

Spawning Gravel Placements in Ash and Nanaimo River Watersheds, Vancouver Island (2003)



prepared by:

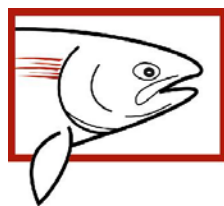
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prepared for:

Habitat Conservation Trust Fund
Victoria, BC
Project # 2978128

Ministry of Water, Land and Air Protection
Fisheries Section
Nanaimo, BC

March 2004



GREATER GEORGIA BASIN
STEELHEAD Recovery Plan
www.SteelheadRecoveryPlan.ca

ACKNOWLEDGEMENTS

The Habitat Conservation Trust Fund provided project funding. James Luxmoore¹ and TimberWest provided in-kind support for the Nanaimo Lakes Project. Mike Piggott² coordinated TimberWest's involvement in the Nanaimo Lakes Project. Wayne Hansen³ and Ritchie Fulla⁴ provided technical advice and granted permission to access the South Nanaimo watershed. Russ Gregory⁵ was consulted on the South Nanaimo project.

Mike McCulloch⁶ managed the Dickson Lake Project. Craig Wightman⁷ acted as scientific authority and provided technical support and guidance. Also, a special thanks to James Craig⁸ for editing and reviews of draft reports.

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1.0 INTRODUCTION

Since the early 1990s many Georgia Basin steelhead stocks have fallen to levels considered to be a conservation concern (<30% of a stream's carrying capacity; Lill 2002, Wightman et al. 1998). This decline is mostly due to reduced ocean survival and loss of freshwater habitat. Many scientists believe oceanic factors affecting fish survival are cyclical in nature, so fisheries managers are concentrating restoration efforts on freshwater environments. A significant portion of the provincial steelhead program's efforts are now focused on habitat assessment, prescription and restoration activities, particularly in regions 1 and 2 as part of the **Greater Georgia Basin Steelhead Recovery Action Plan** (Lill 2002).

Fish production in BC's freshwater environments is influenced by many factors, **including the availability and quality of spawning habitat**. In many watersheds the quantity and quality of spawning habitat have significantly declined, largely as a result of forestry, mining, agriculture, hydro developments and urbanization.

Lake outlets are excellent locations for spawning gravel placement because of their low sediment loads and inherent stability. The lake basin itself acts as a sediment trap, allowing most sediment carried by upstream tributaries to settle out. Thus, lake outlets are usually less affected by logging-related hydrological changes and spawning substrate remains relatively clean and highly suited for egg incubation and fry emergence.

Lake outlets also provide excellent rearing habitat due to the lake's stabilizing influence. Fry recruited at a lake outlet benefit from warmer water temperatures and zooplankton drift from the lake. Aquatic invertebrate production tends to be higher in lake outlets. In addition, juvenile fish living near lake outlets are not subjected to rapid changes in water height during freshet events, providing a competitive advantage by creating a stable rearing environment.

The outlets of Dickson (Ash River) and Second (Nanaimo River) lakes are well suited to spawning gravel enhancement. The addition of spawning gravel to the South Fork Nanaimo River is vital because South Fork Dam limits the natural recruitment of spawning substrate below the dam. Given high winter flows, it was expected this material would be displaced downstream over time. In summer 2004 spawning substrates were added to these locations with funding provided by the Habitat Conservation Trust Fund (HCTF; Appendix A). The projects were managed by the BC Conservation Foundation (BCCF), and employed local contractors, gravel suppliers and workers from local First Nations.

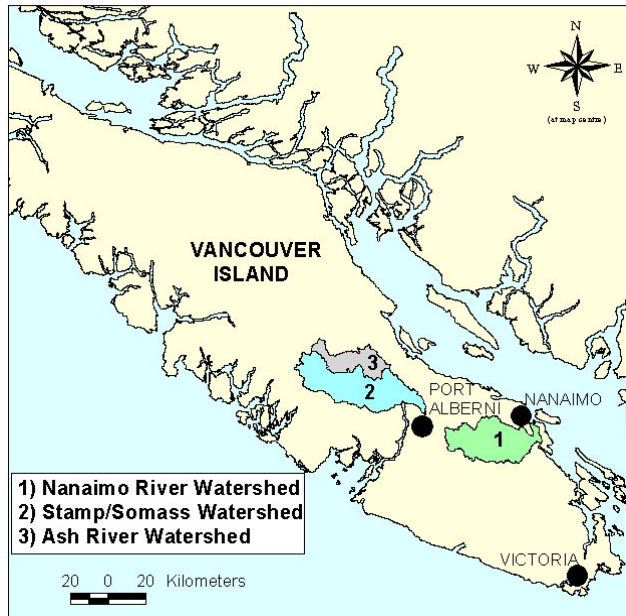
Specific project objectives included:

- **Dickson Lake Outlet (Ash River):** Install 400 m³ of suitable gravel in two locations, one on either side of the lake outlet, to create approximately 665 m² of spawning habitat.
- **Nanaimo River (between 1st and 2nd lakes):** Install 150 m³ of suitable gravel in one location on the south side (right bank) of the Second Lake outlet channel to create an estimated 240 m² of spawning habitat.
- **South Nanaimo River:** Install 250 m³ of suitable gravel in three locations immediately downstream of South Fork Dam in locations that will provide immediate spawning benefit and allow for gravel recruitment to suitable areas downstream⁹.

⁹ Funding was originally earmarked for spawning platforms at the outlet of Great Central Lake near Port Alberni. However, it was decided to reallocate these funds to the South Nanaimo River, consistent with comments from the HCTF technical review committee which emphasized priority should be given to east coast island watersheds. Permission to reallocate \$18,405 was granted by HCTF via email on July 3, 2003 (Appendix B).

1.1 Study Area

The Nanaimo and Ash River watersheds are located on southern Vancouver Island (Figure 1).



The Nanaimo River flows into the Strait of Georgia one km south of Nanaimo. The South Nanaimo River is the largest tributary, entering 26 km upstream of tide water.

The Ash River is a sub-basin of the Stamp/Somass watershed, entering the Stamp River 22 km upstream of tide water. The Stamp/Somass drains into Alberni Inlet near Port Alberni on the west coast of Vancouver Island.

Figure 1. Location of Ash and Nanaimo watersheds, Vancouver Island.

1.1.1 Dickson Lake

The Ash River watershed (Figure 2) supports a significant stock of wild summer run steelhead, representing approximately half of the production of the Stamp/Somass system.



Salmon and summer steelhead in the Stamp and Ash rivers have been shown to consistently use lake outlets for spawning and incubation (MJL Environmental Consultants 2001). Dickson Falls, located two km downstream of Dickson Lake, restricts all anadromous fish except summer steelhead.

The outlet of Dickson Lake (Appendix C, photo 1) is accessed by the Ash River Mainline off Beaver Creek Road, north of Port Alberni. The lake is 120 ha in size, has a maximum depth of 16 m, and is elevated 207 m above sea level (Fish Wizard/BC Fisheries web site). As well as summer steelhead, the lake supports small stocks of resident cutthroat and rainbow trout, and Dolly Varden char.

Figure 2. Ash River watershed.

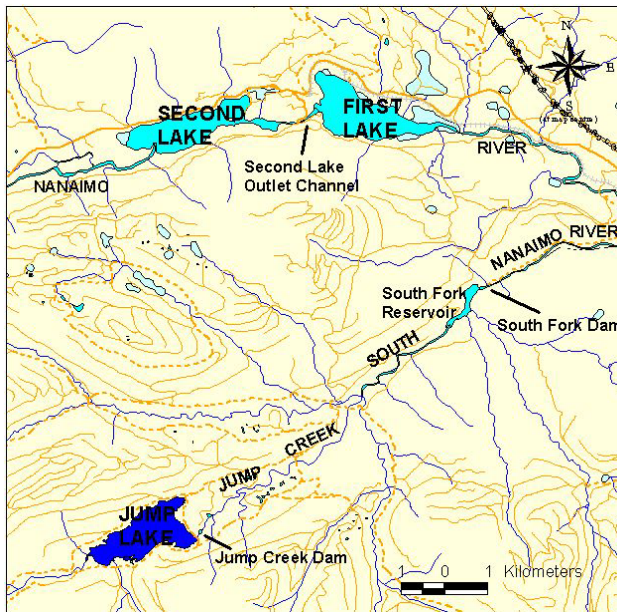
BC Hydro operates a storage dam and diversion facilities at Elsie Lake, 11 km upstream of Dickson Lake. The dam is the migration barrier for steelhead. Ash River steelhead stocks are directly affected by BC Hydro operations associated with the Elsie Lake facility. The effects are most severe on spawning and rearing areas between Elsie and Dickson lakes (Craig et al. 2000). Adverse effects at the Dickson Lake outlet and downstream are substantially reduced through buffering provided by the lake.

The outlet of Dickson Lake was “gravel poor” prior to a 1990 summer steelhead enhancement project (Griffith 1990) that installed 200 m³ of spawning gravel immediately upstream of the Dickson Lake Bridge abutments. Post-project assessment suggested that the site chosen was not ideal; being too far downstream and too localized (MWLAP files, Nanaimo). As part of a new prescription assessment, recent monitoring showed that some of this gravel has since been displaced downstream, primarily to two sites within 100 m of the bridge crossing, and is being well used by spawning summer steelhead (MJL Environmental Consultants 2001).

1.1.2 Nanaimo River (including South Nanaimo)

Nanaimo River

The majority of the upper Nanaimo watershed (Figure 3) is privately managed forest (TimberWest and Weyerhaeuser) containing maturing second growth stands. The forest companies permit some camping near the Second Lake outlet and both lakes support modest recreational fisheries. The lower river is heavily urbanized and the estuary has been damaged by industry, including forestry and mining. There is a community fish hatchery 400 m downstream of the Highway 19A Bridge.



Provincial and BCCF snorkel counts show that Nanaimo River winter steelhead numbers have been in serious decline for several years. Peak observed abundance in the last five years has averaged 3.8 fish/km (1998 – 3.3 fish/km, 1999 – 0.5 fish/km, 2000 – 2.4 fish/km, 2001 – 12 fish/km, 2002 – 0.7 fish/km; BCCF files, Nanaimo). This decline is consistent with other east coast Vancouver Island steelhead stocks. Historical snorkel counts have documented steelhead in the Nanaimo River more than 10 km above Second Lake (MWLAP files, Nanaimo). Recent radio telemetry work also confirmed “Living Gene Bank” steelhead adults released in the lower river migrated above Second Lake (Smith 2001).

Figure 3. Upper Nanaimo River watershed (including South Nanaimo).

Second Lake is located 18 km southwest of Nanaimo in the Nanaimo River watershed. Access is via Highway 19 and TimberWest’s Nanaimo River Road Mainline. The lake is one of four headwater lakes in the upper river, situated less than 500 m upstream of First Lake, the largest lake in the chain. First and Second lakes are 196 and 180 ha in size, have maximum depths of 19

and 45 m, and are elevated 196 and 198 m above sea level, respectively. Salmonids supported by First and Second lakes include chinook and coho salmon, cutthroat and rainbow trout, Dolly Varden char, kokanee, and winter steelhead (BC Fisheries/DFO Fish Wizard web site).

The stream channel that connects Second to First Lake is stable and ranges from 30 to 50 m in width, with relatively large, angular substrates poorly suited for spawning (Appendix C, photo 2). Gaboury and McCulloch (2002) documented an opportunity to improve spawning habitat for steelhead in the Nanaimo River, in the outlet of Second Lake, a short distance above First Lake. During adult steelhead snorkel counts, BCCF staff noted that substrates in this reach are poorly suited for spawning steelhead and rainbow trout. Juvenile production should be significantly increased in this reach with the addition of washed, screened spawning gravel.

South Nanaimo River

The South Nanaimo is the largest tributary in the Nanaimo watershed, with a drainage area of 210 km². The river is flow controlled at South Fork Dam, 4.6 km upstream of its confluence with the Nanaimo River (Appendix C, photo 3). Over time, the quantity and quality of spawning material in the channel below the dam have diminished, as gravel was flushed-out of the system during high water events and not replaced naturally (Axford 1995). Jump Lake, managed by the Greater Nanaimo Water District (GNWD), is the primary domestic water supply for the City of Nanaimo.

2.0 METHODS

Notifications for work “in or about a stream” were submitted under Section 9 of the Water Act to MWLAP staff in mid-June 2003 and approved in mid-July (Appendix B). Other approvals and permits were in place prior to commencement of individual projects.

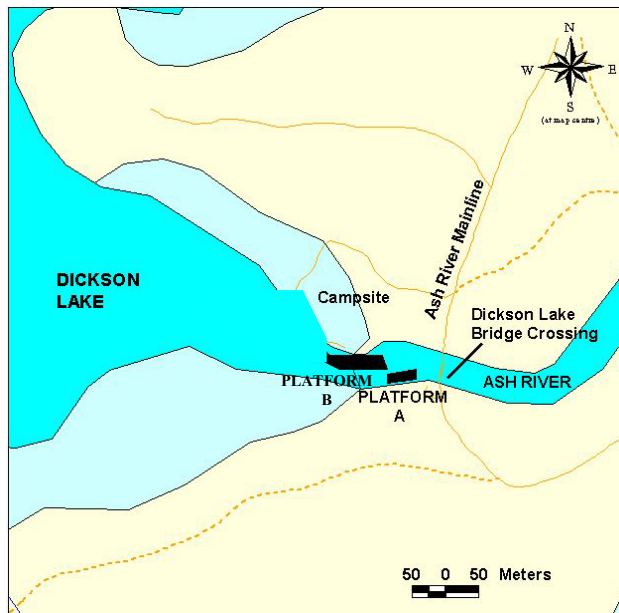
Property owners were contacted to obtain access and ensure gravel delivery/installation schedules did not conflict with commercial operations or recreational activities. BCCF monitors were on site to ensure compliance with environmental and safety regulations.

Suitably sized¹⁰, washed round river-rock was purchased and delivered from Ozero Sand & Gravel Ltd. (near Qualicum, BC) for the Nanaimo watershed projects. Material (with similar specifications) was purchased and delivered from Dolans Concrete Ltd. (Port Alberni, BC) for the Dickson Lake project. In each of the three projects, heavy equipment working in or near the water carried appropriate oil spill response kits and actual time spent in the water was minimized whenever possible.

2.1 Dickson Lake

Permission was granted by Weyerhaeuser Company Ltd. on July 1, 2003 for road access to the Dickson Lake site (Appendix B). DFO and Hupacasath First Nation confirmed project support by email (Appendix B). McCoy Lake Excavating Ltd. (Port Alberni, BC) was contracted to supply a Caterpillar 312BL excavator and a Caterpillar 416C front-end loader. Hupacasath fisheries staff were contracted to provide field support for BCCF and aided in site preparation, environmental monitoring and clean-up.

¹⁰ Gravel specifications were requested as follows: 10% small gravel (0.63-2.5 cm), 20% medium gravel (2.5-5.0 cm), 60% gravel/cobble (5.0-7.5 cm) and 10% cobble (7.5-10.0 cm). Ozero Sand & Gravel matched specifications using a mixture of three substrate sizes: small drain rock, medium drain rock, and 6-inch minus. Dolans Concrete arranged for a dedicated sort to achieve the required specifications.

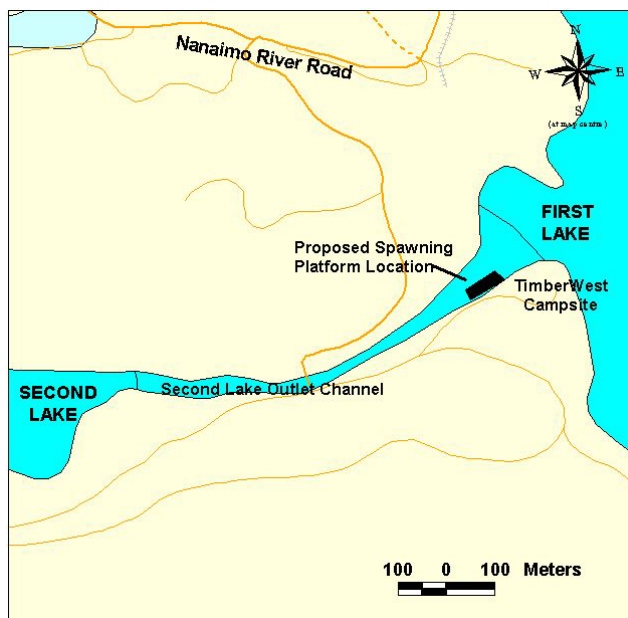


Based on prescriptions by MJL Consultants (2001), two sites were identified for spawning gravel placement in 2003 (Figure 4; Appendix C, photos 4-5), accessible via the campground on the north side (left bank) of the lake and a short spur road on the south side (right bank). Improvements to the left bank spur road were necessary using angular road base supplied by Dolans. Spawning gravel was staged at each location for placement at the proposed sites.

Figure 4. Dickson Lake outlet spawning gravel locations, Ash River watershed.

2.2 Nanaimo River

The gravel placement site was located along the south bank of the river channel, 235 m downstream of the mainline bridge crossing (Figure 5).



An assessment of the proposed site and potential access routes was made by the author on April 16, 2003 (Appendix C, photo 6). Permission to access TimberWest lands was granted on June 25, 2003 (Appendix B). An on-site meeting with TimberWest¹¹ occurred on July 8, 2003.

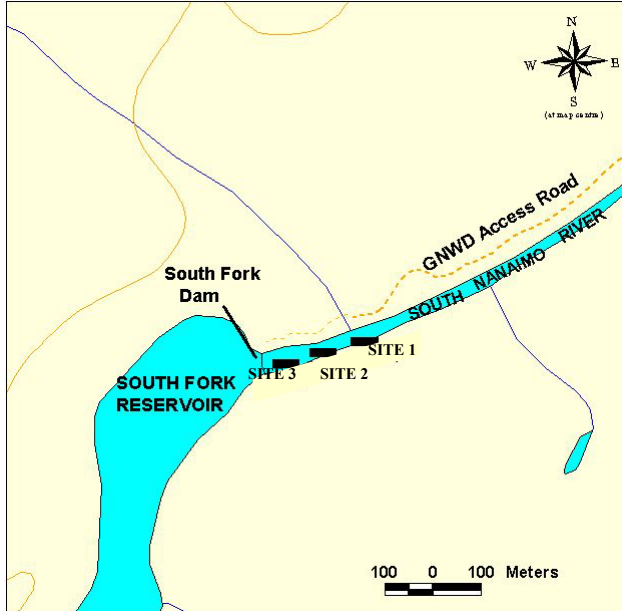
TimberWest (Nanaimo Lakes Division) supplied an excavator and operator (in-kind; Appendix B). A 100 m spur road, required to access the site, was built on July 15 (Appendix C-photo 7). From July 17 to 19 a total of 150 m² of spawning material was delivered and stockpiled on the newly built road adjacent to the river.

Figure 5. Second Lake outlet spawning gravel location, Nanaimo River watershed.

¹¹ M. Piggott, Engineer, TimberWest, Nanaimo Lakes Division

2.3 South Nanaimo River

Permission was granted by Weyerhaeuser Company Ltd. on July 1, 2003 for road access to the South Nanaimo River site (Appendix B). Three right bank sites were identified in a 200 m section immediately downstream of the dam (Figure 6; Appendix C, photos 8-9).



The GNWD and Water Survey of Canada (WSC) were consulted given the project's close dam and a newly installed hydrometric station. With concerns about working around each of the infrastructures identified, permission to undertake the project was granted by GNWD and WSC in early August.

Contractors completed the mandatory GNWD training course and were issued watershed access cards in mid-August. Copcan Contracting Ltd.¹² supplied a Caterpillar 690E-LC excavator, Caterpillar 966 front-end loader, rubber mats and other required construction materials. Both machines had fish-safe oil.

Figure 6. South Nanaimo River spawning site locations.

Gravel was delivered (250 m³) over a period of four days (August 18-21) and off-loaded over the channel bank near the proposed sites (Appendix C, photo 10).

3.0 RESULTS

3.1 Dickson Lake

Originally scheduled for late July, gravel installation was completed September 18-19, 2003. Delays arose when poor road conditions made truck access impractical (Appendix C, photo 11). Province-wide road closures, in place to minimize forest fire risk, caused further unexpected delays from late August to September 15.

Special permission was granted from DFO (Habitat Protection Branch; Appendix B) and MWLAP (Environmental Stewardship Section) for a two-week extension past the typical September 15 fisheries work window.

A total of 400 m³ of material was installed using the excavator and front-end loader, creating two platforms at the lake outlet (Appendix C, photos 12-13). Platform A, located along the right bank of the outlet adjacent to a large willow island, received 125 m³ of material. Platform B, located on the left bank, received 275 m³ of material. Average depth of both platforms was 0.6-1.0 m and total spawning area created was approximately 665 m² (Figure 4; Appendix C, photos 14-15).

¹² A division of Gregson Holdings Ltd., Nanaimo

To mitigate minor disturbances to riparian vegetation adjacent to both sites, a reclamation mix of native grasses, herbs and red alder was applied in early October. Additional seeding/planting will occur in spring 2004 and beyond, if required.

3.2 *Nanaimo River*

On July 23, 2003 the spawning gravel was hoe-chucked into position, from the stockpile near the river channel, creating a spawning area approximately 240 m² in size with an average depth of 0.6-1.0 m (Appendix C, photos 16-17). TimberWest staff¹³ conducting a wildlife reconnaissance helicopter flight provided aerial photographs of gravel installation (Appendix C, photo 18).

Some gravel at the stockpile was contaminated with native soil (~3 m³) and therefore left in-situ. A reclamation mix of native grasses, herbs and red alder was used to re-seed the access road and disturbed banks in mid-September (after the first fall rain). Additional seeding will occur in spring 2004 and beyond, as required. The access road was blocked with debris (remaining on-site from road clearing) but not deactivated so that short-term site maintenance could be achieved, as required.

3.3 *South Nanaimo River*

Gravel was installed at three sites in the 200 m section downstream of South Fork Dam on August 21-22, 2003. The excavator built a path down the steep rip-rap bank and “drivable” routes across the large boulder substrate in the river channel (Appendix C, photos 19-20). The front-end loader used the routes to move gravel from the stockpile into the identified sites (Appendix C, photo 21). The excavator then spread the gravel out to create usable areas for spawning fish. Average depth of each platform was 0.7-1.0 m and spawning area created totaled approximately 425 m² (Appendix C, photos 22-23).

Upon completion of each platform, the excavator replaced boulders removed to create loader routes. The disturbed river bank was restored and fortified with large boulders (Appendix C, photo 24). GNWD provided additional funding to rehabilitate the eroding rip-rap bank adjacent to their pumphouse facility.

¹³ D. Lindsay, Biologist, TimberWest, Duncan, BC

4.0 SITE MONITORING AND RECOMMENDATIONS

4.1 *Dickson Lake*

To monitor the stability and fish use of installed gravel a spot swim was conducted on February 3, 2004 from the outlet of Dickson Lake to 200 m below Ash River (Appendix D). Both pads were intact and each showed signs of use by fish. One steelhead (wild female, ~3 kg) was observed. The single fish appeared fecund and was observed about 100 m downstream of the bridge crossing.

The south pad (right bank) contained one complete redd and one other depression that appeared to be a test redd. Both were located near the downstream perimeter of the pad (fastest velocities at time of inspection). The north pad (left bank) contained what appeared to be one complete redd plus at least three test redds, also located in relatively fast water near the pad's downstream perimeter. Water depth at the time of survey averaged 35-40 cm near the redds, and ranged from 50-60 cm in the depressions associated with the redds. Additional redds were noted in natural substrates on the left bank, immediately downstream of the installed pads. These redds appeared to be from previous spawning seasons, though new redds may have been difficult to identify due to the nature and colour of the substrates.

Both banks appeared to have weathered seasonal high flows well, with the layer of gravel left on each slope minimizing erosion at these disturbed sites.

Recommendation: Continue to monitor fish use, gravel pad stability and downstream displacement of material over time (caused by high water events). Additional seeding of disturbed riparian areas may also be considered, as required.

4.2 *Nanaimo River*

An initial survey of the site was made on October 24, 2003, following a significant high water event that peaked six days prior. A significant portion of the gravel had been displaced downstream, with ~30% of materials remaining along the bank's edge where velocities were lowest. Flows and stream clarity were not suitable for snorkel observations to determine where the gravel settled downstream.

A snorkel survey was completed on March 10, 2003 from 100 m upstream to 300 m downstream of the site (total distance 400 m; Appendix D). A majority of gravel (of the ~30% remaining following the October 18 event) was still in place. The displaced gravel had deposited as far as 250 m downstream, settling in interstitial spaces between larger substrate throughout the lake inlet. Several gravel accumulations were considered suitable for spawning. No fish or redds were observed, though Nanaimo River steelhead spawn primarily in April.

Recommendation: Monitoring of fish use, gravel pad stability and downstream displacement of material over time should be continued.

Option: Further gravel additions (500-600 m³) would create more spawning areas downstream of the site and increase the probability of successful spawning in areas where displaced gravel has already been deposited. Gravel dumped directly into the channel to be redistributed during high flow events would be more cost-effective as results could be achieved without the need for an excavator.

4.3 South Nanaimo River

The South Nanaimo River sites were preliminarily surveyed on October 24, 2003, following the October 18 high water event. Gravel sites 2 and 3 had shifted considerably, with materials distributed as far as 300 m downstream. Site 1 appeared more stable and likely benefits from a relic log weir immediately upstream of the site that reduces local velocities.

A snorkel survey was completed on March 10, 2003 from the top of site 3 for 300 m downstream (Appendix D). Spawning conditions at sites 2 and 3 were poor, as most material had been displaced downstream. However, conditions at site 1 appeared good, as ~70% of materials still remained in-situ. Displaced material had settled into interstitial spaces between larger substrate throughout the 300 m section. Several areas for spawning were identified in this section, where enough gravel had accumulated (typically behind large boulder substrate). No fish or redds were observed, though peak escapement and spawning should not occur until April.

Recommendations: Additional gravel sites throughout the South Nanaimo River should be investigated. Access restrictions and site logistics make work at the present site difficult. As with this project, future gravel additions should be considered a maintenance measure to offset the cessation of natural gravel recruitment caused by the South Fork Dam. Monitoring fish use of installed gravel and downstream displacement of material over time should be continued.

5.0 REFERENCES

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Appendix A

Project Expenditures.

British Columbia Conservation Foundation Project Budget Update 2003/2004

Today's Date : 29-Mar-04
 Regional Contact: Pat Stephenson nanaimo@bccf.com

CLIENT NAME : Craig Wightman CLIENT AGENCY: MWLAP ADDRESS : 2080-A Labieux Road CITY, PROVINCE : Nanaimo, B.C. POSTAL CODE : V9T 6J9 TEL. NUMBER : 250-751-3230 FAX NUMBER : 250-751-3103	PROJECT NAME BCCF PROJECT # CLIENT CONTRACT # TOTAL CONTRACT FEES CARRY-OVER OR SUBSIDY WORKING BUDGET	Spawning Gravel Placement - Vancouver Island Lake Outlets 110420 2978126 \$ 20,523.00 \$ 2,280.34 \$ 18,242.66
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GL ACC'T.	EXPENDITURE	Working Budget	Spent to Date	Committed Cost	Balance Of Funds
4050	Equipment Rental				
4051	Other Charges				
4055	Coordinator/Mgmt Charges				
4056..5030	Contract wages	10318.39	10095.12	223.27	
5110	Sub Contracts	6332.72	6332.72		
5115	Premises Rent				
5210	Equipment > 100				
5220	Equipment < 100				
5230	Equipment Repairs				
5235	Rentals	75.25	75.25		
5240	Communications				
5245	Computer Costs				
5300	Materials/Supplies/Courier	32.28	32.28		
5400	Project Publications	49.40	49.40		
5500	Vehicle Operating Costs				
5520	Transportation				
5530	Vehicle Rental				
5540	Mileage (only)	251.12	251.12		
5545	Travel Costs/Fuel	217.96	217.96		
5550	Accommodation/Food				
5555	Allowances				
5560	Per Diem (only)	136.00	136.00		
5600	Miscellaneous	580.46	580.46		
5700	Training / Safety				
5750	Employee Advances				
5800	GST	249.08	249.08		
TOTAL		\$18,242.66	\$18,019.39	\$223.27	

Budget Check \$ - % working budget spent 98.78%

Comments:
 balance for hours for report writing by Brad

Billings to date - internal check		
3050	fees	-2280.33
3100..3359	expenses	-18242.67



Ministry of Water Land and Air Protection and Ministry of Sustainable Resource Management
Financial Data Warehouse
George's Special by Client / Responsibility Centre / Service Line / Project / STOB Level 4
as at 26-MAR-04 (MAR-04)

Client	048
Responsibility Centre	296AR
Service Line	31226
Project	2978128
STOB Level 4	EC50-EC99
Page Break	Client

STOB Level 4	Budget	Actuals	Encumbrance	Total	Variance
Client : 048 Water Land and Air Protection					
Responsibility Centre : 296AR Recoveries, Fish & Wild, VI					
Service Line : 31226 Stewardship Standards					
Project : 2978128 Spawning Gravel - Van Isl Lk Outlets					
EC60 Prof Serv-Oper and Reg	0.00	0.00	0.00	0.00	0.00
EC69 Utilities Materials and Supplies	28,000.00	27,996.16	0.00	27,996.16	3.84
EC85 Other Expenses	0.00	0.00	0.00	0.00	0.00
EC90 Rec-Ext to Govt Rptng Entity	<28,000.00>	<27,996.16>	0.00	<27,996.16>	<3.84>
Total: 2978128	0.00	0.00	0.00	0.00	0.00
Total: 31226	0.00	0.00	0.00	0.00	0.00
Total: 296AR	0.00	0.00	0.00	0.00	0.00
Total: 048	0.00	0.00	0.00	0.00	0.00
Total: Report	0.00	0.00	0.00	0.00	0.00



Ministry of Water Land and Air Protection and Ministry of Sustainable Resource Management
Financial Data Warehouse

Account Analysis
Client 048, APR-04 to MAR-04 as at 26-MAR-04

High 296AR 31226 2978128 99EA
Low 296AR 31226 2978128 1000

Resp 296AR 31226
Project 2978128 99EA

STOB 2978128 1000

Printed by jeffraser

Client 048 Water Land and Air Protection

Resp 296AR Recoveries, Fish & Wild, VI

Service Line 31226 Stewardship Standards

Project 2978128 Spawning Gravel - Van Isl Lk Outlets

Stob 6001 Operational Contracts-Fees

Source	Eff Date	Batch	PO	Invoice	Description	Encumbrance	Actual
PO	24-JUL-03		CNWLA04-31		JUL-04 OZERO SAND & GRAVEL LTD; NANAIMO RIVER WATERSHED	15,700.00	0.00
					Period Total:	15,700.00	0.00
PO	06-AUG-03		CNWLA04-31		AUG-04 OZERO SAND & GRAVEL LTD; NANAIMO RIVER WATERSHED	<15,700.00>	0.00
					Period Total:	<15,700.00>	0.00
					STOB Total:	0.00	0.00

Source	Eff Date	Batch	PO	Invoice	Description	Encumbrance	Actual
PO	03-SEP-03		CNWLA04-31		SEP-04 OZERO SAND & GRAVEL LTD; NANAIMO RIVER WATERSHED	15,700.00	0.00
Matched Invoice	04-SEP-03	WL04R1064	CNWLA04-31	4366	OZERO SAND & GRAVEL LTD; NANAIMO RIVER WATERSHED	<5,488.00>	5,488.00
Matched Invoice	30-SEP-03	WL04R1076	CNWLA04-31	4530	OZERO SAND & GRAVEL LTD; NANAIMO RIVER WATERSHED	<831.50>	831.50
Matched Invoice	30-SEP-03	WL04R1076	CNWLA04-31	4531	OZERO SAND & GRAVEL LTD; NANAIMO RIVER WATERSHED	<2,399.50>	2,399.50
Matched Invoice	30-SEP-03	WL04R1076	CNWLA04-31	4543	OZERO SAND & GRAVEL LTD; NANAIMO RIVER WATERSHED	<2,352.00>	2,352.00
Matched Invoice	30-SEP-03	WL04R1076	CNWLA04-31	4559	OZERO SAND & GRAVEL LTD; NANAIMO RIVER WATERSHED	<2,447.00>	2,447.00
Matched Invoice	30-SEP-03	WL04R1076	CNWLA04-31	4569	OZERO SAND & GRAVEL LTD; NANAIMO RIVER WATERSHED	<784.01>	784.01
PO	30-SEP-03		CNWLA04-31		OZERO SAND & GRAVEL LTD; NANAIMO RIVER WATERSHED	<1,397.99>	0.00
					Period Total:	0.00	14,302.01

Source	Eff Date	Batch	PO	Invoice	Description	Encumbrance	Actual
PO	22-OCT-03			2275	OCT-04 MCCOY LAKE EXCAVATING LTD; ONE TIME PAYMENT NO CONTRACT ISSUED	0.00	1,203.60
					Period Total:	0.00	1,203.60
					STOB Total:	0.00	15,505.61

Appendix B

Project Approvals, Permits and Documentation.

-----Original Message-----

From: Stanlake, Liz WLAP:EX

Sent: July 3, 2003 2:28 PM

To: Wightman, Craig WLAP:EX

Subject: RE: Transfer of HCTF funds from project #1-302 (Great Central Lake outlet gravel placement) to South Fork Nanaimo River

Yes - go ahead with the change

Liz Stanlake, R.P.Bio.
Head, Biological & Evaluation Services,
Habitat Conservation Trust Fund
PO Box 9354, Stn PROV GOV.,
Victoria, BC, V8W 9M1
Phone: (250) 387-1159
Fax: (250) 952-6684
Liz.Stanlake@gems4.gov.bc.ca

-----Original Message-----

From: Wightman, Craig WLAP:EX

Sent: July 3, 2003 9:47 AM

To: Stanlake, Liz WLAP:EX

Subject: FW: Transfer of HCTF funds from project #1-302 (Great Central Lake outlet gravel placement) to South Fork Nanaimo River

Liz, you and I discussed this by phone back in May. At the time you thought there would be no problems shifting the gravel placement funds from Great Central Lake to the south fork of the Nanaimo River. Do I have HCTF approval for this project amendment?

-----Original Message-----

From: Craig Wightman [mailto:jcwightman@shaw.ca]

Sent: July 3, 2003 7:01 AM

To: Wightman, Craig WLAP:EX

Subject: Fw: Transfer of HCTF funds from project #1-302 (Great Central Lake outlet gravel placement) to South Fork Nanaimo River

----- Original Message -----

From: [Craig Wightman](#)

To: [Liz Stanlake](#)

Cc: [Ptolemy, Ron WLAP:EX](#) ; [Mike McCulloch BCCF](#) ; [Mike McCulloch \(home\)](#) ; [Alan F Lill](#) ; [Ashley, Ken WLAP:EX](#) ; jcraig@bccf.com

Sent: Tuesday, May 27, 2003 1:38 PM

Subject: Transfer of HCTF funds from project #1-302 (Great Central Lake outlet gravel placement) to South Fork Nanaimo River

Liz, as we discussed this morning, we have re-evaluated our plans for lake outlet gravel placements on Vancouver Island in 2003/04, following field inspections and discussions with Ken Ashley, who chaired the HCTF fisheries project review team this year. We would now like to reallocate the budget share originally earmarked for Great Central Lake (Port Alberni) to the South Fork of the Nanaimo River, below the City of Nanaimo's Jump Creek reservoir. This is consistent with original comments from the technical review committee which emphasized that priority should be given to east coast watersheds where steelhead conservation is most at risk. While there is a somewhat greater chance that gravel will be displaced during major flood events

in the Nanaimo's South Fork, the risk of losing incubating steelhead eggs is relatively small given they are spring spawners and the river's hydrograph tends to be receding by March-April. We believe the steelhead production benefits from high quality gravel placements will be high, since the city's dam has effectively cut-off normal gravel recruitment processes over many decades. The South Fork gravel placements will complement the other approved Nanaimo River gravel placement between First and Second lakes in 2003.

Preliminary estimates indicate as much as 320 cubic metres of screened, washed gravel could be introduced to upper South Fork to create >500 square metres of steelhead spawning habitat, or enough for 100 spawning pairs (at 5 square metres per pair). This would represent a significant improvement over the "baseline case" where much of this reach is virtually devoid of gravel. Within the next year, the intent would be to further enhance steelhead and other salmonid production in this reach by a nutrient addition program using the pollock bone meal product now being field-tested by provincial research staff.

The reallocation to South Fork of the Nanaimo River will be \$18,405 from a total budget of \$48,523. We are also hopeful of obtaining some in-kind services from Weyerhaeuser Canada Ltd. or the City of Nanaimo in expediting the project this summer (use of heavy excavator/gravel trucks). I will send you a detailed budget for the South Fork project later this week. Please call if you have any questions.



#110420

JUL 22 2003

July 17, 2003

File: 76945-20/N1-1575

Water, Land and Air Protection
Environmental Stewardship
2080-A Labieux Rd
Nanaimo BC V9T 6J9

FAXED

ATTENTION: Craig Wightman

Dear Mr. Wightman:

Re: Work In and About a Stream
Water Act, Section 9 - Regulation 204/88

I have your Notification dated July 2, 2003, and received July 2, 2003, for works described as fish habitat restoration or maintenance affecting Dickson Lake.

I have no objection to your undertaking the project described in your application **PROVIDED THE WORK IS DONE IN COMPLIANCE WITH THE WATER ACT, SECTION 9 AND REGULATION 204/88, PART 7** and is completed within the year 2003 timing window. Please refer to the document titled "A Users Guide to Working in and Around Water - Revised January, 2001" (Users Guide) which sets out work requirements. This guide is available on the Land and Water British Columbia Inc. web site at:

<http://lwbc.bc.ca/water/surface.html>

A qualified environmental monitor must be on site at all times during construction to ensure that all potential impacts to fish habitat are mitigated. This person will be responsible for ensuring that sediment control procedures are followed as per the Fisheries and Oceans' Land Development Guidelines (Chilibeck 1992) and that fish salvage operations are

... /2

Ministry of
Water, Land and Air
Protection

Vancouver Island Region

Mailing Address:
2080A Labieux Road
Nanaimo BC V9T 6J9

Telephone: 250 751-3100
Facsimile: 250 751-3103

July 18, 2003

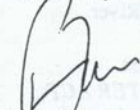
conducted, as necessary. All construction personnel should be familiar with these guidelines prior to commencing work on the site. Four guiding principles are worthy of note here:

- the natural riparian vegetation and stream banks should be protected and/or rehabilitated during and after construction;
- prevent the introduction of pollutants and deleterious substances by controlling construction activities and site conditions;
- prevent the generation of sediment by utilizing proper instream construction controls and supervision; and
- conduct fish salvage as required to remove fish from the area of impact (using minnow traps, beach seines, or lastly, electrofishing).

Please note that we may contact you in the future to monitor the works that you are doing under this Notification.

This grants authorization under Section 9 of the *Water Act* only, and does not constitute permission or consent under any other Act or Authority. In addition to DFO, you must also consult with local government (municipality or regional district), to determine if there are any requirements under that level of government for your proposed works.

Yours truly,



Peter Law
Designated Habitat Officer, Water Act Regulation
Vancouver Island Region

cc: John Lamb, Fisheries & Oceans, Nanaimo
Mike McCullough, BC Conservation Foundation



110420

July 18, 2003

File: 76945-20/N1-1577

Water, Land and Air Protection
Environmental Stewardship
2080-A Labieux Rd
Nanaimo BC V9T 6J9

ATTENTION: Craig Wightman

Dear Mr. Wightman:

Re: Work In and About a Stream
Water Act, Section 9 - Regulation 204/88

I have your Notification dated July 2, 2003, and received July 2, 2003, for works described as fish habitat restoration or maintenance affecting the Nanaimo River.

I have no objection to your undertaking the project described in your application **PROVIDED THE WORK IS DONE IN COMPLIANCE WITH THE WATER ACT, SECTION 9 AND REGULATION 204/88, PART 7** and is completed within the year 2003 timing window. Please refer to the document titled "A Users Guide to Working in and Around Water - Revised January, 2001" (Users Guide) which sets out work requirements. This guide is available on the Land and Water British Columbia Inc. web site at:

<http://lwb.bc.ca/water/surface.html>

A qualified environmental monitor must be on site at all times during construction to ensure that all potential impacts to fish habitat are mitigated. This person will be responsible for ensuring that sediment control procedures are followed as per the Fisheries and Oceans' Land Development Guidelines (Chilibeck 1992) and that fish salvage operations are

... /2

Ministry of
Water, Land and Air
Protection

Vancouver Island Region

Mailing Address:
2080A Labieux Road
Nanaimo BC V9T 6J9

Telephone: 250 751-3100
Facsimile: 250 751-3103

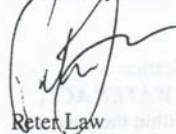
conducted, as necessary. All construction personnel should be familiar with these guidelines prior to commencing work on the site. Four guiding principles are worthy of note here:

- the natural riparian vegetation and stream banks should be protected and/or rehabilitated during and after construction;
- prevent the introduction of pollutants and deleterious substances by controlling construction activities and site conditions;
- prevent the generation of sediment by utilizing proper instream construction controls and supervision; and
- conduct fish salvage as required to remove fish from the area of impact (using minnow traps, beach seines, or lastly, electrofishing).

Please note that we may contact you in the future to monitor the works that you are doing under this Notification.

This grants authorization under Section 9 of the *Water Act* only, and does not constitute permission or consent under any other Act or Authority. In addition to DFO, you must also consult with local government (municipality or regional district), to determine if there are any requirements under that level of government for your proposed works.

Yours truly,



Reter Law
Designated Habitat Officer, Water Act Regulation
Vancouver Island Region

cc: John Lamb, Fisheries & Oceans, Nanaimo
Mike McCullough, BC Conservation Foundation



110490

July 18, 2003

File: 76945-20/N1-1578

Water, Land and Air Protection
Environmental Stewardship
2080-A Labieux Rd
Nanaimo BC V9T 6J9

ATTENTION: Craig Wightman

Dear Mr. Wightman:

Re: Work In and About a Stream
Water Act, Section 9 - Regulation 204/88

I have your Notification dated July 2, 2003, and received July 2, 2003, for works described as fish habitat restoration or maintenance affecting the south fork of Nanaimo River.

I have no objection to your undertaking the project described in your application **PROVIDED THE WORK IS DONE IN COMPLIANCE WITH THE WATER ACT, SECTION 9 AND REGULATION 204/88, PART 7** and is completed within the year 2003 timing window. Please refer to the document titled "A Users Guide to Working in and Around Water - Revised January, 2001" (Users Guide) which sets out work requirements. This guide is available on the Land and Water British Columbia Inc. web site at:

<http://lwbc.bc.ca/water/surface.html>

A qualified environmental monitor must be on site at all times during construction to ensure that all potential impacts to fish habitat are mitigated. This person will be responsible for ensuring that sediment control procedures are followed as per the Fisheries and Oceans' Land Development Guidelines (Chilibeck 1992) and that fish salvage operations are

... /2

Ministry of
Water, Land and Air
Protection

Vancouver Island Region

Mailing Address:
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Nanaimo BC V9T 6J9

Telephone: 250 751-3100
Facsimile: 250 751-3103

July 18, 2003

conducted, as necessary. All construction personnel should be familiar with these guidelines prior to commencing work on the site. Four guiding principles are worthy of note here:

- the natural riparian vegetation and stream banks should be protected and/or rehabilitated during and after construction;
- prevent the introduction of pollutants and deleterious substances by controlling construction activities and site conditions;
- prevent the generation of sediment by utilizing proper instream construction controls and supervision; and
- conduct fish salvage as required to remove fish from the area of impact (using minnow traps, beach seines, or lastly, electrofishing).

Please note that we may contact you in the future to monitor the works that you are doing under this Notification.

This grants authorization under Section 9 of the *Water Act* only, and does not constitute permission or consent under any other Act or Authority. In addition to DFO, you must also consult with local government (municipality or regional district), to determine if there are any requirements under that level of government for your proposed works.

Yours truly,



Peter Law
Designated Habitat Officer, Water Act Regulation
Vancouver Island Region

cc: John Lamb, Fisheries & Oceans, Nanaimo
Mike McCullough, BC Conservation Foundation

1. **EFFECTIVE DATE:** July 1st, 2003 **EXPIRY DATE:** August 31, 2003
2. **LICENSOR:** Weyerhaeuser Company Limited ("WY")
925 West Georgia Street
Vancouver, B.C.
V6C 3L2
3. **LICENSEE:** BC Conservation Foundation
#3 – 1200 Princess Royal Ave
Nanaimo, BC V9S 3Z7
250.716.8776 Phone, 250.719.2167 Fax
4. **GRANT:** WY grants to the Licensee, the non-exclusive licence to enter and be upon that part of the "Lands" shown in red on the attached print and described as
Spawning Gravel Placement at:
South Fork Nanaimo River at South Island Timberlands, and
Dickson Lake West Island Timberlands
5. **PURPOSE:** This Licence is granted for the purpose of Road Access to complete works.
_____ and no other purpose, upon the terms agreed to herein.
6. **LICENCE FEES:** N/A
7. **SECURITY DEPOSIT:** N/A other than for Gate Keys where required

The Security Deposit is security for the performance of all obligations by the Licensee under this Licence. If the Licensee defaults in the performance of any obligations herein, WY may, without prejudice to any right or remedy hereunder, apply the said security to the extent necessary.
8. **TAXES:** On demand from WY the Licensee shall pay all taxes associated with the Lands and improvements on the Lands.
9. **MAINTENANCE AND REPAIR:** The Licensee shall keep the Lands in a state of repair acceptable to WY. On termination, the Licensee shall leave the Lands in a condition acceptable to WY.
10. **IMPROVEMENTS:** No improvements may be placed on, or physical changes made to, the Lands without the prior written consent of WY.
11. **TIMBER:** The Licensee shall not cut or damage, or allow the cutting or damaging of, trees in the vicinity of the Lands without the prior written consent of WY.
12. **ROAD USE RULES:** The Licensee shall
 - a) strictly observe all speed limits and traffic regulations, and
 - b) suspend use of WY roads whenever such use is likely to cause excessive damage to them.
13. **PROTECTION AGAINST FIRE:** The Licensee shall
 - a) carry at all times fire fighting tools and equipment as advised are necessary by WY,
 - b) immediately notify WY and the nearest Ministry of Forests office upon discovery of any fire in the vicinity of the Lands, and
 - c) strictly observe WY and Ministry of Forests closure instructions with regard to forest fire hazards.
14. **ENVIRONMENTAL RESPONSIBILITY:**
 - a) The Licensee shall comply with all applicable environmental laws and implement practicable measures to protect environmental quality and human health.
 - b) The Licensee shall use the Lands in a manner to prevent the occurrence of any adverse events and minimize potential hazards that may affect WY and its contractors, invitees, licensees, employees, agents and servants, the public and the environment; and in connection with any occurrence the Licensee shall implement effective control measures and notify all concerned parties.
 - c) The Lands used by the Licensee shall be subject to environmental audits at the Licensee's cost, as WY, in its sole discretion, thinks advisable.
15. **COMPLIANCE WITH LAWS AND REGULATIONS:** The Licensee shall comply with all laws, by-laws, and regulations, Federal, Provincial or otherwise, including those under the Highway (Industrial) Act.

16. **ASSUMPTION OF RISK AND LIABILITY OF LICENSEE:**
- a) WY has made no representations or given any warranties save as set forth in this Licence.
 - b) The Licensee assumes all risk of damage to property of, or injury to the Licensee and the Licensee's contractors, invitees, licensees, employees, agents and servants ("said Licensee") in connection with the exercise of the privileges under this Licence.
 - c) The Licensee shall pay for all damage resulting directly or indirectly from any act or omission of the said Licensee, whether negligent or otherwise, and shall reimburse WY for all expenses incurred for fighting fire resulting directly or indirectly from said Licensee's acts or omissions under this Licence whether or not negligent.
 - d) The Licensee shall indemnify and save harmless WY against all claims or liabilities asserted by third persons resulting directly or indirectly from said Licensee's acts or omissions whether or not negligent.
17. **INSURANCE:** The Licensee shall obtain and maintain during the term of this Licence
- a) Comprehensive general liability insurance including non-owned automobile, covering bodily injury and property damage including loss of use hereof, and loss of use of tangible property which has not been physically injured or destroyed. The policy shall also include coverage for:
 - i) unlicensed and specially licensed vehicles,
 - ii) contractual liability covering the Licensee's liability under this Licence; and
 - b) Motor vehicle liability insurance covering all said Licensee's licensed vehicles (owned and leased) exercising privileges granted under this Licence.
- The minimum limits of liability for (a) and (b) shall be \$2,000,000 inclusive. Such insurance shall be issued by an insurance company acceptable to WY, and shall include an endorsement requiring thirty (30) days notice to WY prior to cancellation. The Licensee shall furnish evidence of the insurance prescribed in sub-paragraphs (a) and (b) above to WY before exercising any privileges granted under this Licence.
18. **TERMINATION, SUSPENSION AND RENEWAL:**
- a) Either party may terminate this Licence by giving the other thirty (30) days notice and if WY terminates this Licence for any reason the unearned portion of any prepaid consideration shall be returned to the Licensee, without interest.
 - b) If the Licensee defaults, all privileges terminate ten (10) days after notice of default is given by WY to the Licensee, if the default is not remedied within such time. WY's termination of this Licence shall not prejudice WY's right to collect damages on account of the Licensee's breach.
 - c) Any failure to exercise WY's right to terminate this Licence in case of default does not constitute a waiver of the Licensee's obligations to perform strictly in accordance with the terms of this Licence. Any such right to terminate remains in effect and may be exercised as long as the default continues.
 - d) The privileges granted under this Licence may be suspended or modified as WY, in its sole discretion, thinks advisable.
 - e) If the Licensee requests a renewal of this Licence at least 1 months before the Expiry Date, WY may, but is not obligated to grant a renewal on terms satisfactory to it.
19. **NON-ASSIGNMENT:** Neither this Licence nor the privileges in it may be assigned in whole or in part by operation of law or otherwise, without the previous written consent of WY.
20. **NOTICES:** All notices shall be written and deemed duly given if delivered by hand or mailed by registered mail, postage prepaid, addressed to the party concerned at the address herein set forth or at such other address as may from time to time be communicated by notice. Any notice is deemed given and received, if delivered by hand, on the day delivered, and, if mailed when it should have been received in the ordinary course of post.
21. **INTEREST CHARGES:** The Licensee agrees to pay WY interest at a rate of 1.5% monthly on any overdue amounts payable under this Licence.
22. **OTHER TERMS:**
- Follow Weyerhaeuser's Safety Program including the companies PPE SOP
- All Employee review the Nanaimo River Watershed Video
- BC Conservation Foundation is responsible for all required approvals and permits from government agencies and or landowners for the two projects
- Use the companies Radio Frequencies when moving equipment or gravel on company Roads
- Have on site Fire Fighting equipment to BCFS regs.

23. **SIGNED:**

<p>Weyerhaeuser Company Limited Timberlands and Properties Division</p> <p>Per _____</p> <p>Signature Brad Rodway, RPF</p> <p>Type/Print Name Supt Forestry and Planning</p> <p>Position July 7, 2003</p> <p>Dated _____</p>	<p style="text-align: center;">Licensee</p> <p>Per _____</p> <p>Signature _____</p> <p>Type/Print Name _____</p> <p>Position _____</p> <p>Dated _____</p>
--	--

From: ShengM@pac.dfo-mpo.gc.ca
To: jcraig@bccf.com
Subject: RE:
Date: Tue, 6 Nov 2001 19:50:34 -0800
X-Mailer: Internet Mail Service (5.5.2653.19)

James:

The DFO in the Southcoast Division has no objections to the proposals listed below that are in our area (i.e., Puntledge, Ash). Your request for support for Campbell and Salmon R. watersheds should be directed to the Central Coast Division in our Dept. I believe the contact is Jim Van Tine.

Mel

-----Original Message-----

From: James [mailto:jcraig@bccf.com]
Sent: Monday, November 05, 2001 2:49 PM
To: ShengM@pac.dfo-mpo.gc.ca
Subject:

Mel:

Further to my voice mail this afternoon, we (Craig and BCCF) are requesting support from DFO for the following proposals, being submitted to BCRP for their consideration by November 8, 2001:

1. Elk Falls Gravel Enhancement. Place approximately 75 m³ of washed and screened spawning gravel in the upper Elk Falls Canyon, within 500 m of Elk Falls, in July 2002. Gravel will be installed in predetermined locations suitable for spawning salmon and steelhead by heavy lift helicopter. This project will be very similar to that which occurred in July 1999.
2. Salmon River Diversion Electronic Counter Assessment. Monitor the effectiveness on an electronic counter soon to be installed in the fishway at the Salmon River Diversion. This will involve maintaining the site, data collection, and snorkel surveys upstream of the diversion to confirm presence/abundance of returning coho and steelhead.
3. "Living Gene Bank" (LGB) Program Evaluation (Quinsam and Puntledge rivers). Extensive snorkel surveys to assess the first returns of winter run LGB steelhead in the 2002/03 season (first brood year released as smolts in spring 2001). NOTE: We realize this may be more appropriately directed to Dave at Quinsam and Chris at Puntledge, and are forwarding same to them.
4. Upper Salmon River Watershed Habitat Enhancement. Work will involve 1.) a review of recent Level 1 and Level 2 assessments centred around lower Grilse Creek and its confluence with the Salmon River, 2.) a review of enhancement works constructed in the area during the summer of 2001, and

3.) identification and prioritization of remaining potential projects to be funded by BCRP.

5. Dickson Lake gravel enhancement. Approximately 450 m3 of washed and screened gravel will be installed in the lake outlet, primarily to enhance spawning for summer steelhead. This will augment gravel installed in 1990, which was installed too far downstream. Most of this has been displaced to downstream areas as well.

Many Thanks

James

James Craig
Fisheries Technician
BC Conservation Foundation
3-1200 Princess Royal Avenue
Nanaimo, BC V9S 3Z7
tel: (250) 716-8776
fax: (250) 716-2167
email: jrcraig@bccf.com

tjones@island.net, 07:57 AM 11/7/200, Re: Dickson Lake Spawning Grav

From: tjones@island.net
To: James <jcraig@bccf.com>
Subject: Re: Dickson Lake Spawning Gravel Enhancement
Date: Wed, 07 Nov 2001 07:57:08 -0800 (PST)
User-Agent: IMP/PHP IMAP webmail program 2.2.6
X-Originating-IP: 204.244.161.175

Of course this First Nation would be very supportive of such a proposal as long as there was sufficient consultation and opportunities for involvement.

Thanks for your notice.

Regards

Trevor Jones
Executive Director
Hupacasath First Nation

Quoting James <jcraig@bccf.com>:

> Dear Trevor Jones:
>
> I got your name and email address from Scott Sylvestri and Corey
> Hryhorczuk
> (BCCF techs conducting Ash River migration studies).
>
> On behalf of the Ministry of Water, Land and Air Protection and the BC
> Conservation Foundation, I am requesting local First Nation conceptual
> support for a proposal being submitted to BC Hydro (Bridge Coastal
> Restoration Program) for the following:
>
> Install ~450m3 of washed and screened spawning gravel in the Ash River
> at
> the outlet of Dickson Lake in August 2002 for enhancement of the
> system's
> native fish species (primarily summer run steelhead, as well as
> resident
> trout). This proposal is in the final stages (one of several
> Vancouver
> Island lake outlet enhancements proposed for next year) of completion
> prior
> to submission to BCH on NOVEMBER 9.
>
> At this time, we are simply looking for general support for the
> concept.
> There is a labour component within the proposal that may allow for the
> hiring of First Nations, should the proposal be approved.
>
> Please respond at your earliest convenience by fax to (250) 716-2167,
> or
> simply reply to this email.
>
> Many Thanks,
>
>
> James Craig
> Fisheries Technician
> BC Conservation Foundation
> 3-1200 Princess Royal Avenue
> Nanaimo, BC V9S 3Z7
> tel: (250) 716-8776
> fax: (250) 716-2167
> email: jcraig@bccf.com
>
>



TimberWest Forest Company
Nanaimo Lakes Operation

5055 Nanaimo River Road
Nanaimo, British Columbia
Canada V9X 1E9

Tel 250.729.3770
Fax 250.729.3780

June 25, 2003

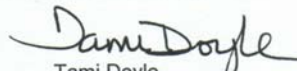
TO: Mike McCulloch
FROM: Tami Doyle
RE: Permission to complete project between 1st and 2nd Lake

This is to confirm that permission has been granted for you to come into TimberWest Forest Company - Nanaimo Lakes Operation to complete your project near the Nanaimo River Watershed between 1st and 2nd lake. I understand that you will be bringing in one (1) Gravel Truck to complete this work and that we will provide the Backhoe. Please ensure that the Gravel Truck that you are bringing in is a unionized truck. We would appreciate as much advance notice as possible so that we can arrange to have the Backhoe for you on the day that you are going to come in.

Because this work is being done between 1st and 2nd Lakes and near a main road that the general public may be using at that time we also request that you ensure that you have a flag person at the site to direct traffic if required.

If you have any further questions please contact Mike Pigott (729-3797) or Tami Doyle (729-3767).

Sincerely,


Tami Doyle
Operations Administrator
Nanaimo Lakes Operation



TimberWest Forest Company, a partnership of TimberWest Forest Corp., TFL Forest Ltd. and PFP Forest Ltd.

TW FC NL 2100

MEMO:

October 30, 2002

James Craig
Fisheries Technician
BC Conservation Foundation
3-1200 Princess Royal Avenue
Nanaimo, BC V9S 3Z7

Dear James:

RE: Spawning Gravel Proposal at Nanaimo Lakes

TimberWest - Nanaimo Lakes Division is very interested in ensuring healthy salmon and trout populations in the streams and lakes within our properties. We appreciate this opportunity to support your efforts in salmon enhancement.

At our cost, we will provide an excavator onsite with operator and carry out the gravel placement to the satisfaction of your project supervisor should your proposal be approved.

Please contact me if you require further information.

Sincerely,

James Luxmoore

James Luxmoore R.P.F.
Engineer
Nanaimo Lakes Operation

From: LambJ@pac.dfo-mpo.gc.ca
To: mmccullo@bccf.com
Subject: RE: RE: Spawning platforms for steelhead trout
Date: Tue, 16 Sep 2003 08:25:33 -0700
X-Mailer: Internet Mail Service (5.5.2653.19)

Mike,

Thank you for referring this matter. I understand that an environmental monitor will be present during the work.

I have no objection to this two week extension subject to the following:

- The movement of migrating salmon is not impaired
- Active spawning (egg deposition) is not occurring downstream within 200 metres of the work site or in the immediate vicinity of the work site, and
- Significant release of sediment (> 200 ppm above background levels) does not occur from the work site.

If any of the above conditions occur, work should be suspended and the monitor should contact me.

-----Original Message-----

From: Mike McCulloch [mailto:mmccullo@bccf.com]
Sent: September 15, 2003 4:38 PM
To: LambJ@pac.dfo-mpo.gc.ca
Subject: Fwd: RE: Spawning platforms for steelhead trout

John,

As previously discussed I would like to apply for an extension of the DFO approval of the Dickson Lake spawning gravel project.

I have acquired a two week extension (to October 1) on the Section 9 Permit allowing for in-stream restoration on the Dickson Lake Outlet in the Ash River Watershed from the Min. WLAP.

The project remains unchanged in design and scope.

This extension is necessary stemming from a closure of the forest due to a high fire hazard, during the latter part of the summer.

Your support is appreciated.

Date: Thu, 19 Jun 2003 13:04:34 -0700
To: LambJ@pac.dfo-mpo.gc.ca
From: Mike McCulloch <mmccullo@bccf.com>
Subject: RE: Spawning platforms for steelhead trout

John,

I realize that you are very busy and I appreciate you looking at these projects expeditiously but could you reply to each email with a separate response so that it is clear which projects you have reviewed.

Tahnks

At 02:22 PM 18/06/2003 -0400, you wrote:

Mike,

Thank you for forwarding the information on these projects.

I note that the Englishman River project includes fish salvage, riparian and streambank protection constraints, and sediment controls in accordance with our Land Development Guidelines. Also an environmental monitor will be onsite. Access is described as "fair" and temporary crossing and disturbances will be restored. The projects will also be conducted under a Section 9 Water Act Notification included permitted protection measures.

I have no objection to these projects subject to the constraints and mitigation measures contained in the project design reports.

I have sent copies of these projects to the environmental coordinator for the Regional District of Nanaimo for her information.

-----Original Message-----

From: Mike McCulloch [<mailto:mmccullo@bccf.com>]

Sent: June 17, 2003 11:21 AM

To: lambj@pac.dfo-mpo.gc.ca

Subject: Spawning platforms for steelhead trout

Attached is the Habitat Conservation Trust Fund (HCTF) proposal for funding for the placement of spawning gravel in the tailout of Dickson Lake (Ash River Watershed), and between first and second Lakes in the Nanaimo River to enhance steelhead trout spawning. The third project listed in the Application for funding (Great Central Lake) has been modified with permission from the funding agency to a gravel placement directly downstream of the impoundment dam on the South Fork Nanaimo River.

I also have letters of support for this project from local first Nations and Mel Sheng, Habitat Restoration Biologist for DFO.

Mike McCulloch
Fisheries Technician
Greater Georgia Basin Steelhead Recovery Plan
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Appendix C

Photo Documentation.

Appendix C. Photo Documentation.



Photo 1. Outlet of Dickson Lake, Ash River watershed.



Photo 2. Stream channel that connects Second Lake to First Lake, upper Nanaimo River.



Photo 3. South Fork Dam, South Nanaimo River.

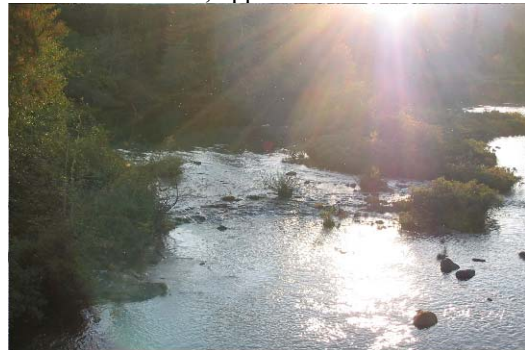


Photo 4. Proposed gravel site (Platform A), Dickson Lake outlet.



Photo 5. Proposed gravel site (Platform B), Dickson Lake outlet.



Photo 6. Proposed spawning gravel site, Second Lake outlet channel, Nanaimo River.



Photo 7. Spur road constructed to access site near Second Lake outlet, Nanaimo River.



Photo 8. Proposed spawning gravel site #2, 60 m d/s South Fork Dam



Photo 9. Proposed spawning platform site #3, 35 m d/s South Fork Dam



Photo 10. Gravel delivery down steep bank adjacent to South Nanaimo River.



Photo 11. Road grade improvements at campsite near Dickson Lake outlet (left bank).



Photo 12. Upstream view of platform A construction, Dickson Lake outlet.



Photo 13. Upstream view of platform B construction, Dickson Lake outlet.



Photo 14. Cross stream view of platform A, Dickson Lake outlet.



Photo 15. Upstream view of platform B, Dickson Lake outlet.



Photo 16. Excavator placing material into outlet channel, Nanaimo River.



Photo 17. Downstream view of installed gravel, Nanaimo River.



Photo 18. Aerial view of installed gravel, Nanaimo River.



Photo 19. Excavator building route for front-end loader, South Nanaimo River



Photo 20. Access route into South Nanaimo River channel.



Photo 21. Front-end loader moving material into Site #2, South Nanaimo River.



Photo 22. Upstream view of Site #2, South Nanaimo River.



Photo 23. Upstream view of Site #3, South Nanaimo River.



Photo 24. Armouring disturbed stream bank, South Nanaimo River.

Appendix D

Snorkel Survey Monitoring Reports.

FILE NOTE

Date: February 5, 2004
File: 34560-20/SNORK
xf: 34560-27/*Ash*

SNORKEL SURVEY REPORT **Ash River / Dickson Lake Outlet**

DATE: February 3, 2004
WEATHER: Overcast, cool (about 30 cm of snow on the road)
WATER TEMP.(°C): 4 (est)
DISCHARGE (m³/s): low-moderate winter flow (estimated at 100%MAD)
VISIBILITY (m): 6
PERSONNEL: C. Wightman, J. Craig
AREA: Spot swim from outlet of Dickson Lake to 200 m below Ash River
Road bridge crossing (total distance = 300 m)

1. Fish Observed:

Adults

One steelhead (wild female, ~3 kg) was observed. The single fish appeared fecund and was observed about 100 m downstream of the bridge crossing.

Juveniles

None observed.

2. Notes

- The purpose of the survey was to evaluate spawning gravel placed at the outlet of Dickson Lake in September 2003. This project was intended to improve summer steelhead spawning success, and was funded by the Habitat Conservation Trust Fund and completed by BC Conservation Foundation, with support from Hupacaseth FN.
- Both gravel pads were intact and each showed signs of use by fish. The south pad (right bank) contained one complete redd and one other depression that appeared to be a test redd. Both were located near the downstream perimeter of the pad (fastest velocities at time of inspection). The north pad (left bank) contained what appeared to be one complete redd plus at least three test redds, also located in relatively fast water near the pad's downstream perimeter. Water depth at the time of survey averaged 35-40 cm near the redds, and ranged from 50-60 cm in the depressions associated with the redds.
- Additional redds were noted in natural substrates on the left bank, immediately downstream of the installed pads. These redds appeared to be from previous spawning seasons, though new redds may have been difficult to identify due to the nature and colour of the substrates.
- Banks on both sides of the outlet were used for machine access during pad construction. Both banks appeared to have weathered seasonal high flows well, with the layer of gravel left on each slope minimizing erosion at these disturbed sites. Additional seeding this spring is recommended to further improve slope stability and minimize any potential erosion.

James Craig
Fisheries Technician
BC Conservation Foundation

FILE NOTE

Date: March 15, 2004
File: 34560-20/SNORK
xf: 34560-27/*Ash*

SNORKEL SURVEY REPORT Nanaimo Lakes/South Nanaimo River

DATE: March 10, 2004
WEATHER: Sunny, mild, 12°C air temp.
WATER TEMP.(°C): 6.3 (Nanaimo Lakes) 5.8 (South Nanaimo River)
DISCHARGE (m³/s): moderate spring flows
VISIBILITY (m): 5-6 (Nanaimo Lakes) 5 (south Nanaimo River)
PERSONNEL: B. Smith
AREA: Spot swim from 100 m of spawning gravel site to 300 m
downstream of site (400 m; Nanaimo Lakes)
Spot swim from top of site 3 to 250 downstream (250 m: South
Nanaimo River)

1. Fish Observed:

Adults

No fish observed in either survey.

Juveniles

None observed in either survey.

Notes:

- The purpose of the surveys was to evaluate spawning gravel placed at between First and Second lakes (Nanaimo River) and below the South Fork Dam (South Nanaimo River) in summer 2003.
- *South Nanaimo River:* as expected, spawning conditions at sites 1 and 2 were poor, as most material had been displaced downstream. However, conditions at site 1 appeared good, as ~70% of materials still remained in-situ. Material that had been displaced had settled into interstitial spaces between larger substrate throughout the section. A few usable areas for spawning were identified in this section, where enough gravel had accumulated (typically behind large boulder substrate). Further monitoring is recommended.
- *Nanaimo Lakes:* A majority of material observed (of the ~30% remaining following the October 18 event) was still in place. Other material had been displaced as far as 250 m downstream, settling in interstitial spaces between larger substrate throughout the lake inlet. A few gravel accumulations were identified in this section as suitable for spawning. No redds or fish were observed during the survey. Further monitoring is recommended.

Brad Smith
Fisheries Technician
BC Conservation Foundation