Best Management Practices for Environmental and Habitat Protection In Design and Construction of Recreational Boating Facilities

Oregon State Marine Board

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Table of Contents

Introduction

The purpose of this document is to provide information and guidance to facility owners and operators as well as planners, engineers, and contractors involved in facility improvements. The Best Management Practices (BMPs) listed here will also serve as a ready reference to regulators and natural resource professionals regarding standard environmental practices on OSMB funded facility projects. These projects are generally limited to repairs and modification to existing boat ramps, docks and related features. Occasionally, facilities are removed and replaced in an alternate location. New facilities are seldom constructed.

The following BMPs minimize potential project impacts to water quality and habitat degradation from boating facility projects typically conducted in Oregon. Application of the BMPs do not diminish the importance of individual project assessment, which may identify additional measures required to protect unique site attributes or to address potential impacts of atypical project components.

LAUNCH RAMPS

FACILITY SITING

- Facilities should be located at existing boating access points whenever reasonable and feasible.
- New or replacement sites, when necessary, should be chosen to avoid excessive impacts to aquatic or riparian vegetation and fish spawning or rearing habitat.
- Preference should be given to project locations and designs that minimize the effects of boat wakes, on adjacent shoreline and reduce the potential for sediment accumulation on the ramp.
- Launch ramps should be located and designed so that the greatest amount of excavation occurs above the water line, with the underwater portion of the ramp closely matching the mud line topography whenever possible. This will reduce the required cut or fill in the submerged/submersible zone and decrease any resulting environmental impacts and issues.

RAMP ELEVATION

Establishing the proper ramp elevation is critical to minimizing ramp size, while providing a ramp that is usable throughout the normal range of water elevations. The ramp toe must extend below Design Low Water (DLW) to provide a hard surface for the trailer to travel on during launch and retrieval. Design high water (DHW) and DLW elevations are based on average high and low water elevations for each month of the intended use period, based on ten or more years of record.

Best Management Practices for Ramp Elevation Design

- The ramp toe should be established at not more than 3 feet below DLW to provide adequate water depth to float the average boat from its trailer. The ramp toe helps protect against disturbance of streambed sediments during boat loading.
- The top of the ramp should be not more than 1 foot above the Design High Water (DHW) elevation. However, local topography may dictate the establishment of the top of ramp. For example, setting the top of ramp elevation to 1 foot above DHW is impractical when the surrounding upland area is below the DHW elevation.

WIDTH

Adequate launch ramp width is necessary to provide room for boaters of various abilities to maneuver their boat trailers down the boat ramp. The ramp width should be wide enough to accommodate the boarding floats that rest on the ramp surface during low water. Lane widths for single lane ramps are greater than the allowance for some multi-laned ramps since use areas of adjacent lanes may overlap.

Best Management Practices for Ramp Width Design

- Launch lanes should not exceed 20 feet in width.
- In situations where narrower lanes are acceptable, e.g., single lane ramps less than 75 feet in length, or ramps with two or more adjacent lanes not separated by boarding floats, width should not exceed 15 feet.

SURFACES

Ramp surfaces have historically been gravel, asphalt or concrete, depending on ramp location and its character of use. Ramps are now constructed exclusively of concrete. Two types of concrete are used, cast in place concrete for dry applications and precast concrete for structures that may contact flowing water during construction.

CAST-IN-PLACE CONCRETE

Cast-in-place concrete has proven to be the most durable and cost effective material for launch ramp construction and provides the necessary traction for vehicle wheels operating on the ramp surface, which is often wet and/or has algae growth.

Best Management Practices for Cast in Place Concrete

- Care must be taken to avoid pouring concrete in conditions or locations that would subject uncured concrete to contact with surface water or heavy precipitation.
- To ensure long service life, concrete should be placed on a compacted 3/4 inch minus (3/4"- 0") aggregate base. Larger aggregate, 1½ inch crushed rock, should be used in areas with strong current or coastal areas where the tides will flow across the aggregate base and potentially erode it before the concrete is placed.
- The concrete should be protected from contact with water until concrete has hardened.

PRECAST CONCRETE PLANKS

Precast concrete planks are used for the construction of the underwater portion of a launch ramp. The use of precast planks eliminates the need for costly dewatering operations necessary to cast the concrete in place. The dewatering operations disrupt more of the marine environment than placing precast planks, and should be avoided whenever possible.

Best Management Practices for Concrete Plank Design

- Precast concrete planks should be used for construction of that portion of the ramp extending from the toe up to a point at least 2 vertical feet above the water level anticipated during construction.
- Floating silt curtains should be used around the perimeter of the precast plank placement operation to reduce the migration of turbidity beyond the construction zone within the waterway.

RIPRAP

Riprap is placed along both sides and across the lower end of all ramps for protection from external water generated forces (current, waves, and wakes) on the structure.

Best Management Practices for Riprap

- Riprap should be placed on a layer of geotextile fabric to prevent the underlying sediment from being washed out through the openings of the riprap.
- Oregon Department of Transportation (ODOT) Class 700 or larger size riprap should be installed at the ramp toe and along the sides or precast concrete portions of a launch ramp to protect the structure and to stabilize the project area.
- For projects where Class 700 riprap is not available, such as areas where quarries have no state classed

riprap or large rock, a graded mix of smaller stones such as Class 350 to 500 should be used.
- Riprap should be keyed into the streambed to ensure its stability and effectiveness in protecting the facility.

SITE PREPARATION (VEGETATION REMOVAL/REPLACEMENT)

Best Management Practices for Vegetation Removal/Replacement

- Vegetation removal should be confined to the smallest portion of the project area necessary for completion of the work.
- To the maximum extent practicable, riparian vegetation should be protected during construction.
- The species and location of trees to be replanted should be similar to the trees removed to ensure restoration of watershed functions. Further, the location of the replanted trees should be chosen to ensure that they do not pose a future threat to public safety or the facility.
- When practicable, vegetative material including plants and topsoil containing seeds, roots, tubers (i.e., the "seed bank") should be salvaged and stockpiled for use in site restoration after the project is completed.
- Project limits should be clearly marked to avoid unnecessary ground disturbance.
- Only vegetation within 20 feet of the construction limits should be removed. All other vegetation not within the construction area should be left in its current condition, unless the vegetation interferes with site access or if the vegetation is a noxious weed.
- Removal of mature trees (> 12 inch dbh) providing shade or bank stabilization within the riparian area of any waterway should be coordinated with ODFW or other appropriate regulatory agencies.
- In the event removal of mature trees (> 12 inch dbh) is necessary in riparian areas, two seedlings should be replanted for each tree removed.
- Trees identified by a qualified forester or appropriate resource agency staff as danger trees and any other vegetation that threatens the project, downstream structures, or public safety should be removed prior to construction.
- Only healthy trees and shrubs meeting or exceeding ANSI Z60.1, American Standard for Nursery Stock, should be used for vegetation replacement.
- Planting methods should conform to ODOT's 1996 Standard Specifications, Section 01040 - Planting, or the equivalent section of the latest version of ODOT's Standard Specifications.
- Disturbed soils should be permanently stabilized using appropriate methods (seeding, plants, mulch, fabric, etc.).
- Coordinate with waterway permitting agencies (Corps of Engineers and DSL) when performing work below ordinary high water.

BOAT RAMP CONSTRUCTION/REPLACEMENT

This section applies to construction of new or replacement boating facilities, including ramps, landings and upland features such as maneuver areas and access roads. Projects may include permanent impacts, such as placing new or additional structures, or temporary impacts such as short term turbidity increases. Inwater construction may include placement of rock, riprap, steel framework, steel pilings and cured concrete planks. Out of water construction may also include all of those elements as well as placement of fresh, uncured concrete, asphalt and installation of stormwater management features, such as bioswales and infiltration/detention basins.

Best Management Practices for Boat Ramp Construction/Replacement

- The project should be designed and constructed using best available technologies to minimize environmental and habitat impacts and to avoid significant adverse modification of the aquatic system.
- Projects should be designed to avoid impacts to known wetlands whenever possible.

- All facilities should be designed to ensure they do not constrict streamflow or serve as a barrier to fish passage.
- Bioengineering solutions should be considered as a means to minimize riprap use in locations above ordinary high water where success is probable and the safety of structural elements are assured.
- Inwater work should comply with ODFW guidelines on inwater work timing, or during times acceptable to ODFW and other resource agencies having jurisdiction over the project.
- Work should be completed using equipment having the least impact.
- Work should be done from the top of the bank or a floating barge, when practicable. Heavy equipment use within the active flowing channel should be avoided.
- Care should be taken to prevent any petroleum products, chemicals, or deleterious materials from entering the water during construction.
- The applicant should take all practicable steps to control erosion during construction and establish permanent erosion protection upon completion of the work.
- Silt fencing and floating silt curtains should be installed and maintained to prevent movement of soil and sediment and to minimize turbidity increases in the water.
- Excavated materials should be disposed of at an off-site, upland location.
- Only clean, suitable material should be used as fill. Fill material should be placed, not randomly dumped.
- No fill should be placed in spawning areas or areas with submerged aquatic vegetation as part of this project.
- Temporary fills should be entirely removed and the site restored to pre-existing elevation.
- Ramp structures in this project should use only steel or concrete construction materials.
- Wood treated with oil-borne preservatives such as copper naphthenate or creosote solutions, or other environmentally harmful substances should not be used in the construction of inwater structures.
- No uncured concrete should be allowed to enter the water.
- Construction impacts should be confined to the minimum area necessary to complete the work.
- Damaged areas should be restored to pre-work conditions, including use of native plant species where appropriate.
- Coordinate with waterway permitting agencies (Corps of Engineers and DSL) when performing work in wetlands or below ordinary high water.

BOARDING FLOATS

FACILITY SITING

Boarding floats are docks located adjacent to boat launch facilities that enable boaters to safely and efficiently launch, retrieve, load and unload boats.

Best Management Practices for Boarding Float Placement

- Boarding floats should be provided at all ramps with two or more lanes whenever site and river conditions are favorable.
- The placement of boarding floats whether on one side of the ramp or the other, is first determined by the direction of river flow and second by the location providing the most visibility for the boater as they maneuver the trailer down the ramp.

SIZE

Best Management Practices for Boarding Float Size

- In order to minimize potential environmental effects, the length and width of the float should be limited to the minimum necessary for safety and usability.
- Boarding float length should be long enough to extend beyond the end of the submerged boat trailer at DLW.

- Boarding floats should be wide enough to provide stability and adequate room for a boater to handle, guide, and tie-down their boat without stepping or falling off the float. Adequate width should be provided so boaters can pass each other without getting too close to the edge of the float.
- Boarding float systems should be of sufficient length to provide not less than 50 feet of float in the water at the design low water.
- Minimum clear travel width of a float deck should not be less than 60 inches between bull rails, toe rails, cleats, and other mooring hardware mounted along the edges of the float.
- The boarding floats should not exceed 6 feet in width.

FLOATATION

Boarding floats contain buoyant materials to float the structure and to support loads on the float. Materials historically used for floatation include logs, foam and various foam, or air filled devices, such as drums or pontoons. Polystyrene Foam floatation is typically used in nearly all new floats at public facilities in Oregon.

Best Management Practices for Boarding Float Floatation

- Foam floatation must be encapsulated in accordance with Oregon Administrative Rules, to prevent the introduction of foam particles in public waters.
- All unused or replaced polystyrene foam shall be removed from the water and disposed in an approved, upland disposal site.

TRANSIENT FLOATS

FACILITY SITING

A transient float is a platform-type floating structure secured to piling that provides short-term boat moorage for recreational boats in transit. The floats may have pedestrian access to shoreside facilities such as, restrooms or a marine park.

Best Management Practices for Transient Float Placement

- Facility sites should offer shelter for boaters from strong currents, wind, wind-generated waves, and commercial vessel wakes.
- Water depths at the site should be great enough to avoid grounding of floats or vessels.
- Placement of floats in areas of high-quality aquatic habitats should be avoided whenever practical and feasible.
- Transient floats should be located at 20 to 25 mile intervals along main cruising routes, depending on the locations of appropriate sites.
- Where possible, floats should be placed in a location with a minimum of 20 feet of water depth at Ordinary Low Water (OLW). In no case should floats be placed in water less than 6 feet deep at OLW.
- Maintain at least a 50 feet clear distance between the transient float and shore, whenever possible.
- Floats should be located in waters having current velocities greater than 0.6 fps during summer, low flow periods.

SIZE

Transient floats are typically wider than boarding floats to allow for bow overhang from larger boats that may encroach into walking areas. Added width also offers more stability and capability to support a greater number of users at any given time.

Best Management Practices for Transient Float Size

- In order to minimize potential environmental effects, the length and width of the float should be limited

to the minimum necessary for safety and usability.

- Typical transient floats should not exceed 300 feet in length. Longer transient floats may be needed to accommodate moorage needs along major rivers and close to popular boating activity centers. Floats exceeding 500 feet in length should be avoided since they may pose a safety hazard due to limited access to shore in case of emergencies.
- Interior floats and floats in protected areas should not exceed 8 feet to 10 feet in width unless additional width is required to provide reasonable stability.
- Floats providing wave/wake attenuation for boats moored shoreward of the float should not exceed 12 feet in width unless additional width is justified using engineering calculations.

FLOATATION

Transient floats contain buoyant materials to float the structure and to support loads on the float. Polystyrene foam is typically used for floatation in transient floats.

Best Management Practices for Boarding Float Floatation

- Foam floatation must be encapsulated in accordance with Oregon Administrative Rules, to prevent the introduction of foam particles in public waters.
- All unused or replaced polystyrene foam shall be removed from the water and disposed in an approved, upland disposal site.

DEBRIS BOOM

FACILITY SITING

Floating debris is prevalent in many Oregon rivers and bays during periods of high flows. A debris deflection boom protects floats, piles and other improvements from damage caused by floating debris.

Best Management Practices for Debris Boom Placement

- Debris booms should only be provided at facilities with significant inwater improvements (i.e., floats, piers or piles) in need of protection as indicated by site and river conditions.
- Protective boom installation should be considered only for facilities located, 1) on rivers downstream from significant amounts of large woody debris, or 2) in coastal bays with significant amounts of driftwood.

MATERIAL

Booms are comprised of floating logs or foam filled plastic pipe, supported by piles.

Best Management Practices for Debris Boom Materials

- Materials used in boom construction, including logs, should be free from contaminants or chemicals known to be harmful to the aquatic environment.
- Foam floatation used in debris boom construction must be encapsulated in accordance with Oregon Administrative Rules, to prevent the introduction of foam particles in public waters.
- All unused or replaced polystyrene foam shall be removed from the water and disposed in an approved, upland disposal site.

PILING

MATERIAL

Piles must resist corrosion and have sufficient strength to bear applied lateral forces from floats, boats, wind, waves, and debris as well as combined vertical and lateral forces from structures like fixed piers and

cantilever ramps. Use of piling with chemical treatment or coatings that leach into the water may be harmful to the aquatic environment.

Best Management Practices for Piling Material

- Round steel pipe is the preferred material for piling.
- Use of treated, wooden piling should be avoided.
- Existing wooden piles on the site should be removed whenever possible.

NUMBER

Best Management Practices for Piling Number

- To the extent practicable, the total number of piles in the facility should be minimized.
- For replacement projects the number of new piles should not exceed the number of piles being removed.