

**CONSERVATION MEASURES AND TIMING WINDOWS
FOR PEACE REGION FISH STREAM CROSSINGS**

(Excluding the Mackenzie District)



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CONSERVATION MEASURES AND TIMING WINDOWS FOR PEACE REGION FISH STREAM CROSSINGS

(Excluding the Mackenzie District - Revised May, 2002)

1.0 PURPOSE

The purpose of this document is to provide direction regarding timing windows and measures for in-stream works, in order to adequately manage and conserve aquatic resources. It has been prepared by the designated environment officials (DEOs) in the Peace sub-region, using the best information currently available, and in consultation with Fisheries Branch of the Ministry of Water, Land and Air Protection (MWLAP) and the federal Department of Fisheries and Oceans (DFO).

These measures may be revised from time to time as new information becomes available.

2.0 SCOPE

This document applies to all drainage construction, road deactivation and temporary stream crossings falling under the Forest Act, Range Act and Forest Practices Code of BC Act, and which may affect a fish stream within the Dawson Creek, Fort St. John or Fort Nelson Forest Districts. It includes all works in or about a stream for forestry operations or projects performed under the auspices of Forest Renewal BC (FRBC).

3.0 AUTHORITY

The Minister of Environment, Lands and Parks (now MWLAP) has established Forest Ecosystem Specialists, Habitat Protection Officers and Water Resource Specialists as DEO's for the purposes of the following regulations:

1. Timber Harvesting Practices Regulation (THPR) [June 15, 1998]
 - 21(3)
2. Forest Road Regulation (FRR) [March 1, 2000]
 - Part 2 Section 2.4;
 - Part 3 Section 13(1)(h);
 - Part 5 Sections 19 and 20(1)(h)
3. Woodlot License Forest Management Regulation (WLFMR)[March 1, 1999]
 - Part 4 Sections 50(2) and 56;
 - Part 5 Section 68

In-stream works not covered under the above noted FPC Regulations require a notification for works "in-and-about a stream" under Section 9 of the Water Act. Notifications must be submitted to a Habitat Officer from MWLAP.

4.0 RESPONSIBILITY

It is the responsibility of the proponents of operations in and about a stream to ensure compliance with these measures and timing windows, which are legally required to be applied to all works that the above FPC regulations apply. However, these measures are not approvals for activities that may result in harmful alteration, disruption or destruction of fish or fish habitat (*Fisheries Act Sect. 35(1)*), or the introduction of deleterious substances (*Fisheries Act Sect. 36(3)*). No authorization to alter, disrupt or destroy fish habitat is expressed or implied, as such authorization is exclusive purview of the Minister of Fisheries and Oceans, Canada. **It is the proponent's responsibility to identify and refer proposals to DFO where concerns regarding protection of fish and fish habitat are of concern. Please refer to Section 5.0 for instances where DFO would require a referral.**

Works that will not be carried out within these specified timing windows or that will not be in accordance with the specified measures must be referred to the DEO for site-specific timing windows and/or measures. These measures and timing windows do not authorize anyone to conduct or participate in activities that are contrary to any provincial or federal statute. Any contract between a forest licensee or tenure holder and the Ministry of Forests does not affect the MWLAP's mandate to monitor and, when necessary, investigate violations involving land, fish, wildlife or their habitats.

Proponents are reminded that it is their responsibility to correctly classify streams being crossed and to determine the species of fish present in order to comply with the in-stream work windows and measures. Stream classification must be conducted as described in the Fish-stream Identification Guidebook or by a Local Area Agreement (LAA). All streams with gradients less than 20% must be considered as fish streams unless Code definitions, standard sampling techniques prove fish absence, or Local Area Agreements allow otherwise. Planning and construction costs may be reduced by strategic and timely stream assessments and riparian classifications.

5.0 REFERRALS

In-stream activities that are consistent with this identified timing windows and measures document do not require referral to the MWLAP unless specifically requested by the DEO for consideration of alternate timing windows and/or measures. Works conducted in and about a stream to which a standard or regulation under the Forest Practices Code of BC Act applies do not require authorization under the Water Act (Section 44(2)).

The Department of Fisheries and Oceans (DFO), Habitat and Enhancement Branch, will require referral for projects that propose, but are not necessarily limited to the following activities:

1. Bridge designs that identify or require the use of instream piers.

2. Where instream work is proposed outside the window of least risk for the fish species present.
3. Bridge design proposals where approaches or abutments are planned in areas of off channel habitat such as ephemeral channels.
4. Road fill placement proposals within the active floodplain of a stream.
5. Design that involves channelization, redirection (groynes), or constriction of the active stream channel.
6. Roads running parallel to streams within the riparian management zone.
7. Road approaches and bridge crossing proposals that are not perpendicular to the stream channel.
8. Crossing design proposals over streams in areas where the stream is highly active (meandering or braiding).
9. Any proposal that requires a stream diversion.
10. Proposals that replace an existing bridge with a new bridge at a different crossing site.

6.0 TIMING WINDOWS

In-stream work can result in detrimental effects to fish and fish habitat, including the harmful alteration or destruction of spawning habitat, introduction of sediment and the destruction of fish eggs and juveniles prior to emergence from gravel. Therefore, such work must be undertaken during times or periods when these harmful effects will be minimized. Timing windows may better be referred to as **windows of least risk** regarding fish and fish habitat.

In-stream timing windows (windows of least risk) for the Dawson Creek, Fort St. John and Fort Nelson Forest Districts are as follows:

FISH AFFECTED	WINDOWS OF LEAST RISK *
Both spring and fall spawners	July 15 - August 15
Fall spawners (e.g. Bulltrout, Kokanee and Mountain Whitefish)	June 15 - August 15
Spring spawners (e.g. Arctic Grayling, Rainbow Trout, Walleye)	July 15 - March 31
Anadromous Salmon	DFO has site-specific time windows if needed

- * If fish species information for a particular stream is not available, the in-stream timing window for both spring and fall spawners must be used.
- * Proponents are reminded that stream inventory data for fish presence/absence are critical to establishing the widest possible timing windows.
- * These timing windows must be applied to all construction in fish streams, as well as tributaries that have a high risk of depositing sediment into fish streams.

6.1 Variances to Timing Windows

Where a proponent wishes to vary from the approved timing window, a **variance must be requested from the DEO**. Requests will be evaluated on a case by case basis. Any such request must include site specific information (i.e. see Stream Crossing Data Sheet, attached) and include a description of any **mitigation strategy** and an environmental **monitoring plan**. Any request for a variance must be submitted, **in writing**, to the DEO at least 3 weeks prior to the initiation of in-stream work. Any approval for a variance from the timing windows outlined in this document must be kept at the construction site.

Notwithstanding the above, if any one of the following conditions is met, then the timing window extends from January 1 through December 31 of any given year:

1. On fish streams, the stream channel is dry and the construction, modification or deactivation activity will not result in the introduction of sediment into fish habitat.
2. Winter crossings of fish streams located on cutblocks where appropriate winter crossing methods are identified in a Forest Practices Code approved plan (i.e. SP, FDP, SFMP).
3. On fish streams, the structure does not encroach below the high water mark, no work is proposed within the stream channel and the risk of sediment delivery to the stream is low.

7.0 MEASURES

Unless specifically stated otherwise in this section, measures apply to any construction, modification, and deactivation activity at fish stream crossings. As well, the measures apply to any deactivation activity on all stream crossings except those requiring District Manager approval pursuant to Forest Road Regulation Section 20(2)(b), (c), and (d).

Guidelines, such as the *Forest Practices Code Fish-stream Crossing Guidebook (March, 2002)* and the *Land Development Guidelines for the Protection of Aquatic Habitats (BC Environment and DFO, 1992)*, should be consulted for potential culvert and bridge installation options to minimize the risk of damage to fish and fish habitat. However, the

additional direction in this document takes precedence over such guidelines, where differences occur.

Stream channel width referred to in these measures is defined in the Forest Practices Code Fish-stream Identification Guidebook as follows: *“Stream channel width is the horizontal distance between streambanks on opposite sides of the stream measured at right angles to the general orientation of the banks. The point on each bank from which width is measured is usually indicated by a definite change in vegetation and sediment texture. This border is the ‘normal’ high-water mark of the stream and is sometimes shown by the edges of rooted terrestrial vegetation. Above this border, the soils and terrestrial plants appear undisturbed by recent storm erosion. Below this border, the banks typically show signs of both scouring and sediment deposition.”*

7.1 Planning Measures

- 7.1.1 Upon request from the DEO, documentation must be provided which shows how the crossing will provide fish passage, minimize sedimentation and protect spawning and other fish habitats.
- 7.1.2 Road approaches and bridge crossings should be perpendicular to the stream to minimize impacts to the stream bank and riparian vegetation.
- 7.1.3 Crossing sites in areas where streams are highly active (meandering or braided) should be avoided.
- 7.1.4 Culverts in fish streams **must** be embedded into the substrate. Closed bottom pipe arch or elliptical culverts should be embedded below the natural grade line of the stream a minimum of 0.3 metres, or 20 percent of the culvert height – whichever is greater. In some cases, e.g., large pipe arch structures to be installed at gentle gradients, it may be inappropriate to embed to this extent. Where a proponent wishes to vary from the installation standard given above, application in writing must be made to the DEO, who will prescribe installation procedures on a case by case basis. Round culverts measuring 1000 millimetres or greater in diameter should be embedded a minimum of 0.6 metres, or 40 percent of the culvert diameter – whichever is greater. Smaller round culverts must be embedded a minimum of 20 percent of the culvert diameter. Culverts must be sized to accommodate the 100 – year return period peak flow after embedment.
- 7.1.5 The gradients of embedded culverts must not exceed the following standard:
 - a. pipe arch culverts: 5%
 - b. round culverts: 3.5%
- 7.1.6 A bridge or other open bottom structure must be installed where gradients of fish streams exceed 5%. Where a proponent wishes to vary from this standard, application in writing must be made to the DEO. Applications will be reviewed on a case by case basis.

- 7.1.7 For culverts measuring at least 1400 millimetres in diameter, in order to promote fish passage and mitigate against the loss of the productive capacity of a stream where it flows through such a structure, individual pieces of riprap or rock of a size equal to the largest 10% of substrate material present in the natural stream channel must be placed throughout the barrel of the culvert. A heterogeneous mixture of various substrates sizes containing enough fine material to seal the streambed is recommended. This prevents sub-surface flow which can result in a barrier to fish passage. Covering the culvert barrel completely with large, coarse riprap should also be avoided, as this can result in a “de-watering” of the substrate during low flow periods as water moves through the pipe below the riprap surface.
- 7.1.8 Rock used as riprap must be durable and clean
- 7.1.9 Approaches or abutments should not be placed in areas of off channel habitat such as ephemeral channels and approach fills should not be placed within the active floodplain.
- 7.1.10 Bridges and culverts must be designed and installed to permit the passage of bedload and debris. This is especially important for fish streams or direct tributaries to fish streams that have high gradients, exhibit evidence of channel instability or debris torrenting, or have unstable terrain or highly erodible soils within the inner gorge.
- 7.1.11 Baffled culverts are not recommended for new installations and therefore should only be considered when all other practicable options have been exhausted.
Applications to use baffled culverts must be made to the DEO.
- 7.1.12 Avoid constricting the channel and increasing stream velocities in the vicinity of stream crossings by employing the following:
- a) The culvert width at the bed, or footing width, must be equal to or greater than the average width of the stream channel at the crossing location. A definition of stream channel width can be found on page 6 of this document.
 - b) Bridge abutments must not encroach the stream channel width, and associated riprap should be keyed into the existing bank, and must not encroach on the stream channel width.
 - c) Stream channel width must not be constricted by riprap placed above or below culvert installations.
 - d) Culverts must be set at the average channel slope for the site.

7.2 CONSTRUCTION MEASURES

- 7.2.1 Within each 24 hour period, in-stream work is not conducted for a period of at least eight hours during the dark period of the night, to allow opportunity for fish movement.

- 7.2.2 The installation period must be minimized.
- 7.2.3 Equipment must be located on and work from the stream bank or naturally dry channel rather than within the wetted perimeter of the stream, unless authorized by the MWLAP Designated Environment Official or DFO.
- 7.2.4 Wherever possible, the work area must be isolated from the stream flow.
- 7.2.5 If channel de-watering is conducted, fish must be salvaged from the de-watered area and returned to the stream. Fish salvaging requires a collection permit to be obtained from MWLAP (Fort St. John) prior to salvage activities.
- 7.2.6 If standing water is present within the work site (original stream channel) in appreciable amounts, it must be pumped to an off-channel vegetated area that is sufficiently far from the stream to allow for suspended fine particles to settle or be filtered out, prior to the water re-entering the stream.
- 7.2.7 Road surface runoff is to be diverted into vegetated areas that are sufficiently far from the stream to allow for suspended fine particles to settle or be filtered out, prior to the water re-entering the stream.
- 7.2.8 Measures must be taken to prevent deleterious substances from entering the stream (e.g. oil spill kits on site).
- 7.2.9 All equipment used on site should be in good repair and free of excess grease and oil.
- 7.2.10 If wood preservatives that are toxic to fish are used, use them only in accordance with the publication entitled “Guidelines to Protect Fish Habitat from Treated Wood used in Aquatic Environment in the Pacific Region” (Canadian Technical Report of Fisheries and Aquatic Sciences 2314) and use wood that has been treated using “Best Management Practices for the Use of Treated Wood in Aquatic Environment – Canadian Version” (Canadian Institute of Treated Wood – Western Wood Preservers Institute). Both documents may be found (in PDF format) at the Western Wood Preservers Institute website <http://www.wwpinstitute.org/>.
- 7.2.11 All cast-in-place concrete and grouting must be completely separated from fish bearing waters until fully set.
- 7.2.12 Sediment control structures may be temporary or long-term. Temporary sediment control structures must be in place prior to initiation of construction, and functioning properly during construction. Long-term sediment control structures must form part of the as-built plan and must be functioning immediately after construction is completed. Suggested measures include, but are not limited to, those outlined in the *Fish-stream Crossing Guidebook* and the *Land Development*

Guidelines for the Protection of Aquatic Habitats (BC Environment and DFO, 1992). Short-term sediment control structures utilized, such as straw bales or silt fences, must be maintained and cleaned out on a regular basis.

- 7.2.13 In-stream work must be suspended if stream flows exceed the capacity of sediment control measures (settling ponds, silt fence, etc.).
- 7.2.14 During construction or deactivation activities, damage to the stream channel, banks, and riparian vegetation in the vicinity of the work area must be minimized. Where damage occurs the channel and/or banks must be stabilized.
- 7.2.15 During periods of heavy or persistent rainfall, work in or near the stream should stop.
- 7.2.16 If migrating adults or redds of species of fish listed in the Operational Planning Regulation 1 are observed in or downstream of the work area, work activities must be suspended and the DEO notified.
- 7.2.17 Fisheries experts may establish site-specific operating standards for projects carried out under the Watershed Restoration Program of FRBC. Such standards must be referred to the DEO.

7.3 Measures Upon Completion of Construction or Deactivation

- 7.3.1 The stream channel, banks and other affected work areas at the site must be restored to their approximate original configuration. Any fill material that has been added to the stream channel must be removed and deposited above the normal high-water mark.
- 7.3.2 Upon completion of in-stream work, all temporary bridges, culverts, pipe conduits, non-natural or treated wood construction materials, or other structures that are no longer being utilized, must be placed above the normal high-water mark. These materials must be removed from the stream floodplain prior to the spring freshet.
- 7.3.3 All soils exposed as a result of work activities must be promptly re-vegetated to prevent erosion and stream sedimentation. Seeding with an ecologically suitable seed mix concurrent with the work to maximize the speed and density of re-vegetation is recommended for most stream crossings. Fertilizers must not be applied where they will directly enter a fish stream.

7.4 Crossing Measures

7.4.1 Crossings associated with the installation of crossing structures

If multiple crossings of a fish stream are required, an appropriate temporary or permanent crossing structure (e.g. bridge, culvert) should be installed. Two pre-installation crossings (across once – first crossing; return cross – second crossing) by heavy equipment such as a hoe are permitted for the installation of crossing structures, providing the stream bed and banks are comprised of relatively stable, non-erodible materials. If more than two pre-installation crossings are required, a request to the DEO must be made. If the stream bed or banks are composed of highly erodible materials (e.g. silt, silt loams, dominated by organic materials, etc.) and experience significant erosion, stream sedimentation, bank destabilization or stream channel degradation as the result of heavy equipment crossings, a temporary work bridge must be used for crossing fish streams.

7.4.2 Crossings not associated with the installation of crossing structures

- Work bridges should be used as temporary crossing structures wherever possible, rather than fording over natural substrates or across logs placed in the stream channel. *The Fish-stream Crossing Guidebook* recommends against the use of constructed fords for fish streams, and the use of constructed fords is only acceptable to the MWLAP under certain conditions.
- Heavy equipment crossings of fish streams that are not associated with the installation of a crossing structure (e.g. excavator crossing a stream through a deactivated road, to conduct mounding on a block) must be authorized by the DEO when those crossings occur outside of the appropriate timing window.
- For crossings during the appropriate timing window, two crossings of fish streams are permitted without DEO approval. If more than two crossings are required, authorization by the DEO is required. If the stream bed and banks are highly erodible (e.g. dominated by organic materials, silt, silt loams, etc.), and significant erosion, stream sedimentation, bank destabilization or stream channel degradation will likely result from heavy equipment crossings, a temporary work bridge must be used.
- For fish streams averaging at least 1.5 meters in width, a temporary work bridge must be used for all stream crossings that occur outside of the appropriate timing window, unless a different means of crossing is authorized by the DEO.

7.5 Other Considerations

7.5.1 Water Licensees and Other Users

Water licensees or domestic users downstream from a proposed crossing, who may be affected by the proposal (especially by sedimentation or disruption of water flow), must

be notified of the development prior to the commencement of work, and must be protected from the effects of the development.

7.5.2 Beavers

In locations where beaver activity occurs, bridges or oversized culverts should be used to reduce maintenance requirements and to reduce downstream habitat damage resulting from dam removal. If non-oversized culverts are used where signs of recent beaver activity are present, measures should be taken (e.g. “beaver stops”) to reduce the chance of beavers damming the culvert.

The removal or modification of beaver dams must be authorized in writing under authority of the provincial Wildlife Act, obtained through application to the MWLAP Conservation Officer Service.

Normally, the removal of beaver dams will only be allowed during the in-stream work windows identified in this document and definitely no later than September 15. If approval is given, the following procedures for dam removal must be followed:

- Dam removal must occur slowly, a bit at a time, in order to minimize scouring and the addition of silt to downstream areas. As a general guideline, water flowing through a dam breach should not exceed 0.1 – 0.2 square meters in area.
- Where two (or more) dams in succession will be breached or removed, the dam furthest downstream must be breached first, and its associated pond allowed to drain completely, before the upstream dam is breached.

7.5.3 Emergency Situations

Damage to stream channels or fish habitat, or the introduction of deleterious substances to a stream, must be reported to the MWLAP and DFO immediately. This includes impacts that have occurred **inside or outside** the prescribed timing window.

In some circumstances, emergency action will be required to protect roads, stream environments or crossing structures from catastrophic damage. Should consultation on mitigative measures be impossible due to an emergency need to prevent damage, the emergency situation and extent of remediation activity must be reported, in writing and with a map, to the MWLAP and DFO within 72 hours.

7.6 **Variances to Measures**

Where a proponent wishes to vary in-stream work from the measures outlined in this document, a **variance must be requested from the DEO in writing** at least three weeks prior to the initiation of in-stream work. Any such request must include site specific information (i.e. see Stream Crossing Data Sheet, attached), and include a description of

any **mitigation strategies** and an **environmental monitoring plan**. Any approval for a variance from the measures outlined in this document must be kept at the work site.

8.0 MWLAP STREAM CROSSING DATA SHEET

STREAM CLASS:		CONTACT PERSON / LICENSEE:	
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Administrative Information:

Stream Name:		General Location:	
Tributary to:		Watershed:	
Fish species present in system and what information was used to determine this (anecdotal, F.I.S.S. maps, sampling):			
Road Permit No.:		CP/Block No.:	
Date Surveyed:		Field Crew:	
BCGS Mapsheet :		Air Photo No.:	

Crossing Structure Information:

Type and Dimensions of Crossing Structure (bridge/culvert/arch):	
Culvert Gradient:	
Permanent or Temporary Installation:	
Proposed Dates of Work (start / finish):	
In-stream Work Window:	

Stream Channel Information:

Average channel width (m):		Average wetted width (m):	
Average water depth (m):		High water mark (m):	
Left bank height (m):		Left bank sideslope (%):	
Right bank height (m):		Right bank sideslope (%):	
Stream gradient (%):		Flow estimate: (Low / Moderate / High)	
Permanent / ephemeral:		Length surveyed:	

Note that left and right banks are designated when facing downstream.

Stream Bed Material:	Percent (%)
Fines/Organics (clay, silt, sand (<2 mm))	
Small Gravels (.2-1.0 cm)	
Large Gravels(1-6 cm)	
Small Cobbles (6-12 cm)	
Large Cobbles (13-25 cm)	
Boulders (>25 cm)	
Bedrock	

