GIS data layers for municipal-designated growth zones into our analysis. Furthermore, a graduate student from the Muskie School of Public Service reviewed official town documents to identify locally important places. Finally, we surveyed planners and other municipal officials in order to understand and document conservation activity in each community.

Over the course of three years, our collaborative group met every three to six months in order to direct the core project team, which consisted of Vanessa Levesque, Project Coordinator; Matt Craig, CBEP; and Stephen Engle, CCGIS. The project team established the meta-process; developed data, information, and maps; managed grant logistics; and communicated with stakeholders. A subset of stakeholders formed a Steering Committee that provided leadership, guidance, and decision-making to the project team between meetings, contributing significantly toward intermediate and final outputs and outcomes.

OUR APPROACH IN A NUTSHELL:

1. Agree on shared goals and process.
2. Identify shared conservation values.
3. Articulate a vision for the future.
4. Build maps of conservation values.
5. Identify conservation priority areas.
6. Define next steps.

About this Report

The culmination of three years of collaborative, consensus-driven conversations between individuals, towns, and organizations is what follows in this report: a *shared* vision, *shared* values, and *shared* priorities for land conservation in the Presumpscot River Watershed. This vision is shared in the sense that the land conservation priority areas articulate a collective statement about regionally-significant resources that warrant prioritization for long-term protection. It is a guide for sustaining the cultural and ecological resources of this place, both for current and future generations to enjoy and use.

It was important to clearly define boundaries for what we would not attempt to accomplish. Identification of areas that support different conservation values and conservation priorities were developed from a regional perspective for use at a regional scale. We used data on municipal growth zones to represent local priorities for economic development and growth, and referenced official town documents to identify locally-significant places. Otherwise, we did not attempt to address local needs and issues, and the data we used are not intended for use at detailed, local scales. Specifically, we did not attempt to assess land protection values or priorities at a parcel level, although individual land trusts may elect to do so.

Furthermore, we did not attempt to inventory and map threats to conservation values, such as suburban sprawl and climate change, relying instead on existing resources (for example, see *State of the Bay*, CBEP, 2010). Although climate change is an issue of critical importance for land conservation—and landscape-scale conservation improves habitat resiliency in the face of a changing climate—we did not consider projected changes to the local climate as a lens through which to identify priorities for land protection.

A digital version of this report can be found on the PRWC website: www.presumpscotcoalition.org/vvp.

IDENTIFYING CONSERVATION PRIORITY AREAS CENTER FOR COMMUNITY GIS



Conservation Vision & Values

Core Outcomes

The outcomes of this project are a conservation vision for the Presumpscot River Watershed; a set of conservation values on the landscape; and priority areas that stand out for their exemplary conservation values. The vision and values are described below and are the foundation for the conservation priorities maps, which can be found on pages 12-24 of this report.

Our vision represents a unified concept for the future of the watershed. The conservation values are features and characteristics—literally the fishing holes, hilltops, and habitat blocks—about which we care. We assessed these values on the landscape at the scale of the watershed, emphasizing the relationship between the land and aquatic resources. The conservation priorities are the areas we identified as being the most important to protect. In other words, the conservation priorities are the places throughout the watershed that provide the most conservation value, based on the values that we defined.

Vision

As a group dedicated to the well-being of the Presumpscot River Watershed, we came to common ground on how we envision the future of the region:

WE SHARE A VISION that future generations benefit from diverse and healthy terrestrial and aquatic habitat, high water quality, recreational access to natural areas, and vibrant, working woodlands and farms in the Presumpscot River Watershed. The Watershed's conservation community is strengthened through collaboration, and successfully conserves land and implements strategies that achieve this vision.

Conservation Values

We articulated a set of conservation values to express what inspires us to protect land, and to identify the watershed's important landscape elements in the context of current and future trends.

As a community of conservation practitioners, we value: a healthy watershed and ecosystems; the Presumpscot River's role culturally, both historically and for future generations; access to recreational opportunities; and the landscape's role in the economy. These values collectively contribute to our region's quality and sense of place. The conservation values identified in a series of stakeholder meetings were grouped into the following eight categories:

- Aquatic Habitat
- Terrestrial Habitat
- Natural Communities of Special Concern
- Water Quality
- Recreation & Access
- Working Woodlands
- Agriculture
- Historic Resources

Conservation Values Maps

The conservation values informed development of the conservation values maps and the selection of priority areas. The conservation values maps feature a combination of readily available GIS information and a noteworthy amount of new GIS data. Existing GIS mapping layers were obtained from organizations such as: Maine Office of GIS, U.S. Fish & Wildlife Service, Beginning with Habitat, Maine Department of Inland Fisheries & Wildlife, and The Nature Conservancy, among others. New GIS data that we created include: parcels in three current use taxation programs, snowmobile trails, boat launches, hiking and walking trails, and updated conservation lands. The final conservation values maps, along with additional information about source data, are described in the next section of the report.

PRESUMPCOT PRESERVE, FALMOUTH CASCO BAY ESTUARY PARTNERSHIP



Selecting Conservation Priority Areas

Approach

After developing and refining the eight core conservation values maps, our next goal was to identify areas within the watershed that stand out for their exemplary characteristics and therefore warrant focused effort and resources for protection. We used a qualitative ‘bottom-up’ approach to identify these priority areas. Following this approach, we visually compared the numerous maps that had been generated through this project, along with other important landscape features and our local knowledge, and then designated areas that emerged as important. More specifically, we used the following mapped information to help us identify priority areas:

- Conservation values
- Conserved and public lands
- Land trust service areas
- Municipal areas of importance
- GIS-modeled conservation values

In this section, starting with the Conserved & Public Lands map, we describe each aforementioned map and explain how it was used to inform our process of selecting conservation priority areas. The conservation values maps begin on page 12 and also feature the final conservation priority areas that we identified.

First, a note about using maps for identifying priorities is warranted. GIS provides a powerful tool for integrating, analyzing, and representing complex environmental data—strengths that continue to make GIS an essential tool for conducting conservation studies worldwide. The capacity of any GIS-based assessment to inform conservation planning, however, ultimately depends on the accuracy, resolution, scale, and quality of the data layers that can be cost-effectively gathered as part of the effort. For some conservation values in this project, the best available data was (and remains) incomplete for the watershed.

Data limitations do not make GIS technology, data, and models any less valuable so long as one recognizes that the overarching conservation assessment represents a coarse-filter approach that is appropriate for making generalized, regional assessments about conservation value. More detailed studies and fine-scale analyses—that incorporate local knowledge—are always needed to establish current on-the-ground value of any location. The GIS data and maps shown in this report represent a snapshot in time; they are static images and need to be revisited and updated to support future and ongoing conservation planning efforts.

Maps used to inform priority areas selection



Conserved and Public Lands

About this map

There are many ways that land can be protected, and as a result, different parcels of conserved land have varying degrees of protection. The Conserved & Public Lands map (opposite page) shows properties that have permanent protection, such as those purchased by a land trust or government agency for the purpose of conservation, or those protected by conservation easement. Permanently protected lands may or may not be accessible to the public. This map also includes properties that lack permanent protection but are managed for conservation or open space purposes. These properties are often public lands that include a range of land uses, from town forests to town parks and ball fields, each with unique and varying degrees of protection. Due to inconsistencies between data sets, we opted not to distinguish properties that are permanently protected or publicly accessible.

How this map was used in identifying conservation priorities

This map was used to identify the proximity of areas with high conservation value to existing conserved lands. We want to protect contiguous blocks of habitat; larger intact forests, fields, and riparian corridors have greater habitat value than small pieces of separated habitat. Larger blocks of forest, for example, provide habitat for interior forest birds, provide better water quality protection near waterways, and provide space for migrating animals. Adjacent conserved areas also provide opportunities for trail connections.



Conserved & Public Lands



Conserved and public lands

Lands shown on this map may not allow public access. Be sure to contact the landowner before accessing any of these parcels.

0 1 2
Miles



Data sources:
USFWS-Casco Bay GIS Service Center
Maine Office of GIS
Center for Community GIS

Land Trust Service Areas

About this map

Multiple local land trusts are currently working to protect land within the Presumpscot River Watershed. The Land Trust Service Areas map (at right) shows the regions within which each participating land trust focuses conservation activities.

The land trust service areas shown are not formal, nor exclusive. In some cases, multiple land trusts serve the same community, and occasionally, land trusts work outside their designated service areas. Other statewide and national conservation organizations play a role in local land conservation efforts as well; however, we did not attempt to identify service areas or conservation priorities for these larger conservation entities.

Staff and board members from each of the following land trusts participated in this regional initiative.

Chebeague & Cumberland Land Trust (CCLT)

Founded in 1987, CCLT protects natural resources in the towns of Cumberland and Chebeague (www.ccltmaine.org).

Falmouth Land Trust (FLT)

FLT was started in 1981 to preserve the rural character of the Town of Falmouth through the protection of open space, and now also works to develop a network of trails (www.falmouthlandtrust.org).

Portland Trails (PT)

A nonprofit land trust that has roots starting in 1976, PT preserves green space in the Greater Portland region for public access, with a goal of creating a 50-mile network of trails in the region (www.trails.org).

Presumpscot Regional Land Trust (PRLT)

Formed in 1986, PRLT conserves and protects outstanding lands in Gorham, Gray, Sebago, Standish, Westbrook, and Windham in order to preserve the character of the Presumpscot River Watershed for the benefit of people and wildlife (www.prlt.org).

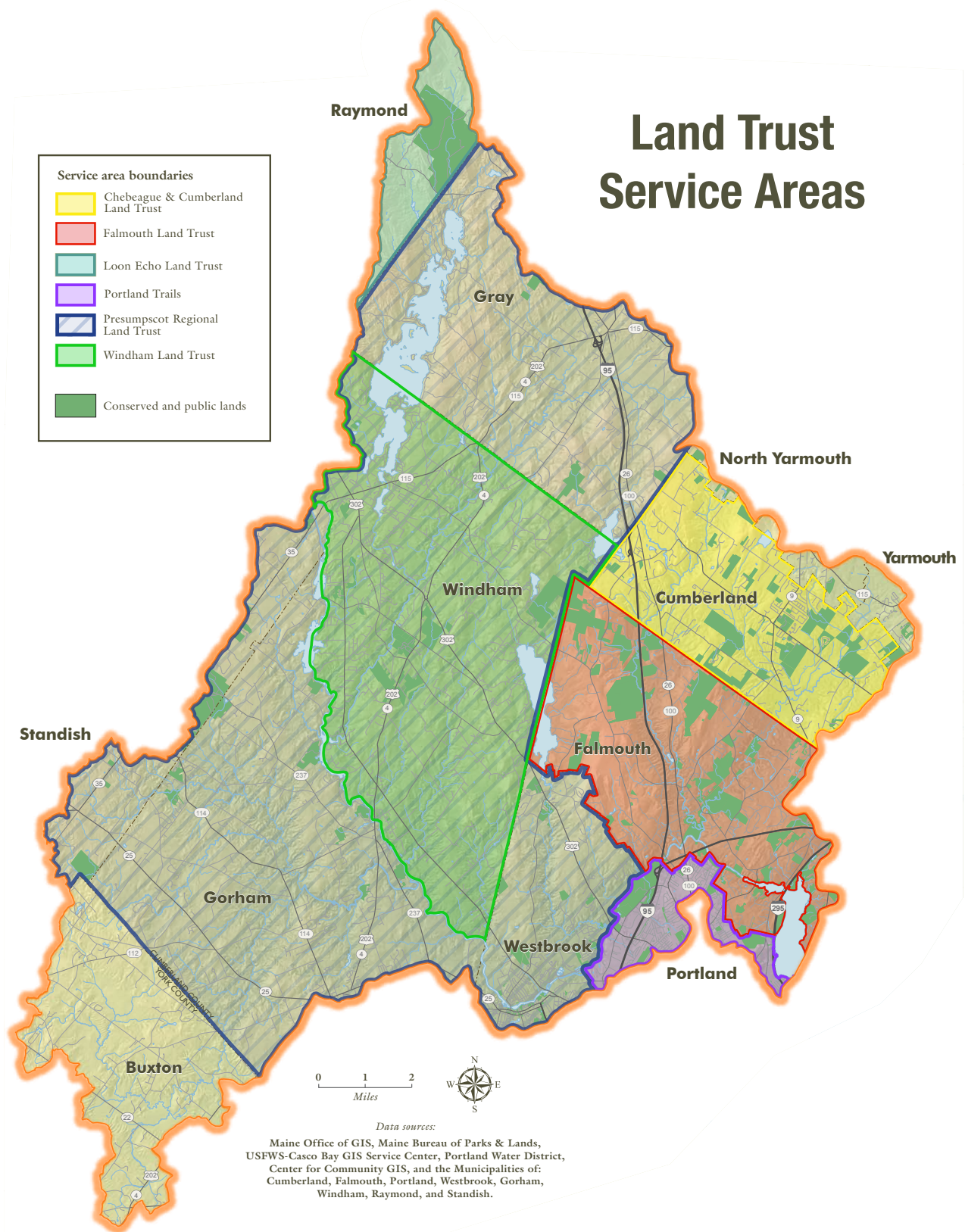
Windham Land Trust (WLT)

WLT was founded in 2000 and works to conserve natural resources in the Town of Windham and surrounding areas (www.thewindhamlandtrust.org).

How this map was used in identifying conservation priorities

Although this report takes a regional perspective, conservation activities on the ground are mostly carried out by local entities—mostly notably land trusts and municipalities. The map of land trust service areas helped us consider the overall spatial distribution of priority areas, such that all the land trusts are involved. This map also helps land trusts themselves to identify which watershed-wide conservation priorities areas are within their service areas.

Some land trusts had previously developed conservation priority areas, and when possible, these priorities were integrated into the broader watershed prioritization. For confidentiality purposes, those land trust-specific conservation priorities were not included on the above map. We did, however, reference that data as part of our own prioritization process. If a region of high conservation value was already identified as a focus area for one land trust, it generally increased the likelihood that the area would be considered as a regional conservation priority for this project.



Municipal Areas of Importance

About this map

The map on the opposite page shows municipal growth zones, or local growth areas, as well as areas of importance indicated by municipalities. Municipal growth zones show the areas that municipalities have designated in their comprehensive plans for future growth. Growth zones often contain existing town centers and/or major travel corridors, and have been registered with the State by the municipality.

Although most of the municipalities in the Presumpscot River Watershed have identified growth zones, few have completed comprehensive assessments of open space, or specific on-the-ground conservation priority areas. By reviewing official town documents, such as comprehensive plans and open space plans, for several municipalities in the watershed we were able to identify several areas recognized for having high conservation values. We approximated these areas as polygons on paper maps and then entered those areas into GIS.

It should be noted that there are limitations to the information obtained from town documents, which may be out-of-date, inconsistent with more recent plans, and/or only one piece of information that a town might use when making land use decisions. Therefore, the municipal areas of interest displayed on the map should be considered conceptual.

How this map was used in identifying conservation priorities

In the process of developing conservation priorities, we took into consideration whether a municipality cited a location as locally important, or identified it as a priority to protect. Generally, this increased the likelihood that a place would be included within a priority area, particularly if specific features were tied to the conservation values. On the other hand, we generally avoided municipally-designated growth zones when identifying conservation priorities.

Municipal Areas of Importance



GIS-modeled Combined Values Maps

About these maps

GIS is most commonly thought of as a ‘map making’ tool, but GIS can also be used as an analytical tool for exploring and assessing a wide range of land (and water) use scenarios. GIS modeling, or spatial analysis, refers to a process of combining existing GIS data layers to create new data sets and assess potential landscape conditions or scenarios. In this project, a GIS modeling approach called ‘weighted overlay’ was used to assess the relative conservation value of lands within the watershed. The modeling process made it possible to: systematically integrate and analyze the numerous data layers that had been gathered; weight the relative importance of each conservation value based on group input; and generate new visualizations to help with assessing the geographic distribution of high value conservation lands in the region.

GIS models like weighted overlay are based on a hierarchical structure that defines how data layers are grouped together and then integrated. In this project, source data layers for each of the eight core conservation values were combined to create new ‘modeled value maps.’ The modeled value map for Terrestrial Habitat, for instance, was created by combining data for undeveloped habitat ‘blocks’ (ranked by size), three data sets focused on bird habitat, potential habitat corridors, and deer wintering areas. In the next section of this report, individual modeled value maps are presented in the top right-hand corner of each large conservation values and priorities map.

The next step in the GIS modeling process was to merge the eight modeled value maps into a single ‘combined values map’ (see below). This map, which appears on the opposite page, shows the distribution of relative

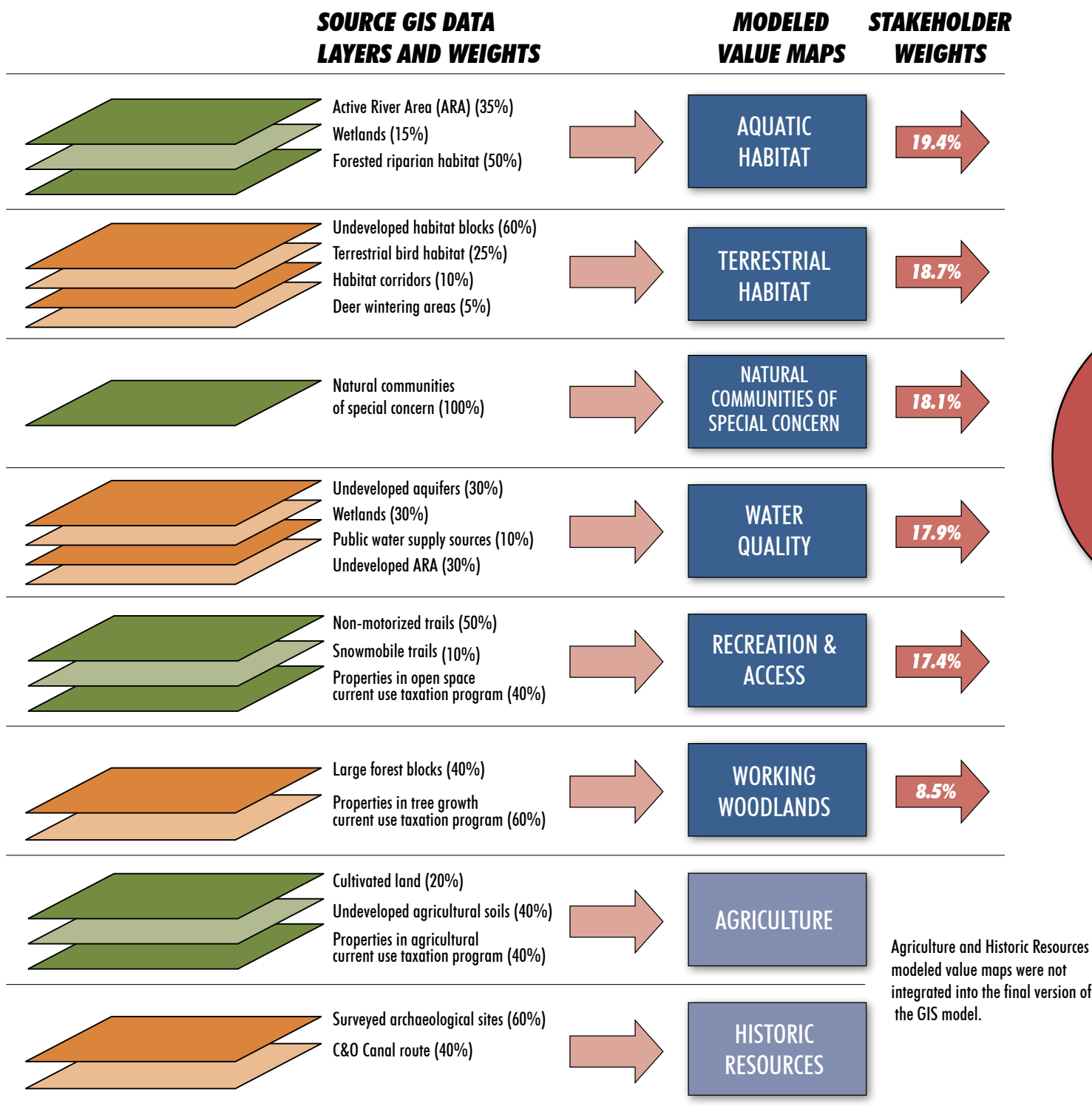
conservation values for any part of the watershed and across all conservation values. Areas predicted to have the highest conservation value are mapped in dark red; lighter colored areas on the map correspond to areas that have lower relative conservation value according to the model.

Numeric weights are applied to the data sets at each step in the process to make the GIS model responsive to the relative importance of each data set based on project participants’ values. A subset of the project Steering Committee developed the weights that were applied to the source data sets to create the modeled value maps. Engagement of the full stakeholder group determined the weights that were used in the final step of the model to create the modeled combined values map. These weights are shown in the diagram below.

How these maps were used in identifying conservation priorities

The set of conservation values maps generated through the GIS-modeling process provides new ways of looking at the geographic distribution of conservation value across the watershed. By themselves, the group found the maps challenging to use for the purpose of identifying conservation priority areas. The complexity of the GIS model and resulting maps were confusing to some members of the stakeholder group. In addition, the scattered and highly fragmented distribution of conservation value shown on the final, combined value map (opposite page) made it difficult to identify discrete conservation priority areas. For these reasons, all GIS-modeled maps were used as decision-making aids as part of our process. Most commonly, the areas identified as high value on the individual modeled value maps were used to help refine the placement of priority area boundaries and to validate decisions that were made.

GIS DATA MODEL FRAMEWORK



GIS-modeled Combined Conservation Values





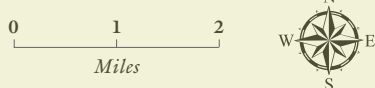
GIS-modeled Conservation Values

Relative conservation value for aquatic habitat

■ Highest	■ Low
■ High	■ Lowest
■ Moderate	■ No value

Aquatic habitat conservation priority

- | | |
|-------------------------|--|
| Active River Area | Wetlands |
| Wild brook trout stream | Catadromous fish habitat - Current and Assumed |
| Wild brook trout pond | Anadromous fish habitat - Current and Assumed |



Data sources:
 Beginning with Habitat
 The Nature Conservancy
 USFWS-Casco Bay GIS Service Center
 Maine Office of GIS

Aquatic Habitat Conservation Values & Priorities

About this conservation value

Native aquatic ecosystems are important for multiple reasons, and we value the rivers and streams that connect to Casco Bay and serve to exchange energy, organisms, and nutrients in both directions.

Wild brook trout populations provide fishing enthusiasts with opportunities to enjoy trout fishing near Maine’s most populated area. Brook trout require access to cool water during the hot summer months. Many resource managers consider brook trout to be a ‘forest species’ due to its sensitivity to reduced watershed forest cover and increases in impervious surfaces. Some areas of the Presumpscot River Watershed, by virtue of their mature forest land cover, continue to provide native brook trout with access to cold water refugia during summer months when the main stem of the river has become too warm. Maine is the last stronghold for native brook trout throughout its range, but the species could be highly vulnerable to expected changes in precipitation and temperature associated with climate change. Good buffer protection and land use planning, especially the protection of headwaters and groundwater seeps, is more critical than ever for this species.

Historically, the Presumpscot River supported thriving sea-run fisheries that included Atlantic salmon, American shad, and alewife. Today, substantial efforts are underway to restore anadromous species and other fish of interest. Following the removal of the Smelt Hill Dam in 2002, sea-run fish have begun to return to the Presumpscot, including alewives, which swim up Mill Brook to Highland Lake each spring to spawn. Alewives are eaten by many of the species we identify with our native coastal ecosystems, including eagles, osprey, striped bass, cod, haddock, and Atlantic salmon. Alewives are also preferred bait for the lobster fishery. Fish passage at Cumberland Mills Dam, completed in 2013, will further enhance the long-term prospects for recovering sea-run fisheries in the Presumpscot. Today, the Presumpscot River Watershed supports several species that are State or Federally listed as threatened or endangered, or that are being considered for listing, including: short-nosed sturgeon, Atlantic sturgeon, river herring, American eel, and the freshwater brook floater mussel.

Efforts to recover and protect aquatic habitat in the Presumpscot are often disconnected from land use planning in local communities. Land protection is critical for maintaining the qualities that enable aquatic ecological communities to thrive. Aquatic habitat is influenced by what is happening upstream in the watershed. Tree

cover and shading, the quality and extent of the riparian buffer, the presence of woody debris, hydrology, development/impervious surfaces, stormwater runoff and geomorphologic characteristics affect the physical, chemical, and biological characteristics of the water, which, in turn, influences the type of species that live there.

Threats to aquatic habitat include development of riparian areas and increasing impervious surface area, which collects contaminant-laden stormwater, sediment, and debris that flow into waterways during rain storms. Roads can create barriers to aquatic organism passage as well as to the movement of sediment, wood and terrestrial species. Dams create impoundments that are warm and resemble lakes and ponds, and present an insurmountable barrier to most aquatic organisms. Aquatic communities in the Presumpscot’s impoundments differ because sensitive, native organisms cannot survive. Other threats include climate change and invasive species.

What this map shows

The map illustrates the best available information we have on the location of high value native aquatic species, including wild brook trout, and diadromous (sea-run) fish. Although aquatic habitat quality is influenced by the characteristics of the watershed as a whole, this map highlights those parts of the landscape that most directly influence waterways, including riparian corridors, floodplains, headwater streams, and wetlands.

The Nature Conservancy’s Active River Area map layer provides a comprehensive picture of the ‘footprint’ of a river or stream, and the landscape processes that affect it, including the stream and river channels, as well as the riparian lands “necessary to accommodate the physical and ecological processes associated with the river system” (Smith *et al.*, 2008). The Active River Area approach recognizes that rivers are dynamic systems that evolve and change over time. Also shown are wetlands from the National Wetlands Inventory, which in some cases overlap with the Active River Area.



ALEWIVES ATLANTIC SALMON FEDERATION



The numbers used on this map are for reference only and do not indicate relative priority.

Aquatic Habitat Conservation Priorities

1. Pleasant River

The Pleasant River, in addition to supporting wild brook trout, is the southernmost documented location in Maine of the State-threatened brook floater freshwater mussel. Recent surveys indicate that the population is in decline due to habitat degradation and declining water quality.

2. Little River

According to Maine’s Department of Inland Fisheries & Wildlife, the south-flowing tributaries to the Little River,

including Douglas Brook, contain the healthiest eastern brook trout populations and cold water habitat in the watershed.

3. Mill Brook

Mill Brook, with its largely intact riparian corridor, is critical habitat for one of just two documented, self-sustaining alewife runs in the Casco Bay Watershed. The continued growth of this run could serve as a springboard for long-term recovery of sea-run fish throughout the Presumpscot tributaries.

4. Piscataqua River (West Branch)

Approximately 109 miles of rivers and streams in the Piscataqua River watershed were re-connected with Casco Bay when the Smelt Hill Dam was removed, providing access to anadromous fish as well as striped bass and other coastal fish. If passage into Forest Lake is restored, additional spawning habitat would become available to alewives.

5. Piscataqua River (East Branch)

A backbone of conservation land lies alongside much of the East Branch of the Piscataqua River, and local land trusts are working hard to build on this success. With wetlands and aquifers feeding headwaters, cold water habitat is available to brook trout. Knight’s Pond has been listed as a place where alewife spawning may occur. As a result of successful conservation efforts, the riparian corridor remains largely intact.



BROOK TROUT U.S. FISH & WILDLIFE SERVICE



BROOK FLOATER MUSSEL BIODRAWERSITY



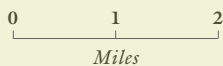
GIS-modeled Conservation Values

Relative conservation value for terrestrial habitat

■ Highest	■ Low
■ High	■ Lowest
■ Moderate	■ No value

Terrestrial habitat conservation priority

- Undeveloped habitat blocks
- Inland waterfowl/wading bird habitat
- Predicted habitat corridor
- Tidal waterfowl/wading bird habitat
- Deer wintering area
- Shorebird habitat



Data sources:
Beginning with Habitat
The Nature Conservancy
Maine Office of GIS

Terrestrial Habitat Conservation Values & Priorities

About this conservation value

Southern Maine has historically supported the highest diversity of plants and animals in the state. Many native birds, fish, plants, and mammals depend on large undeveloped habitat areas with interior forest habitat. The continued persistence of these species requires preservation of the terrestrial ecosystems on which they depend. Forest specialists, such as migrant songbirds, require large blocks of forested habitat to nest; some mammals, such as bear and lynx, utilize large areas of forest; and native aquatic organisms, such as brook trout, depend on the cool, shaded waters that are found below the forest canopy. Forests are vital to maintaining in-stream habitat; woody debris influences channel features, creates pools for fish, provides habitat complexity, and increases macroinvertebrate diversity and abundance.

Maintaining habitat for species that require large areas and interior forest habitat requires protection of remaining large undeveloped forest blocks, particularly those that connect multiple blocks. The Greater Portland Area is one of the fastest growing parts of the state. As forests and fields are converted to development, the habitat benefits associated with large undeveloped blocks are reduced, resulting in the local disappearance of once common species and contributing to an overall decline in local species diversity. Patchy development patterns reduce interior forest, wetland, and field habitat, and as undeveloped blocks grow smaller, the number of specialist species that can persist declines. Large blocks of conservation land—and protecting habitat connections between those blocks—is one of the most promising strategies for maintaining habitat resiliency in the face of climate change. The watershed's river and stream corridors themselves are important migratory/travel routes for many species, adding to the importance of protecting contiguous habitat along water bodies.

Large forested blocks often co-occur with woodlands, particularly areas designated as tree growth parcels. Forest management practices that incorporate existing habitat features, are regularly updated, and use best management practices to protect terrestrial habitat values, are most likely to minimize conflict between forestry and habitat benefits, and maximize the available habitat for interior forest species.

What this map shows

The Terrestrial Habitat map was created to emphasize the largest remaining undisturbed habitat blocks, identified by subtracting developed areas (*e.g.*, roads, buildings) from statewide land cover data. The result shows approximate blocks of intact habitat. Deer wintering areas, shorebird habitat, and inland waterfowl/wading bird habitat are highlighted.

Habitat is extensively fragmented close to the travel corridors between Portland and Sebago Lake, particularly near Routes 302 and 202, as well as areas closer to water bodies. A few pockets of undeveloped habitat remain, located between major roads. Although the presence of smaller roads divides some of these remaining blocks, there is still the potential to protect some of the largest areas and the corridors that help connect them.



CASCO BAY ESTUARY PARTNERSHIP



The numbers used on this map are for reference only and do not indicate relative priority.

1. Little Sebago Lake Watershed

Although the shores of Little Sebago Lake are developed, the adjacent watershed contains large contiguous habitat blocks. These areas encompass important wading bird and waterfowl habitat, and several lengthy habitat corridors. One of the largest deer wintering areas in Southern Maine is found along the eastern shores and upland of Little Sebago Lake.

Terrestrial Habitat Conservation Priorities

2. Little Duck Pond & Atherton Hill

This area stands out as being a significant part of the largest contiguous forest block between Mount Agamenticus, in York County, and Mid-coast Maine.

3. Muskrat Hollow

A solid core of protected land exists in this region, and there are significant opportunities to expand upon the existing conservation block. Local land trusts are working actively to build and expand on a regional trail network.

4. Little River Corridor

The North Branch of the Little River connects a series of undeveloped blocks that extend across Gorham from the Presumpscot River to Sebago Lake, and likely serves as an important wildlife corridor.

5. Presumpscot River Main Stem

The shores along this five-mile, undammed reach of the Presumpscot River upstream of Saccarappa Dam remain fairly intact, providing a unique opportunity to protect a block of contiguous terrestrial habitat that also serves as a wildlife corridor. Sea-run fish will begin to return to this segment of the river in 2014 and beyond.



SUCKFISH BOG, FALMOUTH CASCO BAY ESTUARY PARTNERSHIP



ROYAL RIVER CONSERVATION TRUST

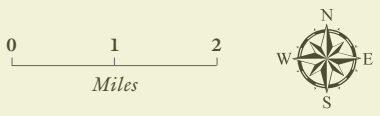


GIS-modeled Conservation Values

Relative conservation value for communities of special concern

Dark Red	Highest	Light Orange	Low
Red	High	Yellow	Lowest
Orange	Moderate	White	No value

- Natural communities of special concern conservation priority
- Significant vernal pools
- Rare and exemplary plant locations and communities
- Rare, endangered and threatened species occurrences
- Forested active river areas adjacent to brook floater mussel habitat



Data sources:
Beginning with Habitat
The Nature Conservancy
Maine Office of GIS

Natural Communities of Special Concern Conservation Values & Priorities

About this conservation value

Maine contains a variety of plant and animal life, many of which are woven into our local sense of place. Some species and communities are uncommon enough that they could disappear if precautions are not taken, and go the way of the once abundant Atlantic salmon (referred to in some historical documents as the 'Presumpscot Jumper'). To ensure that rare and threatened species and natural communities of special concern are protected for future generations to enjoy, we need to locate and protect areas where these individuals persist as well as the habitat on which they depend. Threats to natural communities and species of concern include habitat fragmentation, habitat degradation, pollution, and other forms of human disturbance. In many cases, protecting the land that these species depend on is the only long-term option for maintaining their presence in the region.

What this map shows

This map primarily depicts documented occurrences of rare, threatened, and endangered species and communities in the watershed, information that is tracked statewide by Maine Department of Inland Fisheries & Wildlife (IFW) and the Maine Natural Areas Program (MNAP).

Sites shown represent species ranging from brook floater freshwater mussels to New England cottontail rabbits to wood turtles, and also include plants and insects. Exact locations of documented species occurrences are buffered in order to protect private landowners and sensitive species. The map also displays significant vernal pools that have been mapped by the State, as well as aquatic habitat adjacent to documented brook floater mussel sites in the Pleasant River.

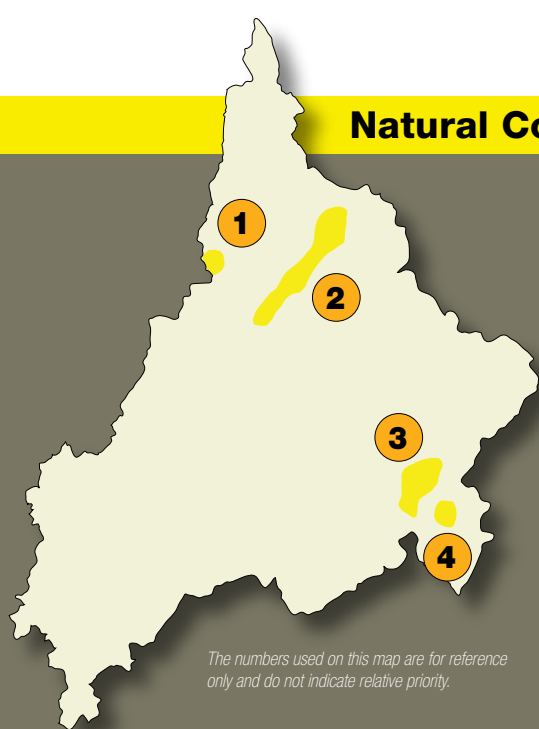
The map shows several clusters of rare and threatened species, particularly within coastal communities. One possible explanation for the clusters is that some towns have been inventoried more thoroughly than others. Overall, the data presented should not be considered comprehensive. For example, not every community has conducted assessments for significant vernal pools, and not all town data has been reviewed and accepted by the State. The information regarding vernal pools needs to be supplemented by municipal information gathering.

The Presumpscot River Watershed includes the southernmost population of the State-threatened brook floater freshwater mussel, which is found in the main stem of the Pleasant River in Windham. Recent population assessments for the Pleasant River population show that the species is at risk of becoming locally extirpated due to heavy sediment loads that are degrading water quality.



SIGNIFICANT VERNAL POOL VANESSA LEVESQUE

Natural Communities of Special Concern Conservation Priorities



The numbers used on this map are for reference only and do not indicate relative priority.

1. North Windham Pitch Pine Bogs

A cluster of pitch pine bogs lies between the Sebago Lake Basin and Little Sebago Lake in North Windham. This community type, which ranks as an 'S2' for its relative rarity in the state, is sparsely forested but dominated by pitch pines, with berry shrubs a common ground layer.

2. Pleasant River Main Stem

This priority area represents the approximate reach of river where the State-listed freshwater brook floater mussel has been found. Sensitive to poor water quality conditions caused by sedimentation and low dissolved oxygen levels, this population is the southernmost in Maine, and one of just four that have been documented statewide.

3. Piscataqua River/Presumpscot River Confluence

Much of this region is permanently protected thanks to municipal and private efforts. The landscape around this confluence contains a cluster of rare, endangered, and/or threatened species, significant vernal pools, and wood turtles. This region is home to half a dozen rare plants and several rare birds, including Blue-winged warblers, which are believed to nest here. It also has historical significance as the first Native American campsite on the path from the ocean to Sebago Lake.

4. Lower Presumpscot River Main Stem

This area has a high concentration of significant vernal pools and wood turtles, which tend to live close by to clean, flowing freshwater streams (according to recent survey work by Beginning with Habitat and the Town of Falmouth). The intact riparian corridor in this region serves as important corridor for terrestrial wildlife, while providing shade and woody debris to aquatic habitat.



WOOD TURTLE MAINE INLAND FISHERIES & WILDLIFE



PITCH PINE BOG MAINE NATURAL AREAS PROGRAM

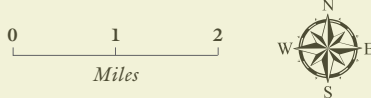


GIS-modeled Conservation Values

Relative conservation value for water quality

Highest	Low
High	Lowest
Moderate	No value

- Water quality conservation priority
- Wetlands
- Aquifers
- Active River Area
- Public water supply source with buffers (0.25 mile)



Data sources:
 The Nature Conservancy
 Maine CDC - Drinking Water Program
 Maine Office of GIS

Water Quality Conservation Values & Priorities

About this conservation value

Clean water is important to all of us, whether we swim in it, drink it, or fish in it. All native aquatic organisms depend on clean water as habitat. We value clean, safe water to support habitat and drinking water supplies. Aquifers are also critical for maintaining cold water fisheries.

Since the days when local communities and factories used the Presumpscot River as a conduit for disposing raw sewage and other wastewaters, water quality in the Presumpscot River Watershed has improved significantly. However, recent trends show that these gains in water quality appear to be waning; as of 2010, eight sections of stream or river habitat in the Presumpscot Watershed were listed as impaired by the Maine Department of Environmental Protection.

The Presumpscot River begins at the outlet of Sebago Lake, which serves as the water supply source for much of the Greater Portland Area. In this initial reach of the river, water quality is considered very high quality, but as water travels down the main stem, and in through tributaries, water quality is impacted by permitted discharges of pollution, stormwater runoff, development (impervious/paved land cover), and dams.

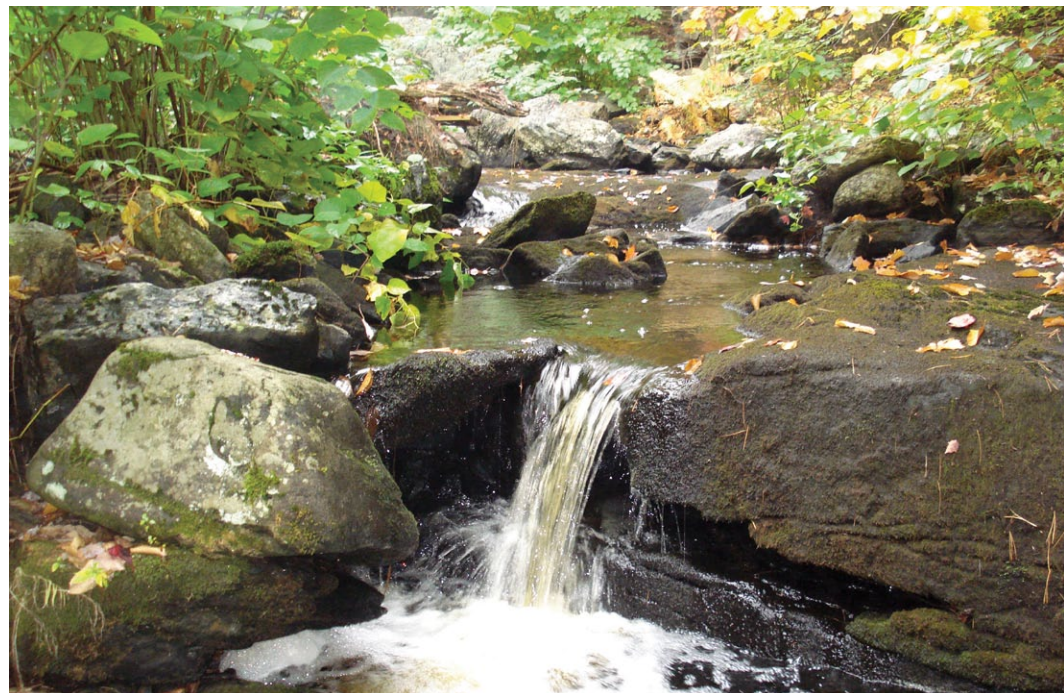
In many ways, the Presumpscot's water quality reflects the characteristics of the landscape. Although reduction in point source pollution from industrial discharges and sewer systems has contributed to significant water quality improvements in the lower main stem of the Presumpscot River, in densely developed areas, the impervious surface cover of some sub-watersheds exceeds 10%, a threshold which is known to impact aquatic ecosystems and degrade water quality.

Protecting water quality requires much more than land protection—it requires that people rethink the way that development occurs on the landscape. Many local communities are working hard to address this problem. Land conservation can play a significant role in protecting areas that directly affect the water, such as floodplains, drainages, riparian areas, wetlands, and aquifers. Land conservation groups can also steward properties so that the benefits to water quality protection are maximized, ensuring that these areas are permanently undeveloped, undisturbed, and naturally vegetated with trees and woody shrubs. In some cases, purchasing developed land adjacent to water bodies then returning the land to a naturally vegetated state can produce immediate and significant benefits to water quality by reducing and eliminating local stormwater runoff and associated water quality impacts.

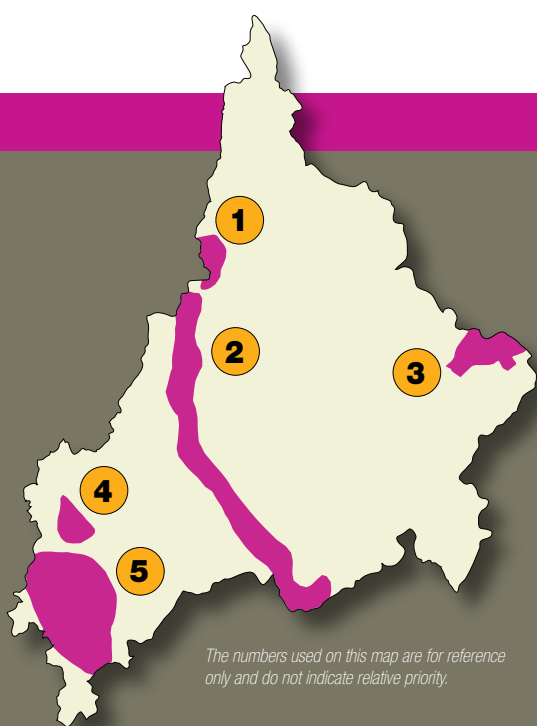
What this map shows

Although water quality is influenced by the characteristics of the watershed as a whole, this map highlights those parts of the landscape that most directly influence waterways, including riparian corridors, floodplains, headwater streams, and wetlands. The Nature Conservancy's Active River Area (ARA) map layer provides a comprehensive picture of the 'footprint' of a river or stream, and the landscape processes that affect it, with existing developed areas in this footprint removed. This holistic approach to managing rivers recognizes that rivers are dynamic systems that evolve and change over time. Although water quality is often associated with surface water, groundwater often feeds surface water sources. Significant aquifers, mapped by the Maine Geological Survey, illustrate these connections, and highlight important long-term drinking water supply sources. Also shown are wetlands, tracked by the U.S. Fish & Wildlife Service and documented in the National Wetlands Inventory, which in some cases overlap with the Active River Area, aquifers, and public water supply sources.

Collectively, the areas displayed on this map represent the most important places to conserve in order to protect and maintain water quality. The map shows that the corridors around much of the watershed's rivers and streams remain intact. Headwater areas, which generally lie at the outer areas of the watershed, are rich in wetlands, aquifers, and overall have a large ARA 'footprint.' Maintaining good water quality begins with protection of headwater streams and aquifers.



HEADWATERS OF THE WEST BRANCH PISCATAQUA RIVER CASCO BAY ESTUARY PARTNERSHIP



The numbers used on this map are for reference only and do not indicate relative priority.

Water Quality Conservation Priorities

1. North Windham/Little Sebago Lake

A significant complex of wetlands and aquifers lines the upland of Little Sebago Lake's southwestern shores.

2. Upper Presumpscot River Main Stem

Where the Presumpscot River drains out of the Sebago Lake Basin, it is classified Class 'A,' with lower reaches classified as Class 'B+' until reaching downtown Westbrook. Maintaining an intact riparian corridor along the shorelines can help to ensure that the river continues to meet or exceed high water quality standards. This area is also popular for fly-fishing and swimming.

3. Cumberland

An aquifer provides an important, potentially long-term source of drinking water. Cold water seeps from here into the headwaters of the East Branch of the Piscataqua River.

4. Douglas Brook Aquifer

A complex of wetlands and aquifers feeds clean, cold water to headwaters of Douglas Brook, considered one of the best native brook trout streams in the Presumpscot Watershed.

5. Buxton

Significant wetlands, floodplains, and riparian areas feed the headwaters of the Little River, another native brook trout stream. An aquifer provides an important source of drinking water.



CLASS A REACH OF THE PRESUMPCOT RIVER CASCO BAY ESTUARY PARTNERSHIP



INTACT RIPARIAN CORRIDOR CASCO BAY ESTUARY PARTNERSHIP



Relative conservation value for recreation/access

■ Highest	■ Low
■ High	■ Lowest
■ Moderate	■ No value

Existing trails - Non-motorized	Recreation/Access conservation priorities
Future/Proposed trails	Discontinued roads
Snowmobile trails	C&O Canal towpath
Public boat launch	Hand-carry site
Conserved and public lands	Parcels enrolled in open space current use taxation program

0 1 2
Miles

Data sources:
Maine Office of GIS, Center for Community GIS, Portland Trails, Sebago to the Sea, Portland Water District, Casco Bay Estuary Partnership, and the Municipalities of: Falmouth, Windham, Gray, and Cumberland

Recreation & Access Conservation Values & Priorities

About this conservation value

Our communities live in and enjoy the Presumpscot River Watershed, and this landscape provides us all with a sense of place. Conservation efforts must not only protect habitat and water quality for the sake of the plants and animals that depend on them, but also ensure that we can collectively continue to use the land as we have historically—for hunting, fishing, hiking, paddling, bird watching, skiing, snowmobiling, mountain biking, and quiet reflection.

Mainers have historically relied on the good will of neighbors to allow recreational access on privately owned lands, but as parcels are subdivided and developed, access to the landscape tends to be reduced. Conservation organizations can protect large swaths of land and create trails and water access points on those properties, or they can purchase more limited easements to allow access along a trail or at a put-in location along a waterway.

What this map shows

The recreation priorities map focuses on access for two specific types of recreation: hiking/walking and boating. As such, the map depicts existing trails, discontinued roads (often used informally as trails), and proposed trails, as well as boat launches and hand-carry boat put-ins. The map also displays parcels enrolled as open space in the State's Current Use taxation program, some of which may be eligible for tax reductions because the owner provides public access, scenic 'open space,' or 'forever wild' habitat benefits. Although most of the trails displayed are public, some may not be open to the public without permission. The map also shows snowmobile trails for two reasons: combining what are now separate snowmobile trail maps onto one regional map may help snowmobile groups visualize needed links; and some of these trails may be appropriate for multiple uses, such as cross-country skiing or hiking, and may be useful for other trail stakeholders to see.

Significant effort went into collecting trail information from local groups to create this map, but please note that the data does not depict all trails and access points known to be in the region. Recreation information was especially limited for Buxton and Gray, and there are likely many more community trails not depicted here. In addition, there may be desired trail connections that we were not aware of when identifying priority larger-scale trail and water access corridors. A more robust gap analysis that incorporates input from local communities and adjacent regions would greatly inform regional trail connectivity needs. The Sebago to the Sea Trail serves as a backbone for expanding the regional trail network both within and beyond the watershed.



PRESUMPCOT PRESERVE, FALMOUTH CASCO BAY ESTUARY PARTNERSHIP



SACCARAPPA FALLS U.S. ENVIRONMENTAL PROTECTION AGENCY



The numbers used on this map are for reference only and do not indicate relative priority.

Recreation & Access Conservation Priorities

1. Gray/Windham

This priority area is a conceptual depiction of a desire to connect trail networks in Cumberland and Yarmouth up to Raymond. The exact location of these connector trails would depend on actual conservation opportunities and acquisitions within the general area shown.

2. Upper Presumpscot River Main Stem

This area provides potential opportunities for continuing trail access along the main stem of the Presumpscot River, while also connecting to the Cumberland & Oxford (C&O) Canal Towpath in places.

3. Cumberland & Oxford Canal Towpath

The C&O Canal was completed in 1830 to move goods between Portland and Sebago Lake, as well as points to the north. The route closely followed the Presumpscot River along much of its length. Boats could be pulled through the canal by horses on an adjacent towpath. Parts of that path are currently protected and contain hiking trails, and there is a desire to expand protection to other sections of the towpath.

4. Westbrook/Cumberland Mills

The local paddling community is interested in having a put-in location immediately downstream of the Cumberland Mills Dam for carry-in access and to portage boats around the dam.



STRIPED BASS MIDWEST BIODIVERSITY INSTITUTE



LAUNCHING AT SHAW PARK, GORHAM CASCO BAY ESTUARY PARTNERSHIP

Working Woodlands



Working Woodlands Conservation Values & Priorities

About this conservation value

Working woodlands support the economic vitality and community character of the region. There is a desire to promote a wide array of economic opportunities in the watershed, especially those that are culturally important in Maine, such as forestry.

Although the Presumpscot River Watershed is too developed to support large-scale forestry operations, there are still many small woodland owners in the region. They, too, feel the pressure of development, and may be able to sell their land for more money than they make harvesting wood. Also, as neighboring parcels transition to developed uses, small woodland owners may lose both the community support and goods and supplies needed to continue operating.

Conservation can play a role in supporting working woodlands by providing working lands easements for particular landowners as well as through the protection of large blocks of unfragmented forest.

What this map shows

This map brings together three data layers that are useful for assessing and understanding the current extent of working woodlands in the watershed: existing forest land cover, areas with greater than 500 acres of unfragmented forest, and parcels enrolled in the State's Tree Growth current use taxation program. Land cover data from 2002 illustrate that a significant amount of the watershed remains forested, but forested blocks are becoming increasingly fragmented as development expands into formerly rural areas. Few intact forested blocks greater than 500 acres remain. Current Use data show that woodlots are scattered throughout the watershed, and similarly fragmented as existing forest is subdivided and developed.

Individual Tree Growth properties, by virtue of their Current Use designation and the corresponding tax incentives that discourage development, present the highest value conservation opportunities for working woodlands. These woodlots are not circled as priority areas, but stand out as places where landowners may be particularly interested in partnering with land trusts to secure permanent working forest protection. These landowners actively manage properties for timber production, and thus maintain an economic base, rural character, and ecosystem benefits associated with working forests. Community forests provide similar values, economic benefits, and resources to towns.

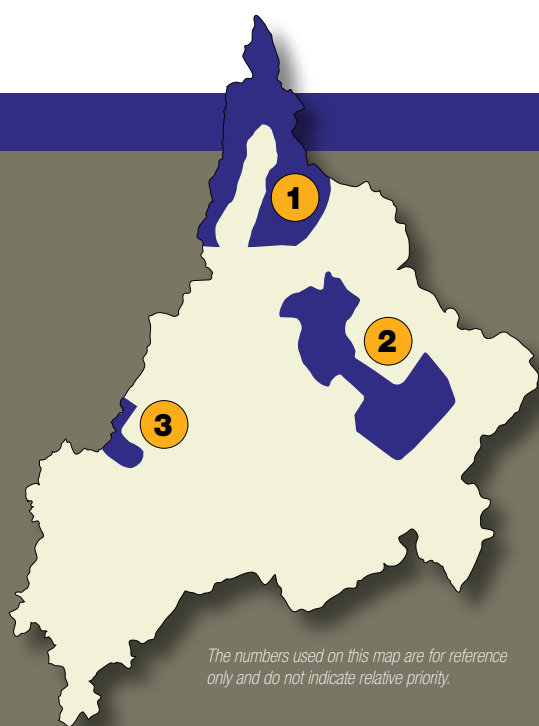
In addition to the Tree Growth parcels, priority areas drawn on the map reflect unfragmented blocks of forest land that are greater than 500 acres and have the greatest likelihood of supporting both working woodlands and forest ecosystems over time.

The priority areas shown may contribute to preserving the community, goods, and services that support long-term working woodlands in the watershed. Balancing terrestrial habitat with working forests promotes both natural and cultural values. It is important to note that the largest blocks of forest may not be good stands for forestry, and may in fact be more valuable as relatively large habitat blocks, particularly for those animals with large ranges.



FELLER BUNCHER U.S. FOREST SERVICE

Working Woodlands Conservation Priorities



The numbers used on this map are for reference only and do not indicate relative priority.

1. Raymond/Gray

This area adjacent to Little Sebago Lake contains the greatest concentration of unfragmented forest in the watershed. In addition, the area has been identified as a priority in the *The Lake Region Greenprint* (TPL and LELT, 2012) and contains some working forest easements.

2. Falmouth/Cumberland/Windham

This area is mostly forest within a rapidly developing part of the watershed, and thus provides both the opportunity and threats to raise it to a priority. Falmouth has been actively pursuing conservation in this region, which is a focus area for two local land trusts. Some parcels already have forest management plans in place.

3. Gorham/North Branch Little River

The unfragmented forest block in this area is adjacent to existing properties enrolled in Tree Growth. This area also surrounds the headwaters of the North Branch of the Little River, which is important brook trout habitat, and is contiguous with adjacent conservation land. A municipally designated growth zone is adjacent to, but outside of, this area.



CHEWONKI SEMESTER SCHOOL



MACHINE PLANTING RED AND WHITE PINE, GORHAM CASCO BAY ESTUARY PARTNERSHIP

VALUES Agriculture



Data sources:
 Maine Office of GIS, USDA-NRCS
 and the Municipalities of: Falmouth, Westbrook,
 Gorham, Windham, and Cumberland.

Agriculture Conservation Values

About this conservation value

Working farmland provides a secure source of locally grown food along with important economic benefits, while contributing to rural character in the region. In the Presumpscot River Watershed, locally-owned farms have persisted across many generations right next to the state's largest metropolitan area, providing both locally sourced food to communities, and a large, nearby customer base to farmers.

Working farms face many challenges. The high cost of fuel and food transportation, Maine's disproportionately high dependence on imported food, high rates of local hunger, and global food security concerns all contribute to the growing awareness of the importance of securing safe, locally grown food for local communities. Working farms are the most important asset for the burgeoning local food movement, providing the state's most populous region with local meat, crops, cheese, fruit, and flowers. Agricultural lands can also serve as habitat for birds and animals that rely on open fields. The wide open space of agricultural land provides unique scenic vistas, but can also be a very desirable place for development of new subdivisions due to the relative ease of building on a landscape with little forested area or rocky outcrops.

In order to maintain and support farming as a way of life and viable land use, local communities must continue to support local farmers. In addition to the most basic form of support—purchasing food grown by local farms when possible—a suite of conservation tools is also available to support local agriculture. Agricultural easements can help to solidify the economic viability of a farm, while ensuring that there are enough farmers in an area to maintain the materials, machinery, and services needed to support an agricultural economy. Other tools, such as town zoning and land use regulations, organized local farmers markets, and open space planning and protection, are also needed to help maintain farm-

friendly communities. Local land trusts have been successful in partnerships with Maine Farmland Trust to protect significant agricultural properties, and efforts to partner with local farms on permanent protection are ongoing.

What this map shows

The Agriculture Values map shows existing agricultural land cover, parcels enrolled in Current Use for agriculture, and high quality farmland soils. Current information on the status and type of working farmland was not available for this project, and the resources were not available to inventory each individual farm. Therefore, the data sets shown were used as surrogates. The region's significant agricultural soils are shown by displaying areas designated as containing farmland soils of statewide significance, and prime farmland, recognized by the U.S. Department of Agriculture/Natural Resource Conservation Service as having an optimal combination of physical and chemical characteristics for agricultural crops.

Two other data layers show indicators of past or current land use. The agricultural land cover data layer outlines areas in cultivation or production based on satellite imagery taken in 1999 and analyzed for land use by the State in 2004. Lastly, the map shows parcels enrolled as Farmland in Maine's Current Use taxation program. The properties meet guidelines for active farming in order to have decreased property taxes; the degree of actual farming cannot be determined. Taken together, this map presents the areas of the watershed that are likely to be of highest value for agriculture, which can be useful for organizations interested in protecting and promoting local farms in the region.

Although stakeholders collectively identified agriculture as an important regional conservation value, we did not attempt to identify specific priorities for agricultural lands. Instead, agricultural lands were, as a whole, recognized for the importance of individual farms to the region. For the purposes of this project, all working farms are considered important. Conservation of working farmland presents unique opportunities to combine local economic benefits with expanded recreational assets while maintaining open space.

PORTLAND FARMERS MARKET COREY TEMPLETON



PRIORITIES Overlapping Areas

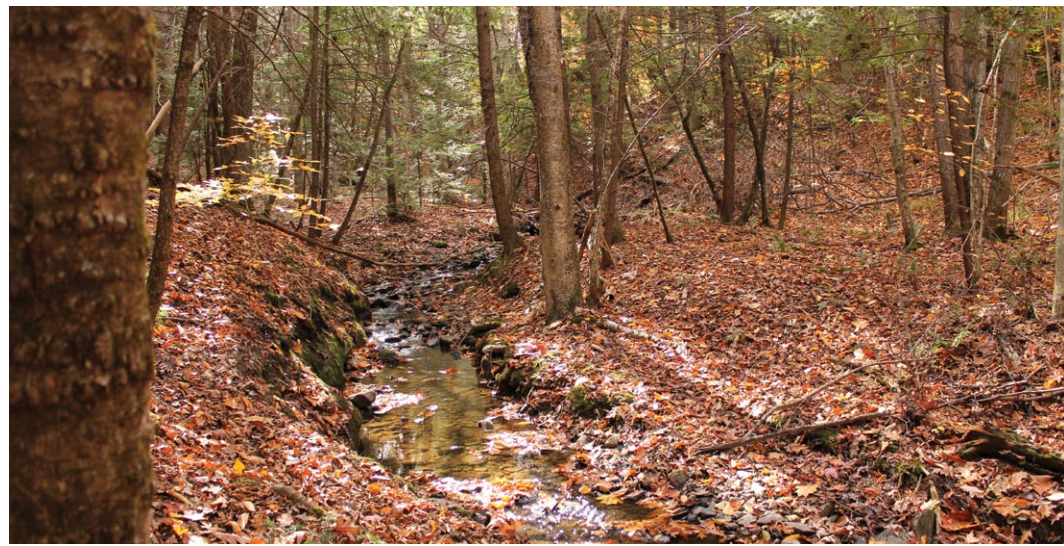


Areas with Multiple Priorities

The priority conservation areas highlighted on each of the previous maps show regions that were identified as important for specific values, such as for protecting aquatic habitat and providing recreation opportunities. These priority areas stand on their own as significant and worthy of protection. However, there is also interest in knowing what areas in the watershed contain more than one conservation priority.

To help us visualize what areas of the watershed contain overlapping priorities, we first combined all priority areas onto one map. The small map on the opposite page (top right) shows all of these areas together. We next conducted a visual assessment of where the individual priority areas overlapped and outlined those regions. The outlined areas are relatively larger regions where at least three or more categories of underlying priorities intersect. The Overlapping Areas map (opposite page) shows those locations in the watershed that are important for at least three conservation priorities. Detailed descriptions of the multiple conservation values found in these areas are presented below.

There is one important limitation of the overlapping priorities map: some values will by definition not overlap. It may be tempting to perceive areas without overlapping priorities are less important, while in fact, there may be some places that stand out as extremely significant for a specific conservation value. For example, Mill Brook, an aquatic habitat priority area, is unique to the watershed in that it contains the only self-sustaining anadromous fish run.



CASCO BAY ESTUARY PARTNERSHIP



CASCO BAY ESTUARY PARTNERSHIP

Areas with Multiple Overlapping Conservation Priorities

1 Morgan Meadows to Highland & Forest Lakes Corridor

This region, which runs from northern Highland Lake to northern Little Sebago Lake, contains conservation priorities for aquatic habitat, terrestrial habitat, natural communities of special concern, recreation and access, and working woodlands.

Aquatic habitat: The headwaters of the Pleasant River are in this region, and the river, in addition to supporting wild brook trout, is the southernmost documented location of the State-threatened brook floater freshwater mussel. Recent surveys indicate that the population is declining due to habitat degradation and declining water quality (Nadeau, 2010).

Terrestrial habitat: Although the shores of Little Sebago Lake are developed, the adjacent watershed contains a large contiguous habitat block. This area contains important wading bird and waterfowl habitat, and several lengthy habitat corridors. One of the largest deer wintering areas in Southern Maine is found along the eastern shores and upland of Little Sebago Lake.

Natural communities of special concern: As mentioned above, the area shown includes the southernmost occurrence of the brook floater freshwater mussel. In addition, this region is believed to be habitat for the New England cottontail rabbit.

Recreation and access: The recreational value of this area is conceptual; there is a desire to connect trails in Cumberland and Yarmouth north to Raymond. The exact location of these connector trails would be dependent on actual conservation opportunities in this region.

Working woodlands: This area adjacent to Little Sebago Lake contains the greatest concentration of unfragmented forest in the watershed. In addition, the area has been identified as a priority to a neighboring land trust (Loon Echo Land Trust), and contains several working forest easements.

2 Little Sebago West

The area southwest of Little Sebago Lake is a conservation priority for terrestrial habitat, natural communities of special concern, and water quality.

Terrestrial habitat: Although the shores of Little Sebago Lake are developed, the adjacent watershed contains a large contiguous habitat block.

Natural communities of special concern: This area contains important wading bird and waterfowl habitat, and several lengthy habitat corridors. A cluster of pitch pine bogs exists at this location—a State ‘S2’ listed community by MNAP.

Water quality: This region contains a cluster of significant aquatic resources, including an aquifer, wetlands, and vernal pools.

3 Little River Headwaters

This area contains aquatic habitat, terrestrial habitat, and working woodlands conservation priorities.

Aquatic habitat: The northern Little River (along with Douglas Brook right outside of this overlapping priority area) contains the healthiest wild brook trout populations and best cold water habitat in the watershed.

Terrestrial habitat: The North Branch of the Little River connects a series of undeveloped blocks that extend across Gorham from the Presumpscot River to Sebago Lake.

Working woodlands: The unfragmented forest block in this area is adjacent to existing properties enrolled in the Tree Growth current use taxation program. This area also surrounds the headwaters of the North Branch of the Little River, and is contiguous with already conserved land.

4 Presumpscot River Main Stem

The Presumpscot main stem is a conservation priority for terrestrial habitat, water quality, and recreation and access.

Terrestrial habitat: The shores along a 5-mile, undammed reach of the lower Presumpscot remain largely intact, providing a unique opportunity to protect a large reach of terrestrial habitat. Sea-run fish began returning to this segment of the river in 2013, and the shoreline serves as an important wildlife corridor.

Water quality: The upper Presumpscot main stem is a priority for maintaining existing clean water (Class A and B+). It is a high priority area for the Town of Windham and local land trusts.

Recreation and access: This area provides potential opportunities for continuing trail access along the main stem of the Presumpscot, while also connecting to the Cumberland-Oxford Canal Towpath in places. Parts of the C&O Canal path are currently walking trails, and a desire exists to protect the rest of the towpath. The area is also popular for fly fishing and swimming.

5 Piscataqua River Watershed

This region encompasses the East and West Branches of the Piscataqua River and is a priority conservation area for aquatic habitat, terrestrial habitat, water quality, and working forestland.

Aquatic habitat: Approximately 109 miles of rivers and streams in the Piscataqua River watershed were reconnected with Casco Bay when the Smelt Hill Dam was removed, providing habitat access to shad, alewives, striped bass, and other native fish. As a result of successful conservation efforts, the riparian corridor remains largely intact, providing a good base from which to extend protection.

Terrestrial habitat: A strong core of protected land exists in this region, and there are significant opportunities to expand upon the existing conservation block, providing opportunities for both wildlife and a regional trail network.

Water quality: An aquifer provides a source of drinking water in the headwaters of the East Branch of the Piscataqua River.

Working woodlands: This area is mostly forest within a rapidly developing part of the watershed, and thus provides both the opportunity and threats to raise it to a priority. Furthermore, this area is a focus for two of the local land trusts, and some of it already has forest management plans in place.

Next Steps & Conclusion

Next Steps

This document lays out a vision and set of conservation values and priorities for the Presumpscot Watershed. In the last few meetings preceding the drafting of this report, we held several discussions about how to proceed in order to maximize the impact of our work. Although we did not seek consensus agreement upon specific strategies, several recurring suggestions were raised that warrant documentation here for future consideration.

Public Outreach: Sharing our findings with the broader community, and public at large, will multiply the value of this work. Public outreach could be accomplished through a combination of activities such as: presenting to communities, land trust memberships, conservation organizations, and educational institutions; attracting media interest and coverage; and providing copies of this report to local libraries and conservation commissions. Although limited copies will be printed and distributed, a reformatted version will also be available on the Internet.

Share GIS Data: To make best use of the data we developed, GIS layers should be made available to land trusts, municipalities, and other organizations, providing that permissions are granted by the original data providers. Several ideas were raised about how to deliver GIS data, ranging from simply burning and handing out CDs, to creating a GIS ‘Circuit Rider’ position for GIS support, to creating online GIS mapping tools that allow limited interaction with these data.

Municipal Planning: Outreach to municipal governments and employees was suggested by many stakeholders as a way of ensuring that communities are provided access to the information we have gathered and developed. More importantly, we might assist municipalities to incorporate our data into local GIS databases, to integrate findings on conservation values into official planning and conservation documents, and to engage in dialogues with local land trusts about strategies for conserving land within priority areas.

Regional Recreation Needs and Opportunities: Our focus on access to the land and water for recreation was necessarily constrained, but there is a strong interest in diving deeper into this topic. We see the need for a broader, regional dialogue on regional trail networks, improved access to the water, and an untapped potential for multi-use trails. The discussion should foster a dialogue inclusive of a broad range of user groups, from hunters to cyclists to snowmobile clubs. Significant opportunities exist; suggestions raised include the creation of a regional snowmobile trail map, a paddling guide to the Presumpscot River, and building upon the success of the Sebago to the Sea Trail to expand trail connectivity into surrounding communities.

Climate Change Adaptation: The Presumpscot’s conservation community should incorporate climate adaptation strategies into land protection planning as new and refined science-based strategies emerge. Landscape-scale conservation efforts will enhance ecosystem resiliency to disturbances likely to accompany climate change.

Maintain the Collaboration: The Presumpscot River Watershed Coalition served as the convening entity for this project, but the stakeholder group evolved into a unique, self-organized collaborative between land trust boards and staff, municipal conservation commissions and planners, resource agencies, and non-governmental organizations. There is universal recognition of the value of this collaborative among participants and widespread interest in maintaining the collaborative, but the path toward this transition remains uncertain. PRWC will likely serve as the forum where stakeholders regroup. As a bridge, CBEP will commission a study to explore how other landscape scale conservation efforts have successfully navigated the transition from planning to collaborative land protection.

Conclusion

The Presumpscot River Watershed remains a distinctive place within Maine, where inhabitants of the state’s largest urban area can step outside the city to find clean water, native fish and wildlife, locally-sourced foods and wood, and abundant recreational opportunities. After decades of turning away from the Presumpscot, communities still have an opportunity to strategically conserve the features that make this place special, and ensure that the characteristics of the region that we value today remain intact.

By taking a collaborative approach to prioritizing our land protection activities, we have identified exemplary places to protect for ourselves, and for the generations of Mainers to come. Laying out this vision was a first step, and the hard work of protecting land in these priority areas has already begun. Within the coming months and years, our work as individual organizations, and as a collaborative conservation community, will bring us closer to our joint vision of a healthy and vibrant Presumpscot River Watershed.

References

- Beginning With Habitat. www.beginningwithhabitat.org.
- Casco Bay Estuary Partnership. 2010. *State of the Bay Report*. Portland, ME: CBEP. www.cascobay.usm.maine.edu/sotb10.html.
- Casco Bay Estuary Partnership-Habitat Restoration Committee. 2008. *Recommendations for Future Restoration and Management Efforts for Mill Brook, Westbrook, Maine*. Portland, ME: CBEP. www.cascobay.usm.maine.edu/pdfs/mill_bk_restor_recommend_final.pdf.
- Friends of the Presumpscot River. www.presumpscotriver.org
- Knight, K. 2009. *Land Use Planning for Salmon, Steelhead and Trout*. Olympia, WA: Washington Department of Fish and Wildlife. wdfw.wa.gov/publications/00033.
- Krohn, W.B. and Hepinstall, J.A. 2000. *A Habitat-Based Approach for Identifying Open-Space Conservation Needs in Southern Maine Towns*. Maine Department of Inland Fisheries & Wildlife. www.beginningwithhabitat.org/pdf/Habitat_Based_Approach.pdf.
- Maine Department of Marine Resources. 2013. *Maine River Herring Fact Sheet*. www.maine.gov/dmr/searunfish/alewife/index.htm
- Nadeau, E. 2010. *Brook Floater (Alasmidonta varicose) Population Assessments in Nine Maine Rivers*. Biodiversity.
- Presumpscot River Watershed Coalition (PRWC). 2003. *A Plan for the Future of the Presumpscot River*. www.presumpscotcoalition.org/plan.html.
- Smith, M.P., Schiff, R., Olivero, A., and MacBroom, J.G., 2008. *The Active River Area: A Conservation Framework for Protecting Rivers and Streams*. Boston, MA: The Nature Conservancy.
- Trust for Public Land (TPL) and Loon Echo Land Trust (LELT). 2012. *The Lake Region Greenprint: A Community Partnership*. Portland, ME: TPL. cloud.tpl.org/pubs/convis-me-lake-region-report.pdf.
- Varrichhionne, J. 2008. *Large Wood In Streams: A Literature Review and Annotated Bibliography*. Maine Department of Environmental Protection.





