Fisheries Division Policy & Procedure	Program **Field Operation**	
	Chapter **Construction Impact Assessment**	Date Approved: **REVISED 02/25/2009**
	Responsible Program **Habitat Management Unit**	
Title **Dams and Barriers**		Number **02.01.002**

LEGAL REFERENCES

Michigan, acting through its Department of Natural Resources, has an obligation to preserve and protect its resources as prescribed by Article 4, § 52 of the Michigan Constitution. Fish and other aquatic organisms in the public waters of Michigan are entrusted to the State for the use and enjoyment of the public, present and future.

Part 301, Inland Lakes and Streams, of the Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451, as amended.

Part 315, Dam Safety, of the Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451, as amended.

Part 483, Passage of Fish over Dams, of the Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451, as amended.

Structures on State designated Natural Rivers systems (which include specific tributaries) are also subject to the respective Natural Rivers Plan (available on the DNR web site under Forest, Land and Waters, http://www.michigan.gov/dnr) and accompanying zoning ordinances administered by the local zoning review board, or the Michigan Department of Natural Resources, Fisheries Division. The Natural Rivers Program is established pursuant to NREPA, Part 305.

Projects which obstruct or alter navigable waters of the United States require federal review by the U.S. Army Corps of Engineers under Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403). The following projects are subject to Section 10 permit review: 10,000 cubic yards or more of wetland fill; stream enclosures of 100 feet or more; stream channelization of 500 feet or more; work in Section 10 (navigable) waters; projects which involve federal or state lands or rivers (e.g. federally designated wild and scenic rivers, federal parks, national lake shores, wildlife sanctuaries); projects that would impact federal endangered species.

For all construction related projects, refer to the following Soil Erosion and Sedimentation Control guidance documents:

- Department of Management and Budget Soil Erosion and Sedimentation Control Guidebook, February 2003 http://dnrintranet/pdfs/divisions/fish/sesc/DMB_handbook.pdf
- DNR Soil Erosion and Sedimentation Control Procedures, July 2003 http://dnrintranet/pdfs/divisions/fish/sesc/SESCProcedure7-22-03.pdf
- DNR Fisheries Division Process for Soil Erosion and Sedimentation Control, March 2003 and Addendum, September 2003

POLICY

The Michigan Department of Environmental Quality (DEQ) Land and Water Management Division has regulatory authority over all new dams, certain existing dam structures which may be periodically repaired, modified, or removed when practical, and water management practices at dams on public waters. Fisheries Division staff will review these proposed activities and provide comments and concerns to DEQ in a timely manner.

This policy does not pertain to structures that provide legally established lake levels or Federally-licensed hydropower projects (see relevant policies). For the placement of new sea lamprey barriers, the Great Lakes Fishery Commission Interim Policy will be followed (Great Lakes Fishery Commission 1999).

When dams or barriers are subject to review, Fisheries Division will recommend dam operations that mimic natural riverine conditions, protect and maintain desired aquatic communities, protect recreational uses, and where possible, rehabilitate natural resources degraded by the dam. Fish passage may be required in conjunction with dam

construction, repair, or other modifications. When natural resource impacts have occurred that can be mitigated or restored through dam modification, Fisheries Division will seek modification or voluntary removal, in lieu of repair, of deteriorated dams that no longer have value or provide a service. The construction of new dams, including dams on intermittent streams or wetlands, will generally be opposed. Recommendations shall take into account social, economic, ecological, and public trust values.

For additional information, also refer the Policy & Procedure entitled: Hydropower (FERC) Licensing Study Guidance, Lake Level Management.

EXPLANATION

The adverse impacts of dams on river and stream ecosystems have been well documented (Hammad 1972, Ligon et al. 1995, Shuman 1995, Petts 1980, Cushman 1985, Doppelt 1993, Benke 1990, Bain et al. 1988, and Ward and Stanford 1989). Dams interrupt and alter most of a river's ecological processes by changing the flow of water, sediment, nutrients, energy, and biota (Ligon et al. 1995). Some of the main ecological issues regarding effects of dams include water quality degradation, prevention of fish migration, and altered flow regimes. Dams transform long river reaches into impoundments and change downstream reaches, resulting in streambed degradation (Kohler and Hubert 1993).

Protection and restoration of river environments is essential for sustainable, diverse, and productive stream fisheries. Over the last two decades, fisheries managers and ecologists have explored the changes dams cause in the ecological processes of river environments. Rivers emerging beyond a dam may be substantially altered from the character of the river entering an impoundment above a dam. Aquatic community health is closely linked to water temperature tolerances and impounded waters may discharge at significantly higher or lower temperatures than normally encountered in the stream. Water quality may decline in impounded streams if excessive nutrients, sediments, and aquatic plants accumulate in the impoundment. Flow patterns reflecting normal high and low water conditions may also be fundamentally altered, affecting stream channel configuration, fisheries habitat, and many other physical and biological processes. Stream changes induced by dams are often reflected in the fish community. Native and desirable stream species are almost always displaced in river segments affected by dams. Dams also limit the normal movement of fish, other aquatic organisms, and organic material.

Dams not properly maintained can fail during flood events, resulting in fish kills, habitat destruction, and release of large amounts of sediment that may contain toxic contaminants. Many of these effects are long-term and difficult or impossible to correct. These effects proceed in an uncontrolled manner and represent a tremendous loss of investment in the dam and in natural resource management (e.g., fish stocking and habitat improvements). Dams that no longer serve any useful purpose should be removed to avoid catastrophic failure, eliminate dam maintenance and liability costs, and to restore natural river functions. Adverse effects of dams on the health and viability of our rivers and streams can be reversed with dam removal.

The DEQ has inventoried 2,503 dams across the state. These dams range in size and function to include large actively generating hydropower dams, down to small earthen dams. The majority of these dams are small, privately owned, non-power generating dams that are not subject to the dam safety provisions of the NREPA. Many State and Federally owned dams in Michigan provide water level control for waterfowl and fisheries management purposes. . Other services potentially provided by dams include recreation, irrigation, flood control, domestic use, debris control, navigation and holding of mine tailings. Most Michigan dams are several decades old and deteriorated due to age, erosion, poor maintenance, flood damage, ice damage, and poor design. Dams in disrepair that are not modified or removed are at significant risk of failure, particularly during high flow events.

Fisheries Division will review proposed dam construction, operation, and repair and make recommendations to protect fish spawning and migration periods and to minimize other potential adverse resource effects. Where significant damage to the public health, safety, welfare, property, and natural resources or the public trust in those natural resources or damage to persons or property occurs or is anticipated to occur due to the construction or operation of a dam, Fisheries Division will recommend to DEQ that they order the owner to limit dam operations (or deny new dam construction). These orders may include, but are not limited to:

A. Operation in run-of-river mode, which is defined as instantaneous inflow into the impoundment equals instantaneous outflow from the impoundment

B. Provide minimum flow release that mimic seasonal flows to protect downstream environments in bypass channels or other river reaches
C. Restrict reservoir fluctuations during drawdown by defining a specific drawdown window to protect aquatic resources, drawdown rate (0.5 feet per day), specified refill rate, maximum range of variation in water surface elevation (bandwidth), and daily stranded fish and mussel surveys
D. Cold water releases to enhance fishery when appropriate

Fish passage will be recommended in conjunction with other permitted dam modifications or repairs, unless the dam is a functional sea lamprey barrier or is serving other fisheries management objectives. Fish passage may be recommended for a dam serving as a functional sea lamprey barrier if fish passage or sea lamprey control can be provided using alternative technologies. Dams that are petitioned to be legally abandoned, or that undergo major modifications by their owners, will also be required to provide fish passage.

Construction activities that call for a temporary or permanent drawdown of the water level of a dam impoundment will be expected to utilize sediment management practices to limit the release of material to the downstream reach of the stream. Sediment management may include controlled release, silt curtains, dredging, sediment traps, and monitoring. Drawdowns must be scheduled to minimize adverse effects to fishes, including aquatic habitat, spawning areas, and spawning periods. Because of lethal effects caused by low water, drawdown timing should also protect reptiles, invertebrates, and amphibians that over-winter by burrowing into shoreline areas.

It is well-known that dams disrupt a river's continuity and most stream channels downstream of dams have little woody debris. Wood and other vegetative materials provide important energy and habitat structure to a river system. Fisheries Division supports efforts to ensure that woody debris is passed below a dam rather than removed or held within the impoundment. Rock piles, logs, stumps, and other natural material may provide important fisheries habitat in the impoundment and should not be removed during drawdown conditions.

Because of the significant adverse environmental effects of dams, Fisheries Division does not support new dam construction.

Dam removal will be considered where the dam serves little or no purpose and there is a reasonable expectation that dam removal will benefit the environment or aquatic resources. If the dam is likely to cause significant damage to public health, safety, welfare, property, natural resources, or the public trust in those natural resources, Fisheries Division will recommend that DEQ order its removal.

CITATIONS AND REFERENCES

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