



ORDER – FISHERIES SENSITIVE WATERSHED
PRINCE GEORGE FOREST DISTRICT

This Order is given under the authority of sections 14(1) and 14(2) of the *Government Actions Regulation* (B.C. Reg. 582/2004).

The Regional Executive Director of Forests, Lands, Natural Resource Operations and Rural Development, being satisfied that:

- a. the area of land comprising each of the watersheds shown in the map set out in Schedule A have significant downstream fisheries values and significant watershed sensitivity; and
- b. the area of land comprising each of the watersheds shown in the map set out in Schedule A require special management to:
 - i. conserve the natural hydrological conditions, natural stream bed dynamics and stream channel integrity,
 - ii. conserve the quality, quantity and timing of water flow consistent with the needs of fisheries values,
 - iii. prevent cumulative hydrological effects that would have a material adverse effect on fish and fish habitat; and
- c. the watersheds require special management not provided by the Forest Planning and Practices Regulation, or another enactment.

orders that:

1. the fisheries sensitive watersheds (also referred hereafter as FSWs) shown in the map set out in the attached Schedule A (FSW identifier: f-7-019 for Walker Creek) and named in Schedule 1 are established,
2. the objectives outlined in Schedule 1 are established for the FSWs set out in the attached Schedule A,
3. the special management of the watersheds established by this Order is required to protect the habitat of fishes, including, but not limited to bull trout (*Salvelinus confluentus*) and chinook salmon (*Oncorhynchus tshawytscha*), hereinafter referred to as fish, and
4. if there is any discrepancy between the FSWs as shown in the map set out in the attached Schedule A and the approved FSW spatial layer stored in the government data warehouse, the areas as detailed in the approved FSW spatial layer will take precedent.

Definitions

Words and expressions not defined in this Order have the meaning given to them in the *Forest and Range Practices Act* (FRPA) and the regulations made under it, unless context indicates otherwise.

“access structure” - (i) temporary or permanent; (ii) and active or deactivated. Include, but are not necessarily limited to, roads, the road prism, and stream crossings as defined or described under the FRPA.

“active road” - a Forest Service Road or other form of permitted *Forest Act* road tenure that has not been deactivated.

“connected” - the water-mediated transport of matter and energy (including sediment) to downstream areas.

“coupled” - the linkage between a sediment source and a stream. Coupled slopes are those where sediment from landslides or other processes directly enters the channel, partially coupled slopes are those where only a portion of the sediment generated will enter the channel and decoupled slopes are those where none of the sediment reaches the stream because it settles along the valley bottom.

“equivalent clearcut area” (ECA) - is a disturbance-based indicator that identifies the proportion of a watershed, or specified sub-units, that has an equivalent hydrological response to a clearcut. Disturbance-based equivalency factors are assigned to forested areas that have been harvested (with consideration given to the silvicultural system & regeneration growth), cleared (anthropomorphic such as roads, private land, gravel pits, mines, railway, pipelines, utility corridors, etc.), burned (wildfire or prescribed), and/or impacted by insect infestations.

“old growth” - for the purpose of quantitative analysis for Objective 2, old growth is defined as interior forest dominated by lodgepole pine or deciduous species more than 120 years old and all other interior forest more than 140 years old.

“road” - for the purposes of Objective 6, road refers to all roads of any type

“riparian area” -For the purposes of Objective 2, riparian area refers to the management area for the entire length of the stream, measured from each streambank to a distance 15m upslope from each streambank on:

- i. S4 streams that are 0.5m or greater in stream channel width, or
- ii. S6 streams that are 0.5m or greater in stream channel width that flow directly into a fish stream.

‘sediment production’ - a source of sediment that is generated by unstable terrain, a road right-of-way, road or roadway stream crossing, and associated features and that has the potential to enter a stream.

“stream channel width” – stream channel width is the horizontal distance between the streambanks on opposite sides of the stream measured at right angles to the general orientation of the banks.

“streambank” – The point on each stream’s bank from which stream channel width (or bank height) 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 stream erosion. Below this border, the banks typically show signs of both scouring and sediment deposition.

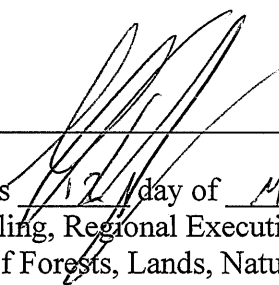
“undisturbed” – for the purpose of quantitative analysis for Objective 2, an undisturbed **riparian area** is: (i) undisturbed by primary forest activities or (ii) has recovered from a disturbance pre-dating the Order and now meets the **old growth** definition.

Schedule 1

Gazetted Name¹	Forest District	GIS FSW Identifier²
Walker Creek	Prince George	f-7-019
¹	The gazetted name of a creek or river at the lowest (downstream) point in the named FSW.	
²	The legal approved spatial FSW layer associated with this Order spatially defines the FSWs and sub-units within each FSW essential to the management direction provided by this Order.	

Objectives for f-7-019 (Walker Creek)

1. Do not exceed an equivalent clearcut area (ECA) of 13%.
2. Maintain old growth attributes and long term large woody debris (LWD) recruitment to the stream channel by retaining at least 90% of the riparian area in a state undisturbed by primary forest activities. Up to 10% of the riparian area can be in a state disturbed only by access structures crossing the stream.
3. Manage fine sediment production at all active road crossings on fish streams, and direct tributaries to fish streams, such that sediment production is kept below a moderate rating,
4. Maintain fish habitat and fish movement by ensuring that active roads crossing fish streams will be constructed, replaced, and deactivated so that they preserve or replicate, throughout the stream channel at the crossing:
 - a. the pre-crossing stream channel width, and
 - b. the natural roughness of the stream channel bed.
5. On alluvial fans and/or floodplains, minimize the extent and plan primary forest activities such that they reduce the risk of erosion, sedimentation, terrain instability and stream channel disturbance that would interfere with natural hydrogeomorphic processes and natural channel morphology.
6. Minimize road density on unstable slopes that are coupled to fish-bearing streams as well as their directly connected non-fish bearing tributaries such that they achieve a low hazard rating.
7. Do not construct new access structures within areas with lacustrine soils that are coupled to fish-bearing streams as well as their directly connected non-fish bearing tributaries except where no other practicable option exists to access timber beyond the area with lacustrine soils.
8. Minimize disturbances resulting from primary forest activities within areas identified as having lacustrine soils that are coupled to fish-bearing streams as well as their directly connected non-fish bearing tributaries.
9. Plan primary forest activities on gentle-over-steep terrain that is coupled to fish-bearing streams as well as their directly connected non-fish bearing tributaries to avoid destabilization that may result in landslides or other mass wasting events



Signed this 12 day of March, 2018
Greg Rawling, Regional Executive Director
Ministry of Forests, Lands, Natural Resource Operations and Rural Development

APPENDIX 1:

The following information is provided by the Ministry of Forest, Lands, Natural Resource Operations, and Rural Development (FLNRORD) as background information only, supporting the order establishing watersheds identified in Table 1 of the Order (FSW f-7-019). This appendix is not part of the Order.

1. Watershed Review

The content of this order is supported by information provided in the reports listed in Section 6 below.

For the purpose of providing context to this Order:

- **“fisheries values”** – any fish(es) relying on the FSW at some point during its life cycle including all associated: social, cultural, economic, or ecological characteristics attributed to a fish species. Examples of watersheds with significant fish values include watersheds with one (or combination) of the following: (i) hosts a species that is sensitive to disturbances; (ii) species richness; (iii) rare or endangered species/ populations (e.g. listed); (iv) species/populations of cultural or social importance (e.g. species that have significance to First Nations); and (v) species/populations that support a commercial or recreational fishery. Furthermore, the habitat of any one (or more) of the species as described above is also considered to be a fisheries value because the two are integrally tied, and without habitat, the fishery would be jeopardised.
- **“watershed sensitivity”** - Sensitivity, in the case of a FSW, needs to be understood in the context of a watershed. The term refers to the inherent susceptibility of a watershed to disturbance and adverse impacts resulting in changes to natural watershed processes essential to the maintenance of fish habitat attributes. For the purpose of this definition, impacts (singular or cumulative) include disturbances that are natural and/or anthropogenic in origin.

2. Further to Objective 1.

It is noted that the use of alternate silviculture regimes (e.g. partial cuts) is a potential strategy to meet ECA objectives.

Discussion on the term “equivalent clearcut area” (ECA) used in the Order and the term “hydrologically equivalent disturbed area” (HEDA) used in various reference reports:

- Within this Order, the term ECA is being used to establish an ECA percentage threshold. The percentage threshold number used is the HEDA percentage as recommended in various reports by Beaudry.
- We note that ECA and HEDA are related indicators that represent the best available science to identify the portion of a watershed that responds hydrologically as a clearcut. They are both a ‘disturbance- based’ indicators that have their foundation in the IWAP process. They report on the state of the hydrologic disturbance of the forested area of a watershed after disturbances. Disturbance-based equivalency factors are assigned to forested areas that have

been harvested (with consideration given to the silvicultural system & regeneration growth), cleared (anthropomorphic ; such as roads, private land, gravel pits, mines, railway, pipelines, utility corridors, etc.), burned (wildfire or prescribed), and/or impacted by insect infestations.

- In the reports completed by Pierre Beaudry for the Missinka, Table, Hominka and Anzac watersheds, the unique term Hydrologically Equivalent Disturbed Area (HEDA) is used to ensure clarity to the reader that in addition to using disturbance-based equivalency factors obtained from the Watershed Assessment Procedure Guidebook (Government of BC, 1999), the author incorporated equivalency factors for pine stands killed by MPB from MPB snow survey work the author completed in 2006 and 2007 in a wide variety of watersheds.
- It is recommended that qualified professionals completing ECA calculations use the best available science on hydrological recovery and disturbance-based equivalency factors for disturbed forest stands.

3. Further to Objective 5

Further information, discussion and guidance on alluvial fans and floodplains can be found in the following reference:

Wilford, D.J., M.E. Sakals, and J.L. Innes. 2005. Forest management on fans: hydrogeomorphic hazards and general prescriptions. B.C. Min. For., Res. Br., Victoria, B.C. Land Manage. Handb. No. 57.

URL: <http://www.for.gov.bc.ca/hfd/pubs/Docs/Lmh/Lmh57.htm>

Accessed: November 2017

4. Further to the terms ‘coupled’ and ‘connected’

Further information and discussion on the terms ‘coupled’ and ‘connected’ can be found in the following reference:

Church, M. 2002. Geomorphic thresholds in riverine landscapes. *Freshwater Biology* 47 (2012) pp 541-557.

Heckmann, T and Schwanghart, W. 2013. Geomorphic Coupling and sediment connectivity in an alpine catchment – Exploring sediment cascades using graph theory. *Geomorphology* 182 (2013) pp 89-103.

5. Monitoring Protocols/Methodologies

a. For calculating equivalent clearcut area (ECA) (Objective 1):

For the purpose of calculating ECA of a fisheries sensitive watershed, the calculation is done for the entire watershed area and any Parks and Protected Areas and private land that fall within the entire watershed area are to be included.

It is recommended that qualified professionals completing ECA calculations use the best available science on hydrological recovery and disturbance-based equivalency factors for disturbed forest stands.

For the purposes of monitoring compliance and determining the effectiveness of the FSW ECA objective, government will use the methodology¹ (Nov 2016) developed in the Omineca region to calculate ECA. This methodology will be updated as new science-based information becomes available on hydrological processes within watersheds.

b. For water quality assessments (Objective 3):

The Forest and Range Evaluation Program (FREP) Water Quality Effectiveness Evaluation (WQEE) protocol provides a standardized, government approved, and repeatable methodology with an order of magnitude estimate of the sediment delivery attributed to stream crossings, roads and road right-of-ways. For the purposes of monitoring compliance and determining the effectiveness of the FSW water quality Objective 3, government will use the WQEE to: (i) define the value associated with a “below a moderate rating”, and may use the WQEE (ii) as its primary method to measure water quality. For the most current version of this document, consult the FREP website.

Carson, B., D. Maloney, S Chatwin, M. Carver and P. Beaudry. 2009. Protocol for Evaluating the Potential Impact of Forestry and Range Use on Water Quality (Water Quality Routine Effectiveness Evaluation). Forest and Range Evaluation Program, B.C. Min. For. Range and B.C. Min. Env., Victoria, BC.

URL: <http://www2.gov.bc.ca/gov/content/industry/forestry/managing-our-forest-resources/integrated-resource-monitoring/forest-range-evaluation-program/frep-monitoring-protocols/water-quality>
Accessed: November 2017

c. For road density on unstable slopes Objective 6

It is recommended that the identification of unstable slopes is achieved by the completion of terrain stability assessment

For the purpose of monitoring compliance and determining effectiveness of Objective 7 for road density on unstable slopes, government will use the information contained in the September 1995 Interior Watershed Assessment Procedure Guidebook (IWAP), Level 1 Analysis Guidebook to define the

¹ Omineca Region methodology for the calculation of ECA is available upon request from the Omineca Region Research Hydrologist.

value of less than 0.15 km/km² as the density of roads on unstable slopes that fall with a “low hazard” category.

B.C. Ministry of Forests. 1995. Interior Watershed Assessment Procedure Guidebook (IWAP), Level 1 Analysis. For. Prac. Br., Min. For., Victoria, B.C. Forest Practices Code of British Columbia Guidebook.

URL:

<https://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/iwap/iwap-toc.htm>

Accessed: November 2017

d. Watershed Status Evaluation protocol (WSEP):

As part of the provincial government’s FREP a Watershed Status Evaluation Protocol (WESP) intended to assess the potential risk and current condition of a watershed with important fisheries values has been developed. For further information on the WESP protocol please visit the following FREP webpage:

URL: <https://www2.gov.bc.ca/gov/content/industry/forestry/managing-our-forest-resources/integrated-resource-monitoring/forest-range-evaluation-program/frep-monitoring-protocols/fish-watershed>

Accessed: November, 2017

e. Stream channel width measurements:

Measuring stream channel width for the purposes of this order should follow an approved, standardized and repeatable methodology. A commonly used example is detailed in the document referenced below. Determination of channel width should not include disturbed areas such as stream channel widths at pre-existing crossings.

Anon. 1998. Fish-stream Identification Guidebook. Ministry of Forests and Ministry of Environment.

URL: <http://www.for.gov.bc.ca/tasb/legsregs/fpc/FPCGUIDE/FISH/FishStream.pdf> Accessed: November 2017.

6. References and documents providing additional guidance and background information:

The following documents are provided as guidance to those persons preparing and implementing plans for primary forest activities. This list is not exhaustive and does not preclude professionals from obtaining additional, more detailed, or more current information.

b) FSW watershed reports:

Beaudry, Pierre G. 2011. Watershed Review – Walker Creek Watershed. Prepared for Ministry of Forest, Lands and Natural Resource Operation. 13 pages.

URL: <http://a100.gov.bc.ca/pub/acat/public/viewReport.do?reportId=51629>

Accessed: November 2017

Beaudry, Pierre G. 2011. Methodology: Stuart Takla - Watershed Fisheries Sensitive Watershed Selection Process. Prepared for Ministry of Forest, Lands and Natural Resource Operation. 41 pages.

URL: <http://a100.gov.bc.ca/pub/acat/public/viewReport.do?reportId=51628>

Accessed: November 2017.

APPENDIX 2:

The following information is provided by the Ministry of Forest, Lands, Natural Resource Operations, and Rural Development as background information supporting the order establishing watersheds identified in Schedule A – Table 1 of the Order FSW f-7-019. This appendix is not part of the order.

Preparing for, or modifying, a requirement stipulated in a Fisheries Sensitive Watershed (FSW) Order under the GAR

Background

Under FRPA, the Ministry of Forest, Lands, Natural Resource Operations, and Rural Development (FLNRORD) uses the Government Actions Regulation (GAR) to conserve fish, wildlife, and habitat in one of two ways: (1) using “practice” requirements, or (2) using “planning” requirements. Both of these approaches involve the establishment of a legal Order, authorized under GAR, with the Minister of Forest, Lands, Natural Resource Operations and Rural Development’s approval.

When establishing conservation measures under GAR, FLNRORD generally uses species-specific practice requirements called “general wildlife measures” (GWM). Examples of these are seen in most Ungulate Winter Range (UWR) and Wildlife Habitat Area (WHA) Orders. Once an Order containing GWMs is signed by the DM, the Order: (a) comes into effect (immediately, once the required GAR notifications are made); (b) does not require an amendment to a Forest Stewardship Plan (FSP) as it is a practice requirement under the Forest Planning and Practices Regulation (FPPR), and (c) applies to anyone holding an agreement under the *Forest Act* (e.g. permit to cut timber or build roads) for the purposes of primary forest activities on crown land.

In the case of an FSW, FLNRORD establishes conservation measures using planning requirements, called “objectives”. While all GAR orders containing either objectives or GWMs look similar, those containing objectives use somewhat different rules in their implementation. In the case of objectives, they apply only to *Forest Act* agreement holders who require an approved Forest Stewardship Plan (FSP) to operate. Also, once an Order with objectives is legally established, there is a two year amendment (phase-in) period within which the agreement holder is required to update and receive approval for their FSP reflecting the content of the order and its objective(s).²

The establishment of an Order containing objectives requires the *Forest Act* agreement holder amend their FSP by adding appropriate “results” and/or “strategies” consistent with both: the area of land described; and, each objective contained in the FSW Order. The amended FSP is then submitted for review and approval to the FLNRORD District Manager responsible for the area. While considering the content of the FSP, the District Manager is encouraged to work closely with the FLNRORD staff member responsible for coordinating FSW evaluation and Order preparation to help ensure that the FSP content is consistent with the intent of the order.

² 2009. Effects of orders made under the *Forest and Range Practices Act*, Government Actions regulation on Forest Stewardship Plans. FRPA General Bulletin #17. <https://www.for.gov.bc.ca/ftp/hth/external/publish/Web/frpa-admin/frpa-implementation/bulletins/frpa-general-no-17-effects-of-orders-made-under-the-frpa-gar-on-fsp-feb-19-2009.pdf>. Accessed: November 2017.

Application

On occasion a licensee may encounter a condition or circumstance where a planned activity is not explicitly consistent with an objective in an Order. Some examples are provided here to illustrate how these situations may be dealt with while meeting both regulatory requirements and the intent of an FSW Order.

Known information, total chance planning, & FSW Order preparation

If a forest licensee is aware of a condition or circumstance through their normal development or total chance planning processes *prior* to the approval of an Order that will make some aspect of the Order impracticable to implement, the condition or circumstance should be brought to FLNRORD's attention. Discussion at this stage of the Orders' development will ensure that the condition or circumstance is dealt with appropriately while the Order is in preparation, or during the required GAR review and comment period, prior to DM approval and legalization.

Amending a FSP to reflect FSW Orders' content

During the phase-in period used to amend a FSP and reflect the new Order, a licensee may encounter an unforeseen condition or circumstance where it is anticipated that meeting the explicit intent of an objective may be impracticable³. In these circumstances the licensee should ensure the content of an FSP (i.e. result or strategy) is crafted accordingly, following requirements for FSP preparation and approval consistent with FRPA and its regulations⁴, while maintaining the overall intent of the FSW Order (for example, but not limited to, FPPR s.12(7) and s.25.1).

New information

FSW Orders are established based on the best available science and a thorough consultative process with affected licensees and partners. If, subsequent to the Orders' establishment, new information showing that a particular metric, or management criterion, can be modified (e.g. adjusting a stipulated benchmark described in the Order) consistent with the tests provided in GAR, the Order can be amended to reflect the new information. In these cases, the licensee would simply be required to modify their FSP based on the amended FSW Order, and then submit an FSP amendment for approval to the FLNRORD District Manager responsible for the area.

In examples such as those provided above, licensees are encouraged to work closely with the FLNRORD staff member responsible for coordinating FSW evaluation and Order preparation to help ensure: (1) the appropriate content of the initial FSW Order, and (2) an efficient FSP amendment review process.

³ 2005. Use of term "practicable" under FRPA and regulations. FRPA General Bulletin #3 . <https://www.for.gov.bc.ca/ftp/hth/external!/publish/Web/frpa-admin/frpa-implementation/bulletins/frpa-general-no-3-defining-practicable-under-frpa-jun-9-2005.pdf> . Accessed November 2017.

2007. Use of term "practicable in results and strategies. FRPA General Bulletin #12 . <https://www.for.gov.bc.ca/ftp/hth/external!/publish/Web/frpa-admin/frpa-implementation/bulletins/frpa-general-no-12-use-of-practicable-in-results-or-strategies-mar-30-2007.pdf> . Accessed: November 2017.

⁴ 2005. Interpretive guidance respecting Forest Stewardship Plan questions. FRPA Administrative Bulletin #3. <https://www.for.gov.bc.ca/ftp/hth/external!/publish/Web/frpa-admin/frpa-implementation/bulletins/frpa-admin-no-3-interpretive-guidance-respecting-fsp-questions-nov-7-2005.pdf> . Accessed: November 2017.