MINISTRY OF TRANSPORTATION
BEST MANAGEMENT PRACTICES MANUAL
FOR
FISHERIES
DRAFT

ISSUED BY:
Environmental Policy Office
MINISTRY OF TRANSPORTATION
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ST. CATHARINES, ONTARIO
L2R 7R4

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BEST MANAGEMENT PRACTICES MANUAL FOR FISHERIES

PURPOSE OF DOCUMENT

• The MTO Best Management Practice Manual is intended to provide MTO staff, service providers and contractors with the necessary procedures on how to undertake routine activities in a manner that avoids impacts to fish and/or fish habitat. The BMPs can be used for maintenance, major and minor capital construction and design build projects.

• Users of this document are reminded to refer to the MTO/DFO/MNRF Fisheries Protocol (Version 3) for additional information. BMPs are applied at Step 3 of the protocol process. Steps 1 and 2 are to be undertaken before proceeding with work under a BMP.

• The BMPs have been developed to streamline the regulatory review process for routine activities in or near a waterbody with minimal to no impacts to fish and fish habitat, by identifying the necessary mitigation measures needed to avoid serious harm.

• In case of an emergency situation where emergency works may result in serious harm to fish or may impact species at risk, the contents of this BMP manual are not sufficient to ensure compliance with the Fisheries Act, Species at Risk Act or the Endangered Species Act. Follow emergency procedures outlined in the MTO/DFO/MNRF Fisheries Protocol.

• Activities undertaken in relation to the project shall comply with the federal Species at Risk Act and the provincial Endangered Species Act as outlined in the Fisheries Protocol. It is up to the user of this BMP to obtain all necessary permits required to proceed with the work. For more detailed information on species at risk screening refer to the Maintenance Guide for Fisheries.

• Activities that meet all the conditions of a BMP and are carried out in accordance with all of the following operational constraints, protection measures and submission requirements should be considered to be in compliance with the Fisheries Act and the MTO/DFO/MNRF Fisheries Protocol, as such may proceed without further review.

• This document provides a reference section to guide the user to the appropriate legislation, policy, guidelines and construction specifications.

• Each BMP includes the following sections:
  • Checkbox – The checkbox indicates whether the activity can be conducted if federally-listed Species at Risk (SAR) are present, fish are present (Fisheries Act), and/or if important or exceptional habitat is present.
Important Habitat is defined as:
• Uncommonly found habitat, may (but may not) be one of the limiting factors to the fish population (e.g., spawning or rearing habitats)
• Habitat in its natural condition or only slightly degraded relative to the function that it supports
• Non-critical habitat for aquatic species at risk, including special concern species, that supports key lifecycle functions

Exceptional Habitat is defined as:
• Known and documented rare or limiting habitat, fish populations are highly dependent on the habitat to support critical life functions
• Critical habitat for aquatic species at risk as described in the Recovery Strategy or Action Plan for the species (may be described in terms of features and attributes)

Scope—describes the specific activity and the works that can be undertaken

Additional References—provides additional guidance tools specific to the activity being conducted

Maintenance/Construction Procedures
• Potential Impacts to Fish and Fish Habitat—outlines the impacts that may occur as a result of the activities being conducted.
• Operational Conditions—states that all works conducted in accordance with all of the operational constraints, protection measures and submission requirements identified in each BMP should be considered to be in compliance with the Fisheries Act and the MTO/DFO/MNRF Fisheries Protocol.
• Operational Constraints and Protection Measures—outlines the necessary mitigation measures to follow to avoid impacts that may cause serious harm to fish.

Submission Requirements—outlines the form that needs to be submitted prior to the commencement of works.

Quick Reference Guide—a removable section, ideal for field operators, that provides specific mitigation measures relevant to the BMP with references to corresponding OPSS and SSP.

REFERENCES

Federal Statutes
Fisheries Act, R.S.C., 1985, c. F-14
Species at Risk Act, S.C. 2002, c. 29
Provincial Statutes
Endangered Species Act, S.O. 2007, c. 6
Fish and Wildlife Conservation Act, S.O. 1997, c. 41 - Ontario Regulation 664/98 - Fish Licensing

Provincial Policy and Guidelines
MTO/DFO/MNRF Protocol for the Protection of Fish and Fish Habitat on Provincial Transportation Undertakings
MTO Environmental Guide for Erosion and Sediment Control During Construction of Highway Projects
MTO Environmental Guide for Fisheries
MTO Best Management Practice for In-Water Work Timing Windows

Ontario Provincial Standard Specifications, Construction
OPSS 180 Management for Excess Materials
OPSS 182 Environmental Protection for Construction In and Around Waterbodies and on Waterbody Banks
OPSS 185 Temporary Flow Control
OPSS 518 Control of Water from Dewatering Operations
OPSS 804 Seed and Cover
OPSS 805 Temporary Erosion and Sediment Control Measures
BEAVER DAM REMOVAL

BEST MANAGEMENT PRACTICE

1 SCOPE

This MTO Best Management Practice (BMP) applies to beaver dam removal within a waterbody identified as containing or supporting a commercial, recreational or Aboriginal fishery.

This BMP for Beaver Dam Removal may be used for the following:

- Removal of beaver dams, including partial removal (e.g., breaching), to protect, maintain or construct infrastructure or to avoid the flooding of private and public land.

This BMP for Beaver Dam Removal may not be used for the following:

- Removal activities that may adversely affect a fishery, or private property uses that depend on the dam's existence, both upstream and downstream;
- Removal activities beyond removing or breaching the beaver dam itself;
- Modification of the waterbody bed or bank downstream of the beaver dam (e.g., widening, straightening, ditching, etc.);
- Removal activities outside of In-Water Work Timing Windows; and
- Use of explosives to remove beaver dams.

Activities undertaken in relation to the project shall be in compliance with the federal Species at Risk Act and the provincial Endangered Species Act as outlined in Step 2 of the MTO/DFO/MNRF Fisheries Protocol. It is the responsibility of the user of this BMP to obtain all necessary permits required to proceed with the work.

2 ADDITIONAL REFERENCES


MTO BMP for Maintenance of Riparian Vegetation in Existing Rights-of-Way
3 MAINTENANCE PROCEDURES

It is important to exercise extreme caution when proceeding with beaver dam removal due to the possibility of flooding/damage to downstream property and infrastructure and negative impacts to fish and fish habitat:

Potential Impacts to Fish and Fish Habitat

- Disruption of downstream fish during spawning or nursery periods.
- Physical impacts from use of heavy machinery on land.
- Deposition of deleterious substances into the watercourse.
- Erosion and sediment release into watercourse.
- Re-entry of sediment that was removed/stockpiled into the watercourse.
- Sediment release and bank damage due to uncontrolled, cascading breaches of multiple dams.
- Release of sediments and other deleterious substances stored in the bottom of the beaver pond.
- Release of large volumes of water (that can be devoid of oxygen, particularly in winter) in a short period of time.
- Damage to the downstream channel from erosion due to sudden release of water.
- Release of excessive woody debris from the dam to downstream channel.
- Stranding of fish in isolated ponds following de-watering of pond.
- Impingement or entrainment of fish when de-watering pumps are used.

Operational Conditions

Beaver Dam Removal

Beaver dam removal activities, within the description provided in section 1 (Scope), that meet the following conditions and are carried out in accordance with all of the following operational constraints, protection measures and submission requirements should be considered to be in compliance with the Fisheries Act and the MTO/DFO/MNRF Fisheries Protocol. As such these works may proceed without further review.

If any of the conditions, operational constraints or protection measures cannot be met, this BMP cannot be used and MTO staff and service providers shall proceed to a fisheries assessment as outlined in the Fisheries Protocol process.

Operational Constraints and Protection Measures

General

- Removal of the beaver dam shall be scheduled to avoid wet and rainy periods and in-water works shall be conducted during low flow conditions.
- The MNRF District Office shall be contacted before proceeding with the beaver dam removal, to identify any fishery or other public uses that may be affected by beaver dam removal. Consultation with users identified by MNRF may be
necessary before removal of dam can proceed. Identify any safety concerns or flag potential downstream infrastructure or stakeholders who should be consulted.

- When a series of dams is to be removed, this shall be done from downstream to upstream in order.
- Whenever possible, remove beaver dams by using hand tools. Where removal by hand tools is not possible then machinery may be used.
- The beaver dam shall be removed gradually (~20 cm at a time) to allow the water to release slowly and prevent sediment at the bottom of the pond from being released downstream. As the water levels drop in the upstream pond, increase the size of the opening to drain the pond.
- The width of the breach opening of the beaver dam shall not exceed the width of the original stream channel to prevent bank erosion and flooding of adjacent properties.
- An Erosion and Sediment Control Plan shall be developed and implemented for the site that minimizes risk of sedimentation of the waterbody during all phases of the project. A response plan shall also be developed that is to be implemented immediately in the event of a sediment release.

**Beaver Dams on Private Property**

Contact the property owner for permission to enter private property. If there are issues, such as the owner refusing permission to enter:

- Area Maintenance Contactor shall contact the MTO Maintenance Superintendent; and
- MTO staff shall contact the Corridor Management Section.

**Persistent Beaver Dam Activity**

The breaching or removal of a beaver dam may not prevent future beaver activity in the area. Persistent breaching or removal of a beaver dam can increase the risk of negative impacts to fish habitat.

Where a beaver dam has been previously removed, the MNRF District Office shall be contacted if the services of a licensed trapper are required for the removal of beaver. Once MTO has been advised by a licensed trapper or MNRF that the beaver(s) have been removed, MTO shall remove the dam in accordance with the applicable operational constraints and protective measures within this BMP.

**Dewatering and the Use of Pumps**

Dewatering activities and the use of pumps shall be conducted in accordance with **OPSS 518** and **OPS 182**.

**Fish Salvage**

Fish salvage operations shall be conducted in accordance with **OPSS182**.
Equipment Use
Use of equipment shall be in accordance with OPSS182.

Preservation of Riparian Vegetation
Removal of riparian vegetation shall be in accordance with OPSS182.

Erosion and Sediment Control
The installation, monitoring, maintenance, and removal of temporary erosion and sediment control measures shall be according to OPSS 182 and OPSS 805.

Restoration of Disturbed Areas
Vegetation protection and rehabilitation shall be in accordance with OPSS 182 and OPSS 804.

Management of Excess Materials
All excess material shall be managed in accordance with OPSS 180.

4 SUBMISSION REQUIREMENTS
A MTO Project Notification Form* shall be completed prior to the commencement of work, indicating that the BMP will be followed during the beaver dam removal activities. It shall be signed by the appropriate individual and retained by the MTO Regional Environmental Section, or, for forms completed by Area Maintenance Contractor (AMC) Service Providers, by the Regional Operations Office.

* An electronic version of MTO Project Notification Form is available online.
Beaver Dam Removal Quick Reference Guide

Disclaimer: This table has been provided as a quick reference guide. Compliance with this guide does not relieve the Contractor of other obligations imposed by statute or by the requirements and conditions specified under contract with the Owner.

<table>
<thead>
<tr>
<th>Timing</th>
<th>MTO Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beaver dam removal activities shall be scheduled to be compliant within-water work timing windows.</td>
<td>182.07.01</td>
</tr>
<tr>
<td>Beaver dam removal activities shall be scheduled to avoid wet and rainy periods and in-water works shall be conducted during low flow conditions.</td>
<td>SSP 101F23</td>
</tr>
<tr>
<td>The MNRF District Office shall be contacted before proceeding with the beaver dam removal, to identify any fishery or other public uses that may be affected by beaver dam removal. Consultation with users identified by MNRF may be necessary before removal of dam can proceed. Identify any safety concerns or flag potential downstream infrastructure or stakeholders who should be consulted.</td>
<td>SSP 101F23</td>
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</table>

Controlling Flows

<table>
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<tr>
<td>When a series of dams is to be removed, this shall typically be done starting from the most downstream dam and working upstream.</td>
<td>SSP 101F23</td>
</tr>
<tr>
<td>The beaver dam shall be removed gradually (~20 cm at a time) to allow the water to release slowly and prevent sediment at the bottom of the pond from being released downstream. As the water levels drop in the upstream pond, increase the size of the opening to drain the pond.</td>
<td>SSP 101F23</td>
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<td>Whenever possible, remove beaver dams by using hand tools. Where removal by hand tools is not possible then machinery may be used.</td>
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</tr>
<tr>
<td>The width of the breach opening of the beaver dam shall not exceed the width of the original stream channel to prevent bank erosion and flooding of adjacent properties.</td>
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</tr>
</tbody>
</table>

Land-based Impacts Through Use of Industrial Equipment

<table>
<thead>
<tr>
<th>Timing</th>
<th>MTO Reference</th>
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<tbody>
<tr>
<td>Existing trails, roads or cut lines shall be used wherever possible as access routes to avoid disturbance to waterbody banks and riparian vegetation areas.</td>
<td>182.07.03</td>
</tr>
<tr>
<td>Equipment shall arrive on site in clean condition. It shall be operated on dry land in a manner that minimizes disturbance to waterbody banks and riparian vegetation areas.</td>
<td>182.07.02</td>
</tr>
<tr>
<td>Unless specified in the Contract Documents, equipment shall not enter or be operated in waterbodies or on waterbody banks but shall be operated on land above the high water level, on ice, or from a floating barge in a manner that minimizes disturbance to the waterbody banks of the watercourse.</td>
<td>182.07.02</td>
</tr>
<tr>
<td>Removal of riparian vegetation shall be kept to a minimum to help maintain the stability of waterbody banks. The area over which vegetation in riparian vegetation areas is removed shall affect no more than one third (1/3) of the total woody vegetation in the right-of-way within 30 metres of the ordinary high water level of a waterbody. Vegetative root masses found within the waterbody banks shall remain undisturbed unless specified in the Contract Documents.</td>
<td>182.07.03</td>
</tr>
</tbody>
</table>

Deposit of Deleterious Substances

<table>
<thead>
<tr>
<th>Timing</th>
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</tr>
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<tbody>
<tr>
<td>All Equipment used for the work in waterbodies or on waterbody banks at all</td>
<td>182.07.02</td>
</tr>
</tbody>
</table>
times shall be free of excess or leaking fuel, lubricants, coolant and any other deleterious substances that could enter the waterbody.

| Equipment refueling and maintenance shall take place at locations as far away as practical from a waterbody and in a manner that prevents sediment and other deleterious substances from entering into a waterbody. | 182.07.02 |
| Ensure Spills Management Plan (including materials, instructions regarding their use, education of contract personnel, emergency contact numbers) is on-site at all times for implementation in event of accidental spill during construction. An emergency spill kit shall be kept on site. | OPSS 100 7.13.02 |

**Erosion and Sediment Control**

| An Erosion and Sediment Control Plan shall be developed and implemented for the site that minimizes risk of sedimentation of the waterbody during all phases of the project. A response plan shall also be developed that is to be implemented immediately in the event of a sediment release. | SSP 101F23 |
| Effective erosion and sediment control measures shall be installed before starting work to prevent the entry of sediment into the watercourse. Inspect them regularly during the course of construction and conduct regular maintenance and repairs as necessary. | 182.07.04 805.07.11 |
| All disturbed areas shall be stabilized with effective temporary erosion and sediment control measures that shall be maintained until vegetation is established. | 182.07.05 |
| All waste materials (e.g., dredging spoils, construction waste and materials, commercial logging waste, uprooted or cut aquatic plants, accumulated debris) shall be contained and stabilized above the high water level of nearby waterbodies to prevent re-entry. | 182.07.01 |

**Fish Impingement and Entrainment**

| Any water intakes or outlet pipes in fish bearing waters shall have screens to prevent entrainment or impingement of fish and follow the measures as outlined in Fisheries and Oceans Freshwater Intake End-of-Pipe Fish Screen Guideline. | 182.07.06.03 |

**Fish Salvage**

| Fish stranded by the Work or found in the work area during construction shall be salvaged and relocated according to the Licence to Collect Fish for Scientific Purposes, unless specified in the Contract Documents. If fish cannot be safely relocated, the local MNRF office shall be consulted prior to fish collection commencing to determine a suitable relocation site. All fish shall be handled as little as possible and in a manner that minimizes stress and prevents death to the fish. | 182.07.06.01 |

**Restoration of Disturbed Areas**

| All disturbed areas shall be stabilized with effective temporary erosion and sediment control measures that shall be maintained until vegetation is established. | 182.07.05 |
| Immediately after disturbance or upon completion of the work in or around waterbodies, waterbody banks, and riparian vegetation areas, the disturbed areas shall be restored to the original contour and gradient and cover treatment applied. | 182.07.05 |
| If an area cannot be restored to the original contour and gradient due to instability or other reasons, a stable gradient shall be constructed and cover treatment applied according to the above requirements. | 182.07.05 |
| Materials for the restoration of disturbed areas shall not be obtained from below the high water level of any waterbody unless specified in the Contract Documents. | 182.07.05 |
BRIDGE MAINTENANCE

BEST MANAGEMENT PRACTICE

1 SCOPE

This MTO Best Management Practice (BMP) applies to bridge maintenance activities requiring in-water works or works over a waterbody identified as containing or supporting a commercial, recreational or Aboriginal fishery.

This Bridge maintenance BMP may be used for the following:

- Removal of debris to protect piers and abutments; and
- Structural repairs and reinforcement.

This Bridge maintenance BMP may not be used for the following:

- In-water work if SAR are present
- In-water work outside of In-Water Work Timing Windows
- Realigning the watercourse or replacing the existing bridge;
- New dredging, or excavating the waterbody bed or waterbody banks below the high water level;
- New fill placed below the high water level; or
- Use of explosives to remove debris, including ice build-up.

Activities undertaken in relation to the project shall be in compliance with the federal Species at Risk Act and the provincial Endangered Species Act as outlined in Step 2 of the Fisheries Protocol. It is up to the user of this BMP to obtain all necessary permits required to proceed with the work.

2 ADDITIONAL REFERENCES


MTO Best Management Practice for Maintenance of Riparian Vegetation in Existing Rights-of-Way
3 MAINTENANCE PROCEDURES

Potential Impacts to Fish and Fish Habitat

- Introduction of sediments, concrete and other deleterious substances (e.g., salt, paint, solvents, oil and grease) into watercourses.
- Removal of woody debris and riparian vegetation may alter natural habitat features and flows that exist in the watercourse.
- Operation of machinery may impact habitat on the waterbody banks and bed, and result in erosion and sedimentation.
- Placement of rock to stabilize structures may alter natural habitat and flows, and block fish passage.
- Infilling floodplain fish habitat with temporary construction access ramps (some fish species such as northern pike rely on the floodplain during high flows for fish passage and/or spawning).

Operational Conditions

Bridge maintenance activities, within the description provided in section 1 (Scope), that meet the following conditions and are carried out in accordance with all of the following operational constraints, protection measures and submission requirements should be considered to be in compliance with the Fisheries Act and the MTO/DFO/MNRF Fisheries Protocol. As such the works may proceed without further review.

If any of the conditions, operational constraints or protection measures cannot be met, this BMP cannot be used and MTO staff and service providers shall proceed to a fisheries assessment as outlined in the Fisheries Protocol process.

Operational Constraints and Protection Measures

General

- Bridge maintenance shall be scheduled to avoid wet and rainy periods and in-water works shall be conducted during low flow conditions.
- While this BMP does not cover the clearing of riparian vegetation, the removal of select plants may be required and shall be kept to a minimum and limited to the right-of-way of the bridge, refer to the MTO BMP for Maintenance of Riparian Vegetation in Existing Right-of-Way.

Removal of Debris

- The removal of material shall be limited to that which is necessary to protect piers and abutments.
- Debris removal shall be by hand or with machinery operating from waterbody banks or a floating barge.
- An Erosion and Sediment Control Plan shall be developed and implemented for the site that minimizes risk of sedimentation of the waterbody during all phases of
the project. A response plan shall also be developed that is to be implemented immediately in the event of a sediment release.

**Structural Repairs and Reinforcements**

- Barges or shrouding shall be used to trap and prevent concrete and other bridge materials from entering the waterbody.
- If replacement rock reinforcement/armouring is required to stabilize eroding areas around bridge structures (e.g., abutments and/or wing walls), the following measures shall be incorporated:
  - Place appropriately-sized, clean rocks into the eroding area;
  - Do not obtain rocks from below the high water level of any waterbody;
  - Avoid the use of rock that is acid-generating and rock that fractures and breaks down quickly when exposed to the elements;
  - Install rock at a similar slope to maintain a uniform watercourse bank and natural watercourse alignment; and
  - Ensure rock does not interfere with fish passage or constrict the watercourse width.

Note: If Species at Risk or Important or Exceptional Habitat is present, no replacement rock reinforcement/armouring is to be completed below the high water mark.

**Fish Protection**

Fish protection shall be in accordance with **OPSS182**.

**Equipment Use**

Use of equipment shall be in accordance with **OPSS182**.

**Preservation of Riparian Vegetation**

Removal of riparian vegetation shall be in accordance with **OPSS182**.

**Erosion and Sediment Control**

The installation, monitoring, maintenance, and removal of temporary erosion and sediment control measures shall be according to **OPSS 182 and OPSS 805**.

**Restoration of Disturbed Areas**

Vegetation protection and rehabilitation shall be in accordance with **OPSS 182 and OPSS 804**.

**Management of Excess Materials**

All excess material shall be managed in accordance with **OPSS 180**.
4 SUBMISSION REQUIREMENTS

A MTO Project Notification Form* shall be completed prior to the commencement of work, indicating that the BMP will be followed during the bridge maintenance activities. It shall be signed by the appropriate individual and retained by the MTO Regional Environmental Section or, for forms completed by Area Maintenance Contractor (AMC) Service Providers, by the Regional Operations office.

* An electronic version of MTO Project Notification Form is available online.
## Bridge Maintenance Quick Reference Guide

*Disclaimer: This table has been provided as a quick reference guide. Compliance with this guide does not relieve the Contractor of other obligations imposed by statute or by the requirements and conditions specified under contract with the Owner.*

<table>
<thead>
<tr>
<th>Timing</th>
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<tbody>
<tr>
<td>Bridge maintenance activities shall be scheduled to prevent disruption to sensitive fish life stages by adhering to appropriate in-water work timing windows.</td>
<td>182.07.01</td>
</tr>
<tr>
<td>Bridge maintenance activities shall be scheduled to avoid wet and rainy periods and in-water works shall be conducted during low flow conditions.</td>
<td>SSP 101F23</td>
</tr>
<tr>
<td>Debris Removal</td>
<td></td>
</tr>
<tr>
<td>The removal of material shall be limited to what is necessary to protect piers and abutments.</td>
<td>SSP 101F23</td>
</tr>
<tr>
<td>Debris removal shall be by hand or with machinery operating from waterbody banks or a floating barge.</td>
<td>SSP 101F23</td>
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<tr>
<td>Land-based Impacts Through Use of Industrial Equipment</td>
<td></td>
</tr>
<tr>
<td>Existing trails, roads or cut lines shall be used wherever possible as access routes to avoid disturbance to waterbody banks and riparian vegetation areas.</td>
<td>182.07.03</td>
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<tr>
<td>Equipment shall arrive on site in clean condition. It shall be operated on dry land in a manner that minimizes disturbance to waterbody banks and riparian vegetation areas.</td>
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<td>Unless specified in the Contract Documents, equipment shall not enter or be operated in waterbodies or on waterbody banks but shall be operated on land above the high water level, on ice, or from a floating barge in a manner that minimizes disturbance to the waterbody banks of the watercourse.</td>
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<tr>
<td>Removal of riparian vegetation shall be kept to a minimum to help maintain the stability of waterbody banks. The area over which vegetation in riparian vegetation areas is removed shall affect no more than one third (1/3) of the total woody vegetation in the right-of-way within 30 metres of the ordinary high water level of a waterbody. Vegetative root masses found within the waterbody banks shall remain undisturbed unless specified in the Contract Documents.</td>
<td>182.07.03</td>
</tr>
<tr>
<td>Deposit of Deleterious Substances</td>
<td></td>
</tr>
<tr>
<td>Barges or shrouding shall be used to trap and prevent concrete and other bridge materials from entering the waterbody.</td>
<td>SSP 101F23</td>
</tr>
<tr>
<td>All Equipment used for the work in waterbodies or on waterbody banks at all times shall be free of excess or leaking fuel, lubricants, coolant and any other deleterious substances that could enter the waterbody.</td>
<td>182.06</td>
</tr>
<tr>
<td>Equipment refueling and maintenance shall take place at locations as far away as practical from a waterbody and in a manner that prevents sediment and other deleterious substances from entering into a waterbody.</td>
<td>182.07.02</td>
</tr>
<tr>
<td>Ensure Spills Management Plan (including materials, instructions regarding their use, education of contract personnel, emergency contact numbers) is on-site at all times for implementation in event of accidental spill during construction. An emergency spill kit shall be kept on site.</td>
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### Erosion and Sediment Control

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<tr>
<td>An Erosion and Sediment Control Plan shall be developed and implemented for the site that minimizes risk of sedimentation of the waterbody during all phases of the project. A response plan shall also be developed that is to be implemented immediately in the event of a sediment release.</td>
<td>SSP 101F23</td>
</tr>
<tr>
<td>Effective erosion and sediment control measures shall be installed before starting work to prevent the entry of sediment into the watercourse. Inspect them regularly during the course of construction and conduct regular maintenance and repairs as necessary.</td>
<td>182.07.04 805.07.11</td>
</tr>
<tr>
<td>All disturbed areas shall be stabilized with effective temporary erosion and sediment control measures that shall be maintained until vegetation is established.</td>
<td>182.07.05</td>
</tr>
<tr>
<td>All waste materials (e.g., dredging spoils, construction waste and materials, commercial logging waste, uprooted or cut aquatic plants, accumulated debris) shall be contained and stabilized above the high water level of nearby waterbodies to prevent re-entry.</td>
<td>182.07.01</td>
</tr>
</tbody>
</table>

### Maintaining Channel Integrity

If replacement rock reinforcement/armouring is required to stabilize eroding areas around bridge structures (e.g., abutments and/or wing walls), the following measures shall be incorporated:

- Place appropriately-sized, clean rocks into the eroding area;
- Do not obtain rocks from below the high water level of any waterbody;
- Avoid the use of rock that is acid-generating and rock that fractures and breaks down quickly when exposed to the elements;
- Install rock at a similar slope to maintain a uniform watercourse bank and natural watercourse alignment;
- Ensure rock does not interfere with fish passage or constrict the watercourse width; and
- If any in-water work is involved, it shall be in accordance with the in-water works timing windows.

Note: If Species at Risk or Important or Exceptional Habitat is present, no replacement rock reinforcement/armouring is to be completed below the high water mark.

### Restoration of Disturbed Areas

<table>
<thead>
<tr>
<th>Description</th>
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<tr>
<td>All disturbed areas shall be stabilized with effective temporary erosion and sediment control measures that shall be maintained until vegetation is established.</td>
<td>182.07.05</td>
</tr>
<tr>
<td>Immediately after disturbance or upon completion of the work in or around waterbodies, waterbody banks, and riparian vegetation areas, the disturbed areas shall be restored to the original contour and gradient and cover treatment applied.</td>
<td>182.07.05</td>
</tr>
<tr>
<td>If an area cannot be restored to the original contour and gradient due to instability or other reasons, a stable gradient shall be constructed and cover treatment applied according to the above requirements.</td>
<td>182.07.05</td>
</tr>
<tr>
<td>Materials for the restoration of disturbed areas shall not be obtained from below the high water level of any waterbody unless specified in the Contract Documents.</td>
<td>182.07.05</td>
</tr>
</tbody>
</table>
CLEAR SPAN BRIDGES
BEST MANAGEMENT PRACTICE

1 SCOPE

This MTO Best Management Practice (BMP) applies to the construction of clear span bridges over a waterbody identified as containing or as supporting a commercial, recreational or Aboriginal fishery.

This Clear Span Bridges BMP may be used for the following:

- A bridge that spans a waterbody without altering the waterbody bed and bank; and
- A bridge that is placed entirely above the high water level (i.e. including bridge approaches, abutments, footings, and armouring).

This Clear Span Bridges BMP may not be used for the following:

- In-water work outside of In-Water Work Timing Windows
- Construction of a bridge that is located on meander bends, braided watercourses, active floodplains, or any other area that is inherently unstable and may result in the alteration of natural watercourse functions or erosion and scouring of the bridge structure;
- Encroachment on the natural width of the watercourse by the placement of abutments, footings or rock armouring below the high water level;
- Realigning the watercourse; or
- Alteration of the watercourse banks or bed or infilling of the watercourse.

Activities undertaken in relation to the project shall be in compliance with the federal Species at Risk Act and the provincial Endangered Species Act as outlined in Step 2 of the Fisheries Protocol. It is up to user of this BMP to obtain all necessary permits required to proceed with the work.

2 ADDITIONAL REFERENCES

MTO Best Management Practice for Temporary Watercourse Crossing
3 CONSTRUCTION

Potential Impacts to Fish and Fish Habitat

- Removal of riparian vegetation adjacent to the watercourse which directly contributes to fish habitat by providing shade, cover and areas for spawning and food production.
- Stormwater run-off and the use of machinery can introduce deleterious substances to the water body and result in erosion and sedimentation.

Operational Conditions

Clear-span bridge construction, within the description provided in section 1 (Scope), that meets the following conditions and are carried out in accordance with all of the following operational constraints, protection measures and submission requirements should be considered to be in compliance with the Fisheries Act and the MTO/DFO/MNRF Fisheries Protocol. As such these works may proceed without further review.

If any of the conditions, operational constraints or protection measures cannot be met, this BMP cannot be used and MTO staff and service providers shall proceed to a fisheries assessment as outlined in the Fisheries Protocol process.

Operational Constraints and Protection Measures

General

- Clear span bridge work shall be scheduled to avoid wet and rainy periods and in-water works shall be conducted during low flow conditions.
- Bridge approaches shall be designed and constructed to be perpendicular to the watercourse to minimize loss or disturbance to riparian vegetation.
- The bridge shall be designed so that stormwater runoff from the bridge deck, side slopes and approaches is directed into a retention pond or vegetated area to remove suspended solids, dissipate velocity and prevent sediment and other deleterious substances from entering the watercourse.
- Only the vegetation required to accommodate operational and safety concerns for the crossing structure and approaches, within the right-of-way, shall be removed.
- Travel paths, stockpile areas and staging areas, within the vicinity of the crossing, should be pre-planned and followed.
- An Erosion and Sediment Control Plan shall be developed and implemented for the site that minimizes risk of sedimentation of the waterbody during all phases of the project. A response plan shall also be developed that is to be implemented immediately in the event of a sediment release.
- Perform as many bridge construction activities as possible well away from the waterbody (i.e. preparation of piers, footings and abutments, painting, concrete mixing, sandblasting).
- Machinery fording the watercourse to bring equipment required for construction to the opposite side is limited to a one-time event (over and back) and shall occur...
only if an existing crossing at another location is not available or practical to use. Refer to the MTO BMP for *Temporary Watercourse Crossing*. **Note:** Fording is not permitted if SAR are present.

- If minor rutting is likely to occur, watercourse bank and bed protection methods (e.g., swamp mats, pads) shall be used provided they do not constrict flows or block fish passage.
- Grading of the watercourse banks for the approaches is not permitted.
- If the watercourse banks and bed are steep and highly erodible (e.g., dominated by organic materials and silts) and erosion is likely to occur as a result of equipment fording, then a temporary watercourse crossing structure or other practice shall be used to protect these areas. Refer to the MTO BMP for *Temporary Watercourse Crossing*.
- The one-time fording shall adhere to the in-water work timing windows.
- Fording shall occur under low flow conditions and not when flows are elevated due to local rain events or seasonal flooding.

**Equipment Use**

Use of equipment shall be in accordance with **OPSS182**.

**Preservation of Riparian Vegetation**

Removal of riparian vegetation shall be in accordance with **OPSS182**.

**Erosion and Sediment Control**

The installation, monitoring, maintenance, and removal of temporary erosion and sediment control measures shall be according to **OPSS 182** and **OPSS 805**.

**Restoration of Disturbed Areas**

Vegetation protection and rehabilitation shall be in accordance with **OPSS 182** and **OPSS 804**.

**Management of Excess Materials**

All excess material shall be managed in accordance with **OPSS 180**.

**4 SUBMISSION REQUIREMENTS**

A MTO Project Notification Form* shall be completed prior to the commencement of work, indicating that the BMP will be followed during the clear span bridge construction activities. It shall be signed by the appropriate individual and retained by the MTO Regional Environmental Section, or, for forms completed by Area Maintenance Contractor (AMC) Service Providers, by the Regional Operations Office.

* An electronic version of MTO Project Notification Form is available online.
## Clear Span Bridges Quick Reference Guide

*Disclaimer: This table has been provided as a quick reference guide. Compliance with this guide does not relieve the Contractor of other obligations imposed by statute or by the requirements and conditions specified under contract with the Owner.*

<table>
<thead>
<tr>
<th>Timing</th>
<th>MTO Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generally, there are no restrictions on timing for the construction of clear span structures as they do not involve in-water work. However, if there are any activities with the potential to disrupt sensitive fish life stages (e.g., fording of watercourse by machinery), they shall adhere to appropriate in-water work timing windows.</td>
<td>182.07.01</td>
</tr>
<tr>
<td>Clear span bridge activities shall be scheduled to avoid wet and rainy periods and in-water works shall be conducted during low flow conditions.</td>
<td>SSP 101F23</td>
</tr>
</tbody>
</table>

### Land-based Impacts Through Use of Industrial Equipment

<table>
<thead>
<tr>
<th>Description</th>
<th>MTO Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel paths, stockpile areas and staging areas, within the vicinity of the crossing, should be pre-planned and followed.</td>
<td>SSP 101F23</td>
</tr>
<tr>
<td>Existing trails, roads or cut lines shall be used wherever possible as access routes to avoid disturbance to waterbody banks and riparian vegetation areas.</td>
<td>182.07.03</td>
</tr>
<tr>
<td>Equipment shall arrive on site in clean condition. It shall be operated on dry land in a manner that minimizes disturbance to waterbody banks and riparian vegetation areas.</td>
<td>182.07.02</td>
</tr>
<tr>
<td>Unless specified in the Contract Documents, equipment shall not enter or be operated in waterbodies or on waterbody banks but shall be operated on land above the high water level, on ice, or from a floating barge in a manner that minimizes disturbance to the waterbody banks of the watercourse.</td>
<td>182.07.02</td>
</tr>
<tr>
<td>Machinery fording the watercourse to bring equipment required for construction to the opposite side is limited to a one-time event (over and back) and shall occur only if an existing crossing at another location is not available or practical to use. <strong>Note: Fording is not permitted if SAR are present.</strong> Refer to the MTO BMP for Temporary Watercourse Crossing.</td>
<td></td>
</tr>
</tbody>
</table>

Note the following conditions:
- If minor rutting is likely to occur, watercourse bank and bed protection methods (e.g., swamp mats, pads) shall be used provided they do not constrict flows or block fish passage.
- Grading of the watercourse banks for the approaches is not permitted.
- If the watercourse banks and bed are steep and highly erodible (e.g., dominated by organic materials and silts) and erosion is likely to occur as a result of equipment fording, then a temporary watercourse crossing structure or other practice shall be used to protect these areas. Refer to the MTO BMP for Temporary Watercourse Crossing.
- The one-time fording shall adhere to the in-water work timing windows.
- Fording shall occur under low flow conditions and not when flows are
<table>
<thead>
<tr>
<th>Topic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevated due to local rain events or seasonal flooding.</td>
<td>Perform as many bridge construction activities as possible well away from the waterbody (i.e., preparation of piers, footings and abutments, painting, concrete mixing, sandblasting).</td>
</tr>
<tr>
<td></td>
<td>Removal of riparian vegetation shall be kept to a minimum to help maintain the stability of waterbody banks. The area over which vegetation in riparian vegetation areas is removed shall affect no more than one third (1/3) of the total woody vegetation in the right-of-way within 30 metres of the ordinary high water level of a waterbody. Vegetative root masses found within the waterbody banks shall remain undisturbed unless specified in the Contract Documents.</td>
</tr>
<tr>
<td>Only the vegetation required to accommodate operational and safety concerns for the crossing structure and approaches, within the right-of-way, shall be removed.</td>
<td></td>
</tr>
<tr>
<td>Deposit of Deleterious Substances</td>
<td>All Equipment used for the work in waterbodies or on waterbody banks at all times shall be free of excess or leaking fuel, lubricants, coolant and any other deleterious substances that could enter the waterbody.</td>
</tr>
<tr>
<td></td>
<td>Equipment refueling and maintenance shall take place at locations as far away as practical from a waterbody and in a manner that prevents sediment and other deleterious substances from entering into a waterbody.</td>
</tr>
<tr>
<td></td>
<td>Ensure Spills Management Plan (including materials, instructions regarding their use, education of contract personnel, emergency contact numbers) is on-site at all times for implementation in event of accidental spill during construction. An emergency spill kit shall be kept on site.</td>
</tr>
<tr>
<td>Erosion and Sediment Control</td>
<td>An Erosion and Sediment Control Plan shall be developed and implemented for the site that minimizes risk of sedimentation of the waterbody during all phases of the project. A response plan shall also be developed that is to be implemented immediately in the event of a sediment release.</td>
</tr>
<tr>
<td></td>
<td>Effective erosion and sediment control measures shall be installed before starting work to prevent the entry of sediment into the watercourse. Inspect them regularly during the course of construction and conduct regular maintenance and repairs as necessary.</td>
</tr>
<tr>
<td></td>
<td>All disturbed areas shall be stabilized with effective temporary erosion and sediment control measures that shall be maintained until vegetation is established.</td>
</tr>
<tr>
<td></td>
<td>All stockpiled and waste materials (e.g., dredging spoils, construction waste and materials, commercial logging waste, uprooted or cut aquatic plants, accumulated debris) shall be contained and stabilized above the high water level of nearby waterbodies to prevent re-entry.</td>
</tr>
<tr>
<td>Restoration of Disturbed Areas</td>
<td>All disturbed areas shall be stabilized with effective temporary erosion and sediment control measures that shall be maintained until vegetation is established.</td>
</tr>
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<td></td>
<td>Immediately after disturbance or upon completion of the work in or around waterbodies, waterbody banks, and riparian vegetation areas, the disturbed areas shall be restored to the original contour and gradient and cover treatment applied.</td>
</tr>
<tr>
<td>If an area cannot be restored to the original contour and gradient due to instability or other reasons, a stable gradient shall be constructed and cover treatment applied according to the above requirements.</td>
<td>182.07.05</td>
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<tr>
<td>Materials for the restoration of disturbed areas shall not be obtained from below the high water level of any waterbody unless specified in the Contract Documents.</td>
<td>182.07.05</td>
</tr>
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</table>
1 SCOPE

This MTO Best Management Practice (BMP) applies to the maintenance of culverts within a waterbody identified as containing or supporting a commercial, recreational or Aboriginal fishery.

This Culvert Maintenance BMP may be used for the following:

- Removal of accumulated sediment and debris that prevents the efficient passage of water and fish through the structure;
- Reinforcement of eroding inlets and outlets (not permitted if SAR or Important/Exceptional habitat are present); and
- Repair of defects in concrete including scaling, disintegration, concrete erosion, delamination, spalling, cracking, struts and bracing to prevent culvert collapses.

This Culvert Maintenance BMP may not be used for the following:

- In-water work outside of In-Water Work Timing Windows;
- Realigning the watercourse;
- Installing a culvert liner;
- Use of explosives to remove debris; or
- Infilling (e.g., filling scour pools) or excavation of the channel upstream or downstream of the culvert.

Activities undertaken in relation to the project shall be in compliance with the federal Species at Risk Act and the provincial Endangered Species Act as outlined in Step 2 of the Fisheries Protocol. It is up to user of this BMP to obtain all necessary permits required to proceed with the work.

2 ADDITIONAL REFERENCES

N/A

3 MAINTENANCE PROCEDURES

Potential Impacts to Fish and Fish Habitat

- Removal of woody debris that is important for cover and food production
- Flooding and excessive watercourse scouring if blockages are removed too quickly
- Excessive erosion and sedimentation from the use of equipment along the waterbody bank
- Disruption of critical fish life stages
- Replacement of eroded rock armoring can alter flows and fish movement patterns if done excessively
- Infilling fish habitat by encroachment of the water crossing footprint (e.g. piers, footings, abutments within the natural bankfull width of channel)
- Harmful substrate alteration of fish habitat (e.g. blockage of groundwater upwellings, critical SAR habitat, spawning areas) as a result of the water crossing
- Removal of riparian vegetation and cover along the banks or shoreline of a waterbody
- Removal of edge habitat (e.g. undercut bank, shallower areas with lower velocity, aquatic vegetation)
- Creation of barriers to fish movement (e.g. perched crossings, velocity barriers, alteration of the natural stream gradient, restrictive causeways resulting in the loss of floodplain which is used by fish for passage during high flows)
- Introduction of sediments, concrete and other deleterious substances (e.g., salt, paint, solvents, oil and grease) into watercourses.

**Operational Conditions**

Culvert maintenance activities, within the description provided in section 1 (Scope), that meet the following conditions and are carried out in accordance with all of the following operational constraints, protection measures and submission requirements should be considered to be in compliance with the *Fisheries Act* and the *MTO/DFO/MNRF Fisheries Protocol*. As such these works may proceed without further review.

If any of the conditions, operational constraints or protection measures cannot be met, this BMP cannot be used and MTO staff and service providers shall proceed to a fisheries assessment as outlined in the Fisheries Protocol process.

**Note:** Accumulated sediment within a culvert may be indicative of an improperly sized culvert. Where culverts require repeated and/or ongoing sediment removal, a hydrological assessment of the culvert should be considered to determine if a culvert replacement is necessary.

**Operational Constraints and Protection Measures**

**General**
- Culvert maintenance shall be scheduled to avoid wet and rainy periods and in-water works shall be conducted during low flow conditions.
Debris and Sediment Removal
- Debris and other materials shall be removed gradually. Whenever possible, remove debris and other materials by hand.
- Removal of debris (i.e., branches, stumps, other woody materials, garbage, etc.) shall be limited to the area within the culvert, immediately upstream of the culvert and to that which is necessary to maintain proper culvert function and safe fish passage.
- Accumulated debris shall be removed slowly to allow clean water to pass, to prevent downstream flooding and reduce the amount of sediment-laden water going downstream. Gradually reintroducing flow will also reduce the potential for stranding fish in upstream areas.
- Accumulated sediment removal shall be limited to within the culvert and to the level of the waterbody bed, to maintain embedment of the culvert.
- Sediment shall be removed in a manner that prevents it from moving downstream.
- An Erosion and Sediment Control Plan shall be developed and implemented for the site that minimizes risk of sedimentation of the waterbody during all phases of the project. A response plan shall also be developed that is to be implemented immediately in the event of a sediment release.

Eroding Inlets and Outlets
- If replacement rock reinforcement/protection is required to stabilize eroding inlets and outlets, the following measures shall be incorporated:
  - Place appropriately-sized, clean rocks into the eroding area;
  - Do not obtain rocks from below the high water level of the waterbody;
  - Avoid the use of rock that is acid-generating. Also avoid the use of rock that fractures and breaks down quickly when exposed to the elements;
  - Install rock at a similar slope to maintain a uniform watercourse bank and natural alignment; and
  - Ensure rock does not obstruct fish passage or constrict the watercourse width.

If Species at Risk or Important or Exceptional Habitat is present, no replacement rock reinforcement/armouring is to be completed below the high water mark.

Concrete Repair
- For concrete repair in or on the culvert, in-water work shall adhere to in-water work timing windows and shall occur when waterbody flows are at a minimum or non-existent. Where works are required to take place outside of the dry season, all works shall be conducted in an isolated area "in-the-dry".

Temporary Flow Diversions
Temporary flow diversions shall be conducted in accordance with OPSS 182 and OPSS 185.
Dewatering and the Use of Pumps
Dewatering activities and the use of pumps shall be conducted in accordance with OPSS 518 and OPSS 182.

Fish Protection
Fish protection shall be conducted in accordance with OPSS182.

Equipment Use
Use of equipment shall be in accordance with OPSS182.

Preservation of Riparian Vegetation
Removal of riparian vegetation shall be in accordance with OPSS182.

Erosion and Sediment Control
The installation, monitoring, maintenance, and removal of temporary erosion and sediment control measures shall be according to OPSS 182 and OPSS 805.

Restoration of Disturbed Areas
Vegetation protection and rehabilitation shall be in accordance with OPSS 182 and OPSS 804.

Management of Excess Materials
All excess material shall be managed in accordance with OPSS 180.

4 SUBMISSION REQUIREMENTS

A MTO Project Notification Form* shall be completed prior to the commencement of work, indicating that the BMP will be followed during the culvert maintenance activities. It shall be signed by the appropriate individual and retained by the MTO Regional Environmental Section, or, for forms completed by Area Maintenance Contractor (AMC) Service Providers, by the Regional Operations Office.

* An electronic version of MTO Project Notification Form is available online.
Culvert Maintenance Quick Reference Guide

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<td>182.07.01</td>
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<td>Culvert maintenance activities shall be scheduled to avoid wet and rainy periods and in-water works shall be conducted during low flow conditions.</td>
<td>SSP 101F23</td>
</tr>
<tr>
<td>Culvert maintenance activities shall occur in the dry season when waterbody flows are at a minimum or nonexistent. Where works are required to take place outside of the dry season, all works shall be conducted in an isolated area &quot;in-the-dry&quot;.</td>
<td>SSP 101F23</td>
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Debris and Sediment Removal

| Debris and other materials shall be removed gradually. Whenever possible, remove debris and other materials by hand. | SSP 101F23    |
| Removal of debris (i.e., branches, stumps, other woody materials, garbage, etc.) shall be limited to the area within the culvert, immediately upstream of the culvert and to that which is necessary to maintain proper culvert function and safe fish passage. | SSP 101F23    |
| Accumulated debris shall be removed slowly to allow clean water to pass, to prevent downstream flooding and reduce the amount of sediment-laden water going downstream. Gradually reintroducing flow will also reduce the potential for stranding fish in upstream areas. | SSP 101F23    |
| Accumulated sediment removal shall be limited to within the culvert and to the level of the waterbody bed, to maintain embedment of the culvert. Sediment shall be removed in a manner that prevents it from moving downstream. | SSP 101F23    |
| No alteration to the natural stream channel shall take place. | SSP 101F23    |

Eroding Inlets and Outlets

| If replacement rock reinforcement/protection is required to stabilize eroding inlets and outlets, the following measures shall be incorporated: |
| - Place appropriately-sized, clean rocks into the eroding area; |
| - Do not obtain rocks from below the high water level of the waterbody; |
| - Avoid the use of rock that is acid-generating. Also avoid the use of rock that fractures and breaks down quickly when exposed to the elements; |
| - Install rock at a similar slope to maintain a uniform watercourse bank and natural alignment; |
| - Ensure rock does not obstruct with fish passage or constrict the watercourse width; and |
| - If any in-water work is involved, adhere to in-water work timing windows. | SSP 101F23 |

Note: If Species at Risk or Important or Exceptional Habitat is present, no
replacement rock reinforcement/armouring is to be completed below the high water mark.

**Land-based Impacts Through Use of Industrial Equipment**

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>182.07.03</td>
<td>Equipment shall arrive on site in clean condition. It shall be operated on dry land in a manner that minimizes disturbance to waterbody banks and riparian vegetation areas.</td>
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<tr>
<td>182.07.02</td>
<td>Unless specified in the Contract Documents, equipment shall not enter or be operated in waterbodies or on waterbody banks but shall be operated on land above the high water level, on ice, or from a floating barge in a manner that minimizes disturbance to the waterbody banks of the watercourse.</td>
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**Deposit of Deleterious Substances**

<table>
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<tr>
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<th>Description</th>
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<tbody>
<tr>
<td>182.06</td>
<td>All Equipment used for the work in waterbodies or on waterbody banks at all times shall be free of excess or leaking fuel, lubricants, coolant and any other deleterious substances that could enter the waterbody.</td>
</tr>
<tr>
<td>182.07.02</td>
<td>Equipment refueling and maintenance shall take place at locations as far away as practical from a waterbody and in a manner that prevents sediment and other deleterious substances from entering into a waterbody.</td>
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</tbody>
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**Erosion and Sediment Control**

<table>
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<tr>
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<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSP 101F23</td>
<td>An Erosion and Sediment Control Plan shall be developed and implemented for the site that minimizes risk of sedimentation of the waterbody during all phases of the project. A response plan shall also be developed that is to be implemented immediately in the event of a sediment release.</td>
</tr>
<tr>
<td>182.07.04</td>
<td>Effective erosion and sediment control measures shall be installed before starting work to prevent the entry of sediment into the watercourse. Inspect them regularly during the course of construction and conduct regular maintenance and repairs as necessary.</td>
</tr>
<tr>
<td>182.07.05</td>
<td>All disturbed areas shall be stabilized with effective temporary erosion and sediment control measures that shall be maintained until vegetation is established.</td>
</tr>
<tr>
<td>805.07.11</td>
<td>All waste materials (e.g., dredging spoils, construction waste and materials, commercial logging waste, uprooted or cut aquatic plants, accumulated debris) shall be contained and stabilized above the high water level of nearby waterbodies to prevent re-entry.</td>
</tr>
</tbody>
</table>

**Dewatering and Temporary Flow Diversions**

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>518.07.01</td>
<td>Dewatering operations shall be directed to a sediment control device or...</td>
</tr>
</tbody>
</table>
natural attenuation area prior to discharge to watercourses. If a natural attenuation area is used, a minimum 15 m setback shall be maintained from the receiving watercourse. When water is discharged to a watercourse, the water discharged shall be done in a manner that does not cause erosion or other damage to adjacent lands - i.e. energy dissipation is required.

**Fish Impingement and Entrainment**

Any water intakes or outlet pipes in fish bearing waters shall have screens to prevent entrainment or impingement of fish and follow the measures as outlined in Fisheries and Oceans Freshwater Intake End-of-Pipe Fish Screen Guideline.

**Fish Salvage**

Fish stranded by the Work or found in the work area during construction shall be salvaged and relocated according to the License to Collect Fish for Scientific Purposes, unless specified in the Contract Documents. If fish cannot be safely relocated, the local MNRF office shall be consulted prior to fish collection commencing to determine a suitable relocation site. All fish shall be handled as little as possible and in a manner that minimizes stress and prevents death to the fish.

**Restoration of Disturbed Areas**

All disturbed areas shall be stabilized with effective temporary erosion and sediment control measures that shall be maintained until vegetation is established.

Immediately after disturbance or upon completion of the work in or around waterbodies, waterbody banks, and riparian vegetation areas, the disturbed areas shall be restored to the original contour and gradient and cover treatment applied.

If an area cannot be restored to the original contour and gradient due to instability or other reasons, a stable gradient shall be constructed and cover treatment applied according to the above requirements.

Materials for the restoration of disturbed areas shall not be obtained from below the high water level of any waterbody unless specified in the Contract Documents.
CULVERT REPLACEMENT/EXTENSION

BEST MANAGEMENT PRACTICE

**PILOT**

Effective May 2018

The Culvert Replacement / Extension BMP has been discontinued as a pilot.

Projects that are in progress as of May 2018 may continue to use the BMP, however no new projects may use this BMP.

All new projects shall continue to follow the MTO/DFO/MNRF Protocol for Protecting Fish and Fish Habitat on Provincial Transportation Undertakings and the supporting Environmental Guide for Fisheries.

A copy of the BMP is maintained on the MTO Project Management Best Practices website for any ongoing projects.

For further direction, please contact your local MTO office.
DITCH MAINTENANCE WITHIN 30 METRES OF A WATERBODY

BEST MANAGEMENT PRACTICE

1 SCOPE

This Best Management Practice (BMP) applies to the maintenance of existing ditches within 30 metres of the high water level of a commercial, recreational or Aboriginal fishery, and ditches identified as containing or supporting a seasonal commercial, recreational or Aboriginal fishery within highway rights-of-way as long as they are currently dry.

This Ditch Maintenance within 30 metres of waterbody BMP may be used for the following:

- Activities to restore the grades and positive drainage of ditches to the original highway design criteria, including:
  - Removal of accumulated sediment;
  - Removal of vegetation;
  - Repair of damaged ditch embankments and shoulders;
  - Cleaning of ditch outlet pipes; and
  - Cleaning of entrance culverts that have deposited accumulated sediment into the ditch being maintained.

This Ditch Maintenance BMP may not be used for the following:

- Work in any ditches within 30m of the high water level in which fish are present
- Work in any ditches within 30m of the high water level of a waterbody in which SAR are present in the area
- Work in any ditches within 30m of the high water level of a waterbody in which standing surface water is present
- Works between the top of valley slope and the waterbody, unless necessary to provide reasonable outlet without creating an erosion situation;
- Construction of a new ditch; or
- Modification of a waterbody.

Activities undertaken in relation to the project shall be in compliance with the federal Species at Risk Act and the provincial Endangered Species Act as outlined in Step 2 of the MTO/DFO/MNRF Fisheries Protocol. It is up to user of this BMP to obtain all necessary permits required to proceed with the work.
3 MAINTENANCE PROCEDURES

Potential Impacts to Fish and Fish Habitat

- Removal of habitat features from ditch, adjacent banks and riparian zone (resulting in loss and/or reduction in diversity of habitat)
- Removal or disruption of migratory corridor (barrier to fish migration)
- Sedimentation of spawning, rearing and food production areas
- Reduction in food supply (allochthonous or autochthonous inputs)
- Reduction or disruption of invertebrate production
- Reduced water quality (increased turbidity, sedimentation, warming of water)
- Changes to flow regime (especially baseflows)
- Drainage works may negatively impact adjacent wetlands by lowering the water table
- Introduction of deleterious substances
- Excessive loss of riparian vegetation
- Disturbance to the banks and the bottoms of ditches from the use of heavy equipment
- Decreased channel/bank stability to the receiving watercourse

Operational Conditions

Ditching activities within the description provided in section 1 (Scope) that meet the following conditions and are carried out in accordance with all of the following operational constraints, protection measures and submission requirements should be considered to be in compliance with the Fisheries Act and the MTO/DFO/MNRF Fisheries Protocol. As such these works may proceed without further review.

If any of the conditions, operational constraints or protection measures cannot be met, this BMP cannot be used and MTO staff and service providers shall proceed to a fisheries assessment as outlined in the Fisheries Protocol process.

Operational Constraints and Protection Measures

General

- Ditch maintenance activities shall not be conducted within the receiving waterbody or within a wetland and shall only be conducted when/if the ditch is dry.
- Ditch maintenance activities shall be conducted during dry weather and when heavy or persistent precipitation is not expected to occur.
• An Erosion and Sediment Control Plan shall be developed and implemented for the site that minimizes risk of sedimentation of the waterbody during all phases of the project. A response plan shall also be developed that is to be implemented immediately in the event of a sediment release.

**Equipment Use**

Use of equipment shall be in accordance with **OPSS182**.

**Preservation of Riparian Vegetation**

Removal of riparian vegetation shall be in accordance with **OPSS182**.

**Erosion and Sediment Control**

The installation, monitoring, maintenance, and removal of temporary erosion and sediment control measures shall be according to **OPSS 182 and OPSS 805**.

**Restoration of Disturbed Areas**

Vegetation protection and rehabilitation shall be in accordance with **OPSS 182 and OPSS 804**.

**Management of Excess Materials**

All excess material shall be managed in accordance with **OPSS 180**.

**4 SUBMISSION REQUIREMENTS**

A MTO Project Notification Form* shall be completed prior to the commencement of work, indicating that the BMP will be followed during the ditch maintenance activities. It shall be signed by the appropriate individual and retained by the MTO Regional Environmental Section, or, for forms completed by Area Maintenance Contractor (AMC) Service Providers, by the Regional Operations Office.

* An electronic version of MTO Project Notification Form is available online.
Ditch Maintenance within 30 m of the Right-of-Way Quick Reference Guide

Disclaimer: This table has been provided as a quick reference guide. Compliance with this guide does not relieve the Contractor of other obligations imposed by statute or by the requirements and conditions specified under contract with the Owner.

<table>
<thead>
<tr>
<th>Timing</th>
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<tbody>
<tr>
<td>Ditch maintenance activities shall not be conducted within the receiving waterbody or within a wetland and shall only be conducted when/if the ditch is dry.</td>
<td>SSP 101F23</td>
</tr>
<tr>
<td>Ditch maintenance activities shall be conducted during dry weather and when heavy or persistent precipitation is not expected to occur.</td>
<td>SSP 101F23</td>
</tr>
</tbody>
</table>

**Land-based Impacts Through Use of Industrial Equipment**

<table>
<thead>
<tr>
<th>Timing</th>
<th>MTO Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing trails, roads or cut lines shall be used wherever possible as access routes to avoid disturbance to waterbody banks and riparian vegetation areas.</td>
<td>182.07.03</td>
</tr>
<tr>
<td>Equipment shall arrive on site in clean condition. It shall be operated on dry land in a manner that minimizes disturbance to waterbody banks and riparian vegetation areas.</td>
<td>182.07.02</td>
</tr>
<tr>
<td>Unless specified in the Contract Documents, equipment shall not enter or be operated in waterbodies or on waterbody banks but shall be operated on land above the high water level, on ice, or from a floating barge in a manner that minimizes disturbance to the waterbody banks of the watercourse.</td>
<td>182.07.02</td>
</tr>
</tbody>
</table>

**Deposit of Deleterious Substances**

<table>
<thead>
<tr>
<th>Timing</th>
<th>MTO Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Equipment used for the work in waterbodies or on waterbody banks at all times shall be free of excess or leaking fuel, lubricants, coolant and any other deleterious substances that could enter the waterbody.</td>
<td>182.07.02</td>
</tr>
<tr>
<td>Equipment refueling and maintenance shall take place at locations as far away as practical from a waterbody and in a manner that prevents sediment and other deleterious substances from entering into a waterbody.</td>
<td>182.07.02</td>
</tr>
<tr>
<td>Ensure Spills Management Plan (including materials, instructions regarding their use, education of contract personnel, emergency contact numbers) on-site at all times for implementation in event of accidental spill during construction. An emergency spill kit shall be kept on site.</td>
<td>OPSS 100 7.13.02</td>
</tr>
</tbody>
</table>

**Erosion and Sediment Control**

<table>
<thead>
<tr>
<th>Timing</th>
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</tr>
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<tbody>
<tr>
<td>An Erosion and Sediment Control Plan shall be developed and implemented for the site that minimizes risk of sedimentation of the waterbody during all phases of the project. A response plan shall also be developed that is to be implemented immediately in the event of a sediment release.</td>
<td>SSP 101F23</td>
</tr>
<tr>
<td>Effective erosion and sediment control measures shall be installed before starting work to prevent the entry of sediment into the watercourse. Inspect them regularly during the course of construction and conduct regular maintenance and repairs as necessary.</td>
<td>182.07.04 805.07.11</td>
</tr>
<tr>
<td>All disturbed areas shall be stabilized with effective temporary erosion and sediment control measures that shall be maintained until vegetation is established.</td>
<td>182.07.05</td>
</tr>
<tr>
<td>All waste materials (e.g., dredging spoils, construction waste and materials, commercial logging waste, uprooted or cut aquatic plants, accumulated</td>
<td>182.07.01</td>
</tr>
</tbody>
</table>
debris) shall be contained and stabilized above the high water level of nearby waterbodies to prevent re-entry.

<table>
<thead>
<tr>
<th>Restoration of Disturbed Areas</th>
<th>182.07.05</th>
</tr>
</thead>
<tbody>
<tr>
<td>All disturbed areas shall be stabilized with effective temporary erosion and sediment control measures that shall be maintained until vegetation is established.</td>
<td>182.07.05</td>
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<tr>
<td>Immediately after disturbance or upon completion of the work in or around waterbodies, waterbody banks, and riparian vegetation areas, the disturbed areas shall be restored to the original contour and gradient and cover treatment applied.</td>
<td>182.07.05</td>
</tr>
<tr>
<td>If an area cannot be restored to the original contour and gradient due to instability or other reasons, a stable gradient shall be constructed and cover treatment applied according to the above requirements.</td>
<td>182.07.05</td>
</tr>
<tr>
<td>Materials for the restoration of disturbed areas shall not be obtained from below the high water level of any waterbody unless specified in the Contract Documents.</td>
<td>182.07.05</td>
</tr>
</tbody>
</table>
MAINTENANCE OF RIPARIAN VEGETATION IN EXISTING
RIGHT-OF-WAY
BEST MANAGEMENT PRACTICE

1 SCOPE

This MTO Best Management Practice (BMP) applies to the removal of riparian vegetation in the existing highway right-of-way corridor within 30 metres of the high water level of a waterbody identified as containing or supporting a commercial, recreational or Aboriginal fishery.

This maintenance of riparian vegetation in existing right-of-way BMP may be used for the following:

- Mowing, brushing, topping and slashing of terrestrial vegetation.
- Alteration (e.g., topping and pruning) of select plants.
- Work that involves the maintenance of vegetation in an existing right-of-way for a transportation or utility corridor and not construction of a new right-of-way.
- Vegetative maintenance techniques that allow the root system to stay intact, to help bind the soil and encourage rapid colonization of low-growing plant species.

This maintenance of riparian vegetation in existing right-of-way BMP may not be used for the following:

- In-water work outside of In-Water Work Timing Windows
- Removal of more than one third (1/3) of the total woody vegetation (i.e. trees and shrubs) in the right-of-way within 30 metres of the ordinary high water level in any given year; or
- Complete clearing of riparian vegetation.

Activities undertaken in relation to the project shall be in compliance with the federal Species at Risk Act and the provincial Endangered Species Act as outlined in Step 2 of the MTO/DFO/MNRF Fisheries Protocol. It is up to user of this BMP to obtain all necessary permits required to proceed with the work.
2 ADDITIONAL REFERENCES

MTO Best Management Practice for a Temporary Watercourse Crossing

3 MAINTENANCE PROCEDURES

Potential Impacts to Fish and Fish Habitat

- Excessive loss of riparian vegetation
- Erosion and sedimentation
- Disturbance to the banks and the bottom of the water body from use of heavy equipment
- Introduction of deleterious substances as a result of inadequate containment of spoil piles and improper maintenance of equipment

Operational Conditions

Maintenance work within the description provided in section 1 (Scope) that meets the following conditions and is carried out in accordance with all of the following operational constraints, protection measures and submission requirements shall be considered to be in compliance with the Fisheries Act and the MTO/DFO/MNRF Fisheries Protocol. As such these works may proceed without further review.

If any of the conditions, operational constraints or protection measures cannot be met, this BMP cannot be used and MTO staff and service providers shall proceed to a fisheries assessment as outlined in the Fisheries Protocol process.

Operational Constraints and Protection Measures

General

- Combined maintenance activities (e.g., mowing, brushing, topping, slashing, etc.) will affect no more than one third (1/3) of the total woody vegetation, such as trees and shrubs, in the right-of-way within 30 metres of the ordinary high water level in any given year.
- When practicable, alter riparian vegetation in the right-of-way by hand. If machinery must be used, operate machinery on land and in a manner that minimizes disturbance to the banks of the water body.
- Machinery fording the watercourse to bring equipment required for maintenance to the opposite side is limited to a one-time event (over and back) and should occur only if an existing crossing at another location is not available or practical to use. Refer to the BMP for Temporary Watercourse Crossing. Note: Fording is not permitted if SAR are present.
  - If minor rutting is likely to occur, waterbody bank and bed protection methods (e.g., swamp mats, pads) should be used provided they do not constrict flows or block fish passage.
  - Grading of the stream banks for the approaches should not occur.
o If the stream bed and banks are steep and highly erodible (e.g., dominated by organic materials and silts) and erosion and degradation are likely to occur as a result of equipment fording, then a temporary crossing structure or other practice should be used to protect these areas.

o The one-time fording should prevent disruption to sensitive fish life stages by adhering to appropriate In-water work timing window.

o Fording should occur under low flow conditions and not when flows are elevated due to local rain events or seasonal flooding.

- When altering a tree that is located on the bank of a waterbody, ensure that the root structure and stability are maintained.
- Stabilize any waste materials removed from the work site to prevent them from entering the water body. This could include covering spoil piles with biodegradable mats or tarps. All long-term storage of waste materials should be kept outside of the riparian area.
- In order to prevent erosion and to help seeds germinate, vegetate any disturbed areas by planting and seeding preferably with native trees, shrubs or grasses and cover such areas with mulch. If there is insufficient time remaining in the growing season, the site should be stabilized (e.g., cover exposed areas with erosion control blankets to keep the soil in place and prevent erosion) and vegetated the following spring.
- Implement selective or phased vegetation removal or species management to maintain or reduce shade on stream and provide specialized riparian communities or habitats. This may be desirable for the management of certain species, such as Redside Dace, salmonids, or warmwater species at risk.
- Travel paths, stockpile areas and staging areas should be pre-planned and followed.
- An Erosion and Sediment Control Plan shall be developed and implemented for the site that minimizes risk of sedimentation of the waterbody during all phases of the project. A response plan shall also be developed that is to be implemented immediately in the event of a sediment release.

**Equipment Use**

Use of equipment shall be in accordance with OPSS182.

**Preservation of Riparian Vegetation**

Removal of riparian vegetation shall be in accordance with OPSS182.

**Erosion and Sediment Control**

The installation, monitoring, maintenance, and removal of temporary erosion and sediment control measures shall be according to OPSS 182 and OPSS 805.

**Restoration of Disturbed Areas**

Vegetation protection and rehabilitation shall be in accordance with OPSS 182 and OPSS 804.
Management of Excess Materials
All excess material shall be managed in accordance with OPSS 180.

4 SUBMISSION REQUIREMENTS

A MTO Project Notification Form* shall be completed prior to the commencement of work, indicating that the BMP will be followed during the maintenance of riparian vegetation in existing right-of-way. It shall be signed by the appropriate individual and retained by the MTO Regional Environmental Section, or, for forms completed by Area Maintenance Contractor (AMC) Service Providers, by the Regional Operations Office.

* An electronic version of MTO Project Notification Form is available online.
### Maintenance of Riparian Vegetation in Existing Right-of-Way Quick Reference Guide

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<tbody>
<tr>
<td>Generally, there are no restrictions on timing for maintenance of riparian vegetation within the existing right-of-way as this activity does not involve in-water work. However, if there are any activities with the potential to disrupt sensitive fish life stages (e.g., fording of watercourse by machinery), they shall adhere to appropriate in-water work timing windows.</td>
<td>182.07.01</td>
</tr>
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<table>
<thead>
<tr>
<th>Vegetation Removal</th>
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<td>Combined maintenance activities (e.g., mowing, brushing, topping, slashing, etc.) will affect no more than one third (1/3) of the total woody vegetation, such as trees and shrubs, in the right-of-way within 30 metres of the ordinary high water level in any given year.</td>
<td>SSP 101F23</td>
</tr>
<tr>
<td>When practicable, alter riparian vegetation in the right-of-way by hand. If machinery must be used, operate machinery on land and in a manner that minimizes disturbance to the banks of the water body.</td>
<td>SSP 101F23</td>
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<tr>
<td>Implement selective or phased vegetation removal or species management to maintain or reduce shade on stream and provide specialized riparian communities or habitats. This may be desirable for the management of certain species, such as Redside Dace, salmonids, or warmwater species at risk.</td>
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<td>Travel paths, stockpile areas and staging areas should be pre-planned and followed.</td>
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<tr>
<td>Machinery fording the watercourse to bring equipment required for maintenance to the opposite side is limited to a one-time event (over and back) and should occur only if an existing crossing at another location is not available or practical to use. Refer to the BMP for Temporary Watercourse Crossing. <strong>Note: Fording is not permitted if SAR are present.</strong></td>
<td></td>
</tr>
<tr>
<td>• If minor rutting is likely to occur, waterbody bank and bed protection methods (e.g., swamp mats, pads) should be used provided they do not constrict flows or block fish passage.</td>
<td>SSP 101F23</td>
</tr>
<tr>
<td>• Grading of the stream banks for the approaches should not occur.</td>
<td></td>
</tr>
<tr>
<td>• If the stream bed and banks are steep and highly erodible (e.g., dominated by organic materials and silts) and erosion and degradation are likely to occur as a result of equipment fording, then a temporary crossing structure or other practice should be used to protect these areas.</td>
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<tr>
<td>• The one-time fording should prevent disruption to sensitive fish life stages by adhering to appropriate in-water work timing windows.</td>
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<tr>
<td>• Fording should occur under low flow conditions and not when flows</td>
<td></td>
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are elevated due to local rain events or seasonal flooding.

| Equipment shall arrive on site in clean condition. It shall be operated on dry land in a manner that minimizes disturbance to waterbody banks and riparian vegetation areas. | 182.07.02 |
| Equipment shall not enter or be operated in waterbodies or on waterbody banks but shall be operated on land above the high water level, on ice, or from a floating barge in a manner that minimizes disturbance to the waterbody banks of the watercourse. | 182.07.02 |

**Deposit of Deleterious Substances**

| All equipment used for the work in waterbodies or on waterbody banks at all times shall be free of excess or leaking fuel, lubricants, coolant and any other deleterious substances that could enter the waterbody. | 182.06 |
| Equipment refueling and maintenance shall take place at locations as far away as practical from a waterbody and in a manner that prevents sediment and other deleterious substances from entering into a waterbody. | 182.07.02 |
| Ensure Spills Management Plan (including materials, instructions regarding their use, education of contract personnel, emergency contact numbers) on-site at all times for implementation in event of accidental spill during construction. An emergency spill kit shall be kept on site. | OPSS 100 7.13.02 |

**Erosion and Sediment Control**

| An Erosion and Sediment Control Plan shall be developed and implemented for the site that minimizes risk of sedimentation of the waterbody during all phases of the project. A response plan shall also be developed that is to be implemented immediately in the event of a sediment release. | SSP 101F23 |
| Effective erosion and sediment control measures shall be installed before starting work to prevent the entry of sediment into the watercourse. Inspect them regularly during the course of construction and conduct regular maintenance and repairs as necessary. | 182.07.04 805.07.11 |
| All disturbed areas shall be stabilized with effective temporary erosion and sediment control measures that shall be maintained until vegetation is established. | 182.07.05 |
| All stockpiled and waste materials (e.g., dredging spoils, construction waste and materials, commercial logging waste, uprooted or cut aquatic plants, accumulated debris) shall be contained and stabilized above the high water level of nearby waterbodies to prevent re-entry. | 182.07.01 |

**Restoration of Disturbed Areas**

| All disturbed areas shall be stabilized with effective temporary erosion and sediment control measures that shall be maintained until vegetation is established. | 182.07.05 |
| Immediately after disturbance or upon completion of the work in or around waterbodies, waterbody banks, and riparian vegetation areas, the disturbed areas shall be restored to the original contour and gradient and cover treatment applied. | 182.07.05 |
| If an area cannot be restored to the original contour and gradient due to instability or other reasons, a stable gradient shall be constructed and cover treatment applied according to the above requirements. | 182.07.05 |
| Materials for the restoration of disturbed areas shall not be obtained from below the high water level of any waterbody unless specified in the Contract Documents. | 182.07.05 |
In order to prevent erosion and to help seeds germinate, vegetate any disturbed areas by planting and seeding preferably with native trees, shrubs or grasses and cover such areas with mulch. If there is insufficient time remaining in the growing season, the site should be stabilized (e.g., cover exposed areas with erosion control blankets to keep the soil in place and prevent erosion) and vegetated the following spring.
TEMPORARY WATERCOURSE CROSSING
BEST MANAGEMENT PRACTICE

1 SCOPE

This MTO Best Management Practice (BMP) applies to the placement of a temporary crossing over a watercourse that has been identified as being, or as supporting a commercial, recreational or Aboriginal fishery.

This temporary watercourse crossing BMP may be used for the following:

- A one-time ford in flowing waters (Note: Fording is not permitted if SAR are present);
- A seasonally dry streambed ford;
- A temporary bridge (e.g., Bailey bridge or log stringer bridge) or an ice bridge, no greater than one lane in width;

This temporary watercourse crossing BMP may not be used for the following:

- In-water work outside of In-Water Work Timing Windows
- A temporary bridge greater than one lane in width;
- Placing any part of a temporary bridge structure within the wetted portion of the waterbody;
- Realigning the watercourse;
- Disturbance to riparian vegetation;
- Dredging, infilling, grading or excavating the watercourse bed or bank;
- Fording more than a one-time event (over and back);
- Fording occurring in areas that are known fish spawning sites;
- Prolonged use; or
- Installation of a temporary culvert.

Activities undertaken in relation to the project shall be in compliance with the federal Species at Risk Act and the provincial Endangered Species Act as outlined in Step 2 of the MTO/DFO/MNRF Fisheries Protocol. It is up to user of this BMP to obtain all necessary permits required to proceed with the work.
2 ADDITIONAL REFERENCES

N/A

3 MAINTENANCE PROCEDURES

Potential Impacts to Fish and Fish Habitat

- Direct harm to stream banks and beds (e.g. compaction and rutting).
- Physical or hydraulic barrier to fish movement under different flow regimes (e.g. interstitial or laminar flow under low flow conditions).
- Sediment deposition into fish habitat from construction, operation, decommissioning or from road drainage.
- Construction materials can be placed directly on fish habitat (e.g. harmful alteration of substrate, loss of groundwater upwellings).
- Removal of vegetation and cover along the stream bank which provides riparian habitat and bank stability.
- Removal of edge habitat (e.g. undercut bank, shallower areas with lower velocity).
- Alteration of channel morphology causing upstream and downstream channel sediment aggradation/erosion/downcutting.
- Deposit of deleterious substances from vehicle.
- Debris used in construction of ice bridges or other temporary crossings may impact fish passage and channel stability.
- Disruption to sensitive fish life stages.

Operational Conditions

Temporary watercourse crossing activities within the description provided in section 1 (Scope) that meet the following conditions and are carried out in accordance with all of the following operational constraints, protection measures and submission requirements should be considered to be in compliance with the Fisheries Act and the MTO/DFO/MNRF Fisheries Protocol. As such these works may proceed without further review.

If any of the conditions, operational constraints or protection measures cannot be met, this BMP cannot be used and MTO staff and service providers shall proceed to a fisheries assessment as outlined in the Fisheries Protocol process.

Operational Constraints and Protection Measures

General

- Locate crossings at straight sections of the watercourse, perpendicular to the watercourse bank. Avoid crossing on meander bends, braided streams, alluvial fans, or any other area that is inherently unstable and may result in the erosion and scouring of the watercourse bed and banks.
• An Erosion and Sediment Control Plan shall be developed and implemented for the site that minimizes risk of sedimentation of the waterbody during all phases of the project. A response plan shall also be developed that is to be implemented immediately in the event of a sediment release.

• Machinery fording a flowing watercourse to bring equipment required for construction to the opposite side shall be limited to a one-time event (over and back) and is to occur only if an existing crossing at another location is not available or practical to use.
  o If minor rutting is likely to occur, watercourse bank and bed protection methods (e.g., swamp mats, pads) shall be used, provided they do not constrict flows or block fish passage.
  o Grading of the watercourse banks for the approaches is not permitted.
  o If the watercourse bed and banks are steep and highly erodible (e.g., dominated by organic materials and silts) and erosion and degradation are likely to occur as a result of equipment fording, then a temporary bridge shall be used in order to protect these areas.
  o The one-time fording shall adhere to in-water work timing windows.
  o Fording shall occur under low flow conditions, and not when flows are elevated due to local rain events or seasonal flooding.

Equipment Use
Use of equipment shall be in accordance with OPSS182.

Preservation of Riparian Vegetation
Removal of riparian vegetation shall be in accordance with OPSS182.

Erosion and Sediment Control
The installation, monitoring, maintenance, and removal of temporary erosion and sediment control measures shall be according to OPSS 182 and OPSS 805.

Restoration of Disturbed Areas
Vegetation protection and rehabilitation shall be in accordance with OPSS 182 and OPSS 804.

Management of Excess Materials
All excess material shall be managed in accordance with OPSS 180.

3 SUBMISSION REQUIREMENTS

A MTO Project Notification Form* shall be completed prior to the commencement of work, indicating that the BMP will be followed during the temporary watercourse crossing activities. It shall be signed by the appropriate individual and retained by the
MTO Regional Environmental Section, or, for forms completed by Area Maintenance Contractor (AMC) Service Providers, by the Regional Operations Office.

* An electronic version of MTO Project Notification Form is available online.
Temporary Watercourse Crossing Quick Reference Guide

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<thead>
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<th>Timing</th>
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<tbody>
<tr>
<td>Generally, there are no restrictions on timing for the construction of temporary bridge structures or fording seasonally dry waterbody beds, as they do not involve in-water work. However, if there are any activities with the potential to disrupt sensitive fish life stages (e.g., fording of the watercourse by machinery) these shall adhere to appropriate in-water work timing widows.</td>
<td>182.07.01</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Design</th>
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<tr>
<td>Locate crossings at straight sections of the watercourse, perpendicular to the watercourse bank. Avoid crossing on meander bends, braided streams, alluvial fans, or any other area that is inherently unstable and may result in the erosion and scouring of the watercourse bed and banks.</td>
<td>SSP 101F23</td>
</tr>
<tr>
<td>All materials used must be removed prior to the spring freshet or immediately following project completion if this occurs earlier.</td>
<td>SSP 101F23</td>
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<th>Land-based Impacts Through Use of Industrial Equipment</th>
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<td>Travel paths, stockpile areas and staging areas, within the vicinity of the crossing, should be pre-planned and followed.</td>
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<td>Existing trails, roads or cut lines shall be used wherever possible as access routes to avoid disturbance to waterbody banks and riparian vegetation areas.</td>
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<tr>
<td>Equipment shall arrive on site in clean condition. It shall be operated on dry land in a manner that minimizes disturbance to waterbody banks and riparian vegetation areas.</td>
<td>182.07.02</td>
</tr>
<tr>
<td>Unless specified in the Contract Documents, equipment shall not enter or be operated in waterbodies or on waterbody banks but shall be operated on land above the high water level, on ice, or from a floating barge in a manner that minimizes disturbance to the waterbody banks of the watercourse.</td>
<td>182.07.02</td>
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<td>Machinery fording the watercourse to bring equipment required for maintenance to the opposite side is limited to a one-time event (over and back) and should occur only if an existing crossing at another location is not available or practical to use. Refer to the BMP for Temporary Watercourse Crossing. <strong>Note: Fording is not permitted if SAR are present.</strong></td>
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<td>• If minor rutting is likely to occur, waterbody bank and bed protection methods (e.g., swamp mats, pads) should be used provided they do not constrict flows or block fish passage.</td>
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<td>• Grading of the stream banks for the approaches should not occur.</td>
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<td>• If the stream bed and banks are steep and highly erodible (e.g., dominated by organic materials and silts) and erosion and degradation are likely to occur as a result of equipment fording, then a temporary crossing structure or other practice should be used to protect these areas.</td>
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<td>• The one-time fording should prevent disruption to sensitive fish life</td>
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</tr>
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stages by adhering to appropriate in-water work timing windows.

- Fording should occur under low flow conditions and not when flows are elevated due to local rain events or seasonal flooding.

Removal of riparian vegetation shall be kept to a minimum to help maintain the stability of waterbody banks. The area over which vegetation in riparian vegetation areas is removed shall affect no more than one third (1/3) of the total woody vegetation in the right-of-way within 30 metres of the ordinary high water level of a waterbody. Vegetative root masses found within the waterbody banks shall remain undisturbed unless specified in the Contract Documents.

### Deposits of Deleterious Substances

**All Equipment used for the work in waterbodies or on waterbody banks at all times shall be free of excess or leaking fuel, lubricants, coolant and any other deleterious substances that could enter the waterbody.**

**Equipment refueling and maintenance shall take place at locations as far away as practical from a waterbody and in a manner that prevents sediment and other deleterious substances from entering into a waterbody.**

**Ensure Spills Management Plan (including materials, instructions regarding their use, education of contract personnel, emergency contact numbers) on-site at all times for implementation in event of accidental spill during construction. An emergency spill kit shall be kept on site.**

### Erosion and Sediment Control

**An Erosion and Sediment Control Plan shall be developed and implemented for the site that minimizes risk of sedimentation of the waterbody during all phases of the project. A response plan shall also be developed that is to be implemented immediately in the event of a sediment release.**

**Effective erosion and sediment control measures shall be installed before starting work to prevent the entry of sediment into the watercourse. Inspect them regularly during the course of construction and conduct regular maintenance and repairs as necessary.**

**All disturbed areas shall be stabilized with effective temporary erosion and sediment control measures that shall be maintained until vegetation is established.**

**All stockpiled and waste materials (e.g., dredging spoils, construction waste and materials, commercial logging waste, uprooted or cut aquatic plants, accumulated debris) shall be contained and stabilized above the high water level of nearby waterbodies to prevent re-entry.**

### Restoration of Disturbed Areas

**All disturbed areas shall be stabilized with effective temporary erosion and sediment control measures that shall be maintained until vegetation is established.**

**Immediately after disturbance or upon completion of the work in or around waterbodies, waterbody banks, and riparian vegetation areas, the disturbed areas shall be restored to the original contour and gradient and cover treatment applied.**

**If an area cannot be restored to the original contour and gradient due to instability or other reasons, a stable gradient shall be constructed and cover treatment applied according to the above requirements.**
<p>| Materials for the restoration of disturbed areas shall not be obtained from below the high water level of any waterbody unless specified in the Contract Documents. | 182.07.05 |</p>
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aboriginal (fishery)</td>
<td>Means that fish is harvested by an Aboriginal organization or any of its members for the purpose of using the fish as food, for social or ceremonial purposes or for purposes set out in a land claims agreement entered into with the Aboriginal organization.</td>
</tr>
<tr>
<td>Active Floodplains</td>
<td>Means an area adjacent to a waterbody that is periodically flooded, ranging from rare, severe storm events to flows experienced several times a year. For example, a &quot;10 year floodplain&quot; would include the area of inundation that has a frequency of occurring, on average, once every 10 years. It includes lands at the same elevation as areas with evidence of moving water, such as active or inactive flood channels, recent fluvial soils, and sediment on the ground surface or in tree bark, rafted debris, and tree scarring.</td>
</tr>
<tr>
<td>Aquatic Vegetation</td>
<td>Means a plant that grows partly or wholly in water whether rooted in the streambed, floating without anchorage or rooted along a waterbody bank.</td>
</tr>
<tr>
<td>Braided Watercourses</td>
<td>Means when a watercourse does not occupy a single channel but the flow is diverted into many separate ribbons of water with sand bars between.</td>
</tr>
<tr>
<td>Channel Tie-in</td>
<td>Means a minor realignment of the existing channel during culvert replacement or extension activities that is limited to the extent immediately upstream and/or downstream of the culvert necessary to provide the appropriate gradient and streambed elevation consistent with conditions in the natural channel in order to provide free flow of water through the culvert, maintain fish passage and mitigate channel erosion or down cutting during all flows.</td>
</tr>
<tr>
<td>Commercial (fishery)</td>
<td>Means that the fish is harvested under the authority of a license for the purpose of sale, trade or barter.</td>
</tr>
<tr>
<td>Concrete</td>
<td>Means concrete mixtures produced with Portland cement and may include blended hydraulic cement, supplementary cement materials, spent debris and silica sand abrasive blasting media from abrasive cleaning of concrete and reinforcing steel, and concrete brick and block and associated mortar. It may include embedded steel and excludes asbestos modified Portland cement concrete mixtures.</td>
</tr>
<tr>
<td>Concrete Erosion</td>
<td>Means the deterioration of concrete caused by mechanical abrasion by water-borne ice or sand and gravel particles scrubbing against concrete surfaces.</td>
</tr>
<tr>
<td>Critical Habitat</td>
<td>Means as defined by the <em>Species at Risk Act</em> means 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</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
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</tr>
<tr>
<td>Cracking</td>
<td>Means a linear fracture in concrete that extends partly or completely through the member.</td>
</tr>
<tr>
<td>Culvert</td>
<td>Means a conduit, usually covered by fill, whose primary function is to convey surface water through an embankment.</td>
</tr>
<tr>
<td>Dam</td>
<td>Means a barrier constructed across a waterway to control flow and are made of non-earth material, such as water inflated portable dams, pea gravel bags, concrete blocks, steel or wood wall, clean rock, sheet pile.</td>
</tr>
<tr>
<td>Debris</td>
<td>Means branches, stumps, logs, boulders, ice build-up, garbage or any other organic or inorganic materials that prevent the passage of water and/or fish, or that damages or impairs the proper functioning of infrastructure.</td>
</tr>
<tr>
<td>Delamination</td>
<td>Means a discontinuity of the surface concrete which is substantially separated but not completely detached from concrete below or above it.</td>
</tr>
<tr>
<td>Deleterious Substance</td>
<td>Means as defined by the <em>Fisheries Act</em> as any substance that, if added to water, makes the water deleterious to fish or fish habitat or any water containing a substance in such quantity or concentration or has been changed by heat or other means, that if added to water makes that water deleterious to fish or fish habitat. Note that sediment is considered a deleterious substance.</td>
</tr>
<tr>
<td>Dewatering</td>
<td>Means pumping, baling, temporary ditching, or vacuum removal of uncontaminated groundwater, rainwater, melt water, surface run-off, water pipe leakage from excavations and trenches or within sheeted cofferdams to improve the soil stability or for other construction purposes.</td>
</tr>
<tr>
<td>Disintegration</td>
<td>Means the physical deterioration or breaking down of concrete into small fragments or particles.</td>
</tr>
<tr>
<td>Ditch</td>
<td>Means part of the highway drainage system that generally conveys water for short periods of time following precipitation or snowmelt and typically outlet to a waterbody that may support fish and fish habitat. If ditches are wetted seasonally or year round, they should be considered to be containing or supporting a commercial, recreation or Aboriginal fishery.</td>
</tr>
<tr>
<td>Diversion Channel</td>
<td>Means a channel that is used to move water downstream, around a Working Area in order to isolate the Working Area from a waterbody.</td>
</tr>
<tr>
<td>Embedment</td>
<td>Means the portion of the culvert opening that is countersunk below</td>
</tr>
</tbody>
</table>
the natural waterbody bed.

<table>
<thead>
<tr>
<th>Entrainment</th>
<th>Means when a fish is drawn into a water intake and cannot escape.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erosion</td>
<td>Means the process by which the natural (earth) or unnatural (embankment, slope protection, structure, etc.) land surface is naturally worn away by the actions of water, wind, ice or other geologic agents.</td>
</tr>
<tr>
<td>Erosion and Sediment Control Plan</td>
<td>Means measures that minimize the risk of sedimentation of the waterbody during all phases of the project. Erosion and sediment control measures should be maintained until all disturbed ground has been permanently stabilized, suspended sediment has resettled to the bed of the waterbody or settling basin and runoff water is clear. The plan should, where applicable, include:</td>
</tr>
<tr>
<td></td>
<td>• Installation of effective erosion and sediment control measures before starting work to prevent sediment from entering the waterbody.</td>
</tr>
<tr>
<td></td>
<td>• Measures for managing water flowing onto the site, as well as water being pumped/diverted from the site such that sediment is filtered out prior to the water entering a waterbody. For example, pumping/diversion of water to a vegetated area, construction of a settling basin or other filtration system.</td>
</tr>
<tr>
<td></td>
<td>• Site isolation measures (e.g., silt boom or silt curtain) for containing suspended sediment where in-water work is required (e.g., dredging, underwater cable installation).</td>
</tr>
<tr>
<td></td>
<td>• Measures for containing and stabilizing waste material (e.g., dredging spoils, construction waste and materials, commercial logging waste, uprooted or cut aquatic plants, accumulated debris) above the high water mark of nearby waterbodies to prevent re-entry.</td>
</tr>
<tr>
<td></td>
<td>• Regular inspection and maintenance of erosion and sediment control measures and structures during the course of construction.</td>
</tr>
<tr>
<td></td>
<td>• Repairs to erosion and sediment control measures and structures if damage occurs.</td>
</tr>
<tr>
<td></td>
<td>• Removal of non-biodegradable erosion and sediment control materials once site is stabilized.</td>
</tr>
<tr>
<td></td>
<td>Note that these measures may be implemented through contract requirements, negating the need for a stand-alone plan.</td>
</tr>
<tr>
<td>Exceptional Habitat</td>
<td>Means:</td>
</tr>
<tr>
<td></td>
<td>• Known and documented rare or limiting habitat, fish populations are highly dependent on the habitat to support critical life functions</td>
</tr>
<tr>
<td></td>
<td>• Critical habitat for aquatic species at risk as described in the Recovery Strategy or Action Plan for the species (may be described in terms of features and attributes)</td>
</tr>
</tbody>
</table>
Examples of exceptional habitat may include:

- Cold water streams (streams that include any of the following species: American Brook Lamprey, Brook Trout, Brown Trout, Chestnut Lamprey, Chinook Salmon, Coho Salmon, Longnose Sucker, Pink Salmon, Rainbow Trout, Slimy Sculpin)
- Fish sanctuaries
- Specialized habitats that CRA fish use for spawning, nursery (e.g. slower moving areas with instream cover), or overwintering (e.g. pools)
- Littoral zones in lakes
- Coastal wetlands
- Migratory corridors fish require to reach high value upstream spawning habitat
- Offshore spawning shoals

**Excess Material**

Means earth, vegetation and debris removed during ditching activities.

**Fish**

Means, as defined by the *Fisheries Act*, 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.

**Fish Habitat**

Means, as defined by the *Fisheries Act*, spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out their life processes.

**Fish Passage**

Means the migration and movement of all life stages of fish to obtain access to food, shelter or spawning habitat through bridges, culverts or other obstructions.

**Flume**

Means a temporary flow diversion measure by which water is conveyed to restrict channel flows to a desired location downstream.

**High Water Level**

Means the usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land. In flowing waters (rivers, streams) this refers to the “active channel/bank-full level” which is often the 1:2 year flood flow return level. In inland lakes, wetlands or marine environments it refers to those parts of the waterbody bed and banks that are frequently flooded by water so as to leave a mark on the land and where the natural vegetation changes from predominately aquatic vegetation to terrestrial vegetation.

**Impingement**

Means a fish becomes entrapped and is held in contact with the intake screen and is unable to free itself.

**Important Habitat**

Means:
Uncommonly found habitat, may (but may not) be one of the limiting factors to the fish population

- Habitat in its natural condition or only slightly degraded relative to the function that it supports
- Non-critical habitat for aquatic species at risk, including special concern species, that supports key lifecycle functions

Examples of important habitat may include:

- Cold water streams (streams that include any of the following species: American Brook Lamprey, Brook Trout, Brown Trout, Chestnut Lamprey, Chinook Salmon, Coho Salmon, Longnose Sucker, Pink Salmon, Rainbow Trout, Slimy Sculpin)
- Fish sanctuaries
- Specialized habitats that CRA fish use for spawning, nursery (e.g. slower moving areas with instream cover), or overwintering (e.g. pools)
- Littoral zones in lakes
- Coastal wetlands
- Migratory corridors fish require to reach high value upstream spawning habitat
- Offshore spawning shoals

| In-Water Timing Windows | Means a restriction to in-water work related to an activity during certain periods in order to protect fish from impacts of works or undertakings in and around water during spawning migrations and other critical life stages. They are established by the Ontario Ministry of Natural Resources and Forestry (MNRF). |
| Maintenance | Means the activities required to keep the roadway in a safe, passable condition and prolong the life of the infrastructure. |
| Meander Bends | Means the outer bank of a watercourse where the water level is deeper, leading to higher water velocities. |
| Mitigation | Means as defined by DFO Fisheries Protection Policy measures to reduce the spatial scale, duration, or intensity of serious harm to fish that cannot be completely avoided. Mitigation measures include the implementation of best management practices during the construction, maintenance, operation and decommissioning of a project. |
| Perched Culvert | Means a structure which is found at or above the elevation of the native material. |
| Permanent Alteration | A permanent alteration to fish habitat of a spatial scale, duration or intensity that limits or diminishes the ability of fish to use such habitats as spawning grounds, or as nursery, rearing, or food supply areas, or as a migration corridor, or any other area in order to carry out one or |
more of their life processes.

<table>
<thead>
<tr>
<th>Term</th>
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<tbody>
<tr>
<td>Realigning (watercourse)</td>
<td>Means the construction of a new watercourse or a new alignment which may include the clearing, widening, and/or deepening of the existing watercourse.</td>
</tr>
<tr>
<td>Recreational (fishery)</td>
<td>Means that fish is harvested under the authority of a license for personal use of the fish or for sport.</td>
</tr>
<tr>
<td>Right-of-Way</td>
<td>Means the strip of land within the limits of which a roadway is built and is usually indicated by a fence line or bush line.</td>
</tr>
<tr>
<td>Riparian Vegetation Areas</td>
<td>Means trees, shrubs and other vegetation within 30 metres of the top of a waterbody bank.</td>
</tr>
<tr>
<td>Scaling</td>
<td>Means the local flaking or loss of the surface portion of concrete or mortar as a result of the freeze-thaw deterioration of concrete.</td>
</tr>
<tr>
<td>Sediment</td>
<td>Means soils or other surface material transported by wind or water as a result of erosion. Note that sediment is considered a deleterious substance.</td>
</tr>
<tr>
<td>Serious harm</td>
<td>Means, as defined by the Fisheries Act, the death of fish, or a permanent alteration to, or destruction of fish habitat.</td>
</tr>
<tr>
<td>Spalling</td>
<td>Means the detachment of a fragment from a larger concrete mass.</td>
</tr>
<tr>
<td>Top of Valley Slope</td>
<td>Means any permanent or intermittent, natural or constructed body of water including lakes, ponds, wetlands and watercourses, but does not include stormwater management ponds.</td>
</tr>
<tr>
<td>Waterbody Bank</td>
<td>Means the area of slope on or adjacent to a waterbody, from the high water level to the top of valley slope.</td>
</tr>
<tr>
<td>Waterbody Bed</td>
<td>Means the bottom of the watercourse over which the water flows.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
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<td>-------------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Watercourse</td>
<td>Means a stream, creek, river, or channel, including ditches, in which the flow of water is permanent, intermittent or ephemeral.</td>
</tr>
<tr>
<td>Watercrossing (MTO)</td>
<td>Means a culvert or bridge structure used on a roadway to cross a waterbody.</td>
</tr>
<tr>
<td>Wetlands</td>
<td>Means lands that are seasonally or permanently covered by shallow water, as well as lands where the water table is close to or at the earth’s surface.</td>
</tr>
</tbody>
</table>