Water and Aquatic Habitat Management for Forestry Operations

Why manage water?

Any time water collects on the ground and begins to flow across its surface, we need to consider potential implications. Flowing water can lead to erosion, pick up contaminants and carry debris. Any of these things can cause impacts to fish habitat or water supplies downslope of your work site. It is important to know the legal requirements and best management practices associated with your project prior to getting started in order to prevent damage to aquatic resources.

Natural watercourses such as lakes, rivers, creeks, springs, gullies, wetlands and swamps all have legal status under various legislation and require specific management.

In some cases, man-made structures also need to be managed where they contribute to resource values. You need to be aware of ditches, ponds and surface runoff areas if they contribute to fish habitat or water supplies.

Where you don’t know the status of a watercourse, ask someone. Awareness of your site is your responsibility. In complex cases a Qualified Environmental Professional (QEP) will be required to develop a plan, and an Environmental Monitor will need to be on–site during the work to implement it.

Where do I start?

With any project, you can start by becoming familiar with your worksite and the project details (i.e. designs, equipment required, material excavation and placement etc.). In most cases, a few simple questions will help you determine the requirements to proceed, or the need to consult a QEP:
### 1. Do I have all the information that I need?

| YES | You should have copies of Harvest Plan and/or Road Construction maps, as well as Riparian Management Prescriptions and Environmental Management System (EMS) documents for your job. **Classifications** and **special restrictions** should be indicated and you should be able to find features at your work site. |
| NO | Ask your supervisor or BCTS representative for these documents. They need to be on-site while you are working.

### 2. Am I Working within a Community Watershed, Upstream of an intake or in a Fisheries Sensitive Watershed?

| YES | Various extra restrictions may apply (ERP for Community Watersheds) including harvesting or construction methods, equipment use and storage, types of lubricants allowed, and waste storage or disposal. Consult your supervisor or agency representative if these have not been provided. |
| NO | Additional restrictions do not apply. Refer to legislation and guidance documents consistent with your activity.

### 3. Is there a watercourse within or adjacent to my worksite?

| YES | There is a risk of environmental damage. Best Management Practices (BMPs) will be defined by the classification of the waterway and the type of work being performed. |
| NO | The risk of damage to aquatic resources is low. Adhere to normal operating procedures regarding soil disturbance, rainfall shutdowns etc. Refer to EMS documents such as ‘Ground Based Harvesting Guidelines’ for these requirements.

### 4. What Legislation Applies?

- **Federal**
  - **Fisheries Act** – Governs all aspects of fish habitat management including: harm to fish or habitat and introduction of substances.

- **Federal**
  - **Species At Risk Act** – Provides protection for threatened and endangered species. Knowing what species are present in your area will help you manage any requirements.

- **Provincial**
  - **Forest and Range Practices Act** – If you are doing forestry related work on crown land, this legislation applies and governs fish habitat, obstructions and riparian areas.

- **Provincial**
  - **Wildlife Act** – This legislation applies to bird nests, beaver dams, and threatened and endangered species. Be aware of these requirements.

- **Provincial**
  - **Water Sustainability Act** – If your project is governed under FRPA, You are exempt from the requirement to notify The provincial government (Section 11) but fish windows, BMPs and other requirements are provided in the ‘terms and conditions of the habitat officer’.
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<th>Are there established BMPs for my project?</th>
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| ☐ | **YES** | DFO and MFLNRO have published BMPs for common projects such as bridge and culvert removal, installation and maintenance. Check their websites to see if there is a guidance document for your project. Some of these can be found here:  
| ☐ | **NO** | Follow General BMPs for your project. EMS guidance documents can be accessed here:  
[https://www.for.gov.bc.ca/bcts/areas/TSG/TSG_ems.htm](https://www.for.gov.bc.ca/bcts/areas/TSG/TSG_ems.htm) |

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<th>6.</th>
<th>Do I need a Qualified Environmental Professional?</th>
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Best Management Practices for Forestry Activities

Project Planning:

- When preparing prescriptions or making recommendations, Make sure you incorporate the available guidance documents such as ‘Guidelines for Preparing Riparian Management Prescriptions’ into your work.
- Plan the project for good weather. For installation of structures, work within the fish window. If you are working outside the fish window, a QEP needs to review your project for potential impacts to fish or habitat features. Have a contingency plan for unsuitable weather conditions.
- Be prepared. Know the plan have all the documents on-site with you.
- Make sure all permits, approvals and licences have been obtained and have copies on-site.
- If a Sediment and Drainage Management Plan (SDMP) is part of the project plan, make sure the equipment and tools needed to implement it are on-site.
- Walk the site prior to starting work. Look for hazards, potential habitat and access points for equipment. Discuss requirements for removal of vegetation or timber in relation to safety, visibility, machine clearance, etc. with other workers on the project.
- Know the location of machine free zones, riparian management areas, designated stream crossings and temporary access structures. These should be clearly marked.
- If you anticipate difficulties with the project plan, communicate them to the on-site supervisor or BCTS representative. The plan may need to be changed before starting work.
- Where dewatering and/or fish salvage is required, discuss this part of the plan with your Environmental Monitor or QEP before getting started.

Equipment:

- Make sure your spill response equipment is adequate, on-site and readily available to deploy – spills happen fast! Conduct a test or drill if required.
- Equipment is to arrive at worksites clean, leak free and free of invasive species.
- Equipment should be inspected daily, prior to starting work.
- Equipment should be parked, fuelled and serviced away from watercourses, where spilled contaminants will not impact riparian areas.
- Equipment should be in good running condition, breakdowns in watercourses can lead to violations.

Accessing work areas:
Disturbance adjacent to streams should be kept to a minimum, choose access points that are stable and that provide optimal reach for machines.

Avoid concentrated soil disturbance. Be conscious of rutting and compaction of soils in heavily travelled areas. Use available materials such as logs or branch cuttings to buffer soil disturbance where possible.

Avoid wet areas and maintain natural drainage patterns.

Limit vegetation removal to that which is required for safety, access and visibility.

Where possible, avoid pulling or snapping trees with excavators. Cut vegetation adjacent to streams to limit soil disturbance and promote re-growth.

Consider placing geotextile over sensitive or unstable soils to minimize disturbance and sedimentation into streams.

Rehabilitate disturbed access points with re-contouring, scattering cut vegetation, and planting with native seed mix.

Working at the Site:

Ensure spill response and erosion control measures are in place and properly installed (i.e. spill boom deployed downstream).

Spill response equipment should be on board equipment at all times.

Operate machines from stable locations above the high water mark.

Where a wetted crossing is part of the plan, place logs or other clean materials in the channel to minimize disturbance.

Use access trails and crossing locations indicated on your Harvest, Road Construction or Site Plan.

Use clean construction materials adjacent to streams (ballast, rip rap etc.).

Do not pile slash or debris on watercourses. Keep these materials out of RMAs if possible.

Spoil excavated materials that will not be re-used in designated areas only. All spoil sites must be outside riparian areas to prevent introduction of sediments and contaminants.

Know and follow rainfall shutdown guidelines and shut down the site. Deploy sediment control devices during periods of heavy rainfall.

Do not introduce foreign materials (sawdust, woody debris, road surface material etc.) into streams.

Follow stream cleaning prescriptions provided. If you see a problem with the prescription for a stream, communicate it to the on-site supervisor or BCTS representative. The plan may need to be changed before starting work.

Store all potential contaminants (fuel, oil, grease) away from riparian areas.
For fish bearing watercourses, (unless directed by a Qualified Environmental Professional) Do not:
- Remove material from a stream or other waterbody.
- Alter a channel or stream banks.
- Place any part of structures (including rip rap) below the high water mark.

**Leaving the site for the day:**

- Park equipment and vehicles away from riparian areas.
- Use excavators to block access to potentially hazardous areas of the work site.
- Set up erosion and sediment control devices (i.e cover up) spoil areas, open excavations and destabilized banks if rainfall is expected before returning.
- Ensure servicing and fuelling equipment is stored away from riparian areas.
- Check sediment control and site isolation installations to make sure they are secure. If shutting down the site due to heavy rains or for extended periods of time, remove any devices deployed in the stream.
- Where sites will be shut down for extended periods, make sure periodic inspections are planned to monitor the site for erosion/environmental impacts.

**Completion of the Work:**

- Stabilize, re-contour and re-vegetate all disturbed areas and exposed soils
- Remove all debris and refuse from the work site.
- Remove any foreign materials that may have fallen into streams during construction.
- When no longer required, remove all site isolation and sediment management devices from streams and stream banks.
- Remove all contaminants, soiled spill response equipment and contaminated soils to an appropriate disposal location.

**Definitions:**
**Best Management Practices:** Frequently used practices endorsed by industry or governing agencies for common tasks. This document, and guidelines provided in your EMS documentation, as well as those provided by DFO and MoE are examples of BMPs for working around fish habitat.

**Qualified Environmental Professional (QEP):** DFO provides the following guidance on retaining a QEP: Professionals who provide this type of support are often referred to as a: natural resource consultant, environment consultant, aquatic biologist or a fisheries biologist. This person must have a combination of education, training and experience that qualifies them to make judgements regarding your specific situation. When choosing an Environmental Monitor, it is advisable to ensure that they can also satisfy these requirements.

**Environmental Management System (EMS) Documents:** These documents are provided by BCTS as part of a contract or Timber Sale Licence (TSL). They include: Environmental Emergency Response Plan (ERP), Environmental Field Procedures (EFPs) and guidelines such as Ground Based Harvesting Guidelines.

**Timing Windows:** These are the times of year when in stream work is least likely to result in serious harm to fish or habitat. They are provided by MoE as part of the ‘Terms and Conditions of the Habitat Officer’. They vary by region and fish species and can be found here: [http://www.env.gov.bc.ca/wld/instreamworks/regionaltimingwindows.htm](http://www.env.gov.bc.ca/wld/instreamworks/regionaltimingwindows.htm)

**Fish Habitat:** DFO defines fish habitat as: spawning grounds and any other areas, including nursery, rearing, food supply and migration areas, on which fish depend directly or indirectly in order to carry out their life processes.

**Obstruction:** DFO defines an obstruction as: any slide, dam or other thing impeding wholly or partially the free passage of fish.

**Serious harm to fish:** DFO defines serious harm to fish as: the death of fish or any permanent alteration to, or destruction of, fish habitat.
References and Links:


### Example Photographs:

#### Crossing Structure Installation

<table>
<thead>
<tr>
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<th>Poor</th>
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<tbody>
<tr>
<td><img src="example1.jpg" alt="Good Structure" /></td>
<td><img src="example2.jpg" alt="Poor Structure" /></td>
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<tr>
<td>- Minimal disturbance to vegetation</td>
<td>- Heavily disturbed vegetation</td>
</tr>
<tr>
<td>- Structure preserves stream banks</td>
<td>- Inadequate span to preserve stream banks</td>
</tr>
<tr>
<td>- Adjacent disturbed sites oriented to prevent sedimentation into stream</td>
<td>- Adjacent disturbed sites not adequately re-worked to prevent sedimentation</td>
</tr>
<tr>
<td>- No debris / disturbance in channel</td>
<td>- Structure below high water mark of stream, disturbance to channel</td>
</tr>
<tr>
<td>- Clean, appropriate materials used in construction</td>
<td>- Dirty, damaged building materials</td>
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#### Road Drainage Management

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<tr>
<td><img src="example3.jpg" alt="Good Road" /></td>
<td><img src="example4.jpg" alt="Poor Road" /></td>
</tr>
<tr>
<td>- Exposed soils Minimized where possible</td>
<td>- Large exposed areas of fine materials</td>
</tr>
<tr>
<td>- Road surface crowned to drain water</td>
<td>- Improper crown to drain road surface</td>
</tr>
<tr>
<td>- Stable travelled way (not damaged by vehicle traffic)</td>
<td>- No ditching to capture overland flow</td>
</tr>
<tr>
<td>- Sediment management deployed in response to mobile sediments</td>
<td>- Uneven surface, large windrow in center of travelled way</td>
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<tr>
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<td>- Sediment management absent</td>
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### Harvesting

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<tr>
<td><img src="image1" alt="Good Harvesting Image" /></td>
<td><img src="image2" alt="Poor Harvesting Image" /></td>
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</tbody>
</table>
| - Exposed soils minimized where possible  
  - Minimal disturbance from machines  
  - Streams free of debris and other materials | - Large accumulations of debris  
  - Excessive disturbance and rutting  
  - Material being introduced to streams  
  - Erosion and sedimentation occurring |

### Spill Response

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<td><img src="image4" alt="Poor Spill Response Image" /></td>
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</tbody>
</table>
| - Source of spill remedied  
  - Spill area controlled/contained  
  - Spill pads/bioremediation deployed  
  - Soiled materials properly disposed/cleaned up | - Source of spill not remedied  
  - No containment/spill response equipment deployed  
  - Soiled materials not removed and disposed |
## Fuel Storage

### Good

- Legal and EMS requirements satisfied (see callout boxes)
- Storage containers clean and leak free
- Spill response equipment clean and accessible
- Fire suppression equipment accessible
- Tank secured properly

### Poor

- Legal requirements not satisfied
- Soiled materials not properly contained/disposed
- Leak/spill prevention not properly addressed