

Re*Envisioning Dam Management in Michigan



A Summary of Regional Meetings and Recommendations
of Michigan's River and Conservation Community



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List of Abbreviations

ASCE	American Society of Civil Engineers
CRA	Conservation Resource Alliance
CRWC	Clinton River Watershed Council
CZM	Coastal Zone Management
DNR	Department of Natural Resources
DEQ	Department of Environmental Quality
DNRE	Department of Natural Resources and Environment
EAC	Environmental Advisory Council
EPA	Environmental Protection Agency
FERC	Federal Energy Regulatory Commission
GLC	Great Lakes Commission
GLRI	Great Lakes Restoration Initiative
HRWC	Huron River Watershed Council
I & E	Information and Education
LIAA	Land Information Access Association
PCBs	Polychlorinated Biphenyls
RC&D	Resource Conservation and Development Council
MiCorps	Michigan Clean Water Corps
MNSP	Michigan Natural Shoreline Partnership
MRWA	Muskegon River Watershed Assembly
NFWF	National Fish and Wildlife Foundation
NOAA	National Oceanic and Atmospheric Administration
TNC	The Nature Conservancy
USFWS	United States Fish and Wildlife Service
WMP	Watershed Management Plan

Part 1: Background

On October 8, 2009 Governor Jennifer M. Granholm issued Executive Order 2009-45 (effective January 17, 2010), which eliminated the Department of Natural Resources (DNR) and of Department of Environmental Quality (DEQ), and created in their stead the Department of Natural Resources and Environment (DNRE). In preparation for this transition, the Environmental Advisory Council (EAC) was called upon to develop strategic guidance for the newly formed department. The EAC was formed in 2003 as the principal advisory body to the Department of Environmental Quality, and now provides similar capacity for the DNRE.

In December 2009 the EAC published a report entitled “A Roadmap to a New Environmental Management Model for Michigan” to provide a vision for a new approach in addressing environmental issues in the state of Michigan. The concept of a new environmental management structure was echoed in the January 2010 Transition Report for the new DNRE. The new paradigm emphasizes a movement away from media-specific management towards more holistic approaches to environmental management. Specifically, the EAC recommends a new model focused on:

- outcomes in environmental quality;
- public health and ecological function and integrity;
- a legal framework restructured to achieve public health and environmental quality outcomes;
- broader funding structure for environmental governance;
- expanding collaboration and partnerships to facilitate achieving desired outcomes;
- encouraging innovation; and
- new and refined government structures to leverage expertise and inform decisions.

In contribution to the effort to inform and update watershed planning and management, the Huron River Watershed Council (HRWC) was awarded funding from the River Network to facilitate a statewide process in Michigan that will support the DNRE in ameliorating its dam management program. In the current environmental management model, the wide array of dam-related issues are spread across various branches (dam safety, water quality, fisheries) resulting in a disjointed management approach. This issue is particularly salient in light of the current condition of Michigan’s dam infrastructure.

The American Society of Civil Engineers (ASCE) Michigan section recently awarded the state’s dam infrastructure a “D” grade since over 90% of Michigan’s 2,581 inventoried dams will reach or exceed their design life by 2020. This outdated network includes abandoned dams, dams that no longer serve their intended purpose, and dams that pose safety hazards and alter hydrologic conditions. Addressing this deficiency is further complicated by the lack of a stable funding mechanism to assist dam owners to repair, rehabilitate, or remove aging dams. Whereas other state infrastructure networks have dedicated

funding programs such as water pollution control structures (wastewater treatment plans, sewers) funded through Michigan's Water Pollution Control Revolving Fund (a.k.a. State Revolving Fund), or roadways funded through gasoline taxes, there is no analogous program for dams. Currently, only a handful of Michigan dams have a funding mechanism to provide for maintenance costs and state funding for inspections is limited so only serious risk of failure is identified. Furthermore, dam maintenance is expensive and many dam owners cannot afford to repair, replace, or remove their dams (e.g. the ASCE identified 120 dams that need over \$50 million for repair or rehabilitation alone).

Part 2: Regional Dam Discussions

During June and July 2010, a group of river and conservation professionals met as part of a series of meetings facilitated by HRWC to provide the newly formed DNRE with input on dam removal as a viable ecological restoration and management action. The reorganization of the state's environmental management departments provides a remarkable opportunity for the river and conservation community to become involved in the revision of Michigan's dam management protocol.

Three regional meetings were held across the state of Michigan; the meetings were held at Tip of the Mitt Watershed Council in Petoskey (June 22, 2010), Arcus Depot in Kalamazoo (July 13, 2010), and DeVries Nature Conservancy in Owosso (July 30, 2010). Attendees are listed in **Appendix A**.

The meeting objectives were: 1) To develop a set of recommendations for improving Michigan's dam removal program for the river community and its partners; and 2) To network and share dam removal experiences.

At the start of each meeting, Elizabeth Riggs with HRWC provided an overview of the status of dams in Michigan and a summary of the EAC recommendations for a revised environmental model to guide DNRE activities. With this common background information, each of the three groups addressed the same set of questions over a three-hour discussion facilitated by Riggs. Prior to the meetings, three publications were sent to the attendees:

1. The Growing Crisis of Aging Dams; Policy Considerations and Recommendation for Michigan Policy Makers. March 2007. (**Appendix B**)
2. A Roadmap to a New Environmental Management Model for Michigan – Recommendations of the Environmental Advisory Council. December 16, 2009. (**Appendix C**)
3. Michigan Riverways Program Proposal. November 9, 2009 Presented to the Environmental Advisory Council by MDNRE staff. (**Appendix D**)

Participants voiced both ecological and social perspectives which inform a common interest in seeing a revised, streamlined dam management program. Recreational groups (e.g. Trout Unlimited, Michigan United Conservation Clubs) focus on retaining high quality, cold- and cool- water systems unhindered by thermal pollution and reduced connectivity associated with dams. Drain commissioners are concerned about flood control, legal lake levels, and the tension between providing retention and allowing flow. Policy groups hope to support MDNRE as they restructure the agency. Public health advocates prioritize improving public perception of Michigan rivers so people do not think of them as “dirty” and “unsafe,” and thus work to remove contaminated sediments (e.g. PCBs) near former dam impoundments. This wide range of interests and motivations reflect the complexity of dam management and informed the following series of considerations and recommendations.

The considerations and recommendations made at the three meetings have been organized into broader categories for clearer presentation.

Decision Making

- Dam management decisions should include consideration of repairs and removals
- Need to have an interdisciplinary, coordinated approach
 - Bring “everyone” in the room at the beginning and figure out which questions to ask in which order. It is critical that river and conservation groups assist state in developing a strategy.
- State must develop a clear, consistent message regarding dam management
 - Need to establish routine so that we can get more efficient at removals to reduce costs
 - Have flexibility throughout the state in how the upstream pond is regulated for permitting

MDNRE Staffing and Structure

In each of the regional meetings, participants called on the MDNRE to take a more proactive, collaborative, consistent, and efficient approach to dam management. Achieving this goal will require additional investment in human resources and potential reorganization of divisional duties.

- **Capacity**
 - Long-term goal: Increase staff. Add 1-2 river morphologists to state staff, increase enforcement.
 - Short-term goal: Dedicate staff and equipment to current projects so that dams are removed successfully and the state builds a history of success in order to remove more dams

- **Enforcement**
 - Better enforce water quality (stream temperature) violations by issuing fines to dam owners after a series of warning letters. State has sufficient data in many cases (e.g. Muskegon River) supporting stream temperature violations, but DNRE typically doesn't follow up with penalties for the violations, so the dam owners just ignore/dismiss this as an issue when watershed council reminds them of the situation. Though DNRE is resource-limited, somehow dam owners who violate water quality standards need to be held accountable and there needs to be an economic disincentive for continuing with the violations. Fines could help generate revenue for a dam removal program and send the message that the state is serious about this issue & protecting stream water quality.

- **Training**
 - Need consistency in standards, services, and experience
 - Invest in the districts or in the central office? State should look at costs associated with training of all staff, district and central, and regular meetings (1-2 times per year)
 - Have central staff on the road to come in to the districts to offer support
 - Recommend that training should be extended to all state staff, not just Lansing contingency
 - The state needs to train employees to get current on techniques, programs, etc. so they're a resource to dam removal/management projects
 - Training should include scientific disciplines relevant to dams and rivers (e.g. geomorphology)
 - Rosgen training alone is not the answer for river restoration
 - Leverage training by developing the ability of state and local professionals
 - Provide standardized training and expectations for consultants, private sector
Example: MI Natural Shoreline Partnership

- **Structure**
 - Align the district boundaries of the field offices for fisheries and DNRE instead of continuing with different boundaries. Coordinate with the 5 regional offices.
 - MDNRE Fisheries construction crew has been key to several dam removals in MI. They're a great resource that is threatened with going away because the crew leader is retiring in September 2010; crew may be cut with budget concerns.
 - Should institutionalize the construction crew resource. Need to determine the value of that crew as it's probably a considerable source of match for funds.

- Call for an advisory board to provide regular interactions with state staff, consultants, NGOs, university researchers
- **Consistency between District & Central Offices**
 - Address inconsistency with regional approach at MDNRE – Projects on the Clinton River benefit from an active and involved State Fisheries Biologist. But there is no required role for Fisheries Division to assist with dams so other rivers don't receive the same benefits. Level of involvement varies throughout state. Some regions don't give support to dam removals and studies.
 - Develop a means and motivation for the Lansing staff to work with the district staff
 - Need trust between locals and state for success of these dam projects and river restoration
 - Develop checks and balances, measures in place to increase district-central communications and to ensure decisions made are good ones and that poor decisions are being fixed.
 - Michigan United Conservation Clubs working on Great Lakes Regional Collaboration and dams are a priority for their membership. They want to have local resources so problems are solved at local level.
 - Look to pioneers: How have VT and MA dealt with this issue of centralized v. district expertise and organization?

Coordination with Watershed Groups & Other Agencies

- What project components should the state be responsible for? What is better suited to regional/watershed groups?
- DNRE should bring in the local watershed group in any new dam removal project
 - Past experiences with dam owners/communities have created tension among parties that require local groups to step in. Local and regional groups embrace this role and think it should continue.
 - Involve river groups more meaningfully in Superfund discussions, lack of transparency at DNRE historically
- Improved coordination with federal and other state agencies is wanted
 - Need to move on proactive dam removal and repair for those dams that aren't FERC or in the Dam Safety Program
- Special Expertise
 - Recommend that Joe Rathbun, MDNRE, Water Quality Analyst, is involved with sediment testing and assessment aspects of dam projects. He teaches on this subject as part of the instructional staff for the University of Wisconsin-Madison professional engineering course on dam removals.

Funding

Though funding is typically limiting, the state will inevitably spend money on this issue – directly or indirectly. As one participant noted, “It’s a state investment either way for biologists to count dead fish from a dam failure or plan proactively.” Based on universal recognition that funding is needed for dam repair or removal, participants identified the following potential funding mechanisms:

- Mitigation Fund
 - Great Lakes Fishery Trust was created to compensate for loss of fish at turbine pump station. Use this example to fund mitigation of dams, something on top of FERC programs. Consumers Energy, DTE, others with FERC licenses – provide a portion of funding for dams.
 - If dam repair is the selected action, then some funding should be directed to repair and some to a conservation fund that anticipates future removal.
 - Fees from enforcement of water quality (stream temperature) violations.
- “Dam-nysty” – create a dam amnesty program to give current dam owners an option to give up ownership of their dam (liability), and transfer to the state or other approved agency for retirement of dams
- Require escrow account for dam or insurance policy to cover failure – attractive nuisance problem – to cover their financial responsibility
- Push for a decommissioning bond tied to FERC licensing
- State funding
 - Capacity building funding from state is suggested
 - Dedicate more resources for preliminary engineering studies
 - USFWS (Rick Westerhof) is a great resource for funding preliminary engineering studies
 - What about state bonding? Michigan is losing its appetite for environmental bonds. State as a player in paying these costs not realistic.
- River/Watershed Group Role
 - Remind dam owners that they are liable for failure. Urge them to take advantage of local watershed/river group so they can help find funding (for removal) otherwise cost of repair falls on owners.
 - Local groups should collect data on matching contributions from state entities during recent years for dam projects. Collect this data during the summer and specify the year (e.g. 2007-2010) to build the case for what the state has contributed in “bad economy.” Leads to: “Just imagine what the state can do when the economy is decent.”

Working with MDNRE

In preparation for the regional meetings, Elizabeth Riggs contacted MDNRE staff to solicit questions the agency would pose to the river and conservation community. MDNRE requested feedback on two specific topics:

- What kinds of tools could the state develop that would be useful?
- MDNRE would like help in forming a loose group of go-to people – private residents – who give “testimonials” of dam removals that have been successful. Do the meeting participants have suggestions of residents who might be interested in serving in this way?

The regional meetings yielded a variety of responses about tools that would benefit dam management.

Tools

- **Assessments**
 - Need to coordinate river assessments (5-yr basin assessments, fishery surveys, Integrated Reports), prepare on more timely process, and make easily accessible for public.
- **Dam Information Clearinghouse**
 - One-stop “shopping” for dam-related services and stream restoration is needed
 - Content for Clearinghouse
 - Coordinated dam listings, I&E, policy efforts, guidelines on how to compare data collected, funding sources for dam removal, habitat restoration.
 - Existing resources: Michigan River Partnership appendix, Public Sector Consultants report of dam removal/rehab projects in Saginaw Bay watershed, UC-Berkeley clearinghouse example.
 - Manual with what’s been done, what works, what doesn’t, points of disagreement and agreement. Bring together in-state and out-of-state experts. Provide information on who to contact, costs actual and projected.
 - Should have access to great wealth of data already collected – just need to coordinate. We need to recognize existing expertise in aspects of dam removals.
 - Past/Upcoming Dam Workshops (e.g. 2004 Kalamazoo River Watershed Council dam removal summit, 2009 HRWC Dam Workshop, 2010 Huron Pines Small Dams Workshop.)
 - Strategies (e.g. Emergency Management Hazard Mitigation Plan (County role) is another vehicle for raising status of dam management besides Watershed Management Plans (WMPs). Often a criteria for grant funders.)
 - Maintenance

- Funding for clearinghouse should be written into grants
 - Regional groups could maintain the database (e.g. Huron Pines, HRWC)
- ***Build Capacity for Dam Projects among Contractors/Consultants***
 - Contractors for dam projects need to be trained, maybe certified. Have list of contractors with experience from state (like an “Angie’s List”). What’s included in the certification process? Ask for referrals from practitioners. Check with engineer and dam removal expert Laura Wildman on whether such a program exists elsewhere.
 - Build capacity among practitioners (consulting firms) on how to do dam removals using example from Michigan Natural Shoreline Partnership (MNSP) natural shorelines program.
- ***Public Information and Education***
 - MDNRE can help local and regional groups raise the conservation ethic and knowledge among the public. Need consistent messaging!
 - Part of education to public should be why dam failures are bad, even on small dams
- ***Permitting***
 - Develop general permit for dam removals. If in Dam Safety Program, here’s what’s expected for sediment sampling, etc. If not in dam safety program (“minor” project), then here’s what’s expected.
 - Create financial disincentives for dam construction, including new and renewed hydroelectric dams
- ***Consistency for State Decision-making***
 - State can help with setting a consistent set of expectations for permitting, preliminary engineering, sediment characterization and transport. Create dam management decision-making flowchart.
 - Small dams vs. large dams, different strategies required
 - Some of the dam removal process needs to be cookie cutter and spend far less on fine-tuning restoration. Rivers are self- correcting. Need to trust that the river knows what it needs to do.
 - Retain room for adaptive management for some dam removals instead of having all of the answers upfront
- ***State-wide Dam Inventory and Prioritization***
 - Different listings of dams are used and none are comprehensive – National Inventory of Dams, DNR Fisheries, American Rivers, TNC all keep their own spreadsheets.

- Carl Lindquist of Superior Watersheds Partnership has inventory forms from partnership with TNC, can share GIS data for Upper Peninsula.
- Challenge with data sharing with MDNRE, e.g. state not sharing lat/long for dam locations
- MSU project underway to ground-truth locations of dams of state database
- Prioritization efforts are happening at the local watershed level. Need a state-wide dam inventory with restoration and removal attributes to cover all rivers and streams.

Which dams? Prioritizing dams for removal or repair

As a result of the regional meetings, HRWC researched the current efforts in Michigan to prioritize dams for removal or repair and produced a review of that research (**Appendix E & F**). As dam removal becomes a more popular management tool, direction is needed in targeting dams that will yield the greatest ecological and social benefits. Currently, several groups across the state are in the process of taking inventory of dams in their watershed for subsequent analysis and prioritization for potential removal.

The three projects in Michigan are profiled in detail:

- Potawatomi RC & D Council working on the St. Joseph River
- Muskegon River Watershed Assembly working on the Muskegon River
- Huron Pines working on the AuSable River and Lake Huron drainage

Testimonials on Dam Removal Successes

- Develop lessons learned on Michigan dam removals
- Testimonials should come from private residents on dam removal successes in the state. River and conservation groups can help with identifying folks.
 - Salling dam in Grayling produced good spokespeople of all views on dam removals; ~15 people involved in that effort who could be interviewed.
- Should reflect land ownership issues when submerged lands are exposed
 - Can pull testimonials from various examples around the state.
 - What do we do for vegetation management? Require native, riparian vegetation.

Completed and Proposed Projects

One participant sees “dam removals as [an] opportunity to bring the public to the rivers.” To make this case, it will be critical to share stories of successful dam removals, with greatest impact derived from local examples. Participants shared initial thoughts on their experiences with dams, some of which may be instructive as case studies:

- ***Battle Creek River*** (Contact: Kristine Boley-Morse, Calhoun Conservation District)
 - Elm St dam removed: funding from Consumers Energy and from Great Lakes Commission (GLC). Did pre- and post-monitoring (geomorphic assessments, fisheries, macroinvertebrates) with Section 319 funding. Considered a success.
 - Dam removed in Charlotte: Funding from GLC, USFWS, DNR. \$200k for project. 3-4 dams on list to remove next but limited funds prevent moving forward, as well as lack of accountability on part of dam owners especially if not under auspices of Dam Safety Program.

- ***St. Joseph River Watershed*** (Contact: Marcy Colclough, Southwest Michigan Planning Commission)
 - DNR Fisheries has been a critical resource and partner on their dam removals
 - Jonesville Dam is a priority due to failure; also a dam removal on the Dowagiac River.
 - Paw Paw River dam removal has NOAA, USFWS and more \$ from other sources with pre- and post-monitoring
 - Next dam removals on their list are limited by funding

- ***Kalamazoo River*** (Contact: Robert Whitesides, Kalamazoo River Watershed Council)
 - Upstream good for lake sturgeon hatchery; concern for invasive species and sediment buildup in impoundments
 - DNRE received GLRI \$ for engineering feasibility studies for Plainwell Dam removal \$30M with Superfund designation
 - Otsego City dam will be \$50M for contaminated sediment removal

- ***Clinton River*** (Contact: Anne Vaara, Clinton River Watershed Council)
 - Jim Francis and Gary Towns of MDNRE Fisheries have been supportive
 - Paint Creek dam coming out soon; Cascade dam coming out in 2010
 - Wolcott dam coming out. Funding from GLRI, NFWF, USFWS
 - Local historical societies and commissions have been pro-dam advocates

- **Upper Peninsula, Dead River** (Contact: Carl Lindquist, Superior Watersheds Partnership)
 - Removed 3 dams in UP with hazard mitigation funding. Largest dam failure in MI on Dead River; 2 dams failed in one day. Light and power is owner and trying to rebuild downstream dam.
 - SWP is working with partners to prevent new dam construction

- **Chesaning River** (Contact: Jim Hergott, Saginaw RC&D)

- **Boardman River; Stronach River** (Contact: Bryan Burroughs, Trout Unlimited)

- **Muskegon River** (Contact: Gary Noble, Muskegon River Watershed Assembly)
 - Muskegon is a cool water system, so dams lend to thermal pollution
 - ~100 inventoried dams, 4 on main stem. 3 of the 4 are FERC and owned by Consumers Energy
 - MRWA focuses on small dams. Removed Hersey Dam on Hersey River, a high quality, coldwater stream. Now working on removing Marion Dam on Middle Branch River. Big Rapids Dam removal and Hersey Dam removal are success stories.

- **Huron River** (Contact: Elizabeth Riggs, Huron River Watershed Council)
 - Mill Pond dam in Dexter. The Village of Dexter approached HRWC with a desire to remove the dam. HRWC advised on the project and dam was successfully removed in 2008 with funding from the village and state road reconstruction funds primarily.
 - Dam removal projects of interest: Peninsular Paper dam in Ypsilanti and Argo dam in Ann Arbor. Both dams were identified by State Fisheries Division as priority dams for removal.

Where do we want to be in 10 years with dams in Michigan?

- We have a body of scientific knowledge so the default for river management in Michigan is that free-flowing systems without dams are the best/preferred option
- The pace of dam removals has accelerated from 2010 levels due to tools available including dam inventory, clearinghouse, and manual/decision flow-chart alongside elevated public concern and increased knowledge
- We have a dam game plan: Capacity within the state has been built with all players engaged, and structure set-up and tested on dam projects
- Funding mechanisms are in place
- Michigan will be on the leading edge of dam removal and river restoration, such as WI, PA, VT, and MA are today

Part 3: Recommendations

The regional meetings yielded a set of recommendations for moving Michigan into a proactive position on its dam infrastructure, along with this summary of the regional meetings. HRWC personnel met at the beginning of the process (April 2010) with MDNRE staff and the EAC facilitator to discuss the regional meeting approach and content for the meetings in order to coordinate with the agency's reorganization and revisioning. HRWC and other meeting participants will meet with MDNRE staffers and management, the EAC, and state legislators such as Rep. Warren (D-Ann Arbor) to present and review the recommendations from the regional meetings and to identify priorities for implementation. To further disseminate the efforts of the river and conservation community's discussions, the report is posted on HRWC's website at www.hrwc.org and shared with the groups invited to the meetings. Moreover, HRWC will share the information with national river interests such as American Rivers and U.S. EPA Region V to build on existing partnerships and seek investment in Michigan's dam program.

- 1. Develop a dam information clearinghouse, decision-making flowchart, and other tools recommended above to share lessons on what works and what doesn't.**
- 2. Institutionalize current agency knowledge and experience on dams and river restoration to anticipate when people leave MDNRE.**
- 3. Establish an Advisory Board to MDNRE regarding dam removal.**
- 4. Establish funding mechanisms to address the dam infrastructure crisis.**
- 5. Establish consistency and guidelines in permitting requirements at the state level.**
- 6. Aspire to a "dam" division at the state level. Develop the Michigan Riverways Program Proposal.** *Generally, river and conservation groups are in support of the proposal, but would like to see the proposal developed to show how the program would interact with other state agencies and departments of MDNRE.*

- 7. Improve information transfer by training both field and central office staff in dam removal and river sciences.**
- 8. Add staffing to the Dam Safety Program.**
- 9. Develop a state-wide inventory of dams and a dynamic prioritizing scheme of dam removals.**
- 10. Push FERC for removals prior to relicensing, or at least mitigate impacts of dam through fish ladders and other means.**

In closing, the prospect of a new governor and state legislature in January 2011 will introduce some new faces to state administration and to this long-standing problem of maintaining safe dam infrastructure in Michigan. River and conservation groups bear some of the responsibility to convey the sense of urgency to them and this re*envisioning of dam management, and applying pressure to see that the difficult choices are not avoided. Pushing this agenda needs to be balanced with the realities that legislators and state staffers face under these times of fiscal drought (e.g., limits or bans on travel and training; lack of staff resources to enact new ideas and programs).

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