



Minnesota DNR Fish Habitat Vision

February 2010

In the face of many pressures on our natural resources, sustaining Minnesota's excellent fishing is not guaranteed and cannot be taken for granted. Changing land use and population growth threaten aquatic habitats in Minnesota. Maintaining high quality aquatic habitat and healthy ecosystems are essential for sustaining the fisheries that provide fish that are safe to eat, support a multi-billion dollar angling economy, and contribute to the quality of life we enjoy. Just as wildlife managers focus on managing terrestrial habitat, fisheries managers must focus on managing aquatic habitat.



THE VISION

of the Minnesota Department of Natural Resources is to achieve healthy, resilient aquatic ecosystems throughout the state that provide sustainable fishing and diverse, native fish communities. This vision will be realized through active collaboration with our partners to protect, enhance, and restore aquatic habitat in order to insure our multi-billion dollar angling economy.

GUIDING PRINCIPLES

- **High-quality aquatic habitats must be protected.** Losses of aquatic habitat for fish are occurring at a rapid pace because of land use changes in watersheds, development along shorelands, climate change, and a widening societal disconnect with healthy, natural systems. While many of our aquatic resources are still of outstanding quality, they are under increasing ecological stress. The generally acknowledged statement that it is "cheaper to protect than to restore" will guide the Section of Fisheries to identify high-quality lakes and streams and prioritize them for protection.
- **Healthy watersheds are fundamental to clean water and fish habitat.** Fish are indicators of the ecosystem health of the lakes and streams in which they live. Therefore, improving watershed conditions and sustaining ecosystem services improves fish habitat and benefits a multitude of other aquatic and terrestrial organisms.
- **Partnerships are critical for improving aquatic habitat.** The experience, knowledge, and skills of Fisheries staff must be leveraged with that of our partners to improve aquatic ecosystem management. The Section of Fisheries will be an effective partner with federal and state agencies, local governments, non-governmental organizations, sporting groups, lake associations, and others. These strong partnerships will enable us to capitalize on the expertise and fiscal resources that maximize the delivery of habitat protection and restoration programs and policies.

GUIDING PRINCIPLES (cont)

- **A key partner will be the integrated Ecological Resources/Waters division.** The Section of Fisheries will partner with the new division and work with landowners, watershed managers, and policy makers to achieve healthy watersheds. The extensive, field-based network of biological expertise at Fisheries area offices will enable the Section to assist the new division with local aquatic habitat issues and resource monitoring.
- **Section of Fisheries procedures and staffing patterns will focus on habitat management activities.** Increased focus on aquatic habitat requires strategic changes in how the Section of Fisheries conducts its business. This will shift how we gather habitat data; how we recruit staff and allocate budget resources; how we develop and implement habitat projects; and how we acquire Aquatic Management Areas. The Section will communicate this shift in focus with our stakeholders and engage them in this important work.
- **Aquatic habitat management is implemented within a strategic framework that maximizes the habitat benefit for the amount of resources allotted.** The Section's strategies for prioritizing habitat work will be based on ecologically sound, scientific principles that maximize protection, enhancement, and restoration of aquatic habitat. This strategic framework will be particularly important as large funding sources, such as the Outdoor Heritage Fund, Clean Water Legacy Fund, National Fish Habitat Action Plan, and the Minnesota Environmental and Natural Resources Trust Fund, base their funding decisions on how proposed habitat actions maximize benefits and outcomes.
- **Realistic protection, enhancement, and restoration goals will guide habitat work within specific eco-regions.** Aquatic resources are exposed to different stressors across the state. Therefore, organizing aquatic habitat management actions around eco-regions and watershed boundaries will facilitate development of geographically appropriate strategies.
- **The Section of Fisheries will support research and programs that seek to increase public understanding, acceptance, and practice of aquatic habitat stewardship behaviors.** Established programs include MinnAqua and the Shoreland Habitat Restoration Program. The Section will initiate internal research projects or contract with research institutions to gather critical human dimensions data from which to develop or adapt programs.



- **The sum of habitat management actions will result in measureable restoration and protection of aquatic systems.** Cost-effective monitoring and evaluation tools will be developed that will allow us to measure success (protection measures will include modeling future consequences of unprotected scenarios). These tools will build upon our existing lake and stream survey programs and be coordinated with monitoring programs within other DNR divisions, state agencies, and capable partners.

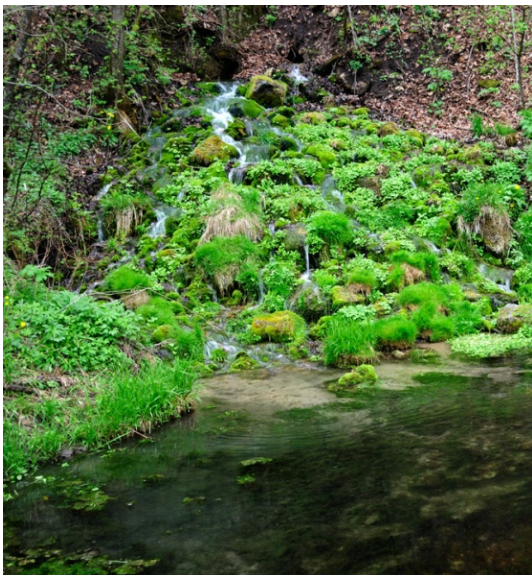
Fish habitat in lakes...

...is the physical structure that fish need for food production, spawning substrate, and cover from predation:

- **Submerged vegetation** e.g. large-leaf pond weed, coontail, bladderwort, musk grass
- **Emergent vegetation** e.g. lily pads, bulrushes, wild rice
- **Woody structure** e.g. fallen trees along shorelines
- **Bottom substrate** e.g. boulders, gravel, sand, organic sediments

...and the water quality that determines:

- **Oxygen levels in the deep water** below the thermocline (especially important for coldwater fish such as tullibee, lake whitefish, lake trout)
- **Susceptibility to undesirable fish species** such as carp and black bullhead, which thrive in poor water quality environments
- **Build up of attached algae** on spawning substrates which is detrimental for fish such as walleye
- **Water clarity** important for sight feeders such as muskellunge, northern pike, and largemouth bass



Fish habitat in streams...

...can be described by the following components:

- **Hydrology** – controls the source, amount, and rate of flow within the stream channel. Wetland drainage, road building, field tiling, and withdrawing water affect the hydrologic cycle within the watershed.
- **Connectivity** – refers to the pathways for exchange of water and organisms throughout a river system. Physical barriers such as dams and flow reductions from water withdrawals disrupt connectivity.
- **Biology** – the plants and animals that comprise the living ecosystem of a stream. The mosaic of terrestrial and riparian plants along the channel, flood plain, and watershed are especially vital for determining the health of a stream ecosystem.
- **Geomorphology** – the geologic template of landscape topography, soil type, and stream flow patterns that set the foundation for the shape of the stream channel and flood plain. These forces interact dynamically with hydrology to directly affect the habitat of stream fishes.
- **Water Quality** – the chemical and physical nature of water in the stream. Sediment loads, nutrient concentrations, and water temperature determine the suitability of the stream for different species of fish. As with lakes, water quality in streams is a direct reflection of land use in a watershed.



Actions for Anglers

Anglers can help support and implement this vision by:

Implementing projects – Get involved in habitat restoration or protection projects. Work with local DNR Fisheries staff to identify project opportunities, help organize a project, or partner with other organizations and lake associations.

Seeking project funding – Write grant applications to fund high priority habitat projects or lend your organizational clout to existing partnership initiatives. Your local DNR Fisheries staff can help identify high priority habitat projects or connect you with partnership opportunities.



Participating in policy development – Take a seat at local and state policy development tables. Citizen input committees are an important opportunity to shape policy decisions favorable for fish habitats. Angler voices need to be heard at the table.



Reaching out to others – Educate others on the importance of fish habitat in sustaining the fishing that you enjoy and the economy of our state that depends on clean water and quality fishing. Fishing is important to you and fish habitat is essential to high quality fishing. Write about it, talk about it, whatever it takes to get the word out to others and then keep telling them.

Providing comments to DNR – Your opinions and perspectives matter. Your opinions will shape and guide our operations and decision making into the future. Talk with your local DNR Fisheries staff or contribute through the DNR website.

Photo credits: Underwater fish photos from Eric Engbretson, spring-fed stream from Peter Jacobson, wooded shoreline from Tara Duval, and meandering stream from DNR photo.

We'd like to hear your thoughts. Please contact Michael Duval, Lakes Management Coordinator, at 218-833-8612, michael.duval@state.mn.us, or Peter Jacobson, Fisheries Habitat Research Supervisor, at 218-846-8350, peter.jacobson@state.mn.us, to share your ideas.