



Hitting deadheads can damage lower units and propellers.

The Solution

As a boater, *you* are the key to reducing shoreline erosion when you are on the river by reducing the speed and resulting wake from your boat, especially when the water level is above normal. To reduce your wake, you first need to understand that most modern power boats operate in three different speed zones:

- **Displacement Speed** - This is the slowest speed for most motorboats and occurs when the boat operates with the bow down at slow speeds resulting in very little wake.

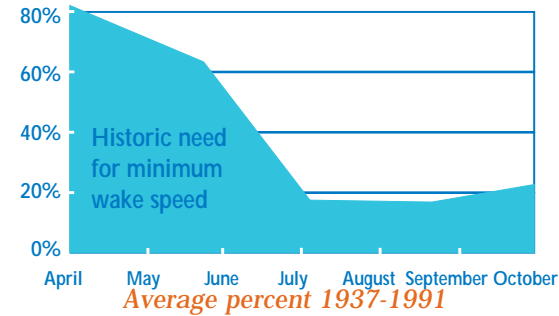
- **Transition Speed** - When power is applied, the bow rises and the engine is using the maximum amount of fuel as it attempts to get the boat up on *plane* (if the boat has a planing hull). It also creates the largest wake, since the boat is now plowing through the water.

- **Planing Speed** - When a boat reaches planing speed the bow drops, fuel consumption is less than transition speed and only a small portion of the hull contacts the water (which creates less of a wake than transition speed). Note: many cruisers and houseboats cannot reach this speed.

To give a better idea of wake size, a 12-ounce beverage can is a little less than five inches high - the height of a wake that will reduce damage to the shore and allow a reasonable speed. Many runabouts and larger fishing craft create a wake approximately 10 inches high when they are on plane, while large displacement hulls (cruisers and houseboats) can create a wake about 25 inches high or more. *Hydrologists estimate a wake 10 inches high is five times as destructive to the shoreline as a 5-inch wake, while the wake that is 25 inches high has a destructive potential that is 30 times greater.*

When the water level is three feet or more above the normal low level (667 feet above sea

Mississippi River at Red Wing



level) on this section of the Mississippi River, minimum wake speed is recommended. **During this period, boaters need to slow down and make sure their wakes are five inches or less in this area.** The best way to do this is to always be aware of the wake behind your craft and what it looks like as it impacts the shore. *As a boat operator, you need to know that you are legally responsible for your wake under both federal and state law.*

A river level three feet above normal low pool will be encountered approximately 80 percent of the time during April, but that drops to 17 percent during the month of August. During years in which there is a low river flow, it is likely that there will be little need to restrict your boat wake during the months of July through October. However, you should be alert for water level changes that sometimes vary unexpectedly as the result of heavy rains upstream.

The Future

If all boaters become aware of the wakes their boats create and take action to reduce them when necessary, the shoreline erosion can be reduced and conditions should improve. If this does not occur voluntarily, however, mandatory speed and wake restrictions may have to be placed on this stretch of the river.

Watch and Listen!

Watch for:

- High water levels when you launch your boat or leave the marina.

Listen for:

- River level information from the Corps of Engineers. Call (612) 222-3623
- Latest information on "Minimum wake" conditions on broadcast and marine band radio.

FOR MORE INFORMATION ON BOATING

In Minnesota call:

Minnesota Department of Natural Resources
Boat and Water Safety Section
500 Lafayette Road
St. Paul, Minnesota 55155-4046
(651) 259-5400

Goodhue County Sheriff
Red Wing, Minnesota 55066
(651) 385-3155

In Wisconsin call:

Pierce County Sheriff
Ellsworth, Wisconsin 54011
(715) 273-5051

The Wisconsin Department of Natural Resources may be contacted through the Pierce County Sheriff's office listed above.



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Illustrations by Beth Petrowske

MISSISSIPPI RIVER BANK EROSION AND BOATING

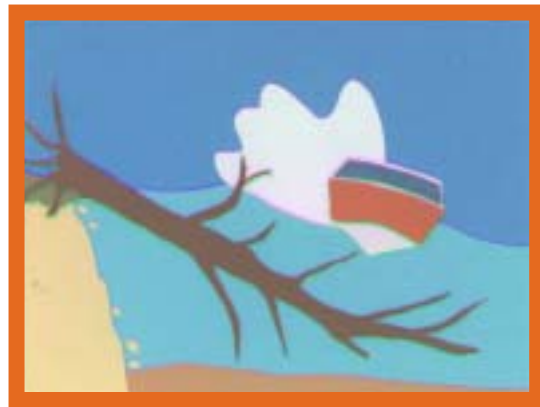
FACTS AND SOLUTIONS

The River

The Mississippi River along the southeastern border of Minnesota has scenic values and fish and wildlife resources of national significance. This provides for a great diversity of recreational opportunities. Boating, particularly is popular, with craft ranging in size from canoes to cruisers.



Sediment clouds the water, creating poor swimming, fishing and boating conditions.



Snags can cause capsizing and hull damage.

The Problem

Unfortunately, some of this use has resulted in serious riverbank erosion problems in a portion of Pool # 4, extending from Lock and Dam # 3 (north of Red Wing) to the northern end of Lake Pepin. The banks in this section of the river are composed mostly of fine silt and sand that is easily eroded by wake or wave action, especially during high water levels.

Research done on the river by the Minnesota Department of Natural Resources (DNR) near Red Wing from 1989 through 1992 revealed that high energy wakes from motorboats can greatly accelerate natural erosion, causing the banks to erode by as much as two feet per year on the inside of a riverbend and up to 14 feet on the outside of the riverbend over a three-year period! This erosion was most common during periods when the river was at least three feet above the normal low water level. The study used locations and techniques to reflect the specific effects attributable to recreational boat wakes, realizing that the river is also subject to commercial barge traffic, as well as the natural action of waves and currents. As an example, a parallel channel in the same area of the river, which receives very little recreational boat traffic, did not show the same accelerated bank erosion.

This has the potential for serious consequences for river ecology, fishing and boating. In addition to the loss of the shoreland itself, there are at least two other detrimental effects that result from it:

- **Increase in Sediment** - As the riverbank erodes sand and silt are washed into the river in large amounts.

- **Loss of Trees and Vegetation into the River** - When soil is washed from around their roots, trees and other vegetation fall into the river in increasing numbers. The loss of shoreline vegetation then further increases the potential for further loss of riverbank.

The Effects

1. **Reduced Recreation** - Sediment washed into the river clouds the water, creating poor swimming, fishing and boating conditions.

Sediment settles out of the water and fills in important backwater areas choking out aquatic vegetation that is essential to fish and wildlife.

3. **Additional Dredging** - Over time, this extra sediment will probably require additional dredging to maintain the navigation channel. This costs additional taxpayer dollars and presents the problem of where to safely place the extra dredge spoil.

4. **Property Loss** - When land is lost, it cannot easily be replaced. Owners of riverbank property, whether private or public, are deprived of its use. In addition, the expenditure of thousands of dollars may be necessary by the owners in an attempt to stabilize the shoreline.

5. **Damage to Boats** - Trees and large branches can float downstream after falling into the water (creating snags or deadheads), sometimes lodging in the bottom of the river. These become serious hazards to watercraft. Many of them also float just below the surface of the river, hidden like a mine from the unsuspecting boater and serious damage can result from hitting one of them. At best you will be left with a repair bill for hull repairs, a new propeller or a lower drive unit (which can cost up to \$3,000 to repair or replace). At worst, your boat could hit a deadhead at night and capsize, resulting in injury or death.

6. **Damage to Facilities** - When floating snags hit an obstruction (such as a bridge, navigational buoy, dock or lock and dam) they can cause damage. In addition, removal of the floating trees and repair to buoys and facilities costs money, most of which comes from you as a taxpayer.

See other side

