

Goals, Objectives, and Strategies for the Huron River Articulated in Existing County and State Plans

Watershed Plan for the Huron River in the Ann Arbor-Ypsilanti Metropolitan Area (Washtenaw County Drain Commission, 2000)

Section Two – Goals and Objectives (p. IV)

The goal of this watershed plan is to “*protect and restore the Huron River, its floodplains, recreational impoundments, tributary waterways, and associated wetlands so that their beneficial functions and uses are achieved and maintained.*” Objectives to accommodate this goal focus on both programmatic and regulatory intergovernmental coordination: land use planning, natural resource protection, nonpoint source pollution control and stormwater management.

Objectives (p. 5)

Encourage local ordinances, strategies and programs that:

- 1) Prevent unnecessary modification of the Huron River, its tributaries and adjacent riparian areas.
- 2) Maintain and restore hydraulic function of floodplains and floodways by discouraging their alteration and encouraging restoration.
- 3) Protect and preserve natural features that perform stormwater management functions;
- 4) Preserve natural infiltration and the recharge of groundwater, by protecting and restoring open spaces and natural recharge areas, and reducing the amount of impervious area.
- 5) Promote buffering of waterways from the direct impacts of stormwater-related pollution.
- 6) Minimize the adverse effects of stormwater runoff from new highways and streets.
- 7) Encourage the use of native landscapes and reduced dependence on chemical applications.

Section Three – Uses, Threats And Impairments (p. IV)

All surface waters of the state of Michigan are designated for and shall be protected for all of the following uses:

- A. Agriculture
- B. Navigation
- C. Industrial Water Supply
- D. Public Water Supply at the Point of Intake
- E. Warm Water Fishery/Cold Water Fishery
- F. Other Indigenous Aquatic Life
- G. Partial Body Contact Recreation
- H. Total Body Contact Recreation Between May 1 and October 31

In addition to the Designated Uses listed above, Creek Groups are concerned with a variety of issues that can be categorized into one additional use:

- I. Recreation and Urban Amenity Opportunities

Section Five - Recommendations

A. STRUCTURAL, VEGETATIVE AND MANAGERIAL BMP'S

5. **Protect, stabilize and restore stream banks and channels through engineering / bio-engineering in County Drain and non-County drain areas and reduce erosive runoff that undermines stream systems. (p. 23)**

Discussion

Subsequent to flow stabilization provided by added stormwater structures, retrofits and source controls, the tributary channels can be stabilized to arrest bank wasting and erosion of the riparian corridor. Stabilization can be accomplished using a wide range of techniques depending on velocity and flow constraints for any given area. Where velocity and flow have been sufficiently mitigated stream banks can be re-contoured and re-vegetated (bio-engineered). Rip-rap and armoring can be employed where sufficient flow management has not been achieved. Often a combination of the two is possible whereby vegetation can be re-established along stream banks that have been artificially stabilized. The Malletts Creek Restoration Plan includes bank stabilization of Malletts following implementation of upstream flow control.

11. **Construct appropriate recreational access points to reduce erosion and protect banks and shorelines. Engage livery and marina operations to establish no wake zones and similar managerial BMPs to properly control erosion associated with recreational uses. (p. 11)**

Discussion

Uncontrolled use of popular fishing and boating access points leads to bank erosion and sedimentation. Improved access structures, piers and ramps can reduce the impact near high use areas and reduce erosion.

D. MONITORING AND DATA COLLECTION

22. **Continue water quality sampling and bio-monitoring. USGS, MDEQ, local governments and other entities are encouraged to expand river and creek sampling and water quality monitoring throughout the plan area, and sample and monitor on a more consistent and thorough basis. Track and publicize information on water quality and other trends. Utilize monitoring results to influence land use decision-making processes, and to support the need for new programs and new land use planning and development standards where appropriate. Expand the Huron River Watershed Council's Adopt-A-Stream program, to monitor effectiveness of watershed planning and to further encourage stream stewardship and community education, with the objective of protecting and restoring the Huron River and its tributary waterways. Further identify chemicals threatening water quality, and identify sources. (p.34)**

Discussion

Monitoring provides watershed managers with the quantitative tools to assess the effectiveness of stormwater management strategies. Continual evaluation of the components of this watershed plan will be supported by the results of monitoring programs. Adapting the priorities of plan implementation will depend largely on the results of monitoring programs. Additionally, future computer modeling for flow, velocity and water quality will rely heavily on these data.

The Adopt-A-Stream program samples biotic communities and habitat throughout the Huron River basin and serves as a regional model for long-term watershed monitoring of water quality parameters and for community organization for watershed protection efforts. Sampling continually finds excessively high levels of conductivity in local waterways. High conductivity can indicate the presence of any number of nonpoint source pollutants that may threaten water quality. Further laboratory analysis is necessary to identify specific contaminants and their sources so that control and mitigation can begin.

The USGS has established continuous flow gauging stations on Malletts Creek, and the Huron River. Dry and wet weather water quality sampling will continue at these locations.

Several programs managed by The Huron River Watershed Council offer technical assistance to local governments, review wetland permits and respond to citizen requests to provide input into local decisions affecting water resources.

E. INTERAGENCY COORDINATION

27. Encourage dam removal where opportunities exist. (p.36)

Discussion

The Huron River and its tributaries are impounded and fragmented by 96 dams and lake level control structures. Of these, 23 are located within the urban Ann Arbor-Ypsilanti study area. Ann Arbor currently operates all dams run of the river, per U. S. Department of Fish and Wildlife and Federal Energy Regulatory Requirements. Still, dams and their operation influence river and stream flow patterns and channel cross-sections, block drift and migration of aquatic organisms, alter water temperature and water chemistry, increase evaporation and causing a decrease in stream flow, and disrupt the transport woody debris.

In order to improve water quality, and natural river processes, all structures should continue to operate at run-of-the-river. In the long term, consideration should be given to removal of dams that no longer serve a critical function or are, in balance, provide a negative net benefit to the communities they serve.

MDNR Fisheries Division Huron River Assessment (1995)

MANAGEMENT OPTIONS (p. 52-59)

Compared to many rivers affected by urbanization, the Huron River is a fairly healthy system. Nonetheless, there are fishery-related problems that need attention. The management options presented in this assessment are an attempt to address the most important problems that are now understood and to establish priorities for further investigation.

These options follow the recommendations of Dewberry (1992), who outlined measures necessary to protect the health of the nation's public riverine ecosystems. Dewberry stressed protection and restoration of headwater streams, riparian areas, and floodplains. Streams and floodplains need to be reconnected where possible. We must view the river system as a whole, for many important elements of fish habitat are driven by whole-system processes.

The identified options are consistent with the mission statement of the FD. This mission is to protect and enhance the public trust in populations and habitat of fishes and other forms of aquatic life, and promote optimum use of these resources for the benefit of the people of Michigan. In particular, the division seeks to: protect and maintain healthy aquatic environments

and fish communities and rehabilitate those now degraded; provide diverse public fishing opportunities to maximize the value to anglers; and foster and contribute to public and scientific understanding of fish, fishing, and fishery management.

We convey three types of options for correcting problems in the watershed. First, we present options to protect and preserve existing resources. Second are options requiring additional surveys. Third are opportunities for the rehabilitation of degraded resources. Opportunities to improve an area or resources, above and beyond the original condition, are listed last.

Biological Communities

Species diversity remains high, but certain problems require attention. Fish species that require clean gravel or clear, heavily-vegetated water at some point in their life history have declined significantly. Those that tolerate silty conditions have increased. This change in community structure is a result of changes to certain habitats within the river. Most significant has been the loss of aquatic vegetation by dredging and construction of lake-level control structures or dams. Gravel substrate has mostly been lost to impounding of high gradient areas behind dams, channelization of tributaries to enhance drainage, or sediment deposition in low-gradient stretches. The other significant change to the fish community has been the loss of potamodromous species that historically used the river for spawning.

Mussel species have declined as large portions of the mainstem have gone from a free-flowing river to one with many impoundments. Amphibians and reptiles are suffering from the loss of wetlands available to them. The status of aquatic invertebrate communities is unknown.

- Option: Preserve vegetated headwater lake outlets by identifying any remaining ones, and prohibiting dredging and construction of lake-level control structures at these areas. The area most affected by this is from Big Lake to Baseline (Flook) Dam.
- Option: Preserve stream margin habitats, including floodplains and wetlands, by requiring setbacks in zoning regulations and controlling development in the stream corridor.
- Option: Preserve remaining high gradient and naturally-graveled habitats. This is mostly the area from Baseline (Flook) Dam to French Landing Dam, although other short stretches exist on the mainstem and on tributaries.
- Option: Survey the historic record to determine the pre-settlement fish fauna in the watershed.
- Option: Survey distribution and status of aquatic invertebrate and fish fauna.
- Option: Survey distribution and status of mussel populations and develop strategies for protection and recovery of these species.
- Option: Survey distribution and status of species of concern and develop protection and recovery strategies for those species.
- Option: Rehabilitate rare, high-gradient areas and fragmented habitats by removal of unnecessary dams (ex. removal of the Dexter Dam would reconnect the entire Mill Creek system to the mainstem).
- Option: Rehabilitate gravel habitats through reduction of sediment loads by stringent enforcement of local construction codes and implementing nonpoint source best management practices.
- Option: Rehabilitate populations of potamodromous fish by removal of the Flat Rock low-head barrier and Dam and restoration of spawning habitats.

- Option: Rehabilitate migration ability of fish by installing upstream and downstream passage at dams and barriers.

Geology and Hydrology

The Huron River has moderately stable flows. Many reaches, however, have less stable flows than expected or desirable. The most severe flow problems are caused by operations of the complex of dams in the Ann Arbor-Ypsilanti area, the on/off operations of many lake-level control structures, and the management of the various tributaries as drains.

- Option: Protect and rehabilitate the function of wetlands and floodplains as water retention structures for high flow conditions. Develop an inventory of existing and potential areas, with emphasis on riparian areas.
- Option: Protect critical groundwater recharge areas by identifying these and developing a strategy to protect them. Also identify any major removal of groundwater.
- Option: Protect and rehabilitate flow stability by developing an operational hydrologic routing model for the entire river system that describes both ground and surface water routes in response to changes on the landscape. Such a model would although various alternatives to be examined and drive future planning processes by providing fundamental information critical for proactive landscape and stormwater management planning.
- Option: Protect remaining natural lake outlets by prohibiting the construction of new lakelevel control structures. This would allow for the natural fluctuation of water levels needed for maintenance of wetlands.
- Option: Survey historical records to determine pre-settlement river flow patterns.
- Option: Rehabilitate mainstem run-of-the-river flows by linking the operation of the seven Ann Arbor-Ypsilanti dams to a single telemarked upstream-flow gauge. This will reduce errors in dam operations.
- Option: Rehabilitate headwater, tributary, and mainstem run-of-the-river flows by operating lake-level control structures as fixed-crest structures rather than by opening and closing gates.
- Option: Rehabilitate headwater summer base flows by establishing minimum flow requirements downstream of all lake-level control structures. These levels might be established through administrative or legal processes.
- Option: Rehabilitate headwater and tributary flow stabilities by working with county drain commissioners to incorporate flow patterns into criteria for drain design and stormwater management.
- Option: Rehabilitate flow stability by removing or plugging drain tile fields that are no longer critical for land drainage.
- Option: Rehabilitate flow stability by amending the Lake-level Control Act to disallow on/off operations.

Channel Morphology

The channel of the Huron River has been adversely altered. Most high-gradient reaches have been impounded. Early dredging, increased flood peaks, and current erratic dam operations have resulted in most of the remaining river and its tributaries being generally over-wide, shallow, simple, lacking diversity, or lacking woody structure.

- Option: Protect tributaries from further channelization by developing alternatives to current drainage practices (dredging).

- Option: Survey the historical record to determine pre-settlement channel form.
- Option: Rehabilitate rare high-gradient habitats by removing dams no longer used for their original purpose (example retired hydroelectric facilities), dams that are a safety hazard, and dams serving little purpose.
- Option: Rehabilitate recruitment of woody debris by developing and managing wooded greenbelts on riparian lands and managing amounts of wood in the channel (e.g. don't tear it all out).
- Option: Rehabilitate channel form by lowering flood peaks through addressing hydrologic concerns discussed in the Geology and Hydrology section.
- Option: Rehabilitate river banks below French Landing Dam to preserve the woody vegetation in this corridor that is in eminent danger of destruction.

Soils and Land Use Patterns

Agricultural and urban land uses have altered the river system, however, extensive undeveloped lands in the upper watershed have buffered these changes. Projected urban sprawl threatens the integrity of this buffer.

- Option: Protect undeveloped landscapes through property tax, transportation policies, integrated land use planning, and encourage redevelopment of urban areas.
- Option: Protect developed lands through land-use planning and zoning guidelines that emphasize protection of critical areas, minimizing impervious surfaces, and improved quality and quantity of stormwater management.
- Option: Protect and rehabilitate the functions of wetlands and floodplains.
- Option: Protect and rehabilitate the forested corridor along the river and its tributaries.
- Option: Protect and rehabilitate critical areas through the maintenance of current stormwater management systems and the retrofitting of areas that are in need of stormwater management systems.
- Option: Rehabilitate Mill Creek by developing a creekshed strategy that addresses controlling urban development, minimizing sediment inputs from agriculture and developed lands, creating a riparian corridor that includes floodplain/wetlands for flow stabilization, encouraging sustainable agricultural practices, and reconnecting this system to the mainstem by removing Dexter dam.

Special Jurisdictions

The Federal Energy Regulatory Commission licenses four active hydropower facilities within this basin. County drain commissioners have authority over designated drains and many lake-level control structures. The State of Michigan and the Huron-Clinton Metropolitan Authority control large amounts of riparian land and many dams.

- Option: Protect and rehabilitate the river system by supporting cooperative planning and decision making. Develop a Geographic Information System that could be used in these processes.
- Option: Survey and review management of land and dams owned by the State of Michigan and the Huron Clinton Metropolitan Authority.
- Option: Survey stream road crossings, identify negative affects, and implement best management practices.
- Option: Rehabilitate designated drains to natural stream status where such designation is no longer appropriate or where past drainage modifications have been excessive.

- Option: Rehabilitate designated drains by encouraging drain commissioners to use stream management approaches that protect and rehabilitate natural processes rather than the traditional clearing, deepening, straightening, and widening practices that emphasis moving water away most quickly with little consideration for the affect on the stream

Recreational Use

The watershed provides extensive recreational opportunities in large public-owned areas. Present impoundments in the high-gradient mainstem reach from Barton Impoundment to French Landing Dam provide poor-to-good opportunities. This reach has the potential to provide exceptional riverine fishing, canoeing, kayaking, and sightseeing. Portions of the river not in public ownership have little public access.

- Option: Rehabilitate attractive, high-gradient reaches by removing retired hydroelectric dams in the Ann Arbor-Ypsilanti area (e.g. Argo and Paper Peninsula dams) and in other high gradient reaches (e.g. Dexter Dam). This should occur in conjunction with development of parks on the reclaimed landscape, especially within communities.
- Option: Improve small-scale public access where lacking through MDNR, county, township, and other municipal recreation departments, as well as private organizations.
- Option: Improve public access at hydropower facilities under FERC relicensing agreements.

Dams and Barriers

The 96 dams within the watershed impound most high-gradient habitat, eliminate vegetated stream habitat at lake outlets, create flow fluctuations, trap sediments and woody debris, fragment habitat for resident fishes, and block potamodromous fishes from much of the river.

- Option: Protect the biological communities of the river by providing upstream and downstream passage at dams to mitigate for habitat fragmentation.
- Option: Protect fishery resources by screening turbine intakes at operating hydroelectric dams.
- Option: Survey and develop an inventory of barriers to fish passage, such as culverts.
- Option: Survey and develop a watershed list of the 20 most environmentally damaging dams and barriers to the river with recommendations to mitigate the damage.
- Option: Rehabilitate free-flowing river conditions by requiring dam owners to make appropriate financial provisions for future dam removal.
- Option: Rehabilitate free-flowing river conditions by removing dams.
- Option: Rehabilitate natural river flows by requiring dam owners to operate at run-of-the-river flows.
- Option: Rehabilitate natural river flows by physically modifying dams to permit run-of-the-river flows.
- Options: Rehabilitate natural river flows by modifying all possible dams to fixed-crest structures.
- Options: Rehabilitate natural river flows by operating dams based on river inflows, not impoundment levels.
- Option: Rehabilitate natural river flows by amending the Lake-level Control Act.

Water Quality

Water quality is good in most parts of the watershed. The mainstem is affected by moderate nutrient enrichment and turbidity. The presence of many Act-307 pollution sites raises concerns about future loadings of toxic materials in the river.

- Option: Protect the river by implementing improved stormwater and nonpoint-source best management practices.
- Option: Protect water quality by protecting existing wetlands, rehabilitating former wetlands, and maximizing the use of constructed wetlands as natural filters.
- Option: Survey loadings of nutrients and sediments to the river and develop strategies to reduce identified problems.
- Option: Rehabilitate water quality by supporting Act 307 site cleanups.
- Option: Rehabilitate the integrity of Mill Creek by implementing land use and drain management changes to reduce sediment loads.
- Option: Rehabilitate water quality downstream of Flat Rock by eliminating combined sewer overflow problems in Flat Rock and Rockwood.
- Option: Rehabilitate the quality of existing degraded wetlands by rigorous enforcement of Act 346 and local building ordinances.

Fishery Management

Fishing is good in headwater lakes and in the river system from the chain-of-lakes downstream to Barton Impoundment. However, gamefish populations appear reduced by a lack of woody structure and habitat fragmentation. Fishing ranges from poor to good through the seven mainstem impoundments. An attractive potamodromous fishery exists downstream of Flat Rock. Further development of this fishery is limited by Flat Rock Dam and weir.

- Option: Rehabilitate habitat continuity by removing unnecessary dams. Require upstream and downstream fish passage at those dams that remain.
- Option: Rehabilitate in-stream habitat for smallmouth bass and rock bass in the middle portions of the Huron River and its larger tributaries. This includes increasing cover and channel diversity.
- Option: Rehabilitate rare, bedrock spawning habitat for potamodromous fishes by removing Flat Rock Dam and weir.
- Option: Rehabilitate historic potamodromous fish runs, through stocking if needed. The original species that are best suited are walleye, white bass, muskellunge, and lake sturgeon.
- Option: Improve angling opportunities in the impoundments and chain-of-lakes by continued improvement and acquisition of public access.

Citizen Involvement

The Huron River Watershed Council coordinates citizen involvement in watershed planning and protection.

- Option: Protect and rehabilitate watershed integrity by supporting the watershed council in its efforts to build public support.
- Option: Protect and rehabilitate watershed integrity by encouraging and supporting watershed- based development practices by other agencies.
- Option: Improve and implement strategies to educate the community as to the benefits of riverine ecosystems, wetlands, and floodplains.