July 26, 2006

BEST MANAGEMENT PRACTICES FOR SMALL BOAT MOORAGE 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 moorage structures on lakes, such as docks, can have direct, indirect and cumulative impacts on this sensitive habitat.

The increasing number of docks along our lakeshores has the potential to degrade sensitive freshwater habitats by making changes to the lakebed and water column, shading vegetation, introducing pollutants from motors and bilge water and causing damage from boat propellers. Placing fill into lakes 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. Placing pilings may also alter local water currents and associated patterns of sediment transport and deposition. During dock construction, activities along the shore may cause sediment and contaminants to enter the water column where they interfere with rearing fish and fish food items such as insects, plankton and algae. Shading by improperly designed docks and floats may reduce or eliminate the growth of aquatic vegetation in the productive littoral zone of lakes, an integral part of the lake food web. Preservatives may seep from treated wood into the water and sediments around docks and may also cause lake sediments to become toxic to aquatic organisms. Mooring watercraft and floating structures 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 development of small boat moorage protect water quality 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 following works may be permitted under the Water Act Regulation, allowing you to complete your works under the Water Act Notification

Ministry of Environment

Environmental Stewardship Division
Okanagan Region
102 Industrial Place
Penticton BC V2A 7C8

Telephone: (250) 490-8200
Facsimile: (250) 490-2231

process:

Small boat moorage works on lakes covered by regulation

- Construction, maintenance or removal of a wharf or pier.

These works may only be permitted under specific conditions. See the publication *Water Management - A Users Guide to Working In and Around Water* for specifics. This document is available for viewing on the Internet at
http://www.env.gov.bc.ca/wsd/water_rights/licence_application/section9/index.html
If you do not have access to the Internet, then hard copies are also available from the Penticton office of BC MOE at (250) 490-8200 or through Front Counter BC at (250) 372-2127.
The corresponding application form for works under the Regulations is at
http://www.env.gov.bc.ca/wsd/water_rights/licence_application/section9/index.html
If your planned works do not fall into this category, then you must obtain a formal **approval** through the Water Act Approval process managed by Front Counter BC. See 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.

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 permanent small boat moorage works, then you may be required to obtain a licence of occupation or lease for moorage from Land and Water BC Inc. If you are not the owner of the adjacent upland, then you will likely also require the written consent of the upland landowner. See
http://www.agf.gov.bc.ca/clad/tenure_programs/programs/marinas/index.html
http://www.agf.gov.bc.ca/clad/tenure_programs/programs/privatemoorage/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. Additional information regarding the BC Wildlife Act is available at 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. Some local governments have implemented this legislation but others have been given an extension until March 31, 2006. Check with your local government as to the applicability. 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.

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). 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 small boat moorage works on lakes. These are detailed in Section 5 of the BC Ministry of Environment (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 alternation, 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
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" 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

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 small boat moorage 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

Before you decide to design and build your own private dock you should consider several things: Do you actually need a dock and/or float for your boat or would a mooring buoy, which has far less environmental impact, be sufficient? Could you use a public dock or share a neighbour's private dock instead? Does your local government have plans to develop a community dock in your area?

You should also be aware that development and operation of small boat moorage structures poses particular risks to sensitive lakeshore habitat areas, including inlet/outlet streams, fish spawning areas, adult fish holding areas, juvenile fish dispersal areas and

areas of aquatic and riparian vegetation. These risks increase with the number of docks constructed in a local habitat area, as may occur in association with large large lakeshore subdivisions or similar local community developments. As a result, if you are proposing such a development, you should provide a minimum 50 metre lakeshore frontage for individual lots and/or designate a single, common lakeshore access point and moorage location for the local community to help avoid direct, indirect and cumulative impacts to sensitive habitat areas.

If you decide to proceed with design and construction of your own private dock, 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 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.**

The following Best Management Practices (BMPs) are directed to the design, construction and operation of small boat moorage facilities on lakes of the Okanagan Region of BC MOE. Use of the 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 avoiding conflicts with legislation during dock construction and operation. Ensure that your professional/contractor provides a site assessment and design that 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;
- existing or potential fish and wildlife use, aquatic habitat and riparian habitat;
- potential access related disturbances from machinery or other equipment, if required, and the ability to access and repair moorage works in the future;
- potential erosion or sediment releases resulting from proposed works;
- 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 dock, your professional/contractor should consider what types of habitats are present and select a site where the dock will cause the least impact. **In general, lake inlet/outlet streams, fish spawning areas, holding areas for adult fish, dispersal areas for juvenile fish and areas of aquatic and riparian vegetation should be avoided.** No dredging, blasting and/or placement of fill below the lake high water mark should occur to facilitate dock construction. Structures should also be designed and located so that future maintenance dredging will not be required. Care should be taken to minimize the area disturbed by

construction activities and to preserve trees, shrubs and grasses near the shoreline. Leaving the site in as natural a condition as possible, together with installing a minimum number of well-spaced pilings, should prevent interruption of lake currents and reduce the potential for altered patterns of erosion or sediment deposition. Existing rocks and logs in the aquatic environment are important fish habitats and should not be used as building materials. The use of heavy equipment below the lake high water mark should also be avoided wherever possible. 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 lakeshore spawning occurs and/or vegetated or potentially vegetated (i.e. in the absence of beach grooming) foreshore areas exist at or adjacent to the proposed dock location, then options for project relocation should be explored to avoid these sensitive habitat areas. If project relocation is impossible, then you are strongly advised to retain the services of an appropriately qualified professional to assess potential direct, indirect (e.g. changes in longshore drift and sedimentation patterns) and cumulative impacts of dock construction and operation on riparian vegetation and fish and wildlife individuals, populations, species and habitats. If this assessment determines that a HADD of fish habitat may occur due to dock construction and/or operations, then you should contact your nearest DFO Field Office to discuss the potential for authorisation of the potential HADD of fish habitat under the Fisheries Act.

Where relocation options do not exist **and** it has been determined by a qualified professional that a HADD of fish habitat will not occur or that any potential impacts can be mitigated through project design (e.g. piling spacing to avoid changes in longshore drift and sedimentation patterns) and use of construction BMP's, then access across lakeshore spawning areas and presently or potentially vegetated foreshore areas should be achieved via an elevated fixed deck on pilings, linked by a hinged walkway to a floating dock. At a minimum, the base of the elevated fixed deck should be located at least 1-m above the lake high water mark and at least 1-m above existing foreshore vegetation to provide sufficient light to maintain the density and diversity of foreshore vegetation communities. Many of the lakes in this region are controlled and the high water mark or natural boundary is a defined elevation. The following information should be used to guide the design of moorage 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

Elevated decks and walkways should be kept to a maximum width of 1.5 meters and

decking over vegetated foreshore areas should be constructed or spaced in such a manner as to allow light penetration to the foreshore below. In addition, elevated fixed decks should extend a sufficient distance offshore of the lake high water mark as to prevent grounding of floating dock sections onto spawning or vegetated foreshore areas during low water levels.

Other Areas

In all other habitat areas, seasonally grounded floating dock sections may be employed provided that a discontinuous floatation system (e.g. foam-filled floats or sealed bulkheads) is used in place of continuous log stringers to maintain fish access to shallow nearshore areas. These should be attached to floating dock sections at a minimum spacing of one metre such that that a minimum of one third of the length of each dock section remains free of floatation structures. As rubber tires are known to produce extracts that are toxic (i.e. deleterious) to fish and aquatic invertebrates, these should not be utilised as floatation system components for proposed floating dock sections.

For all moorage systems, individual floating dock sections should be limited to 3 meters in width and 8 meters in length and individual finger floats, where proposed, should be limited to 1.5 meters in width (see Figure 1). In addition, the minimum clearance of floating structures utilised at low water should be 1.5 meters to avoid the wash from propellers disturbing the lakebed.

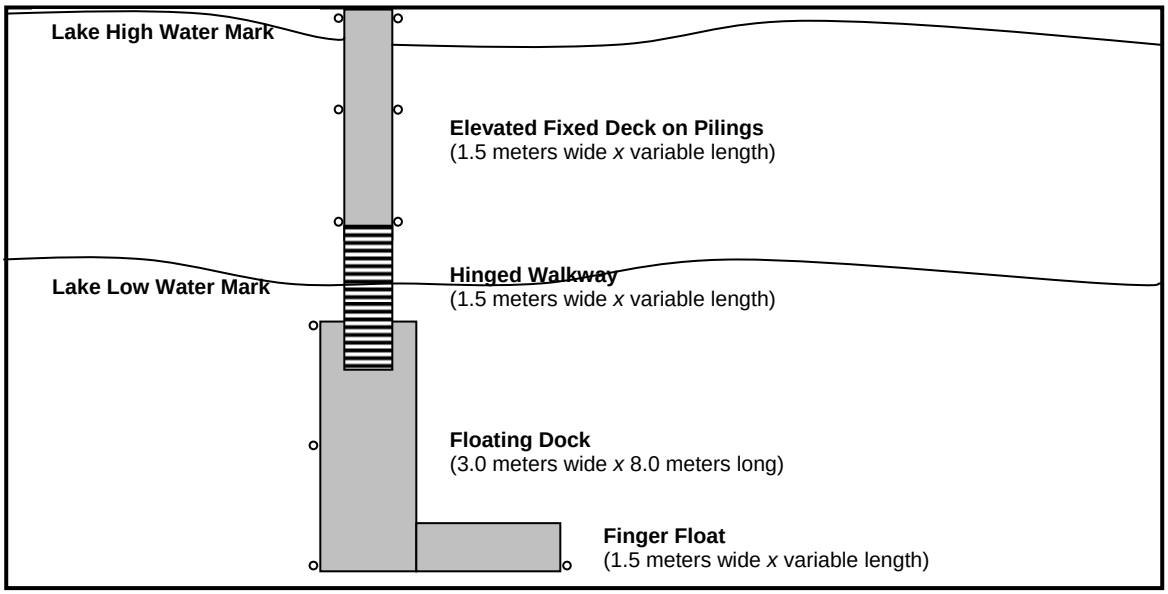

Figure 1 Typical boat moorage structures and dimensions over lakeshore spawning areas and/or presently or potentially vegetated foreshore areas.

To find out if lakeshore spawning occurs at or adjacent to your proposed dock location, 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.

Operational Best Practices

Removal of Existing Structures
Removal of existing docks and/or pilings should be completed in a manner that will prevent foreshore disturbance and/or sediment generation. Any piles removed should be cut or broken off as close to the lakebed as possible if they cannot be pulled out. Any old docks or pilings should be removed to a suitable upland disposal site. No burning of old docks, pilings or new construction waste should occur on the lake foreshore or riparian areas.

Construction Procedures and Timing of Works
Pile driving for dock construction or maintenance should be conducted from a floating structure (i.e. a barge) so that disturbance to the lakebed is prevented. However, it is imperative that:

- There is sufficient water to prevent the barge from grounding on the foreshore.
- The use of barge stabilising spuds is kept to a minimum and operated in such a manner that will prevent disturbance of the foreshore. Also, any foreshore areas disturbed by the spuds should be fully restored by handwork in the dry during low water and prior to the next spring freshet.
- Prop scour of the foreshore should not occur from the tending vessel(s). This may require manoeuvring the barge in shallow water with ropes tied to shore and/or pilings.

Lake-based pile-driving 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, check the regional website at http://wlapwww.gov.bc.ca/okr/wateract/workwindows.html. If you do not have web access contact your regional BC MOE office. To take advantage of high spring lake levels, pile driving may also be conducted in non-lakeshore spawning areas outside of the instream works reduced risk timing window, provided that fish are absent within 10 metres of the work area. For installation of wooden piles, fish may be frightened out of the work area by an air compressor hose discharged into the work area or by two pile impacts followed by a short delay to allow fish to leave the area before a continuous drive. If hollow steel pilings are proposed for installation, then fish should be isolated from the work area prior to the commencement of pile driving operations.

Pile driving for dock construction may also be conducted from the foreshore during the winter. However, foreshore substrates should be inspected in advance of operations to determine whether frozen substrate conditions exist or whether machine pads will be required to minimise foreshore disturbance. Disturbance to riparian and foreshore areas by machine tracks should be prevented. Any foreshore areas inadvertently disturbed

should be fully restored by hand work in the dry during low water and prior to the next spring freshet.

If pile driving is proposed for a lakeshore spawning area, then this should be conducted only during the instream works reduced risk timing window for the watercourse.

Monitoring

- Dock construction involving pile driving 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. Monitoring of dock construction projects that do not involve pile driving may be limited to pre- and post-work site inspections. In either case, the environmental monitor(s) must be an ***appropriately qualified professional(s)*** and 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 WLAP 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).
- 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.
- A CO_2 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_2 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 moorage 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 dock 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 the disturbance to existing vegetation on and adjacent to the lakeshore.
- Put sediment control measures (e.g. silt curtain, 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 restrictive covenant or riparian area, 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 or another source is the book *Birds of the Okanagan Valley, British Columbia by Cannings etal 1987*.
- 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. If you require additional information, then 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. It can be found at: 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)*.

- 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 multi-year monitoring to ensure your revegetation meets survival requirements.

REMEMBER:

If you have not already done so, then you **must** submit a Notification to Land and Water BC Inc. for proposed wharf or pier construction, maintenance or removal works in compliance with the Water Act Regulation.

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. Ensure to keep all 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/documents/bmp/iswstdsbpsmarch2004.pdf. Contact your nearest DFO Field Office if you have any concerns with regards to your proposal and application of the Fisheries Act. 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.