

British Columbia Fish Passage Program



June 2018



Ministry of
Forests, Lands, Natural
Resource Operations
and Rural Development

2008 - 2017 Program Highlights

757
kilometres of fish habitat

18,400
crossing assessments

161
crossings remediated

139
habitat confirmations



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Background

British Columbia is the most biologically diverse of Canada's provinces and territories. In turn, this has created rich diversity and geographic distribution in our aquatic ecosystems and resulting fish species. The ability for fish and other aquatic organisms inhabiting streams to move freely (upstream and downstream) throughout their natural environment is an essential component of sustaining fish populations, along with healthy and resilient aquatic ecosystems.

In addition to their ecological importance, British Columbia's fish play an important role culturally, socially, and economically. Indigenous communities located in the northwest are among the oldest known fishing cultures in the world. With freshwater and salmon species ranging across the province, fish are foundational to the cultural, traditional, and ceremonial foundations, both historically and in current practice. Wild fish are an important food source for many British Columbians. Fishing is a commonly enjoyed practice among the young and old, including catch-and-release fishing for recreation. British Columbia also supports a world renowned, and economically important, guided-fishery. British Columbia's fish are also part of our iconic global image, a key ingredient to our "Super Natural British Columbia" tourism brand.



A fish passage barrier is anything that hinders any life-stage of fish from moving through its natural range. The primary barriers are some of the culverts installed before 1995, before the legislation was enacted to protect fish passage. These culverts may allow water to flow but may not provide conditions that fish can actually swim through. The water that flows through culverts may also block fish migration because the flow is too swift, too shallow, or has a waterfall into or out of the culvert.

A single removed barrier can deliver impressive benefits, improving fish access for kilometres both upstream and downstream. When rivers and streams are connected, fish can better access the habitat they need. This is an important component of protecting and restoring fish populations.

The Fish Passage Remediation Program was established in 2007, and is delivered in collaboration between the partners listed on the outside back cover. Funding is primarily provided by the Ministry of Forests, Lands, Natural Resource Operations and Rural Development through the Land Based Investment Strategy.

The program has identified approximately 140,000 stream crossings on approximately 800,000 km of road in British Columbia. To date, the program has remediated over 150 road stream crossings resulting in fully restored access to over 750 kilometres of fish habitat (See 2008 – 2017 Accomplishments table, page 4).

The following information provides a summary update of the remediation projects undertaken in the 2-year period from 2015/16 to 2016/17.

For more information about the Fish Passage Program please visit both:

www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/fish/fish-passage
and

www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/land-based-investment/investment-categories/fish-passage

Opposite from left to right: Edwin Blewett (consultant), Brian Chow (FLNRORD, Engineering Branch, Chief Engineer), Richard Thompson (ENV, Ecosystems Branch, Unit Head), Lisa Nordin (FLNRORD, Resource Practices Branch, Aquatic Resource Stewardship Evaluation Officer), Craig Mount (ENV, Knowledge Management Branch, Aquatic Habitat Geomorphologist), Elizabeth Easton (FLNRORD, Resource Practices Branch, Strategic Resource Management Analyst), Dave Maloney (FLNRORD, Resource Practices Branch, Forest Water Management Officer), Peter Tschapinski (ENV, Ecosystems Branch, Unit Head, Ecosystems Science)

Acronym Index

BCTS B.C. Timber Sales
CMP corrugated metal pipe
DFO Department of Fisheries and Oceans
ENV B.C. Ministry of Environment and Climate Change Strategy
FIA Forest Investment Account
FLNRORD B.C. Ministry of Forests, Lands, Natural Resource Operations and Rural Development
FSR Forest Service Road
GFA Gitanyow Fisheries Authority
LBIS Land Based Investment Strategy
LWD large woody debris
PSF Pacific Salmon Foundation
RFCPP Recreational Fisheries Conservation Partnership Program
TWG Technical Working Group
WBC wood box culvert
WFP Western Forest Products

2008 - 2017 Accomplishments

FISCAL YEAR	EXPENDITURE (millions)	CROSSING ASSESSMENTS	INSTALLED CULVERTS	INSTALLED BRIDGES	DEACTIVATIONS	TOTAL CROSSINGS REMEDIATED	KILOMETRES OF FISH HABITAT RECOVERED
2008/09	\$6.1 *	4 683	28	17	■	44	158
2009/10	\$3.6 *	4 594	23	11	■	34	184
2010/11	\$2.4	8 171	■	■	■	17	305
2011/12	\$0.8	1 987	■	■	■	2	25
2012/13	\$2.0	3 000	■	■	11	18	27
2013/14	\$0.5	1 954	2	2	2	6	18
2014/15	\$1.0 **	1 416	1	4	20	25	11.6
2015/16	\$1.4 **	16	6	4	0	11 ***	22.3
2016/17	\$1.2 **	276	0	1	3	4	6.3
Totals	\$17.8	26 097****	60	39	36	161	757.2

* denotes FIA funding ** includes RFCPP funding *** includes removal of one small dam **** includes assessments completed on non-fishbearing streams

Note: From 2002/03 to 2007/08, a further \$18.5 MM was expended from Forest Investment Account (FIA)

2015 - 2017 Remediation Projects Summary

PROJECT	LOCATION	2016/17 COSTS	RESTORATION	HABITAT GAIN	FISH
1. O'Cook River Tributary	Stuart - Nechako	\$106,645	■ Bridge installed.	5000 m	Rainbow trout, likely also Coho salmon, Cutthroat trout, and Dolly Varden
2. Cypre River/Clayquot	Vancouver Island	\$59,600	■ Three Deactivations.	550 m 4675 m ²	Chinook, Coho, Chum, and Pink salmon, Cutthroat trout, and Rainbow trout
3. Tranquil Creek/Clayquot - Year One	Vancouver Island	\$82,139	■ Site Plan and Structure Purchase 2016/17. ■ Bridge to be installed in 2017/18.	225 m in 17/18	Coho salmon and Cutthroat trout, likely also Chinook, Chum, Pink, and Sockeye salmon, Rainbow trout and Steelhead, and Dolly Varden
4. Lemon Creek - Year One	Kootenays	\$115,687	■ Site Plan and Structure Purchase 2016/17. ■ Bridge to be installed in 2017/18.	5000 m in 17/18	Rainbow trout and Bull trout
5. Rock Creek - Year One	Kootenays	\$115,000	■ Habitat Confirmation, Site Plan and Structure Purchase 2016/17. ■ Bridge to be installed in 2017/18.	2500 m in 17/18	Rainbow trout
6. Dead Horse Lake Tributary/Kuldo FSR Site 23 - Year One	Skeena	\$20,138	■ Site Plan and Structure Purchase in 2016/17. ■ Embedded structure installation in 2017/18.	1500 m in 17/18	Rainbow trout
7. Shuttleworth Creek/Kilmer FSR - Year One	Okanagan - Columbia	\$11,613	■ Habitat Confirmation and Site Plan in 2016/17. ■ Purchase and install replacement structure in 2017/18.	6600 m in 17/18	Rainbow trout

2015 - 2017 Remediation Projects Summary *Continued*

PROJECT	LOCATION	2016/17 COSTS	RESTORATION	HABITAT GAIN	FISH
8. Coast South 700 Main	Vancouver Island	\$150,000	■ Habitat Confirmation, Site Plan, Structure Purchase, and Installation.	750 m 1875 m ²	Coho, Chum, Pink, and Chinook salmon, Cutthroat trout and Steelhead, and Dolly Varden
9. Jamieson Creek Weir Removal	Kamloops	\$85,000	■ Groundwater well drilled with pump and power installed 2016/17. ■ The dam (weir) removal will occur in 2017/18.	9,250 m in 17/18. 2,900 m in 17/18.	Rainbow trout, Bull trout, and Coho salmon
10. Maxan Creek Derelict Bridge Removal	Nadina	\$28,800	■ Derelict Stimbold Bridge removed.	Fish barrier at some flows removed.	Chinook, Coho, and Sockeye salmon, Rainbow trout and Steelhead, Dolly Varden and Mountain whitefish
11. Date Creek 1,200 Backwater weir	Skeena	\$6,200	■ Backwater weirs installed and four upstream abandoned beaver dams breached.	275 m	Cutthroat trout
12. Copper Creek - Skidegate Lake	Haida Gwaii	\$149,400 (Year 2 costs)	■ Spur 30 bridge. ■ NES2 embedded structure.	1,700 m gain 530 m gain	Coho, and Sockeye salmon
13. Clint Creek	Haida Gwaii	\$107,200 ²	■ Dam removal. ■ Habitat enhanced.	1,300 m gain 375 m enhanced	Coho, Chum, and Pink salmon, Steelhead, and Dolly Varden
14. Honna River	Haida Gwaii	\$69,000	■ Habitat enhanced.	325 m enhanced	Coho, Chum, and Pink salmon, Steelhead and Dolly Varden
15. Shelley Creek	Haida Gwaii	\$83,400	■ Habitat enhanced.	285 m enhanced	Coho and Chum salmon, Cutthroat trout, and Dolly Varden
16. Plumbob Creek	East Kootenays	\$198,500	■ Bridge installed.	7,000 m gain	Cutthroat, Eastern Brook, and Bull trout
17. Linklater FSR - Purcell Creek	East Kootenays	\$195,600	■ Bridge installed.	7,600 m gain	Cutthroat, Eastern Brook, and Bull trout
18. Nass River Brown Bear FSR	Skeena	\$99,200 (Year 2 costs)	■ Two embedded structures.	350 m gain	Rainbow trout
19. Kispiox River - Helen FSR	Skeena	\$177,700 (Year 2 costs)	■ Two embedded structures.	2,300 m gain	Bull and Rainbow trout
20. Cherry Creek - North Fork FSR	Okanagan - Columbia	\$146,400	■ Bridge installed.	>500 m gain (up to 2,500 m)	Rainbow and Bull trout
21. Bench FSR	Chilliwack	\$211,500	■ Embedded structure. ■ Habitat restored.	1,000 m gain	Cutthroat and Rainbow trout, Coho salmon, and Dolly Varden
Totals 2015 - 2017		\$2,852,524³	■ 354 Fish passage assessments; ■ 34 habitat confirmations. ■ 2 assessment reviews.	>35,130 m gain (up to 37,130 m) >985 m enhanced > 27,975 m gain estimated for 2017 - 2018	-Coho, Sockeye, Chum, and Pink salmon -Steelhead -Dolly Varden & Mountain whitefish -Cutthroat, Bull, Rainbow, and Eastern Brook trout

1 For projects Year 2 costs, Year 1 costs in 2014/15 included site plans and purchase of structures.

2 Includes \$29,150 paid by Western Forest Products (WFP) for dam removal.

3 Total costs = LBIS Fish Passage + RFCPP + in kind (BCTS + FLNRORD + PSF + Interagency Fish Passage Technical Working Group + WFP).

Location of 2015 - 2017 Fish Passage Remediation Projects

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1

Fish Passage Remediation Project Number One

O’Cock River

Project Costs	
LBIS 2015/16	\$86,034
LBIS 2016/17	\$50,645
PSF 2016/17	\$2,500
RFCPP 2016/17	\$53,500
Total	\$192,679
Total 2016/17	\$106,645



Before: Closed bottom structure that impeded fish passage that was removed

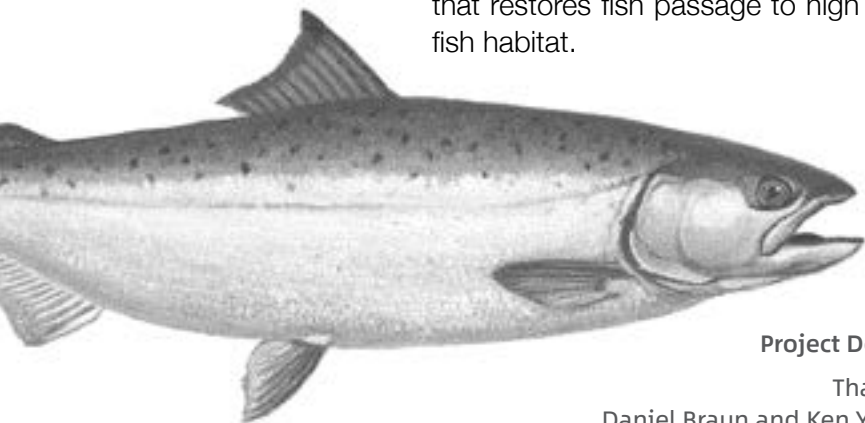
After: Open bottom bridge that provides for fish passage that was installed

Project Objectives

1. Remove the existing closed bottom crossing structure that was impeding fish passage, located at km 3.5 on the O’Cock Forest Service Road (also referred to as Crossing OCOC 001), and
2. Replace it with an open bottom structure that restores fish passage to high quality fish habitat.

Project Results

1. The project objective was achieved with the removal of the closed bottom structure, and installation of an open bottom bridge. With the crossing structure replacement, the O’Cock River Tributary Fish Passage Restoration Project now provides fish access to at least 5,000 linear metres of high quality upstream rearing and over-wintering habitat for:
 - Rainbow trout (*Oncorhynchus mykiss*), and likely for
 - Coho salmon (*O. kisutch*),
 - Cutthroat trout (*O. clarkii*), and
 - Dolly Varden trout (*Salvelinus malma*).



Project Delivery

Thanks to
Daniel Braun and Ken Yortson
BC Timber Sales
Stuart-Nechako



Project Delivery

Thanks to
Dave Hamilton
BC Timber Sales
Strait of Georgia

Fish Passage Remediation Project Number Two

Cypre River / Clayquot

2

Project Costs	
LBIS 2014-2015	\$40,808
LBIS 2016/17	\$23,516
PSF 2016/17	\$2,500
RFCPP 2016/17	\$33,584
Total	\$100,408
Total 2016/17	\$59,600



Before: Looking upstream toward the collapsed wood box culvert outlet

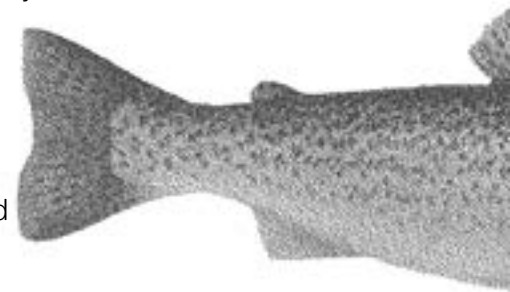
After: Looking upstream after removal of the collapsed wood box culvert

Project Objectives

- The project objectives were to:
1. Remove a collapsed wood box culvert (WBC) and a corrugated metal pipe (CMP), located at two CYP-3001 crossings, that were a barrier to fish passage access to upstream habitat including an off-channel habitat restoration site (Channel 23) on the Cypre River,
 2. Restore the streambed and streambank at the CYP-3001 crossing sites following removal of the WBC and CMP, and
 3. Remove a collapsed WBC that was discovered at the restoration site during the deactivation work; this was included as an additional objective.

Project Results

- The project objectives were achieved with:
1. The removal of the two WBCs and the CMP, and the restoration of the streambed and streambank.
 2. The deactivation of the CYP-3001 road crossing.
 3. The Cypre River Fish Passage Restoration Project now provides fish access to 550 linear metres, and 4,675 square metres, of upstream habitat for utilization by:
 - Chinook salmon (*Oncorhynchus tshawytscha*),
 - Coho salmon (*O. kisutch*),
 - Chum salmon (*O. keta*),
 - Pink salmon (*O. gorbuscha*),
 - Cutthroat trout (*O. clarkii*), and
 - Rainbow trout (*O. mykiss*).



Note: This includes access to a 1999 fish habitat rehabilitation project where a groundwater-fed channel (Channel 23) was constructed along the right bank of the Cypre River.

3

Fish Passage Remediation Project Number Three

Tranquil Creek / Clayquot

Project Costs

RFCPP 2014/15	\$30,068
LBIS 2016/17	\$39,639
PSF 2016/17	\$2,500
RFCPP 2016/17	\$40,000
Total 2016/17	\$82,139



Project Objectives

1. Restore 225 linear metres of high value habitat for coho salmon and cutthroat trout on Tranquil Creek by replacing a road crossing (TNQ-0005) culvert that is a barrier to fish passage with a fish-friendly crossing structure that provides for safe fish passage.
2. The restoration of high value fish habitat should result in increased opportunities for recreational and aboriginal fisheries. The Clayquot Sound area where the Cy-pre River is located is important to several First Nations.



Project Delivery

Thanks to
Dave Hamilton
BC Timber Sales
Strait of Georgia

Project Results

In 2014/15, fish passage assessments and habitat confirmations were undertaken.

In 2016/17 (Year One):

1. A site plan was prepared.
2. The replacement bridge structure was purchased and delivered – with installation planned for 2017/18.



Fish Passage Remediation Project Number Four

Lemon Creek

4

Project Costs

LBIS 2016/17	\$73,187
PSF 2016/17	\$2,500
RFCPP 2016/17	\$40,000
Total 2016/17	\$115,687



Project Objectives

1. Restore access to 5,000 metres of fish habitat for rainbow and bull trout by replacing a culvert that impedes fish passage with an open bottom structure (arch culvert or bridge) on a tributary to Lemon Creek located in the Slocan Valley of British Columbia. This project will address two of three limiting factors.
2. Bull trout are classified as blue-listed by the British Columbia Conservation Data Centre as populations are declining throughout its global range due to habitat degradation, disruption of migration patterns, and overfishing.
3. Rainbow trout are a prized recreational sport fish and angling for them contributes to the local economy.

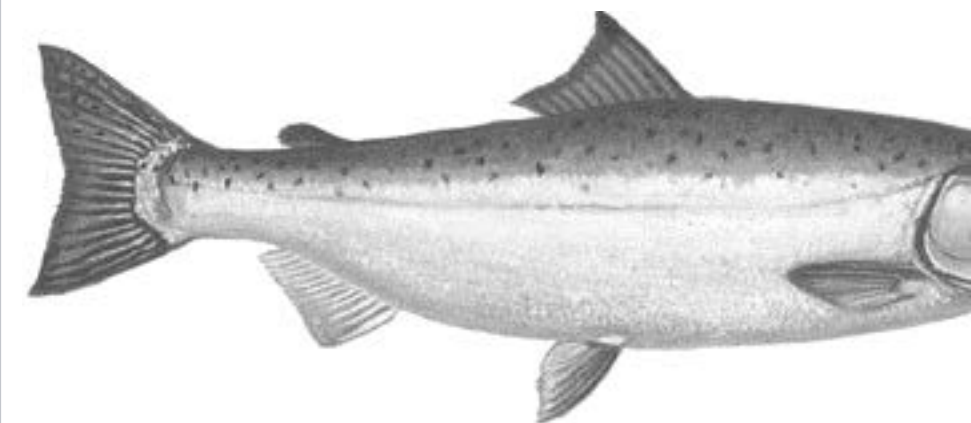
Project Delivery

Thanks to
Phil MacDonald
BC Timber Sales
Kootenay

Project Results

In 2016/17 (Year One),

1. The site plan was prepared.
2. The replacement bridge structure was purchased and delivered – with installation planned for 2017/18.



5

Fish Passage Remediation Project Number Five

Rock Creek

Project Costs

LBIS 2016/17	\$72,500
PSF 2016/17	\$2,500
RFCPP 2016/17	\$40,000
Total 2016/17	\$115,000

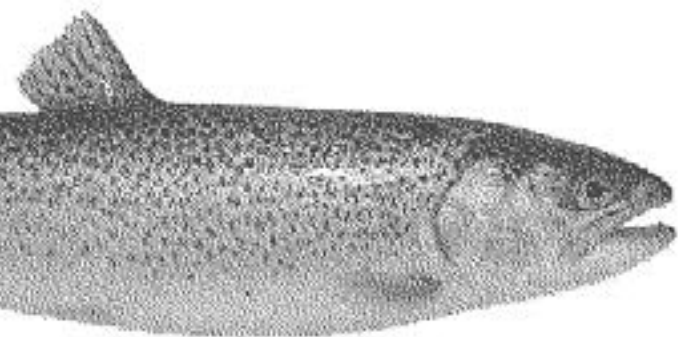


Project Objectives

1. Restore access to 2,500 metres of high quality fish habitat for rainbow trout (spawning, rearing, and overwintering) upstream of crossing #58924 Rock Creek (or a better crossing pending the outcomes of habitat confirmation work in 2016/17) by replacing a culvert that impedes fish passage with a fish-friendly structure that provides for safe fish passage.
2. Rainbow trout are a prized recreational sport fish and angling for them contributes to the local economy.

Project Delivery

Thanks to
Phil MacDonald
BC Timber Sales
Kootenay



Project Results

1. In 2016/17 (Year One), habitat confirmation work verified that the crossing was a priority for remediation.
2. A site plan was prepared.
3. The replacement bridge structure was purchased and delivered.
4. In 2017/18 (Year Two funding \$136,373) bridge installation was completed



Fish Passage Remediation Project Number Six

Deadhorse Lake / Kuldo

6

Project Costs

LBIS 2016/17	\$8,838
PSF 2016/17	\$1,500
RFCPP 2016/17	\$10,000
Total 2016/17	\$20,138



Project Objectives

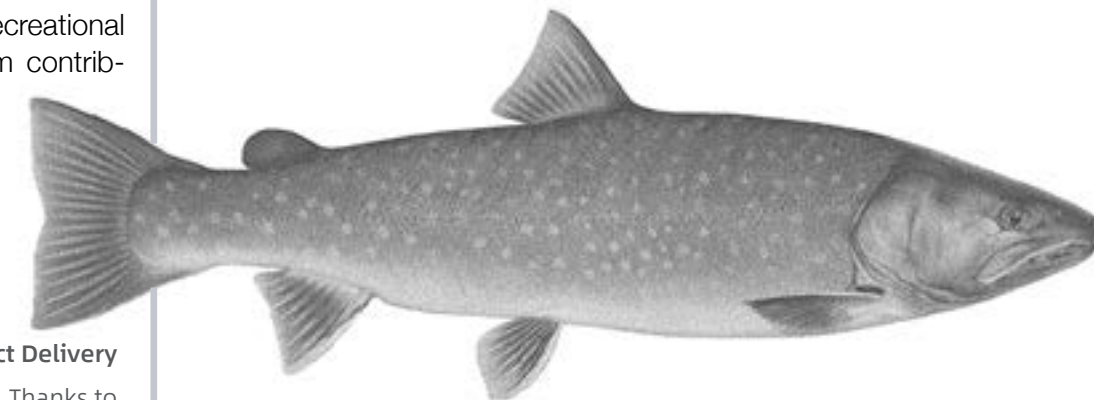
1. Restore access to 1,500 metres of moderate value spawning habitat for rainbow trout by replacing a culvert that impedes fish passage with a fish-friendly structure (likely an arch culvert) on a tributary of Dead Horse Lake located in the Skeena region of British Columbia.
2. Rainbow trout are a prized recreational sport fish and angling for them contributes to the local economy.

Project Results

- In 2016/17 (Year One).
1. A site plan was prepared.
 2. The replacement embedded culvert structure was purchased and delivered – with installation planned for 2017/18.

Project Delivery

Thanks to
Alan Harrison and Gail Campbell
BC Timber Sales Skeena



7

Fish Passage Remediation Project Number Seven

Shuttleworth Creek / Kilmer

Fish Passage Remediation Project Number Eight

Coast South 700 Main

8

Project Costs

LBIS 2016/17 \$11,613



Project Objectives

1. Restore at least 6.6 km of spawning and rearing habitat for:
 - Rainbow trout (*Oncorhynchus myskiss*),
 - Longnose dace (*Rhinichthys cataractae*),
 - Redside shiner (*Richardsonius balteatus*) and
 - Slimy sculpin (*Cottus cognatus*) on Shuttleworth Creek which is a tributary of the Okanagan River located in the Southern Interior of British Columbia near Penticton.

Project Delivery

Thanks to
Megan Sheshurak
BC Timber Sales
Okanagan-Columbia



Project Results

- In 2016/17 (Year One),
1. Habitat confirmation work and a site plan was prepared.
 2. Purchase of replacement structure and installation planned for 2017/18.



Before: Significant constriction of channel with large rip rap

After: Remediation with installation of new clear span bridge

Project Objectives

1. Replace the existing road crossing with rip rap that restricts upstream fish access to high value fish habitat to times of high and moderate flow with a clear span bridge that enables a diversity of salmon and other species to have access to 1,875 m² of fish habitat.

Project Delivery

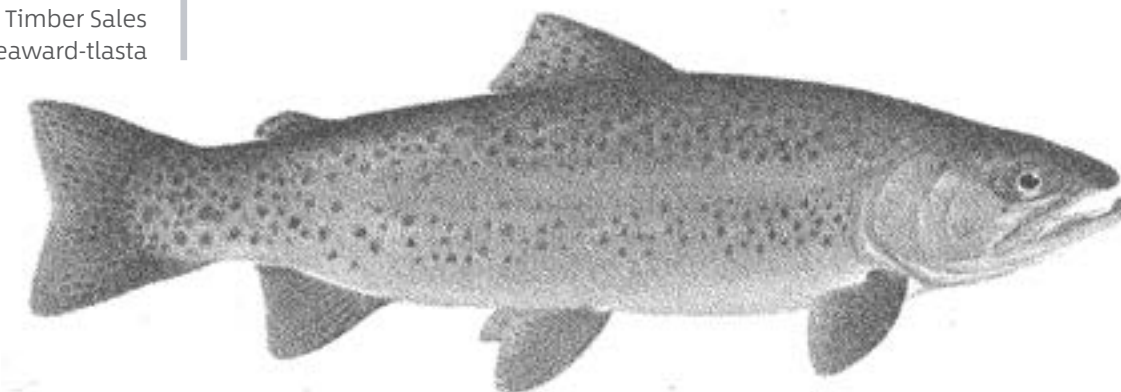
Thanks to
Mike McCulley
BC Timber Sales
Seaward-tlasta

Project Results

1. The habitat confirmation work, site plan, structure purchase and installation were all completed in 2016/17.
2. BCTS provided additional funding to augment and partner with LBIS Fish Passage investments to help complete the project.

Project Costs

LBIS 2016/17	\$90,000
BCTS 2016/17	\$60,000
Total:	\$150,000



9

Fish Passage Remediation Project Number Nine

Jamieson Creek

Fish Passage Remediation Project Number Ten

Maxan Creek

10

Project Costs

LBIS 2016/17	\$85,000
LBIS 2017/18	\$ 11,280



Before: Cross view of weir

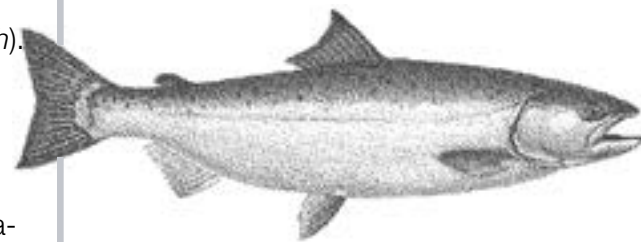
After: Wier removed

Project Objectives

1. Remove a dam (weir) that is a barrier to fish passage.
2. Restore 9,250 m of habitat for:
 - Rainbow trout (*Oncorhynchus mykiss*) and
 - Bull trout (*Salvelinus confluentus*).
3. Restore 2,900 m of habitat for:
 - Coho salmon (*Oncorhynchus kisutch*).
4. Before removing the dam, alternative sources of water need to be provided to water licence holders; this will be accomplished by drilling to provide access to groundwater, and the installation of a pump and power.

Project Results

1. Groundwater well was drilled with pump and power installed.
2. the dam (weir) removal occurred in 2017/18



Project Delivery

Thanks to
Drew Alway
Southern Engineering Group
Engineering Branch, FLNRORD



Before: With derelict bridge

After: Removal of derelict bridge

Project Costs

LBIS 2016/17	\$28,800
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Project Objectives

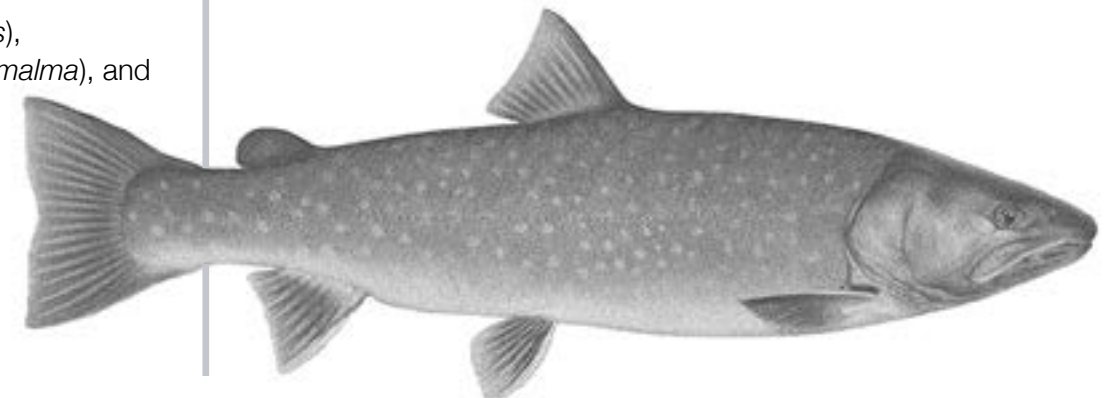
1. To remove the derelict Strimbold Bridge that is impacting fish habitat and likely a barrier to fish passage at some flows, and may pose a environmental risk if washed downstream due to flood event. Fish species present include:
 - Chinook salmon (*Oncorhynchus tshawytscha*),
 - Coho salmon (*O. kisutch*),
 - Sockeye salmon (*O. nerka*),
 - Steelhead (*O. mykiss*),
 - Rainbow trout (*O. mykiss*),
 - Dolly Varden (*Salvelinus malma*), and
 - Mountain whitefish (*Prosopium williamsoni*).

Project Results

1. An Environmental Mitigation Plan was prepared in fall 2015 and commented on by ENV, DFO, and FLNRORD to determine work windows, acceptable procedures, and disposal. The derelict bridge was removed in 2016/17 at a lower than expected cost (\$40,000 was original cost estimate). An Environmental Monitoring Report was prepared in July 2016.

Project Delivery

Thanks to
Rob Phillips
Nadina Forest District
FLNRORD



11

Fish Passage Remediation Project Number Eleven

Date 1200

Project Funding

LBIS 2016/17 \$6,200

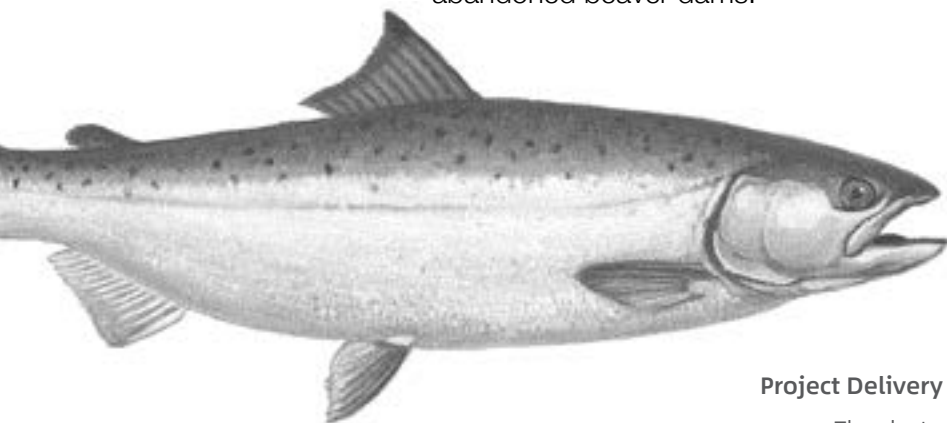


Before installation of the backwater weir

After installation of the backwater weir

Project Objectives

1. To restore fish passage to 275 m of up-stream habitat for cutthroat trout by installing a backwater weir and breaching four abandoned beaver dams.



Project Delivery

Thanks to
Alan Harrison and Gail Campbell
BC Timber Sales Skeena

Project Results

Project objectives were achieved by installing the backwater weir to allow fish passage through a culvert that was a barrier to fish passage, and by breaching four abandoned beaver dams. The Gitanyow Fisheries Authority (GFA) undertook the habitat confirmation field work in 2015 that confirmed that the fish-stream crossing at Date 1200 was a barrier to fish passage, and GFA was commissioned to carry out the remediation project in 2016 and prepare a report on the weir installation and beaver dam breaching work.



12

Fish Passage Remediation Project Number Twelve

Copper Creek – Skidegate Lake Project

Project Funding

Year 2
2015/16 \$149,400



Spur 30-1 Before and After

NES 2 Before and After

Project Objectives

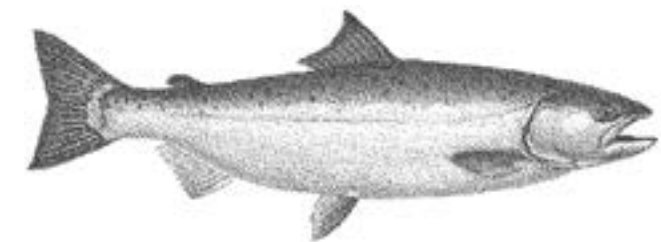
The project objective was to replace two crossing structures (Spur 30-1 and NES2) that impeded fish passage with two fish-friendly crossing structures that provide for safe fish passage.

Project Delivery

Thanks to Larry Duke
Haida Gwaii District, FLNRORD and
Dave Hamilton
BC Timber Sales Strait of Georgia

Project Results

1. The project objective was achieved with the installation of a bridge at Spur 30-1 and an embedded open bottom culvert at NES2 (also referred to as South Bay Mainline).
2. The Copper Creek project restored fish access to 1,700 m of high value spawning and rearing habitat at Spur 30-1 for coho salmon, and 530 m of high value spawning and rearing habitat at NES 2 for coho salmon and sockeye salmon.



13

Fish Passage Remediation Project Number Thirteen

Clint Creek Project

Project Funding

2015/16 \$107,200



Upper photo: Clint Creek dam before the project

Lower photo: Clint Creek dam removed due to the project

Project Objectives

1. To remove a small dam (weir) that is no longer needed and that impeded fish passage on Clint Creek in order to restore fish passage, and
2. To remediate key areas surrounding the lower 375 m of Clint Creek to improve and restore fish habitat quality through the installation of large woody debris structures.



Project Delivery

Thanks to Larry Duke
Haïda Gwaii District
FLNRORD

Project Results

1. The project objectives were achieved with the dam removal increasing access to at least 1,300 m of high and moderate value habitat for:
 - Coho salmon (*Oncorhynchus kisutch*),
 - Chum salmon (*O. keta*), and
 - Dolly Varden (*Salvelinus malma*);
 and 375 m of habitat restoration completed with installation of LWD structures.

Fish Passage Remediation Project Number Fourteen

Honna River Project

14

Project Funding

2015/16 \$69,000



Honna River large woody debris structure #7

Project Objectives

The project objective was to enhance fish habitat by installing large woody debris (LWD), the lack of which was limiting salmon production.

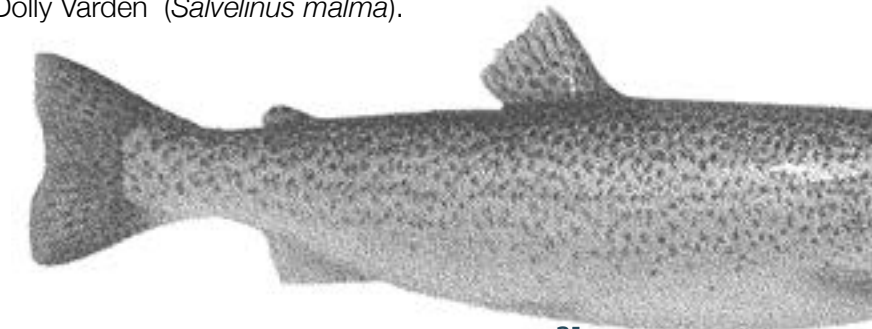


Project Delivery

Thanks to Larry Duke
Haïda Gwaii District
FLNRORD

Project Results

1. The project objective was achieved with the installation of nine LWD structures along 325 m of channel as prescribed in the report "2015 Instream Habitat Enhancement Prescriptions: Clint Creek, Shelley Creek, and Honna River" that was prepared as part of this project.
2. The project enhanced 325 m of high value fish habitat for :
 - Coho salmon (*Oncorhynchus kisutch*),
 - Chum salmon (*O. keta*),
 - Pink salmon (*O. gorbuscha*),
 - Steelhead (*O. mykiss*),
 - Cutthroat trout (*O. clarkia*), and
 - Dolly Varden (*Salvelinus malma*).



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Fish Passage Remediation Project Number Fifteen

Shelley Creek Project

Project Funding

2015/16 \$83,400



Examples of large woody debris structures that were installed

Project Objectives

The project objective was to enhance fish habitat by installing large woody debris (LWD), the lack of which was limiting salmon production.

Project Results

1. The project objective was achieved with the installation of 12 LWD structures along 285 m of channel as prescribed in the report "2015 Instream Habitat Enhancement Prescriptions: Clint Creek, Shelley Creek, and Honna River" that was prepared as part of this project.
2. The project enhanced 285 m of high value fish habitat for:
 - Coho salmon (*Oncorhynchus kisutch*),
 - Chum salmon (*O. keta*),
 - Cutthroat trout (*O. clarkia*), and
 - Dolly Varden (*Salvelinus malma*).

Project Delivery

Thanks to Larry Duke
Haida Gwaii District, FLNRORD



Fish Passage Remediation Project Number Sixteen

Plumbob Creek Project

16

Project Funding

2015/16 \$198,500



Plumbob Creek Crossing - before and after

Project Objectives

The project objective was to restore fish passage by replacing an undersized, perched culvert on Plumbob Creek, which flows into the Koocanusa Reservoir. The culvert was located on the Teepee Forest Service Road (FSR) in the East Kootenay area of British Columbia. The culvert was an impassable barrier for fish.

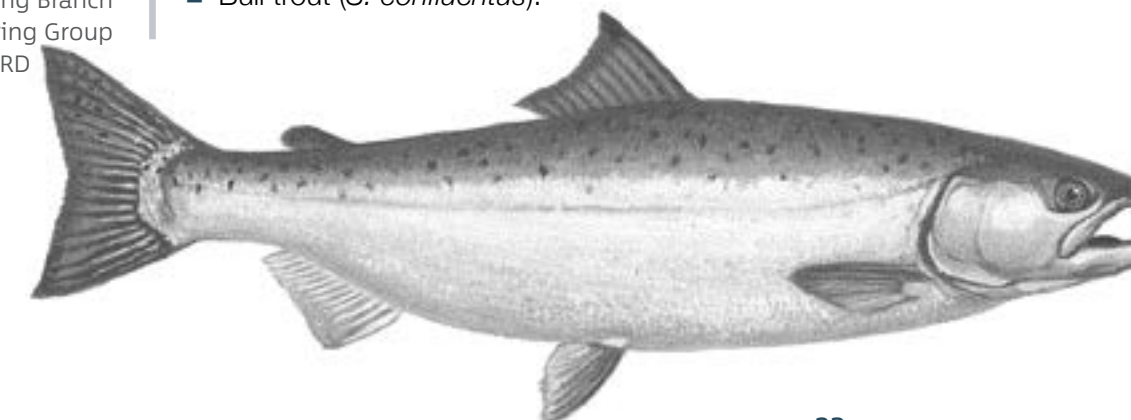
Project Delivery

Thanks to Phil MacDonald
BC Timber Sales Kootenay and
Jasbir Naul, Engineering Branch
Southern Engineering Group
FLNRORD

Project Results

The project objective was achieved with the installation of a clear span bridge. With the removal of the old culvert and installation of the bridge, the Plumbob Creek Fish Passage restoration project now provides fish access to 7,000 linear metres of upstream habitat for utilization by:

- Westslope cutthroat trout (*Oncorhynchus clarkii lewisii*),
- Eastern Brook trout (*Salvelinus fontinalis*), and
- Bull trout (*S. confluentus*).



17

Fish Passage Remediation Project Number Seventeen

Linklater FSR – Purcell Creek Project

Project Funding

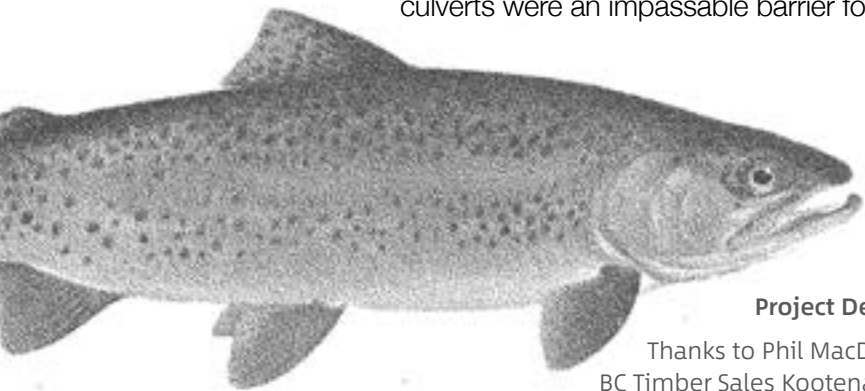
2015/16 \$195,600



Purcell Creek Crossing – before and after

Project Objectives

The project objective was to restore fish passage by replacing two undersized, perched culverts on Purcell Creek, which flows into the Kooacanusa Reservoir. The crossing is located on the Linklater FSR in the East Kootenay area of British Columbia. The culverts were an impassable barrier for fish.



Project Delivery

Thanks to Phil MacDonald
BC Timber Sales Kootenay and
Jasbir Naul, Engineering Branch
Southern Engineering Group, FLNRORD

Project Results

The project objective was achieved with the installation of a clear span bridge. With the removal of the perched culverts and installation of the bridge, the Linklater FSR-Purcell Creek Fish Passage restoration project now provides fish access to 7,600 linear metres of upstream habitat for utilization by:

- Westslope cutthroat trout (*Oncorhynchus clarkii lewisii*),
- Eastern Brook trout (*Salvelinus fontinalis*), and possibly also
- Bull trout (*S. confluentus*).

Fish Passage Remediation Project Number Eighteen

Nass River – Brown Bear Forest Service Road Project

18

Project Funding

2015/16 \$99,200
(Year 2 costs)



Axnegrelga Creek (Nass River tributary) Site 262 on Brown Bear FSR – before and after

Project Objectives

The project objective was to replace two crossing structures (Site 262 and Site 264) that impeded fish passage with two fish-friendly crossing structures that provide for safe fish passage.

Project Results

1. The project objective was achieved with the installation of embedded open bottom culverts at both Sites 262 and 264.
2. The Nass River – Brown Bear FSR project restored fish access to 350 m of high quality fish habitat for spawning, rearing, and overwintering habitat use by rainbow trout.
3. First Nations involvement: The Gitanyow Fisheries Authority was subcontracted to prepare the environmental management plan for the two culvert replacements.



Project Delivery

Thanks to Stephen Hales
Alan Harrison and Gail Campbell
BC Timber Sales Skeena and
Howard DeBeck, Engineering Branch
Northern Engineering Group, FLNRORD

19

Fish Passage Remediation Project Number Nineteen

Kispiox River – Helen Forest Service Road Project

Project Funding

2015/16 \$177,700
(Year 2 costs)



Before: Kispiox River tributary Site 6 on Helen FSR

After: Kispiox River tributary Site 6 on Helen FSR

Project Objectives

The project objective was to replace two crossing structures (Site 5 and Site 6) that impeded fish passage with two fish-friendly crossing structures that provide for safe fish passage.



Project Delivery

Thanks to Stephen Hales
Alan Harrison and Gail Campbell
BC Timber Sales Skeena and
Howard DeBeck, Engineering Branch
Northern Engineering Group, FLNRORD

Project Results

1. The project objective was achieved with the installation of embedded open bottom culverts at both Sites 5 and 6. In tandem with the project, BCTS deactivated a crossing at Site 5b that increased fish access to above Site 5 to 1,300 m.
2. The Kispiox River – Helen FSR project restored fish access to 2,300 m (1,300 m for Site 5 and 1,000 m for Site 6) of high and moderate value habitat for:
 - Bull trout (*Salvelinus confluentus*) and
 - Rainbow trout (*Oncorhynchus mykiss*).
3. First Nations involvement: The Gitanyow Fisheries Authority prepared the habitat confirmation report that led to this site being identified as a priority for remediation.

Fish Passage Remediation Project Number Twenty

Cherry Creek – North Fork Forest Service Road

20

Project Funding

2015/16 \$ 146,400



Before: Tributary to Cherry Creek crossing

After: Tributary to Cherry Creek crossing

Project Objectives

The project objective was to restore fish passage by replacing an undersized, perched closed bottom culvert on an unnamed tributary of Cherry Creek. The culvert was located on the North Fork FSR in the Okanagan-Columbia area of British Columbia. The culvert was an impassable barrier for fish.

Project Delivery

Thanks to Warren Yablonski and Jock McArthur
BC Timber Sales Okanagan-Columbia

Project Results

The project objective was achieved with the installation of a clear span bridge. With the removal of the perched culvert and installation of the bridge, the Cherry Creek – North Fork FSR Fish Passage restoration project now provides fish access to at least 500 linear metres of upstream habitat for utilization by:

- Bull trout (*Salvelinus confluentus*) and
- Rainbow trout (*Oncorhynchus mykiss*).

Based on TRIM data, there is the potential for up to 2,500 metres of habitat gain.



21 Fish Passage Remediation Project Number Twenty-One

Bench Forest Service Road Project

Project Funding

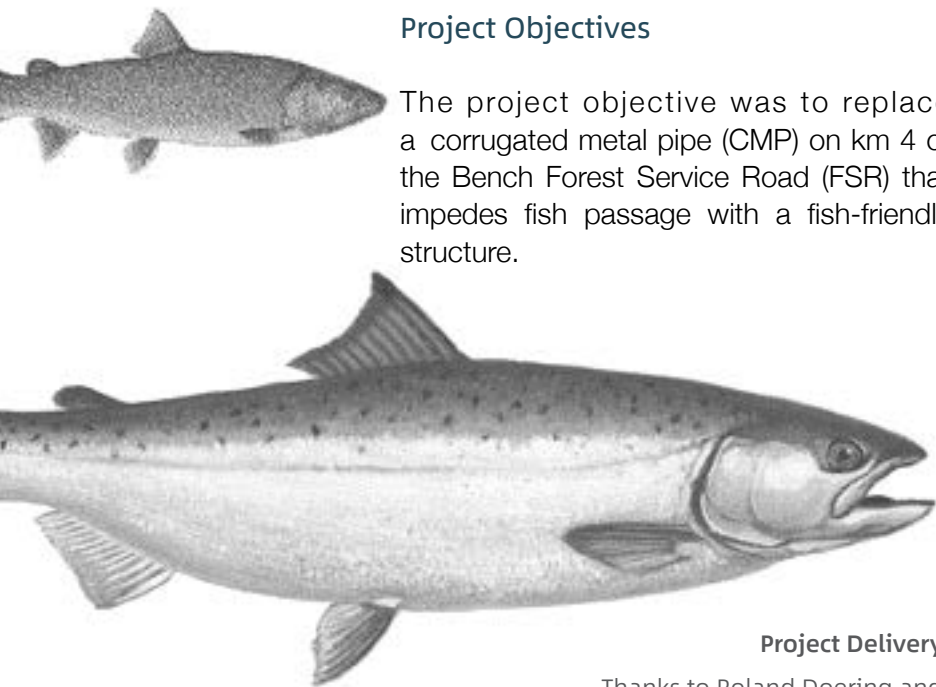
2015/16 \$211,500



Newly installed open bottom arch culvert that provides for safe fish passage

Project Objectives

The project objective was to replace a corrugated metal pipe (CMP) on km 4 of the Bench Forest Service Road (FSR) that impedes fish passage with a fish-friendly structure.



Project Delivery

Thanks to Roland Doering and Dave Hamilton
BC Timber Sales
Strait of Georgia

Project Results

1. The project objective was achieved with the installation of an open bottom arch culvert. The project also addressed stream flooding of the FSR by raising the road, undertaking bank restoration, restoring thalweg, and restoring riparian area by re-routing the ATV trail to prevent future bank failure.
2. The Chilliwack Bench project restored fish access to 1,000 m of high value habitat for:
 - Cutthroat trout (*Oncorhynchus clarkii*) and possibly
 - Rainbow trout (*O. mykiss*),
 - Coho salmon (*O. kisutch*), and
 - Dolly Varden (*Salvelinus malma*).
3. First Nations involvement: Seven Generations Environmental Services were hired to provide First Nations environmental monitoring for the project, and Chilliwack First Nations were hired for cultural heritage monitoring through Ts'elxwéyeqw Tribe Management Ltd.



Partnering Organizations

The British Columbia Fish Passage Program is a partnership between the following organizations:



Ministry of
Environment and
Climate Change Strategy

BC Ministry of Environment and Climate Change Strategy



Ministry of
Forests, Lands, Natural
Resource Operations
and Rural Development

BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development



Ministry of
Transportation
and Infrastructure

BC Ministry of Transportation and Infrastructure

BCTS

BC Timber Sales

British Columbia Timber Sales



Fisheries and Oceans
Canada

Pêches
Canada

Recreation Fisheries Conservation Partnership Program (RFCPP) /
Programme de partenariats relatifs à la conservation
des pêches récréatives

and



Pacific Salmon Foundation.

