

Policy and Practice Report

Regulation of Forestry Activities Impacting Fraser River Sockeye Habitat

20 May 2011

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Introduction

1. This policy and practice report (“Report”) is intended to provide an overview of the forestry regime in British Columbia, in particular, the management practices of the provincial Ministry of Forests, Lands and Natural Resource Operations (the “Ministry”)¹ and the federal Department of Fisheries and Oceans (“DFO” or the “Department”) as they relate to Fraser River sockeye and the protection of fish habitat. This Report relies principally on information obtained from documents disclosed to the commission or otherwise made available during the commission’s investigations. The accuracy of this Report is contingent on the accuracy of those documents.² A list of the documents referred to in this Report can be found at Appendix A.
2. This Report does not purport to be comprehensive nor authoritative, but instead aims to provide a contextual background to inform the hearings on issues arising from forestry practices and management in British Columbia relating to the protection of fish and fish habitat. A list of acronyms and abbreviations used can be found at Appendix B. This Report does not duplicate information found in other commission policy and practice reports on themes such as freshwater urbanization, effluents or pulp and paper.

BC Forests and Forestry

3. Almost 60 percent of BC’s 95 million hectares is classified as forest land.³ Protected areas (primarily in the form of federal and provincial parks) make up 7.6 million hectares, or 14 percent, of BC’s forests.⁴ Protected areas include old-

¹ For ease of reference, the Ministry of Forests, Lands and Natural Resource Operations will be referred to as the “Ministry” throughout this Report, given the name changes the Ministry has undergone during the time frame covered in this Report. The forest service was under the authority of the Ministry of Forests from 1978 - 2005, and the Ministry of Forests and Range from 2005 - 2010. In 2010 the Ministry went through three name changes and reorganizations. In March 2011, the Ministry of Forests, Lands and Natural Resource Operations was created.

² The commission’s Terms of Reference direct the Commissioner to use the automated documents management program specified by the Attorney General of Canada, Ringtail Legal. Some references in this Report list the unique document identifier attached to a given document by the Ringtail database, such as “CAN002605.”

³ Ministry of Forests, Mines and Lands, “The State of British Columbia’s Forests Third Edition” (2010) http://www.for.gov.bc.ca/hfp/sof/2010/SOF_2010_Web.pdf 2010 at 1

⁴ *Ibid.*, at 2

growth management areas, riparian reserves, wildlife habitat areas, visually sensitive areas, areas around recreation and cultural features, environmentally sensitive areas, and community watersheds.⁵ Harvesting is permitted in 22 million hectares of public forest land and in an additional two million hectares of private forest land.⁶

4. Over the last century, the amount of timber harvested annually in BC significantly increased up until the mid-1980s.⁷ It then fluctuated until 2007, when it began to show a significant decline due to the collapse of the United States housing market and the general global economic downturn.⁸ For the last ten years, timber harvest on public land averaged 69 million cubic metres per year.⁹ The area of land harvested each year (based on the average over the last decade) translates to 0.4 percent of the forest area in BC, and 0.8 percent of the forest area where harvesting is permitted.¹⁰ The Ministry estimates the long-term sustainable harvest level at 70 million cubic metres per year.¹¹

Potential Logging Impacts on Fish and Fish Habitat

5. As noted in the commission's Technical Report 3, scientific literature exists linking forestry practices to a variety of possible impacts on stream habitat.¹² Forestry practices performed within riparian areas can negatively affect stream habitat. The "riparian area" is the forest vegetation located next to the banks of streams, lakes and wetlands; it possesses distinct ecological characteristics which exert influence on the aquatic system.¹³ Riparian areas play a vital role in maintaining bank and stream channel stability, providing shade and nutrients to

⁵ *Ibid.*, at 2

⁶ *Ibid.*, at 3

⁷ *Ibid.*, at 3

⁸ *Ibid.*, at 3

⁹ *Ibid.*, at 3

¹⁰ *Ibid.*, at 3

¹¹ *Ibid.*, at 3

¹² Commission's Technical Report 3, "Evaluating the Status of Fraser River Sockeye Salmon and Role of Freshwater Ecology in their Decline," February 2011 at 125 [Exhibit 562]

¹³ Forest Practices Code Riparian Management Area Guidebook, (December, 1995) [BCP002161] at 5 See also Fisheries and Oceans Canada, Canadian Science Advisory Secretariat, *Floodplains, Flooding, and Salmon Rearing Habitats in British Columbia: A Review*, 2002 [CAN010315] at 78. See also the commission's policy and practice report entitled Overview of Freshwater Urbanization Impacts and Management.

the aquatic environment, and protecting streams from logging debris.¹⁴ Fish-bearing streams rely on forested riparian areas and large woody debris (“LWD”) in stream channels for channel stability, erosion control, creation of pools and riffles, shading, and temperature modification.¹⁵

6. *Large Woody Debris.* LWD refers to natural and human-placed logs, branches, or other wood, including uprooted or fallen trees, along the foreshore or riverbed of a stream. For fish-bearing streams, LWD is important for the overall creation of fish habitat.¹⁶ It maintains stream channel morphology, and provides storage of sediment and organic matter.¹⁷ In addition, LWD plays an important role in forming salmonid rearing pool habitats.¹⁸ These pools provide a variety of biological benefits for salmonid feeding, growth, predator avoidance, and habitat partitioning within and between species.¹⁹ The presence and amount of these pools is directly related to the amount and distribution of LWD.²⁰ The removal of sources of LWD through forestry practices can negatively impact on stream morphology by reducing sediment storage capacity and eliminating local hydraulic variability.²¹
7. *Sedimentation.* Many forestry practices, particularly road construction and steep slope logging, create soil disturbance which has the potential to significantly increase the rate of sediment input into streams.²² There are both short-term effects (turbidity increases) and long-term effects (changes to stream channel configuration) associated with increased sedimentation, all of which can be damaging to fish habitat and fish production.²³ Increases of fine sediment in

¹⁴ Ministry of Forests, Mines and Lands “The State of British Columbia’s Forests Third Edition” (2010) http://www.for.gov.bc.ca/hfp/sof/2010/SOF_2010_Web.pdf at 97

¹⁵ *Ibid.*, at 64

¹⁶ Appendix 1: Review of Impacts of Logging on Salmon Production, by David A. Levy, Ph.D., R.P. Bio. (Hatfield Consultants) [CCI001180] at 259

¹⁷ *Ibid.* at 259

¹⁸ *Ibid.*, at 259

¹⁹ *Ibid.*, at 259

²⁰ *Ibid.*, at 259

²¹ *Ibid.*, at 252

²² *Ibid.*, at 258

²³ *Ibid.*, at 258

streambed gravel can reduce the gravel suitability for salmon spawning.²⁴ Increased sediment may also fill pools and other habitat features thereby reducing the utility of the stream habitat.²⁵

8. *Fish-Stream Crossing Structures*. The installation of crossing structures may potentially cause sediment loading into streams, create alterations in channel morphology, result in direct losses to fish habitat by way of channel, benthic and riparian loss, and impede fish passage.²⁶ Adult and young fish need to be able to move freely throughout a stream system in order to find suitable habitat, and to migrate.²⁷ Crossings can impede fish passage by creating outlet drops too high for fish to navigate, “plunge” pool conditions, turbulence within the culvert, ice and debris blockage, and a lack of resting pools.²⁸

9. *Mountain Pine Beetle*. The mountain pine beetle (“MPB”) is a bark beetle native to BC that kills pine by burrowing galleries beneath the bark of mature pine trees.²⁹ The galleries kill the trees by disrupting their vascular systems.³⁰ Over 60 percent of the Fraser River watershed is affected by the MPB epidemic.³¹ In an attempt to salvage the trees killed by MPB, the provincial government significantly increased the allowable annual cut by 50 percent.³² MPB salvage logging results in loss of the forest canopy, potentially affecting water yield (the total amount of water flowing out of a watershed), low and peak flows, and flood

²⁴ *Ibid.*, at 258

²⁵ *Ibid.*, at 258

²⁶ D.J. Harper and J.T. Quigley, *No Net Loss of Fish Habitat: An Audit of Forest Road Crossings of Fish-Bearing Streams in British Columbia, 1996-1999*, published by OHEB, DFO 2000 [CAN297763] at 8

²⁷ Forest Practices Board Special Investigative Report – Fish Passage at Stream Crossings (2009) [CAN005925] at 6

²⁸ *Ibid.*

²⁹ Natural Resources Canada, Canadian Forest Service Pacific Forestry Centre Information Report BC-X-423, *Quantifying the water resource impacts of mountain pine beetle and associated salvage harvest operations across a range of watershed scales: Hydrologic modeling of the Fraser River Basin*, 2010 http://dsp-psd.pwgsc.gc.ca/collection_2010/nrcan/Fo143-2-423-eng.pdf at 13

³⁰ *Ibid.*

³¹ Pacific Fisheries Resource Conservation Council, *Mountain Pine Beetle: Salmon Are Suffering Too* [CAN412261]

³² Presentation by DFO Pacific Region to the Strategic Directions Committee “Mountain Pine Beetle” (November 22, 2007) [CAN125207] at 9

timing. A report prepared by the Forest Practices Board (the “Board”) on the attack of MPB explains the effect of removing a forest canopy:

“Removing the forest canopy may potentially increase streamflow by four processes. First, the forest canopy intercepts a percentage of the snowfall and returns it to the atmosphere, reducing the amount of snow reaching the ground and becoming runoff. Secondly, the forest provides shade, reducing snowmelt rates. The loss of wind speed in a forested stand also reduces snow melt rates. In addition, trees use water during transpiration.”³³

10. In 2010, the Canadian Forest Service Pacific Forestry Centre released a report on impacts of the MPB infestation and associated salvage logging on water resources within the Fraser River Basin.³⁴ The project found the following:

“Forest harvesting (in conjunction with beetle-kill) tends to manifest a stronger signal than beetle-kill alone, suggesting that the peak-flow regime is more sensitive to forest harvesting (represented as clearcuts) than to the conversion of live forest to dead forest.

...

The greatest sensitivity to infestation-induced forest disturbance is exhibited by modestly sized sub-basins located on the Interior Plateau (i.e., Baker Creek, West Road River, Salmon River, Mahood River, and parts of the Nechako and Stuart drainages). These areas are characterized by pine dominated forest cover (i.e., potentially high-disturbance areas) and low topographic relief (i.e., no significant regions of sub-alpine or alpine runoff). In these highly sensitive areas, peak-flow changes are substantial and can have significant local impacts on channel morphology, water quality, aquatic ecosystems, and flood risk.”³⁵

11. Technical Report 3 describes the fish habitat impacts resulting from salvage logging as hydrological changes, specifically higher peak flows, which can destabilize stream channels leading to lower egg survival.³⁶ However, Technical

³³ Forest Practices Board Special Investigation “The Effect of Mountain Pine Beetle Attack and Salvage Harvesting On Streamflows” (March, 2007) [CCI000008] at 6

³⁴ Natural Resources Canada, Canadian Forest Service Pacific Forestry Centre Information Report BC-X-423, *Quantifying the water resource impacts of mountain pine beetle and associated salvage harvest operations across a range of watershed scales: Hydrologic modeling of the Fraser River Basin*, 2010 at 11

³⁵ *Ibid.*, at 52

³⁶ Commission’s Technical Report 3, “Evaluating the Status of Fraser River Sockeye Salmon and Role of Freshwater Ecology in their Decline,” (February 2011) at 111 [Exhibit 562]

Report 3 concludes that the effects of MPB on Fraser River sockeye are expected to be relatively small.³⁷

12. The 2010 report *The State of British Columbia's Forests*, produced by the Ministry, states that "the available data suggest that forest and range activities are generally conserving and not degrading soil and water resources."³⁸ This report also notes that the management of riparian areas appears to be improving over time.³⁹

Legislative Framework

13. Section 92 of the *Constitution Act, 1867*,⁴⁰ gives provincial legislatures exclusive power over the management and sale of the provincial lands including the "timber and wood therein." Each province has the exclusive authority to make laws for the development, conservation and management of forestry resources including laws in relation to the rate of primary production.⁴¹ In accordance with this constitutional authority, the Ministry is the government agency responsible for the management of forest harvesting and the forest industry. The Ministry exercises this authority mainly through the provincial *Forest and Range Practices Act*⁴² ("FRPA").
14. Pursuant to section 91 of the *Constitution Act, 1867*, the federal government has legislative authority over the sea coast and inland fisheries.⁴³ In accordance with this constitutional authority, DFO is responsible for the management of fisheries, habitat and aquaculture, acting under the *Fisheries Act* (the "Act").⁴⁴ More information about the legislative framework can be found in the commission's policy and practice report entitled "Legislative Framework Overview."

³⁷ *Ibid.*, at 112

³⁸ Ministry of Forests, Mines and Lands, "The State of British Columbia's Forests Third Edition" (2010) http://www.for.gov.bc.ca/hfp/sof/2010/SOF_2010_Web.pdf 2010 at 5

³⁹ *Ibid.*, at 103

⁴⁰ (U.K.), 30 & 31 Victoria, c.3

⁴¹ *Constitution Act, 1867*

⁴² [SBC 2002] c.69

⁴³ *Constitution Act, 1867*

⁴⁴ [RSBC 1996], c. 149

15. Accordingly, two levels of government are engaged in management of forestry impacts on fish habitat. The provincial government (the Ministry) regulates the industry by granting licences to harvest timber, stipulating forestry practice requirements, and subsequently granting approval to licensees to carry out forestry activities. The federal government (DFO) is responsible for ensuring that forestry activities are carried out in a manner that does not harm fish or fish habitat. This means that licensees are required to comply with both the Ministry's and DFO's governing legislation.

Brief History of Forestry Regulation

16. The Province passed its first *Forest Act* in 1912, as a result of recommendations from a Royal Commission in 1910.⁴⁵ The Province amended the *Forest Act* in 1947 to regulate harvests through “allowable annual cuts.”⁴⁶ Up until 1979, Provincial compliance and inspection activities did not consider the non-timber values of forests; rather, compliance and inspection activities focused on timber harvesting contracts and unauthorized timber harvesting.⁴⁷ In 1976, a further Royal Commission led to the 1979 *Forest Act* and a new *Ministry of Forests Act*.⁴⁸ These acts put in place a new planning process that required forest managers to consider non-timber values when making management decisions.⁴⁹
17. In 1987, DFO, the Ministry, the provincial Ministry of Environment (the “MOE”), and the forest industry jointly developed the Coastal Fisheries Forestry Guidelines (the “CFFG”).⁵⁰ The CFFG were intended to represent the best management practices for forestry along the BC coast and provide protection to salmon bearing streams from forestry practices.⁵¹ They were developed in response to two DFO-led fish-forestry interaction studies, both of which found

⁴⁵ Ministry of Forests, Mines and Lands, “The State of British Columbia’s Forests Third Edition” (2010) http://www.for.gov.bc.ca/hfp/sof/2010/SOF_2010_Web.pdf 2010 at 23

⁴⁶ *Ibid.*, at 23

⁴⁷ *Ibid.*, at 214

⁴⁸ *Ibid.*, at 23

⁴⁹ *Ibid.*, at 23

⁵⁰ Fish-Forestry Monitoring Program- Draft Proposal, (March 22, 1999) [CAN020036]

⁵¹ “Freshwater Habitat” prepared by Marvin Rosenau and Mark Angelo for the Pacific Resource Conservation Council, (June, 1999) [CAN002592] at p. 61; see also Fish-Forestry Interaction Program website <http://www.for.gov.bc.ca/hre/ffip/index.htm> Government of British Columbia [BCP000474]

that existing forest practices were damaging fish habitat.⁵² In 1970, DFO initiated the first watershed study at the Carnation Creek watershed with MacMillan Bloedel Ltd. (now Weyerhaeuser Company).⁵³ The Carnation Creek Project quickly expanded into a multi-agency program and has studied the effects of forest practices on both watershed processes and salmon populations for over 35 years.⁵⁴ The second fish/forestry interaction project was initiated in 1981 in the Queen Charlotte Islands and focused on the effects of landslides on channel morphology and fish habitat, as well as rehabilitation techniques and silviculture treatments.⁵⁵

18. In 1994, Tripp Biologist Consultants Ltd. prepared the report, *The Use and Effectiveness of the Coastal Fisheries Forestry Guidelines in Selected Forest Districts of Coastal BC*.⁵⁶ This report confirmed the growing concerns about non-compliance with the CFFG and brought the issue into the public spotlight.⁵⁷ One year later, the provincial government passed the *Forest Practices Code of British Columbia Act*⁵⁸ (“FPC Act”), changing the regulation of forestry dramatically by implementing prescriptive requirements for the forest industry. BC’s regulation of the forest industry from 1994 forward is discussed further in the sections below.

Provincial Regulatory Tools

19. As noted above, the Ministry is responsible for regulating forestry practices as per the *FRPA*. The Ministry is a three-tiered, decentralized organization consisting of headquarters (divided into divisions), regional offices and district

⁵² *Ibid.*

⁵³ Fish-Forestry Interaction Program website, Government of British Columbia <http://www.for.gov.bc.ca/hre/ffip/CarnationCrk.htm#Introduction> [BCP000474]

⁵⁴ *Ibid.*

⁵⁵ “Freshwater Habitat” prepared by Marvin Rosenau and Mark Angelo for the Pacific Resource Conservation Council (June 1999) [CAN002592] at 61

⁵⁶ As cited in “Freshwater Habitat” prepared by Marvin Rosenau and Mark Angelo for the Pacific Resource Conservation Council (June 1999) [CAN002592] at 61

⁵⁷ *Ibid.*, at 61

⁵⁸ [RSBC] 1996 c. 159

offices. This general structure has been in place since the passing of the *Ministry of Forests Act* and the subsequent creation of the Ministry in 1978.⁵⁹

20. The *Forest Practices Code* (the “Code”) was implemented in 1994 and was the first piece of provincial forestry legislation that provided for the protection of fish and fish habitat. In response to the implementation of the Code, the Ministry underwent a ministry-wide reorganization in 1994.⁶⁰ The Ministry was divided into four main divisions: Operations, Forestry, Management Services, and Policy and Planning.⁶¹ Each division was led by an assistant deputy minister.⁶² The Operations division was the largest and the only division with direct regional and district responsibilities.⁶³ The Operations division included a newly created Enforcement Branch.⁶⁴
21. Under the Operations division, the province was divided into six forest regions and further subdivided into 43 districts.⁶⁵ Each region was led by a regional manager and each district by a district manager, with the district manager reporting to the regional manager.⁶⁶ Regional office staff were responsible for coordinating and monitoring the activities of the field staff operating out of the district offices.⁶⁷ Regional office staff were also responsible for developing regional programs and plans, and ensuring that all policies, programs, and procedures directed from Ministry headquarters were administered consistently and effectively throughout the region.⁶⁸ In 1996, the Ministry eliminated 515

⁵⁹ Report of the Ministry of Forests Year Ended December 31, 1978
http://www.for.gov.bc.ca/hfd/pubs/docs/mr/annual/ar_1966-80/annual_1978.pdf Province of British Columbia Ministry of Forests at 13

⁶⁰ Ministry of Forests Annual Report 1994/1995
http://www.for.gov.bc.ca/hfd/pubs/docs/mr/annual/ar_1994-95/part1.htm

⁶¹ *Ibid.*, at Part 3

⁶² *Ibid.*, at Part 3

⁶³ *Ibid.*, at Part 3

⁶⁴ *Ibid.*, at Part 1

⁶⁵ *Ibid.*, at Part 3

⁶⁶ *Ibid.*, at Part 3

⁶⁷ *Ibid.*, at Part 3

⁶⁸ *Ibid.*, at Part 3

positions (of approximately 4,600) and reduced the number of forest districts from 43 to 40 in order to cut costs.⁶⁹

22. The Ministry announced a new organizational structure in February 2002, which included the closing of offices and branches as a result of reductions to ministry resources.⁷⁰ The new structure gave the Victoria headquarters the following re-structured divisions: Corporate Policy and Governance, Operations (Field Services and BC Timber Sales), Forest Stewardship, Tenure and Revenue, and Communications.⁷¹ The Operations division was reorganized to include three forest regional offices with 29 forest district offices, four satellite offices, 12 BC Timber Sales offices, and six fire centres.⁷² Implementation of the new structure took place over a three-year period, with a total reduction of 893 employees.⁷³ In 2004, BC Timber Sales was taken out of the Operations division and began reporting to a separate assistant deputy minister.⁷⁴ In 2005, the Ministry was renamed the Ministry of Forests and Range.⁷⁵
23. On October 25, 2010, the Ministry of Forests and Range was dissolved and its responsibilities were split between the new Ministry of Forests, Mines and Lands and the new Ministry of Natural Resource Operations.⁷⁶ On March 14, 2011, Premier Christy Clark announced a further reorganization creating the new Ministry of Forests, Lands and Natural Resource Operations.⁷⁷ Under this organization there are eight regions and 25 districts. District managers will

⁶⁹ Ministry of Forests Annual Report 1996/97 http://www.for.gov.bc.ca/hfd/pubs/docs/mr/annual/ar_1996-97/appndx_1.htm#1 Appendix 1: The Ministry Structure

⁷⁰ Ministry of Forests 2002/03 Annual Service Plan Report http://www.for.gov.bc.ca/hfd/pubs/docs/mr/annual/ar_2002-03/for.pdf Appendix 2: Ministry Organization at 43

⁷¹ *Ibid.*, at 43

⁷² *Ibid.*, at 43

⁷³ Ministry of Forests 2003/04 Annual Service Plan Report http://www.for.gov.bc.ca/hfd/pubs/docs/mr/annual/ar_2003-04/for.pdf at 9

⁷⁴ Ministry of Forests 2004/05 Annual Service Plan Report http://www.for.gov.bc.ca/hfd/pubs/docs/mr/annual/ar_2004-05/for.pdf at 14

⁷⁵ Ministry of Forests and Ranges and Minister Responsible for Housing 2005/06 Annual Service Plan Report http://www.for.gov.bc.ca/hfd/pubs/docs/mr/annual/ar_2005-06/for.pdf at 7

⁷⁶ Ministry of Forests, Mines and Lands "The State of British Columbia's Forests Third Edition" (2010) http://www.for.gov.bc.ca/hfp/sof/2010/SOF_2010_Web.pdf at 4(iv)

⁷⁷ British Columbia Office of the Premier News Release, Premier Christy Clark announces Cabinet, March 14, 2011 http://www2.news.gov.bc.ca/news_releases_2009-2013/2011PREM0018-000255.htm

continue to be responsible for forest authorization approvals, and will take on a more generic role approving other natural resource authorizations. At the time of writing this Report, implementation of this new organizational structure was still in progress.

24. The Compliance and Enforcement (“C&E”) branch operates under the Integrated Resource Operations division of the Ministry. C&E’s activities apply to all natural resource operations under the Ministry (e.g., forestry, mining, oil and gas). The regions provide C&E staff with a priority list to guide their work. In addition to C&E’s work, the Ministry’s Forest and Range Evaluation Program (“FREP”) conducts monitoring to determine how effective forestry practices carried out by licensees are in achieving management objectives.⁷⁸ Thus, C&E carries out compliance and enforcement work assessing whether licensees are complying with the *FRPA* and its regulations, and FREP carries out monitoring of forestry practices focusing on the outcomes, and whether management objectives are being achieved. FREP is discussed further below.
25. As outlined in the *Ministry of Forests and Range Act*, the Ministry has five key purposes:
 - “Encourage maximum productivity of forest and range resources;
 - Manage, protect and conserve forest and range resources for immediate and long term economic and social benefits;
 - Plan the use of the forest and range resources of government, coordinated and integrated with other natural resources; in consultation and cooperation with other government ministries and agencies, and with private sector;
 - Encourage a vigorous, efficient and world competitive timber processing industry, and ranching sector; and
 - Assert the financial interest of the government in its forest and range resources in a systematic and equitable manner.”⁷⁹

⁷⁸ British Columbia, Forest and Range Evaluation Program website
<http://www.for.gov.bc.ca/hfp/frep/about/index.htm>

⁷⁹ Ministry of Forests and Range 2009/10 Annual Service Plan Report
http://www.for.gov.bc.ca/hfd/pubs/docs/mr/annual/ar_2009-10/for.pdf at 6; *Ministry of Forests and Range Act*, [RSBC 1996], c. 300, s. 4

26. The Ministry is responsible for granting the right to harvest timber and stipulating the allowable annual cut through the issuance of licences pursuant to the *Forest Act*. The Ministry is also responsible for providing approval to licensees to commence forestry practices once it is satisfied the licensee has complied with the *FRPA*'s planning requirements. As described further below, as part of the *FRPA* planning requirements, licensees must demonstrate how their forestry practices will be carried out in such a way as to protect fish and fish habitat.
27. Prior to 2004, and the passing of the *FPRA*, the forest industry was regulated by the Code which was comprised of the *FPC Act*, its regulations, guidebooks, and practice standards. The Code included provisions pertaining to the protection of fish and fish habitat by way of the *FPC Act* and the guidebooks.
28. The transition from the *FPC Act* to the *FRPA* has significantly reduced the requirements on industry.⁸⁰ Instead of six plans (discussed below) under the *FPC Act*, the *FRPA* only requires that two plans be submitted to the district manager for approval. In addition, the content requirements of the main operational plan under the *FRPA* (*i.e.*, the Forest Stewardship Plan) are significantly less than that of the main operational plan under the *FPC Act* (*i.e.*, the Forest Development Plan). Instead of prescriptive and detailed information requirements under the Forest Development Plan, the Forest Stewardship Plan outlines the licensee's strategies for achieving the government's broad objectives as set out in the regulations.⁸¹ In addition, the *FRPA* does not require mandatory watershed assessments as the *FPC Act* did.⁸²
29. Despite the transition to the *FRPA*, the guidebooks (discussed below) created under the *FPC Act* remain important operational tools used by licensees, the Ministry, and DFO.

⁸⁰ Ministry of Forests, Mines and Lands, "The State of British Columbia's Forests Third Edition" (2010) http://www.for.gov.bc.ca/hfp/sof/2010/SOF_2010_Web.pdf 2010 at 24

⁸¹ *Ibid.*, at 24

⁸² Operational and Site Planning Regulation B.C. Reg. 107/98 Deposited April 2, 1998; O.C. 0426/98 effective June 15, 1998 (Consolidated to December 12, 2003) at s. 14

30. The Ministry's current main legislative tools, the *Forest Act* and the *FRPA*, are described below. Given the influence that the *FPC Act* had in regulating the forest industry, the difference between the *FPC Act* and the *FRPA* planning requirements, and the fact that the guidebooks created under the *FPC Act* remain relevant today, the *FPC Act*'s protection of fish and fish habitat provisions are included in the description below, even though the *FPC Act* is no longer the governing legislation.

Forest Act

31. The provincial *Forest Act*⁸³ grants the right to harvest timber in BC, by issuing licences to harvest and permits to construct or maintain roads for the purpose of harvesting. In addition, the *Forest Act* gives authority to the Lieutenant Governor in Council to make regulations to designate Crown land that is infested with MPB as MPB salvage areas for a prescribed period of time.⁸⁴
32. The forms of agreements that grant rights to harvest timber are set out in section 12 of the *Forest Act*:

12 (1) A district manager, a regional manager or the minister may enter on behalf of the government into an agreement granting rights to harvest Crown timber in the form of a

- (a) forest licence,
- (b) [Repealed 2004-36-4.]
- (c) timber licence,
- (d) tree farm licence,
- (e) community forest agreement,
- (f) community salvage licence,
- (g) woodlot licence,
- (h) licence to cut,
- (i) free use permit,
- (j) Christmas tree permit, or
- (k) road permit.

⁸³ [RSBC 1996], c. 157

⁸⁴ *Forest Act*, s. 14.1

(2) A timber sales manager may enter on behalf of the government into an agreement granting rights to harvest Crown timber in the form of a

- (a) timber sale licence,
- (b) forestry licence to cut, or
- (c) road permit.

33. The *Forest Act* requires the Chief Forester⁸⁵ to determine the allowable annual cut at least every ten years.⁸⁶
34. A forest licence must be no longer than 20 years.⁸⁷ It must specify the location where the holder of the licence is permitted to harvest, the allowable annual cut, and cutting permits to authorize the licence holder to harvest the allowable annual cut from specified areas of land.⁸⁸

Forest Practices Code

35. As stated above, the Code was comprised of the *FPC Act*, the *Forest Practices Code Regulations*, guidebooks, and practice standards. The *FPC Act* and its regulations regulated the forestry in BC from 1995-2004.
36. Under the *FPC Act* licensees were required to prepare, submit, and have approved operational plans prior to commencing any harvesting activities. An “operational plan” could mean a forest development plan, logging plan, range use plan or silviculture prescription, or a site plan for a woodlot licence or a community forest.⁸⁹
37. The forest development plan (“FDP”) was the main operational plan. An FDP covered a period of at least five years with mandatory updates.⁹⁰ Licensees were required to include the following information in an FDP:

⁸⁵ Section 2 of the *Ministry of Forests and Range Act* [RSBC 1996], c. 300 allows a Chief Forester to be appointed under the *Public Service Act*

⁸⁶ *Forest Act*, s. 8

⁸⁷ *Ibid.*, s. 14

⁸⁸ *Ibid.*, s. 14

⁸⁹ *Forest Practices Code of British Columbia Act*, s. 1

⁹⁰ *Ibid.*, s. 10

- Approximate timing, size, shape, and location of cutblocks for harvesting;
- Location of the existing and proposed roads providing access to the cutblocks;
- Timing of proposed timber harvesting and related forest practices, including road construction, modification, and maintenance and deactivation;
- Description of how silviculture systems and harvesting methods will be carried out; and
- Matters required by regulation.⁹¹

38. Before submitting an operational plan for approval to the district manager, the licensee had to conduct any assessments required by the regulations.⁹² These assessments included identifying and classifying streams, wetlands and lakes, and assessing watersheds to determine the impact of proposed timber harvesting and related forest practices.⁹³ The operational plans also provided protection for the licensees. Section 45 (1) of the *FPC Act* stated, “a person must not carry out a forest practice that results in damage to the environment,” but it also said that if a person acted in accordance with an operational or site plan, the *FPC Act* or any permit issued under the *FPC Act*, then that person was not in violation of section 45(1).⁹⁴

39. The *FPC Act* provided the Minister with the authority to establish areas of Crown land, and certain areas of private land, as resource management zones or sensitive areas.⁹⁵ In doing so, the Minister would provide objectives for any resource management zone or sensitive area established. The *FPC Act* also set out restrictions on forest practices that would affect soil conservation, and allows

⁹¹ *Ibid.*, s. 10

⁹² *Ibid.*, s. 17

⁹³ *Ibid.*, s. 17

⁹⁴ *Ibid.*, s. 45

⁹⁵ *Ibid.*, s. 3, s. 5

the district manager to direct licensees to take measures and pay costs necessary to rehabilitate areas with soil disturbance as a result of forestry practices.⁹⁶

40. Part 6 of the *FPC Act* contained compliance and enforcement provisions and gave an official (a person employed by the Ministry) the following powers: inspection, seizure, assigning penalties (including fines as set out in section 143), and making stop work and remediation orders. This part also applies to the *Forest Act*, the *Range Act*, and its regulations.
41. The *FPC Act* also established the Board and continued the Forest Appeals Commission (the “FAC”), both of which were continued under the *FRPA* and are described later in this Report.
42. A total of 21 regulations were created under the *FPC Act*.⁹⁷ The *Operational and Site Planning Regulation*⁹⁸ (the “OSPR”) set out detailed content requirements of the operational plans including the scope and general content, mapping, assessments, information requirements, and notice, review, and comment requirements.
43. In relation to fish habitat and fisheries resources, the OSPR required the following be included in an FDP:
 - *Watershed Assessments*. Licensees were required to carry out watershed assessments for areas with significant downstream fisheries values and significant watershed sensitivity. These were done in accordance with the Coastal/Interior Watershed Assessment Procedure Guidebook, and the results were incorporated into the final FDP.⁹⁹

⁹⁶ *Ibid.*, s. 46 and s. 48

⁹⁷ For a list of the regulations created under the *Forest Practices Code of British Columbia Act*, please see: <http://www.for.gov.bc.ca/tasb/legsregs/archive/fpc/fpcaregs/oplanreg/opr.htm>

⁹⁸ B.C. Reg. 107/98 Deposited April 2, 1998; O.C. 0426/98 effective June 15, 1998 (Consolidated to December 12, 2003)

⁹⁹ Operational and Site Planning Regulation, s.14

- *Mapping and Information Requirements.* Licensees were required to include a topography of the area, and the location of any streams, wetlands, and lakes shown on forest cover maps or fish and fish habitat inventory maps or terrain resource inventory maps.¹⁰⁰ They also had to identify any known sensitive areas (with respect to fish-streams and riparian management areas) established in accordance with the *FPC Act*, the approximate location of any construction for roads, bridges, or major culverts, the time of year the work was proposed to take place, and the riparian class of streams, wetlands, and lakes.¹⁰¹
- *Riparian Management Areas.* Licensees were required to define and classify riparian management areas for the purpose of complying with the restrictions established in the OSPR and the Riparian Management Area Guidebook. This is discussed below under the Riparian Management Area Guidebook section.

44. The OSPR also set out criteria for other operational plans, including further fish and fish habitat protection measures. Logging plans included descriptions of the following: (1) the construction and rehabilitation methods of any temporary access structures, including drainage control measures to control soil erosion; (2) the riparian class and width of each designated zone of each stream, lake and wetland, including any timing of in-stream operations; and (3) harvesting methods including felling, yarding, and debris management for protecting the stream bank.¹⁰² The district manager had the discretion to require that a logging plan be made available for public review and comment. With respect to the site plan, a licensee was required to include a map illustrating the approximate size, shape, and location of each cutblock, the location of all riparian management

¹⁰⁰ *Ibid.*, s. 18

¹⁰¹ *Ibid.*, s. 18

¹⁰² *Ibid.*, s. 33

areas of all streams, wetlands, lakes including their riparian class, and whether the streams were in a community watershed or were fish-bearing.¹⁰³

45. The *FPC Act* gave the chief forester the authority to establish, vary, or cancel standards to be met in preparing an operational plan, or in carrying out a forest practice.¹⁰⁴ Practice standards allowed the Chief Forester the flexibility to make accommodations for different locations or regions. Once established by the Chief Forester, practice standards were mandatory and legally enforceable.

Guidebooks under the Forest Practices Code

46. The Code permitted the creation of guidebooks to recommend practice standards to industry. These guidebooks enabled both provincial and federal government agencies (including the Ministry and DFO) to state their expectations of industry. While they are created under the Code and published by the Ministry, in some instances (identified below) outside agencies (including DFO) were involved in developing the guidebooks. These guidebooks, while not legally enforceable, remain an important tool used by both industry and government. They are easily accessible online. Licensees, while encouraged to use them by the Ministry, are currently under no obligation to follow them under the *FRPA*.
47. Four guidebooks relevant to the protection of fish and fish habitat were created under the Code. They are as follows:
- Coastal/Interior Watershed Assessment Procedure Guidebook (1999);
 - Riparian Management Area Guidebook (1995);
 - Fish Stream Identification Guidebook (1998); and
 - Fish-Stream Crossing Guidebook (2002).
48. These guidebooks are discussed in the sections below.

¹⁰³ *Ibid.*, s. 36.2

¹⁰⁴ *Forest Practices Code of British Columbia Act*, s. 8

Riparian Management Area Guidebook (1995)

49. The purpose of the Riparian Management Area Guidebook (the “RMA Guidebook”) was to assist industry, managers and others in complying with the *FPC Act’s* and the OSPR’s riparian protection provisions. This guidebook provides information to help ensure the correct identification, classification, and mapping of all relevant streams, wetlands, and lakes. It also provides best management practices for industry to follow when carrying out forest practices within riparian areas.
50. The RMA Guidebook defines and classifies six stream riparian classes designated S1 through to S6 based on the stream reaches,¹⁰⁵ presence of fish, presence of a community watershed, and average channel width.¹⁰⁶ Streams in community watersheds and fish-bearing streams are assigned the following riparian classes:¹⁰⁷

Stream Width (m)	Riparian Class
> or equal to 100	S1 large rivers
> 20	S1 (except large rivers)
> 5 < or equal to 20	S2
1.5 < or equal to 5	S3
< 1.5	S4

51. With respect to streams outside of community watersheds that are not fish-bearing streams, the RMA Guidebook assigns the following riparian classes:¹⁰⁸

Stream Width (m)	Riparian Class
> 3	S5
< or equal to 3	S6

¹⁰⁵ Note: The definition of stream reach referred to in the RMA Guidebook is described below in the *Fish-Stream Identification Guidebook*.

¹⁰⁶ Forest Practices Code, Riparian Management Area Guidebook, (December 1995) [BCP002161]

¹⁰⁷ *Ibid.*, at Table 1

¹⁰⁸ *Ibid.*, at Table 1

52. Part 8 of the OSPR (and Table 1 of the RMA Guidebook) defines the riparian management area (“RMA”), riparian management zone (“RMZ” or “management zone”), and riparian reserve zone (“RRZ” or “reserve zone”). Each area or zone is defined by setting a minimum width, which is determined by attributes of the stream and adjacent terrestrial ecosystems.¹⁰⁹ The management zone and the reserve zone are located within the management area. The management zone is the area within the management area that is outside the reserve zone, or if there is no reserve zone, the management zone is that area located adjacent to a stream, wetland or lake of a width determined in accordance with Part 8.¹¹⁰ The RRZ is that area of the RMA located adjacent to a stream, wetland, or lake of a width determined in accordance with Part 8.¹¹¹ The minimum widths of the RRZ, RMZ, and RMA are assigned to each riparian class as follows:¹¹²

Riparian Class	Riparian Reserve Zone (m)	Riparian Management Zone (m)	Riparian Management Area (m)
S1	50	20	70
S2	30	20	50
S3	20	20	40
S4	0	30	30
S5	0	30	30
S6	0	20	20

53. The OSPR and the RMA Guidebook also define the class and subsequent RRZ, RMZ, and RMA widths for wetlands and lakes. The class of a wetland or lake is based on the size (ha) and the presence of different species of trees.¹¹³ The largest RMA width for a wetland is 50m and the smallest is 30m.¹¹⁴ For lakes, the

¹⁰⁹ *Ibid.*, at 5

¹¹⁰ Operational and Site Planning Regulation, s. 1

¹¹¹ *Ibid.*, s. 1

¹¹² *Ibid.*, s. 60

¹¹³ *Ibid.*, s. 61 and s.63

¹¹⁴ *Ibid.*, s. 62

RMA width is 30m for each class except for one class which has a RRZ width of 10m.¹¹⁵

54. The RMA Guidebook provides acceptable overall average levels of retention within the RMZ for each class of stream, wetland, or lake. For streams classified as S1, S2, or S3 the retention level is at 50 percent; for streams S4 or S5 the retention level is 25 percent; and S6 is five percent.¹¹⁶
55. The RMA Guidebook provides general guidelines or recommendations and specific “Best Management Practices” for carrying out forestry practices in each riparian classification. General guidelines are included for activities within streams, roads and crossings, falling and yarding, and windthrow hazard management. Recommendations are included for carrying out forestry practices in and around fisheries sensitive zones.¹¹⁷ Best Management Practices are included for forestry practices within the RMA for each stream classification (S1 to S6). Best Management Practices for streams S1 to S6 are attached to this Report as Appendix C.

Fish-stream Identification Guidebook (Second Edition, 1998)

56. The Ministry published the second edition of the Fish-stream Identification Guidebook (the “Identification Guidebook”) in 1998.¹¹⁸ The Identification Guidebook provides recommendations for fish-stream identification and procedures for licensees to follow when carrying out a fish inventory. The OPSR refers to the Identification Guidebook as the source for definitions of stream “reach” and “fish stream,” acceptable methods for determining stream channel gradient, and conduct of fish inventories for fish-stream identification.¹¹⁹ In order to identify and classify streams in an RRZ or RMZ, the licensee must be able to

¹¹⁵ *Ibid.*, s. 64

¹¹⁶ Forest Practices Code, Riparian Management Area Guidebook, (December 1995) [BCP002161] Table 4

¹¹⁷ Note: The RMA Guidebook defines fisheries sensitive zones as side and back channels, ponds, swamps, seasonally flooded depressions, lake littoral zones, and estuaries that are seasonally occupied by over-wintering fish.

¹¹⁸ Forest Practices Code, Fish-stream Identification Guidebook 2nd Ed. (1998) [CAN021792]

¹¹⁹ *Ibid.*, at 4

identify the fish stream correctly, and as such, the Identification Guidebook should be read in conjunction with the RMA Guidebook. The width of RMA zones and reserves is contingent on the physical and biological attributes of stream reaches (such as presence of fish species) and adjacent terrestrial ecosystems.¹²⁰ The Identification Guidebook states that while the standards and methodologies provided are not required by licensees, they will be used by resources agencies, such as the Ministry and DFO, for guidance when assessing and auditing stream-riparian classifications, management, and mapping.¹²¹

57. As mentioned above, the Identification Guidebook provides two important definitions: “reach” and “fish stream.” A “reach” is a watercourse with a continuous channel bed of at least 100 m in length (measured from any one of the specified locations as set out in the guidebook), or with a channel bed of less than 100 m in length if the continuous channel bed is known to contain fish or flows directly into a fish stream or lake that is known to contain fish.¹²² A “fish stream” is a stream that is frequented by anadromous salmonids, among other fish species, with a slope gradient in accordance with the Identification Guidebook.¹²³

Coastal Watershed Assessment Procedure Guidebook /Interior Watershed Assessment Procedure Guidebook (1999)

58. The Coastal/Interior Watershed Assessment Procedure Guidebook (“WAP Guidebook”) outlines an analytical procedure for industry to follow when conducting watershed assessments.¹²⁴ As stated earlier in this Report, section 14 of the OSPR required a licensee to conduct a watershed assessment in accordance with this guidebook for watersheds with significant downstream

¹²⁰ *Ibid.*, at 10

¹²¹ *Ibid.*, at 11

¹²² *Ibid.*, at 13

¹²³ *Ibid.*, at 17

¹²⁴ Forest Practices Code, Coastal Watershed Assessment Procedure Guidebook Interior Watershed Assessment Procedure Guidebook, section edition, version 2.1 (April 1999)
<http://www.for.gov.bc.ca/tasb/legsregs/fpc/fpcguide/wap/WAPGdbk-Web.pdf>

fisheries values and to include the results of that assessment in the FDP.¹²⁵ This mandatory watershed assessment requirement was not carried over to the *FRPA*. Instead, under the *FRPA*, licensees are expected to conduct watershed assessments as they deem necessary. The WAP guidebook remains relevant insofar as licensees determine a watershed assessment is necessary, and seek the book's guidance.

59. The WAP Guidebook directs consideration of the cumulative effects of forest practices on the aquatic environment, including the following:
- Potential for changes to peak streamflows;
 - Potential for accelerated landslide activity;
 - Potential for accelerated surface erosion;
 - Channel bank erosion and changes to channel morphology as a result of logging the riparian vegetation;
 - Potential for change to the stream channel; and
 - Cumulative interaction of all these processes, which would indicate the sensitivity of a watershed to further forest development.

Fish Stream Crossing Guidebook (2002)

60. A steering committee comprised of representatives from the provincial government (the Ministry, Ministry of Water, Land and Air Pollution (now MOE), Ministry of Energy and Mining, and the Oil and Gas Commission), DFO, and the Council of Forest Industries ("COFI") created the Fish Stream Crossing Guidebook (the Crossing Guidebook). Its purpose was to identify policies and practices acceptable to reviewing agencies and industry, for the selection and designation of fish stream crossings in order to provide for the safe passage and protection of fish and fish habitat, as required under both the *FRPA* and the

¹²⁵ Operational and Site Planning Regulation, s. 14

Act.¹²⁶ The Crossing Guidebook applies to the following industries: forestry, mining and oil and gas.

61. This Crossing Guidebook's objectives are as follows:

- “protecting fish and fish habitat and accommodating the safe passage of fish during the location, design, installation, maintenance, and deactivation of stream crossings;
- administering an efficient proponent submission and review process that addresses all federal and provincial legal requirements involved in the construction, maintenance, and deactivation of stream crossing structures;
- pursuing options that recognize the value and sensitivity of fish and fish habitat in balance with other environmental, social, resource and economic values; and
- guidance on agency review requirements for selecting the appropriate type of structure for any given site, based on stream gradient and fish habitat present.”¹²⁷

62. The Crossing Guidebook defines and categorizes fish habitat into three groups: critical, important, and marginal. The licensee is encouraged to have a qualified professional or technologist conduct an evaluation of fish habitat at the crossing site to determine what type of habitat is present. Three main types of crossing structures are considered: open bottom structures (e.g., bridges, open bottom culverts); closed bottom structures (e.g., corrugated metal pipes or, “CMPs”); and other structures (e.g., ice bridges, snowfill).¹²⁸

63. The Crossing Guidebook provides a decision-making matrix to assist licensees in determining which type of crossing structure should be incorporated and what actions are required with respect to agency reviews. The decision matrix prompts a licensee to consider habitat type and stream gradient to determine the appropriate structure.¹²⁹ It states that DFO should be notified before the installation of **any** fish-stream structure commences.¹³⁰ When notifying DFO, the installations should be identified on a map to allow for any subsequent monitoring

¹²⁶ Forest Practices Code, Fish-stream Crossing Guidebook (March 2002) [CAN006054]

¹²⁷ *Ibid.*, at 11-12

¹²⁸ *Ibid.*, at 12

¹²⁹ *Ibid.*, at 14

¹³⁰ *Ibid.*, at 20

to ensure the site has been properly classified (with respect to habitat) and further, to ensure the installations are consistent with the objectives outlined in the Crossing Guidebook.¹³¹ It is the responsibility of the licensee to determine whether a referral to DFO is necessary to seek a section 35(2) authorization under the *Fisheries Act*. Section 35(2) authorizations are discussed briefly below. For a more detailed discussion of section 35(2) authorizations please refer to the commission's policy and practice report entitled, "The Department of Fisheries and Oceans' Habitat Management Policies and Practices" ("Habitat Management PPR").¹³²

64. The Crossing Guidebook cites the *Decision Framework for the Determination and Authorization of HADD of Fish Habitat* (1998) as DFO's approach to reviewing referrals of stream crossings from licensees.¹³³ An authorization is generally not required where the stream crossing does not disturb the instream fish habitat, encroach on the stream channel width, or cause excessive loss of riparian vegetation.¹³⁴
65. When a licensee has determined that a referral to DFO is required, the licensee should submit a proponent application plan to DFO. The Crossing Guidebook recommends that a qualified professional or technologist be tasked with preparing the proponent application plan.¹³⁵ The proponent application plan should include a detailed description of existing fisheries resources values of the area, a description of proposed activities, any impacts to the fisheries resources, any mitigation proposed, and environmental monitoring.¹³⁶

¹³¹ *Ibid.*, at 20

¹³² Policy and Practice Report, The Department of Fisheries and Oceans' Habitat Management Policies and Practices (8 March 2011) [Exhibit PPR8]

¹³³ Forest Practices Code, Fish-stream Crossing Guidebook (March 2002) [CAN006054] at 18

¹³⁴ *Ibid.*, at 18

¹³⁵ *Ibid.*, at 18

¹³⁶ *Ibid.*, at 20

66. In determining whether to issue an authorization under section 35(2), DFO may consider the following:¹³⁷
- Whether the proponent investigated all relocation and redesign options and provided appropriate justification as to why such options were not feasible;
 - The value and sensitivity of the habitat involved; and
 - The mitigation or compensation proposed.
67. The Crossing Guidebook warns that generally, in areas of critical habitat, DFO is unlikely to grant approvals.¹³⁸ The Crossing Guidebook states that DFO strongly recommends the use of open bottom structures that do not affect fish habitat.¹³⁹

Forest Range and Practices Act

68. The *FPRA* officially replaced the *FPC Act* on January 31, 2004. The Ministry presented the *FPRA* as a “results-based” approach to forestry management, relying on the professional reliance principle.¹⁴⁰ The *FRPA* replaced the prescriptive aspects of the *FPC Act* and streamlined the planning process while maintaining tough penalties for non-compliance.¹⁴¹ The *FRPA* calls for three operational plans: the Forest Stewardship Plan (the “FSP”), the Site Plan,¹⁴² and the woodlot licence plan (the “WLP”). The FSP and the WLP require approval by

¹³⁷ *Ibid.*, at 18

¹³⁸ *Ibid.*, at 18

¹³⁹ *Ibid.*, at 20

¹⁴⁰ “The term *professional reliance* is used to describe the specialized knowledge that professionals bring to their practice. This includes the understanding that professionals, on a regular and consistent basis, maintain a currency of knowledge, have a method of acquiring the current science and then incorporate this knowledge into their practice. Under professional reliance, government and industry rely on the judgement of resource professionals who, in turn, are held accountable for their actions by the Association of BC Forest Professionals (Mike Larock, ABCFP, pers. comm.)” See Forest and Range Evaluation Program, Chief Forester’s 2010 Annual Report on the Forest and Range Evaluation Program, (February 2011) (Import to Ringtail pending)
http://www.for.gov.bc.ca/ftp/hfp/external!/publish/frep/reports/FREP_Chief%20Forester's%20Report_Feb_2011.pdf

¹⁴¹ Backgrounder: What is Results-Based Forest Management? Ministry of Forests, (January 2004)
<http://www.for.gov.bc.ca/code/backgrounders/whatis.pdf>

¹⁴² Note: The site plan must identify the approximate locations of cutblocks and roads and be consistent with the FSP. A site plan must be made publicly available; however, a site plan does not require approval by the minister (*FRPA*, s.10).

the Minister. The *FPRA* sets out broad objectives (including fish and fish habitat protection objectives described further below), which a licensee must strive to meet when carrying out forestry practices. In an FSP or WLP, a licensee must describe its strategies to achieve the objectives set out in the *FPRA* and its regulations.¹⁴³

69. The FSP is the main operational plan. Licensees with a major licence,¹⁴⁴ community forest agreement, community salvage licence or a pulpwood agreement must prepare a FSP and obtain approval by the district manager before commencing any harvesting activities, including the construction of roads.¹⁴⁵ In short, a licensee must submit a FSP and obtain approval by the Minister before conducting any forestry activity. The term of the FSP is five years, though amendments are permitted.¹⁴⁶ The FSP must include a map illustrating the boundaries of all forest development units,¹⁴⁷ specify the intended results or strategies in relation to the objectives set out in the *Forest Planning and Practices Regulation* (the “FPPR”), identify any fisheries sensitive watersheds and lakeshore management zones,¹⁴⁸ and conform to any other prescribed requirements.¹⁴⁹
70. Similar to the *FPC Act*, the *FRPA* includes a “protection of environment” provision prohibiting a person from carrying out forest practices that result in damage to the environment, unless in doing so the person acted in accordance with an operational plan, authorization or permit, or the person could not reasonably have known such activity could result in damage to the

¹⁴³ *Forest Range and Practices Act*, s. 21

¹⁴⁴ Note: The *Forest Act* defines “major licence” as a timber sale licence, forest licence, timber licence, and forestry licence to cut (that specifies it as a major licence) (*Forest Act*, s. 1).

¹⁴⁵ *Forest Range and Practices Act*, s. 3

¹⁴⁶ *Ibid.*, s. 6 and s. 20

¹⁴⁷ Section 1 of the FPPR defines a “forest development unit” as an area where forest development may occur during the term of the plan, and within which, during the term of the plan, timber to be harvested or roads to be constructed are entirely located.

¹⁴⁸ Forest Planning and Practices Regulation, B.C. Reg. 14/2004 O.C. 17/2004, s. 14(3)

¹⁴⁹ *Forest Range and Practices Act*, s. 5

environment.¹⁵⁰ The FPPR defines damage to include (among other things) the deposit of a harmful substance into a stream, wetland, or lake.¹⁵¹

71. The *FRPA* provides for the Lieutenant Governor in Council to make regulations prescribing objectives in relation to a list of topics, including water, fish, resource features, and soils.¹⁵² Further, section 150.5 gives authority to the Lieutenant Governor in Council to make regulations respecting the criteria for, and classification of, streams, wetlands, and lakes, as well as establishing RRZ, RMZ, and RMA for each classification.¹⁵³
72. The Lieutenant Governor in Council has made 14 regulations under the *FRPA*.¹⁵⁴ The FPPR is the main regulation respecting fish habitat. The FPPR addresses the following (among other things): (1) the objectives set by government that must be included in the operational plans; (2) practice requirements pertaining to soils, timber and forest health, riparian areas, watersheds, biodiversity and roads; and (3) reporting requirements.
73. The FPPR provides objectives specifically for the FSP, including objectives related to fish habitat, as follows:

Objectives set by government for water, fish, wildlife and biodiversity within riparian areas

8 The objective set by government for water, fish, wildlife and biodiversity within riparian areas is, without unduly reducing the supply of timber from British Columbia's forests, to conserve, at the landscape level, the water quality, fish habitat, wildlife habitat and biodiversity associated with those riparian areas.

Objectives set by government for fish habitat in fisheries sensitive watersheds

8.1 (1) In this section, "**fisheries sensitive watershed**" means an area identified in Schedule 2 of this regulation

¹⁵⁰ *Ibid.*, s. 46

¹⁵¹ *Ibid.*, s. 3(1)

¹⁵² *Ibid.*, s. 149

¹⁵³ *Ibid.*, s.150.5

¹⁵⁴ For a list and link to all regulations made under the *FRPA*, see <http://www.for.gov.bc.ca/tasb/legsregs/frpa/frparegs/>

(a) with significant downstream fisheries values continued under section 180 (f) of the Act and significant watershed sensitivity continued under section 180 (g) of the Act, and

(b) for which there is no fisheries sensitive watershed objective.

(2) Until December 31, 2005 the objective set by government for fish habitat in fisheries sensitive watersheds is to prevent to the extent described in subsection (3) the cumulative hydrological effects of primary forest activities in the fisheries sensitive watershed from resulting in a material adverse impact on the habitat of the fish species for which the fisheries sensitive watershed was established.

(3) The objective set by government under subsection (2) applies only to the extent that it does not unduly reduce the supply of timber from British Columbia's forests.

(4) If satisfied that the objective set out in subsection (2) is not required to provide special management, the minister responsible for the *Wildlife Act* must exempt a person from the requirement to specify a result or strategy in relation to the objective.

(5) If satisfied that the objective set out in subsection (2) is addressed, in whole or in part, by an enactment, the minister responsible for the *Wildlife Act* must exempt a person from the requirement to specify a result or strategy in relation to the objective set out in subsection (2) to the extent that the objective is already addressed.

[B.C. Reg. 62/2005, s. 2.]

74. Additional objectives pertain to timber, wildlife, community watersheds, wildlife and biodiversity, visual quality, and cultural heritage resources.¹⁵⁵

75. Schedule 1 of the FPPR provides a list of factors for licensees to consider in specifying results or strategies for the established objectives of an FSP:¹⁵⁶

Factors relating to objective set by government for water, fish, wildlife and biodiversity in riparian areas

2 The following factors apply to a result or strategy for the objective set out in section 8 [*objectives set by government for water, fish, wildlife and biodiversity within riparian areas*]:

(a) the type of management regime that is required for a riparian area, having regard to

¹⁵⁵ Forest Planning and Practices Regulation, ss. 6, 7, 8.2, 9.2, and 10

¹⁵⁶ *Ibid.*, s. 12

- (i) the need to buffer the aquatic ecosystem of a stream, wetland or lake from the introduction of materials that are deleterious to water quality or fish habitat,
 - (ii) the role played by trees and understory vegetation in conserving water quality, fish habitat, wildlife habitat and biodiversity,
 - (iii) the need to maintain stream bank and stream channel integrity, and
 - (iv) the relative importance and sensitivity of different riparian classes of streams, wetlands and lakes in conserving water quality, fish habitat, wildlife habitat and biodiversity;
- (b) the type, timing or intensity of forest practices that can be carried out within the context of a management regime referred to in paragraph (a);
- (c) the role of forest shading in controlling an increase in temperature within a temperature sensitive stream, if the increase might have a deleterious effect on fish or fish habitat.¹⁵⁷

76. Prior to submitting the FSP (or amendment thereof) to the Minister for approval, the licensee must publish at least one public notice in a newspaper.¹⁵⁸ Any comments received must be reviewed by the licensee and attached to the FSP.¹⁵⁹
77. The FPPR also sets out the requirements for riparian areas. It establishes stream, wetland, and lake riparian classes. It sets restrictions to harvesting within the RMA, RRZ, and RMZ. It also addresses other topics related to the protection of fish and fish habitat such as temperature sensitive streams, stream crossings, and fish passage.¹⁶⁰
78. The FPPR adopts the riparian classification and management standards as set out in the OSPR and the RMA Guidebook developed under the Code.¹⁶¹ With respect to the minimum widths of the RMA, RRZ and RMZ, the FPPR adopts the standards as set out in the OSPR with one exception. The FPPR follows the

¹⁵⁷ *Ibid.*, Schedule 1

¹⁵⁸ *Ibid.*, s. 20

¹⁵⁹ *Ibid.*, s. 21

¹⁶⁰ *Ibid.*, ss. 47, 48, 49, 53, 55, and 56

¹⁶¹ *Ibid.*, s. 47(2)

RMA Guidebook by including a separate stream classification (S1-A) for large rivers with an average channel width of 100 or greater.¹⁶² The riparian classes and minimum riparian areas for wetlands and lakes are mostly carried over from both the RMA Guidebook and the OSPR.

79. The FPPR restricts forest practices within the RMA, RRZ, and the RMZ. Within the RMA, a licensee is not permitted to construct a road unless such road is in connection with a stream crossing or there is no other practicable option.¹⁶³
80. Forestry practices within the RRZ are restricted except as provided by section 51 which states as follows:

Restrictions in a riparian reserve zone

51 (1) An agreement holder must not cut, modify or remove trees in a riparian reserve zone, except for the following purposes:

- (a) felling or modifying a tree that is a safety hazard, if there is no other practicable option for addressing the safety hazard;
- (b) topping or pruning a tree that is not wind firm;
- (c) constructing a stream crossing;
- (d) creating a corridor for full suspension yarding;
- (e) creating guyline tiebacks;
- (f) carrying out a sanitation treatment;
- (g) felling or modifying a tree that has been windthrown or has been damaged by fire, insects, disease or other causes, if the felling or modifying will not have a material adverse impact on the riparian reserve zone;
- (h) felling or modifying a tree under an occupant licence to cut, master licence to cut or free use permit issued in respect of an area that is subject to a licence, permit, or other form of tenure issued under the *Land Act*, *Coal Act*, *Geothermal Resources Act*, *Mines Act*, *Mineral Tenure Act*, *Mining Right of Way Act*, *Ministry of Lands, Parks and Housing Act* or *Petroleum and Natural Gas Act*, if the felling or modification is for a purpose expressly authorized under that licence, permit or tenure;

¹⁶² *Ibid.*, s. 47(4)

¹⁶³ *Ibid.*, s. 50

- (i) felling or modifying a tree for the purpose of establishing or maintaining an interpretive forest site, recreation site, recreation facility or recreation trail.
- (2) An agreement holder who fells, tops, prunes or modifies a tree under subsection (1) may remove the tree only if the removal will not have a material adverse effect on the riparian reserve zone.
- (3) An agreement holder must not carry out the following silviculture treatments in a riparian reserve zone:
- (a) grazing or broadcast herbicide applications for the purpose of brushing;
 - (b) mechanized site preparation or broadcast burning for the purpose of site preparation;
 - (c) spacing or thinning.

[am. B.C. Regs. 62/2005, s. 10; 151/2007, s. 2 (c); 269/2010, s. 7.]

81. The FPPR also restricts cutting, modifying, or removing trees within a RMZ where streams are present. Licensees are restricted in the amount of harvesting within a RMZ that includes streams and must ensure that the standing trees are “reasonably representative” of the physical structure of the pre-harvest RMZ, and that the stream bank or channel stability is suitably maintained.¹⁶⁴
82. Other FPPR requirements relating to the protection of fish and fish habitat include the following:
- Licensees are required to prevent the increase in temperature of a temperature sensitive stream to a point that it would have a material adverse impact on fish when carrying out harvesting activities;¹⁶⁵
 - Licensees must retain streamside trees (providing shade to the stream) and/or understory vegetation (providing shade to the stream) in an amount sufficient to prevent the increase in temperature;¹⁶⁶

¹⁶⁴ *Ibid.*, s. 52

¹⁶⁵ *Ibid.*, s. 53

¹⁶⁶ *Ibid.*, s.53

- Stream crossings are to be built in such a manner that protects the stream channel and stream bank and must mitigate disturbances;¹⁶⁷
- Licensees must ensure that primary forest activities do not have a material adverse effect on fish passage in a fish stream when fish are migrating or spawning;¹⁶⁸
- Any primary forest activity carried out must be done in a manner that is unlikely to harm fish, or destroy, or harmfully alter fish habitat;¹⁶⁹ and
- Requirements for the construction, maintenance, and deactivation of roads, as well as, notification and reporting requirements.

83. The FPPR also includes provisions on soil disturbance, timber, and forest health, including allowance for MPB salvage logging.¹⁷⁰

84. Section 86 sets out the annual reporting requirements for licensees operating under an FSP.¹⁷¹ A licensee must report to the district manager before June 1 of each year to specify the area in which harvesting occurred, the amount of area harvested, and other information relating to the methods of harvesting and retention.¹⁷²

Programs and Administrative Bodies

Forest Practices Board

85. The Board was established in 1995 under the *FPC Act*¹⁷³ and continued under the *FRPA*.¹⁷⁴ The Board reports to the public on industry and government compliance with BC's forest practices legislation.¹⁷⁵ The Board's staff includes professional foresters, biologists, accountants, and lawyers.

¹⁶⁷ *Ibid.*, s. 55

¹⁶⁸ *Ibid.*, s. 56

¹⁶⁹ *Ibid.*, s. 57

¹⁷⁰ *Ibid.*, ss. 35-40 and ss. 41-46.2

¹⁷¹ *Ibid.*, s. 86

¹⁷² *Ibid.*, s. 86

¹⁷³ *Forest Practices Code of British Columbia Act*, s. 190

¹⁷⁴ *Forest and Range Practices Act*, s. 136

¹⁷⁵ Forest Practices Board website http://www.fpb.gov.bc.ca/FPB_Profile.htm

86. The Board conducts the following activities:

- Audits and investigations to monitor forest and range practices;
- Assessments of government's enforcement of the *FRPA*;
- Random, field-based audits, the results of which are reported to the public;
- Special investigations; and
- Selected appeals of enforcement decisions made by the provincial government.¹⁷⁶

87. The Board is arms-length from the provincial government, and therefore decides independently which operations to audit.¹⁷⁷ The Board takes complaints from the public and may commence an investigation from a public complaint, or on its own initiative.¹⁷⁸ It reports its findings to the public without government revisions or comments.¹⁷⁹ However, in practice, draft reports are referred to government agencies for peer review purposes to confirm the Board has not misstated any facts.¹⁸⁰ Following an audit and investigation, the Board provides industry and government with recommendations. However, the Board has no legal authority to impose penalties.¹⁸¹

88. Since it was established in 1995, the Board has conducted 129 compliance audits and 12 enforcement audits, in relation to the following:¹⁸²

- 8,029 cutblocks;
- 4,060 kilometres of road construction;

¹⁷⁶ *Ibid.*

¹⁷⁷ *Ibid.*

¹⁷⁸ *Ibid.*

¹⁷⁹ *Ibid.*

¹⁸⁰ Email from Jason Hwang to Jeff Guerin (December 4, 2008) [CAN176485] (see page 2 of email from Ian Miller of the Forest Practices Board)

¹⁸¹ *Ibid.*

¹⁸² Ministry of Forests, Mines and Lands, "The State of British Columbia's Forests Third Edition" (2010) http://www.for.gov.bc.ca/hfp/sof/2010/SOF_2010_Web.pdf 2010 at 214

- 43,657 kilometres of road maintained;
- 2,256 kilometres of road deactivation; and
- 3,309 bridges.¹⁸³

Forest Appeals Commission

89. The FAC is an independent tribunal established under the *FPC Act* and continued under the *FRPA*.¹⁸⁴ The FAC hears appeals from administrative decisions made under the following statutes:

- *FPC Act*;
- *FRPA*;
- *Private Manager Forest Land Act*,¹⁸⁵
- *Forest Act*;
- *Range Act*,¹⁸⁶ and
- *Wildfire Act*.¹⁸⁷

90. The following decisions made pursuant to the *FRPA* are appealable to the FAC:

- “approval of a forest stewardship plan, WLP or an amendment;
- authorizations regarding range stewardship plans;
- approvals, orders, and determinations regarding range use plans, range stewardship plans or an amendment;
- suspensions and cancellations regarding forest stewardship plans, woodlot licence plans, range use plans or range stewardship plans, and permits under this *Act*;
- orders regarding range developments;
- orders relating to the control of insects, disease, etc.;
- orders regarding unauthorized construction or occupation of a building on Crown land in a Provincial forest;

¹⁸³ *Ibid.*, at 214

¹⁸⁴ *Forest and Range Practices Act*, s. 1

¹⁸⁵ [SBC 2003], c. 80

¹⁸⁶ [SBC 2004], c. 71

¹⁸⁷ [SBC 2004], c. 31

- orders regarding unauthorized construction of trail or recreation facilities on Crown land;
- determinations regarding administrative penalties;
- remediation orders and stop work orders;
- orders regarding forest health emergencies;
- orders relating to the general intervention power of the minister;
- orders regarding declarations limiting liability of persons to government;
- relief granted to a person with an obligation under this *Act*, the regulations, standards or operational plan;
- conditions imposed in respect of an order, exemption, consent or approval; and,
- exemptions, conditions, and alternative requirements regarding roads and rights of way.¹⁸⁸

91. Appealable decisions under the *Forest Act* are set out in section 146 of that Act and include certain determinations, orders, and decisions. For example the determination of stumpage or suspension of rights under a licence or agreement, are both appealable decisions.
92. The FAC may confirm, vary, or rescind the decision appealed from, or refer the matter back to the decision-maker with or without directions.¹⁸⁹

Forest and Range Evaluation Program

93. The FREP was established in 2003 and is led by the Ministry in partnership with the Ministry of Environment (“MOE”).¹⁹⁰ The objective of the FREP is to assess the effectiveness of forest and range legislation in achieving stewardship objectives (which include objectives important to fish and fish habitat)¹⁹¹ and to identify opportunities for continued improvement of British Columbia’s forest and

¹⁸⁸ Forest Appeals Commission website
http://www.fac.gov.bc.ca/fileAppeal/FAC_Appeal_Process_2007.pdf

¹⁸⁹ Forest Appeals Commission, Procedure Manual 2009
http://www.fac.gov.bc.ca/fileAppeal/FAC_Procedure_Manual_2009.pdf at 39

¹⁹⁰ Forest & Range Evaluation homepage, Government of British Columbia
<http://www.for.gov.bc.ca/hfp/frep/about/index.htm>

¹⁹¹ *Ibid.*, <http://www.for.gov.bc.ca/hfp/frep/values/fish.htm>

range practices, policies and legislation.¹⁹² The FREP describes its monitoring and evaluation activities as follows:

- “Determine if current practices are achieving governments goals and management objectives for resource values;
- Identify issues related to forest and range practices, policies and legislation; and
- Promote the continuous improvement of forest and range management in BC”.¹⁹³

94. The FREP includes a “fish-riparian” resource team to conduct resource stewardship monitoring. This team includes representatives from the Ministry, DFO, MOE, the Board, and non-government consultants. The team developed the following priority questions to assess and evaluate the effectiveness of the *FRPA* regulations and standards and practices under the Code:¹⁹⁴

1. Are riparian forestry and range practices effective in maintaining the structural integrity and functions of stream ecosystems and other aquatic resource features over both short and long terms?

Notes:

Class S4, S5, and S6 streams as well as other habitats (e.g., fisheries sensitive zones) where riparian reserves and tree retention targets are not required by regulation are a high priority subset for evaluation.

Streams and other water bodies with mandatory reserves are presumed to be at lower risk, but effectiveness has never been confirmed by formal assessments.

2. Are forest road stream crossings or other forestry practices maintaining connectivity of fish habitats?

Notes:

Connectivity and fragmentation of fish habitats are to be assessed relative to the effects on fish distribution caused by impediments or barriers to fish passage.

3. Are forestry practices, including those for road systems, preserving aquatic habitats by maintaining hillslope sediment supply and the sediment regimes of streams and other aquatic ecosystems?

Notes:

¹⁹² *Ibid.*, <http://www.for.gov.bc.ca/hfp/frep/about/index.htm>

¹⁹³ *Ibid.*, <http://www.for.gov.bc.ca/ftp/hfp/external/!publish/frep/about/FREP-Brochure-WebOnly-Aug14-2008.pdf>

¹⁹⁴ *Ibid.*, <http://www.for.gov.bc.ca/hfp/frep/values/fish.htm>

There are clear linkages and overlaps with indicators and methods relevant for the Soils Value.

The focused priority of this question is bed load sediment regimes.

95. In February 2011, the FREP released its second annual *Chief Forester's 2010 Annual Report on the Forest and Range Evaluation Program*.¹⁹⁵ This report summarizes FREPs findings to date and provides recommendations and perspectives for resource managers.¹⁹⁶ With respect to fish/riparian resource values, the report summarizes the findings of the FREP report *State of Stream Channels, Fish Habitats, and their Resource Stewardship Monitoring to Evaluate the Effectiveness of Riparian Management, 2005-2008*.¹⁹⁷ The findings are based on an assessment of 1,441 stream reaches located within or adjacent to randomly selected cutblocks.¹⁹⁸ The FREP conducted these assessments on stream reaches to determine the stream and riparian conditions two years or more following forest harvest.¹⁹⁹ FREPs objectives in assessing these streams was to “determine whether forest and range practices had been effective in maintaining the structural integrity and ecological functions of stream reaches and associated riparian areas.”²⁰⁰
96. The FREP assessments considered whether the stream-riparian sites were in “properly functioning condition” (“PFC”).²⁰¹ For a riparian site to be in PFC, the impacts of forest practices on a stream channel and riparian area must be as follows:
- “small on average;
 - within the range of natural variability; or

¹⁹⁵ Forest and Range Evaluation Program, Chief Foresters 2010 Annual Report on the Forest and Range Evaluation Program, (February 2011)
http://www.for.gov.bc.ca/ftp/hfp/external!/publish/frep/reports/FREP_Chief%20Forester's%20Report_Feb_2011.pdf (Import to Ringtail pending)

¹⁹⁶ *Ibid.*, at 1

¹⁹⁷ Forest and Range Evaluation Program, *State of Stream Channels, Fish Habitats, and their Resource Stewardship Monitoring to Evaluate the Effectiveness of Riparian Management, 2005-2008*, (December 2010) (Import to Ringtail pending)

¹⁹⁸ *Ibid.*, at v

¹⁹⁹ *Ibid.*, at v

²⁰⁰ *Ibid.*, at v

²⁰¹ *Ibid.*, at v

- beyond the range of natural variability in no more than a small portion of the stream and riparian habitat.”²⁰²

97. The FREP report found the following:

- 87 percent of all stream reaches were in PFC, including 93 percent of stream reaches classified as fish-bearing;²⁰³
- The primary forestry-related influences on functional condition are generation and transport of road-related fine sediments, low levels of tree retention in riparian management areas, windthrow, falling and yarding trees across streams, and machine disturbances in riparian management areas during harvest;²⁰⁴
- The functional condition of stream reaches with buffers wider than 10 m was not significantly different from streams with buffers 10 m wide;²⁰⁵ and
- Livestock trampling effects were generally higher for larger streams and their fish-bearing tributaries (S4).²⁰⁶

98. The FREP report provides recommendations to improve fish/riparian resource values on S4, S5 and S6 streams. Among other things, it recommends retaining full retention within the first 10 m of all S4 streams, and those S5 and S6 streams that deliver water, nutrients and invertebrates downstream to fish-bearing areas, and retaining full retention within the first 10 m of all S5 and S6 streams that transport coarse sediment and LWD downstream to fish-bearing areas.²⁰⁷

²⁰² *Ibid.*, at v

²⁰³ Forest and Range Evaluation Program, Chief Foresters 2010 Annual Report on the Forest and Range Evaluation Program, (February 2011)

http://www.for.gov.bc.ca/ftp/hfp/external!/publish/frep/reports/FREP_Chief%20Forester's%20Report_Feb_2011.pdf (Import to Ringtail pending) at 6

²⁰⁴ *Ibid.*

²⁰⁵ *Ibid.*

²⁰⁶ *Ibid.*

²⁰⁷ *Ibid.*, at 6

Federal Regulatory Tools

Fisheries Act

99. DFO is responsible for protecting the fish and fish habitat of Canadian fisheries. The *Fisheries Act* defines fish habitat as “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.”²⁰⁸ Several sections of the Act are relevant to forestry practices, including the following:

Section	Authority
20	The Minister may require fish-ways to be constructed.
22	The Minister may require sufficient flow of water for the safety of fish and flooding of spawning grounds as well as free passage of fish during construction.
26	Prohibits obstruction of fish passage through channels, rivers and streams. In addition, the Minister may authorize devices to prevent the escape of fish.
27	Prohibits the damage or obstruction of fish-ways, the impediment of fish to fish-ways and nearby fishing.
28	Prohibits the use of explosives to hunt or kill fish.
30	The Minister may require fish guards or screens to prevent the entrainment of fish at any water diversion or intake.
32	Prohibits the destruction of fish by any means other than fishing.
35	Prohibits works or undertakings that may result in harmful alteration, disruption or destruction of fish habitat, unless authorized by the Minister or under regulations.
36	Prohibits the deposit of deleterious substances into waters frequented by fish, unless authorized under regulations.
37	The Minister may request plans and specifications for works or undertakings that might affect fish or fish habitat. The Minister may, by regulations or with Governor-in-Council approval, make orders to restrict or close works or undertakings that may harmfully alter fish habitat or lead to the deposit of deleterious substances.

²⁰⁸ *Fisheries Act*, s. 2

100. Section 35 is the primary habitat protection provision. Subsection 35(1) prohibits the unauthorized carrying on of any work or undertaking that results in the “harmful alteration, disruption or destruction of fish habitat” (a “HADD”). DFO has expressed concern that carrying out logging activities adjacent to small fish-bearing streams and direct tributaries to fish-bearing streams may be harmful to fish and fish habitat.²⁰⁹ Another forestry practice that may result in a HADD is the installation of closed bottom structures when constructing road crossings at streams.²¹⁰
101. Relief from the prohibition against HADDs is found in subsection 35(2), which allows a HADD to occur with the minister’s authorization or pursuant to regulations. An authorization permits the HADD that results from a work or undertaking, not the work or undertaking itself that causes the HADD.
102. Section 35 does not impose an affirmative regulatory duty on the Minister of Fisheries and Oceans, but rather creates a prohibition that the Minister may or may not enforce. Unauthorized HADDs brought to the Department’s attention may or may not be prosecuted.
103. Section 36 prohibits the unauthorized deposit of a deleterious substance into water frequented by fish. It is often referred to as the key “pollution prevention” provision. In the context of forestry, section 36 applies to the use of pesticides and sedimentation.
104. Pursuant to an administrative agreement, Environment Canada (“EC”), rather than DFO, administers and enforces aspects of pollution control arising from sections 36 to 42.²¹¹ In February 2006, EC and DFO in the Pacific and Yukon

²⁰⁹ Letter from DFO Director General, Pacific Region D. Petrachenko to Deputy Minister of Ministry of Forests, Lee Doney (2000) [CAN027946]

²¹⁰ Stream Crossing Guidebook – Comments, Concerns and Action Items (March 2002) [CAN285489]

²¹¹ Note: In 1978, the Prime Minister assigned responsibility for section 36 to the Minister of Environment. A 1985 Memorandum of Understanding between DFO and the Department of Environment reiterated the responsibilities of both departments and set out mechanisms for information sharing and co-operation. The administration and enforcement of section 36 is explained more fully in the commission’s policy and practice reports dealing with habitat enforcement and effluents.

Region entered in an “Interim Operational Working Arrangement on Enforcement of Section 36(3) Fisheries Act,” which sets out a response protocol for spills and section 36(3) enforcement.²¹² The agreement states that “If the spill is on land or from land into fresh water the lead agency is the Ministry of Environment,” but “If the spill is related to a deposit of sediment (or a HADD) into fish bearing waters, DFO is the lead agency.”²¹³ Therefore, DFO is the lead agency when sediment is deposited into fish-bearing waters as a result of forestry activities, and EC is the lead agency for the deposit of pesticides (including pesticide runoff) in relation to forestry practices. The regulation and use of pesticides is discussed later in this Report. (See also the commission’s policy and practice report entitled, “Overview of Freshwater Urbanization Impacts and Management.”)

DFO’s Role in Protecting Salmon from Forestry Impacts

105. In the Pacific Region, DFO’s national Habitat Management Program (“HMP”) is administered by the Oceans, Habitat and Enhancement Branch (“OHEB”). HMP has the mandate to conserve and protect fish habitat.²¹⁴ It is a major federal regulator for development projects (including forestry) occurring in or near fish-bearing waters in Canada.²¹⁵

Project Review

106. The primary focus of the HMP’s regulatory work derives from section 35 of the Act. When a developer or licensee submits a proposal to the Department for regulatory review under the Act, the process is termed a “referral.”²¹⁶

²¹² Interim Operational Working Arrangement on Enforcement of Section 36(3) Fisheries Act (February 2006) [CAN269592]

²¹³ *Ibid.*

²¹⁴ 2008-2009 Annual Report to Parliament on the Administration and Enforcement of the Fish Habitat Protection and Pollution Prevention Provisions of the *Fisheries Act* (2010), <http://www.dfo-mpo.gc.ca/habitat/role/141/reports-rapports/2008-2009/pdf/ann08-eng.pdf>

²¹⁵ *Ibid.*, at 9

²¹⁶ “Regional Habitat Regulatory Decision Framework,” (July 2010) [CAN186041] at 1

Approximately 80 percent of the HMP's resources are devoted to referral reviews.²¹⁷

107. The referral process enables the HMP's habitat staff to review submitted proposals to assess whether a HADD is likely to result from the proposed works or undertakings.²¹⁸ Habitat staff provide advice to licensees on how to proceed in a manner that complies with the Act. Often the advice focuses on how to avoid a HADD.²¹⁹ Under certain conditions, where harm to fish or fish habitat is unavoidable, habitat staff issue a section 32 or subsection 35(2) authorization.²²⁰
108. Licensees voluntarily participate in the referral process. The habitat protection provisions do not create a mandatory obligation for licences to seek advice or authorization from DFO.²²¹ However, failure to do so may expose a licensee to charges and prosecutions under the Act.²²² For a more detailed discussion of DFO's HMP policies and practices please refer to the commission's Habitat Management PPR.
109. Under the *FPC Act*, the Ministry referred all FDPs to DFO. The extent of review by DFO habitat staff varied amongst areas, depending on factors such as the extent of harvesting activities in the area, workload, and staff capacity and resources.²²³ Where habitat staff had concerns about an FDP, they would prepare a Letter of Advice to the licensee.²²⁴ (Letters of Advice set out DFO's expectations, standards, and comments on whether a plan or proposal provides

²¹⁷ “[Draft] Backgrounder #6: What are DFO’s key activities in fish habitat management?” (November 18, 2010) [CAN297741] at 1

²¹⁸ Note: HMP staff include habitat biologists, habitat technicians, managers and others. HMP staff are sometimes referred to as habitat referral staff, habitat practitioners or habitat assessors.

²¹⁹ “[Draft] Backgrounder #6: What are DFO’s key activities in fish habitat management?” (November 18, 2010) [CAN297741] at 1

²²⁰ Such authorizations must be preceded by an environmental assessment under the CEEA.

²²¹ 2008-2009 Annual Report to Parliament on the Administration and Enforcement of the Fish Habitat Protection and Pollution Prevention Provisions of the *Fisheries Act* (2010), <http://www.dfo-mpo.gc.ca/habitat/role/141/reports-rapports/2008-2009/pdf/ann08-eng.pdf> at 22

²²² *Ibid.*

²²³ See for example, Email from Gord Kosakoski to various recipients (August 9, 2000) [CAN020056] at 4

²²⁴ See for example, Letter from Adrian Wall, OHEB to Upper Similkameen Indian Band (December 15, 2000) [CAN020266]

for adequate protection of fish and fish habitat.²²⁵ As noted above, guidebooks created under the Code were important tools to inform licensees of standards to meet fish habitat objectives. DFO generally supported the use of these guidebooks with one exception.²²⁶ Some DFO employees have expressed concerns about the RMA Guidebook and its standards for small fish-bearing streams and direct tributaries to fish-bearing streams (S4, S5 and S6).²²⁷

110. The Province's replacement of the *FPC Act* with the *FRPA* coincided with the Department's transition towards a national Environmental Process Modernization Plan ("EPMP")²²⁸ in 2004. (The EPMP includes a referral streamlining and risk management approach. EPMP is discussed in detail in the Habitat Management PPR.) Under the *FRPA*, the Ministry no longer refers the main operational plans it requires from licensees (*i.e.*, the FSPs) to DFO for review. Since the advent of the *FRPA* and EPMP, the BC Interior Area OHEB ("BCI OHEB") and North Coast Area OHEB ("NCA OHEB") have both developed operating principles or position statements to clarify and confirm their standards pertaining to forestry practices and their response activities to the *FRPA* in their respective areas.²²⁹
111. In 2005, the Area Chief of the BCI OHEB sent a Transition Letter to all forest licence holders and to Ministry District Managers setting out its operating principles with respect to forestry.²³⁰ These operating principles include the following:

²²⁵ Letters of Advice are described in the Commission's Habitat Management PPR at section 3.3.2.(b) (or page 38)

²²⁶ Letter from Adrian Wall, OHEB to Upper Similkameen Indian Band (December 15, 2000) [CAN020266]

²²⁷ *Ibid*; see also Letter from DFO Director General for Pacific Region to Deputy Minister of Ministry of Forests, [CAN027946]; DFO Forestry Pager 1, DRAFT (October 22, 2007) [CAN269609]; Draft Project Charter and Work Plan – Title: Review and Update of the Riparian Management Guidebook, (June 11, 2006) [CAN220737]

²²⁸ EPMP is discussed in the Commission's Habitat Management PPR at section 3.2.1 (or p 24).

²²⁹ Letter from BCI OHEB Area Chief, Jason Hwang to Forest Licence Holders (June 30, 2005) (Import to Ringtail pending; draft version found at [CAN197489]); Letter from Rob Dams Habitat Technician to Timber Baron Forest Products Ltd. (November 25, 2004) [CAN248046]; see also Email from Bonnie Antcliffe to Susan Farlinger (November 26, 2004) [CAN248045]

²³⁰ Letter from BCI OHEB Area Chief, Jason Hwang to Forest Licence Holders (June 30, 2005) (Import to Ringtail pending; draft version found at [CAN197489])

- *FSPs*. BCI OHEB no longer engages in a review of FSPs. Instead, it requests that all FSPs be submitted to local OHEB offices for monitoring and auditing purposes.²³¹ BCI OHEB will focus its review efforts on those forestry activities which show a higher risk of creating a HADD.²³² BCI OHEB considers higher risk activities to be associated with the installation of stream crossings and carrying out forestry practices within the riparian management area. BCI OHEB does not require notification for lower risk activities.
- *Stream Crossings*. BCI OHEB accepts the standards contained within the Fish Stream Crossing Guidebook (2002) as meeting the Department's fish habitat management objectives.²³³ It requires at least 45 days notification prior to the commencement of any work related to the installation of any fish-stream crossing structure accompanied with the necessary information required by DFO to engage in a review.²³⁴
- *Riparian Management Areas*. BCI OHEB accepts the standards contained in the RMA Guidebook with the exception of those pertaining to S4, S5 and S6 streams. Instead, BCI OHEB adopts the Interim Standards communicated to the Ministry and licensees from the Director General, Pacific in 2000.²³⁵ BCI OHEB requires at least 45 days of notification before commencing works if the licensee intends on varying the standards in the *FRPA* and RMA Guidebook for S1, S2, and S3 streams, or DFOs Interim Standards for streams S4, S5 and S6.²³⁶ The notification must

²³¹ *Ibid.* See also Habitat Management Operating Principles for Crown Forestry Development, Version July 5/05, OHEB [CAN005944]; Operating Principles: Crown Land Forestry Development, presentation by OHEB [CAN005943] at 4.

²³² Letter from BCI OHEB Area Chief, Jason Hwang to Forest Licence Holders (June 30, 2005) (Import to Ringtail pending; draft version found at [CAN197489])

²³³ *Ibid.*

²³⁴ *Ibid.*

²³⁵ Letter from D. Petrachenko Director General, Pacific Region to Lee Doney, Deputy Minister MOF, (2000) [CAN027946]

²³⁶ Letter from BCI OHEB Area Chief, Jason Hwang to Forest Licence Holders (June 30, 2005) (Import to Ringtail pending; draft version found at [CAN197489])

include a site specific ecological rationale justifying the variance.²³⁷ These Interim Standards will be discussed further below.

- *Watershed Assessments.* As discussed above in this Report, the *FRPA* does not require mandatory watershed assessments, unlike the *FPC Act*. However, for BCI OHEB, watershed assessments are an important component of forestry planning and are necessary in watersheds of significant sensitivity and/or watersheds containing significant fisheries values.²³⁸

112. In 2004, the NCA OHEB prepared a NCA OHEB “generic” response to provide licensees with its current positions regarding forest management issues of concern under the *FRPA*.²³⁹ NCA OHEB took the following positions:

- *Culverts.* NCA OHEB encourages “the use of clear-span bridges or properly-installed open-bottom culverts on virtually all fish-bearing streams.”²⁴⁰ With respect to CMPs, NCA OHEB states “authorized CMPs in fish streams must conform to the recommended specifications in the Fish Stream Crossing Guidebook.”²⁴¹
- *Small Stream Riparian Management.* NCA OHEB notes that unauthorized removal of riparian vegetation adjacent to fish streams may constitute a HADD.²⁴² NCA OHEB supports the RMA Guidebook with respect to S1, S2, S3, and S5 streams. With respect to S4 and S6 streams, there should be retention of all trees within 10 metres of the stream bank.²⁴³ NCA OHEB requests that licensees who propose to carry out harvesting

²³⁷ *Ibid.*

²³⁸ *Ibid.* See also Operating Principles: Crown Land Forestry Development, presentation by OHEB [CAN005943].

²³⁹ Email from Bonnie Antcliffe to Susan Farlinger (November 26, 2004) [CAN248045]; Letter from Rob Dams, Habitat Technician, to Timber Baron Forest Products Ltd (November 25, 2004) [CAN248046]

²⁴⁰ Letter from Rob Dams, Habitat Technician, to Timber Baron Forest Products Ltd (November 25, 2004) [CAN248046] at 1

²⁴¹ *Ibid.*, at 2

²⁴² *Ibid.*, at 2

²⁴³ *Ibid.*, at 3

activities that do not conform to these standards, refer the plans to DFO for comment.²⁴⁴

Monitoring

113. Habitat monitoring allows habitat staff to determine whether licensees are complying with the Act and any conditions of authorizations or orders, and whether developments (including forestry) conform to any advice aimed at avoiding negative effects to fish and fish habitat.²⁴⁵ Habitat Compliance Modernization, an element of EPMP, was developed by DFO to provide a nationally coherent, risk-based approach to compliance with the habitat protection provisions of the Act.²⁴⁶ For a detailed discussion on DFO's monitoring programs including its policies and practices, please see the commission's Habitat Management PPR.

114. The implementation of the Code reduced the volume of forestry referrals to DFO, which in turn increased the importance of DFO's monitoring to ensure fisheries resources were being adequately protected.²⁴⁷ In 1999, then Chief, Habitat Policy Unit of OHEB, Peter Delaney, described the importance of monitoring forestry practices as follows:

“...monitoring/auditing are going to be critical as we reduce/redefine our role in referral reviews. In the past, one of our largest referral workloads related to the forestry sector where, with a significant percent of the land base within the province associated with forest harvesting operations, there is enormous potential to impact fisheries resources. Thus, it is important for the Department to be able to say with some credibility that we are at least monitoring/auditing what is going on out there.”²⁴⁸

115. In 1999, a draft Fish-Forestry Monitoring Program was developed by OHEB with the following objectives:

²⁴⁴ *Ibid.*, at 3

²⁴⁵ Habitat Compliance Decision Framework, [CAN186007] at 8

²⁴⁶ *Ibid.*, at 4

²⁴⁷ Draft Proposal Fish-Forestry Monitoring Program (March 22, 1999) [CAN020036] at 1

²⁴⁸ Email from Peter Delaney to Mike Henderson (April 12, 1999) [CAN020035]

- “To assist DFO in delivering the habitat management program as defined in the Policy for the Management of Fish Habitat.
- To assist the habitat management program of DFO in identifying where forest harvesting is leading to harmful alteration, disrupting or destruction of fish habitat.
- To improve fish habitat protection measures during forest harvesting activities on Crown and private lands.
- To ensure forest harvesting activities meet the requirements of the *Fisheries Act*
- To evaluate the effectiveness of the Private Land Logging Regulations”.²⁴⁹

116. This draft agreement was never finalized. As of 2005, only variable levels of monitoring, with no stated overall strategy, were conducted in the BC Interior area.²⁵⁰ While some strategic plans were drafted, it appears none were approved or put into action.²⁵¹ In light of this, when preparing for the transition from the *FPC Act* to the *FRPA*, the BC Interior OHEB office made the following priorities:

- “develop a compliance monitoring schedule in conjunction with C&P for both OHEB and C&P staff to undertake with built in allowances to monitor unplanned events;
- develop an auditing programme which compliments the OHEB-C&P compliance monitoring schedule; and
- collaborate with RHQ regional monitoring initiatives.”²⁵²

Enforcement and Compliance

117. Responsibilities for habitat enforcement and compliance are shared between DFO’s habitat staff and DFO’s Conservation and Protection (“C&P”) Program.²⁵³ Within C&P, fishery officers enforce all provisions of the Act, including both the fisheries-related and habitat-related provisions. However, over the years there

²⁴⁹ Draft Proposal Fish-Forestry Monitoring Program, (March 22, 1999) [CAN020036]

²⁵⁰ Habitat Management Operating Principles for Crown Forestry Development, Version July 5, 2005 [CAN005944] at 7

²⁵¹ *Ibid.*, at 7

²⁵² *Ibid.*, at 7

²⁵³ See Environment Canada, Compliance and Enforcement Policy for the Habitat Protection and Pollution Prevention Provisions of the *Fisheries Act* (November 2001) at 6.

have been some changes in how the habitat related work is distributed among fishery officers.

118. Habitat prosecutions under the Act require evidence on several elements of the offence, and the Department's approach is to use experts to provide opinion evidence to establish the following:

- "The site was fish habitat;
- The water is frequented by fish;
- A substance is deleterious; or
- Habitat was destroyed or harmfully altered."²⁵⁴

119. Habitat investigations and prosecutions involve teams of people including DFO staff from C&P and HMP, and legal support from the Department of Justice or Crown agents. Other departments such as DFO Science Branch, or outside consultants may also be involved.²⁵⁵ For a detailed discussion DFO's policies and practices on habitat enforcement please refer to the commission's policy and practice report, Enforcement of the Habitat Protection and Pollution Prevention Provisions of the *Fisheries Act*.²⁵⁶

Intra- and Inter-agency Cooperation

120. In 1999, OHEB created the Fish/Forestry Technical Working Group ("FFWG") as one of their Habitat Focus Groups.²⁵⁷ The FFWG included representatives from Areas and Regional Headquarters from OHEB, and a representative from the science branch.²⁵⁸ The FFWG met two to three times annually to do the following:

²⁵⁴ FA-LP 301 Habitat Inspections & Investigations Reference Binder Version 1.0 (September 2008) [CAN027769] at 16 and 101

²⁵⁵ *Ibid.*, at 16

²⁵⁶ Policy and Practice Report, Enforcement of the Habitat Protection and Pollution Prevention Provisions of the *Fisheries Act* (7 March 2011) [Exhibit PPR9]

²⁵⁷ Email from Gord Kosakoski to various recipients (December 13, 1999) [CAN023446]; HEB Focus Group [CAN023450]

²⁵⁸ HEB Focus Group [CAN023450]

- “To serve as a regional forum to discuss fish/forestry interaction issues and make recommendations to senior management regarding DFO policy positions on these statements.
- To serve as an information dissemination body to communicate results of meetings, seminars, studies, prosecutions, legal procedures etc. relating to fish-forestry matters.
- To serve as a vehicle for communication between area habitat management staff and RHQ fish/forestry program.”²⁵⁹

121. In 2005, the *FRPA* Joint Steering Committee (“JSC”) and *FRPA* Joint Management Committee (“JMC”) was formed to foster cross-agency communication and decision making on policy initiatives and operational issues related to the *FRPA*.²⁶⁰ The JMC reports to the JSC and is formed by director-level management members from the following government agencies:

- The Ministry (Chief Forester as chair);
- MOE;
- Ministry of Agriculture and Lands;
- Integrated Land Management Bureau;
- Ministry of Energy, Mines and Petroleum Resources;
- Oil and Gas Commission;
- Ministry of Tourism, Culture and the Arts;
- Ministry of Healthy Living and Sport; and
- DFO.²⁶¹

122. The JSC is formed of Assistant Deputy Ministers of policy and/or operations from the following government agencies:

- Ministry (Chief Forester as chair);

²⁵⁹ *Ibid.*

²⁶⁰ ADM Level *FRPA* Joint Steering Committee Terms of Reference, November 25, 2005 (Import to Ringtail pending); Director Level *FRPA* Joint Management Committee Terms of Reference July 20, 2010 (Import to Ringtail pending)

²⁶¹ ADM Level *FRPA* Joint Steering Committee Terms of Reference, November 25, 2005 (Import to Ringtail pending)

- MOE;
- Ministry of Agriculture and Lands;
- Integrated Land Management Bureau;
- Ministry of Energy, Mines and Petroleum Resources;
- Oil and Gas Commission;
- Ministry of Tourism, Sports and the Arts; and
- DFO.²⁶²

123. The responsibilities of the JMC are set out in its terms of reference, and include the following:

- Find policy solutions to *FRPA* related operational and policy issues;
- Take action on government's strategic direction as directed by the JSC;
- Consider and take action on new and emerging information;
- Promote consistent delivery of forest and range practices within and across agencies;
- Coordinate cross-agency responses to clients;
- Elevate issues and provide advice, as necessary, to the JSC; and
- Provide analysis on *FRPA*-related issues that are identified by the JSC.²⁶³

124. Where the JMC cannot resolve a policy issue, it is raised to the JSC for decision.²⁶⁴ The JSC makes decisions and provides recommendations to the Deputies on government policy issues related to the development and

²⁶² *Ibid.*

²⁶³ Director Level *FRPA* Joint Management Committee Terms of Reference, July 20,2010 (Import into Ringtail pending)

²⁶⁴ *Ibid.*

implementation of the *FRPA* and *FRPA* regulations.²⁶⁵ All JSC decisions are made by consensus.²⁶⁶ The terms of reference state that the JSC and JMC meet once a month,²⁶⁷ though in practice the committees do not meet this frequently.

125. In 2006, OHEB developed a draft Cooperation Agreement Respecting Fish/Forestry Interactions between DFO, the Ministry, MOE, and the BC Forest Industry.²⁶⁸ The draft agreement proposes a cooperative working relationship between the parties in the areas of research and monitoring, training and education, protection and compliance, and consultation and communication.²⁶⁹ This draft agreement was not finalized.

Concerns with the Current Regulatory Regime

126. Since the implementation of the *FRPA*, some DFO habitat staff have noted a significant communications disconnect between the OHEB area offices and the Ministry district offices and the forest industry. The concern is that there exists no viable referral system or standard way for DFO to communicate with licensees or the Province.²⁷⁰ For example, in March 2010, the Ministry was notified of a proposed amendment to a FSP in which the licensee requested a blanket approval to vary RRZ widths (below minimum standards). The amended FSP was not referred to DFO and DFO was not notified or consulted by either the District Manager or the licensee of such proposed amendment.²⁷¹

²⁶⁵ ADM Level FRPA Joint Steering Committee Terms of Reference, November 25, 2005 (Import into Ringtail pending)

²⁶⁶ *Ibid.*

²⁶⁷ *Ibid.* See also Director Level FRPA Joint Management Committee Terms of Reference, July 20, 2010 (Import into Ringtail pending).

²⁶⁸ Draft Cooperation Agreement Respecting Fish/Forestry Interactions [CAN220736]

²⁶⁹ *Ibid.*, at 2

²⁷⁰ OHEB Key Issues, Habitat by Jason Hwang, [CAN027932; Exhibit 662]; Don Lawrence, OHEB BC Interior Annual Report, 2005 [CAN197528]; Shane Smith, OHEB Annual Report 2005, [CAN197504]; Kelly Austin OHEB Annual Report 2006 [CAN260818]; and Tim Panko, OHEB Annual Report 2006 [CAN246247]. See also DFO Forestry 1 Pager DRAFT (October 22, 2007) [CAN269609].

²⁷¹ Email from DFO Habitat Biologist, (March 4, 2010) [CAN178245]. See also Letter from Tolko Industries Ltd., to District Manager, Central Cariboo Forest District (December 14, 2009) [CAN178246].

127. DFO itself has been criticized by environmental groups, including the David Suzuki Foundation, for failing to enforce the Act in the context of forestry.²⁷² In 2005, the David Suzuki Foundation conducted a series of watershed inspections in the Kalum Forest District and noted multiple violations of the Act.²⁷³ The Foundation's investigation found inadequate drainage systems, road surface erosion, landslide debris within stream channels, creeks seeping onto roadways, and fish streams running down forest service roads. The report notes these findings were reported to the Ministry and DFO and a follow up trip made by Foundation staff revealed that little had been done to rectify the situation.²⁷⁴ The report concludes that DFO must start enforcing the Act. The Foundation released another publication in 2006, *The Will to Protect*, which repeats its criticism that DFO is failing to enforce the Act and further failing in its mandate to protect fish and fish habitat, especially in the context of logging.²⁷⁵
128. The two forestry practices DFO deems to be high risk activities – logging within the riparian management area and installing closed bottom stream crossing structures – are discussed further below.

Logging within Riparian Management Areas

129. In February 2000, the Regional Director General of DFO's Pacific Region, then Donna Petrachenko, wrote to the Deputy Minister of the Ministry, then Lee Doney, expressing the Department's concerns that logging practices were being carried out adjacent to small fish-bearing streams and direct tributaries to fish-

²⁷² David Suzuki Foundation, "High and Dry: An Investigation of Salmon-Habitat Destruction in BC," [CAN014339]; David Suzuki Foundation, "The Will to Protect Preserving BCs Wild Salmon Habitat" (2006) [CAN142400]; David Suzuki Foundation, "Kalum Forest District Report," (2005)

http://www.davidsuzuki.org/publications/downloads/2005/Kalum_Forest_Report.pdf (See also News Release, September 28, 2005 BC Forest Practices Continue to Damage Salmon Habitat, David Suzuki Foundation Investigation on Kalum Forest District [CAN083529])

²⁷³ News Release, September 28, 2005 BC Forest Practices Continue to Damage Salmon Habitat, David Suzuki Foundation Investigation on Kalum Forest District [CAN083529]

²⁷⁴ David Suzuki Foundation, "Kalum Forest District Report," (2005) http://www.davidsuzuki.org/publications/downloads/2005/Kalum_Forest_Report.pdf at 5

²⁷⁵ David Suzuki Foundation "The Will to Protect Preserving BCs Wild Salmon Habitat," (2006) [CAN142400]

bearing streams without leaving adequate riparian leave strips.²⁷⁶ The letter attached a set of Interim Standards to meet DFO's fish habitat objectives. These interim standards were meant to be a temporary solution until a review of the riparian provisions of the Code was conducted.²⁷⁷

130. The DFO's Interim Standards for riparian protection (effective since 2000) addressed S4 fish-bearing streams, and S5 and S6 streams that are direct tributaries to fish-bearing streams, as follows:
1. "The riparian management zone of S4 fish-bearing streams must have retention levels approaching 100% retention. Any proposed variation of this retention rate must be supported by an ecological rationale acceptable to Fisheries and Oceans Canada. Justification must be site specific.
 2. The riparian management zone of S5 and S6 streams that are direct tributaries to fish-bearing streams must have retention levels approaching 100% retention. Any harvesting within the riparian management zone on such streams must be supported by a site-specific ecological and operational justification. Riparian management zones for other S5 and S6 streams should be managed as per the Best Management Practices set out in the Riparian Management Area Guidebook. We trust that the foregoing will be considered in the process for approval of Silvicultural Prescriptions.
 3. In areas where there is a high windthrow hazard wider riparian management zones may be required unless alternative windthrow management measures can be shown to be effective. The wider management zone should be designed spatially to match the specific vegetation, topographic, and surficial material characteristics of the site and consist of a retention proportion aimed at protecting the "target" riparian vegetation zone from wind damage. Where trees do blow down across the stream channel they should be left in place to provide future large woody debris to the channel."²⁷⁸
131. These Interim Standards differed from the standards set out in the Code (the OSPR and the RMA Guidebook). An internal DFO memo indicates that the provincial government and the COFI expressed "concern and frustration" to senior management with respect to DFO's position and Interim Standards.²⁷⁹ The Ministry responded to DFO stating District Managers do not have the authority

²⁷⁶ Letter from D. Petrachenko Director General, Pacific Region to Lee Doney, Deputy Minister MOF, (2000) [CAN027946]

²⁷⁷ *Ibid.*

²⁷⁸ *Ibid.* See also Letter from BCI OHEB Area Chief, Jason Hwang to Forest Licence Holders (June 30, 2005) (Import to Ringtail pending; draft version found at [CAN197489]); Letter from Adrian Wall, OHEB to Upper Similkameen Indian Band (December 15, 2000) [CAN020266].

²⁷⁹ Memorandum for Assistant Deputy Minister, DFO Pacific Region "Fish/Forestry Issues" [CAN070165]

under the Code to follow the Interim Standards provided by DFO and that both agencies (DFO and the Ministry) must respect each other's legal framework.²⁸⁰

132. In 2000, DFO met with the Ministry and the provincial Ministry of Environment, Lands and Parks ("MELP")²⁸¹ to discuss how the agencies could cooperate together to resolve this issue.²⁸² The parties agreed to a draft proposal for a Joint-Agency Assessment of Forestry Planning and Practices Around Small Streams.²⁸³ The proposal included short term (2000 field season) and longer term (2001 field season) assessment strategies for all agencies (DFO, the Ministry, and MELP) to work together with a view to assessing whether the standards provided in the RMA Guidebook with respect to S4 streams were adequate to protect fish and fish habitat.²⁸⁴ The results of the 2000 Joint Agency Review were published in the report, *Assessment of the Condition of Small Fish-bearing Streams in the Central-Interior Plateau of BC in Response to Riparian Practices Implemented under the Forest Practices Code*.²⁸⁵ The results of this report were interpreted differently by DFO, the Ministry and the COFI.²⁸⁶ According to the Ministry the report proves that licensees are doing a "great job" in complying with the RMA Guidebook and therefore the stream management issue can be put to bed.²⁸⁷ In agreement with this interpretation, on a CBC morning show, the COFI indicated the findings of the report illustrated that licensees were leaving reserves which exceeded the RMA Guidebook and therefore it was not necessary to amend the Code.²⁸⁸ From the BC Interior OHEB's perspective, the report supported DFO's view of the importance of riparian reserves on small streams to achieve fish habitat protection, and

²⁸⁰ Letter from MOF Deputy Minister to D. Petrachenko Director General, Pacific Region (July 18, 2000) [CAN285480]

²⁸¹ Note: MELP has since been renamed Ministry of Environment ("MOE").

²⁸² Email from Dean Watts to Tina Walker and Adrian Wall, (June 1, 2000) [CAN285486]

²⁸³ Joint-Agency Assessment of Forestry Planning and Practices Around Small Streams, (2000) [CAN285487]; Email from Dean Watts to Tina Walker and Adrian Wall, (June 1, 2000) [CAN285486]

²⁸⁴ *Ibid.*

²⁸⁵ Assessment of the Condition of Small Fish Bearing Streams in the Central-Interior Plateau of British Columbia in Response to Riparian Practices Implemented under the Forest Practices Code [CAN020190]

²⁸⁶ Email from Dean Watts to various recipients (December 20, 2000) [CAN020141]; Email from Gord Kosakoski to Adrian Wall (August 20, 2001) [CAN020191]

²⁸⁷ Email from Dean Watts to various recipients (December 20, 2000) [CAN020141]

²⁸⁸ Email from Gord Kosakoski to Adrian Wall (August 20, 2001) [CAN020191]

underlined the need to revise the OSPR (and the RMA Guidebook) to require minimum mandatory reserves on S4s (and potentially S6s).²⁸⁹ The Area Chief of OHEB for the interior voiced his concern that if DFO failed to be proactive on this issue of riparian management, then the Ministry's and COFI's interpretations that no change is necessary will be the dominating message to the public.²⁹⁰

133. As noted above, with the transition to the *FRPA* and EPMP, BCI OHEB sent a Transition Letter to licensees and District Managers to confirm DFO's requirements to comply with the Act. In this letter, BCI OHEB adopted the 2000 Interim Standards with the caveat that the issue will continue to be reviewed.²⁹¹ BCI OHEB decided to include these Interim Standards until a consolidated regional approach was developed.²⁹² In 2006, DFO held an EPMP information session with the forest industry and the Ministry.²⁹³ At this session, the parties (DFO, the Ministry and the forest industry) agreed to make it a priority to revisit the RMA Guidebook in the context of the *FRPA*, EPMP, and the best available science, with a view to finding consensus on the riparian standards issue.²⁹⁴ Accordingly, DFO proposed a draft work plan entitled *Review and Update of the Riparian Area Management Guidebook* for DFO, the Ministry, and MOE.²⁹⁵ This work plan included a timeline of deliverables which anticipated a redraft of the RMA Guidebook and implementation training to be completed by March 15,

²⁸⁹ *Ibid.* See also Email from Dean Watts to various recipients (December 20, 2000) [CAN020141]; Joint Agency Review Draft Report Comments [CAN020186]; DFO Internal Staff Reviews of "Assessment of the Conditions of Small Fish-Bearing Streams in the Central-Interior Plateau of British Columbia in Response to Riparian Practices Implemented under the Forests Practices Code [CAN020188].

²⁹⁰ Email from Gord Kosakoski to Adrian Wall (August 20, 2001) [CAN020191]; Email from Dean Watts to various recipients (December 20, 2000) [CAN020141]; Joint Agency Review Draft Report Comments [CAN020186]

²⁹¹ Email from Jason Hwang to various recipients (OHEB Habitat Regulatory group) (May 31, 2006) [CAN128193]; Letter from BCI OHEB Area Chief, Jason Hwang to Forest Licence Holders (June 30, 2005) (Import into Ringtail pending; draft version found at [CAN197489])

²⁹² *Ibid.*; Email from Gord Kosakoski to Peter Delaney (February 8, 2001) [CAN020189]

²⁹³ Federal/Provincial Fish/Forestry Meeting Minutes, (December 2, 2005) [CAN220734]; Draft Project Charter and Work Plan – Title: Review and Update of the Riparian Area Management Guidebook, (June 11, 2006) [CAN220737]

²⁹⁴ *Ibid.*

²⁹⁵ Draft Project Charter and Work Plan – Title: Review and Update of the Riparian Area Management Guidebook, (June 11, 2006) [CAN220737]

2007.²⁹⁶ This draft was not finalized and the RMA Guidebook has not been updated.

134. In January 2011, an Extension Note²⁹⁷ was developed by the Ministry, DFO and Pierre Beaudry and Associates, based on the findings of its interdisciplinary study investigating the effectiveness of the Prince George District Manager's policy (the "PGDM") implemented in the Prince George Forest District in 1999.²⁹⁸ The PGDM outlines riparian strategies and includes retention of 10 overstory trees on each side of the stream per 100 m of stream length.²⁹⁹ The interdisciplinary study involved a six-year study (2001-2006) in three different watersheds assessing the physical, chemical, and biological responses to the implementation of the PGDM.³⁰⁰ The interdisciplinary study found that the PGDM was not successful in maintaining overall fish habitat values of the small streams studied.³⁰¹ The Extension Note recommends best management practices, similar to those recommendations contained in the RMA Guidebook.³⁰² The recommendations includes maintaining a long-term LWD supply and retaining all trees within 10 m of the stream bank, and, where windthrow risk is moderate to high and concerns of blowdown are present, retaining trees within 30 m of the stream bank.³⁰³

Crossings on fish-bearing streams

135. In 2000, DFO conducted a review of forest road crossings on fish-bearing streams in Prince George and Port McNeil Forest Districts and published the results in the technical report "*No Net Loss of Fish Habitat: An Audit of Forest*

²⁹⁶ *Ibid.*, at 3

²⁹⁷ An "extension note" is a term used by the Ministry to publish its policies or practices.

²⁹⁸ Rex, J., D. Maloney, E. MacIsaac, H. Herunter, P. Beaudry, and L. Beaudry. 2011. Small stream riparian retention: the Prince George Small Streams Project. B.C. Min. For. Range, For. Sci. Prog., Victoria, B.C. Exten. Note 100. <http://www.for.gov.bc.ca/hfd/pubs/Docs/En/En100.pdf>

²⁹⁹ *Ibid.*, at 2

³⁰⁰ *Ibid.*, at 2

³⁰¹ *Ibid.*, at 4

³⁰² *Ibid.*, at 5

³⁰³ *Ibid.*, at 6

*Road Crossings of Fish-bearing Streams in BC, 1996-1999.*³⁰⁴ The report concluded that No Net Loss of fish habitat was not being achieved under the Code and that the installation of CMPs on fish-bearing streams would most likely result in HADDs.³⁰⁵

136. Prior to the release of the revised Fish-Stream Crossing Guidebook (2002) DFO's policy was that all proposed bridges/culverts across anadromous fish-bearing streams (S1, S2, S3 and S4) were to be referred to DFO for review and comment.³⁰⁶ Proposed stream crossings on non-anadromous fish-bearing streams (S5 and S6) were to be referred to MOE for review and comment.³⁰⁷ But, it was DFO's position that all CMPs would constitute a HADD.³⁰⁸ This caused some confusion in provincial ministries and internally within the Department, as to what DFO's position was – whether it was exempting the forestry industry from HADDs or whether DFO ought to be reviewing each proposal and treating each as a HADD.³⁰⁹ The Ministry's Assistant Deputy Minister, then Greg Koyl, wrote to all District Managers advising that the Ministry did not accept DFO's position that all CMPs result in HADDs, and that the Ministry would continue to approve the installation of CMPs according to a decision matrix, which provided for site assessments to be conducted by habitat specialists.³¹⁰
137. During negotiations leading up to the Crossing Guidebook, the Province and industry continued to reject DFO's position that all CMPs would create a HADD. In response, DFO produced a Culvert Protocol in 2001 which outlined the

³⁰⁴ D.J. Harper and J.T. Quigley, *No Net Loss of Fish Habitat: An Audit of Forest Road Crossings of Fish-Bearing Streams in British Columbia, 1996-1999*, published by OHEB, DFO (2000) [CAN297763]

³⁰⁵ *Ibid.*, at 33 and 37. See also Executive Summary, NNL Audit of Stream Crossings, Dave Harper [CAN020039].

³⁰⁶ Letter from Adrian Wall, OHEB to Upper Similkameen Indian Band (December 15, 2000) [CAN020266] at 6

³⁰⁷ *Ibid.*

³⁰⁸ Stream Crossing Guidebook – Comments, Concerns and Action Items [CAN285489]; Letter from Ministry of Transportation and Highways to D. Petrachenko (January 9, 2001) [CAN285492]

³⁰⁹ Email from Bob Harding to Tim Panko (February 3, 2000) [CAN020034]; Internal DFO Email from Gord Kosakoski to various recipients (March 31, 2001) [CAN020214]

³¹⁰ Memorandum from Assistant Deputy Minister MOF, Greg Koyl to all District Managers (October 12, 2000) [CAN020067]

procedure DFO field staff would follow in reviewing and/or authorizing culverts on fish bearing streams.³¹¹ To resolve this issue, the Crossing Guidebook's joint steering committee (with representatives of the Ministry, Ministry of Water, Land, Air and Protection, Ministry of Energy and Mining, Oil and Gas Commission, COFI, and DFO) participated in a workshop to formulate principles towards the use of CMPs on fish bearing streams.³¹² The workshop participants agreed that in certain streams where fish and fish habitat values are "low," closed bottom structures are a viable option without site specific approval.³¹³ As a result, a decision matrix was created for the Crossing Guidebook based on these principles for authorization of stream crossings which included the continued use of CMPs.³¹⁴

138. DFO endorsed the Crossing Guidebook (2002). However, since then, DFO has raised concerns about culverts installed prior to both the Code (1995) and the Crossing Guidebook (2002). DFO took the view that such crossings installed prior to 1995 must be reviewed by the responsible party (the creator of the structure, or the party who currently controls it) and necessary measures taken in a timely manner to ensure that such crossings are in compliance with the Act.³¹⁵ The Ministry expressed concerns about this on behalf of both the Province and the forest industry, citing the legal liabilities, the approval of the pre-Code standards utilized at the time, the time frame to rectify these structures, and the potential scale of the problem.³¹⁶ Further, the Ministry stated that this issue had been dealt with by the creation of the Crossing Guidebook and suggested that it

³¹¹ Fisheries and Oceans Canada - Culvert Protocol, (January, 2001) [CAN020197]

³¹² Stream Crossing Guidelines for British Columbia Technical Workshop Proceedings, (June 13-14 2001) [CAN020209]

³¹³ *Ibid.*

³¹⁴ Memorandum for Assistant Deputy Minister, Oceans Pacific Region – "Fish/Forestry Issues" from Regional Director General, Pacific Region [CAN070165]

³¹⁵ Letter from Regional Director General, Paul Sprout to Assistant Deputy Minister, Tim Sheldon (April 28, 2005) [CAN170788]

³¹⁶ Letter from Assistant Deputy Minister, Tim Sheldon to Regional Director General, Paul Sprout (March 30, 2005) [CAN170794]

would be resolved over time in such a way that does not hinder any forestry development.³¹⁷

139. In 2008, the JMC Fish Passage Technical Working Group (the “Technical Working Group”) was formed by the Ministry, MOE, and DFO to establish a working relationship with a view to identifying and rectifying problem culverts obstructing fish passage.³¹⁸ The Technical Working Group considers resource-related roads presenting barriers to fish passage that were installed prior to the Code. The Technical Working Group’s terms of reference state the group will meet by conference call each week and sets out the goals of the group as follows:

- “Develop an understanding of the scope of the problem through a combination of field surveys and GIS analysis
- Locate and acquire funding to initiate a solution
- Develop a protocol for selecting the sites which will provide the greatest return on investment in terms of amount of high-value fish habitat restored
- Begin to repair/replace/remediate road crossing sites which block fish passage on high value fish habitat
- Initiate targeted training and extension
- Ongoing communications – Letters to JSC, Licensees, FPB, etc
- Identify priority watersheds that need to be addressed first
- Monitor quality assurance, quality control of repaired crossing.”³¹⁹

140. The Technical Working Group estimates that there are approximately 370,000 stream crossings in BC.³²⁰ Using the best available project information, it estimates that 76,000 fish-stream culverts need to be assessed and that the estimated amount of culverts presenting fish passage problems in BC which are likely in need of repair or replacement is 30,000 to 70,000.³²¹

³¹⁷ *Ibid.*

³¹⁸ Terms of Reference, JMC Fish Passage Technical Working Group (Import to Ringtail pending)

³¹⁹ *Ibid.*

³²⁰ *Ibid.*, at 1

³²¹ *Ibid.*, at 2

141. The Technical Working Group has developed a strategic approach which outlines the process it will follow to address the fish passage issue.³²² It estimates that \$4 million a year is required to allow the group to implement the key elements of the strategic plan.³²³ The key elements of the strategic plan include the following:

- *Prioritization.* A prioritization protocol³²⁴ has been developed to identify high priority sites for restoration based on watershed, habitat gained, and connectivity to the aquatic ecosystem.³²⁵
- *Overview Assessment.* Once priority sites are identified, culvert inspections will be required to assess the scope of the fish passage problem. Data collected during these assessments will be housed in a provincial database. An estimated \$15,000 to \$30,000 of funding is needed to complete culvert inspections on high-priority sites.³²⁶
- *Restoration.* Restoration work will be required in the form of total structure replacements (costing anywhere from \$20,000 to \$150,000) or repairs (costing anywhere from \$4,000 to \$30,000).³²⁷
- *Training Program.* To effectively carry out the above, a training program is required for both industry professionals and government staff for both the short term (existing structures obstructing fish passage) and the long term (design and installation of new structures).³²⁸

142. In 2009, the Board released the *Special Investigative Report – Fish Passage at Stream Crossings*.³²⁹ This report is discussed further below.

³²² Strategic Approach to Fish Passage in British Columbia [BCP000354]

³²³ *Ibid.*, at 3

³²⁴ BC Ministry of Environment, *The Strategic Approach: Protocol for Planning and Prioritizing Culverted Sites for Fish Passage Assessment and Remediation*, 3rd edition, (March, 2009) [BCP000399]

³²⁵ Terms of Reference, JMC Fish Passage Technical Working Group (Import to Ringtail pending) at 4

³²⁶ *Ibid.*, at 3

³²⁷ *Ibid.*, at 3

³²⁸ *Ibid.*, at 9

³²⁹ Forest Practices Board *Special Investigative Report – Fish Passage at Stream Crossings*, (2009) [CAN005925]

Audits and Evaluations of Forestry Practices

143. Audits and evaluations of the forest industry and its practices are conducted and reported to the public by both government and non-government bodies. The Ministry reports to the public by preparing annual Chief Forester's report (*The State of British Columbia's Forests*), and through the FREP. In addition, as noted above, the Board conducts audits and special investigations on forestry issues without government involvement and reports its findings to the public. This section discusses some of the findings of the Board and the Ministry.
144. In 2009, the Board conducted an investigation assessing fish passage at stream crossings in the central and northern interior of Vancouver Island and published the results in the *Special Investigative Report – Fish Passage at Stream Crossings*.³³⁰ The Board assessed a total of 1,110 crossings of fish-bearing streams in 19 watersheds which were a mix of crossings installed prior to the Code, during the tenure of the Code, and after the passing of the *FRPA*.³³¹ While the investigation focused on Vancouver Island, the Board's recommendation and the subsequent follow-up have broader implications for fish-forestry management in BC, including the Fraser River watershed.
145. The Board found that only 42 percent of the 1,100 road crossings were sufficiently well designed to allow salmon, trout and other fish to swim freely above them.³³² The Board provided one recommendation in the report: “[that] government take the necessary actions to ensure fish access to valuable habitat is maintained and restored.”³³³ In addition, the Board noted that while section 56 of the FPPR under the *FRPA* requires licensees to ensure that forestry practices do not have a “material adverse effect on fish passage,” the legislation fails to define “material adverse effect.”³³⁴ As a result, the Board stated that “it became

³³⁰ *Ibid.*, at 5

³³¹ *Ibid.*, at 5

³³² Vancouver Sun News Release: Water crossings pose serious threat to fish: report; Culverts and bridges are a little-known threat to migration, (January 22, 2009) [CAN031207]

³³³ Forest Practices Board Special Investigative Report – Fish Passage at Stream Crossings, (2009) [CAN005925] at 24

³³⁴ *Ibid.*, at 7

apparent to the Board there are differences of opinion among enforcement agencies about what constitutes a material adverse effect on fish passage and how the assessment methodology for fish passage should be interpreted in the context of enforcement of the legislation.”³³⁵ Accordingly, the Board encouraged MOE, the Ministry, and DFO to come to an agreement on what constitutes a material adverse effect and how the legislation should be enforced.³³⁶

146. As requested by the Board, the Ministry has provided updates on steps taken to address the report’s findings and recommendation.³³⁷ The Ministry has written to the Board on at least two occasions (March 12, 2009³³⁸ and April 26, 2010³³⁹) and advised the Board as follows:

- Through the Forest Investment Fund (the primary funder for assessments of crossing structures) approximately nine million dollars of provincial funding has been allocated in the past two fiscal years to conduct crossing assessments and to rectify priority (pre-Code) problematic structures.³⁴⁰ To date, approximately 5,000 stream crossing sites have been investigated, approximately 1,500 sites have been fully assessed, and about 50 restoration/remediation projects have been undertaken at an average cost of \$90,000 per crossing;³⁴¹
- The current focus is to develop a web-based e-learning course to develop a strategic approach to crossing assessments and remediation, assessment methodology, and basic fish biology;³⁴² and

³³⁵ *Ibid.*, at 22

³³⁶ *Ibid.*, at 22

³³⁷ *Ibid.*, at 24

³³⁸ Letter from Ian Miller, Fish Passage Technical Working Group to Forest Practices Board (March 12, 2009) [BCP002162]

³³⁹ Letter from the Honourable Barry Penner, Minister of Environment and the Honourable Pat Bell, Minister of Forests and Range to Dr. Bruce Fraser, Chair of the Forest Practices Board, (April 26 2010) [BCP002122]

³⁴⁰ Letter from the Honourable Barry Penner, Minister of Environment and the Honourable Pat Bell, Minister of Forests and Range to Dr. Bruce Fraser, Chair of the Forest Practices Board, (February 2010) [CAN286932]

³⁴¹ *Ibid.*

³⁴² *Ibid.*

- In collaboration with DFO and MOE, the Ministry created and posted on its website a December 2009 Bulletin – Guidance to C&E program staff and delegated decision makers on interpreting the words “material adverse effect” and “material adverse impact.”³⁴³ The bulletin warns that an incident that does not constitute a contravention of the *FRPA* may constitute a contravention of the *Fisheries Act*.³⁴⁴ The Ministry states that fish passage assessment for compliance and enforcement will remain a provincial priority for 2010/2011.³⁴⁵

147. In December 2010, the Ministry released *The State of British Columbia’s Forests-third edition*³⁴⁶ (The Ministry previously released reports in 2004 and 2006).³⁴⁷ The 2010 report provides information and an assessment on the condition of BC’s forest and range resources, and the environmental, social, and economic values associated with the resources.³⁴⁸ The 2010 report provides information and assessments on 24 topic areas, including water and focuses on riparian management and stream crossings/ fish passage.³⁴⁹
148. With respect to riparian management, the 2010 report assesses whether riparian forestry practices are protecting streams, stream-riparian functions and fish habitat.³⁵⁰ The report states that between 2005 and 2007 the Ministry district staff (sometimes augmented by the MOE) performed a total of 1,022 assessments³⁵¹

³⁴³ CEPS Bulletin 40, December 2009 – Guidance to C&E program staff and delegated decision makers on interpreting the words “material adverse effect” and “material adverse impact” [BCP002122] at 5

³⁴⁴ Letter from the Honourable Barry Penner, Minister of Environment and the Honourable Pat Bell, Minister of Forests and Range to Dr. Bruce Fraser, Chair of the Forest Practices Board, (April 26 2010) [BCP002122]

³⁴⁵ *Ibid.*

³⁴⁶ Ministry of Forests, Mines and Lands News Release, Province Releases Third State of Forests Report (December 9, 2010) http://www2.news.gov.bc.ca/news_releases_2009-2013/2010FOR0022-001551.pdf News Release

³⁴⁷ Ministry of Forests, Lands and Natural Resources Operations, *The State of British Columbia’s Forests*, (2006) [BCP001541]

³⁴⁸ Ministry of Forests, Mines and Lands, *The State of British Columbia’s Forests Third Edition*, 2010 http://www.for.gov.bc.ca/hfp/sof/2010/SOF_2010_Web.pdf 2010 at 1

³⁴⁹ *Ibid.*, at 1

³⁵⁰ *Ibid.*, at 100

³⁵¹ Note: this 2010 report appears to include the results from the FREP riparian report discussed above in this Report. However, there is a difference in the number of assessments conducted and the period of time covered between this 2010 report and the FREP report.

at streams within harvested areas.³⁵² Of the 1,022 stream sites assessed, nearly 50 percent were identified as S6 non fish-bearing streams, and nearly 20 percent were S6 fish-bearing streams.³⁵³ Eighty-seven percent of the stream sites were in proper functioning condition.³⁵⁴ These assessments were carried out on randomly selected streams in riparian areas within or adjacent to randomly selected cutblocks which had been managed since 1996 under the *FPC Act*.³⁵⁵

149. With respect to stream crossings, the 2010 report relies on the 2009 Special Investigative Report conducted by the Board, discussed above. The 2010 report states that 94 percent of the 1,202 sites assessed found forest road stream crossings to have low to moderate potential to transport sediment into a stream.³⁵⁶

150. The 2010 report also considers the Ministry's assessment of compliance, reporting as follows:

- Between 15,000 to 16,000 inspections are conducted each year, down from 33,000 per year in the late 1990s,³⁵⁷
- Compliance actions carried out by the Ministry average 1,994 per year.³⁵⁸ These include actions taken to mitigate minor issues by having licence tenure take corrective action in order to avoid any major problems arising;³⁵⁹
- Enforcement actions which result in formal sanctions, such as monetary penalties, violation tickets, and court-enforced measures, average 461 per year,³⁶⁰

³⁵² Ministry of Forests, Mines and Lands, *The State of British Columbia's Forests Third Edition*, 2010 http://www.for.gov.bc.ca/hfp/sof/2010/SOF_2010_Web.pdf 2010 at 100

³⁵³ *Ibid.*, at 101

³⁵⁴ *Ibid.*, at 100 and 101

³⁵⁵ *Ibid.*, at 100

³⁵⁶ *Ibid.*, at 5, and 10

³⁵⁷ *Ibid.*, at 210

³⁵⁸ *Ibid.*, at 216

³⁵⁹ *Ibid.*, at 216

³⁶⁰ *Ibid.*, at 216

- Compliance inspections were improved in 2001 with the development of an independent Compliance and Enforcement arm of the Ministry and the introduction of an electronic reporting system.³⁶¹ After 2001, inspections were focused on areas at greatest risk for noncompliance regarding environmental, social, and revenue obligations;³⁶²
- Since 2007, there has been an increased focus on interagency coordination of compliance and enforcement among provincial natural resource agencies following the implementation of the Resource Management Coordination Program;³⁶³ and
- In the last five years compliance rates have improved. Compliance action rates averaged (number of compliance actions as a percent of the number of inspections) 14.2 percent and enforcement action rates averaged 2.7 percent during this period.³⁶⁴

Mountain Pine Beetle

151. The MPB epidemic increased significantly after 1997 to peak at over ten million hectares in 2007 and then began to decline in 2008.³⁶⁵ On average, MPB attacked 99,600 hectares of forested pine from 1962 to 1997, and 4.5 million hectares from 1998 to 2008.³⁶⁶ An estimated 46 percent of the merchantable pine within BC's harvestable land base was killed by the MPB from 1998 to 2006.³⁶⁷ By 2015, 76 percent of merchantable pine in BC will likely be killed by MPB, with the epidemic ending by 2019.³⁶⁸
152. From 2003 to 2007, approximately 88-95 percent of the annual MPB infestation occurred in the Fraser Basin.³⁶⁹ Within the Fraser Basin, the

³⁶¹ *Ibid.*, at 214

³⁶² *Ibid.*, at 214

³⁶³ *Ibid.*, at 215

³⁶⁴ *Ibid.*, at 216

³⁶⁵ *Ibid.*, at 55

³⁶⁶ *Ibid.*, at 55

³⁶⁷ 2009 State of the Fraser Basin Report Sustainability Snapshot 4 – January 2009, [CAN198246] at 57

³⁶⁸ *Ibid.*, at 57

³⁶⁹ *Ibid.*, at 57

Cariboo-Chilcotin (at 49-51 percent infested) and the Upper Fraser (at 37-44 percent infested) regions experienced the greatest impact.³⁷⁰

153. In response to the MPB epidemic, the Ministry increased the allowable harvest levels in order to salvage the pine before the trees rotted in place.³⁷¹ The allowable harvest levels were raised by 36 percent overall and in some areas has doubled.³⁷²

154. In August 2004, OHEB's BC Interior Acting Area Chief, then Michael Crowe, wrote to the Chief Forester, then Larry Pedersen, responding to the opportunity to provide input regarding the allowable annual cut increase to allow salvage logging due to the MPB epidemic.³⁷³ The letter stated DFO's support for a precautionary management approach, due to the uncertainties surrounding the MPB epidemic. Specifically, it recommended the following in respect of management plans:

- Implementation and monitoring of watershed assessment procedures (provided in the WAP Guidebook);
- Protection of streamside and riparian areas as provided for by the Code and RMA Guidebook;
- Protection of streams (S4-S6) not provided for in the Code or RMA Guidebook;
- Development of indicator basins for long term monitoring to assist in management decisions; and
- Inclusion of academics and the community in developing and carrying out monitoring programs.³⁷⁴

³⁷⁰ *Ibid.*, at 57

³⁷¹ Pacific Fisheries Resource Conservation Council, Mountain Pine Beetle: Salmon Are Suffering Too [CAN412261] at 3

³⁷² *Ibid.*, at 3

³⁷³ Letter from Michael Crowe, A/Area Chief, OHEB to Mr. Larry Pedersen, Chief Forester, MOF (August 9, 2004) [CAN005900]

³⁷⁴ *Ibid.*

155. A January 2006 Briefing Note for the Pacific Regional Director General outlined the potential impacts to salmon (including sockeye) from the MPB epidemic, and included the following.³⁷⁵

- MPB will continue to attack and destroy most of the Interior Pine forests of BC which will result in hydrological changes and impacts to salmon and their habitat;³⁷⁶
- The large majority of andromous portions of the Fraser Basin are slated for salvage with limited containment effort due to the severity of the attack and inability to control the spread;³⁷⁷
- Landscape level changes are expected to result from MPB and salvage logging including “changes in runoff patterns and timing, higher and earlier peak discharges, higher summer water temperatures, more surface erosion and sedimentation, lower riparian values, potentially eventually higher instream LWD contributions. Overall channel stability and function will likely be compromised;”³⁷⁸ and
- The effects on salmon and salmon habitat is uncertain, although there is “expert opinion” is that it will be dramatic.³⁷⁹

156. The Briefing Note recommended assigning science, fish management, and habitat management resources to determine the impacts and the level of risk to salmon, and to develop management policies and strategies to address operational considerations resulting from MPB, such as riparian protection and streamside salvage logging.³⁸⁰

³⁷⁵ Briefing Note for the Regional Director General, Mountain Pine Beetle – Potential Impacts to Salmon (2006) [CAN197573]

³⁷⁶ *Ibid.*, at 1

³⁷⁷ *Ibid.*, at 1

³⁷⁸ *Ibid.*, at 1

³⁷⁹ *Ibid.*, at 2

³⁸⁰ *Ibid.*, at 3

157. In January 2007, the Fraser Salmon and Watersheds Program (supported by the Pacific Salmon Foundation, the Fraser Basin Council and the Pacific Fisheries Resource Conservation Council) held a workshop in Prince George to discuss concerns about MPB and its threat to salmon stocks.³⁸¹ Participants at the workshop included federal and provincial government staff (including the Ministry and DFO), scientists, First Nations, and salmon conservation groups.³⁸² Scientists advocated for improved monitoring, further research, and management approaches to identify the most vulnerable watersheds and salmon stocks.³⁸³
158. In March 2007, the Board released a special investigative report entitled *The Effect of Mountain Pine Beetle Attack and Salvage Harvesting on Streamflows*.³⁸⁴ This study was based on Baker Creek, a western tributary of the Fraser River at Quesnel which contains high value salmon habitat.³⁸⁵ The study found the following results:
- Peak flows were 60 percent higher after the beetle moved through this watershed;
 - Total annual flows were 30 percent higher;
 - After salvage logging removed 80 percent of trees in the watershed, peak flows were even higher, at 92 percent; and
 - Flood frequency also increased significantly, with projections that a former 20 year flood would occur every three years on average.³⁸⁶
159. The report also warned that MPB would affect flooding, channel stability, and fish habitat within similar watersheds:

³⁸¹ Pacific Fisheries Resource Conservation Council, Mountain Pine Beetle: Salmon Are Suffering Too [CAN412261] at 2

³⁸² *Ibid.*, at 2

³⁸³ *Ibid.*, at 5

³⁸⁴ Forest Practices Board Special Investigation "The Effect of Mountain Pine Beetle Attack and Salvage Harvesting On Streamflows" (March, 2007) [CCI000008]

³⁸⁵ *Ibid.*

³⁸⁶ *Ibid.*

“The peak flow changes have implications on flooding, channel stability and fish habitat within watersheds similar to Baker Creek. These results also have salvage harvest management implications. The current MPB infestation has already created a substantial peak flow hazard. Any salvage harvesting of these stands will increase the peak flow hazard even more.”³⁸⁷

160. The report noted that the *FRPA* fails to require landscape level watershed assessments or planning for most MPB-affected watersheds and found that government needs to develop policy and strategies to protect fish habitat in such watersheds:³⁸⁸

“[M]ore consideration of the hydrological effects of MPB is needed operationally. Priorities should include watershed planning, harvest scheduling, riparian retention, and assessment of the adequacy of drainage structures.”³⁸⁹

161. Later in 2007, a presentation to DFO’s Pacific Region Strategic Directions Committee highlighted the need for DFO to seriously consider its role in MPB management:

- “Minister expressed the need for DFO to be involved in federally funded MPB initiatives and has also indicated the need to redirect federal funds to specifically address aquatic impacts (*Oct 2007, Minister’s Roundtable on Salmon Sustainability*)
- Deputy raised questions on our involvement on the MPB issue in the August 2007 briefing and has discussed MPB at a recent meeting with the Deputy Director of Pacific Salmon Foundation
- There are increasing concerns from stakeholders that infestation and salvage measures could have a significant effect on hydrologic regimes in watersheds impacting fish and fish habitat
- Fraser Assembly, BC Pacific Salmon Forum, Pacific Salmon Foundation, and the Native Brotherhood BC:
 - i. Raised concerns on the disconnect between NRCan MPB initiatives and DFO
 - ii. Expressed need for greater collaboration between federal government and province
 - iii. Requested Minister for political leadership to address aquatic impacts.”³⁹⁰

³⁸⁷ *Ibid.*, at 7
³⁸⁸ *Ibid.*, at 7
³⁸⁹ *Ibid.*, at 17
³⁹⁰ *Ibid.*, at 4

162. The presentation noted the following key issues: the lack of DFO involvement, the lack of federal priorities to address the MPB issue in a manner that provides for the protection of fish and water resources, and the importance of this given the provincial approach does not focus on protecting water quality, preserving fish habitat, or flood prevention.³⁹¹
163. In December 2007, the DFO Minister's office directed the Pacific Region to develop a "coordinated approach to salmon sustainability and to begin discussions related to a briefing of federal ministers around horizontal coordination on pine beetle and watershed management."³⁹² Since then, DFO's key science advice is to leave riparian buffers and implement the "precautionary principle."³⁹³
164. In 2010 the Head of DFO's Fish-Forestry Research Program, Erland Maclsaac, stated that the Fraser River sockeye natal watersheds are not threatened by MPB:

"There's relatively little pine in most of the Fraser River sockeye natal watersheds. Based on the most recent BC forest health aerial survey reports, most of the southern interior watersheds have declining rates of infestation because the mature pine is dead. Areas where there is some current MPB expansion are in the Skeena/Stikine watersheds and northern forest districts as the beetle moves north to more marginal pine areas, but these are areas outside of the Fraser drainage.

There is always the possibility, in the future, that other conifer beetle and defoliant pests (e.g. western balsam bark beetle, western spruce budworm) may experience similar population booms in the types of forests that dominate in the watersheds of Fraser sockeye. But that's mostly speculation at this point."³⁹⁴

³⁹¹ *Ibid.*, at 3

³⁹² See discussion in email from Jas Sidhu to Nick Leone (December 24, 2007) [CAN085918]

³⁹³ Presentation from DFO to Joint Management Committee, Mountain Pine Beetle Rate of Cut Issues, (March 18, 2008) [CAN170815] at 5

³⁹⁴ Email from Erland Maclsaac to various recipients (June 20, 2010) [CAN136457]

Pesticide Use³⁹⁵

165. Pesticide use in Canada is regulated by both the provincial and federal governments. The federal government, through the Pest Management Regulatory Agency (“PMRA”) of Health Canada, is responsible for administering the *Pest Control Products Act* (“PCP Act”) and its regulations.³⁹⁶ The *PCP Act* defines pesticides and requires all pesticides to be registered under the *PCP Act* before they may be sold or applied in Canada.³⁹⁷ As stated earlier in this Report, the *Fisheries Act* prohibits the deposit of deleterious substances into water frequented by fish, which includes pesticides and pesticide runoff, and in accordance with an agreement, EC takes the lead on pesticide occurrences and investigations for the federal government.
166. The provincial government, through the MOE, regulates the use of pesticides through the administration of the *Integrated Pest Management Act* (the “IPM Act”) and its regulations.³⁹⁸ The *IPM Act* and its regulation establishes the requirements for sale, use, and disposal of pesticides, and contains public notification and consultation, reporting, and record keeping provisions.
167. As per the *IPM Act*, licensees (and others) proposing to use pesticides in their forestry practices are required to do the following:
- Apply for and obtain a licence by submitting information requirements and paying a fee as prescribed by the regulation;

³⁹⁵ See also the commission’s policy and practice report entitled “Overview of Freshwater Urbanization Regulation and Management.”

³⁹⁶ *Pest Control Products Act*, S.C. 2002, c. 28; Pest Control Products Regulations, SOR/2006-124

³⁹⁷ *Pest Control Products Act*, s. 6

³⁹⁸ *Integrated Pest Management Act*, SBC 2003, c. 58; Integrated Pest Management Regulation B.C. Reg. 604/2004

- At least 14 days before application of a pesticide, the licensee must give written notice to the owner of any property within 150 m of the treatment area;³⁹⁹
- Prepare annual reports outlining information on all pesticides used, the treatment areas, and methods applied;⁴⁰⁰ and
- Keep all records (information requirements) prescribed in the act for a period of three years after the application of the pesticide.⁴⁰¹

168. Peter Ross, a research scientist for DFO, found that the available data about pesticide use is limited due to the reduced reporting requirements for forestry and agriculture sectors under the *IPM Act* and the fact that PMRA asserts confidentiality over its database.⁴⁰² He concludes that DFO's ability to adequately evaluate and assess pesticides of concern in the context of sockeye salmon is therefore hindered.⁴⁰³ With respect to MPB, Head of DFO's Fish-Forestry Research Program, Erland Maclsaac, has stated that there is no significant use of pesticides by the forestry industry.⁴⁰⁴

³⁹⁹ Integrated Pest Management Regulation, B.C. Reg. 604/2004, s. 62

⁴⁰⁰ *Ibid.*, s. 39

⁴⁰¹ *Ibid.*, s. 83

⁴⁰² Hypothesis Handout Stressor/Hypothesis: Contaminants predisposed salmon to a secondary stress by Ross and Macdonald (June 2010) [CAN360825] at 3; Fraser Sockeye – Future Research Workshop Minutes (July 27, 2010) [CAN354646] at 2

⁴⁰³ *Ibid.*, at 2

⁴⁰⁴ Email from Erland Maclsaac to Peter Ross (September 16, 2009) [CAN088720]

Appendix A: List of Documents Referred to in this Report

Ringtail documents

Count	Doc ID	Main Date	Title
1	EV.CAN.0005.000000. CAN005943		Operating Principles - Crown Land Forestry Development
2	EV.CAN.0008.002000. CAN014339		High and Dry - An Investigation of Salmon-Habitat Destruction in British Columbia
3	EV.CAN.0009.005000. CAN020186		Joint Agency Review Draft Report Comments
4	EV.CAN.0009.005000. CAN020190		Assessment of the Condition of Small Fish-Bearing Streams in the Central-Interior Plateau of British Columbia in Response to Riparian Practices Implemented under the Forest Practices Code
5	EV.CAN.0010.002000. CAN023450		HEB Focus Groups
6	EV.CAN.0010.006000. CAN027932		OHEB Key Issues
7	EV.CAN.0010.006000. CAN027946		Re: Fisheries Act Implications of Logging Adjacent to Small Streams
8	EV.CAN.0014.007000. CAN070165		Pacific Region - 'Fish/Forestry Issues'
9	EV.CAN.0024.000000. CAN186007		Habitat Compliance Decision Framework
10	EV.CAN.0026.001000. CAN197504		Shane Smith - Habitat Biologist - Quesnel
11	EV.CAN.0031.002000. CAN246247		Tim Panko - Habitat Tech. - Clearwater Field Area
12	EV.CAN.0036.000000. CAN285487		Joint-Agency Assessment of Forestry Planning and Practices Around Small Streams
13	EV.CAN.0036.000000. CAN285489		Stream Crossing Guidebook - Comments Concerns and Action Items
14	EV.CAN.0047.009000. CAN412261		Mountain Pine Beetle: Salmon Are Suffering Too
15	BCP002161	1-Dec-1995	Riparian Management Area Guidebook

16	EV.CAN.0009.005000. CAN020036	22-Mar-1999	Draft Proposal: Fish Forestry Monitoring Program
17	EV.CAN.0009.005000. CAN020035	12-Apr-1999	Subject: FW: Fish Forestry Monitoring Program
18	EV.CAN.0001.002000. CAN002592	30-Jun-1999	Freshwater Habitat
19	EV.CAN.0010.002000. CAN023446	13-Dec-1999	Subject: FW: Habitat Focus Groups
20	EV.CAN.0038.002000. CAN297763	1-Jan-2000	No Net Loss of Fish Habitat: An Adult of Forest Road Crossings of Fish- Bearing Streams in British Columbia, 1996-1999
21	EV.CAN.0036.000000. CAN285486	1-Jun-2000	Subject: FW: Small Stream Monitoring - Update on DFO/MELP/MOF Discussions
22	EV.CAN.0036.000000. CAN285480	18-Jul-2000	Re: Your Letter on the Fisheries Act Implications of Logging Adjacent to Small Streams
23	EV.CAN.0009.005000. CAN020056	9-Aug-2000	Subject: FW: DFO-MELP Forestry Referrals
24	EV.CAN.0009.005000. CAN020266	15-Dec-2000	Subject: Forest Development Plan (FDP) #1 for FLA61106 Merritt TSA
25	EV.CAN.0009.005000. CAN020141	20-Dec-2000	Subject: FW: Summary - S4 Stream Review Exit Mtg
26	EV.CAN.0009.005000. CAN020189	8-Feb-2001	Subject: Riparian Review and DFO letter
27	EV.CAN.0009.005000. CAN020188	27-Feb-2001	Note that the following review comments from Fisheries and Oceans Canada staff relate to the report titled: 'Assessment of the Condition of Small Fish-Bearing Streams in the Central-Interior Plateau of British Columbia in Response to Riparian Practices~
28	EV.CAN.0009.005000. CAN020191	20-Aug-2001	Subject: FW: Joint Agency Review
29	EV.CAN.0007.000000. CAN010315	1-Jan-2002	Canadian Science Advisory Secretariat - Research Document 2002/007 - Floodplains Flooding and Salmon Rearing Habitats in British Columbia: A Review
30	EV.CAN.0005.000000. CAN006054	1-Mar-2002	Forest Practices Code of British Columbia - Fish-Stream Crossing Guidebook

31	EV.CAN.0031.004000. CAN248046	25-Nov-2004	Re: F.L. A16994 Timber Baron Forest Products 2004 Forest Stewardship Plan
32	EV.CAN.0031.004000. CAN248045	26-Nov-2004	Forestry
33	EV.CAN.0026.001000. CAN197528	1-Jan-2005	Annual Report 2005
34	EV.CAN.0026.001000. CAN197489	20-May-2005	Subject: Fisheries and Oceans Canada's Transition Strategy Related to Crown Land Forestry Activities and Planning Including the Forest and Range Practices Act - Draft
35	EV.CAN.0020.010000. CAN128193	31-May-2005	RE: Briefing Note - DFO's Position on Riparian Protection of Small Streams Related to Forest Harvesting
36	EV.CAN.0005.000000. CAN005944	5-Jul-2005	Habitat Management Operating Principles for Crown Forestry Development Version July 5/05
37	EV.CAN.0017.006000. CAN083529	3-Oct-2005	David Suzuki Foundation News Release
38	EV.CAN.0028.004000. CAN220734	2-Dec-2005	Federal/Provincial Fish/Forestry Meeting
39	EV.CAN.0032.006000. CAN260818	1-Jan-2006	Annual Report for Kelly Austin for 2006
40	EV.CAN.0033.005000. CAN269592	3-Feb-2006	Interim Operational Working Arrangement on Enforcement of Section 36(3) Fisheries Act Between Environment Canada and Department of Fisheries and Oceans Pacific & Yukon - February 1 2006
41	EV.CAN.0028.004000. CAN220736	28-May-2006	Cooperation Agreement Respecting Fish/Forestry Interactions
42	EV.CAN.0028.004000. CAN220737	11-Jun-2006	Draft Project Charter and Work Plan - Title: Review and Update of the Riparian Area Management Guidebook
43	EV.CAN.0022.004000. CAN142400	1-Oct-2006	The Will to Protect - Preserving BC's Wild Salmon Habitat
44	CCI000008	1-Mar-2007	The Effect of Mountain Pine Beetle Attack and Salvage Harvesting On Streamflows-Special Investigation
45	EV.CAN.0033.005000. CAN269609	22-Oct-2007	DFO Forestry 1 Pager
46	EV.CAN.0020.007000.	22-Nov-2007	Mountain Pine Beetle

	CAN125207		
47	EV.CAN.0023.013000. CAN176485	4-Dec-2008	FW: Forest Practices Board Report on Fish Passage
48	EV.CAN.0005.000000. CAN005925	1-Jan-2009	Fish Passage at Stream Crossings - Special Investigation
49	BCP000474	1-Feb-2009	Fish-Forestry Interaction Program
50	EV.CAN.0023.014000. CAN178246	14-Dec-2009	Re: Notification of Proposed Amendment to the Tolko Industries Ltd Cariboo Woodlands Forest Stewardship Plan (October 2006) - Amendment of the Area Within the FDU Considered to be Hydrologically Sensitive (FSP Section 4.1.5.1 and Appendix I (Map))
51	EV.CAN.0023.014000. CAN178245	4-Mar-2010	Fw: Riparian Reserves
52	EV.CAN.0038.002000. CAN297741	18-Nov-2010	Backgrounder #6 - What are DFO's key activities in fish habitat management?
53	BCP000354		Strategic Approach to Fish Passage in British Columbia
54	EV.CAN.0009.005000. CAN020039		Executive Summary - NNL Audit of Stream Crossings
55	EV.CAN.0009.005000. CAN020197		Fisheries and Oceans Canada - Culvert Protocol
56	EV.CAN.0014.007000. CAN070165		Pacific Region - 'Fish/Forestry Issues'
57	EV.CAN.0036.000000. CAN285489		Stream Crossing Guidebook - Comments Concerns and Action Items
58	EV.CAN.0042.008000. CAN360825		Hypothesis Handout - Stressor / Hypothesis: Contaminants Predisposed Salmon to a Secondary Stress
59	EV.CAN.0047.009000. CAN412261		Mountain Pine Beetle: Salmon Are Suffering Too
60	EV.CAN.0038.002000. CAN297763	1-Jan-2000	No Net Loss of Fish Habitat: An Audit of Forest Road Crossings of Fish-Bearing Streams in British Columbia, 1996-1999
61	EV.CAN.0009.005000. CAN020034	3-Feb-2000	Subject: FW: Crossing Fish Streams
62	EV.CAN.0009.005000. CAN020067	12-Oct-2000	Re: Use of Corrugated Metal Pipes in Fish Streams

63	EV.CAN.0009.005000. CAN020266	15-Dec-2000	Subject: Forest Development Plan (FDP) #1 for FLA61106 Merritt TSA
64	EV.CAN.0036.000000. CAN285492	9-Jan-2001	Re: Audit of Forest Road Crossings and the use of Corrugated Metal Pipes in Fish Bearing Streams
65	EV.CAN.0009.005000. CAN020214	13-Mar-2001	Subject: FW: Why More Culvert Debates??
66	EV.CAN.0009.005000. CAN020209	14-Jun-2001	Stream Crossing Guidelines for British Columbia - Technical Workshop Proceedings
67	EV.CAN.0005.000000. CAN005900	9-Aug-2004	Subject: Expedited Timber Supply Review for the Lakes Prince George and Quesnel Timber Supply Areas - Public Discussion Paper - June 2004
68	EV.CAN.0023.007000. CAN170794	30-Mar-2005	
69	EV.CAN.0023.007000. CAN170788	28-Apr-2005	Subject: Stream Crossing Strategic Review
70	BCP001541	1-Jan-2006	The State of British Columbia's Forests, 2006
71	EV.CAN.0026.001000. CAN197573	1-Jan-2006	Mountain Pine Beetle - Potential Impacts to Salmon (Information Only)
72	EV.CAN.0017.008000. CAN085918	24-Dec-2007	MPB - briefing of Federal Ministers on MPB
73	EV.CAN.0023.007000. CAN170815	18-74Mar-2008	Mountain Pine Beetle Rate of Cut Issues
74	EV.CAN.0005.000000. CAN005925	1-Jan-2009	Fish Passage at Stream Crossings - Special Investigation
75	EV.CAN.0026.002000. CAN198246	1-Jan-2009	2009 State of the Fraser Basin Report Sustainability Snapshot 4 - The Many Faces of Sustainability
76	EV.CAN.0010.009000. CAN031207	22-Jan-2009	Water Crossings Pose Serious Threat to Fish: Report Culverts and Bridges are a Little-known Threat to Migration
77	BCP000399	1-Mar-2009	The Strategic Approach: Protocol for Planning and Prioritizing Culverted Sites for Fish Passage Assessment and Remediation, 3rd edition
78	BCP002162	12-Mar-2009	Re: Special Investigation Report 25 - Fish Passage at Stream Crossings
79	EV.CAN.0017.011000. CAN088720	16-Sep-2009	FW: MPB

80	EV.CAN.0036.001000. CAN286932	1-Feb-2010	Re: Special Investigation Report 25 - Fish Passage at Stream Crossings
81	BCP002122	26-Apr-2010	Re: Special Investigation Report 25 - Fish Passage at Stream Crossings
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2. Cohen Commission Exhibit PPR8
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Appendix B: List of Acronyms Used

Act – *Fisheries Act*

BCI OHEB – BC Interior Area OHEB (DFO)

Board – Forest Practices Board

C&E – Compliance and Enforcement (of Ministry of Forests, Lands and Natural Resource Operations)

C&P – Conservation and Protection Directorate (of DFO)

CFFG – Coastal Fisheries Forestry Guidelines

CMP – Corrugated Metal Pipe (a closed bottom stream crossing structure)

Code – Forest Practices Code (*FPC Act*, regulations, guidebook and practices standards)

COFI – Council of Forest Industries

DFO or Department – Department of Fisheries and Oceans Canada

EC – Environment Canada

EPMP – Environmental Process Modernization Plan

FAC – Forest Appeal Commission

FDP – Forest Development Plan (as per the *Forest Practices Code of British Columbia Act*)

FFWG – Fish/Forestry Technical Working Group

FPC Act – *Forest Practices Code of British Columbia Act*

FPPR – Forest Planning and Practices Regulation (as per the *Forest and Range Practices Act*)

FPTWG – Fish Passage Technical Working Group

FREP – Forest and Range Evaluation Program

FRPA – *Forest and Range Practices Act*

FSP – Forest Stewardship Plan (as per the *Forest and Range Practices Act*)

HADD – Harmful Alteration, Disruption or Destruction of Fish Habitat (as per the Act)

HMP – Habitat Management Program (of DFO)

IPM Act – *Integrated Pest Management Act* (provincial)
JMC – *FRPA* Joint Management Committee
JSC – *FRPA* Joint Steering Committee
LWD – Large Woody Debris
MELP – Ministry of Environment, Lands and Parks
Ministry – Ministry of Forests, Lands and Natural Resource Operations
(previously known as: Ministry of Forests 1978-2005; Ministry of
Forests and Range 2005-2010; Ministry of Forests, Mines and Lands
2010)
MOE – Ministry of Environment
MPB – Mountain Pine Beetle
NCA OHEB – North Coast Area OHEB
OHEB – Oceans, habitat and Enhancement Branch (of DFO)
OSPR – Operational and Site Planning Regulation (as per the *Forest
Practices Code of British Columbia Act*)
PFC – Properly Functioning Condition
PCP Act – *Pest Control Products Act* (federal)
PMRA – Pest Management Regulatory Agency (federal)
Report – commission’s Policy and Practice Report, Regulation of Forestry
Activities Potentially Impacting on Fraser River Sockeye (May 2011)
RMA – Riparian Management Area
RMA guidebook – Riparian Management Area Guidebook
RMZ – Riparian Management Zone
RRZ – Riparian Reserve Zone
WAP guidebook – Coastal Watershed Assessment Procedure Guidebook
Interior Watershed Assessment Guidebook
WLP – Woodlot Licence Plan (as per the *Forest and Range Practices Act*)

Appendix C: Best Management Practices from the RMA Guidebook

Table 5. Best management practices for the management zone adjacent to the reserve zone of S1, S2, and S3 streams – coast and interior

The RMA adjacent to streams with these riparian classes contain a reserve zone where timber practices are constrained by regulation. The primary objective of the management zone for these riparian classes is to manage the risk of windthrow to the reserve zone, and provide opportunities for meeting wildlife tree objectives.

Best Management Practice

- Manage windthrow hazard consistent with the section "Options to reduce windthrow risk to reserve zone"
- Retain wildlife trees consistent with the sections "Wildlife trees in the reserve zone" and "Wildlife trees in the management zone."

Table 8. Best management practices for management zones adjacent to S4 streams – coast

Streams with a riparian class of S4 do not require a reserve zone, but several key management practices should be considered when harvesting these areas. A sufficient number of streamside trees should be retained to maintain streambank stability, to protect fish habitat, and to provide a source of future LWD so as to prevent downstream impacts to S1, S2, or S3 streams or marine-sensitive zones. Windthrow hazard has a strong influence over the successful management of riparian areas adjacent to S4 streams. Where there is a windthrow hazard, reduce the potential impacts and associated damage to streambanks by harvesting windthrow-prone trees. Areas where windthrow hazard is low can provide opportunities to retain trees to meet a wide range of riparian objectives.

Best Management Practice

- Retain all windfirm trees with roots embedded in the bank.
- Remove dominant conifers and retain 50% of the remaining stems within 10 m of the channel. In addition, harvesting strategies should favor maintaining the species, age, and size distribution (excluding dominants).
- Fall and yard away. Remove slash and debris inadvertently deposited in the stream at the time of harvest (see "Falling and yarding"). Where a shallow rooted, wind-prone leaner is felled, fell the tree so that the butt clears the channel or the stem spans both streambanks. Remove only those stems that can be lifted without damage to the channel or bank. For those stems that cannot be lifted clear, leave the portion of the stem that spans the channel. Ensure the stem and limbs do not obstruct stream flow or fish passage.
- Retain nonmerchantable conifer trees, understorey deciduous trees, shrubs, and herbaceous vegetation within 5 m of the channel to the fullest extent possible.
- Retain wildlife trees consistent with the section "Wildlife trees in the management zone."

Where windthrow hazard is high and high tree retention within 10 m of the stream channel cannot be achieved, consider the following:

- Harvest windthrow-prone trees and maintain as many of the windfirm trees as possible, having the characteristics described in "Options to reduce windthrow risk in the management zone," within 10 m of the channel.
- In streams dependent on woody debris to maintain channel processes, retain all conifer stems < 30 cm DBH.
- Previous points "Fall and yard," "Retain nonmerchantable," and "Retain wildlife trees."

Table 9. Best management practices for management zones adjacent to S5 streams – coast

These streams do not require a reserve zone and are not fish streams. Consequently, the objectives of the management zone are primarily to protect wildlife habitat on valley bottom streams and to maintain bank and channel stability to protect downstream values. S5 streams present in valley bottoms are often important wildlife travel corridors and feeding areas and should be managed for these values. In these situations, high retention rates are recommended. Elsewhere, timber harvestings should be consistent with the requirement to retain a sufficient number of streamside trees. This maintains streambank or channel stability and shade over temperature sensitive streams, for protection of downstream values. Also consider the management of wildlife trees and the risk to known critical habitats.

Best Management Practice

Along valley bottom streams*

- Retain 50% of dominant and codominant stems having the characteristics described in "Options to reduce windthrow risk in the management zone," distributed throughout the management zone.
- Retain nonmerchantable conifer trees, understorey deciduous trees, shrubs, and herbaceous vegetation within 10 m of the channel to the fullest extent possible.
- Fall and yard away. Remove slash and debris that enters the stream and becomes subject to the section on "Stream clean-out."
- Retain wildlife trees consistent with the section "Wildlife trees in the management zone."

Along non-valley bottom streams

For streams dependent on woody debris or streamside trees to maintain channel and/or streambank stability:

- Retain conifer stems < 30 cm DBH plus understorey and deciduous trees within 5 m of the stream channel.
- Retain leaners within 10 m of the channel.
- Perform above practices: "Retain nonmerchantable," "Fall and yard," and "Retain wildlife trees."

For streams not dependent on woody debris or streamside trees to maintain channel and/or streambank stability

- Refer to the sections "Falling and yarding" and "Stream clean-out."
- Retain wildlife trees consistent with the section "Wildlife trees in the management zone."

* These are larger non-fish streams forming either the main valley stream or major tributaries to a valley. This does not include steep hillside tributaries.

Table 10. Best management practices for management zones adjacent to S6 streams – coast

These small, non-fish streams do not require a reserve zone, but may impact downstream values if not properly managed. Retain trees, where they are required, for maintenance of streambank or channel stability, or shade over temperature-sensitive streams where tributary to S1 to S4, marine-sensitive zones and fish-bearing lakes.

Best Management Practice

For streams dependent on woody debris or streamside trees to maintain channel and bank stability, and streams that are temperature sensitive:

- Fall and yard away, while retaining a minimum of 10 trees < 30 cm DBH per 100 m of streambank, subject to the section "Falling and yarding."
- Remove slash and debris that inadvertently enters the stream subject to the sections "Falling and yarding" and "Stream clean-out."
- Retain nonmerchantable conifer trees, understorey deciduous trees, shrubs, and herbaceous vegetation within 5 m of the channel to the fullest extent possible.
- Retain wildlife trees consistent with "Wildlife trees in the management zone."

Streams not dependent on woody debris or streamside trees to maintain channel and/or streambank stability can be cross-stream yarded subject to debris management as outlined in the sections "Falling and yarding" and "Stream clean-out."

Table 11. Best management practices for management zones adjacent to S4 streams – interior

The primary objective of the management zone of S4 streams in the interior is to provide for the protection and management of fisheries, important wildlife habitats, and water quality associated with these streams. These streams provide important furbearer as well as fisheries habitat and significantly influence downstream fisheries values. Timber harvesting and other activities should be consistent with the requirement to maintain stream channel processes, stream temperatures, wildlife trees, and habitat for furbearers and other wildlife.

Best Management Practice

- Retain all trees within 10 m of the streambank.
- Retain wildlife trees within 10 m of the streambank by establishing safe work zones within the remainder of the management zone. Retain wildlife trees consistent with the section "Wildlife trees in the management zone."
- Fall and yard away.

Where the best management practice cannot be achieved due to moderate or high windthrow hazard:

- Harvest windthrow-prone trees and maintain as many of the windfirm trees as possible that have the characteristics described in "Options to reduce windthrow risk in the management zone," within 10 m of the channel.
- Fall and yard away. Remove slash and debris inadvertently deposited in the stream at the time of harvest (see "Falling and yarding"). Where a shallow rooted, wind-prone leaner is felled, fell the tree so that the butt clears the channel or the stem spans both streambanks. Remove only those stems that can be lifted without damage to the channel or bank. For those stems that cannot be lifted clear, leave the portion of the stem that spans the channel. Ensure the stem and limbs do not obstruct stream flow or fish passage.
- Retain wildlife trees consistent with the section on "Wildlife trees in the management zone."
- Retain nonmerchantable conifer trees, understory deciduous trees, shrubs, and herbaceous vegetation within 10 m of the channel to the fullest extent possible.

Table 12. Best management practices for management zones adjacent to S5 streams – interior

Management strategies adjacent to S5 streams in the interior should maintain important wildlife habitat and, where needed, a source of LWD and root networks for bank and channel stability, and overbank shading for stream temperature control. Larger S5 streams are often important wildlife corridors and feeding areas and should be managed for these values.

Best Management Practice

For streams greater than 10 m in width:

- Retain all windfirm trees with roots embedded in the bank.
- Remove dominants that are prone to windthrow. Retain a minimum of 30% of the remaining dominant and codominant coniferous stems within the management zone, favoring the most windfirm stems. Concentrate retained trees near the stream channel and/or in patches to buffer important wildlife features. In addition, harvesting strategies should favor maintaining the species, age, and size distribution. Distribution of the specified retention level may vary within the management zone to reflect site conditions (e.g., soils, topography, etc.) and stand characteristics. For example, short sections of the management zone within a cutblock may have low tree retention if other sections of the management zone have full or high tree retention patches. Lower retention for a short section of the stream does not jeopardize channel stability.
- Fall and yard away. Remove slash and debris inadvertently deposited in the stream at the time of harvest (see the section "Falling and yarding"). Where a shallow rooted, wind-prone leaner is felled, fell the tree so that the butt clears the channel or the stem spans both streambanks. Remove only those stems that can be lifted without damage to the channel or bank. For those stems that cannot be lifted clear, leave the portion of the stem that spans the channel. Ensure the stem and limbs do not obstruct stream flow.
- Retain wildlife trees consistent with the section "Wildlife trees in the management zone."

For all other streams:

- Harvest windthrow-prone trees and maintain windfirm trees having the characteristics described in "Options to reduce windthrow risk in the management zone" within 10 m of the channel.
- Perform the above practices: "Fall and yard," and "Retain wildlife trees."

Table 13. Best management practices for management zones adjacent to S6 streams – interior

S6 streams are small but the adjacent riparian habitats often have important wildlife values, especially for furbearers. Sufficient streamside vegetation should be retained to maintain important wildlife habitat values, streambank and channel stability, and streambank shading.

Best Management Practice

- Retain the most windfirm 5 per cent of the codominant conifers having the characteristics described in "Options to reduce windthrow risk in the management zone" within the RMA of two streams (where present), for every 40 ha of harvest area. Preference should be given to the two largest streams that have complex streamside vegetation, have obvious signs of wildlife use, are on the block boundary, or provide connectivity with adjacent unharvested areas. Consider leaving 3-m stubs.
- Remove windthrow-prone trees with roots embedded in the streambank.
- Fall and yard away to the extent possible. Remove slash and debris inadvertently deposited in the stream at the time of harvest. Streams can be cross-stream yarded subject to debris management as outlined in "Falling and yarding" and "Stream clean-out."
- Retain wildlife trees consistent with the section "Wildlife trees in the management zone."
- Retain nonmerchantable conifer trees, understorey deciduous trees, shrubs, and herbaceous vegetation within 5 m of the channel to the fullest extent possible.