

GREAT HABITAT - GREAT FISHING!

Lake Habitat Restoration and Management - These guidelines are meant for lake-property owners interested in voluntarily improving habitat for muskellunge on their shorelines. They are not meant to address serious problems with erosion or run-off.

Site Specific Activities

PLANNING.

- **Sketch** the property and show the location of anticipated restoration activities.
- **Document** the site before and after with photographs.
- **Check** with your local Water Management Specialist and Fisheries Biologist for permits needed on a site-specific basis. Proposals may be subject to Chapter 30, Wis. Stats.

BUFFER ZONE

- **Flag** the shoreland within at least 35 feet of the water's edge for protection - no mowing or brushing should take place, except to maintain a path to a dock or for a viewing corridor (< 30 feet wide). In the long-term, cedar, white pine, or eastern hemlock are the best riparian tree species for muskellunge.

BANK

- **Remove** rip-rap, sea walls, or other artificial erosion control structures. These can impact aquatic plants through wave action and reduce or eliminate near-shore habitat.
- **Slope** the banks, if needed (when removing sea-walls or rip rap). Allow natural shoreline plants to grow. Planting may be needed (guides are available from your Water Management Specialist).
- **Protect** the bank if it is bare. Brush bundles can be staked into the bank to protect raw areas. Use readily sprouting species such as alder, dogwood, or willow (except weeping willow). Also, sedges can be planted.
- **Install** temporary wave breakers, especially in high-energy areas, until plants have become established. Brush bundles staked to the bottom in 3 to 5 feet of water are effective temporary wave breakers and also serve as habitat for aquatic organisms. Bulrushes can be planted between the land and the wave breakers in areas with firm bottoms (consult an expert). Cattails or arrowhead are desirable in soft-bottom areas.

AQUATIC PLANTS

- **Leave** aquatic plants along the shoreline. Muskellunge spawn on aquatic plants. Manually remove (by raking) only enough plants to allow boat access to your dock. If you already have a sandy beach, consider reducing its size to allow for natural shoreland and underwater plants to be reestablished. If aquatic plants are not present, consider plantings to speed up the restoration. Again, bulrushes are ideal for near-shore areas with firm bottoms (restoration can be difficult; consult an expert).
- **Install** temporary wave breakers. These will reduce wave action and hasten reestablishment of aquatic plants. Wild Celery (*Vallisneria*), bulrushes, coontail, and native (not eurasian) milfoil are known to be important for muskellunge nursery areas. Chara is also a documented spawning substrate for muskellunge.

WOODY COVER. Wood particles are important for muskellunge spawning and the structural elements of trees and bushes provide cover for young muskellunge and their food.

- **Tree drops** should be live trees with a minimum of 12" in diameter at the base. Trees at the shoreline should not be entirely severed at the base – this will help anchor the tree to shore. If this is not possible (e.g., trees are brought in from other areas), the base should be anchored to the shore with a cable fastened to the stump, a nearby tree, other secure object, or a "dead man" driven into the bank. Tree drops within 100 feet of shore generally do not need to be marked as navigation hazards because they are within the "slow-no-wake" zone. However, the need for marking should be determined on a case-by-case basis in step one. One fallen tree for every five feet of shoreline is the ultimate goal (this is the frequency of fallen trees in undeveloped Wisconsin lakes). A combination of cedar, pine, and aspen or birch will provide cover for many years. Pine and cedar are long lasting; aspen and birch provide good cover and break down quickly into woody fragments that can improve muskellunge spawning.
- **Secure** old Christmas trees under piers to provide shelter for young muskellunge. Plant cover is usually lost due to the shading effects of docks. Half-logs in about 3 feet of water provide nest sites for bass.

Lake-wide Activities

- **Identify Sensitive Areas** – Cruise shorelines and identify areas with ideal muskellunge habitat (spawning areas, nursery areas, or rare/unique adult habitat). Mark them on maps and share them with local Fisheries Biologists and Water Management Specialists. They can conduct “Sensitive Area Designations” and flag them for protection in the event of future permit applications to alter the habitat.
- **Identify existing spawning areas (spot light surveys)** – Cruise the shorelines at night during the spawning period (50-60 F). Spotlights will pick up reflections from muskellunge eyes. Record the number and location of muskellunge seen during this time period (along with the areas and times surveyed). At this time of the year, fish are located in spawning areas, AND night-time fish counts are directly related to population abundance, so trends in these counts over time can be used to track changes in adult abundance.
- **Develop a “Demonstration Area”** to showcase shoreline restoration and use it to educate other lake shore property owners. Work with other interested lake shore property owners adjacent to identified muskellunge spawning areas to protect these areas from development, destruction, or alterations.
- **Monitor dissolved oxygen** at dawn in spawning areas if problems with egg/fry survival are suspected,. If it falls below 3.2 ppm, sealing high BOD materials may be needed. Alternatively, use water-level management, where possible, for over-winter drawdown to compact and aerate bottom sediments in spawning areas. This, however, can result in freeze-out of aquatic plants during harsh winters.
- **Work with local units of government** to develop boating ordinances (“slow-no-wake”, etc.) to protect sensitive or critical habitats if boat traffic is a concern.

Useful Background/Reference Materials: The Department of Natural Resources and the University of Wisconsin-Cooperative Extension Service offer a variety of resources and materials to help lakefront property owners plan restoration projects and improve the habitat along a waterfront. Contact your local DNR service center to request information. DNR Water Management Specialists will explain the rules and describe how property owners can design their project to meet personal and environmental concerns and possibly avoid the need for a permit. For further information check the DNR Waterfront page (www.dnr.state.wi.us/org/water/fhp/waterfront.htm) or the [UW-Extension clean water web site \(http://clean-water.uwex.edu/\)](http://clean-water.uwex.edu/).

- **Lakescaping for Wildlife and Water Quality** (180 pages, \$19.95, available from the Minnesota Bookstore at 1-800-657-3757). Wisconsin DNR staff recommend this book as a detailed planning guide for shoreland restoration in Wisconsin.
- **The Living Shore**, a 17-minute video produced by UW-Extension and University of Minnesota Extension showing the importance of leaving a natural ‘buffer zone’ between the lake and lake owners’ dwellings, and providing information about selecting and planting shoreline plants. Call the Wisconsin Association of Lakes (1-800-542-LAKE) to order a copy for \$15 plus \$2 in shipping, or check your local library for a copy.
- **A Fresh Look at Shoreland Restoration**, A 4-page pamphlet describing options for restoring shoreland habitat. Available from UW-Extension # GWQ027, or the DNR, publication # DNR-FH-055
- **What is a shoreland buffer?**, A brief ecological and legal overview of shoreland buffers. Available from the UW-Extension, publication #GWQ028 or the DNR, publication # DNR FH-233.
- **The Water’s Edge**. A 12- page brochure about what you can do on your lakeshore property to improve habitat for fish and wildlife. Available from your local DNR Service Center.
- **Life on the Edge... Owning Waterfront Property**, UW-Extension. Send \$3 per copy plus \$1.50 for shipping and handling for a total of \$4.50 (make checks payable to UW-Extension) to: UWEX-Lakes Program, College of Natural Resources, University of Wisconsin, 1900 Franklin St. Stevens Point, WI 54481

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