

4.14. BOAT OPERATION

Management Measure for Boat Operation:

Manage boating activities where necessary to decrease turbidity and physical destruction of shallow water habitat.

Management Measure Description

No wake zones, motorized craft restrictions, and sign and buoy placement are widely used practices for protecting shallow-water habitats. Important aquatic vegetation should be protected from damage due to boat and personal watercraft propellers because of its ecological importance and value in preventing shoreline erosion. This management measure presents effective, easily implemented practices for protecting aquatic vegetation and shorelines.

Boat traffic (including personal watercraft) through shallow-water areas and in nearshore areas at wake-producing speeds can resuspend bottom sediment, uproot submerged aquatic vegetation, erode shorelines, and harm some animals, including manatees. Resuspended sediment and erosion along shorelines increases turbidity in the water column. Turbid waters can't support submerged aquatic vegetation to the same depths as clear waters because sunlight can't penetrate to as great a depth. With photosynthesis limited to the upper foot or so of water, less dissolved oxygen is produced.

Fish that locate prey primarily by sight have a harder time finding prey in turbid waters. Plant leaves can become coated with fine sediment, and bottom-dwelling organisms are continually covered by resettling sediment.

Resuspended sediment can also contain harmful chemicals that were discharged at the marina or elsewhere in the watershed and had been trapped in the sediment. Once in the water column, these chemicals are more likely to be ingested by fish

and shellfish and to work their way up the food chain, possibly to someone's dinner table.

Uprooted submerged aquatic vegetation can no longer provide habitat for fish and shellfish or food for waterfowl. Instead of recycling nutrients released from matter decomposing in the waterbody, the vegetation adds more nutrients as it decomposes. It also cannot reduce wave energy at shorelines, so the shorelines become more exposed to the erosive forces of storm waves and the boat wakes that contributed to their initial loss. Replacing submerged aquatic vegetation once it has been uprooted or eliminated from an area is difficult, and the science of replacing it once it is lost is not well developed.

Many manatee mortalities are human-related, occurring from collisions with watercraft, and restrictions on boating activity in shallow water habitats favored by the animals could reduce the number of animals injured by propellers. West Indian manatees (*Trichechus manatus*) are found in shallow, slow-moving rivers, estuaries, saltwater bays, canals, and coastal areas. They are a migratory species, and in the United States they are concentrated in Florida in the winter but can be found in summer months as far west as Alabama and as far north as Virginia and the Carolinas. There are about 2,600 West Indian manatees left in the United States.

Manatees are protected under federal law by the Marine Mammal Protection Act of 1972 and the Endangered Species Act of 1973, which make it illegal to harass, hunt, capture, or kill any marine mammal. They are also protected by the Florida Manatee Sanctuary Act of 1978, which states:

Guidelines for Responsible Personal Watercraft Operation

Personal watercraft, include jet skis and waterbikes, are propelled by waterjet drives, have shallow draft designs, and are able to achieve planing speeds (65 mph and higher). Approximately one-third of all new boat sales in recent years have been personal watercraft. They are defined as Class A inboard boats by the U.S. Coast Guard and are required to follow most boating regulations. The personal watercraft industry encourages users of personal watercraft to adopt the following simple guidelines to preserve natural resources:

- Ride in main channels to avoid stirring bottom sediments; limit riding in shallow water.
- In coastal areas, be aware of low tide when seagrass beds, other delicate vegetation, and bottom organisms are more exposed.
- Operate away from shore as much as possible to avoid disturbing wildlife with wakes and noise and to avoid interfering with their feeding, nesting, and resting.
- Ride at controlled speeds in waters where sea otters, sea lions, manatees, whales, and sea turtles live and swim, so you can avoid hitting and injuring them.
- Avoid mangrove communities, kelp forests, seagrass beds, and coral reefs, since these are delicate ecosystems that are easily damaged.
- Avoid high speeds near the shore to minimize or eliminate your contribution to shoreline erosion.
- Wash your personal watercraft off after use and before trailering it to other waters to avoid spreading exotic, nonnative species to uninfected waters.

(PWIA, 1999)

“It is unlawful for any person, at any time, intentionally or negligently, to annoy, molest, harass, or disturb any manatee.” Anyone convicted of violating Florida’s state law faces a possible maximum fine of \$1,000 and/or imprisonment for up to 60 days. Conviction on the federal level is punishable by a fine of up to \$50,000 and/or 1 year in prison.

The manatee is mentioned to illustrate the harm that can be done to aquatic life by boats. Species other than manatees, such as seals or dolphins, might be more likely to be affected by boat operation in other regions of the country. The state natural resources agency can be contacted for state- or region-specific information.

Applicability

This management measure is applicable to state natural resource managers. Marina managers and boaters can become involved in efforts to protect sensitive aquatic habitats.

Best Management Practices

- ◆ *Restrict boater traffic in shallow-water areas.*

Where shallow areas that normally have submerged aquatic vegetation are found instead to have trenches (usually 10 to 24 inches wide) without vegetation running through them, boat propellers or personal watercraft are probably the reason. Seagrass beds usually grow in patches; the center of the patch is protected from erosive currents by vegetation at the edge of the patch. Trenches cut by boat propellers act like roads cut through a forest, exposing the center of the patch to currents and making the entire patch less stable. The sediment in the trench is also newly exposed to currents, making it difficult for new vegetation to establish itself. Further loss of submerged aquatic vegetation and sediment next to the trenches is likely after the initial loss.

To protect seagrass beds and bottom habitats, shallow-water areas can be established as “off limits” to boat traffic of any type, including personal watercraft. Signs or buoys in the water around the edges of these areas can help the public comply with shallow habitat protection efforts. Distribution of flyers with maps that show shallow areas and indicate permanent landmarks, so boaters can easily determine whether they are near shallow areas, is another effective tool. Boaters usually try to protect these habitats once they understand their ecological importance and are aware of their presence. Shallow-water habitat destruction is due more to a lack of knowledge than to negligence.

- ◆ *Establish and enforce no wake zones to decrease turbidity, shore erosion, and damage in marinas.*

No wake zones are more effective than speed limits in shallow surface waters for reducing turbidity and erosion caused by boat passage. Hull shape strongly influences wake formation, allowing some boats to go fast with little wake while other boats throw a large wake at slow, nonplaning speeds. In shallow areas, larger waves from the wakes of “speed-limited” watercraft are more likely to resuspend bottom sediments and create turbid waters.

Although the prime responsibility for creating, enforcing, and posting signs for no wake zones rests with government, marinas can (*and many do!*) post NO WAKE signs within their marina waters.

BMP Summary Table 14 summarizes the BMPs for Boat Operation mentioned in this guidance.

BMP Summary Table 14. BOAT OPERATION MANAGEMENT

MANAGEMENT MEASURE: Manage boating activities where necessary to decrease turbidity and physical destruction of shallow-water habitat.

APPLICABILITY: State natural resources managers. Marina managers and boaters can become involved in efforts to protect aquatic habitats.

ENVIRONMENTAL CONCERNS: Boat and personal watercraft traffic through very shallow water and nearshore areas at wake-producing speeds can resuspend bottom sediments and erode shorelines, all of which can increase turbidity in the water column. Turbidity blocks the penetration of sunlight to underwater plants that need light for survival, and it reduces visibility for fish who rely on sight to catch their prey. Vessel traffic can also uproot submerged aquatic vegetation (SAV), which is habitat for fish and shellfish and food for waterfowl, recycles nutrients released from matter decomposing in the waterbody, and reduces wave energy at shorelines, thus protecting them from erosion. Vessel traffic also might churn up harmful chemicals that had been trapped in the sediments and might contaminate fish and shellfish that people eat. Propellers or jet drives, when in contact with the bottom, dig visible furrows across the soil and the vegetation, which can take years to recover.

BOAT OPERATION PRACTICES

Best Management Practice Examples	Marina Location & Usage	Benefits to Marina	Projected Environmental Benefits	Initial Cost Estimate	Annual Operation & Maintenance Cost Estimate	Notes
Restrict boater traffic in shallow-water areas	Shallow-water boating areas; generally recommended	MODERATE; vegetated bottoms help limit erosion and resuspension of sediments	HIGH; shallow water habitats are important to many aquatic organisms for feeding, shelter	MODERATE	MODERATE	Mark areas with signs and buoys; include sensitive shallow area restrictions on navigation charts; post charts on marina bulletin boards
Establish and enforce no-wake zones to decrease turbidity, shoreline erosion, and damage in marinas	Near-shore areas; universally recommended	HIGH; wake control reduces damage to docks, floats, and shorelines and saves cost of maintenance dredging; wave-free marina basins are more pleasant for boaters	HIGH; reduces shoreline erosion; preserves biologically important nearshore habitats and the flora and fauna that live in them	LOW	LOW	Consider posting "no-wake" signs near shoreline areas in the marina; solicit the local government to establish no-wake zones where shoreline erosion might be a problem