

**Terms and Conditions For Changes In And About A Stream Specified By
Ministry of Forests, Lands and Natural Resource Operations
Habitat Officer, West Coast Region (Bella Coola/Central Coast)
(Updated February, 2011)**

Section 42 (1) of *the Water Regulation* gives authority to a Habitat Officer to add specific conditions to ensure the protection of habitat in addition to the conditions of general application. Under this authority the Ministry of Forests, Lands and Natural Resource Operations (MFLNRO) Habitat Officer for West Coast Region requires the following mandatory terms and conditions:

42 (1) To protect habitat, a person making a change in and about a stream under this regulation, other than under section 44(1) (o) to (s) or (2), must make that change in accordance with terms and conditions specified by the habitat officer with respect to

(a) the timing window or the period or periods of time in the year during which the change can proceed without causing harm to fish, wildlife or habitat,

The timing window of least risk to fish and fish habitat must be applied to all activities in fish streams as well as tributaries that have a risk of depositing sediment into fish streams. Windows of least risk are designed to protect all fish species known to occur in a stream. One way fish presence can be confirmed is through a fish inventory database.¹ Please note if using this database that the lack of fish records for a particular area is not necessarily equivalent to fish absence. All streams are assumed to have both spring and fall spawners, until proven otherwise. The Table below represent time periods when instream work must be conducted. Numbers in the Table represent an approved start or end date for instream work.

It should be know and understood that there is no actual time when fish (adults, fry, juveniles, alevins or eggs) are not within numerous watershed systems in the Mid Coast portion of the North Island and Mid Coast Forest District. However, these timing windows provide the time of least risk to fish and fish habitat. Salmon species are included.

CONTACT THE DEPARTMENT OF FISHEREIS AND OCEANS FOR INSTREAM WORK WINDOWS FOR SALMON SPECIES.

**Reduced Risk Work Windows for Fish and and Fish Habitat for the
Mid Coast Portion of the North Island and Mid Coast Forest District**

Location	Species	Reduced Risk Work Window	
		Start Date	Finish Date
Throughout	All Salmon	May 15	July 15
+Throughout	RB, ST, CT	September 1	November 30
Throughout	KO	August 1	September 1
Throughout	DV, BT	June 1	September 15

¹ Fisheries Inventory site at www.env.gov.bc.ca/fish/

Glossary of Abbreviations

Common Name, Scientific Name and Species Code of Fish Identified in the Reduced Risk Work Window Tables

Common Name	Scientific Name	Species Code
Steelhead	<i>Oncorhynchus mykiss</i>	ST
Rainbow trout	<i>Oncorhynchus mykiss</i>	RB
Cutthroat trout	<i>Oncorhynchus clarki</i>	CT
Coastal Cutthroat	<i>Oncorhynchus clarki</i>	CCT
Dolly Varden char	<i>Salvelinus malma</i>	DV
Bull trout	<i>Salvelinus confluentus</i>	BT
Lake trout	<i>Salvelinus namaycush</i>	LT
Brook trout	<i>Salvelinus fontinalis</i>	EB
Chinook salmon	<i>Oncorhynchus tshawytscha</i>	CH
Chum salmon	<i>Oncorhynchus keta</i>	CM
Coho salmon	<i>Oncorhynchus kisutch</i>	CO
Pink salmon	<i>Oncorhynchus gorbuscha</i>	PI
Kokanee	<i>Oncorhynchus nerka</i>	KO
Sockeye salmon	<i>Oncorhynchus nerka</i>	SO
Mountain whitefish	<i>Prosopium williamsonii</i>	MW
Chiselmouth	<i>Acrocheilus alutaceus</i>	CMC

Notwithstanding the above, if any one of the following conditions is met, the timing window is not applicable:

- If the stream channel is naturally dry (no flow) or frozen to the bottom at the worksite and the instream activity will not adversely impact fish habitat (e.g. result in the introduction of sediment into fish habitat).
- If construction of a winter crossing is proposed and such works does not adversely impact the stream channel (including stream banks), fish habitat of fish passage.

A qualified professional (Registered Professional Biologist) must be consulted to determine whether the project will have any impact on Species at Risk. Please refer to the BC Species and Ecosystems Explorer for details: <http://www.env.gov.bc.ca/atrisk/toolintro.html>

Beaver: The instream work window for beaver dam removal is June 15th to September 15th.² Opening plugged culverts or removing beaver dams and draining ponds between September 15th and June 15th can result in mortalities of both beavers and fish, and will not normally be accepted. Special circumstances may warrant dam removal during this time. Request to modify or remove beaver dams, or unplug culverts outside the work window must be accompanied by a detailed request directed to a Habitat Officer. Such request will be dealt with on a case-by-case basis, and approval may be given.

Minimize the amount of time the work site is in a disturbed state by completing work as quickly as possible, while considering worker safety and minimizing environmental risk.

(b) The minimum instream flow or the minimum flow of water that must remain in the stream while the change is being made,

- The natural rate of water flow must be maintained upstream and down stream of the worksite during all phases of instream activity. Instream activities must be conducted in the dry and the worksite must be isolated from water flowing in the stream channel.

(c)

The removal of material from the stream or stream channel in connection with the change,

- In fish streams, the permanent removal of stable, naturally occurring material from the stream or stream channel is not permitted.
- In non-fish streams, the permanent or temporary removal of stable, naturally occurring material must be minimized and completed only as necessary to make the change in accordance with Part 7 of the *Water Regulation*.
- The removal of material must not lead to stream channel instability or increase the risk of sedimentation into the watercourse.
- Any spoil materials must be placed in a location which ensures that sediment or debris does not enter the watercourse.
- For works conducted in lakes, to maintain water quality and to ensure sediment does not affect possible spawning fish populations, the in-lake work site must be isolated from the remainder of the lake. The isolated work area must ensure that sediment is contained within the work site. The isolated area must remain in place until sediments within the work site have settled. If conditions prevent the containment of sediments within the work site then the work must cease. Only the bucket of the machine is permitted to enter the lake during the works and the machine must work from above the wetted perimeter.

² A beaver dam may be modified or removed only in order to protect property (e.g. a road base), as per Section 9(2) of the *BC Wildlife Act*. A "Habitat Officer" of the Ministry of Forests, Lands and Natural Resource Operations establishes terms and conditions associated with the removal or modification of beaver dams, pursuant to Part 7, Sections 42 and 44 (1) (v) of the *BC Water Act Regulation* and Section 9 of the *BC Wildlife Act*.

Any equipment needed on site for construction work must be used in a manner that will prevent deleterious substances, such as oil, grease and other chemicals from entering the lake. This may necessitate cleaning such products from equipment prior to use.

(d) The addition of substance, sediment, debris or material to the stream or stream channel in connection with the change,

- Instream activities must be conducted in the dry and the worksite must be isolated from water flowing in the stream channel.
- All equipment must be located and operated in the dry.
- Equipment used in close proximity to the wetted perimeter must be free of deleterious material (e.g. hydrocarbons) and in good mechanical condition (e.g. no fuel or hydraulic leaks).
- Measures must be taken to ensure that no harmful material (e.g. fuel and other hydrocarbons, soil, road fill, or sediment), which could adversely impact water quality, fish and other aquatic life, and /or fish habitat, can enter the wetted perimeter as a result of the project activities.
- Erosion and sediment control structures are to be available onsite and utilized as necessary.
- Do not work in weather conditions likely to contribute to sediment production to the stream.
- If approved, beaver dam removal must occur slowly, a bit at a time, in order to minimize scouring and the addition of silt to downstream areas. Water flowing through a dam breach should normally not exceed 0.2 square metres in area (i.e., a typical breach could measure 1.0 metre x 20 centimetres in size). All material removed from a beaver dam must be side-cast in such a manner that it cannot re-enter the stream.

(e) The salvage or protection of fish or wildlife while the change is being made or after the change has been made,

- If dewatering of the worksite is necessary, fish salvage must occur on a fish-bearing stream prior to commencing works. A scientific fish collection permit must be obtained from the MFLNRO Permits and Authorization Service Bureau (<http://www.env.gov.bc.ca/pasb/applications.html>) prior to commencing salvage activities. A fish salvage permit is required from Department of Fisheries and Oceans in salmon bearing waters, contact Doug Wilson at 250 627-3448. Additional information can be accessed through the following link:
<http://www.pac.dfo-mpo.gc.ca/habitat/permits-permis-eng.htm>
- If an area is de-watered as a result of beaver dam removal or modification and results in the stranding of fish, then these fish must be salvaged and returned to the stream.
- Measures must be taken to ensure that equipment (e.g. water pumps) does not harm aquatic life.

- Do not disturb wildlife and /or their residences (e.g. beaver lodges³) within the project area.

(f) The protection of natural materials and vegetation that contribute to habitat or stream channel stability,

- Minimize disturbance to natural materials (e.g. embedded logs) and vegetation that contribute to habitat or stream channel stability.
- Useful information for adequate protection of riparian vegetation such as appropriate development setbacks can be found at the following link:
http://www.env.gov.bc.ca/habitat/fish_protection_act/riparian/documents/assessment_methods.pdf.

Note that the Riparian Area Regulation (RAR) referenced in the document accessible through the link above may not apply to your area. For more information on RAR, and whether it applies to your project, visit the Ministry's website and check the Frequently Asked Questions:

http://www.env.gov.bc.ca/habitat/fish_protection_act/riparian/riparian_areas.html.

(g) The restoration of the work site after the change has been made, and

- Complete restoration activities (including erosion control), as required, that will lead to natural pre-disturbance conditions.
- Any disturbed areas must be restored to function as they did in their pre-disturbance condition.

(h) The requirement to obtain an approval from the federal Department of Fisheries and Oceans (DFO) in connection with the change.

- Proponents are responsible for complying with the federal *Fisheries Act*. No harmful alteration, disruption or destruction (HADD) of fish habitat is authorized by this document. Be aware that a series of Operational Statements (OS) have been developed to streamline the Habitat Management Program's (HMP) regulatory review of low risk activities. The OS outline measures and conditions for avoiding the harmful alteration, disruption and destruction (HADD) to fish habitat, and thus be in compliance with subsection 35(1) of the *Fisheries Act*.
- Fisheries and Oceans Canada (DFO) habitat technologists may authorize a net loss of fish habitat, or HADD, where a mitigation/compensation package can be negotiated between DFO and the proponent.
- Project Review Application Forms (PRAF) and additional information can be found at DFO Habitat Management Website "Working Near Water" at <http://www.pac.dfo-mpo.gc.ca/habitat/index-eng.htm>.

³ Beaver may only be removed by the registered trapline holder or contract problem beaver trappers. A list of trappers can be obtained through the Bella Coola Office at 250 982-2011.

- Proponents are not required to submit their proposal for review by Fisheries and Oceans Canada (DFO) when they incorporate the measures and conditions outlined in the OS into their plans. The Following is a list of Operational Statements:

Aquatic Vegetation Removal
Bridge Maintenance
Clear Span Bridges
Culvert Maintenance
Directional Drilling
Dock Construction
Ice Bridges
Routine Maintenance Dredging
Underwater Cables

To obtain this material, please visit the following website:

http://www-heb.pac.dfo-mpo.gc.ca/decisionsupport/os/operational_statements_e.htm

- Proponents are responsible for determining whether DFO must be consulted with and whether an authorization from DFO is required prior to making the change.
- The Bella Coola DFO contact telephone number is as follows:

DFO District (Bella Coola) 250 799-5345

Section 44 of the *Water Regulation* is important, as it provides the requirements for the installation of culverts in streams. **Fish passage in pipe culverts** has historically been a problem in the Pacific Northwest. This follows in part from the emphasis on culvert efficiency and capacity to convey storm flows. Characteristics of culverts that make them efficient may create high velocities, and shallow flow that are impassable to fish. Perched outlets, inadequate jump pools, culvert obstructions, inlet drops, and inaccessible outlet weirs or rock aprons are examples of problems frequently associated with pipe culverts. Investment in stream enhancement is offset by loss of accessible fish habitat by installation of culverts that do not pass fish. If your project involves the installation of a culvert, please make special reference to Part 7 of the *Regulation*, Section 44, where it states:

44 (1) For the purposes of section 9 of the Water Act, the following changes in and about a stream may be made without the necessity of obtaining an approval or licence for that change, provided that the change is made in accordance with this regulation and in accordance with the terms and conditions, described in section 42, specified by a habitat officer:

(a) the installation, maintenance or removal of a stream culvert for crossing a stream for the purposes of a road, trail or footpath, provided that:

(ii) in fish bearing waters, the culvert allows fish in the stream to pass up or down stream under all flow conditions,

Important terms to note:

"fish bearing waters" means a stream having a fish population present at some time during the year;

"stream" includes a natural watercourse or source of water supply, whether usually containing water or not, and a lake, river, creek, spring, ravine, swamp and gulch;

Fish Passage Criteria:

Fish passage design should provide for weakest swimmers including the smallest fish. If small fish are able to pass, this provides reasonable confidence that the majority of fish can pass through the culvert.

Fish passage includes any related downstream works that may affect access to the outlet of the culvert. If the culvert is accessible and not obstructed, fish passage is determined by the hydraulics of the culvert that affect velocity and depth of flow. This is governed by slope and geometry of the culvert relative to assumed levels of discharge and accounting for backwatering effects.

Mitigation to and/or to reduce inlet and barrel velocities and/or maintain adequate swim depth is likely to be required for most culverts installed at greater than 0.5% slope. Culverts installed above 0.5% are generally likely to require backwatering to mitigate against adverse velocities and shallow depth of flow. This may involve constructing a weir or series of weirs downstream of the outlet or use of an alternative design such as embedding the culvert into the stream, so that 1/3rd of the culvert is filled with natural substrates.

Backwatering requires hydraulic design because it influences culvert capacity and results in varied flow conditions in the culvert. Culverts installed above 0.5% will generally involve hydraulic assessment of fish passage in the design. Proposed use of baffles are subject to maintenance to clear obstructed baffle slots or notches. Similarly, downstream weirs must be sufficiently robust to withstand design storm flows. Weir structures including baffle weirs need to be maintained and may require repair over the life of the culvert. This may be problematic where the responsibility for long term maintenance cannot be secured. Local government should be consulted to determine acceptance.

Culverts at less than 0.5% slope may require backwatering if depth of flow is inadequate at the inlet. Culverts should not be installed flat if there is a difference in slope between the culvert and the stream of more than 2% resulting in an inlet drop exceeding 30cm or outlet drop.

Where feasible, open bottom structures, or embedded culverts that preserve or simulate the natural stream bed, are preferred. These structures are generally more likely to be fish passable and are not subject to the same degree of hydraulic design considerations as bare pipe culverts. Provincial guidelines are contained in the Fish Stream Crossing Guidebook available for download at:

<http://www.for.gov.bc.ca/tasb/legsregs/fpc/FPCGUIDE/FishStreamCrossing/FSCGdBk.pdf>.

These guidelines were developed for the forest industry, but have equal applicability in other settings.

Assessment of fish passage in non-embedded pipe and closed bottom box culverts is based on the following criteria that have been adapted from similar criteria used in Oregon. While they are not in regulation, they are considered to be based on best available science and research on fish passage.

Fish passage should be based on juvenile fish swimming capabilities:

- Generally, this will require limiting velocities in the culvert to less than 0.6m/sec^2 .
- The minimum swim depth is 20cm to facilitate both juvenile and adult fish passage.
- Maximum outlet jump or hydraulic drop at the inlet or within the culvert should not exceed 15cm. If an outlet drop exists there must be a jump pool. Outlet jumps are not a desired feature, but may be present as a mitigating measure to a previously installed culvert. The jump pool should be the greater of 1.5 times the outlet drop or 60cm. Added depth is required to facilitate fish accelerating into a jump. The deep point of the pool must be close enough to the outfall for fish to utilize the full depth of the pool to make the jump into the culvert barrel.
- Backwatering to the inlet is important to ensure that fish do not become exhausted short of the inlet. This may happen as a result of accelerated flows at the inlet caused by inlet constriction relative to stream width, steepness of the culvert, or increased velocity associated with high fish passage flows.
- The flow velocities of the culvert need to be checked against a high fish passage discharge estimate for the culvert. Flows that are not exceeded more than 10 percent of the time during the maximum discharge month when fish may be present may be used as a high fish passage flow guideline.
- A range of low flows should be examined to ensure that the culvert will have sufficient depth of flow during low flow periods when fish may be present based on expected flows in the adjacent stream.

The foregoing considerations do not replace the need for adequate professional design or input from a professional biologist with fisheries experience. They do not cover all circumstances that may be encountered. Local government may have additional bylaws or requirements that restrict what is acceptable. Fisheries and Oceans Canada also has requirements and policies relating to fish passage pursuant to the federal *Fisheries Act*.

Confirming Fish Bearing Status of the Stream:

The presence of fish refers to migrating, spawning, and rearing fish and includes all species and life stages that may be present at any time of the year. Fish bearing status is confirmed on the basis of known presence/absence as confirmed by fish observations or inventory.

The alternative to conclusively determining fish absence is to accept that fish may potentially be present and to develop the crossing to pass fish.

Most available information on fish distribution and habitat has been compiled into the Fisheries Information Summary System (FISS) provincial database. FISS provides a standardized, systematic summary of information about fish, fish habitat and resource use (fishing). If information confirming the absence of fish is not available, a reach level survey may be required to prove fish absence.

The Fisheries Information Summary System (FISS) is maintained by the Ministry of Forests, Lands and Natural Resource Operations and Fisheries and Oceans Canada. Information may be accessed through the BC Ministry of Forests, Lands and Natural Resource Operations Fisheries Inventory Data Queries website. Much of the mapping of fish presence is interpreted at a scale of 1:20,000, the FISS misses many small streams that may contain fish in urban and rural areas. Many fish observations are single location spot observations that enable inference of fish presence upstream in the absence of documented barriers.

The Resources Inventory Committee manual Reconnaissance (1:20 000) Fish and Fish Habitat Inventory Manual is an essential reference on data recording protocols for fish-stream identification. The manual is available on the Ministry of Forests, Lands and Natural Resource Operations website: <http://ilmbwww.gov.bc.ca/risc/pubs/aquatic/recon/index.htm>. This manual contains standard data collection forms for stream reaches, reach sample sites, and fish collection records which are recommended for use. The standard for database management is the Field Data Information System (FDIS) which is available to capture and store reach, sample-site, and fish collection data. Copies of the field forms can be obtained from Crown Publications. The RIC manuals contain much more information than that required to identify fish bearing stream reaches.

The basic information needed for fish-stream identification is fish presence or absence; therefore, describing the distribution of fish in a drainage basin is far more important than gathering data on fish abundance or population age structure.

Similarly, habitat quality is not a primary factor for fish-stream identification: fish-bearing status is not based upon the potential of the habitat to produce fish. However, habitat information can provide important clues to the type of fish-habitat use that can occur in an area, and it can identify operational considerations for locating stream crossings.

Fish presence can be determined by a number of acceptable techniques that cover a range of efficiency and sampling intensity. The simplest technique might be sufficient to determine presence. Fish presence is confirmed once an individual specimen of the appropriate species is properly identified.

Determination of the absence of fish from a body of water is much more difficult. While no fish may be captured at successively greater levels of sampling intensity, the ultimate “proof” of absence must be associated with the most intensive and efficient procedure appropriate for the species, life stage and time of year. For example, when sampling for quantitative purposes, baited traps are ideally set over 24 hours for juvenile fish, or two-trial electrofishing is performed. It is recognized that these levels of effort are sometimes difficult to achieve.

Ultimately, an acceptable survey has been performed when there is, in total, sufficient evidence to support the conclusion that fish do not occur in a given stream reach. The evidence must include, *in addition to fish capture results*:

1. Any known information on fish presence upstream and downstream of the reach sampled.
2. Type and location of obstructions to fish migrations.
3. Sampling conditions including stream flow, temperature and conductivity.
4. Sampling methods and effort (include gear selection sample timing).
5. Judgment of seasonal habitat availability.
6. Evaluation of seasonal fish use of stream and off-channel habitats.

A summary of fish presence or absence should reference existing inventories and fish observation mapping. It is recommended that fish sampling results and methods used, be recorded in on standard fish collection forms. Contractors that have the capability are encouraged to enter the information into the FDIS database management system. These data standards will ensure data are captured and available for future uses including the review of the stream classifications.

Sampling should be carried out at least 2 times during the year. The critical sampling periods include:

- Winter periods to capture spawning and fish rearing in headwater streams
- Summer periods during the low flow periods in areas where juveniles may be rearing.

All stream reaches for which non-fish-bearing status is proposed require a short, concise, written justification for this designation. This non-fish-bearing status report contains information that, in the professional opinion of the person responsible for the survey, provides sufficient evidence to support the conclusion that fish do not occur in the stream reach in question. Information that should be provided includes:

1. Date and time of sampling events, including initial and any follow-up sampling efforts.
2. Fish sampling methods and effort employed.
3. Capture methods used (e.g., electrofisher; Gee traps; use of barrier nets at either downstream limit, upstream limit, or at both ends of the sampled site).
4. Sampling area covered (number, length and area of sample site).
5. Sampling effort (e.g., number of traps, electrofishing seconds).
6. Stream conditions during sampling (e.g., specific conductance; flow stage of high, medium or low; temperature; turbidity).
7. Supporting evidence:
 - i. Known fish species presence both upstream and downstream.
 - ii. Type and location of obstructions to fish migrations.
 - iii. Seasonal habitat availability.
 - iv. Seasonal fish use of stream and off-channel habitats.
 - v. Results of any 1:20 000 reconnaissance fish and fish habitat inventory conducted in the watershed.

Downstream barriers must be confirmed as permanent and described as to whether they are assessed as natural or manmade, and whether the barrier is year round or seasonal. Absence of resident fish above barriers must be confirmed.

This document does not supersede the requirements of the *Water Act and Regulations*, *Federal Fisheries Act* or any other related legislation. The proponent is obligated to comply with all applicable federal, provincial or municipal enactments.

Where the West Coast Habitat Officer has an agreement with a company or agency pursuant to the *BC Water Act* Section 9 and Regulation 204/88, Part 7, the agreed Standard Operation Procedures (SOP) will be considered as satisfying the above conditions.

For enquiries regarding Terms and Conditions, please contact:

Habitat Officer/Ecosystems Biologist
West Coast Region
Ministry of Forests, Lands and Natural Resource Operations
1681 Airport Road
Bella Coola BC V0T 1H0
250 982-2011