

# Environmental BEST PRACTICES

for Highway Maintenance Activities



Ministry of  
Transportation  
and Infrastructure

2023  
update













## ACKNOWLEDGEMENT

The 2004 edition of *Environmental Best Practices for Highways Maintenance Activities*, the original precursor of this manual, was produced with guidance from an interagency steering committee comprised of personnel from the British Columbia Ministry of Transportation and Infrastructure (MOTI) and the British Columbia Ministry of Environment and Climate Change Strategy. Input was provided at the time from a large cross section of staff from both ministries and well as representatives from Fisheries and Oceans Canada, and MOTI's Road and Bridge Maintenance Contractors.

The 2010 and 2018 editions of this manual were produced using feedback from MOTI staff, and contractors and incorporated the latest environmental best practices information available for highway operations and activities.

The 2023 update incorporates updates to legislation, updated links, and updated best practices, as well as a reorganization of information to improve access to information.

The contribution of all those involved in the development of the precursor documents and this manual is acknowledged and appreciated.



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# 1.0 INTRODUCTION AND SCOPE

The Ministry of Transportation and Infrastructure (MOTI) has created this manual, titled Environmental Best Practices for Highways Maintenance Activities, to help Maintenance Contractors provide services in an environmentally responsible manner. These standardized practices and protocols are designed to be applicable across the province and to serve as a practical and cost-effective means to meet regulatory agency requirements and public expectations for environmental protection.

The scope of this manual is limited to environmental best practices as they relate to the maintenance specifications described in [MOTI's 2018/19 Highway Maintenance Agreement](#).

This manual is intended to be a living document that will continue to evolve through implementation of the best practices and through continued dialogue with Maintenance Contractors and regulatory agencies.



## 2.0 HOW TO USE THIS MANUAL

This manual is intended to be used during all categories of a construction project or maintenance activity, including:

- Planning/pre-screening,
- Timing of works,
- Site management,
- Equipment use, and
- Material handling and containment.

Prior to undertaking any activity, Maintenance Contractors should ensure that they are familiar with the relevant legislation and any permitting requirements for the work; see Table 1: Summary of Environmental Legislation.

Once the work activity is determined and all regulatory requirements (if any) are understood, review the common best practices for all maintenance activities in Section 4 for each aspect of the project. Then review the activity-specific best practices in Section 5.

This manual includes a glossary of terms in Section 6 to ensure Maintenance Contractors all have a common understanding of terminology, and Section 7 includes additional resources and links to training and other educational materials and guides.





## 3.0 ENVIRONMENTAL LEGISLATION AND DUE DILIGENCE

MOTI and its Maintenance Contractors have a shared commitment to environmental protection and will do their part in protecting environmental values. In addition, there is the expectation that services are delivered in compliance with applicable environmental legislation including federal, provincial, and local.

This legislation may regulate where, when, and how highways maintenance activities can be carried out. A table summarizing the primary legal requirements applicable to highways maintenance activities is provided on the following page.

### Due Diligence

To ensure that highway maintenance work is undertaken in a manner that demonstrates environmental due diligence there is a responsibility by Maintenance Contractors to:

1. Be familiar with federal, provincial, and local requirements.
2. Stay informed of changes to legislation and regulations affecting highways maintenance activities.
3. Include in the Quality Management System a plan to ensure there is appropriate environmental awareness and regulatory compliance training for the Contractor and subcontractors, as per 17.2 (c)(i) of the Highway Maintenance Agreement.
4. Recognize and address the potential impacts of work on the physical, chemical, and biological components of the environment.
5. Avoid or minimize those impacts or risks through the proper planning and delivery of work.
6. Before proceeding with the work, obtain all required permits and authorizations.
7. Conduct works in a manner that complies with the law and avoids, mitigates, or lessens the impacts to:
  - a. aquatic life and riparian habitat,
  - b. water quality and quantity,
  - c. fish and wildlife habitat and populations, and
  - d. public safety and property.

**Note:** Table 1 summarizes the primary legal requirements that apply to highway maintenance activities but may not be full and complete list. It should not be considered an official copy of legislation. If a discrepancy arises between this table and legislation, the legislation takes precedence. The Province does not guarantee the accuracy or completeness of the information referenced here from legislation, and in no event is the Province liable or responsible for damages of any kind arising out of its use.

# TABLE 1 / Summary of Environmental Legislation

Statute	Section(s)/ Regulations	Regulating Agency	Area of Regulation	Potential Approval or Permit Requirements	Relevant Activities <sup>1</sup>	Link(s)
Fisheries Act	Section 35 (1)	Fisheries and Oceans Canada (DFO)	Prohibits any work, undertaking or activity that results in the harmful alteration, disruption, or destruction of fish habitat.	<p>If protection and mitigation measurements cannot be fully implemented, a project authorization may be required before undertaking the activity.</p> <p>If a project does not meet conditions of a Code of Practice, or if there is uncertainty about compliance of compliance with the Act, a Request for Review may be submitted to DFO.</p>	Structure and Drainage Maintenance	<a href="#">Section 35(1)</a> <a href="#">Measures to protect fish and fish habitat</a> <a href="#">Project Authorization</a> <a href="#">Codes of Practice</a> <a href="#">Request for Review</a>
	Section 34.4 (1)	Fisheries and Oceans Canada	Prohibits any activity (except fishing) or work which results in the death of fish.	Work or activities may proceed with an authorization in accordance with Section 35.1, or the work, undertaking or activity is a prescribed work, undertaking or activity under paragraph 35.2 (10)(a).	Structure and Drainage Maintenance	<a href="#">Section 34.4 (1)</a> <a href="#">Measures to protect fish and fish habitat</a> <a href="#">Project Authorization</a>
	Section 36 (3)	Fisheries and Oceans Canada	Prohibits the deposit of deleterious substances into water frequented by fish, or to any place, under any conditions, where a deleterious substance may enter waters frequented by fish.	Authorizations are only provided by regulation for specific activities such as industrial discharges from pulp mills.	Any	<a href="#">Frequently asked questions: Fisheries Act pollution prevention provisions</a>

<sup>1</sup> Relevant activities include most common activities that may relate to the various legislation; however, 1. there may be other activities that require this legislation and it is the Maintenance Contractors responsibility to determine all permits/approvals that are required for the works, and/or 2. individual task or project circumstances may include other pieces of legislation not identified here.



Statute	Section(s)/ Regulations	Regulating Agency	Area of Regulation	Potential Approval or Permit Requirements	Relevant Activities <sup>1</sup>	Link(s)
Migratory Birds Convention Act (MBCA)	Migratory Birds Regulations (MBR), 2022	Environment and Climate Change Canada	<p>Prohibits depositing substances that are harmful to birds in waters or areas frequented by them. Prohibits the capture, killing, taking, injury or harassment of migratory birds without a permit.</p> <p>The MBR also protect migratory bird nests when they contain a live bird or viable egg, or year-round for 18 migratory bird species who re-use their nests.</p>	<p>A Damage or Danger permit issued by Canadian Wildlife Service authorizes permit holders to scare migratory birds, destroy eggs or active nests, relocate birds or their active nests, or kill birds in instances where the birds, nests, or eggs are causing damage to property or threaten public health and safety.</p> <p>A permit is also required to destroy or relocate the nest of any of the 18 birds with year-round nest protection, whether the nest is occupied or not.</p>	Structure and Roadside Maintenance	<p><a href="#">Damage or Danger Permit</a></p> <p><a href="#">FAQ: MBR 2022</a></p> <p><a href="#">Migratory Birds Regulations, 2022: SOR/2022-105</a></p>
Canadian Navigable Waters Act (CNWA)	Section 3	Transport Canada	Prohibits the construction, placement, alteration, repair, rebuilding, removal, or decommissioning of work in, on, over, under, through or across any navigable waters as defined by the CNWA.	<p>Approval under the CNWA is required for major works in any navigable water and works in Scheduled navigable waters.</p> <p>Notification may be required for works considered minor under the CNWA.</p>	Structure Maintenance	<p><a href="#">Canadian Navigable Waters Act</a></p> <p><a href="#">Schedule of Navigable Waters</a></p>
Species at Risk Act (SARA)	Section 32(1), 33, and 73(1)	Environment and Climate Change Canada	Prohibits killing, harming, harassing, capturing, or taking any of the species protected under SARA. Prohibits the damage or destruction of the residence of a species protected under SARA, including any critical habitat that has been established.	<p>A permit may be issued under Section 73 (1) of SARA for activities affecting listed wildlife species, any part of its critical habitat or the residences of its individuals.</p> <p>Note that SARA permits are only applicable on federal land.</p>	Structure, Drainage, and Roadside Maintenance	<p><a href="#">Section 32(1) and 33 of SARA</a></p> <p><a href="#">Section 73(1) of SARA</a></p>

Statute	Section(s)/ Regulations	Regulating Agency	Area of Regulation	Potential Approval or Permit Requirements	Relevant Activities <sup>1</sup>	Link(s)
Environmental Management Act (EMA)	The Hazardous Waste Regulation (HWR)	BC Ministry of Environment and Climate Change Strategy	Addresses the proper handling and disposal of hazardous wastes under the EMA. The discharge of any waste to the environment is prohibited unless it is authorized by the EMA or any of the regulations under the Act.	Types of authorizations include permits, orders, approvals, or compliance with specific regulations or waste management plans.	Any that involve handling and disposal of hazardous wastes	<a href="#">Hazardous waste legislation and regulations</a>  <a href="#">Hazardous Waste Legislation Guide (PDF, 4MB)</a>
	Contaminated Sites Regulation	BC Ministry of Environment and Climate Change Strategy	Regulates the management of contaminated sites, discharge authorizations at contaminated sites, and the transport of waste soil.	Permit or authorization is required for managing a contaminated site and relocating waste soil.	Any that may result in managing or moving contaminated soil	<a href="#">Contaminated Sites Regulation</a>  <a href="#">2023 CSR Amendment</a>  <a href="#">Contaminated sites guidance and resources</a>  <a href="#">Soil Relocation</a>
	Spill Reporting Regulation (SRR)	BC Ministry of Environment and Climate Change Strategy	Prescribes the information that is required, as well as the time and way it is required, when reporting spills.  Note: Section 91.2 of the <i>EMA</i> identifies the requirements for spill reporting.	If a spill occurs, or is at imminent risk of occurring, it must be immediately reported to the Provincial Emergency Program/Emergency Management British Columbia by calling 1-800-663-3456.	Any	<a href="#">Spill Reporting Regulation</a>  <a href="#">Spill Reporting Fact Sheet (PDF, 288KB)</a>



Statute	Section(s)/ Regulations	Regulating Agency	Area of Regulation	Potential Approval or Permit Requirements	Relevant Activities <sup>1</sup>	Link(s)
Public Health Act	Sewerage System Regulation (SSR)	BC Ministry of Health	Regulates the installation, construction, and maintenance of sewage disposal systems.	Under section 6 (1) (b) of the SSR, a person qualified as an authorized person may construct or maintain a sewerage system or supervise an owner constructing or maintaining a sewerage system on their own land. The authorized person must file with the health authorities before beginning to construct and provide a letter of certification after completing a sewerage system.	Rest area facility maintenance	<a href="#">Sewerage System Regulation</a>  <a href="#">Authorized Persons Under the Sewerage System Regulation</a>
	Sections 9, 10, 11, 39 Water Sustainability Regulation	BC Ministry of Forests	Regulates how water is used and how water and riparian ecosystems may be impacted due to works in and about a stream.	Water license or use approval may be required under Section 9 or 10 for water diversion. A Change Approval (in accordance with the Water Sustainability Regulation) is required for works in and about a stream that do not qualify as approved works (Section 11). A Notification is required for any approved works under Section 39 (1) of the Regulation.  A permit for the alteration or removal of beaver dams is required under the Water Sustainability Regulation.	Structure and Drainage Maintenance	<a href="#">Water Sustainability Act (WSA)</a>  <a href="#">Water Sustainability Regulation</a>  <a href="#">Water Licences &amp; Approvals</a>  <a href="#">Approved Works</a>  <a href="#">Beaver Dam Removal</a>

Statute	Section(s)/ Regulations	Regulating Agency	Area of Regulation	Potential Approval or Permit Requirements	Relevant Activities <sup>1</sup>	Link(s)
Wildlife Act	Sections 9, 34, 35 Permit Regulation	BC Ministry of Forests	Protects vertebrate animals from harm, except as allowed by regulation (e.g., hunting and trapping). Includes the protection of habitat and wildlife areas.	Permit or license is required for any work including, but not limited to the relocation of beavers, disturbance or destruction of nests or eggs, and the transport and possession of wildlife carcasses.	Structure, Drainage, and Roadside Maintenance	<a href="#">Wildlife Act</a> <a href="#">Permit Regulation</a> <a href="#">General Wildlife Permit</a>
Weed Control Act	Weed Control Regulation	BC Ministry of Forests	Regulates the management of noxious weeds and prohibits the dispersal of weeds and their seeds.	A permit and/or a Pest Management Plan is required for the chemical treatment of noxious weeds on provincial land.	Roadside Maintenance	<a href="#">Weed Control Regulation</a> <a href="#">Invasive Plant Pest Management Plans and Pesticide Use Permits</a>
Integrated Pest Management Act	Integrated Pest Management Regulation	BC Ministry of Environment and Climate Change Strategy	Establishes the conditions for the sale and use of pesticides.	A license or Pest Management Plan is required for the use of most pesticides.	Roadside Maintenance	<a href="#">Integrated Pest Management Regulation</a> <a href="#">Invasive Plant Pest Management Plans and Pesticide Use Permits</a>
Heritage Conservation Act (HCA)	Section 12.1	BC Ministry of Forests	To facilitate the protection and conservation of heritage property, including archaeology sites, in British Columbia.	Except as authorized by a permit issued under section 12.2 or 12.4, a person must not damage, excavate, dig in or alter, or remove any heritage object from a heritage and/or archaeology site.	Structure, Drainage, and Roadside Maintenance	<a href="#">Heritage Conservation Act</a> <a href="#">Potential Approval, Permit or Code of Practice Requirements</a> <a href="#">Chance Find Procedure</a>





## 4.0 BEST PRACTICES

The environmental best practices (BPs) included in this manual are known to be effective and practical for preventing or limiting harmful impacts to the environment from maintenance activities.

There are five categories of BPs that are common to most maintenance activities:

- planning/pre-screening,
- timing of works,
- site management,
- equipment use, and
- material handling and containment.

Some types of activities will have task-specific BPs, and when work is taking place in or near environmentally sensitive areas (such as watercourses, sensitive habitat, species at risk, etc.) site-specific BPs may be required.

Site-specific BPs should be developed in consultation with an Appropriately Qualified Person (AQP). An AQP is an applied scientist or technologist specializing in a relevant field such as a biologist, engineer, or environmental monitor. Maintenance Contractors are encouraged to involve AQP(s) to advise and assist on the selection and application of BPs and for adherence to permitting requirements.

### Common Best Practices Applicable to all Activities<sup>2</sup>

- a. Planning/pre-screening
  - i. Identify environmental values that require considerations by completing a desktop review, completing a field assessment, and/or obtaining advice from an AQP. Environmental values to consider include, but are not limited to, watercourses, sensitive habitats, invasive plants, and species at risk.
  - ii. If there are environmental values that require special consideration, obtain the advice of an AQP for additional BPs not included in this manual.
  - iii. Identify the erosion and sediment control techniques needed for the site.
  - iv. Determine the activity specific BPs; see Section 5.
  - v. Determine what authorizations or permits are necessary and begin engaging with regulators for approval.
  - vi. Identify potential issues and prepare mitigation plans.

<sup>2</sup> Winter Maintenance and Network Management have several exceptions to these common BPs, see activity specific BPs.



b. Timing of Works

- i. Any instream work or work that may impact fish bearing streams should occur during the designated regional timing window for instream work.
- ii. Maintenance activities are best undertaken during periods of dry weather to allow for easier control of deleterious material and runoff.
- iii. If it is necessary to work in the rain or other inclement weather, the work area should be isolated, and erosion and sediment control should be installed to prevent release of sediment-laden water or other deleterious substances into the environment.

c. Site Management

- i. Organize and plan the worksite(s), including access routes, laydown areas, and equipment and materials storage, to avoid impacts on the environment.
- ii. Avoid disturbing sensitive habitats or obtain the advice of an AQP if avoidance is not possible.
- iii. Minimize soil exposure and removal of vegetation to prevent the establishment of invasive plants.
- iv. Install erosion and sediment controls and regularly monitor them. Remove them when no longer needed and the worksite is re-established.
- v. Dispose of excess materials, excavated soils, and removed debris a minimum of 30 m away from any watercourse and avoid sensitive habitats. If any erodible materials are left on site, ensure they are left in a manner that will not result in sediment entering a watercourse.
- vi. Spread piles of cast materials thinly and reseed to prevent invasive plants from establishing.
- vii. Seed areas of exposed soils to reduce the risk of invasive plant establishment or sediment entering watercourses. Conduct seeding in accordance with the Standard Specifications for Highway Construction, [Section 757 Revegetation Seeding](#).
- viii. Hydroseeding is recommended whenever possible; however, broadcast seeding may be acceptable for areas of small disturbance or where some vegetation remains. Hydroseeding has a much higher success rate than dry, broadcast seeding.

- d. Equipment Use
  - i. Prior to site mobilization, make sure equipment is free of invasive plants and/or plant material.
  - ii. Ensure all equipment used is well maintained and free of fluid leaks.
  - iii. Refuel and lubricate equipment on dry land a minimum of 30 m away from watercourses. Use drip trays to contain spills during equipment maintenance.
  - iv. Avoid parking or staging in areas with invasive plants.
  - v. Prior to leaving the site, make sure equipment is free of invasive plants and/or plant material.
- e. Material Handling and Containment
  - i. Have a spill response plan in place and appropriately sized spill kits on site.
  - ii. Limit the application of surface treatments to the road surface and avoid over spraying near watercourses.
  - iii. Use clean fill free of invasive plant seeds/plant material. If material source piles are infested with invasive plants, scrape off the top one meter to expose clean material underneath. The scraped off material should be stockpiled for proper disposal and not used.
  - iv. If materials contaminated with invasive plants must be used, a rectification process must be approved by the Province before use.
  - v. Maintain a 30 m buffer between materials storage and watercourses and sensitive habitats.
  - vi. Use temporary covers to keep erodible material dry and prevent sediment mobilization.
  - vii. Ensure that all hazardous material storage, use, and disposal is in accordance with applicable regulations and information contained in the material safety data sheets.
  - viii. Load hazardous and/or deleterious substances at a designated site away from any watercourses or sensitive habitat. Use caution when loading trucks and during transport to minimize loss of materials.
  - ix. If potentially deleterious materials (e.g., cement-based products) are used for any repair works, ensure that raw materials and wash water are contained and will not be released into any watercourse.
  - x. Handle all deleterious materials with care.
  - xi. Where possible sweep up loose materials and debris. Any material which may contaminate the environment must be disposed of appropriately offsite.







## 5.0 MAINTENANCE ACTIVITY-SPECIFIC INFORMATION AND BPS

The BPs and information that follows are general guidelines to ensure works are completed in compliance with environmental legislation and to help mitigate potential environmental impacts.

### 5.1 Surface Maintenance

Environmental impacts relating to surface maintenance activities are summarized in the following table. Site-specific conditions may present additional issues that need to be addressed in planning and undertaking works.

Task	Potential Impact
<ul style="list-style-type: none"> <li>• Patching or sealing paved surfaces using chemical compounds/treatments.</li> <li>• Side casting or disposal of debris and other materials from surface cleaning.</li> <li>• Repairs, grading, or shoulder maintenance disturbing existing surfaces (gravel) or introducing new materials.</li> <li>• Release of other deleterious substances, such as dust control products.</li> <li>• Improper storage or disposal of wildlife carcasses.</li> <li>• Over-spraying of road shoulders with dust control materials.</li> <li>• Side casting or disposal of debris and other materials from surface cleaning.</li> </ul>	<p>Introduction of deleterious substances to a watercourse.</p> <p>Contamination of surface water, groundwater, and riparian habitat.</p>
<ul style="list-style-type: none"> <li>• Cleaning aggregate from paved surfaces</li> </ul>	Air quality issues
<ul style="list-style-type: none"> <li>• Repairs, grading, or shoulder maintenance disturbing existing surfaces.</li> <li>• Introducing new material without confirming it is free of invasive plants.</li> </ul>	Contributing to the spread on invasive plants

## **General**

Surface maintenance activities requiring the application of patching components, tar, asphalt, and dust control materials are more susceptible to erosion risk when applied in the rain. These activities should be scheduled for dry periods of weather and caution should be taken to prevent sediment-laden water and deleterious substances from entering watercourses if it is unavoidable to work in the rain.

## **Dust Control**

- Best applied to pre-wetted surfaces.
- Avoid applying in the rain or saturated surfaces.
- Limit the application to the road surface and avoid over spraying.

## **Surface Cleaning**

- Consider the impacts of side casting collected materials. If collected material is to be deposited in the highway right of way designate disposal sites at least 30 m away from watercourses and sensitive habitats.

## **Debris Removal**

- Do not store or bury dead animals within 30 m of watercourses, sensitive habitats, or any drinking water sources. Animal carcass disposal must not cause pollution of the environment. Discuss disposal options with MOTI operations staff.



## 5.2 Drainage Maintenance

Environmental impacts relating to drainage maintenance activities are summarized in the following table. Site-specific conditions may present additional issues that need to be addressed in planning and undertaking works.

Task	Potential Impact
<ul style="list-style-type: none"> <li>• Removal of obstructions, debris, or channel maintenance.</li> <li>• Installation repairs or replacement of draining appliances.</li> <li>• Bank erosion installation or repair with materials that are silt-laden or causing bank disturbance.</li> <li>• Improper storage or disposal of materials associated with bank erosion repair or drainage appliance repair.</li> <li>• Side casting or improper disposal of debris, sediment, and vegetation.</li> </ul>	<p>Introduction of deleterious substances to a watercourse.</p> <p>Damage to roadside watercourses, riparian, and fish habitat.</p>
<ul style="list-style-type: none"> <li>• General maintenance of drainage appliances disturbing bats or birds or their nests/roosts.</li> </ul>	Disturbance of wildlife (e.g., bats and birds).
<ul style="list-style-type: none"> <li>• Improperly revegetating ditches following ditch maintenance.</li> <li>• Improper storage or disposal of debris, sediment and vegetation removed from ditches, watercourses, or drainage appliances.</li> </ul>	Contributing to the spread of invasive plants.

- If maintenance activities require instream work, schedule activities during environmental timing windows (see definition and links in the Glossary and Resources section). Consult with an AQP as site-specific BPs and permits may be required.
- Culverts should be surveyed for the presence of nesting birds or roosting bats prior to work commencing. Culverts where wildlife have been determined to be not present do not require scheduling/implementation of environmental timing windows, buffers, or exclusion practices for bats or birds. Note that when working in and around fish habitat (both fresh water and marine/estuary), fish timing windows and relevant legislation/permits still apply.

- If nesting birds or roosting bats are observed in culverts, schedule activities during environmental timing windows and consult with an AQP as more specific BPs and permits may be required.
- Do not dump ditch waste above or below the ditch where desirable vegetation is established; instead, dispose of waste at a designated disposal site. Where it is necessary to side cast, ensure any material deposited on existing vegetation is spread evenly. Consult with an AQP as site-specific BPs may be required.

### 5.3 Winter Maintenance

Environmental impacts relating to winter maintenance activities are summarized in the following table. Site-specific conditions may present additional issues that need to be addressed in planning and undertaking works.

Task/Action	Potential Impact
<ul style="list-style-type: none"> <li>• Improper storage (and containment) of winter aggregate, de-icing, and anti-icing compounds.</li> </ul>	Introduction of deleterious substances to a watercourse.
<ul style="list-style-type: none"> <li>• Side casting or improper storage of accumulated snow, ice, winter aggregates, or de-icing compounds during snow removal.</li> <li>• Improper storage or containment of winter aggregate, de-icing, or anti-icing compounds.</li> </ul>	Damage to roadside watercourses, riparian, and fish habitat.
<ul style="list-style-type: none"> <li>• Spring cleaning of winter aggregates.</li> </ul>	Air quality.

Timing of winter maintenance works and site-specific management is dependant on weather conditions and traffic safety demands.

Ensure equipment is properly calibrated to prevent over-spraying of aggregate, de-icing, and anti-icing compounds.





## 5.4 Roadside Maintenance

Environmental impacts relating to roadside maintenance activities are summarized in the following table. Site-specific conditions may present additional issues that need to be addressed in planning and undertaking works.

Task/Action	Potential Impact
<ul style="list-style-type: none"> <li>• Tasks causing soils disturbance, exposing erodible soils, or promoting sediment discharge.</li> <li>• Fence repairs using cement-based products or wood preservatives.</li> <li>• Use of chlorinating compounds to treat potable water during rest area maintenance.</li> <li>• Improper storage or disposal of sewage.</li> </ul>	Introduction of deleterious substances to a watercourse.
<ul style="list-style-type: none"> <li>• Installation repairs or replacement of catchment appurtenances and crossing infrastructure.</li> <li>• Poorly managing sewage or sewer systems at rest areas.</li> </ul>	Damage to roadside watercourses, riparian areas, and fish habitat.
<ul style="list-style-type: none"> <li>• Conducting vegetation control activities or danger tree removal during nesting windows or failing to consult an AQP when nests are observed.</li> </ul>	Disturbing wildlife, including birds and their nests.
<ul style="list-style-type: none"> <li>• Brushing or mowing resulting in soil disturbance, failure to identify noxious weeds, or mowing areas identified as “do not mow.”</li> <li>• Failing to clean and check equipment before moving to a new site and parking in invasive plant infestations.</li> </ul>	Contributing to the spread of invasive plants.
<ul style="list-style-type: none"> <li>• In rest areas, remove invasive plants before they set seed. Plants may be removed by removing flowers, hand pulling or mechanical means. The use of herbicide must be approved by the Environmental Roadside Manager.</li> <li>• Do not mow roadsides after invasive plants have set seed. Where possible, begin mowing or brushing in invasive plant free areas and end in infested areas.</li> <li>• Do not mow invasive plants sites within 14 days of being treated with herbicide. Treatment sites are marked with white signs.</li> </ul>	

- Schedule vegetation management activities during environmental timing windows. If activities cannot be scheduled during these windows, confirm birds are not present prior to work commencing. Consultation with an AQP for site-specific BPs is recommended.
- If bird nesting cavities are observed in trees, consult with an AQP regarding potential permit requirements in accordance with the Migratory Birds Convention Act.

## 5.5 Traffic Maintenance

Environmental impacts relating to traffic maintenance activities are summarized in the following table. Site-specific conditions may present additional issues that need to be addressed in planning and undertaking works.

Task/Action	Potential Impact
<ul style="list-style-type: none"> <li>• Sign system maintenance disturbing existing surfaces or introducing new materials.</li> </ul>	Introduction of deleterious substances to a watercourse.
<ul style="list-style-type: none"> <li>• Sign system maintenance disturbing soil that is not properly revegetated.</li> </ul>	Contributing to the spread of invasive plants.

## 5.6 Structures Maintenance

Environmental impacts relating to traffic maintenance activities are summarized in the following table. Site-specific conditions may present additional issues that need to be addressed in planning and undertaking works.

Task/Action	Potential Impact
<ul style="list-style-type: none"> <li>• Improperly managing sediments, oils, de-icing chemicals, paint chips, treated wood debris, cement-based products wood preservatives, sealants, epoxies, or paints during structures cleaning, repairs, or painting.</li> </ul>	Introduction of deleterious substances to a watercourse.
<ul style="list-style-type: none"> <li>• Poorly managing the site during retaining wall cleaning or repairs.</li> </ul>	
<ul style="list-style-type: none"> <li>• Poorly managing cement-based products, epoxies, or sealants during multi-plate repairs.</li> </ul>	







Task/Action	Potential Impact
<ul style="list-style-type: none"> <li>• Changing the stream channel or banks or altering the vegetation during structure repair.</li> <li>• Extracting water for structure cleaning.</li> <li>• Side casting or disposal of debris and other materials from cleaning structures.</li> </ul>	Damage to roadside watercourses, riparian areas, and fish habitat.
<ul style="list-style-type: none"> <li>• Bridge washing or any other maintenance activity without inspecting for the presence of bats or birds or proceeding with their presence.</li> <li>• Brushing or vegetation control during nesting windows or with the presence of birds and their nests.</li> </ul>	Disturbing wildlife, including birds and their nests.
<ul style="list-style-type: none"> <li>• Disturbing soils and improperly revegetating.</li> </ul>	Contributing to the spread of invasive plants.

- If maintenance activities require instream work, schedule activities during environmental timing windows (see definition and links in the Glossary and Resources section). Consult with an AQP as site-specific BPs may be required.
- Culverts should be surveyed for the presence of nesting birds or roosting bats prior to work commencing. Culverts where wildlife have been determined to be not present do not require scheduling/implementation of environmental timing windows, buffers, or exclusion practices for bats or birds. Note that when working in and around fish habitat (both fresh water and marine/estuary), fish windows and relevant legislation/permits still apply.
- If nesting birds or roosting bats are observed in culverts, schedule activities during environmental timing windows and consult with an AQP as more specific BPs or permits may be required.

#### **Structures Cleaning Maintenance Specific BPs**

- Dry sweep and collect loose material off bridge surfaces before washing the bridge.
- If superstructure cleaning is undertaken above or on the bridge deck level, prevent potentially harmful materials from entering the road or deck drains.
  - o Block deck drains with a suitable barrier such as polyethylene or drain blocks to prevent direct discharge to a watercourse.

- Contain any wash water or runoff to the bridge deck.
- Direct wash water towards bridge approaches and away from the water course to a vegetated area or settling area. For example, a dry ditch channel not connected to a water course.
- Consult with an AQP as more specific BPs or permits may be required for work in and about a stream.

#### Timber Bridge Maintenance

- Ensure any wood cutting takes place at least 30 m away from the bridge and water course.

#### Concrete Structures Maintenance

- Prevent the introduction of raw product or wash water from concrete patching materials into a watercourse.
- Direct wash water towards bridge approaches and away from the watercourse to a contained vegetated area or settling area.
- Consult with an AQP as more specific BPs or permits may be required for work in and about a stream.

### 5.7 Network Management

Network management activities are undertaken to proactively monitor, manage, and respond to highway conditions and re-establish traffic flow and includes incident response, which cannot be proactively planned.

Environmental impacts relating to network management activities are summarized in the following table. Site-specific conditions may present additional issues that need to be addressed in planning and undertaking works.

Task/Action	Potential Impact
<ul style="list-style-type: none"> <li>• Improper care taken during the clean-up and removal of vehicles or materials.</li> <li>• Improper care taken cleaning up cargo or dangerous goods.</li> </ul>	Introduction of deleterious substances to a watercourse.
<ul style="list-style-type: none"> <li>• Disturbed soil resulting from incidents or clean up activities associated with incidents.</li> </ul>	Contributing to the spread of invasive plants.
<ul style="list-style-type: none"> <li>• All contaminated materials (e.g., soils, spills, etc.) are regulated under the Environmental Management Act and require an AQP for direction on proper containment, handling, and disposal.</li> </ul>	





## 6.0 GLOSSARY

**Appropriately Qualified Person:** an applied scientist or technologist specializing in a particular applied science or technology including, but not necessarily limited to, agrology, biology, chemistry, engineering, geology, or hydrogeology, erosion and sediment control, engineering, etc. and

- (a) who is registered in British Columbia with their appropriate professional organization, acting under that association's Code of Ethics and subject to disciplinary action by that association, and
- (b) who, through suitable education, experience, accreditation, and knowledge, may be reasonably relied on to provide advice within their area of expertise.<sup>3</sup>

**Best Practices:** a practice or combination of practices that are determined to be the most technologically and economically feasible means of preventing and managing impacts of actions.

**Contaminated Site:** an area of the land in which the soil or any groundwater lying beneath it, or the water or the underlying sediment, contains a prescribed substance in quantities or concentrations exceeding prescribed risk based or numerical criteria, standards, or conditions (*Environmental Management Act*).

**Critical Habitat:** the habitat that is necessary for the survival or recovery of a listed wildlife species and that is identified as the species' critical habitat in the recovery strategy or in an action plan for the species (*Species at Risk Act*).

**Deleterious Substance:** any substance that, if added to any water, would degrade or alter the water quality such that it could directly or indirectly harm fish, fish habitat, or the use of fish by humans. Any substance with a potentially harmful chemical (e.g., acutely lethal), physical (e.g., water temperature), or biological effect (e.g., deformities) on fish or fish habitat may also be deleterious.<sup>4</sup>

**Environment:** the physical, biological, social, spiritual, and cultural components that are interrelated and affect the growth and development of living organisms.

**Environmental Monitor:** AQP hired by the contractor to ensure compliance with relevant legislation, permits, and approvals.

**Environmental Timing Window:** the period(s) during the year when work may be carried out with the lowest risk to fish and wildlife species and habitat. Timing windows and terms and conditions vary based on regional differences in geography, fish and wildlife species, and habitat.<sup>5</sup>

**Fish:** includes parts of fish, shellfish, crustaceans, marine animals and any parts of shellfish, crustaceans, or marine animals, and the eggs, sperm, spawn, larvae, spat, and juvenile stages of fish, shellfish, crustaceans, and marine animals (*Fisheries Act*).

<sup>3</sup> [Mechanisms Supporting or Requiring the Use of Qualified Persons in Natural Resource Administration in British Columbia](#)

<sup>4</sup> [Frequently asked questions: Fisheries Act pollution prevention provisions](#)

<sup>5</sup> [Regional Terms & Conditions & Timing Windows](#)

**Fish Habitat:** water frequented by fish and any other areas on which fish depend directly or indirectly to carry out their life processes, including spawning grounds and nursery, rearing, food supply, and migration areas (*Fisheries Act*).

**Habitat:**

- (a) in respect of aquatic species, spawning grounds and nursery, rearing, food supply, migration, and any other areas on which aquatic species depend directly or indirectly in order to carry out their life processes, or areas where aquatic species formerly occurred and have the potential to be reintroduced; and
- (b) in respect of other wildlife species, the area or type of site where an individual or wildlife species naturally occurs or depends on directly or indirectly in order to carry out its life processes or formerly occurred and has the potential to be reintroduced (*Wildlife Act*).

**Invasive Plants:** plants that do not occur naturally in B.C. or are outside their natural range. The presence of invasive plants can cause environmental, cultural, and economic harm, and some species can harm human health. They are extremely aggressive, reproduce rapidly, and often out-compete crops and native vegetation.<sup>6</sup>

**Mitigate:** actions taken during any or all stages of a project to reduce or eliminate any potential adverse affects caused by the project.

**Noxious Weeds:** a weed designated by regulation to be a noxious weed and includes the seeds of the noxious weed (*Weed Control Act*). All noxious weeds are invasive plants, but not all invasive plants are noxious weeds.

**Riparian Habitat:** also referred to as riparian areas or zones. These are the areas adjacent to streams, lakes, ditches, and wetlands. Vegetation in riparian areas directly influences and provides important fish habitat. It builds and stabilizes stream banks and channels, provides cool water through shade, and provides shelter for fish.<sup>7</sup>

**Regulatory Agencies:** the current, seceding, or successional regulating branches of the federal and provincial governments responsible for the management and protection of the environment and human resources and any permits, approvals, or licences.

**Soil Erosion:** the removal and transport of particles of soil by water and wind action. In B.C., wind erosion is generally less significant on construction projects than water erosion.<sup>8</sup>

**Stream Channel:** in relation to a stream, means the bed of the stream and the banks of the stream, both above and below the natural boundary, whether the channel has been modified or not, and includes side channels of the stream (*Water Sustainability Act*).

**Watercourse:** Any channel carrying water, either continuously or intermittently.

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6 [Invasive plants](#)

7 [Riparian Areas Regulation Guidebook](#)

8 [Erosion and Sediment Control Manual](#)



## 7. RESOURCES

### Emergency Response

[British Columbia Disaster Response Transportation Primer](#)

[British Columbia Disaster Response Transportation Planning Guide for Road Transportation](#)

[Transport Canada 2020 Emergency Response Guidebook](#)

### Environmental Timing Windows

[Regional Terms & Conditions & Timing Windows](#)

[General nesting periods of migratory birds](#)

### Invasive Species

[Best Practices for Managing Invasive Plants on Roadsides - A Pocket Guide for B.C.'s Maintenance Contractors](#)

[Invasive Species Roadside](#)

[Invasive Alien Plant Program \(IAPP\) database and map display - Province of British Columbia \(gov.bc.ca\)](#)

### Reference and Training Materials

[Standard Specifications](#)

[Best Practices](#)

[Policies & Guidelines](#)

[Environmental Regulatory Compliance](#)

[Videos](#)

### Wildlife

[ADVISORY FOR HANDLING WILDLIFE CARCASSES \(gov.bc.ca\)](#)

[Wildlife Accident Reporting System - Province of British Columbia \(gov.bc.ca\)](#)

[Beaver Dam Removal - Activity Guidance - Natural Resource Online Services \(gov.bc.ca\)](#)

[Wildlife Management on B.C. Highways](#)

## **Working Around Water**

[Culverts and Fish Passage \(gov.bc.ca\)](http://gov.bc.ca)

[Guidelines for the protection of fish and fish habitat during bridge maintenance operations in British Columbia](#)

[Fish Stream Crossing Guidebook](#)

[Riparian Areas Protection Regulation \(RAPR\) - Province of British Columbia \(gov.bc.ca\)](#)

[Guidelines for Use of Treated Wood In and Around Aquatic Environments and Disposal of Treated Wood](#)

[Standards and Best Practices for Instream Works](#)

## **Various**

[Best Management Practices to Mitigate Road Dust from Winter Traction Materials \(gov.bc.ca\)](#)

[Environment and Climate Change Canada- Road Salts](#)

[Syntheses of Best Practices Road Salt Management](#)

[Erosion and Sediment Control Manual \(November-2022\)](#)



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# Best Practices for Highway Maintenance Activities



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