

## BEST MANAGEMENT PRACTICES FOR BOAT LAUNCH CONSTRUCTION & MAINTENANCE ON LAKES

### Background

Much of the Okanagan Region of the BC Ministry of Environment (BC MOE) is covered by large to moderate sized lakes that lie close to urban centres and are important for water recreation and recreational fisheries. However, in addition to their recreational values, shoreline areas of these waterbodies are sensitive and productive fish and wildlife habitats. They are home to a multitude of plants and animals. Activities and structures along the shoreline can damage these organisms, their habitats and the complex food webs that support them. Boat launch structures, such as ramps, can have direct, indirect and cumulative impacts on these sensitive habitat areas.

With increasing shoreline development on lakes there is an increased demand for lake access by recreational watercraft. The construction of public and private boat launches along lakeshores to satisfy this demand has the potential to degrade sensitive near shore habitats. Traditional methods of boat launch construction often harm shallow aquatic ecosystems. Placement of fill or the construction of hardened launch surfaces in shallow waters smothers bottom-dwelling organisms, displaces plants and animals that use the water column and alters local water currents and other important conditions of the aquatic environment that these plants and animals depend upon to carry out their life processes. During construction, sediments may be disturbed, causing silt and contaminants to enter the water where they interfere with rearing fish and fish food items such as insects, plankton and algae. The footprint of boat launch facilities prevents the growth of aquatic vegetation in the productive littoral zone of lakes, an integral part of the lake food web. Launching of watercraft may introduce other pollutants such as oils, fuel or sewage into the water. In shallow water, even the wash from propellers can churn up enough sediment to damage fragile aquatic plants and animals.

### Objectives

To ensure the proposed works associated with boat launch development and maintenance protect water quality, fish, wildlife and aquatic and shoreline habitat.

### Applicable Provincial Legislation

#### **BC Water Act and Its Regulations**

Works in or about a stream are defined under Section 9 of the Water Act as any and all works proposed in or about a stream, ravine or active floodplain of a stream or its riparian or streamside area.

The construction - and in some cases maintenance - of boat launches will likely require a formal **approval** through the Water Act Approval process managed by Front Counter BC.

**See the publication *Water Management - A Users Guide to Working In and Around Water* for specific details.** Information can be found at the following link [http://www.env.gov.bc.ca/wsd/water\\_rights/licence\\_application/section9/index.html](http://www.env.gov.bc.ca/wsd/water_rights/licence_application/section9/index.html) or contact Front Counter BC Inc. in Kamloops at (250) 372-2127. If you do not have access to the Internet, then hard copies are also available or through Front Counter BC at (250) 372-2127.

### **BC Land Act**

Though upland areas located adjacent to waterbodies may be privately owned, the Province of British Columbia owns nearly all areas located between the high and low watermarks of streams, rivers and lakes. Individuals cannot build on or develop aquatic Crown land without the Province's authorization, even if they own adjacent property or upland. If you propose to construct a permanent launch, then you may be required to obtain a licence of occupation or lease for boat launch construction from Front Counter BC. See [http://www.agf.gov.bc.ca/clad/tenure\\_programs/index.html](http://www.agf.gov.bc.ca/clad/tenure_programs/index.html) or contact Front Counter BC in Kamloops at (250) 372-2127 for further information regarding tenure applications for Crown foreshore areas.

### **BC Wildlife Amendment Act, 2004**

Recent amendments to the Wildlife Act prohibits the killing, harming, harassment, capture or taking of species at risk and the damage or destruction of a residence of a species at risk except as authorized by regulation, permit or agreement. Additional information regarding the BC Wildlife Amendment Act, 2004, is available at [http://www.legis.gov.bc.ca/37th5th/1st\\_read/gov51-1.htm](http://www.legis.gov.bc.ca/37th5th/1st_read/gov51-1.htm). Additional information regarding the BC Wildlife Act is available at [http://www.qp.gov.bc.ca/statreg/stat/W/96488\\_01.htm](http://www.qp.gov.bc.ca/statreg/stat/W/96488_01.htm).

### **Riparian Areas Regulation, 2004**

The Riparian Areas Regulation, enacted under Section 12 of the Fish Protection Act in July 2004, calls on local governments by March 31, 2006, to protect riparian areas and their, features, functions and conditions during residential, commercial and industrial development. Check with your local government as to the applicability of this legislation to your project. Development refers to a variety of activities associated with or resulting from regulation or approval of residential, commercial or industrial activities or ancillary activities to the extent that they are subject to local government powers under Part 26 of the Local Government Act. Additional information is available at [http://www.env.gov.bc.ca/habitat/fish\\_protection\\_act/riparian/riparian\\_areas.html](http://www.env.gov.bc.ca/habitat/fish_protection_act/riparian/riparian_areas.html)

### **Other Applicable Provincial Legislation**

Your works may also require authorization under the Local Government Act (formerly the Municipal Act; see [http://www.qp.gov.bc.ca/statreg/stat/L/96323\\_00.htm](http://www.qp.gov.bc.ca/statreg/stat/L/96323_00.htm)). Local bylaws may amplify federal or provincial legislation for working in or near water. You should

contact your local municipality or regional district to find out which local bylaws may apply to your proposed works.

Several additional pieces of Provincial legislation may be applicable to works involving the construction or maintenance of boat launches on lakes. These are detailed in Section 5 of the BC MOE publication *Standards and Best Practices for Instream Works (March 2004)* see <http://www.env.gov.bc.ca/wld/documents/bmp/iswstdsbpsmarch2004.pdf>

### **Applicable Federal Legislation**

#### **Fisheries Act**

The federal Fisheries Act provides protection for all fish and fish habitat in Canada. The Fisheries Act defines ‘fish habitat’ as “spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life processes.” This definition indicates that watercourses, including but not limited to streams, ditches, lakes, ponds and wetlands, that provide water or nutrients into a fish bearing stream or lake, are considered fish habitat even if they do not directly support fish and/or if they only have temporary or seasonal flows. This definition also indicates that not only the watercourse itself but also vegetated streamside (riparian) areas that provide nutrients and shade to the stream or lake are considered fish habitat. Section 35 of the Fisheries Act in particular prohibits the harmful alteration, disruption or destruction (HADD) of fish habitat that is not authorized in advance by Fisheries and Oceans Canada (DFO). Depositing sediment or any other ‘deleterious substance’ into streams supporting fish is also prohibited under Section 36(3) of the Fisheries Act.

The Fisheries Act can be found online at <http://laws.justice.gc.ca/en/F-14/>. Please also check out the following website:

[http://www-heb.pac.dfo-mpo.gc.ca/publications/publications\\_e.htm](http://www-heb.pac.dfo-mpo.gc.ca/publications/publications_e.htm) for additional guideline documents and, in particular, the document *Habitat Conservation and Protection Guidelines (1998)*. For further information regarding works that may result in a HADD of fish habitat, please contact your nearest DFO Field Office.

#### **Species at Risk Act**

Impacts to the habitat of threatened or endangered species can have catastrophic effects on a species or local population’s survival and should be avoided at all times. Some species at risk have no “window” of least risk during which instream works may be permitted because of the risk of harm to the animal. Before planning any work, review the website <http://www.env.gov.bc.ca/atrisk/> for further information on the species at risk in your area and follow the links provided there to the Conservation Data Centre and other resources. The “Species Explorer” and “Mapped Known Locations” at the same link can help you to find out what species at risk may be in your area. The absence of a record does not confirm that a species is not present. The legislation guiding the protection of species at risk, the federal Species at Risk Act, is detailed at the following website:

[http://www.speciesatrisk.gc.ca/legislation/default\\_e.cfm](http://www.speciesatrisk.gc.ca/legislation/default_e.cfm)

## **Navigable Waters Protection Act**

The Navigable Waters Protection Program (NWPP) of Transport Canada ensures protection of the public right to navigation and protection of the environment through the administration of the Navigable Waters Protection Act. Program responsibilities of importance to boat launch construction include the approval of works built or placed in, on, over, under, through or across navigable water in Canada prior to construction of the work(s); the removal of obstructions to navigation, including unauthorized works; and, regulating the provision and maintenance of lights, markers, etc. required for safe navigation. Before you start your project, you should contact the nearest NWPP office in your area to determine what information and documentation is required for you to submit an application under the Navigable Waters Protection Act. Further information regarding the Navigable Waters Protection Act is available online at <http://www.tc.gc.ca/marinesafety/Ships-and-operations-standards/nwp/menu.htm>.

## **Best Management Practices**

Application of a best management practice (BMP) does not reduce the importance of individual project design and assessment, which may identify additional measures necessary to protect unique site attributes or address the potential impacts of atypical project components.

### **As an Individual**

Before you decide to design and build a private boat launch facility you should consider several things:

- How frequently will you need to use the launch? If it is only a few times each year, do you really need one or are there public or alternative private launching facilities close by? If not, then does your local government have a community infrastructure plan to develop a community boat launch in your area?
- Are there other ways to launch your boat such as using elevated railway-like tracks or a small crane or boat lift?

Some municipalities have developed bylaws to prevent the proliferation of privately-owned structures on the shoreline. As a result, prior to developing your proposal, you should check with your local government. BC MOE fully supports local government initiatives to limit such structures along our shorelines due to their potential impacts to fish and wildlife habitat.

Development, operation and maintenance of boat launches may harm lakeshore habitat areas. This potential for harm is elevated for more sensitive habitat areas such as lake inlet and outlet streams, fish spawning areas, adult fish holding areas, juvenile fish dispersal areas, areas supporting species at risk and areas of aquatic and riparian

vegetation. Habitat risks also increase and accumulate with greater numbers of boat launch facilities and associated moorage structures in a local area, as may occur in association with large lakeshore subdivisions or similar local community developments.

**Due to their potential to cause a HADD of fish habitat, hard surface boat launches typically require authorization to be obtained prior to construction from DFO under section 35(2) of the Fisheries Act.** However, alternative designs such as elevated railway-like tracks can - in most instances - provide for launching of personal watercraft while avoiding potential harm to fish habitat and are a first preference for private boat launch facilities in most situations. See figure 1 caption below.



**Figure 1.** The system depicted requires no foreshore preparation other than minor hand relocation of foreshore substrates to level and stabilise the track. While not suitable for use on vegetated foreshore areas, due to the potential for harmful alteration of these important fish habitats, it is the preferred launch system for rock, gravel or sand foreshore areas. Each section may be lifted by two people and bolted to/unfastened from adjoining sections as water levels recede in the summer or rise in the spring, also providing for seasonal removal while not in use.

**If you decide to proceed with design and construction of your own private boat launch, then it is advisable to work with a qualified professional or team of professionals depending on the scale and/or scope of the activity. This could include the use of a biologist, hydrologist, fluvial geomorphologist and/or engineer, alone or in some combination.**

### **As a Local Government**

It is recommended that local governments plan public infrastructure to service recreational boating demand on lakes and larger rivers. The development of well-planned lakeshore access points, boat launches and moorage facilities for the local community can facilitate effective public access while helping to avoid direct, indirect and cumulative impacts to foreshore and riparian habitat areas. Such plans should consider;

- The number of access points required based on both current and projected demand, including both the level and season of use.
- The location of existing public and private boat launches serving a large segment of the population or tourist base.
- Whether existing public facilities are located in suitable locations and whether development of new sites and/or rehabilitation of existing facilities (within the context of an overall plan for the area) would better meet current and projected demand, reduce short- and long-term maintenance requirements and reduce potential environmental impacts. Important considerations will include:
  - The location of boat launch facilities to maximize season of use and minimize potential environmental impacts.
  - The type of launch facilities required based on the types of watercraft to be supported.
  - Available upland space (e.g. for turn-around/parking areas and associated services).
  - Prevention of ancillary impacts from existing and proposed facilities ( e.g. signage for appropriate use and identification of sensitive habitats in close proximity to the boat launch area.).
  - Use of applicable BMPs to reduce or avoid impacts to the environment during boat launch construction and maintenance.

It is expected that most new public boat launches will be hard surface designs, likely to cause a HADD of fish habitat and requiring an authorization to be obtained prior to construction from DFO under section 35(2) of the Fisheries Act. A well thought-out public infrastructure plan that reduces the overall impacts of boat launch facilities will be of significant benefit in justifying any proposed HADD of fish habitat, a primary consideration in DFO's determination of whether a Fisheries Act section 35(2) authorization should be issued. **Development of such a plan may require you to retain the services of an appropriately qualified professional, which could include a biologist, hydrologist, fluvial geomorphologist and/or engineer, alone or in some combination.** To increase the likelihood that planning outcomes may be successfully implemented, it is recommended that local government's qualified professionals consult with appropriate Provincial and Federal agencies early in the planning process.

The following BMPs are directed to the design, construction and/or maintenance of boat launch facilities on lakes within the Okanagan Region of BC MOE. Use of these BMPs will help guide works to protect fish and wildlife habitat and avoid conflicts with the Fisheries Act and other applicable legislation.

### **Design Best Practices**

Design and location may be critical to ensuring compliance with legislation and minimizing impacts to the environment. Qualified professionals should ensure that the site assessment and design considers the following factors:

- local soil characteristics;

- local shoreline and stream mouth accretion/erosion dynamics, including local water currents and associated patterns of sediment transport and deposition;
- existing lakeshore morphology and potential impacts or changes;
- historical lake water levels during the proposed season(s) of use;
- existing or potential fish and wildlife use, aquatic and riparian habitat;
- potential disturbances from machinery or other equipment, if required
- the ability to access ,repair and maintain the works with minimal impact;
- potential erosion or sediment releases resulting from proposed works;
- the potential for establishment of invasive aquatic plants and the potential impact of any control measures that may be required;
- minimizing the potential for stormwater and contaminated runoff from parking areas reaching the lake;
- minimizing the footprint of the works and associated foreshore disturbance;
- minimizing direct, indirect and cumulative impacts to riparian vegetation and fish and wildlife individuals, populations, species and habitats; and,
- avoiding direct and indirect impacts to other properties or services.

In particular, when selecting a location for a boat launch, your professional/contractor should consider what types of habitats are present and select a site where the boat launch will cause the least impact. **Lake inlet/outlet streams, fish spawning areas, holding areas for adult fish, dispersal areas for juvenile fish, areas supporting listed species, shallow areas and areas of aquatic and riparian vegetation should be avoided.** Preference should be given to project locations and designs that:

- minimize the effects of boat wakes on adjacent shoreline areas and reduce the potential for sediment accumulation on the ramp;
- do not require dredging, blasting and/or placement of fill below the lake high water mark to facilitate boat launch construction;
- do not require future maintenance dredging;
- minimize the area disturbed by construction activities and preserve trees, shrubs and grasses near the shoreline - existing rocks and logs in the aquatic environment are important fish habitats and should not be used as building materials; and,
- avoid the use of heavy equipment below the lake high water mark - if such access is necessary, then the operational best management practices detailed below should be closely followed.

#### ***Lakeshore Spawning and/or Vegetated or Potentially Vegetated Foreshore Areas***

If your project is proposed within or adjacent to lakeshore spawning habitat and/or a vegetated or potentially vegetated (e.g. historically vegetated) foreshore area, then it is strongly recommended that the services of a qualified professional be engaged early in the planning process. Options for project relocation should be explored to avoid these sensitive habitat areas.

**If project relocation is impossible and the works may result in impacts to provincially or SARA-listed species, or a HADD of fish habitat, then boat launch design options should be developed to mitigate potential fish and wildlife habitat impacts.**

Where relocation options do not exist **and** it has been determined by a qualified professional that a HADD of fish habitat will not occur because potential impacts can be mitigated through project design (e.g. through use of an elevated rail system or deck and well-spaced pilings to avoid footprint impacts, changes in longshore drift and sedimentation patterns) and use of construction BMPs, then it may be possible to proceed without an authorization under section.35(2) of the Fisheries Act

If your qualified professionals' assessment determines that a HADD of fish habitat may occur due to your proposal, then your qualified professional should contact your nearest DFO Field Office to discuss the potential for authorisation of the HADD of fish habitat. If you wish to proceed to apply for an authorization from DFO, then submissions for an authorization need to include an assessment of potential direct, indirect (e.g. changes in longshore drift and sedimentation patterns) and cumulative impacts of boat launch construction and operation on riparian vegetation and fish and fish habitat. These impacts need to be considered for listed wildlife individuals populations and species as well as most authorizations will also trigger a review under the Canadian Environmental Assessment Act. Contact your local DFO office for specific forms.

In all cases, the design footprint of proposed structures below the lake high water mark should be minimized to limit potential habitat impacts. Many of the lakes in this region are controlled and the high water mark (HWM) is a defined elevation. The following information should be used to guide the design of boat launch structures on these waterbodies:

Osoyoos Lake	913 uscgs (crest of spillway)
Okanagan Lake	343 metres geodetic (natural boundary)
Kalamalka Lake	392 metres geodetic (approximate high water mark)
Christina Lake	446.7 metres geodetic (natural boundary)
Mara Lake	348.4 metres geodetic elevation
Mabel Lake	3.08 metres elevation on inactive WSC staff gauge 08LC038 at Rivermouth Marina

To find out if lakeshore spawning occurs at or adjacent to your proposed launch site, contact your regional BC MOE office. **Where spawning records are not available a qualified professional should be engaged to assess whether the site is likely to support shore spawning.**

### ***Design Details***

The following design details should be incorporated, where appropriate, during the project design process.



- The offshore limit of proposed boat launch facilities should be located no less than 1 meter below the 100 year low water level during the proposed season(s) of use to provide adequate water depth to float an average boat from its trailer. A physical toe or similarly effective stop should be incorporated at this offshore limit to protect against disturbance of lake sediments during boat loading.
- Hard surface boat launch ramps should be located and designed so that the majority of any required excavation occurs above the lake HWM, with portions of the ramp located below the HWM closely matching the natural shoreline grade. This will reduce required excavation or fill operations within the aquatic environment and decrease both potential environmental impacts and short- and long-term maintenance requirements for the completed structure.
- The width of hard surface boat launch ramps should be sufficient to accommodate boaters of various abilities to manoeuvre their trailers. The ramp width should also be wide enough to accommodate boarding floats/decks resting on the ramp surface during low water. Multiple lane designs need to consider lane overlap efficiencies to reduce the overall footprint.
- Pre-cast concrete planks are recommended for construction of the underwater portion of hard surface boat launch ramps. The use of precast planks eliminates the need for costly dewatering operations necessary to cast concrete in place and reduces the potential for exposure of aquatic areas to concrete leachate or concrete spills.

### ***Removal of Existing Structures***

Removal of existing boat launches should be completed in a manner that prevents foreshore disturbance and/or sediment generation. Sites may require restoration to provide for long-term recovery and eliminate any depressions that may result in fry entrapment during low water. Construction waste must not be deposited or stored within the lake foreshore or riparian areas. A qualified professional should be engaged to ensure that the removal works are undertaken in a manner that minimizes impact and ensures that areas requiring restoration are appropriately restored.

### ***Maintenance and Upgrading of Existing Facilities***

DFO has advised that where existing facilities require maintenance as a result of general launch use, or as result of poor design (e.g. repeated problems with stuck vehicles and/or trailers during the normal season of use), **and** a proposed upgrade may avoid or reduce the occurrence of such impacts and reduce maintenance requirements, then it is possible that such activities may proceed without a Fisheries Act section 35(2) authorization if:

- proposed maintenance or upgrade activities are limited to the existing area of disturbance;
- there are no impacts to riparian and/or littoral vegetation outside of the seasonal launch footprint; and,
- the operational best practices detailed below are employed.

This information should accompany the Water Act application and be copied to the appropriate DFO Field Office for their consideration as early as possible in the project design process.

## **Operational Best Practices**

### ***Timing of Works***

- Boat launch construction and maintenance is to be completed during the instream works reduced risk timing window approved for your region. To find out what the timing window requirements are for your area, see the BC MOE Okanagan Region website at <http://wlapwww.gov.bc.ca/okr/index.html> . If you do not have access to the Internet, then contact your regional BC MOE office (250) 490-8200. If pile driving is proposed, refer to the procedures and timing for pile driving operations in the regional *Best Management Practices for Small Boat Moorage on Lakes* located at the same website.

### ***Monitoring***

- Construction should be monitored on a full-time basis during project start-up and during any instream work or sensitive activity periods. Otherwise, these projects may be monitored on a daily basis to the completion of the project. In either case, the environmental monitor(s) must be an ***appropriately qualified professional(s)*** and should be provided with written authority to modify and/or halt any construction activity if deemed necessary for the protection of fish and wildlife populations or their habitats. A sign should be posted listing the monitor's company name and phone number at the entrance to, or in the immediate vicinity of, the job site.
- A copy of this document listing standards and best practices for your works and all appropriate plans, drawings and documents should be forwarded to the contractor/crew supervisor and kept readily available at all times at the site while the work is proceeding.
- A pre-construction meeting should be held between the environmental monitor and the contractor undertaking the work on the site to ensure a common understanding of the mitigative best practices for the project.
- Within 60 days of completion of the project, the environmental monitor should complete and submit a minimum of one (1) copy of a monitoring report consistent with the recommended standard format (see monitoring chapter of *Standards and Practices for Instream Works*) to his/her client and one (1) copy to BC MOE with the aquatic tenure number noted.

### ***Deleterious Substance Control/Spill Management***

- Prevent the release of silt, sediment or sediment-laden water, raw concrete or concrete leachate or any other deleterious substances into any ditch, watercourse, ravine or storm sewer system. The recommendations for sediment and erosion control outlined in the *Land Development Guidelines for the Protection of Aquatic Habitat* (Chilibeck *et al.*, 1992) can also be used for reference (see [http://www-heb.pac.dfo-mpo.gc.ca/publications/publications\\_e.htm](http://www-heb.pac.dfo-mpo.gc.ca/publications/publications_e.htm)).

- Ensure that equipment and machinery is in good operating condition, clean (power washed offsite) and free of leaks, excess oil and grease. No equipment refuelling or servicing should be undertaken within thirty (30) metres of any watercourse or surface water drainage.
- Ensure that all hydraulic machinery to be used instream uses environmentally sensitive hydraulic fluids which are non-toxic to aquatic life and which are readily or inherently bio-degradable.
- Keep a spill containment kit readily accessible on site in the event of a release of a deleterious substance to the environment and train on-site staff in its use. Immediately report any spill of a substance that is toxic, polluting or deleterious to aquatic life and of reportable quantities to the Provincial Emergency Program 24-hour phone line at **1-800-663-3456**. For definition of reportable amounts, please refer to the Spill Reporting Regulation at <http://www.env.gov.bc.ca/eemp/spillnotification.html>.
- Pre-cast concrete, plastic or steel pilings should be considered as an environmentally sound and more durable alternative to untreated wooden pilings. As concrete is very toxic to aquatic organisms until it fully hardens, the operational best practices for concrete works detailed below should be followed for non pre-cast concrete applications.
- BC MOE does not promote the use of wood preservatives in or around fish bearing waterbodies and prefers the use of untreated wood or inert materials. The improper use of wood preservatives can adversely affect a broad range of aquatic organisms as the preservatives may contain chemicals that can cause long-term adverse biological effects. If proposed for use, all preserved wood should be treated and follow post-treatment procedures outlined in the document *Guidelines to Protect Fish and Fish Habitat from Treated Wood Used in Aquatic Environments in the Pacific Region* (see <http://www.wwpinstitute.org/pdffiles/treatedwoodguidelines.pdf>).

### ***Concrete Works***

- Ensure that all works involving the use of concrete, cement, mortars and other Portland cement or lime-containing construction materials will not deposit, directly or indirectly, sediments, debris, concrete, concrete fines, wash or contact water into or about any watercourse. Concrete materials cast in place must remain inside sealed formed structures. Concrete leachate is alkaline and highly toxic to fish and other aquatic life. Pre cast materials pose less of a risk to the environment.
- A CO<sub>2</sub> tank with regulator, hose and gas diffuser must be readily available during concrete work to neutralize pH levels should a spill occur and staff should be trained in its use.
- Provide containment facilities for the wash-down water from concrete delivery trucks, concrete pumping equipment and other tools and equipment.
- Report immediately any spills of sediments, debris, concrete fines, wash or contact water of reportable quantities to **1-800-663-3456**. Implement emergency mitigation and clean-up measures (such as use of CO<sub>2</sub> and immediate removal of the material).
- Completely isolate all concrete work from any water within or entering into any watercourse or stormwater system
- Monitor the pH frequently in the watercourse immediately downstream of the isolated worksite until the works are completed. Emergency measures should be implemented

if downstream pH has changed more than 1.0 pH unit, measured to an accuracy of +/- 0.2 pH units from the background level or is recorded to be below 6.0 or above 9.0 pH units.

- Prevent any water that contacts uncured or partly cured concrete (during activities like exposed aggregate wash-off, wet curing or equipment washing) from directly or indirectly entering any watercourse or stormwater system.
- Isolate and hold any water that contacts uncured or partly cured concrete until the pH is between 6.5 and 8.0 pH units and the turbidity is less than 25 nephelometric turbidity units (NTU), measured to an accuracy of +/- 2 NTU.

### ***Minimise Disturbance***

- Only construction, modification, or maintenance works required to meet design specifications should be undertaken below the lake high water mark. No foreshore filling or land reclamation should occur, nor should human or machine disturbance of foreshore and/or riparian vegetation occur during boat launch construction except as provided for by these BMPs.
- Upon completion of construction activities, all work areas below the lake high water mark should be left in a smooth condition free of any depressions that may result in fry entrapment.

### ***Sediment Control***

- Minimize disturbance to existing vegetation on and adjacent to the lakeshore.
- Put sediment control measures (e.g. silt curtain and/or silt fencing) in place before starting any works that may result in sediment mobilization.
- Remove excavated material and debris from the site or place it in a stable area above the high water mark or active floodplain of the lake and/or riparian area or restrictive covenant and as far as possible from the lakeshore. Protect this material and any remaining exposed soils within the work site from erosion and reintroduction to the lake by using mitigative measures including, but not limited to, covering the material with erosion blankets and/or seeding/planting with native vegetation.
- When material is moved off-site, dispose of it in such a manner as to prevent its entry into any watercourse, floodplain, ravine or storm sewer system.

### ***Vegetation Management***

- Limit vegetation clearing for access to and within your work area.
- Consider other options when contemplating the need to remove vegetation. It is very often not the best choice for fish and wildlife habitat and species.
- Wildlife trees are important for many wildlife, bird, and amphibian species. You should avoid vegetation removal or management activities that will affect trees used by all birds and other wildlife while they are breeding, nesting, roosting or rearing young. Section 34(a) of the Wildlife Act protects all birds and their eggs, and Section 34(c) protects their nests while they are occupied by a bird or egg. Nesting periods can be identified by a qualified professional. Another source is the book *Birds of the Okanagan Valley, British Columbia* (Cannings *et.al* 1987). General work windows can also be found at the MOE Regional website

<http://wlapwww.gov.bc.ca/okr/wateract/workwindows.html>

- Section 34(b) of the Wildlife Act protects the nests of eagles, peregrine falcons, gyrfalcons, ospreys, herons and burrowing owls year-round. This means that a tree or other structure containing such a nest must not be felled, even outside of the breeding season.
- Section 6 of the BC Wildlife Amendment Act, 2004, pertaining to species at risk and/or the Species at Risk Act may also be applicable to vegetation management activities.
- If you are unable to avoid riparian disturbance and are proposing to top or remove trees, then have the trees within the riparian area assessed by an appropriately qualified professional who is also a certified Wildlife Danger Tree Assessor to determine the presence and nature of any hazards. Please refer to the BC MOE *Best Management Practices for Hazard Tree and Non-Hazard Tree Limbing, Topping or Removal*. Also refer to information on replacement tree criteria recommended by Provincial and Federal agencies. This can be found at the following website: [http://srmwww.gov.bc.ca/sry/csd/downloads/forms/vegetation\\_riparian/treereplcrit.pdf](http://srmwww.gov.bc.ca/sry/csd/downloads/forms/vegetation_riparian/treereplcrit.pdf) or refer to the *Tree and Shrub Replacement Criteria for Fisheries and Oceans Canada (Salmon Arm Subdistrict)*. Plantings should be tended and monitored over several years to ensure they survive.
- Plant native trees, shrubs and herbaceous plants ecologically suited to the site conditions (i.e. suited to the biogeoclimatic subzone and site series) to revegetate the site and replace impacted riparian vegetation. Often undisturbed riparian areas along the adjacent lakeshore can be used as reference areas for suitable species.
- Revegetation plans should manage for the colonization and spread of invasive plant species. For more information on Invasive weeds see The Weeds BC website <http://www.weedsbc.ca/>

### ***Site Restoration***

- Grade disturbed areas above the lake high water mark to a stable angle of repose after work is completed. As well, revegetate these areas to prevent surface erosion and subsequent siltation of the watercourse.
- Disturbed soil areas may be protected from surface erosion by hydroseeding with a heavy mulch, tackifier and seed mix; by installing erosion blankets; and/or, by heavily seeding/planting with native vegetation. This technique can also reduce the risk of establishment of invasive species.
- Remove any remaining sediment and erosion control measures (e.g. silt fences).
- Ensure that all equipment, supplies and non-biodegradable materials have been removed from the site.
- Complete post-construction and multi-year monitoring to ensure your revegetation meets survival requirements noted in the *Tree and Shrub Replacement Criteria for Fisheries and Oceans Canada (Salmon Arm Subdistrict)*.

### **REMEMBER:**

If you have not already done so, then you **must** submit an application to Front Counter BC Inc. for proposed construction, maintenance or removal works associated with boat launches to be in compliance with the Water Act.

Projects that have been adequately developed using BMPs and the best information available at the time of approval and do not proceed should be revisited if approvals have lapsed and the project is being reactivated. This will ensure that the proposed development considers any new scientific data and conforms to **current** habitat management policy, guidelines and legislation. Keep all project reports and information on file to support your use of due diligence as this information may be requested if your works are monitored by Provincial or Federal agencies.

This is a regional document. Additional information may be found in the *Provincial Instream Works Best Practices 2004*. This document can be found at the following website <http://www.env.gov.bc.ca/wld/BMP/bmpintro.html> .

**If you have difficulty understanding the BMPs presented in this document, then you should consult with a qualified professional who is familiar with these BMPs and with applicable legislation.** The yellow pages often provide listings of Environmental Consultants. Alternatively, contact information for qualified professional biologists may be obtained from the College of Applied Biology of British Columbia (see <http://www.cab-bc.org/>). If you have any concerns with regards to your proposal and application of the Fisheries Act, contact your nearest DFO Field Office. It is your responsibility to ensure that your project is in compliance with applicable legislation such as the Fisheries Act, Water Act and local government bylaws and regulations.