

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:



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1.	Do I have all the information that I need?	
	<input type="checkbox"/>	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.
	<input type="checkbox"/>	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?	
	<input type="checkbox"/>	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.
	<input type="checkbox"/>	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?	
	<input type="checkbox"/>	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.
	<input type="checkbox"/>	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?	
<input checked="" type="checkbox"/>	Federal	Fisheries Act – Governs all aspects of fish habitat management including: harm to fish or habitat and introduction of substances.
<input checked="" type="checkbox"/>	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.
<input checked="" type="checkbox"/>	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.
<input checked="" type="checkbox"/>	Provincial	Wildlife Act – This legislation applies to bird nests, beaver dams, and threatened and endangered species . Be aware of these requirements.
<input checked="" type="checkbox"/>	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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5.	Are there established BMPs for my project?		
	<input type="checkbox"/>	YES	<p>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:</p> <p style="text-align: center;"> http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html http://www.env.gov.bc.ca/wld/documents/bmp/iswstdsbpsmarch2004.pdf </p>
	<input type="checkbox"/>	NO	<p>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</p>
6.	Do I need a Qualified Environmental Professional?		
	<p>If any of the following apply, additional planning and/or consultation with a QEP may be required. An environmental monitor may also be required during works. Consult your supervisor.</p>		
	<input type="checkbox"/>	YES	<p>Work is anticipated to impact a marine environment (i.e. Construction, re-activation or repairs to a log sorting or dumping facility). Refer to EFP #08 for additional guidance.</p>
	<input type="checkbox"/>	YES	<p>Fish presence for the site is not known. There is no indication of waterbody classification on related documents.</p>
	<input type="checkbox"/>	YES	<p>Work is being conducted on a stream in a community watershed or fisheries sensitive watershed where there is risk of sedimentation in the water supply.</p>
	<input type="checkbox"/>	YES	<p>The machine will need to cross a fish stream with no provision for construction of a temporary crossing, or work will need to be conducted on a fish bearing stream below the high water mark.</p>
	<input type="checkbox"/>	YES	<p>Work is being conducted on fish streams outside the fish window.</p>
	<input type="checkbox"/>	YES	<p>Work is being conducted in fish habitat and fish salvage, site isolation or stream diversion will need to take place. Additional permits or approvals may be required. Ensure these requirements have been satisfied and copies of approvals are on-site before proceeding.</p>
	<input type="checkbox"/>	YES	<p>Spawning fish, eggs or juvenile fish have been observed within the work area.</p>
	<input type="checkbox"/>	YES	<p>Sensitive soils or critical fish habitat have been observed at the site. The site will require a Sediment and Drainage Management Plan (SDMP) or habitat protection measures.</p>
	<input type="checkbox"/>	YES	<p>Concrete or other hazardous substances will be used within or adjacent to the watercourse. An Environmental Management Plan, water quality monitoring, or specialized equipment may be required to do this work.</p>
	<input type="checkbox"/>	YES	<p>Species at Risk or other aquatic wildlife habitat features have been noted at the site. Timing windows or other restrictions may apply.</p>
	<input type="checkbox"/>	YES	<p>The status of any of the previous points is not known, or insufficient information is available. Consult your supervisor or Agency representative.</p>

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:



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- **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 **RMA**s 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.**



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- 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:



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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>

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:

Fisheries and oceans Canada. (2012). Fisheries Protection Policy Statement. Ottawa, Ont. Canada. <http://www.dfo-mpo.gc.ca/pnw-ppe/pol/index-eng.html>

Fisheries and Oceans Canada (Website). (2015). Projects Near Water. <http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html>

Ministry of Water, Land and Air Protection. (2004). Standards and Best Practices for Instream Works. Victoria, BC, Canada. <http://www.env.gov.bc.ca/wld/documents/bmp/iswstdsbpsmarch2004.pdf>

FishFor Contracting. (2006). A Guide to Working in and Around Fish Habitat. Port McNeill, BC, Canada. <http://www.pskf.ca/publications/A%20Guide%20to%20Working%20In%20and%20Around%20Fish%20Habitat.pdf>

BC Timber Sales. 2009. BCTS Strait of Georgia Business Area. Ground Based Harvesting Guidelines. Campbell River, BC, Canada. <https://www.for.gov.bc.ca/ftp/TSG/external/!publish/EMS2/Supplements/TSG-Ground-Based-Harvesting-Guidelines.pdf>

BC Timber Sales. 2013. BCTS Strait of Georgia Business Area. Guidelines for Preparing Riparian Management Prescriptions. Campbell River, BC, Canada. <https://www.for.gov.bc.ca/ftp/TSG/external/!publish/EMS2/Supplements/TSG-Guidelines-Riparian-Prescriptions.pdf>

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Example Photographs:

Crossing Structure Installation	
Good	Poor
	
<ul style="list-style-type: none"> - Minimal disturbance to vegetation - Structure preserves stream banks - Adjacent disturbed sites oriented to prevent sedimentation into stream - No debris / disturbance in channel - Clean, appropriate materials used in construction 	<ul style="list-style-type: none"> - Heavily disturbed vegetation - Inadequate span to preserve stream banks - Adjacent disturbed sites not adequately re-worked to prevent sedimentation - Structure below high water mark of stream, disturbance to channel - Dirty, damaged building materials
Road Drainage Management	
Good	Poor
	
<ul style="list-style-type: none"> - Exposed soils Minimized where possible - Road surface crowned to drain water - Stable travelled way (not damaged by vehicle traffic) - Sediment management deployed in response to mobile sediments 	<ul style="list-style-type: none"> - Large exposed areas of fine materials - Improper crown to drain road surface - No ditching to capture overland flow - Uneven surface, large windrow in center of travelled way - Sediment management absent

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Harvesting	
Good	Poor
	
<ul style="list-style-type: none"> - Exposed soils minimized where possible - Minimal disturbance from machines - Streams free of debris and other materials 	<ul style="list-style-type: none"> - Large accumulations of debris - Excessive disturbance and rutting - Material being introduced to streams - Erosion and sedimentation occurring
Spill Response	
Good	Poor
	
<ul style="list-style-type: none"> - Source of spill remedied - Spill area controlled/contained - Spill pads/bioremediation deployed - Soiled materials properly disposed/cleaned up 	<ul style="list-style-type: none"> - 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