



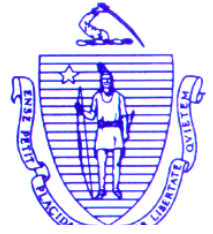
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Memorandum

DIADROMOUS FISH RESTORATION SITE VISIT

To: Town of West Tisbury
From: Brad Chase, *Marine Fisheries*.
Date: November 28, 2012

Purpose: Diadromous Fish Restoration in Tisbury Great Pond Watershed

Attendees (Nov. 6th): John Hoy, West Tisbury Herring Warden; Prudy Burt and Peter d' Angelo, West Tisbury residents, Chris Kennedy, The Trustees of the Reservations; Abby Franklin, NRCS-CCCD; and Greg Skomal and Ben Gahagan, *Marine Fisheries*.

A series of site visits were made by *Marine Fisheries* staff to Mill Pond in West Tisbury to inspect the site for diadromous fish restoration potential following inquiries from local interests. An initial visit was made on November 11, 2009 to view Mill Pond Dam. Following a request from the West Tisbury Mill Pond Committee, a site visit was made on April 17, 2010 to investigate potential herring run restoration in the Mill Brook watershed in relation to a proposal on pond dredging. Additional site visits were made by on April 19th and December 15th in 2011, following requests from the Town's Conservation Commission in relation to both the dredging proposal and interest in dam removal. This memo focuses on tributaries to Tisbury Great Pond and follows the last Mill Pond Dam site visit on November 6, 2012 when we also visited locations on the Tiasquam River.

Location

Mill Brook. Mill Pond is a small impoundment of about two acres formed by the Mill Pond Dam located on the Edgartown-West Tisbury Road. Mill Brook is the primary freshwater tributary to the 915 acre Tisbury Great Pond. Flows primarily exit the pond through a spillway that has two stoplog bays. The Mill Brook channel below the dam is briefly spilt by flows exiting from a second spillway on the north bank before meeting Town Cove in Tisbury Great Pond less than 0.5 km downstream. The reported height of the dam is 5.5 ft length and the length including earth embankment and structural spillways is 280 ft (Chelminski 2011). The actual hydraulic drop with stoplogs removed is 2.0 ft. Mill Pond is quite shallow with an average depth less than two feet and a maximum depth of seven feet that is found upstream of the two spillways (ACT 2006). The watershed above Mill Pond Dam is about 8 km², and includes seven additional dams that all impede fish passage to varying degrees. The presence of diadromous fish in the Mill Brook watershed is known but not well documented. Belding (1921) reported on a profitable alewife and white perch fishery at Tisbury Great Pond in the early 20th century. More recent observations indicate the watershed had valued sea-run fisheries for rainbow smelt, white perch, American eel and river herring (John Hoy and Nelson Bryant, *pers. comm.*). The white perch fishery persists with low catch and effort, while the smelt run apparently faded in the 1950s and the eel and herring experienced declining abundance in the 1970s and 1980s.

Tiasquam River. The Tiasquam River is a tributary that meets Tisbury Great Pond at Town Cove in Chilmark southwest of the confluence of Mill Brook. The combined drainage area and freshwater discharges of Mill Brook and Tiasquam River are among the largest on Martha's Vineyard and likely contribute to the diverse history of diadromous fish in the watershed. Similar to Mill Brook, several small dams (7) create impoundments in close proximity along Tiasquam River and all impede fish passage to varying degrees. The first two dams upstream of Town Cove are an unnamed dam on Rainbow Farm owned by The Trustees of Reservations and the privately owned Looks Pond Dam. The unnamed dam at Rainbow Farm is quite small with a spillway height of only 2-3 ft and the impoundment is less than one acre. The Looks Pond Dam impounds a 4.6 acre pond and has a spillway height of 5.6 ft (Reback et al. 2004). The Tiasquam River has not been subject to recent watershed investigations such as done at Mill Brook, and I have only made a single visit to the river. Therefore, I have less available information on existing and past conditions in the watershed.

Project History

The Mill Brook not been viewed by past *Marine Fisheries* surveys as having significant potential for river herring restoration due to the number of mill dams and limited potential spawning and nursery habitat relative to that available in Tisbury Great Pond (Reback and DiCarlo 1972; and Reback et al. 2004). A wood fishway was installed at Mill Pond Dam by local interests nearly 10 years ago. Our observations and the general impression locally is that the fishway design is unsuitable for this site and fish passage is likely not provided at most flow levels. A growing interest in habitat restoration at Mill Pond has prompted investigations on the pond, dam and watershed. The Town of West Tisbury funded a baseline assessment of Mill Pond in 2006 that provides valuable information on physical features, water quality and aquatic resources (ACT 2006). A preliminary evaluation related to Mill Pond Dam removal was prepared for the Mass. Division of Ecological Restoration in 2011 (Chelminski 2011). At present, the interest in habitat restoration in Mill Pond involves aspects of diadromous fish restoration, pond dredging and dam removal with no clear local consensus on the preferred approach. Restoration goals for Tiasquam River are at a stage of conceptual development with interests in improving stream connectivity and diadromous fish resources.

Site Visit Observations

During all five site visits to Mill Brook, flows exiting Mill Pond were sufficient to provide enough water depth to the brook channel downstream of the dam to allow river herring to approach the spillway. At the April 17, 2010 site visit we met with Bob Woodruff of the Mill Pond Committee and found the custom wood fishway was installed on the dam stoplogs and determined it was impassable due to low water depth in the fishway and exit. No evidence of river herring was observed. We hiked into the wooded buffer downstream of the Mill Pond and found the outlet to Tisbury Great Pond. This natural opening was braided with the potential for shallow depths at lower flows yet appeared passable at the present flows.

During the April 19, 2011 site visit, we found the fishway installed on the dam stoplogs but, with three baffles missing, fish passage into Mill Pond was not possible. The flow was elevated and estimated at 4-6 cfs. River herring scales were easily found downstream of the dam and appeared to come from predation that occurred as herring aggregated below the dam. A single age-1+ American eel was found below the dam. Water chemistry was measured at the pond outlet. All measured parameters (temp., pH, DO, conductivity, and turbidity) at this time were suitable to support river herring spawning habitat. Our Fishway Crew staff returned to the site on December 15, 2011, to meet with Town officials to discuss fish passage improvements including the interest of repairing the fishway.

The November 6, 2012 trip to the Tisbury Great Pond watershed focused on the two lowermost dams in Tiasquam River and we visited dams upstream of Mill Pond at Preister's Pond and Crocker Pond. We met with the owner of Looks Pond Dam, Geraldine Brooks, and had a detailed discussion on the process for pursuing the alternatives of dam removal and installing a fish ladder at the dam. The flows exiting Looks Pond on Nov. 6th were at the low end of suitable flows for a steep pass fish ladder but could likely provide river herring passage in a small Denil or weir and pool fish ladder. No stoplogs were installed on the dam crest. We had a similar discussion with Chris Kennedy representing The Trustees of Reservations at the unnamed dam on Rainbow Farm. The dam was degraded but still a full obstacle to all target diadromous fish except perhaps eel. A tiny custom Denil fish ladder was resting (rotting) on the earth embankment next to the dam. Immediately downstream of the dam were riffles that likely serve as natural spawning substrate for smelt and white perch. This structure has positive features as a dam removal target: favorable ownership, small structure, failing condition, small man-made pond, and potential to enhance diadromous fish passage (river herring and eel) and spawning habitat (white perch and smelt).

Recommendations

At the time of the 2009 and 2010 site visits, we were asked to support the dredging of Mill Pond. We elected not to support dredging at the time, stating that pond dredging was not a jurisdictional issue for *Marine Fisheries* and would not prompt our input unless there was evidence that dredging would sustain or enhance both fish passage and water quality for an existing river herring run. In the Mill Brook watershed, this information was not available at the time and studies were ongoing or planned for water quality monitoring and dam removal feasibility. Following the April 2011 site visits, *Marine Fisheries* offered to reconstruct a seasonal, removable fishway for Mill Pond Dam that would be an improvement over the existing degraded custom wood fish ladder. The Town declined the offer at the time, favoring instead to allow the present studies on Mill Pond Dam to be vetted by the interested parties in West Tisbury. With the benefit of having multiple site visits and discussions with several local interests and authorities, it is apparent that any restoration efforts should be related to broader watershed goals of the Towns and property owners. With this in mind, I offer the following recommendations and our future technical assistance as needed:

- 1. Fish Ladder Replacement.** Our fishway crew is available to provide materials and labor to replace the existing fish ladder at Mill Pond Dam with a properly designed, wood fishway. We understand that the Town wishes to pursue additional investigations and outreach on the merits of alternative passage improvement options at this time. Our offer stands as an option for future consideration as more information is gained.
- 2. Watershed Restoration Plan.** We recommend that restoration goals are focused through the development of a watershed restoration plan that looks at existing and potential conditions of all ponds and stream segments for both Tiasquam River and Mill Brook. Efforts are underway to assemble similar information for Mill Brook. This should be expanded to include Tiasquam River.
- 3. River Herring Habitat Assessments.** *Marine Fisheries* typically seeks information on the suitability of spawning and nursery habitat from projects that are proposing to introduce river herring to waterbodies not presently accessible. This recommendation is relevant for fishway options at both Looks Pond and Mill Pond. *Marine Fisheries* has guidelines for such assessments (Chase 2010) and can offer technical assistance for the preparations.
- 4. Mill Pond Passage Improvements.** We support efforts to investigate improved fish passage and dam removal at Mill Pond Dam. Restoration that improves natural stream connectivity is preferred by *Marine Fisheries* for this location. However, more information is needed to select the preferred approach given the range of existing resource uses and interests. We recommend that

the feasibility studies continue for this topic and be coordinated with reporting with the watershed plan (#2).

5. Looks Pond Passage Analysis. The private property owner of Looks Pond Dam is favorable to fish passage improvements at the dam. It is uncertain if upstream recreation and property issues are compatible with a dam removal option. It is recommended that these issues be explored locally. Secondly, a small, inexpensive fishway could be installed to a notch cut on the dam crest. If a fishway option is pursued, an engineering analysis is needed to determine the hydraulic and hydrologic specifications for installing a fishway on the dam along with projections on headpond and tailwater elevation changes.

6. Lower Tiasquam River Dam Removal. The unnamed dam at Rainbow Farm has the appearance of a feasible, inexpensive dam removal project with benefits to several diadromous species, independent of upstream improvements. We recommend that discussions and planning begin locally to proceed with this project and offer our technical assistance.

Citations

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Cc:

Greg Skomal, and Mike Armstrong, *Marine Fisheries*
Geraldine Brooks, Looks Pond Dam owner
Chilmark Conservation Commission
West Tisbury Conservation Commission
Mill Pond Committee, West Tisbury
Attendees of Nov. 6, 2012 site visit