

Bristol Mills Dam ad hoc Advisory Committee
Minutes of Meeting Tuesday, May 9th, 2017

Amended 5/23/17

Committee members present: Pam Allen, Phil Averill, Bill Benner, Claire Enterline, John Freburger, James Hatch, Abby Ingraham

Also present: Jay Crooker, Chad Hanna, Chris Hall, Richard and Virginia Huffman, Carl McClatchey, Don Means, Rick Poland, Sarah Vogel (UMO), Rosario Vitanza, Dr. Joe Zydlewski (UMO).

The meeting was called to order by chair Enterline at 6:08 pm with a quorum present, and the Pledge of Allegiance was recited.

Chair Enterline reviewed the agenda. There were no proposed changes.

The minutes of April 25th were accepted under a motion proposed by P. Allen, seconded J. Freburger; passed 7 – 0.

C. Enterline then introduced the guest speaker, Dr. Joe Zydlewski of the University of Maine, to speak on how dams impact migratory species.

In introductory remarks, Dr. Zydlewski reviewed the ways in which migratory animals decline in numbers: loss of habitat; over-exploitation; climate change; and human barriers, of which dams are a major category.

In discussing dams, and in particular his and his colleagues' research on Maine rivers, he made six points about how dams affect fish species.

- Access: examples included the return of sea lampreys and Atlantic salmon following the removal of dams on Sedgeunkedunk Stream in Orrington; and the boom-and-bust of alewife populations on the St. Croix River with the opening and closing of fish passages on the US side of the river over the past 30 years. Also, in a study at Veazie Dam on the Penobscot River, he described watching fish, specifically salmon and shad, below the dam with a hydroacoustic visualization, called a Didson, noting many more fish below the dam than were present in the fishway. This study showed that even if access/passage is available, it may not work for all species and all individuals of each species.
- Death and injury due to turbines: Examples included salmon smolt migrating downstream. Not all impacts result in immediate death: injuries such as de-scaling weaken fish and make them more susceptible to infection and disease, increasing their mortality rate.
- Delays in migration: Even where 'state of the art' fish passage exists, such as at the Milford Dam, significant upstream passage delays are incurred, disrupting migration patterns. Dr. Zydlewski also presented research about fish passing

downstream over dams. The study found that the more dams passed by downstream migrating tagged Atlantic salmon smolts had higher mortality rates compared to smolts that passed downstream over only one or no dams.

- Shifts in demography: changes in age structure result from these impacts on mortality in the same way that an over-harvested fishery changes the demography of a fish population; the numbers of older fish decline, with consequent impact on the species as a whole because older, larger fish tend to be stronger, repeat spawners, are more successful at spawning, have higher fecundity (produce more offspring), and their young have greater fitness.
- Shifts in community: each dam removal has winners and losers; an example of a loser is the golden shiner, which prefers warmer, still waters, while migratory fish like river herring and shad see population increases.
- Abatement of ecological services: Migratory fish have diverse roles in the food chain; for example, sea lampreys through their 'sorting' activity in gravel prepare river beds for trout and salmon spawning. Migratory fish also provide nutrient exchange between fresh and saltwater. The example was provided of marine derived nutrients from lamprey that die after spawning being incorporated into juvenile and adult fishes living in freshwater at a time when available freshwater nutrients are limited. Studies have found that Atlantic salmon juveniles grow larger and faster in streams where lamprey have spawned and died. Dr. Zydlewski concluded with the surprising image of the 'lures' exhibited by freshwater mussels, which have growths imitating small fish, which attract predator fish to which they can implant their spawn for purposes of dispersion.

Questions included:

- Is beaver dam removal worthwhile, given the long history of co-existence between beavers and alewives? A: Beaver behavior has changed with the availability of structures like culverts. There are tradeoffs, upstream of beaver dams, habitat may be ideal for alewife rearing, but when beaver dams are built in culverts and other human structures, they have a negative effect on passage.
- Most dams featured in the presentation were much larger than the Bristol Mills Dam; did they originally have fish passage? A: Yes; and the Sedgeunkedunk Steam dams may be comparable to the Bristol Mills Dam.
- How old were these fishways? A: Typically not later than the 1980s. This reflects the 30- to 50-year cycle of hydro dam licensing.
- Have there been improvements in fish passage design since the 1980s? A: There's a wealth of improved fish passage designs, but even the best are less effective than a natural, open river. At the Howland Dam, for example, the new nature-like fishway is effective but predators still use it to exploit fish passing there. He especially liked the new Ice Harbor fish passage design (see pages 38-41 in www.habitat.noaa.gov/pdf/salmon_passage_facility_design.pdf). The Denil and Alaskan Steep Passage designs are popular because inexpensive, but there are trade-offs between cost and percentage mortality.

- What is your opinion of our fishway? A: Have only briefly looked at it. Without speaking to this fishway specifically, because did not have a lot of experience with it, would say that just because you see fish making it past the top of the fishway does not mean that it passes all fish and all species. Some success does not mean it is effective.
- What about other successful fish passage projects, like Damariscotta? Enterline gave update that the Damariscotta project has been very successful since its multi-year fishway restoration. Zydlewski answered that some projects were limited in their success by the fishway design, giving the example that some species including American shad will not make 180 degree turns, though these are designed into many fishways because of site and financial constraints.
- What is the impact of elver harvest and elver passage on eel populations. A: The Atlantic States Marine Fisheries Commission (ASMFC) has recommended reduction in elver harvest, but the exact effect of harvest is hard to nail down because they are a panmictic species (meaning they are a mixed stock whose offspring do not return to the same rivers where their parents lived). Dams do effect elver and eel passage. Even though elvers can climb vertical walls, most don't make it all the way up, so other passage is required. In general, dams restrict eels to downstream sections of rivers where their growth is more limited. Described the importance of having overlap in all of the available habitat between alewives and eels.

At 7.08 Chair Enterline thanked Dr. Zydlewski and invited him and his colleague Ms. Vogel to stay for the rest of the meeting if they had time, which they accepted.

She then reminded members that email discussions are discouraged under Maine's open access law. Personal discussions are inappropriate; the Chair's intent has been and remains to be unbiased and balanced, and she asked that all members give each other the respect due to colleagues who may have differing opinions but are working to a common goal.

Vice Chair Benner offered the committee a letter from a resident of Bristol Mills, concerned at the possible loss of both property value, and wildlife habitat on her property immediately upstream of the dam. She enclosed with the letter a listing of 75 bird species, plus mammals and turtles, observed in the dam's impoundment area in the past 10 years.

Benner then distributed to the committee information on the aluminum fish ladders manufactured in Newcastle by Sheepscoot Machine, and a report on a successful example of their use on the Bronx River in New York City. **Enterline will resend the Wright-Pierce design through email. He also asked that the Chair re-send the Wright-Pierce design from 2015 as a baseline for looking at other options.**

J. Hatch pointed out that the 2015 design already completed for the Bristol Mills Dam was a compromise solution among cost, fish passage and location constraints, and that we should not try to second-guess that calculation. He saw “dam plus fish passage” as a single option, for comparison with other types of solution. Benner stated that he was informed that aluminum fish passage had been looked at and rejected by the engineer before they came up with the design. Hatch asked whether we trust the engineers; Benner replied that it is not a matter of trust, but of looking at ways to save the taxpayer expense. P. Allen stated she felt the committee did not have the expertise to make judgments among fishway designs, while A. Ingraham pointed out that all options will cost money; the attractive feature of the Bronx River design was the way in which recreational, water flow and fish passage needs had all been combined in a similar-sized project where the fish passage and fish-monitoring equipment had cost only \$150,000. The report states that the entire cost of construction of the Bronx fishway, which included concrete turn pools and measures to protect the fishway from theft (aluminum fishways are susceptible to theft if not encased in concrete and have been stolen from many sites, including some in Maine) cost \$460,800. J. Hatch repeated that dam retention with a fishway is just a single option.

Secretary Hall asked to read the committee’s charge and deliverables as adopted at the first meeting. He asked that the committee begin to focus on defining the options it would evaluate. Members discussed how much additional information needs to be gathered before focusing on defining options.

P. Averill asked that the next scheduled meeting focused on water quality be repurposed. He does not question the importance of water quality, but felt that as it is not a variable that will impact the decision on fish passage, we could take note of the issue by circulating existing written reports. He moved, and J. Freburger seconded, a motion to forego the presentation by Scott Williams on water quality. Motion passed 5 – 1, with 1 abstention. Chair Enterline will arrange to have the PWA water quality report distributed.

The Chair then asked that the committee discuss process for the next meeting. P. Averill asked that it be kept to discussion of the committee’s ideas, believing that there is enough intellectual power around the table to be able to refine options for study and costing by engineers, without the engineers leading the discussion. J. Hatch preferred that Joe McLean of Wright-Pierce attend that discussion. J. Freburger asked if we are tied to Wright-Pierce; from the floor the Chair of Selectmen, Chad Hanna, indicated that Wright-Pierce is not a construction company, only design and engineering oversight; the Town would put any construction or demolition work out to bid after funding is voted by the Town Meeting. After discussion of the cost and budget of Wright-Pierce’s current study it was moved by J. Hatch, seconded by A. Ingraham to invite Joe McLean to the next meeting. Passed 7 – 0. Chair Enterline indicated her sense of the committee that about half of the next meeting’s agenda should be for open discussion, and half for Wright-Pierce to lead discussion of options. Because Wright Pierce is still gathering

information to inform the concepts, specifically regarding recreation and fire fighting water supplies, the discussion would still be very conceptual.

Enterline then asked the committee to revert to the discussion at the previous meeting, whether it should make specific recommendations to Selectmen. After discussion, Hall agreed to put the question to Selectmen at their next meeting on May 17th.

Public comment period

Don Means asked if there is a difference in the use of fish passage by different species, based on their relative strength. Joe Zydowski answered that yes, different species have different needs. Alewives are strong swimmers but need water flow with no jumps, as opposed to salmon which are leaping fish – alewives are like long-distance runners, salmon like sprinters. Means also said he appreciated the fact that the committee would soon hear from Deb Wilson on the Damariscotta mills experience, and on the Coopers Mills dam removal.

Richard Huffman thanked the committee for their time and efforts.

Chair Enterline thanked the committee for a good and productive meeting, and called again for mutual respect and courtesy.

ADJOURNMENT

It was moved by Benner, seconded by Enterline, to adjourn at 8.06 pm; passed 7 – 0. The next meeting will be held May 23, 2017 at 6pm at the Bristol Town Hall.

Chris Hall
May 10, 2017