Maine's Sebasticook River

A Rare and Critical Resource for Bald Eagles in the Northeast

MAINE DEPT. OF INLAND FISHERIES AND WILDLIFE

bri

Overview

Due to the combined effects of pesticide use, direct killing, and habitat loss, Bald Eagles (*Haliaeetus leucocephalus*) were nearly extirpated by the mid-20th century. As a consequence of concerted efforts to prevent the loss of this iconic species, the natural history of this eagle is closely intertwined with some of the most important landmark environmental policies in U.S. history, such as banning of the pesticide DDT and the Endangered Species Act.

While traditional conservation efforts focused on increasing reproduction at nest sites, the current management focus is now shifting toward protecting eagle aggregation areas, typically centered on seasonally abundant fisheries.

In 2014, with support from the American Eagle Foundation and local landowners, researchers from Biodiversity Research Institute (BRI) and the Maine Department of Inland Fisheries and Wildlife (MDIFW) conducted ground-based and aerial surveys of Bald Eagles utilizing fishing and perching areas along the Sebasticook River.

The Recovery of Maine's Bald Eagle Population

Fifty years ago, our nation's symbol was in serious decline. Nationwide, populations, once estimated at 300,000-500,000 in the 1700s, had dropped to fewer than 500 individuals by 1963. The widespread use of the pesticide DDT was largely responsible for the significant drop in productivity among breeding pairs.

Conserving nesting habitat has been a vital tool in both the recovery and protection of Bald Eagles. Since 1972 and continuing today, the state provides technical assistance to landowners and an array of conservation organizations concerning eagles and eagle nesting habitat.

MDIFW works through voluntary conservation ownership or easement, and has successfully secured a safety net for nearly 500 eagle territories. This is a significant increase from only five nesting areas protected in 1976. The population has soared from fewer than 30 breeding pairs in the '70s to more than 633 nesting pairs currently and more than 2,500 Bald Eagles in the state.

The Role of Nonbreeding Bald Eagles in Recovery

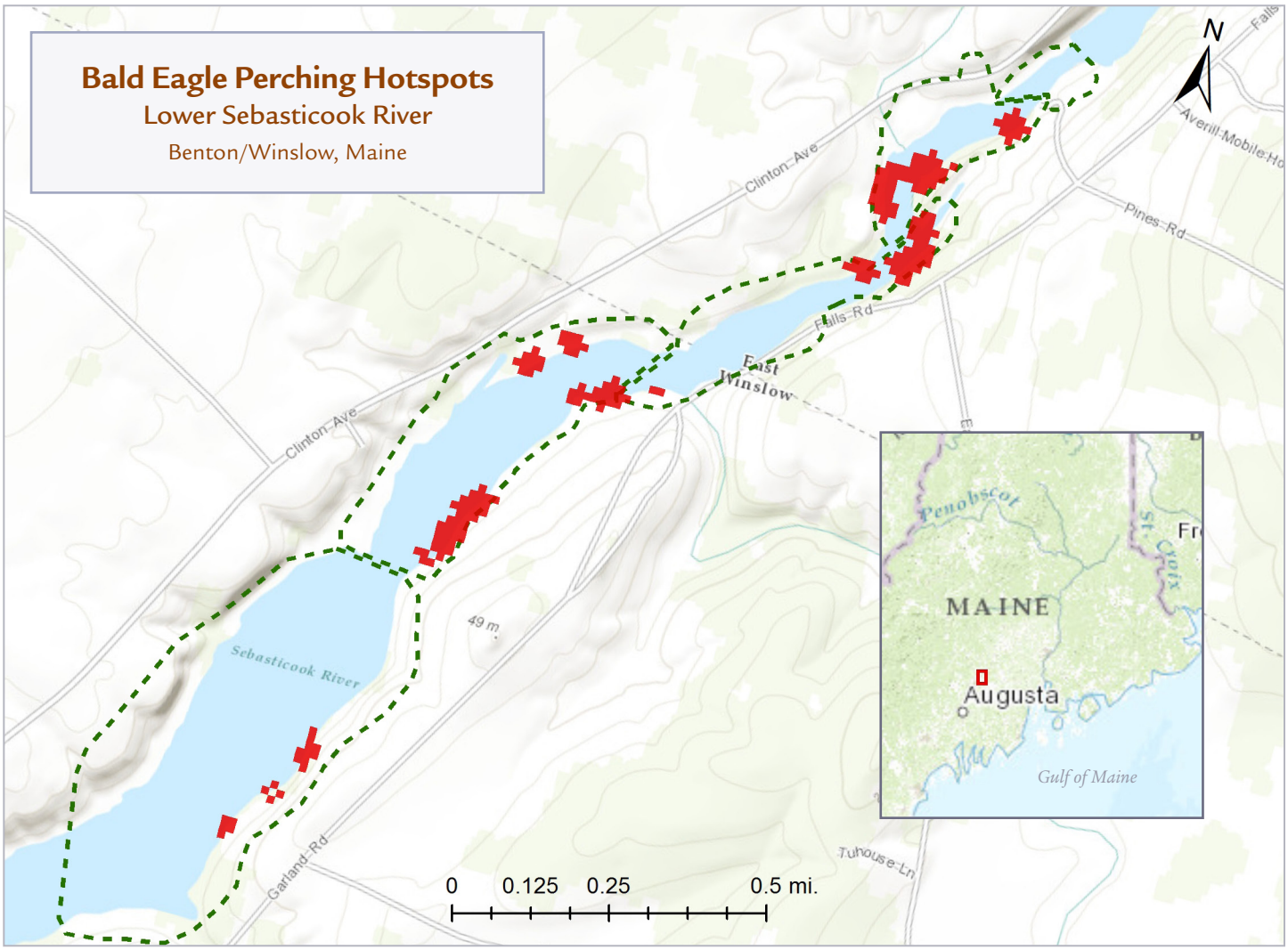
Research has shown that the survival of nonbreeding adults and subadults (younger than five years old) is key to population stability. Yet, the habits of this sector of the population are poorly understood. Conservation management efforts have traditionally focused on protecting nest sites. Since nonbreeding individuals are not associated with nest sites, they and their habitats tend to be overlooked in these efforts.

Nonbreeders often form aggregations in areas of high food abundance, which are important in maintaining their survival. Efforts to protect areas containing seasonally abundant resources therefore contribute to the long-term stability of Maine's thriving, but still sensitive, eagle population.

While highly territorial at nest sites, Bald Eagles commonly group together in higher numbers, called aggregations, where food is abundant (as shown at right). In central Maine, dozens of eagles frequent the Sebasticook River corridor to feed upon millions of river herring migrating between the ocean and their upriver spawning areas.

Roughly three-quarters of the eagles using the Sebasticook during the summer fish runs are subadults aged 1 - 4 years, a period when eagles are vulnerable to mortality. Nonbreeding eagles and the habitats that boost their survival are often overlooked in conservation efforts despite their critical role in maintaining the stability of populations.

Bald Eagles use their keen eyesight to catch fish out of swiftly moving waters. To minimize energy expenditure, they employ a "sit and wait" foraging strategy, perching adjacent to water, awaiting the easiest prey. Bald Eagles are also known to frequently steal fish from Ospreys and other eagles. As a result, eagles in areas with abundant food are seemingly often in conflict with each other as they all strive to procure a meal.



Important Bald Eagle foraging areas identified by analyzing significant clusters, or "hotspots" (indicated by red areas), of perching locations documented during 2014 survey efforts. The map shows five of the surveyed areas (indicated by dashed green line), those farthest upstream and closest to the Benton Falls Dam. In total, 10 sites along the lower Sebasticook River were surveyed.

The Sebasticook River – A Restoration Success Story

Plight of the Alewife

Accounts dating back to the 1500s describe an abundance of alewives throughout the Gulf of Maine. Alewives (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*), also known collectively as river herring, are native to the eastern seaboard—from South Carolina to New Brunswick, Canada—and are mostly known for their commercial value as lobster bait. These anadromous species spend the majority of their lives at sea, returning to their natal freshwater streams and lakes each spring to spawn in large annual migrations known as *runs*.

Widespread dam construction blocking migration, water pollution, and long-term overfishing led to drastic declines in river herring populations.

The Road to Recovery

Recovery of the Kennebec River Basin's dwindling river herring population began following the 1999 removal of Edwards Dam near Augusta. The collaborative restoration efforts of the State of Maine, federal agencies, conservation organizations, and several upstream dam owners have led to removal of the Fort Halifax Dam (2008) and installation of a fish lift at the Benton Falls Dam (2006), enabling migrating fish to reach expanded spawning habitat for the first time in 100 years.

The Sebasticook River—A Resource for Eagles and Other Wildlife

The Sebasticook River in central Maine is an ecologically valuable river running 50 miles from its headwaters near Dexter to the Kennebec River in Winslow. The Sebasticook is the Kennebec's largest tributary, with a watershed covering about 606,000 acres, and it supports the largest annual run of river herring in New England.

More than 2.75 million river herring were able to swim up the river in 2011—an increase from just 47,000 in 2006. Even the much larger Connecticut and Merrimack Rivers do not see river herring runs of this magnitude.

Bald Eagles gather along the Sebasticook River in groups while feeding on this seasonably reliable food resource. Such an unusual abundance of food provides benefits to both nonbreeding and subadult eagles, in addition to local breeding pairs. River otter, cormorant, osprey, and kingfisher also benefit from the renewed river herring run.

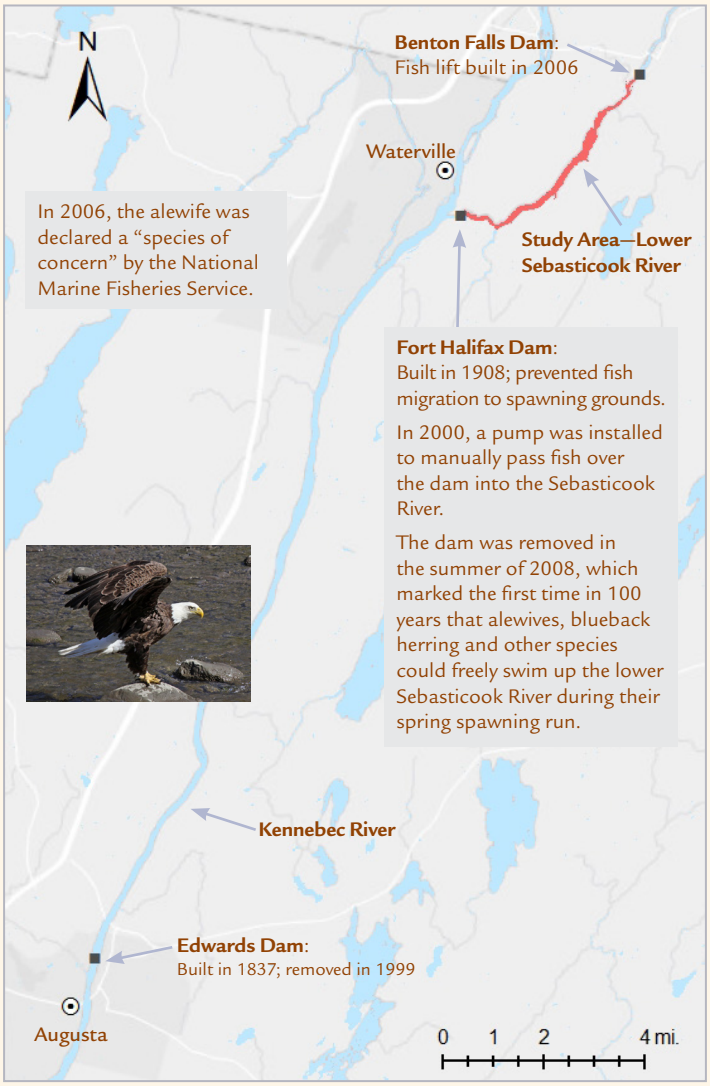


Photo above: River herring pour out of the fish elevator at the Benton Falls Dam. A fish elevator, or *lift*, carries fish over a barrier (the dam). Fish swim into a collection area at the base of the dam. When enough fish accumulate there, they are moved into an "elevator" compartment that carries them into a flume that empties into the river, above the dam. At left: An Osprey catches a river herring along the Sebasticook River.

Surveys of Bald Eagle Use along the Sebasticook River

From mid-May to early July, aggregations of Bald Eagles frequent the reach of the lower Sebasticook River spanning between the Kennebec River, five miles upstream to the Benton Falls Dam.

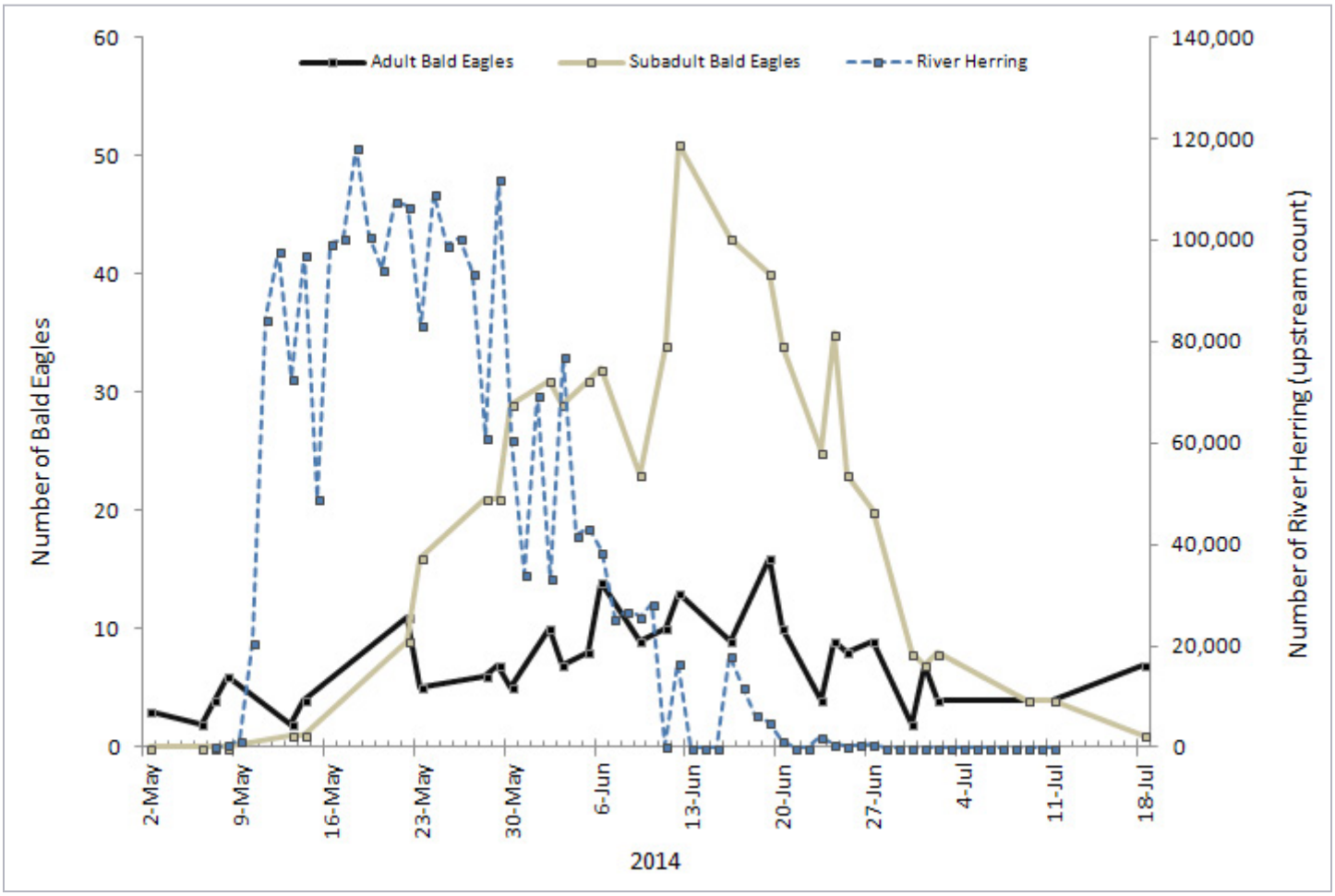
While the relationships between fisheries and wildlife populations are well recognized, no prior research efforts have focused on quantifying the use of the Sebasticook River by Bald Eagles. The information gained in this project will improve the ability of wildlife and conservation managers to make informed decisions about fish-eating birds, river herring, and the critical habitats that support them.

Findings from the Field

To identify when Bald Eagles were most reliant on the river herring run and which areas along the river stretch were most heavily used, BRI and MDIFW field biologists surveyed from May to July in 2014. Researchers focused on ten locations along the five-mile corridor of the Sebasticook River from the Benton Falls Dam downstream to the former Fort Halifax Dam. Surveys were conducted before, during, and after the river herring run to document eagle abundance and identify perching locations.

For a three-week period in June, along this five-mile stretch of riparian corridor, we consistently observed 40-50 eagles. On a single day in mid-June, 64 eagles were observed, the largest aggregation documented in New England.

Bald Eagle aggregations along the Sebasticook River span well beyond the period of the fish run; anecdotal counts by ground and aerial observers regularly note these aggregations during late summer and winter months. There are few examples of comparable aggregations in the northeastern United States. The daily counts of eagles using the Sebasticook River may translate to use by hundreds of eagles over the course of the entire year.



Daily riverwide estimates of adult and subadult Bald Eagles counted along a five-mile stretch of the Sebasticook River, Maine, compared with numbers of river herring (alewives and blueback herring) counted at the Benton Falls fish lift. The apparent time lag between upstream fish passage and the number of eagles documented does not account for, and is likely explained by, post-spawning downstream migrating fish (fish are only counted as they swim upstream). Downstream fish presumably continue to attract eagles long after the upstream fish migration subsides. Fish passage data courtesy of Maine Department of Marine Resources.

Supporting Maine's Eagles

Increasing awareness of conservation efforts along the lower Sebasticook River may be one of the most important investments in maintaining a lasting recovery for New England's Bald Eagle population.

Making a Difference: What You Can Do

- *Get Involved.* Many Maine organizations are dedicated to land and wildlife conservation. Participation and membership are critical to their missions.
- *Conserve Habitat.* Shoreline trees stabilize riverbanks, but they are also used by eagles to perch while foraging. Riverfront property owners can protect eagles, fish populations, and other wildlife by obeying municipal shoreland zoning ordinances, which helps conserve water quality and minimize erosion.
- *Make a Donation.* Private donations play a critical role in conservation. You can support Bald Eagle conservation and research in Maine by contributing to BRI's Bald Eagle Research Fund and by supporting the Maine Department of Inland Fisheries and Wildlife. Support MDIFW conservation efforts through the Chickadee Tax Check-off, the Loon Conservation Plate, Maine Birder Bands, and special lottery ticket sales (Maine Outdoor Heritage Fund).
- *Be Responsible.* Keep a respectful distance from nesting trees and foraging eagles. Properly discard used fishing line and hooks that can entangle wildlife. Consider using non-lead lead fishing weights and ammunition (see www.huntingwithnonlead.org). Vehicle collisions with eagles are common; be aware of eagles feeding on roadkill and flying near waterways.

For more information about Bald Eagles, habitat conservation and restoration, and eagle research in Maine, contact biologists at:

- Maine Department of Inland Fisheries & Wildlife: www.maine.gov/ifw/wildlife
- Biodiversity Research Institute Raptor Program: www.briloon.org/raptors
- U.S. Fish and Wildlife Service Maine Field Office: www.fws.gov/mainefieldoffice

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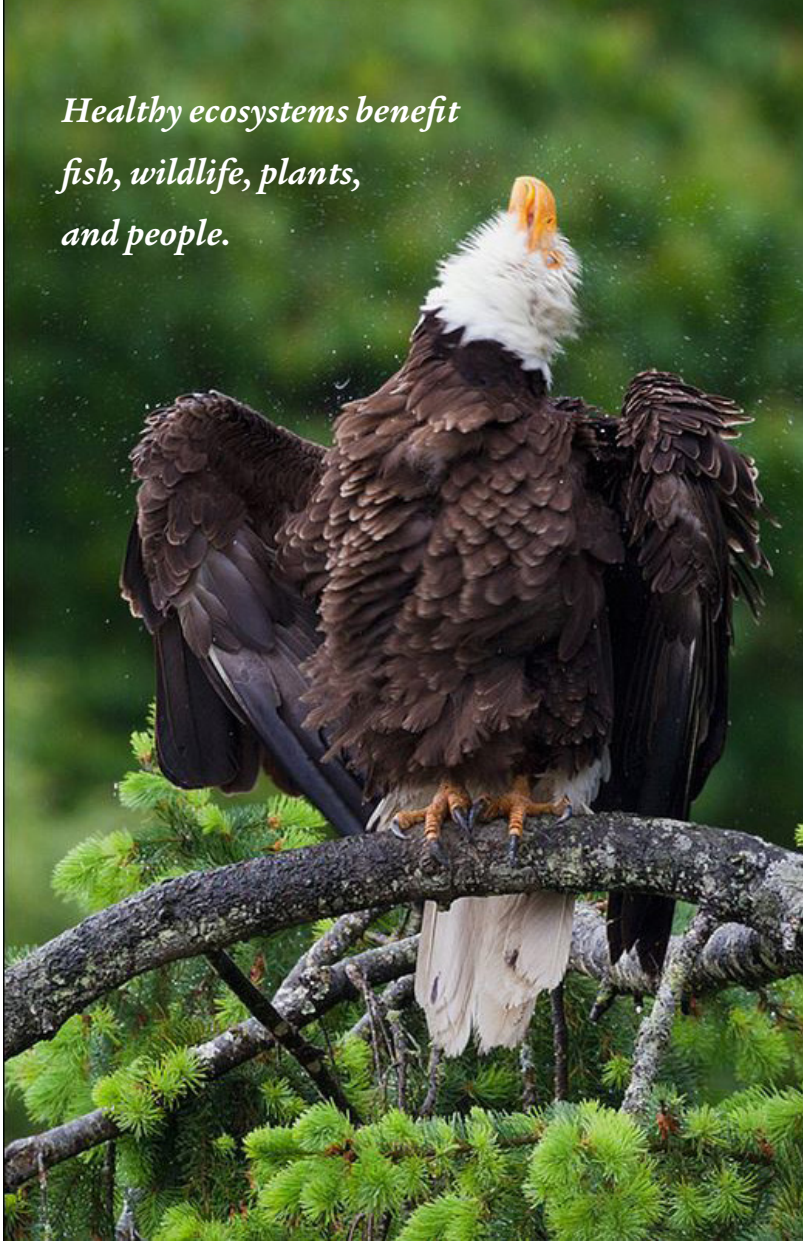

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Acknowledgments

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FINAL MINUTES OF THE AAHTC MEETING ON SUBJECT OF SHEEPSCOT POND FISHWAY

A conference call was held from 1 to 2 pm on 23 FEB 2017. Participants included John Coll and Patricia Barbash of the USFWS, David Bean of NOAA, Cem Giray and Bill Keleher of Kennebec River Biosciences, Michele Walsh the State of Maine Veterinarian, Debbie Bouchard with the University of Maine Cooperative Extension and Aquaculture Research Institute, Mike Brown and Marcy Nelson of Maine DMR, and David Russell and Todd Langevin of Maine IF&W.

On the question of increased disease risk associated with opening passage to alewives and river herring: The consensus of the group is that the open water source (lack of filtration and UV) at the hatchery is already a major risk. Because migratory species are currently coming into contact with the open water source at the hatchery, opening of the fish way for the entire year rather than just for 10 months of the year would not represent a significant increase in risk for introducing a disease of regulatory concern. Ich was mentioned as an example of "nuisance" disease organisms that are encountered by having open, untreated water supplies and having associated increased operations costs via needed treatments. Trish and John asked IFW about Ich at the facility and suggested that UV would not only tackle the bait issue but also remove any potential Ich problems.

The consensus from the group was that the hatchery should add filtration and ultra violet light treatment. David Bean of NOAA mentioned "section 6" funding from NOAA or USFWS. If a disease were to be introduced into the hatchery, the biomass of the hatchery could amplify the disease agent and thus put wild stocks, including endangered Atlantic salmon, at risk. The best way to mitigate the risk is to prevent disease from getting into the hatchery. It was mentioned that funding for UV infrastructure could likely be a good match for some of the grant programs available. Follow up information after the meeting; the NOAA grant has closed for 2016 and the USFWS section 6 funding was primarily focused on habitat improvement projects for 2017. NOAA Restoration Center funding may be available for a redesign of the intake with better screening to prevent juvenile alewives from entering the facility through the intake. It was encouraged by NOAA to seek Federal Funding Opportunities and should be investigated further to assist with facility upgrades.

On the subject of testing wild populations: Several members of the group expressed concern that limited testing of wild populations could potentially give a false sense of security. Debbie mentioned that testing wouldn't hurt and suggested that confidence only comes with time and more data points. Michele warned about the potential harm in getting a negative and then having a false sense of security. She said to consider the long view with population monitoring. Bill Keleher felt a negative doesn't always mean negative. There are lots of variables. Debbie Bouchard said that a testing regime to quantify risks could be designed. The group seemed to be split on whether or not information from disease testing of wild populations would be of use.

On subject of disease risks such as VEN and other minor disease agents: Risk was not viewed as being increased due to the current "open" state of the water source. Any questions of VEN and pathogens become irrelevant with appropriately sized UV. There was little discussion of VEN specifically, because it fell into the realm of what was already discussed and the suggestion that UV treatment be prioritized. Bill Keleher mentioned that disease screening may be best focused to keep screening to the worse of the worse (OIE reportable and major pathogens of regulatory concern). He cautioned about not "setting the needle" for action too low.

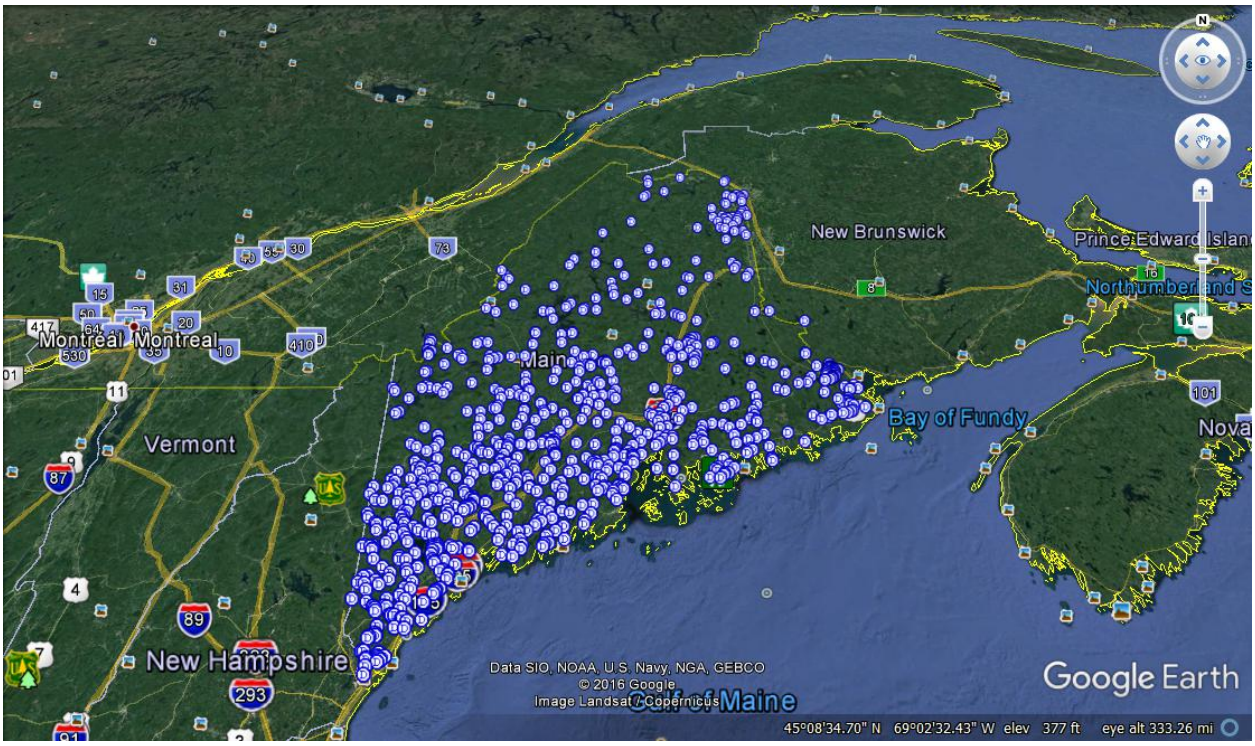
On topic of closing the pond to use of bait and keeping the fishway closed year round: Several members said that they would not be comfortable stating that risk for the hatchery would be reduced with such operation. Others felt the historical lack of pathogen detections at the hatchery were not due to the present closure schedule of the fishway. Some of this discussion came after Todd Langevin suggested that the multi-decade record at the Palermo SDH of no diseases of regulatory concern being detected in screening may be the result of the current seasonal

fishway closure practices. Patricia Barbash mentioned that the pooling of alewives below a closed fishway could be viewed as a factor for increasing risk. Such pooling results in stress and if a disease agent is present, the stress could result in a disease outbreak. Animal activity and migration of eels, which can bypass a closed fishway, could easily introduce diseases present below the fishway passage into the pond. They felt there was not enough historical data on the wild populations and made general statements that large populations have potential to increase pathogen risk "dose makes the poison". Davis Russell mentioned that Trish brought up a good point about pooling of fish below the fishway in that if migratory fish numbers up to the fishway are to be enhanced from downstream removal of barriers, the risk for Sheepscot Pond and the hatchery could increase regardless of fishway operation practices.

Alewife numbers and risk: Mike Brown mentioned that annual alewife numbers could build to tens of thousands after a decade. It was acknowledged by someone in the group that large fish populations moving through a system could have more pronounced pathogen transfer. All AAHTC members present agreed that the water source needs to be treated and that the risk is already high, regardless of the fishway. Only IFW and DMR did not express an opinion. Debbie B. stated that large populations can increase risk, but doesn't see where IF&W has been protected by closing it off. Michele W. stated that higher numbers can equal higher risk, but don't know the true risk without data. The lack of a problem at the hatchery is not likely because of the fishway closure. Trish Barbash there is always going to be a risk, but no more than fish that are passing through. The fishway is not the only risk. Open water source is the problem. Cem G said fish are already intermingling. Bill K - untreated water is the big risk regardless of opening because you already have migratory species coming in contact – open water source is the problem.

Conclusion: The recommendation of the AAHTC was that the opening of the Sheepscot Pond fishway did not constitute a significant added risk over current practices and that installation of UV treatment at the Palermo State Fish Hatchery should be prioritized to protect the hatchery water supply.

Dams in Maine



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