

## Ditch and Watercourse Management

### 5.5 Ditch and Watercourse Management

Ditch and watercourse management activities include debris, sediment, and vegetation removal from both natural channels and constructed ditches; repair of bank erosion; and grading and construction of roadside ditches. These activities are undertaken to provide safe, unobstructed drainage for all highway surface runoffs, natural roadside runoffs and ditches; and to create collection areas for debris, ice, and snow.



#### Highway Maintenance Specification Sections

#### 2-250 Ditch and Watercourse Maintenance

Available at:

[http://www.th.gov.bc.ca/BCHighways/contracts/maintenance/Schedule\\_21\\_Maintenance\\_Specifications.pdf](http://www.th.gov.bc.ca/BCHighways/contracts/maintenance/Schedule_21_Maintenance_Specifications.pdf)



#### Environmental Issues

Primary environmental issues relating to routine ditch and watercourse management activities are summarized in the following table. It should be noted that site-specific conditions might present additional issues you will need to address in planning and undertaking your works.

Work Activity	Potential Environmental Impacts	Performance Standards and Legal Requirements
Debris, Sediment and Vegetation Removal	May introduce sediment or other deleterious substances to a watercourse through removal activities	No release of any substance that could be deleterious (toxic) to fish or fish habitat ( <i>Fisheries Act</i> , Sections 34(1) and 36(3)).
	May damage roadside riparian vegetation or other significant habitats through the side casting of rock or soils	No harmful alteration, disruption or destruction of fish habitat without authorization ( <i>Fisheries Act</i> , Section 35(1)).  No alteration of a stream unless authorized by an approval, licence, or order ( <i>Water Act</i> , Section 9), or through a Notification ( <i>Water Act</i> Regulation, Part 7).
	May damage habitat through the improper location of disposal sites in ditches, wetlands, or other significant habitat areas	No harmful alteration, disruption or destruction of fish habitat without authorization ( <i>Fisheries Act</i> , Section 35(1)).  No alteration of a stream unless authorized by an approval, licence, or order ( <i>Water Act</i> , Section 9), or through a Notification ( <i>Water Act</i> Regulation, Part 7).  No alteration or destruction of a protected species' residence without approval ( <i>Species at Risk Act</i> , Sections 32(1), 33).

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Work Activity	Potential Environmental Impacts	Performance Standards and Legal Requirements
<b>Debris, Sediment and Vegetation Removal</b>	May disturb wildlife species (e.g., birds, beavers) through vegetation removal or the removal of dam and lodge structures	<p>No disturbance, molestation or destruction of a beaver house or den, unless undertaken to provide irrigation or drainage under lawful authority for the protection of property, or if the action is authorized by regulation (<i>Wildlife Act</i>, Section 9)</p> <p>No injury, molestation or destruction of a bird, its egg, and occupied nest, or the nest of an eagle, Peregrine Falcon, Gyrfalcon, Osprey, heron, or Burrowing Owl, unless the species is listed under Schedule C as exempt from this protection (<i>Wildlife Act</i>, Section 34).</p> <p>No killing, capturing, injuring, taking or disturbing migratory birds or damaging, destroying, removing or disturbing their nests, unless permitted under the <i>Act</i> (<i>Migratory Birds Convention Act</i>).</p>
	May contribute to the spread of noxious weeds if the removed material is improperly handled and may displace native vegetation	No dispersal of noxious weeds or their seeds ( <i>Weed Control Act</i> , Weed Control Regulation).
<b>Bank Erosion Repair</b>	May introduce sediment or other deleterious substances to a watercourse through further disturbances to watercourse banks, types of materials used for repairs, proximity of earthmoving equipment to a watercourse	No release of any substance that could be deleterious (toxic) to fish or fish habitat ( <i>Fisheries Act</i> , Sections 34(1) and 36(3)).
	May damage habitat by altering instream and bank structures and vegetation through the placement of riprap	<p>No harmful alteration, disruption or destruction of fish habitat without authorization (<i>Fisheries Act</i>, Section 35(1)).</p> <p>No alteration of a stream unless authorized by an approval, licence, or order (<i>Water Act</i>, Section 9), or through a Notification (<i>Water Act</i> Regulation, Part 7).</p> <p>No spread of invasive plants.</p> <p>No dispersal of noxious weeds or their seeds (<i>Weed Control Act</i>, Weed Control Regulation).</p>
	May contaminate surface waters, groundwater, and soils through improper storage or disposal of materials	Disposal of all waste materials in accordance with the <i>Act</i> and reporting of any hazardous materials spills ( <i>Waste Management Act</i> , Special Wastes Regulation).

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Work Activity	Potential Environmental Impacts	Performance Standards and Legal Requirements
Channel Maintenance (grading, construction)	May introduce sediment or other deleterious substances to a watercourse	No release of any substance that could be deleterious (toxic) to fish or fish habitat ( <i>Fisheries Act</i> , Sections 34(1) and 36(3)).
	May damage habitat by altering instream and bank structures and vegetation	No harmful alteration, disruption or destruction of fish habitat without authorization ( <i>Fisheries Act</i> , Section 35(1)). No alteration of a stream unless authorized by an approval, licence, or order ( <i>Water Act</i> , Section 9), or through a Notification ( <i>Water Act</i> Regulation, Part 7). No spread of invasive plants and dispersal of noxious weeds or their seeds ( <i>Weed Control Act</i> , Weed Control Regulation).
	May contaminate surface waters, groundwater, and soils through improper storage or disposal of materials excavated from channels	Disposal of all waste materials in accordance with the <i>Act</i> and reporting of any hazardous materials spills ( <i>Waste Management Act</i> , Special Wastes Regulation)



### Environmental Best Practices

The following BPs have been compiled for routine maintenance works that do not require a *Water Act* Notification or further approvals from regulatory agencies (i.e., works on non-fish bearing roadside runoffs, ephemeral channels which do not contain fish habitat). Should your works require a *Water Act* Notification or DFO authorization (i.e., works on ditches or watercourses which contain fish and other aquatic species or fish habitat), you will be provided with more detailed BPs by the regulatory agencies in response to your application.

The BPs provided in this document are provided as guidelines to help you ensure your works are completed in compliance with the performance standards and environmental legislation. Please note that the general BPs apply for most work activities within this category; if BPs specific to the activity are available they are also noted below.

### Regulatory Agency Contact

- Prior to beginning your ditch and watercourse management activities, identify any sensitive habitat areas, including wetted ditches and natural watercourses—streams, lakes and marine foreshores, found within your work area.
- Determine how much impact your required works will have on the identified areas. Are you planning to re-grade a non-vegetated roadside drainage ditch that only conveys storm water? Are you required to remove debris jams from a permanently wetted fish-bearing watercourse that crosses the highway right-of-way? What type of equipment and materials are you planning to use to stabilize a large lakeside section of

### Assessing Potential Risks

Watercourses can generally be divided into the following three classes based on their habitat value and the level of protection they require:

1. Any fish-bearing wetted channel
2. Any wetted channel where fish may not be present yet which provides food, nutrients, or cool water to downstream watercourses and habitat for other aquatic species
3. Any non-fish-bearing channel which dries after rainfall and provides insignificant food, nutrient or habitat value

Consider what type of watercourse you will be working in when assessing the level of regulatory agency contact your works will require.

**If you are planning work in or around watercourses that provide direct or indirect fish habitat, contact MoE and DFO.**

highway embankment that has been damaged by erosion? Are there any areas within your jurisdiction prone to regular debris accumulations or erosion issues? By asking these questions, you should be able to identify any planned works or areas that may be of concern to regulatory agencies.

- Meet with the appropriate regulatory agency contact, as listed in Section 8, to discuss site-specific environmental protection measures. Refer to Section 7 for information on the Memorandum of Understanding with MoE, and the recommended protocol for maintaining regular communications with regulatory agencies.

### Beaver and Beaver Dam Management

If your works require you to modify or remove a beaver dam, you will require a permit for the works under the *Wildlife Act* Regulations. Contact your local Conservation Officer for assistance. Permit applications may be submitted online through MoE's Permit and Authorization Service Bureau (<http://www.env.gov.bc.ca/pasb/>)

Best Management Practices for beaver dam modifications and removals may be found in the *MoE Standards and Best Practices for Instream Works* document, accessible online at <http://www.env.gov.bc.ca/wld/documents/bmp/iswstdsbpsmarc h2004.pdf>

### Timing of Works

For most work activities within this category, the following general BPs apply:

- Works are preferably undertaken during periods of dry weather (e.g., summer) as this allows easier control of sediment. Typically this is also a less sensitive period for fish and wildlife than other seasons. If the work schedule requires working in the rain, the area of work must be isolated and appropriate sediment controls must be installed to prevent the release of sediment-laden water or any other deleterious substances.
- If your maintenance activities require work instream, you must schedule them to coincide with your region's instream work window. Contact your local MoE and DFO offices for further information on timing windows in your District.

### Emergency Debris Removal

- If there is a demonstrable risk posed to highway stability and safety by debris or other materials limiting drainage within or across the highway right-of-way during a flood event, it is appropriate for you to undertake works to reduce the flood threat as soon as possible. Where possible, notify your local MoE Habitat Officers and DFO Habitat Management staff before beginning your debris removal works or as soon as you are able. Limit your work to only that which is required to reduce the threat to the highway and associated structures. Take steps to minimize your impact to watercourse structures and vegetation and ensure that appropriate measures (e.g., erosion and sediment control, re-vegetation) are in place to mitigate any impacts resulting from your work.

### Site Management

- Minimize disturbance to areas surrounding the worksite and avoid impacts to surrounding trees and shrubs when preparing your worksite and undertaking your maintenance works. To assist with bank stability and leaving topsoil and root systems intact on upper portions of cleaned channel banks and above areas where riprap is placed.

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### Equipment Use

- Select appropriate equipment and work access routes to reduce damage to riparian vegetation and watercourse banks when using earth. If removing debris from a watercourse, operate equipment from the bank or road shoulder. Do not allow machinery to cross through water.
- Ensure all equipment used on site is well maintained and free of fluid leaks. Refuel and lubricate equipment on dry land away from watercourses. Use drip trays to contain any spillage during equipment maintenance.

### Worksite Isolation

- Isolate your work area from any flowing water that may be present. Ensure any flows are temporarily diverted around the portion of the ditch or watercourse where you are working.
- Contain any sediment-laden water generated during your works in an isolated work cell. Use a pump to draw sediment-laden water out of the work cell and discharge it to a level vegetated area where sediment can settle as the water infiltrates the ground.

### Erosion and Sediment Control

- Use clean materials, free of fine soils that may contribute sediment to the watercourse, when installing riprap or other bank erosion protection measures.
- If excavated materials or any other erodible materials are to be left on site, ensure they are placed in a manner that will prevent the introduction of sediment to any watercourse (i.e., temporary covers, grading and seeding, installation of silt fence around spoil piles).
- Install appropriate erosion and sediment control devices (e.g., silt fence installed below disturbed slopes, rock check dams and temporary silt dikes in low velocity, low volume ditches) to prevent the movement of sediment to downstream watercourses. Ensure that any structures installed are maintained and monitored until they are no longer needed (i.e., vegetative cover on seeded areas is adequate to control erosion).

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- Do not dump ditch waste above or below the ditch where desirable vegetation is established. Instead, dispose of waste materials at a designated disposal site. Record and report the source location of the disposed waste or spill materials.
- Minimize soil exposure and removal of desirable vegetation to prevent establishment of invasive plants.

### DFO Operational Statement – Maintenance of Riparian Vegetation in Existing Rights-of-Way

DFO has developed a series of “Operational Statements” (OS) to streamline the regulatory review of low risk activities completed in and around water. Each OS outlines measures and conditions that must be implemented to be compliant with Subsection 35(1) of the *Fisheries Act* (i.e., no harmful alteration, disruption and destruction (HADD) of fish habitat).

There is an OS for Maintenance of Riparian Vegetation in Existing Rights-of-Way which you can access at: ([http://www-heb.pac.dfo-mpo.gc.ca/decisionsupport/os/operational\\_statements\\_e.htm](http://www-heb.pac.dfo-mpo.gc.ca/decisionsupport/os/operational_statements_e.htm))



### Key Information Sources

The documents and websites listed below are recommended resources for ditch and watercourse management. They can provide examples of existing protocols and management strategies, as well as additional information on specific operational BPs (e.g., erosion and sediment control techniques).

#### MoT Technical Circulars:

There are no relevant Technical Circulars authored to-date for this activity.

All Technical Circulars are available at:

[http://www.th.gov.bc.ca/Publications/Circulars/Current\\_technical.asp](http://www.th.gov.bc.ca/Publications/Circulars/Current_technical.asp)

#### Locally Developed BPs

##### (Provide any locally-developed BPs):

- *Riprap - Skeena BMPs for Road Maintenance*. 2003. MoT.  
[http://www.th.gov.bc.ca/publications/eng\\_publications/best\\_practices/bp.pdf](http://www.th.gov.bc.ca/publications/eng_publications/best_practices/bp.pdf)
- *Ditching - Skeena BMPs for Road Maintenance*. 2003. MoT.  
[http://www.th.gov.bc.ca/publications/eng\\_publications/best\\_practices/bp.pdf](http://www.th.gov.bc.ca/publications/eng_publications/best_practices/bp.pdf)

#### Other Resources:

**Standards and Best Practices For Instream Works**. March 2004. BC Ministry of Water, Land and Air Protection.

<http://www.env.gov.bc.ca/wld/documents/bmp/iswstdsbpsmarch2004.pdf>

**Maintenance of Riparian Vegetation in Existing Rights-of-Way – Pacific Regional Operational Statement**. 2008. Fisheries and Oceans Canada (DFO).

[http://www-heb.pac.dfo-mpo.gc.ca/decisionsupport/os/os-riparian\\_veg\\_maint\\_e.htm](http://www-heb.pac.dfo-mpo.gc.ca/decisionsupport/os/os-riparian_veg_maint_e.htm)

**General Best Management Practices to Protect Water Quality website**. June 2004. Environmental Protection Division, BC Ministry of Environment.

[http://www.env.gov.bc.ca/wat/wq/nps/BMP\\_Compendium/nps\\_bmp.htm](http://www.env.gov.bc.ca/wat/wq/nps/BMP_Compendium/nps_bmp.htm)

**Catalogue of Stormwater Best Management Practices**. September 2005. Idaho Department of Environmental Quality.

[http://www.deq.state.id.us/water/data\\_reports/storm\\_water/catalog/index.cfm](http://www.deq.state.id.us/water/data_reports/storm_water/catalog/index.cfm)

**Manual of Control of Erosion and Shallow Slope Movement**. August 1997. BC Ministry of Transportation.

[http://www.th.gov.bc.ca/Publications/eng\\_publications/environment/references/Man\\_Control\\_Erosion.pdf](http://www.th.gov.bc.ca/Publications/eng_publications/environment/references/Man_Control_Erosion.pdf)

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**T.I.P.S.: Targeted Invasive Plant Solutions.** Invasive Plant Council of British Columbia. 2007.

<http://www.invasiveplantcouncilbc.ca/resources/targeted-invasive-plant-solutions-tips>

**Agricultural Watercourse Maintenance – Lower Fraser Valley and Vancouver Island.** Undated Brochure. BC Ministry of Agriculture, Food, and Fisheries and Ministry of Environment, Lands and Parks.

<http://www.al.gov.bc.ca/resmgmt/ditchpol/brochure/AgDitchMtceBrochure.pdf>



### Checklist for Environmental Protection Requirements

- Is your proposed work considered a “routine” maintenance activity? If not, approvals or permits may be required. Contact your local municipal, provincial, or federal regulatory agency staff.
- Has this project been discussed with local environmental regulatory staff? In addition to the BP information presented, other site-specific conditions may apply.
- Have site-specific environmental protection requirements been identified? List below:
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