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The Presumpscot River, Background

Casco Bay Estuary Partnership

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THE PRESUMPCOT RIVER - BACKGROUND

Location: Cumberland County, Southern Maine, and flowing from Sebago Lake to Casco Bay through Windham, Gorham, Westbrook, Falmouth, and Portland.

Size Characteristics:

- Originally 27 miles long from White's Bridge at the top of Sebago Lake Basin, to Casco Bay.
- Watershed of 648 square miles
- Total drop of 270 feet

Regional Importance:

- Largest river in the Portland area, and largest freshwater input to Casco Bay.
- Water supply for Greater Portland.

Pre-development River of "Many Falls": The name "Presumpscot" has its origin from local native culture and means "many falls" or "many rough places." Before being developed with dams, the Presumpscot had at least 12 named falls along its length.

Early and extensive development with dams; one of Maine's most developed rivers:

- Earliest dam at Presumpscot Falls (site of recent Smelt Hill Dam) in 1732.
- No other river in Maine has had virtually all of its hydraulic head developed with dams: until the removal of the Smelt Hill dam in 2002, there were 9 dams impounding 22 of 27 miles of the river (see attached **Profile of the Presumpscot River**).
- Today there are 8 dams impounding 15 miles of the 20 miles above the Cumberland Mills dam. Dams (and their ownership and generation capacity) include:
 - Eel Weir dam (SAPPI) – 1.8 MW
 - N. Gorham dam (FPL) – 2.25 MW
 - Dundee dam (SAPPI) – 2.4 MW
 - Gambo dam (SAPPI) – 1.9 MW
 - Little Falls dam (SAPPI) – 1.0 MW
 - Mallison Falls dam (SAPPI) – 0.8 MW
 - Saccarappa dam (SAPPI) – 1.35 MW
 - Cumberland Mills dam (SAPPI) – 0 MW

Rich History Reflects competing Values for Development and Fisheries:

- Power from the river was fundamental to the economic development of the area from colonial times through the industrial era.. The Presumpscot was the site of Maine's first pulp mill, first hydroelectric project, and largest gunpowder mill.
- The Presumpscot River was the site of the first armed conflict between the settlers and Indians in Maine, in 1756, over the blockage of fish by dams (Chief Polin uprising). The Rockomeecook Tribe had settlements along the river where they harvested fish for food and fertilizer for corn.
- The first hundred years after the dams were built on the river, beginning in the 1730's and until around 1850, there were protests and filings to require fish passages at dams (some were built).
- Next 100 years (1850's – 1950's): River used for industrial waste; not suitable for fish. Industries included gunpowder, textiles, pulp and paper, and others. Cumberland and Oxford Canal built and operated 1829 – c.1870.
- Since 1970's: Clean Water Act; treatment of waste discharges; river begins recovery.
- Last decade: Flows to the Eel Weir bypass restored for trout and salmon fishery. SAPPI pulp operation ceases and Smelt Hill dam removed; spurs interest in restoring more of the river for fisheries.

THE PRESUMPSCOT RIVER - CUMULATIVE IMPACTS

What Are Cumulative Impacts?

Cumulative Impacts are **impacts resulting from development**, specifically **discharges** to the river, **land uses** in the watershed, and **dams**, which, although they may not individually be significant, combine to produce significant impacts to :

- the river (aquatic life, water quality and hydrology),
- its shorelands (as habitat for wildlife and areas for human recreation),
- the Casco Bay estuary into which it empties (affecting water quality and fisheries), and
- and, indirectly, the character and well-being of the general region (local and regional economy).

Why Are Cumulative Impacts a Concern?

Understanding how the river and its environs have been changed by development over time is important because:

- it provides an understanding of the character and values of the river that existed prior to changes from development, a **valuable context for understanding the potential of the river for improvements**;
- it provides the “big picture” context of the **full range of influences that need to be addressed** for efforts to improve the future of the river to succeed;
- it provides an understanding of **how improvements to the river indirectly affect the aquatic communities in Casco bay estuary, the wildlife community dependent on the river, and the human community using the river.**

How Have Water Resources Been Impacted?

Flow regimes have been altered due to flow regulation at Sebago Lake and dams impounding the river (see **attached hydrograph**):

- More consistent flows throughout the year; lower spring and higher summer flows.
- Decreased current velocity; change from a fast flowing river to a series of river impoundments.

Water quality has been degraded from pollution discharges, stormwater runoff, and land uses:

- more bacteria, suspended and dissolved solids, less oxygen due to direct discharges from industry and sewage treatment facilities;
- more sediment, fertilizers, pesticides, and other pollutants from stormwater runoff;
- warmer water temperatures resulting from clearing of forested land (eliminates shading of the river, and results in higher temperature runoff from watershed lands).

How Have River Fisheries and Other Aquatic Life Been Impacted?

Dams have altered the ecology of the River by:

- Blocking anadromous (sea-run) fish runs;
- Fragmenting river habitat for resident fish;
- Shifting the river from a fast moving coldwater riverine habitat favoring trout and salmon to a series of slower-moving impoundments more suited to (but not providing quality habitat for) bass and panfish. These impoundments function neither as rivers nor lakes.

Water quality impacts have reduced the suitability of the river for fish and other aquatic life.

How Have Threatened and Endangered Species Been Impacted?

- Reduced habitat for species associated with floodplain forests due to flooding by dams.
- Reduced habitat suitability for species that prey upon anadromous fish (e.g. bald eagles, osprey, and herons).

How Have Estuarine Resources Been Impacted?

Salinity - Natural seasonal variations in salinity have been dampened by flow regulation.

Chemistry of Estuarine Sediments - Higher levels of pollutants (PAHs, dioxins, furans).

Physical Character of Estuarine Sediments - More fines, less coarse sediments deposited in the estuary by river flows.

Water Quality - Changes may have eliminated eelgrass in the estuary as monitored in 1993-95.

Estuarine Animals - Reduced production of estuarine fish (in the tens of thousands of pounds) resulting from reduced spawning and reproduction in the Presumpscot River (resulting from blocking of runs by dams); reduced numbers and diversity of wildlife that are predators of these fish.

How Have Recreational Resources Been Impacted?

- Reduced opportunities for whitewater boating and extended canoe trips; and loss of coldwater fishing opportunities, due to impoundments.
- Increased opportunity for flatwater boating and bass and panfish fishing.

How Have the Local and Regional Economy Been Impacted?

- Development of the river for water power and then hydropower provided the basis for the region's early industrial economy, and remains a contributor to the local and regional economy. Hydropower continues to be important to SAPPI's operation in Westbrook as it is low cost.
- Industrialization of the river reduced water quality, and degraded the aesthetics of the river, reducing its attractiveness for boating, swimming, and other forms of recreation, and virtually eliminated the native coldwater sport fishery. These activities generate economic activity.
- The polluted, industrialized river of the past reduced the attractiveness of the river for development and its real estate value; a cleaner, more attractive river is already attracting development and increasing real estate values.
- Water pollution has resulted in costs for water treatment, public health costs, loss of recreational opportunities.

How Does the Plan Address Cumulative Impacts to the Presumpscot River?

The Plan offers a **Vision for the Future of the River** that promotes management to achieve benefits for all communities, both human and ecological, through a careful balancing of all potential uses.

It also includes **Recommended Management Objectives and Actions** to improve water quality and reclassify the river to reflect improvements, address non-point sources of pollution, improve and restore fisheries, protect and enhance river corridor habitat and wetlands, improve stewardship through public education, and improve flood protection. It recommends a **Presumpscot River Council** be formed to coordinate efforts to implement the recommendations of the Plan.

THE PRESUMPCOT RIVER – FISHERIES ISSUES

Why Are Fisheries a Concern for the Presumpscot River?

Removal of the Smelt Hill Dam (restoring 7 miles of the lower river) and improvements to water quality, especially improvements due to the closure of the SAPPI pulp mill, offers new possibilities for enhancement of resident fisheries and restoration of migratory (sea-run) fisheries.

What Fisheries Currently Exist in the Presumpscot River?

- **A Managed Stocked Trout and Salmon** in the Eel Weir Bypass and Dam tailraces;
- **Bass, Perch, and Bullhead** in the impoundments;
- **American Eels** in the river and impoundments;
- **Alewives** - in the lower river, seasonal spawning migrations to Highland Lake, Knights Pond.
- **Other migratory fish** expected to return to the lower 7 miles of the river up to Cumberland Mills dam include river herring, striped bass, and possibly Atlantic salmon, sea-run brook and brown trout, Atlantic sturgeon, rainbow smelt, and tomcod.

What is the Potential of the River for Sea-Run Fisheries?

The Maine Department of Marine Resources estimates that fish **runs totaling over 800,000 fish** could be established if all habitat was available and suitable up to the North Gorham impoundment, including:

- **American Shad** – runs up to 136,000 fish
- **River Herring** – runs up to 450,000 fish
- **Alewives** – runs up 200,000 fish
- **Atlantic salmon** – up to 1,000 fish (Maine Atlantic Salmon Commission estimate)
- **Other migratory fish** – not estimated

What Are the State Fisheries Agencies' Goals for the Presumpscot River?

- **Restore sea-run fish in phases:** Phase 1: as far as Gambo Dam; Phase 2: continue up the river of the 3 fisheries agencies agree.
- **Stocking free flowing reaches with trout and salmon** for angling opportunities.
- **Provide angling opportunities for other resident fish** – smallmouth and largemouth bass, chain pickerel, and perch.

What Can Be Done to Improve Fisheries in the Presumpscot River?

- **Enhance resident fish** through increased stocking of trout and salmon; possible habitat improvements for bass and panfish.
- **Restore migratory fish runs with fish passage at up to 3 dams** (would restore runs of up to 56,000 shad and 187,000 river herring at a cost of \$1 – 8 million).
- **Restore migratory fish runs by removing 3 dams (Saccarappa, Mallison, and Little Falls) and fish passage at up to 3 others** (would restore runs of up to 136,000 shad, and 450,000 river herring, at a cost of \$4 – 13 million). **Recommended option.**

THE PRESUMPCOT RIVER – RECREATION AND OPEN SPACE ISSUES

Why Is There Concern for Protecting Open Space Along the Presumpscot River?

- **An undeveloped corridor:** 84% of the river shoreline is undeveloped at present.
- **New development pressures:** Cleanup of the river and improved air quality in the area are prompting new interest in development along the river.
- **Window of opportunity:** Having an undeveloped river corridor with significant public benefits located so close to Portland is an opportunity to be seized before it is too late.

What Are the Public Values of Open Space Along the Presumpscot River?

- **Fish and wildlife habitat:** 80% of Maine’s terrestrial vertebrate wildlife species use riparian areas as habitat at some point in their life cycle.
- **Habitat for rare or unusual plant species;** many plants that thrive in floodplain areas are now rare, in part because these areas have been flooded by dams.
- **Flood retention:** offers space needed to accommodate and absorb floodwaters;
- **Water quality:** is a buffer that helps maintain the water quality of the river;
- **Agriculture:** provides viable opportunities for agriculture in the areas that are “prime” soils for crops; and
- **Recreation/Education:** offers opportunities for outdoor recreation and education.

What Public Recreation Lands and Access Areas Exist Along the River?

- Presently there are **11 public water access sites** along the river:
 - 6 in Gorham
 - 3 in Windham
 - 1 in Portland (+ additional access through recent land acquisition)
 - 1 in Falmouth (+ additional access through recent land acquisition)
 - Westbrook has no sites providing access to the water (for boating, fishing or swimming) although it has trails and lands along the river
- There are **29 public recreation sites, amounting to 675 acres.** The largest of these are
 - the Portland Golf Course (263 acres);
 - Presumpscot River Preserve (48 acres) in Portland,
 - Westbrook River Trail (57 acres), and
 - Dundee Park in Windham (26 acres).
- Public recreation lands comprise **15% of the lands within 250 feet of the river.**

What Protections Exist for Open Space Along the Presumpscot River?

- **Resource Protection Districts:**
 - Many areas of the shoreline are zoned Resource Protection:
(more than 60% of the shoreline in Gorham, Westbrook, and Falmouth; 40% of the shoreline in Windham and Portland)
 - However, the depth of the zone is frequently less than 250 feet so that development may still be allowed in the shoreland zone.

- **Public or Quasi-Public Ownership:**
 - Total of **16% of the lands within 250 feet of the river** (includes Portland Golf Course, and Riverton Trolley Park, also zoned as open space/recreation).
- **Legal easements or deed restrictions:**
 - Comprise **2.8% of the lands within 250 feet of the river.**

How Does the Plan Address Protection of Open Space and Recreational Lands?

The Plan recommends or promotes:

- **an initiative to identify and protect lands with high public values**, including:
 - Areas important for rare, threatened or endangered species of both plants and animals;
 - Significant wildlife habitats, which include but are not limited to the above;
 - Wildlife viewing areas which in many cases overlook, but may not be located in, significant wildlife habitats;
 - Significant botanical resources, which include but are not limited to occurrences of rare, threatened or endangered species;
 - Scenic areas;
 - Recreational resources, including recreational access points, fishing areas, opportunities for trails, and others;
 - Cultural resources; and
 - Educational resources (e.g., areas which allow study of geological features or biological systems).
- **dedicating existing public lands permanently to open space** through deed restrictions.
- **development of both a water trail and a land trail** for the length of the river.
- **creation of new access sites** along the river.
- **improvements to the Riverton Trolley Park**
- **renovations to portions of the Cumberland and Oxford Canal towpath.**