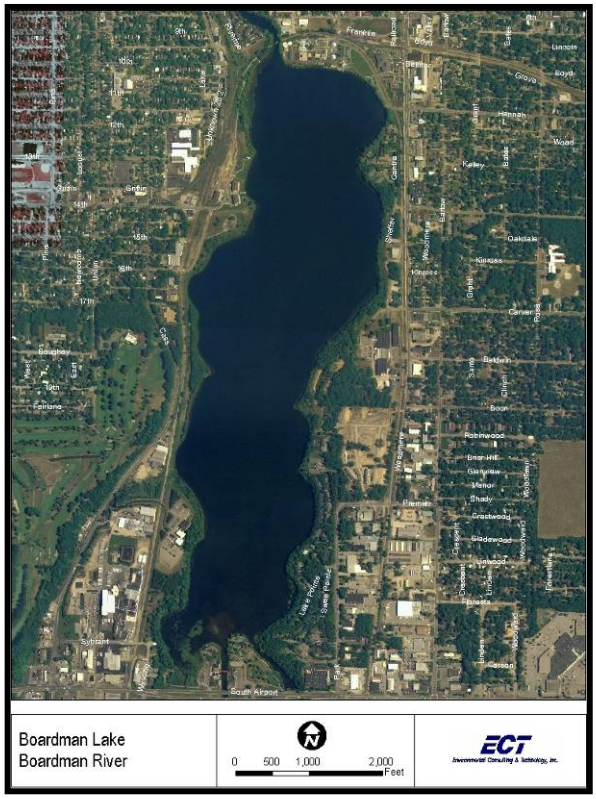
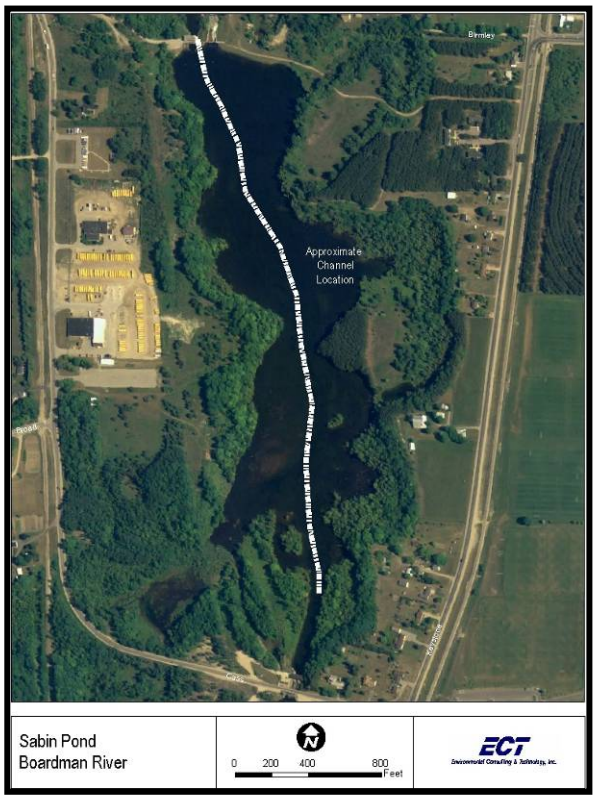
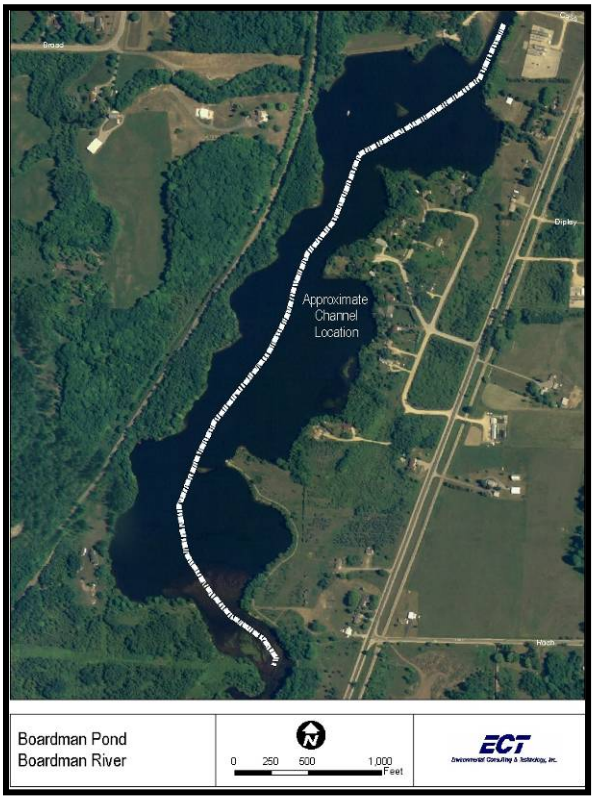
DRAFT - BOARDMAN RIVER FEASIBILITY STUDY

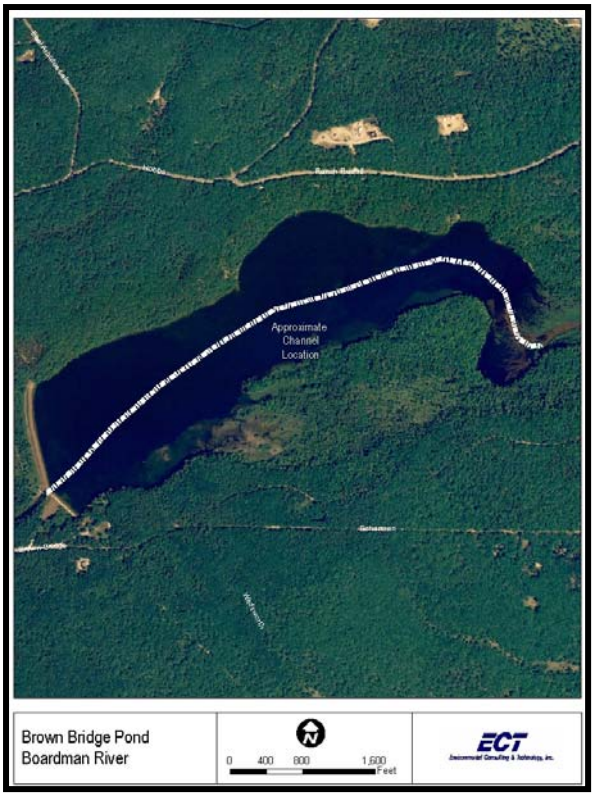
Alternative 81 - Modify Union Street Dam, Remove Sabin, Boardman Pond, and Brown Bridge Dams

September 10, 2008









Alternative 81 - Modify Union Street Dam and Remove Sabin, Boardman, and Brown Bridge Pond Dams

Introduction

This fact sheet is a summary of a detailed analysis of the alternative described below. The alternative was selected for detailed analysis along with five (5) other alternatives by the Boardman River Dams Committee. The following information is provided as a summary of the analysis of the alternative. Information on the existing conditions and impacts of this alternative can be obtained by reviewing the complete report on the website. You may notice that the description of the analysis of the alternative sometimes includes at the end of certain sentences an alphanumeric code in parentheses. This code refers to the list of questions that was included in the Request for Proposals.

Description

This option will consist of retaining Union Street Dam and modifying the fish ladder to allow Great Lakes fish to migrate around the dam. The fish ladder would be operated to allow fish, including Great Lakes fishes to pass around the dam, but invasive species of fish would be blocked at Union Street. Sabin Dam would be removed completely to allow a free flowing river to be restored from Boardman Pond Dam to Boardman Lake. Boardman Dam would be removed and Boardman Pond would be replaced with a new segment of Boardman River. The Brown Bridge Dam would be removed and a river would replace the impoundment known as Brown Bridge Pond.

Impacts of Retaining Union Street Dam, Removing Sabin, Boardman and Brown Bridge Dams

ENVIRONMENTAL:

Fish and Wildlife Populations

- Fish and wildlife, including but not limited to eagles, swans, nesting ducks, shorebirds, insects, ruffed grouse, hex hatches, cold and warm water fish, fur bearing mammals, and deer will be impacted in different ways depending on the habitat requirements of the species. (A2) Primary changes to fish and wildlife habitat from removal of a dam will be the loss of impounded water and its lake-like, slower-moving water and warmer water habitats and the transition to the Boardman's historic cold water riparian habitats similar to those found along the free-flowing unimpounded sections of the river. Wildlife species living in or dependent upon lake-like conditions will lose habitat, and population, those that prefer riverine, flowing-water habitat, or that will benefit from the reconnection of riverine habitats by removal of an impoundment, will gain.
- Reptiles and amphibians: Habitat for Blanding's turtles will decrease while habitat for wood turtles will increase due to cooler water temperature and increased flowing-water or riverine habitats; both are species of special concern. The amphibian populations at the impoundments may change as breeding areas change with the removal of the impoundment. New wetlands and riparian areas are excellent habitat for amphibians and certain populations may increase in these new habitats.
- Birds: Nesting loons and trumpeter swans that use Boardman Pond and Brown Bridge Pond will be forced to adjust to habitat changes resulting from a removal of the impoundment and reduced foraging habitat.
- Wildlife populations may be exposed to additional concentrations of contaminants from Great Lakes fish that are allowed to access the Boardman River.

- Invasive fish species will be managed at the weir and Union Street Dam, but all other species of fish will be allowed to migrate past the dams to access the Boardman River. (A13 A16 and D15)
- The adverse environmental impact to cold-water fisheries of the Brown Bridge Dam will be mitigated (B3).
- Salmon and steelhead spawning in the Boardman River will have a positive impact on the fishery in Grand Traverse Bay.
- A cold water fishery will develop in the area of the existing Sabin Pond, Boardman Pond and Brown Bridge Pond.
- The portion of Boardman River below Brown Bridge Dam may develop an improved trout population due to cooler water temperatures.
- The cold water fish populations in the remaining portion of the Boardman River will not be significantly impacted. (A18 and C20)
- The warm water fish population in Sabin, Boardman, and Brown Bridge ponds will be replaced with a cold water fish population consistent with the Boardman River.
- Control of invasive aquatic species will be maintained by the weir and the dam at Union St. and the threat of invasive aquatic species entering the Boardman River will not be significantly impacted. (A10)

Threatened and Endangered Species

- Existing use of Boardman Pond and Brown Bridge Pond by threatened and endangered species that use the open water area of Boardman Pond and Brown Bridge Pond will be adversely impacted in that the open water habitat will be replaced with a cold water river.
- Opportunities for threatened and endangered species that rely on cold water habitat, uplands, and wetlands will be realized in the new river segments.
- Sturgeon may use the tributaries of the Boardman River for new spawning habitat.
- Loon and trumpeter swan nesting will be adversely impacted by altered water level, but these species may relocate to other suitable habitat in the region.
- Contaminants from Great Lakes fish may affect certain wildlife populations, including, but not limited to, loons and bald eagles.

Plant communities and habitat

Habitat Type	Existing Acres	Proposed Acres
New River Channel	0	36
Existing River	113	113
Impoundment/Lake	673	339
Riparian Habitat	56	141
Wetlands	112	265
New Upland Habitat		60
River Upstream from Brown Bridge	288	288
Total	1,242	1,242

- The wetlands at Sabin Pond, Boardman Pond, and Brown Bridge Pond will change from emergent and floating-leaved plant communities to emergent and riparian wetlands along the new river channel. There will be a net increase in wetland acreage as deep water areas convert to wetlands. Ground water seeps along

the edge of the new river will support wetland communities. New upland plant communities and habitat will develop along the shores of the former impoundments.

- The hydroperiod of wetlands in the impoundments will be changed from permanently inundated to seasonally inundated.(A3)
- Wetlands along the river beyond the influence of the water level in the impoundment will not be significantly impacted.

Hydrology and Hydraulics

- The flow of water will not be impacted by this alternative.
- The flow of water upstream of the Brown Bridge Dam will not be significantly impacted, but the water depth in the impoundment will be significantly impacted. (A24)
- The size and extent of floodplain elevations will be significantly lower in the areas of the former impoundments.

Stream Channel

- The stream channel of the Boardman River will not be impacted in the vicinity of Union Street. The impoundment at Sabin Pond will be replaced with approximately 1 mile of new stream channel. The impoundment at Boardman Pond will be replaced with approximately 2 miles of new stream channel. The impoundment at Brown Bridge Pond will be replaced with approximately 2 miles of stream channel.
- Channel erosion will occur along the banks of the new river in the area occupied by Sabin Pond, Boardman Pond and Brown Bridge Pond and will eventually stabilize as vegetation becomes established.
- Tributaries to the Boardman River upstream from Brown Bridge Pond will not be impacted.

Sediment

- Contaminated sediments that exist in and portions of Boardman Lake will remain.
- Contaminated sediment in Sabin Pond, Boardman Pond, and Brown Bridge Pond will be managed in accordance with MDEQ guidelines, which typically requires removal and stabilization of contaminated sediment.
- Sediment that is stored in the delta and along the new stream channel will be stabilized using several different techniques.
- Base load sediment levels in the river channel will be restored below the dams that are removed.

Water Quality

- Water quality will not be significantly altered and the warm water adverse impact of the Brown Bridge Dam will be mitigated. (A9)
- The regional wastewater treatment plant will not be impacted.

Ground water

- There will be no significant impact on water supplies and septic systems of properties adjacent to the impoundments. (B10, A15)

SOCIETAL:

- The property boundaries of private property will not be significantly impacted. The property adjacent to Brown Bridge Pond and Sabin Pond is primarily in public ownership. (D1)
- There will be no significant change in the risk to property owners due to storm events and flooding. (D2)

Recreation

- Recreational uses will not be significantly impacted at Boardman Lake. Recreational uses of Sabin Pond, Boardman Pond and Brown Bridge Pond will shift from uses associated with an impoundment to those associated with a river. (A19 D5)
- Waterfowl hunting on Brown Bridge Pond will be adversely impacted by removal of the impoundment.
- A whitewater park may be feasible at several locations along the new river channel. (B14)
- Recreational use patterns of users of the Boardman River may change due to the new river segments that will be created. Users interested in a quiet paddling experience may avoid the new river segments, while paddlers who enjoy a strong current may seek out the new river segments.
- The safety concerns associated with an impoundment will continue to exist at Boardman Lake. Steep slopes and fast current may pose a hazard to certain recreational users depending on their experience with river paddling.(D13)
- The County's Natural Education Reserve will be impacted to the extent that an impoundment will be replaced with a new river segment. Educational programs that depend on an impoundment may continue at Boardman Pond, while educational programs at Sabin Pond can be redesigned to include river ecology and restoration ecology. (D17)

Community

- The economic gains for restoring a portion of high quality trout stream will be realized. (C12)
- The taxpayers in the City will be responsible for paying to maintain the remaining Union Street Dam. (C26)

Historic Value

- The dams and powerhouses are not eligible for designation as historic structures; therefore, the repair, removal and modification of the dams will not have an impact on historic properties.

ECONOMIC:

Cost

- The cost of this alternative is estimated to be between $4,700,000 and $8,000,000, which includes annual maintenance of the dams.

Economic Benefit

- Visitors to the Boardman River are estimated to contribute annually $4 million dollars to the local economy. The increase in visitor expenditures has not been determined.

- The Michigan DNR may be able to discontinue planting salmon, thus saving approximately $500,000 per year.

Property Value

- Residential properties within a ½ mile of the current impoundments may see an eventual increase in property values due to dam removal. (C1)
- The current property boundaries will not be affected by this alternative. (C3)

Funding

- The repair, modification, removal and maintenance of the dams are the responsibility of the owners of the dams. (C6,C7)

Energy

- This alternative does not allow traditional hydroelectric power using dams to be produced. Alternative methods of hydroelectric energy production that rely on flowing water may be feasible. (C28, D4)

Jobs

- This alternative may have an impact on job growth in various economic sectors due to the potential for whitewater paddling and increased angler interest in the restored portion of the Boardman River. (C18, C22)

ENGINEERING:

Infrastructure

- This alternative will have no significant impact on transportation or other infrastructure. (A17)
- There will be no significant impact on structure crossings within and downstream of the project area to the termination in Grand Traverse Bay. (B11)
- The risks and liabilities associated with the dams may change if this alternative is implemented. The City and County are responsible for maintenance of the dams and assume the risks and liabilities of the ownership of the dams; therefore, by eliminating three of the dams the risk and liability may be reduced. (D20)