

**Recommendations Concerning Alternative Futures for the Boardman River Dams
-as Approved by the Implementation Team-
December 16, 2008**

INTRODUCTION

For the last three years, a citizen-based Boardman River Dams Committee (BRDC) has examined a range of alternative futures for the Union Street, Sabin, Boardman and Brown Bridge Dams. The engineering, environmental, socio-economic and cultural implications of various alternatives (i.e., repair/ retain, modify, remove) were compiled and analyzed in an Engineering and Feasibility Study. In addition, public input was gathered through monthly BRDC meetings, a public opinion survey, community workshops and other outreach activities. Collectively, these data and information helped shape development of a recommended approach to disposition of the dams that was unanimously approved by the study's Implementation Team. Presented below, this statement is directed to City of Traverse City (City) and Grand Traverse County (County) officials who, as owners of the dams, have decision-making authority over their future.

PROCESS

The process for arriving at a recommended alternative was pursued consistent with the terms of a multi-party Settlement Agreement signed in 2005. That agreement established the citizen-based BRDC, which was responsible for overall direction of the study, including Scope of Work development, contractor selection and oversight, fund acquisition and management, committee leadership, meeting design/ facilitation and public involvement/ communications. An Engineering and Feasibility Study was prepared by a contractor consistent with a BRDC-approved Scope of Work. Eighty one potential alternative futures for the four dam system were identified, representing all possible combinations of retain/ repair, modify and remove. BRDC members, along with the larger stakeholder community, selected six of these alternatives for further analysis to explore, with equal and objective consideration, their respective engineering, environmental, socio-economic and cultural implications (this included revising one of the alternatives to include a hydro-electric power option.) The analysis, along with other study reports, provided the basis for a broadly administered public opinion survey and series of public workshops. Based upon all input received, the November 12, 2008 BRDC meeting featured a facilitated, small group process that focused on three alternatives as a basis for further refining BRDC preferences.

The Consultant Team subsequently prepared a draft recommendations statement featuring a dams disposition alternative reflecting preferences that emerged from the November 12 BRDC meeting and the public opinion survey (Attachment B.) The draft was posted on the project web site for BRDC review and comment by December 11, 2008. The draft alternative did not receive broad support, but was instrumental in helping BRDC members articulate their individual preferences in some detail. Based on the many comments received, a refined statement (featuring two alternatives with the greatest degree of support) was prepared and presented at the December 16 BRDC meeting for review, comment and approval.

All but three of the BRDC members present supported the statement. Given the study's commitment to a consensus-based process (i.e., absence of opposition), however, it was referred to the Implementation Team for action, consistent with Settlement Agreement provisions. The Implementation Team unanimously approved the recommendations presented within, and offers them to the City and County for their consideration.

BASIS FOR RECOMMENDATIONS

The recommendations presented below were informed and shaped by three primary factors: 1) rigorous science-based data and information contained in the Engineering and Feasibility Study; 2) community input gathered from the public opinion survey and public workshops; and 3) the insights and contributions of the BRDC membership and its various committees. The study effort benefitted tremendously from the contributions of the BRDC, an exceptionally active and well-informed group of citizens with a shared passion for the Boardman River system, a commitment to actions that restore or enhance the social values of the system, and a range of ideas and preferences that enriched the study process.

The public opinion survey was also an important part of the process. The survey booklet was distributed by a posting on the project website; inserts (15,000 booklets) in the Traverse City Record Eagle newspaper; direct mail to 391 riparian property owners and 2,609 randomly selected registered voters; and distribution to 180 attendees at three separate public meetings. A total of 749 surveys were completed and returned.

The draft recommendations presented below are the result of a concerted effort to identify and build upon points of agreement within the BRDC membership, while drawing from the wealth of objective, science-based data and information generated by a multi-disciplinary team of experts.

The BRDC is comprised of a diverse group of community members with an equally diverse range of dam disposition priorities, preferences and opinions. Of the 81 alternatives (i.e., combinations of retain/ repair, modify and remove for the four dams) examined over the course of the study, two emerged with significant levels of support within the BRDC. The first of these entails the retention and repair of all four dams, while the second entails modifications to Union Street Dam and the removal of the other three dams.

Presented below is a summary of each of these two alternatives, including a "dam by dam" description and associated rationale. Summary matrices for the two alternatives are presented in Attachment A. (For reference purposes, the Consultant Team alternative developed for the November 2008 BRDC meeting is included as Attachment B. While it did not generate significant support in the ensuing comment period, it may be of interest to the City and the County, given that it was designed to reflect as many shared interests and preferences among the BRDC as possible.)

During development of the recommendations, two issues received considerable amount of discussion and study. The first involved restoring the potential for hydroelectric power generation at Sabin, Boardman and Brown Bridge dams; a detailed discussion is presented in the Final Detailed Analysis of Alternatives Report. The second issue concerned the relicensing process administered by the Federal Energy Regulatory Commission (FERC) and the numerous improvements that would need to be made to the dams and spillways before power could be generated. The Consultant Team estimated the cost to restore hydroelectricity at all three dams to range from \$ 9,690,000 to \$17,180,000. The present value of the gross revenue over 30 years is \$9,100,000 compared to the present value of the relicensing, operation and maintenance, and repairs of \$16,768,000. Tasks and costs associated with restoring hydroelectricity are summarized in Table 1.

Table 1, Tasks and estimated costs to modify Union St. Dam and restore hydroelectric power generating capacity at Sabin, Boardman and Brown Bridge dams.

Task	Estimated Cost for All Dams
FERC licensing process	\$ 600,000 - 750,000
Repair dams	\$ 950,000 - 2,400,000
Provide fish passage	\$ 6,500,000 - 8,500,000
Mitigate warm water impact	\$ 200,000 - 400,000
Upgrade flood control spillway	\$ 1,020,000 - 4,300,000
Operation and maintenance	\$ 420,000 - 830,000/year
Total Cost	\$ 9,690,000 - 17,180,000
Total Cost (Present Value over 30 years)	\$16,768,000
Total Revenue (Present Value over 30 years)	\$ 9,100,000

During BRDC discussions, a citizen presented a proposal for power generation that differed significantly from the findings of the Consultant Team. As a result of this discrepancy, the Implementation Team is advising the City and County to consider further analysis, as noted in the recommendations below.

RECOMMENDATIONS FOR CONSIDERATION BY THE CITY AND COUNTY

The Implementation Team recommends that the City of Traverse City and Grand Traverse County, as dam owners, consider the following recommendations as the dams disposition process moves forward. City and County officials should:

- Focus their attention on the two dams disposition alternatives (1, 81) receiving the greatest degree of support and interest from the BRDC (see description below and Attachment A.)
- Invite proposals from companies/ individuals interested in restoring hydropower capability at Sabin, Boardman and Brown Bridge dams, should a decision be made to retain the dams after reviewing Engineering and Feasibility Study findings. The proposals should be of sufficient detail to establish the economic viability of the project; demonstrate the ability to assume necessary repairs, maintenance and operational costs; and establish an associated timeline.
- Address fish passage at the dams through a fishery management plan for the Boardman River that reflects state, federal, tribal and public interests. (This issue is also being addressed through the Boardman River Assessment Management Plan public review process.)
- Carefully consider additional comments, suggestions and dams disposition preferences expressed by individual BRDC members and other stakeholders. (Any such statements received in a timely manner will be appended to the final Engineering and Feasibility Study document.)
- Establish a mechanism to ensure continued public input as the decision making process moves forward, and continued benefit from the expertise and longstanding commitment of BRDC members.

RECOMMENDED ALTERNATIVE 1 - REPAIR AND RETAIN ALL DAMS

Union Street Dam will be retained and repaired. Salmon will be blocked at the Michigan Department of Natural Resources weir. Sea lamprey would be blocked at or near Union Street dam.

Rationale: The repair of Union Street Dam will achieve the following:

- Preserve Boardman Lake which is used by 72% of the waterfowl;
- Preserve the size of Boardman Lake;
- Maintain current recreational activities;
- Protect the structure;
- Maintain the current interaction between the Boardman River above Boardman Lake and the Great Lakes; and
- Preserve a warm water fishery.

Sabin Dam will be retained and repaired.

Rationale: The repair of Sabin Dam will achieve the following:

- Preserve the size of the impoundment for waterfowl;
- Preserve the size of Sabin Pond;
- Maintain recreational activities on Sabin Pond
- Prevent Great Lakes fish from moving upstream; and
- Preserve a warm water fishery.

Boardman Dam will be modified to meet Michigan Department of Environmental Quality flood protection requirements and return the pond to pre-drawdown levels.

Rationale: The repair of Boardman Dam will achieve the following:

- Preserve the size of the impoundment;
- Maintain recreational activities;
- Protect the buildings and structures;
- Prevent Great Lakes fish from moving upstream;
- Preserve the size of the impoundment for waterfowl;
- Preserve wildlife habitat; and
- Preserve a warm water fishery.

Brown Bridge Dam will be repaired.

Rationale: The repair of Brown Bridge Dam will achieve the following:

- Preserve the size of the impoundment;
- Preserve wildlife habitat;
- Maintain recreational uses;
- Prevent Great Lakes fish from moving upstream;
- Preserve the impoundment for waterfowl; and
- Preserve a warm water fishery.

RECOMMENDED ALTERNATIVE 81 - MODIFY UNION ST. DAM AND REMOVE ALL OTHERS

Union Street Dam will be retained and modified to allow passage of Great Lakes fish except for salmon and sea lamprey, which will be blocked at or near the Michigan Department of Natural Resources weir. The modification will also accommodate kayaking.

Rationale: The modification of Union Street Dam will achieve the following:

- Respond to the preferences of 72% of public opinion survey respondents;
- Preserve the lake used by 72% of the waterfowl examined;
- Preserve the size of Boardman Lake;
- Reconnect the Boardman River above Boardman Lake to the Great Lakes;
- Preserve a warm water fishery; and
- Limit the cost to taxpayers due to availability of public grants.

Sabin Dam will be breached and the impoundment replaced with the Boardman River.

Rationale: The partial removal of Sabin Dam will achieve the following:

- Increase wildlife habitat (by 40 acres) as well as wildlife species diversity;
- Reconnect and restore 0.7 miles of the Boardman River;
- Mitigate the impact of Sabin Dam on the Boardman River;
- Improve cold water fish habitat;
- Limit the cost to taxpayers due to availability of public grant funds; and
- Restore approximately 28 acres of new wetland habitat.

← --- Formatted: Bullets and Numbering

Boardman Dam will be breached to allow the impoundment to be replaced by the Boardman River.

Rationale: The partial removal of Boardman Dam will achieve the following:

- Reconnect and restore 1.2 miles of the Boardman River;
- Increase wildlife habitat as well as species diversity;
- Increase cold water fish habitat;
- Mitigate the impact of Boardman Dam on the Boardman River;
- Limit cost to taxpayers due to availability of public grants; and
- Restore approximately 69 acres of new wetland habitat.

← --- Formatted: Font: Bold

← --- Formatted: Bullets and Numbering

Brown Bridge Dam will be breached at the earthen embankment and the impoundment replaced by the Boardman River.

Rationale: The partial removal of Brown Bridge Dam will achieve the following:

- Reconnect and restore 1.5 miles of the Boardman River;
- Increase wildlife habitat (by 192 acres) as well as species diversity;
- Increase cold water fish habitat;
- Mitigate the impact of Brown Bridge Dam on the Boardman River;
- Limit cost to taxpayers due to availability of public grants; and
- Restore approximately 156 acres of new wetland habitat.

← --- Formatted: Bullets and Numbering

ATTACHMENT A

ALTERNATIVE 1

Concern or Criteria	Ratio of less important to more important	REPAIR Union St./Boardman Lake	REPAIR Sabin Dam/ Sabin Pond	REPAIR/MODIFY Boardman Dam/ Boardman Pond	REPAIR Brown Bridge Dam/Brown Bridge Pond	Notes
Preserve habitat for wildlife	10:90	X	X	X	X	Preserve impoundments.
Limit costs to taxpayers	36:64					Local taxpayers would bear the majority of the repair cost.
Total cost		\$0.4-0.7 M	\$0.2-0.3 M	\$0.2-0.6 M	\$0.4-1.3 M	Total cost=\$ 1.2-2.9 million (Note: local share may vary over time, particularly given longer term costs associated with maintenance of dams that are retained.)
Local share of cost		100%	100%	100%	100%	There are currently very grant funds available for repair and maintenance.
Increase habitat for cold water fish	36:64					Coldwater fish habitat would not increase
Keep impoundments for waterfowl	39:51	X	X	X	X	All impoundments to be preserved
Return river to more natural state	43:57					The river would remain in its current condition.
Generate electric power	44:56		X	X	X	Further modifications would be required to generate power at the dams
Improve conditions for canoeing and kayaking	46:54					
Prevent Great Lake fish from moving upstream	49:51	X	X	X	X	Great Lakes fish except steelhead are blocked at Union St. Dam
Keep size of impoundments	50:50	X	X	X	X	The size of the impoundments would be preserved, but would continue to fill with sediment.
Protect the buildings and dam structures	52:48		X	X	X	Protects the buildings and spillways at the dams
Open river to fish passage	53:47	X				Steelhead blocked at Sabin Dam
Preserve warm water fisheries	64:35	X	X	X	X	Warm water fishing would be preserved.

ALTERNATIVE 81

CONCERN OR CRITERIA	Ratio of less important to more important	MODIFY Union St./Boardman Lake	REMOVE Sabin Dam/Sabin Pond	REMOVE Boardman Dam/Boardman Pond	REMOVE Brown Bridge Dam/Brown Bridge Pond	NOTES
Preserve habitat for wildlife	10:90	X				Preserve 339 acres of impoundments. Create 335 acres of riverine habitat; increase habitat diversity and richness.
Limit costs to taxpayers	36:64	X	X	X	X	Approximately 90% of the cost of the actions are grant eligible
Total cost, total removal		\$1.4-2.1 M	\$1.9-3.7 M	\$5.4 - 8.8 M	\$8.5 - 15.5 M	Total costs \$15.7 - 28.0 M includes demolition of structures, buildings and excavation of earthen embankments.
Total cost, partial removal		\$1.4-2.1 M	\$0.4-1.0 M	\$1.9-2.7 M	\$1.3-2.1 M	Total cost is \$5.0-7.9 million (Note: local share may vary over time, particularly given longer term costs associated with maintenance of dams that are retained.)
Local share of cost		10%	10%	10%	10%	Many sources of funding for river restoration and dam removal
Increase habitat for cold water fish	36:64		X	X	X	Create 3.4 miles of coldwater habitat; mitigate warm water impacts; restore up to 1 mile upstream from impoundment
Keep impoundments for waterfowl	39:51	X				Preserves 339 acres of impoundments used by 72% of waterfowl surveyed in baseline studies.
Return river to more natural state	43:57		X	X	X	Returns 3.4 miles to natural state, removes fragmentation in Boardman, restores natural sediment patterns
Generate electric power	44:56					May be possible with new technology
Improve conditions for canoeing and kayaking	46:54	X	X	X	X	Creates 3.4 miles of river paddling. Creates potential for whitewater park
Prevent Great Lake fish from moving upstream	49:51	X				Salmon and sea lamprey would be blocked at Union St.
Keep size of impoundments	50:50	X				Boardman Lake is preserved
Protect the buildings and dam structures	52:48					Buildings could be preserved
Open river to fish passage	53:47	X	X	X	X	River is open from Union St. to Brown Bridge Dam.
Preserve warm water fisheries	64:35	X				Boardman Lake is preserved

ATTACHMENT B

THE "CONSULTANT TEAM" ALTERNATIVE

Presented below, for reference purposes, are key elements of the alternative prepared by the Consultant Team on the basis of outcomes from the November 2008 BRDC meeting. It is followed by a summary matrix highlighting special features, benefits and cost.

Union Street Dam will be retained and modified to allow passage of Great Lakes fish except for salmon, which will be blocked at the Michigan Department of Natural Resources weir. The modification will consist of a rock ramp passageway that can also accommodate kayaking.

Rationale: The modification of Union Street Dam will achieve the following:

- Respond to the preferences of 72% of public opinion survey respondents;
- Preserve the lake used by 72% of the waterfowl examined;
- Preserve the size of Boardman Lake;
- Reconnect the Boardman River above Boardman Lake to the Great Lakes;
- Preserve a warm water fishery; and
- Limit the cost to taxpayers due to availability of public grants.

Sabin Dam will be breached at the earthen dam and the impoundment replaced by the Boardman River.

Rationale: The partial removal of Sabin Dam will achieve the following:

- Increase wildlife habitat (by 40 acres) as well as species diversity;
- Reconnect and restore 0.7 miles of the Boardman River;
- Mitigate the impact of Sabin Dam on the Boardman River;
- Improve cold water fish habitat; and
- Limit the cost to taxpayers due to availability of public grant funds.

Boardman Dam will be modified to meet Michigan Department of Environmental Quality requirements, return the pond to pre-drawdown levels, and allow steelhead to pass over the dam and access the Boardman River.

Rationale: Modifying Boardman Dam will achieve the following:

- Preserve the pre- drawdown size of Boardman Pond;
- Preserve waterfowl habitat;
- Reconnect the Boardman River for steelhead;
- Preserve a warm water fishery; and
- Preserve the potential for power generation.

Brown Bridge Dam will be breached at the earthen embankment and the impoundment replaced by the Boardman River.

Rationale: The partial removal of Brown Bridge Dam will achieve the following:

- Reconnect and restore 1.5 miles of the Boardman River;
- Increase wildlife habitat (by 192 acres) as well as species diversity;

- Increase cold water fish habitat;
- Mitigate the impact of Brown Bridge Dam on the Boardman River; and
- Limit cost to taxpayers due to availability of public grants.

CONSULTANT TEAM ALTERNATIVE

Concern or Criteria	Ratio of Less important to more important	MODIFY Union Street Dam	REMOVE Sabin Dam	MODIFY Boardman Dam	REMOVE Brown Bridge Dam	Notes
Preserve Habitat for Wildlife	10:90	X		X		Preserve 442 acres of impoundments. Create 232 acres of riverine habitat; increase habitat diversity and richness.
Limit costs to taxpayers	36:64	X	X	X	X	Approximately 90% of the cost of the actions are grant eligible.
Total cost		\$1.0-1.5 M	\$0.4-1.2 M	\$2.2-3.0 M	\$1.3-2.0 M	Total cost = \$4.9-7.7 million.
Local share of cost		10%	10%	10%	10%	Many sources of funding for river restoration and dam removal. (Note: local share may vary over time, particularly given longer term costs associated with maintenance of dams that are retained.)
Increase habitat for cold water fish	36:64		X		X	Creates 2.2 miles of coldwater habitat; mitigate warm water impacts; and restores up to 1 mile upstream from impoundment.
Keep impoundments for waterfowl	39:51	X		X		Preserves 442 acres of impoundments used by 72% of waterfowl surveyed in baseline studies.
Return river to more natural state	43:57		X		X	Returns 2.2 miles to natural state, removes fragmentation in Boardman, restores natural sediment patterns
Generate electric power	44:56			X		Potential for 1 MWh or more of power generation.
Improve conditions for canoeing & kayaking	46:54	X	X		X	Creates 2.2 miles of river paddling. Creates potential for whitewater park
Prevent Great Lake fish from moving upstream	49:51			X		Great Lakes fish except steelhead are blocked at Boardman Dam.
Keep size of impoundments	50:50	X		X		Protects approximately 66% of the total acreage of the impoundments.
Protect the buildings and dam structures	52:48		X	X	X	Protects the buildings and spillways at the dams.
Open river to fish passage	53:47	X	X		X	River is open from Union Street to Boardman Dams, while excluding invasive species. Coldwater species free to move at Brown Bridge Dam.
Preserve warm water fisheries	64:35	X		X		Boardman Lake and Boardman Pond are preserved.