Agenda Item 5.2
For Information

Council

CNL(15)45

Penobscot River Restoration Project - A Multi-stakeholder Effort to Significantly Improve Access to Historic Habitat for Atlantic salmon and other Sea-run Fish

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The free-flowing stretch of the Penobscot River where the Veazie Dam once stood. Photo PRRT 2013.

Overview

The Penobscot River Restoration Project (Penobscot Project) is an unprecedented, innovative and collaborative effort to help restore severely depleted native sea-run fish populations while also maintaining hydropower production in the largest watershed within Maine. Major partners in the project include hydropower companies; federal, state, and tribal governments; and seven conservation groups.

In the 1980s and 1990s, a series of contentious dam relicensing proceedings on the lower Penobscot River failed to result in significant progress for energy interests or fisheries restoration. In 1999, a new owner of the lower Penobscot dams created the opportunity for further discussions about the future of hydropower development and fisheries management. The company (Pennsylvania Power and Light, later PPL Corporation) along with the US Department of Interior, the Penobscot Indian Nation, the State of Maine, and several conservation groups, decided to explore the development of a comprehensive solution to a large number of issues involving hydropower relicensing, migratory fish passage and ecological restoration on the Penobscot River. This discussion led to the Penobscot River Restoration Project.

The Challenge

The Penobscot River and its tributaries flow from near Mount Katahdin in the North Woods through the heart of Maine to Penobscot Bay. It is the largest river system within the State of Maine, draining 8,570 square miles or over one quarter of the State, and is the second largest river in New England. Maine is home to the last remaining wild Atlantic salmon in the United States; the Penobscot's returning run of approximately 1,000 fish (ten year average) is by far the largest remaining run.

For two centuries, the cumulative impacts of dams have caused widespread harm to people and wildlife. Native populations of Atlantic and shortnose sturgeon, American shad, alewives, blueback herring and sea lamprey have also been nearly or completely extirpated from the Penobscot. Populations of other native sea-run species, such as American eel, rainbow smelt,

striped bass, and tomcod, are remnants of their historical abundance. Researchers have linked the decline of inshore cod and groundfish populations to the damming of large rivers, such as the Penobscot, in the 1800's and the subsequent loss of the once prolific river herring runs.

Wildlife along the river corridor has been impacted by the dams. Fish eating birds, such as bald eagles and ospreys, need open-river stretches in winter. Songbirds suffer from decreased abundance of macroinvertebrates. Fish trapped in impounded waters above dams accumulate toxins which pass up the food chain. People have lost recreation and traditions (paddling, salmon angling), business, and culture. The Penobscot Indian Nation, and its members, whose reservation includes river waters and islands, are unable to fully exercise sustenance treaty fishing rights and cultural and ceremonial practices.

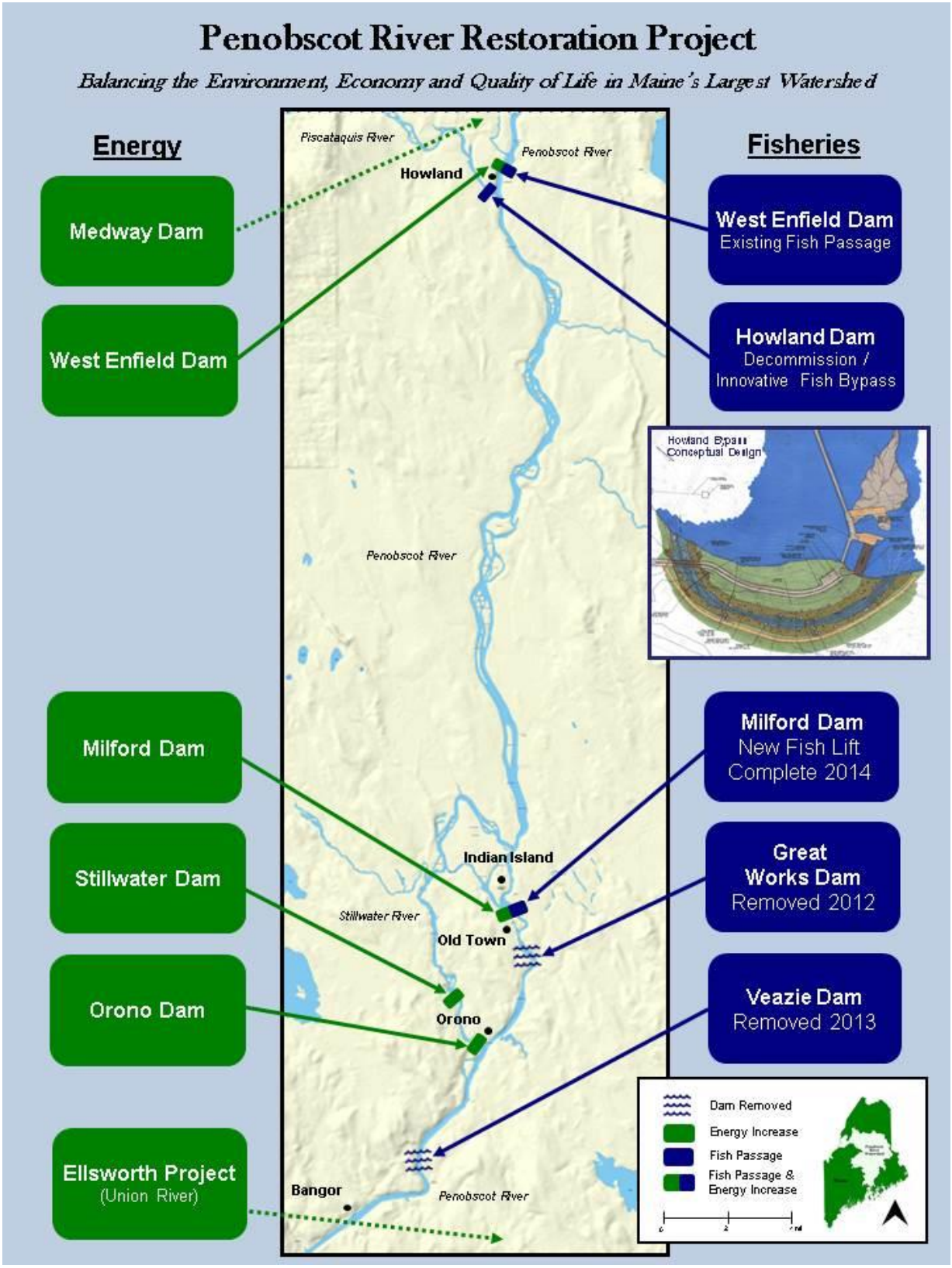
A 2004 National Academy of Sciences (NAS) report on Atlantic salmon in Maine affirmed that there are simply too many dams on the Penobscot River for successful salmon restoration, and that many other species would also benefit from dam removals. The NAS recommended a 'primary focus' on the Penobscot. The NAS's list of 'Urgently Needed Actions' is "'A program of dam removal, with priority on those dams whose removal would make the greatest amount of spawning and rearing habitat available.' The objective of opening access to historic habitat has since been echoed in numerous state, federal and tribal fisheries management plans. This Penobscot Project squarely addresses these recommendations.

The Plan

In June 2004, the Penobscot River Restoration Trust signed the Lower Penobscot River Multi-Party Settlement Agreement ('the Agreement'), a collaborative, far-reaching blueprint for a win-win, public-private effort to rebalance hydropower and sea-run fisheries on the Penobscot River. Since that time, pursuant to the agreement, the Penobscot Trust has exercised an option and purchased and decommissioned three Penobscot River dams; removed the two most seaward dams (Veazie and Great Works) and is currently building a fish bypass around the third, Howland. Under the plan, the power company would have the opportunity to apply for permits, with support from the other parties, for incremental energy increases at six existing dams. These increases would maintain or potentially exceed pre-project energy generation.

Projected benefits of the Penobscot Project are expected to include:

- providing unobstructed access to 100% of historic habitat for 'lower river' species such as Atlantic and shortnose sturgeon and striped bass;
- significantly improved access to nearly 1,000 miles of historic river habitat for endangered Atlantic salmon and other 'upper river' species of native sea-run fish;
- maintenance of hydropower generation;
- restoration of critical ecological functions that will benefit native plant and animal communities in the river, estuary, and Gulf of Maine;
- a cleaner, healthier, more resilient river;
- revitalisation of the Penobscot Indian Nation's culture and traditions;
- new opportunities for economic and community development in riverside communities;
- enhancement of outdoor recreation such as fishing, paddling, and wildlife watching; and
- resolution of a number of longstanding issues and avoidance of future uncertainties.

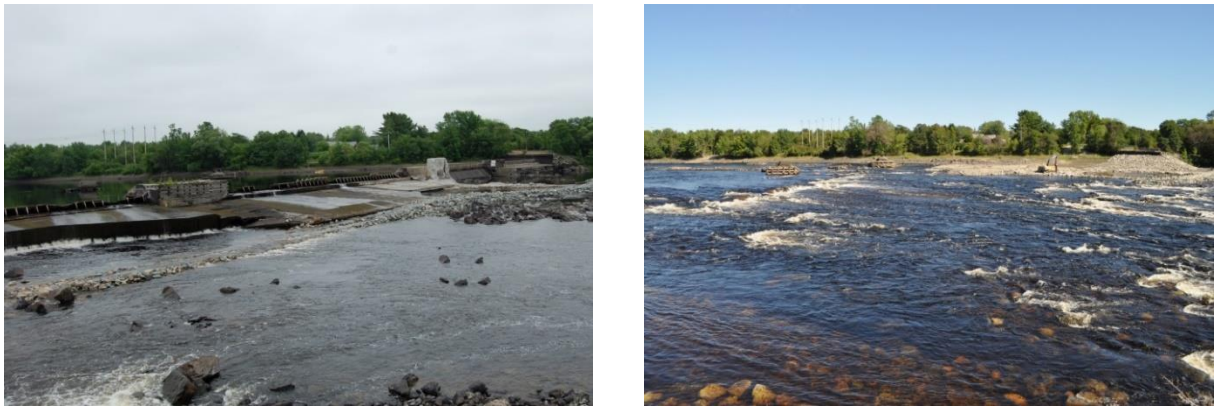


The river has been the ancestral home to the Penobscot Indians for more than 10,000 years. Members of the Penobscot Indian Nation will benefit from a free-flowing river that will re-connect their homeland to the Atlantic Ocean, an important migration and trade route. Renewed connectivity will also bring sea-run fish to the nation, and revitalize opportunities for historic

traditions. A restored river will help to strengthen and reinforce the Tribe's cultural heritage and identity.

Benefits of the Penobscot Project extend to the whole ecosystem and the Gulf of Maine. Endangered Atlantic salmon, American shad, alewives, blueback herring, and seven other species of migratory fish are expected to rebound, fueling large-scale restoration of the Penobscot ecosystem and benefiting its diverse wildlife. Sizeable populations of native fish will provide dependable feeding opportunities for fish-eating birds and mammals such as kingfishers, river otters, osprey, and bald eagles. Waterfowl, such as the Barrows goldeneye, will find winter food in newly open waters; birds of prey stand to benefit from increases in uncontaminated nutrients from the ocean. Over time, the increase in historic herring biomass (alewife, blueback and shad) could help to restore commercial ground fisheries and other vital ecological links between the Gulf of Maine and the Penobscot River, one of the largest inputs of fresh water to the Gulf.

Some types of recreational fishing opportunities will return and others will expand. The removing of the dams will convert impoundments to free-flowing river, improving water quality and increasing the diversity and abundance of aquatic insects, which are ecologically important to fish and migratory songbirds. New whitewater rapids in the project area will create new canoeing and kayaking opportunities. A downriver trip from Old Town all the way to Penobscot Bay is again possible without portages around dams. Wildlife viewing should improve due to increased species diversity associated with free-flowing river segments, and angling opportunities will diversify over time.



Before and after the removal of Great Works Dam in 2012. Photo: PRRT 2013.

Before and after the removal of Veazie Dam in 2013. Photo: PRRT 2013.

Project status

The Penobscot Trust, working with its many public and private partners, has removed the two lowermost dams. The Great Works Dam was decommissioned and removed in 2012; the Veazie Dam was decommissioned and removed in 2013. A recently constructed fish lift at the Milford Dam, above the reconnected lower river, now allows fish to pass another 40 open miles to Howland. However, the Howland Dam still blocks vast, high quality spawning, nursery and rearing headwater habitat. This dam has been particularly harmful to young salmon, typically killing 23% of the salmon smolts migrating to sea each spring. The project is now focused on the construction of a nature-like fish bypass around the decommissioned Howland Dam. Construction is currently underway with completion anticipated in the early fall of 2015.

In addition, with major support from NOAA, monitoring of the Penobscot Project was initiated in 2009 using a multidisciplinary, before-after approach. This baseline monitoring has provided a snapshot of pre-dam removal conditions and thus an objective basis for evaluating restoration outcomes post Project implementation. Collaboration with research scientists from the Penobscot Nation, University of Maine, US Geological Survey and others provides information on the ecological response to the project under the following priority parameters: (1) physical and geomorphic (monumented cross-sections); (2) water quality (chemical and benthic invertebrates); (3) wetland and riparian community (including invasive species monitoring); (4) fish passage (up and downstream via tagging and hydro-acoustic methods); (5) fish community (presence and abundance); (7) Atlantic and shortnose sturgeon reproduction and habitat use (including habitat suitability modeling and active tagging); and (6) ecosystem function (marine derived nutrients). Monitoring of the Project is ongoing and is integral to evaluation of success.