Lakelse Lake Sockeye Rehabilitation Program:

Scully Creek Off-channel Habitat & Flow Augmentation Project

Prepared for:

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Executive Summary

Scully Creek (Schulbuckhand Creek) is one of several tributaries to Lakelse Lake that supports a run of sockeye salmon that has declined from highs of several thousand spawners in previous decades to lows of a few hundred in recent years. The decline is believed to be partly a result of physical changes and habitat impacts that have occurred in the watershed such as logging, linear development, water diversions and beaver activity. A lack of suitable spawning habitat is believed to be the main factor limiting sockeye production in Scully Creek and in the Lakelse watershed in general (Lakelse Lake Sockeye Recovery Plan, 2006).

Historically, Scully Creek South (Scully South) was the mainstem and prime sockeye spawning area of this system. Surface water from Scully Creek South was completely diverted within that last 2 decades, leaving only groundwater flow in the former mainstem. This diversion has been identified as one of the major impacts to the system by the Lakelse Watershed Society (LWS). The lack of higher flushing flows has stopped gravel recruitment and allowed beavers to proliferate in Scully South. Some spawning areas are inaccessible due to beaver dam construction and others are degraded due to flooding and fine sediment accumulations.

Fisheries and Oceans Canada (DFO) – North Coast Division - Resource Restoration Unit, the Lakelse Watershed Society (LWS) and other partners initiated two feasibility studies in 2001-2002 and 2004-2005 to examine the feasibility of increasing flows in Scully South to improve spawning conditions for sockeye salmon.

Two potential projects emerged: 1) to increase flows by accessing groundwater in the fan and surface flows from the relatively stable wetland; 2) to increase flow by connecting water from the more unstable surface water channel to Scully South. As a first step, a plan for the former, more conservative option was developed and submitted to the Pacific Salmon Commission in the fall of 2005.

In the spring of 2006, the LWS, in partnership with DFO, received funding from the Pacific Salmon Commission for the *Scully Creek Off-channel Habitat and Flow Augmentation Project* to improve spawning and flushing flows in Scully South. This was to be accomplished through water impoundments in the wetland area connected to Scully South through the excavation of a groundwater channel through fan sediments.

Project construction planned for the summer fisheries work window in 2006 was delayed until the fall due to a number of factors. The project proceeded with the understanding that the project scope may have to be altered to accommodate winter working conditions and the project deadline would have to be extended to allow some finishing work in the spring of 2007.

In November 2006, a dam was installed to store water and control water flow from a portion of the wetland area of the Scully Creek watershed. A 200 meter long groundwater channel was excavated from the dam to connect the wetland flows and additional groundwater to Scully South. The original plan included the construction of *three* sheet pile weirs with control structures for water storage and release. Spawning gravel placements were also proposed in the channel sections connecting the storage ponds but this did not take place, in part due to the suitable gravels occurring naturally in portions of the excavated channel. These changes in project scope were due to a number of issues including natural changes in the wetland, the delayed start, poor weather and working conditions in the fall of 2006.

Final project components were completed in May 2007, including the removal of accumulated fine sediment from the lower end of the channel and the excavation of another short section of

groundwater channel. The site was cleaned up and the ground prepared for seeding and planting.

A number of outstanding issues persist. An asbuilt survey was completed by McElhanney Consulting Services Ltd. in March 2007 and will need to be updated to reflect the additional work completed in May 2007. Conifers and grass seed have been purchased and will be planted before fall 2007 and maintained throughout the growing season. Interpretive signage is currently under development and will be completed and installed in the summer of 2007. A monitoring program will be established to assess storage and flow capacity and to experiment with staged freshets and assess downstream effects. Spawning potential (incubation success) in the excavated channel will also be examined. Beaver management is another issue to be explored in the watershed as discussions with the local trapper did not lead to additional harvesting. Other possibilities to control beaver populations in the coming years will be explored.

A natural fish barrier at the confluence of the channel with Scully South was temporarily left in place to prevent fish access into the excavated channel. This was considered precautionary, to allow for fluctuations in flows in the channel to be studied and manipulated before introducing fish that could be detrimentally affected by low or high water events in the channel. This will also allow for habitat features in the new channel to stabilise and stream banks to re-vegetate. Access to the channel will be created within a year or two.

Due to the change in project scope, there remains a balance of funds from the project that will not be requested from PSC (only the entire first instalment of $39,500.00 was spent on the project). Although difficulties in implementation resulted in significant changes to the project, the more economical approach to the *Scully Creek Off–Channel Habitat and Flow Augmentation Project* is regarded as a success by project proponents and partners. Despite set-backs, a satisfactory end product was achieved with significantly less funds.

The DFO Resource Restoration Unit is still exploring the feasibility of introducing flows from the surface water channel through a controlled structure in a more stable part of Scully mainstem. This would be developed as a second phase of this project should additional flows still be required.

Acknowledgements

This project was conducted under the umbrella and direction of Fisheries & Oceans Canada on behalf of the Lakelse Watershed Society. DFO provided personnel, labour, travel, equipment and technical expertise as 'in-kind' contributions to this Pacific Salmon Commission (PSC) funded project.

DFO personnel directly involved included:

Don Hjorth - Restoration Engineer, Resource Restoration Unit
Lana Miller - Restoration Biologist, Resource Restoration Unit
Sandy Devcic – Restoration Engineer, Resource Restoration Unit
Mitch Drewes - Community Advisor & Habitat Technician, OHEB
Margaret Kujat - Biology Technician & Recovery Plan Coordinator, Stock Assessment/OHEB

Additional assistance was provided by:

Mr. David Taft of Cambria Gordon Ltd.
Environmental Monitor (EM) during the project construction phase.

McElhanney Consulting Ltd who completed the asbuilt survey.

Johnny's Welding, Terrace, B.C.
Metal works.

Mr. Quinton Freeman, Uplands Nursery, Terrace, B.C.
Indigenous vegetation supplies.

Other personnel included:

Ongoing support and efforts provided by members of the Lakelse Lake Watershed Society based out of the Lakelse Lake area:

Ian and Wilma Maxwell,
Ken Fraser, who also provided all the photos for this report,
Alan Lanctot, and
Kelly Kline.

Mr. Ross Stenquist from 'Nechako Northcoast Construction" is also appreciated for his exceptional excavation work in sediment removal, sheet pile dam installation, channel excavation and riparian protection while working.

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1.0 INTRODUCTION

Sockeye salmon stocks in Lakelse Lake have been declining at an alarming rate due to physical changes and habitat impacts caused by land and resource development and beaver activity in the watershed. Sockeye escapements to Lakelse Lake have experienced a 92% decline over the last 3+ cycles, and in 2003, DFO's Stock Assessment Branch concluded that densities of juvenile sockeye in Lakelse Lake were less than 5% of the rearing capacity, representing the offspring from just 750 spawners. (Lakelse Lake Sockeye Recovery Plan, 2006). Scully Creek is one of 13 tributaries to Lakelse Lake which has historically supported sockeye spawning. Scully is among the top 3 creeks identified as the highest sockeye producers/main spawning tributaries, in addition to Williams and Sockeye Creeks (Lakelse Lake Sockeye Recovery Plan, 2006).

Land and resource development such as logging and linear development and subsequent increases in beaver activity are believed to have contributed to a reduction in the quality and quantity of suitable spawning habitat in the Lakelse Watershed in general and Scully Creek, specifically. In particular, the complete diversion of surface water from the former mainstem (South Scully) into adjacent wetland and fan areas has been identified as a major impact (Lakelse Lake Sockeye Recovery Plan, 2006).

In 1994, Eero Karanka, Habitat Biologist with DFO completed a literature review and watershed evaluation report for Scully Creek (Karanka, 1994). He summarised the history of development impacts in the watershed and made observations and recommendations for further evaluation.
In 1998, a Level II WRP Assessment of Scully Creek was conducted by Triton Environmental Consultants Ltd. This study examined habitat impacts and outlined suggestions for additional assessment and for the development of several restoration prescriptions. One of the recommendations included a hydrologist assessment and flow augmentation from the fan to Scully South.

A follow-up study to explore the feasibility of various restoration options in the Scully Creek watershed was conducted by DFO and funded by B.C. Hydro in 2001/02. This study supported the concept of flow augmentation and spawning/rearing habitat increases in Scully South - but identified significant risks associated with a surface water channel from the fan to Scully South due to the instability of the fan and risk to infrastructure such as gas pipelines and hydro power lines. A feasibility study to assess the potentially less risky option of connecting flows from the more stable wetland area to Scully South was recommended as a first step.

In 2004-2005, the feasibility of this option was assessed with funding assistance from the Pacific Salmon Foundation and BC Hydro. As a result, a channel and water storage concept was designed and funding provided by Pacific Salmon Commission in 2006. The purpose was to improve existing spawning habitat by increasing baseline flows in Scully South and providing staged freshet flows to mobilise silts and possibly beaver dams. The project also involved the creation of additional spawning and rearing habitat in the excavated channel.

1.1 Study Area

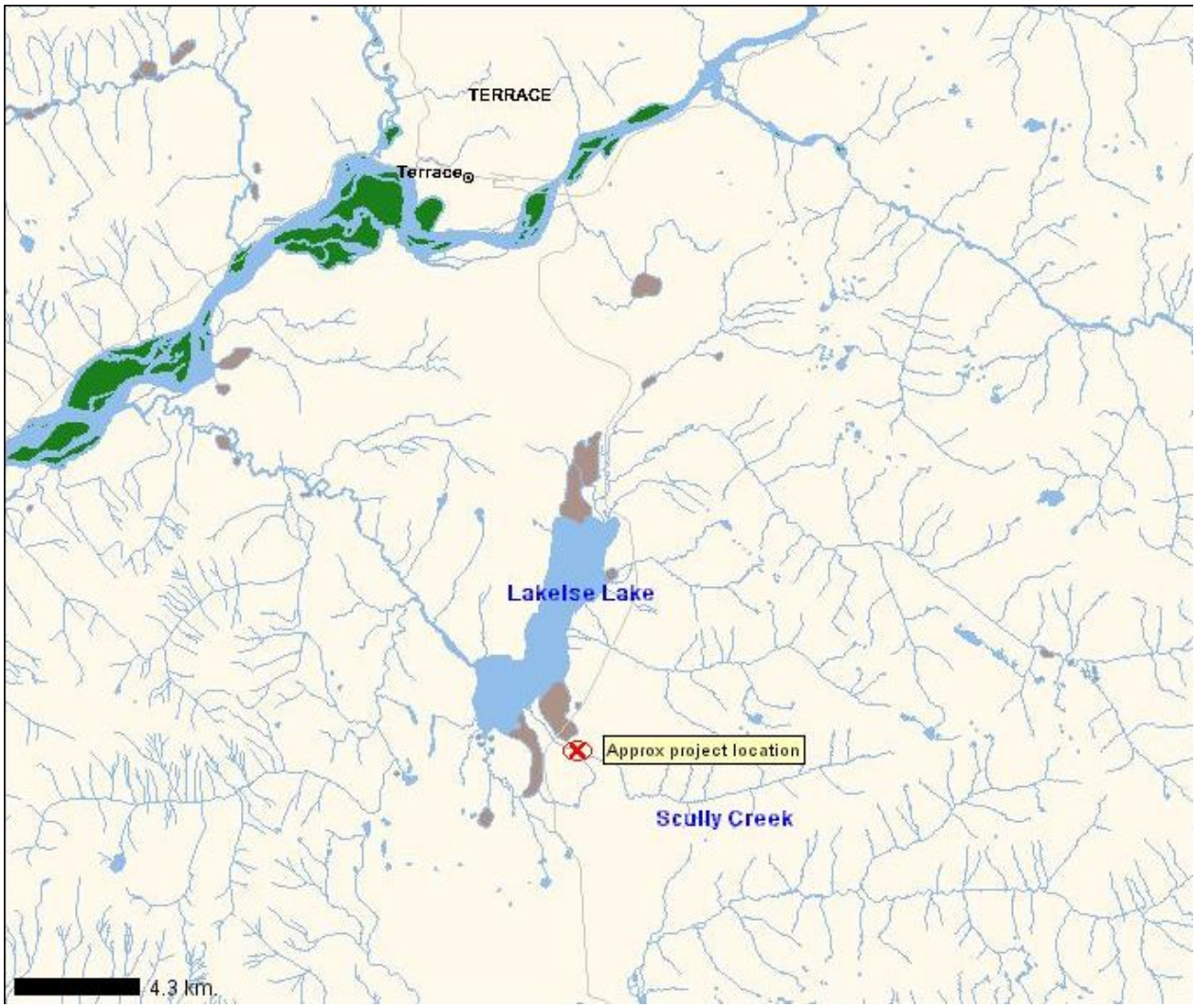

Figure 1: Map of Lakelse Lake Area Showing Location of Scully Creek created in MAPSTER version 2.2.

Scully Creek is located approximately 25km south of the community of Terrace in northwestern British Columbia. It flows in a north-west direction from Mount Layton, draining an area of approximately 28.6 square km into the southeast end of Lakelse Lake (Triton, 1998). Lakelse Lake is drained by Lakelse River which flows for 18km before entering the Skeena River approximately 150 kilometers from tidewater. Scully Creek begins as a steep cascade that becomes braided across an alluvial fan. The mainstem of Scully then filters into an extensive wetland complex until just upstream of Highway 37, where it forms three channels and crosses the highway through three separate culverts. These channels flow through agricultural property before draining into Lakelse Lake. Adjacent to the fan, an isolated tributary (Scully South or Old Scully) fed by groundwater flows in a northwest direction across Highway 37 and empties into Lakelse Lake.

The specific project location is on Scully South, approximately 1km upstream from the Hwy 37 South crossing (see Figure 2 air photo mosaic).

Scully Creek Groundwater Channel (Scully South)

The groundwater channel (Scully South) originates just south of the Scully Creek alluvial fan. In the past, stable channels on the alluvial fan directed surface water flows into the groundwater channel. This convergence of groundwater and surface water flows may have contributed significantly to the high productivity in this channel. Currently, surface water is cut off from Scully South due to channel instability and a redirection of flows down the BC Hydro/Pacific Northern Gas right-of-way. Logging in the watershed and a lack of flushing flows created in the past from the combined surface and groundwater flows have likely contributed to the establishment of beavers in the watershed and a lack of spawning gravel recruitment. The resultant beaver dams block the migration of spawning salmon and increase ponding and siltation of spawning areas upstream of the dams, contributing to decreased habitat values.

Scully Creek Wetland Area

The wetland area is located east of Highway 37 South and north of the groundwater channel (Scully South). The wetland area is fed by subsurface flows from the Scully Creek fan and consists of several channels and beaver dam complexes that eventually drain into the channels on the Mt. Layton Hot Springs property.

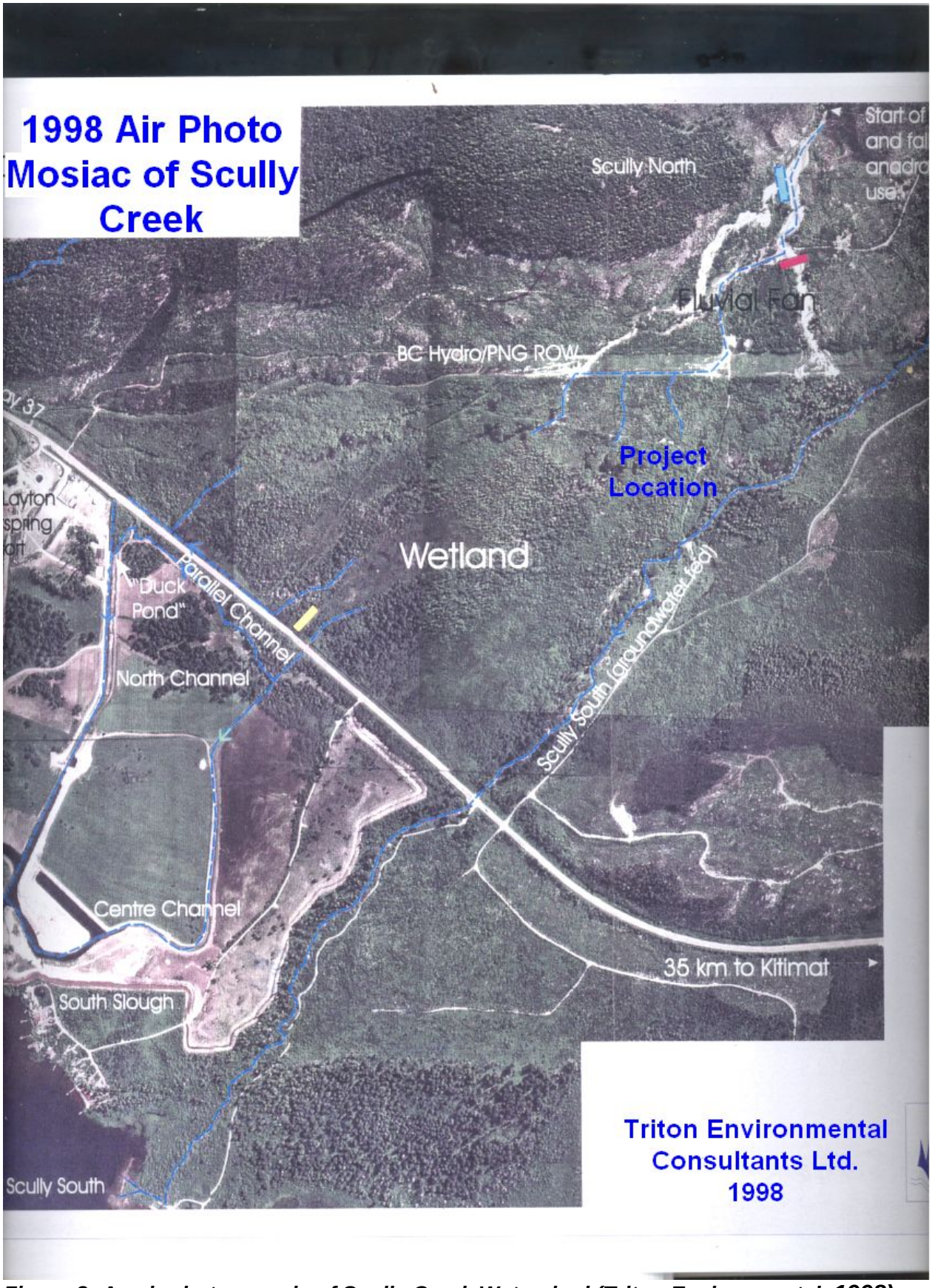

Figure 2: An air photo mosaic of Scully Creek Watershed (Triton Environmental, 1998).

2.0 METHODS

The following section provides a summary of the methods employed in project pre-assessment (feasibility) work, pre-field planning and preparation, construction and post-assessment.

2.1 Pre-assessment/Planning

Feasibility Studies

Two feasibility studies were conducted in the Scully Creek watershed prior to project implementation in 2006.
In 2001/02, the Schulbuckhand (Scully) Creek Restoration Feasibility Study was conducted by DFO which identified several restoration options to improve the quality and quantity of spawning habitat available to sockeye salmon (Fisheries and Oceans Canada, 2002). The study involved a literature review and field reconnaissance by DFO as well as a topographic survey and a hydrology study conducted by a local engineering firm in Terrace, BC (Adam Engineering Ltd, 2002).
In 2004, a second study was undertaken to determine the feasibility of augmenting flows to Scully South by excavating a channel to connect the beaver pond/wetland complexes (fed by the fan) to Scully South (Lakelse Watershed Society, 2004). A helicopter reconnaissance flight was followed by a topographic survey by DFO Resource Restoration to plan the channel layout. A hydrology assessment of watershed flood potential was conducted and report produced by a local engineering firm in Terrace, BC (McElhanney Consulting Services Ltd., 2005).

Construction Planning and Preparation

Equipment and Supplies

Quotes for the fabrication and delivery of materials and the provision of excavator services were acquired by contacting local companies and suppliers. Supplies (sheet pile, stream access logs) and equipment/services (excavators, welding services, pumps) were selected based on the most reasonable costs for acceptable material and equipment/operators.

Permits

Appropriate permits were acquired through the various regulatory agencies. Site visits were conducted with Ministry of Forests (MOF), DFO and Ministry of Environment (MOE) staff to familiarize them with the project concept and site location and to ensure that the project proponent understood all the permit requirements for the project. A Road Permit for access to the site and a License to Cut/Authorisation to Harvest trees in the project footprint were acquired prior to project implementation from MOF. A letter of approval from the MOE under Section 7 for "Works In and About a Stream" was acquired through Chris Broster, Ecosystem Specialist in Terrace, BC. A construction plan was referred to DFO Habitat Management to inform them of the project. Discussions and a site visit with the local trapper, Kolbjorn Eide were initiated regarding the project and future beaver harvest.

Environmental Monitoring

Cambria Gordon Ltd. was retained to provide environmental monitoring services throughout project construction phases.

2.2 Construction

Note: delays in project timing, changes in project scope and expenditures will be discussed in the results and discussion sections of the report.

Access

In late October and early November 2006, equipment and supplies were mobilised to the project site from the nearest community, Terrace, BC. A John Deere 200 CL excavator from Nechako Northcoast was walked into the site from Highway 37 South on an old logging road (~1km long). The excavator transported supplies such as the sheet pile weir and creek crossing logs from the highway to the project site. Three large logs (>1m in diameter and 6m long) were placed on the streambed of Scully South in order to facilitate a stream crossing by the excavator on top of the logs to access the project site. Equipment and supplies (sheet pile, straw bales, filter cloth, pumps) were delivered to the left bank of the creek at the stream crossing site and the excavator moved them across the channel. Equipment and supplies were then walked up to the project site along the continuation of the old logging road (~200m).

Figure 3. An excavator crosses Scully South on three access logs for May 2007 construction work.

Environmental Protection/Monitoring

David Taft from Cambria Gordon Ltd. provided environmental monitoring services for the project. At the downstream end of the excavated channel, three silt dams were constructed from straw bales with rebar supports and filter cloth covering in order to prevent sediment-laden water from

entering Scully South and to exclude fish from the site during construction. Each silt dam was placed approximately 10m downstream from each other with the final dam located approximately 20m upstream from the confluence of the channel with Scully South. Two - 3 inch pumps were employed in a pool created upstream from the first silt dam to pump silt-laden water into the adjacent forest and away from the creek. Pumps and silt dams were maintained throughout construction and the dams were left in the creek at the end of the November excavation to collect any remaining silt that might be mobilised during winter/spring high water events.

Figure 4. Installation of a silt fence to trap sediment during construction.

Figure 5. One of three silt fences installed with accumulated sediment Trapped upstream.

Sheet Pile Weir

In the fall of 2006, a 3mm thick sheet pile dam was fabricated at Johnny's Welding in Terrace, BC. The piling was purchased from Armtec in 1/2 X 5meter sheets and delivered from Langley, BC, by Bandstra Transportation to Johnny's Welding in Terrace, BC. The sheets were welded together to form the dam with a finishing piece of steel welded across the top and a stop log slot welded in place for an outlet. The final dam was approximately 18m wide by 5m deep with a notch for stop log control approximately 1m wide by 1.2m deep. The excavator carried the finished dam from the highway to the dam site at the upstream end of the excavated channel within the wetland area of the Scully Creek fan. A trench was dug and the dam was lowered into the trench and braced laterally. The dam top was set with a survey level and then back filled with local material.

Groundwater Channel

After dam installation, a ~200m long channel was constructed from the dam opening to Scully South using a John Deere 200 CL excavator from Nechako Northcoast. The channel was excavated 2-3 meters deep and 1-4 meters wide. Three pools were excavated in the channel to provide varied habitat. Excavated materials were side-cast into the adjacent forest and onto the existing old logging road and stream banks were sloped 1:1.5 to try to prevent sloughing. The

excavator walked down the constructed channel as it was excavated in order to preserve the greatest amount of riparian vegetation. The site was then left for the winter with plans to complete environmental work such as silt dam removal, planting, seeding and site clean-up work in the spring.

Figure 6. Excavated channel with disturbed banks requiring seeding and planting.

A project extension from March 31, 2006 to May 31, 2007 was requested and granted by the Pacific Salmon Commission and the Collaborative Agreement was amended to reflect the revised project end date.

In April 2007, a site visit with the DFO Resource Restoration staff, members of the Lakelse Watershed Society and Cambria Gordon Ltd. was conducted to determine the remaining tasks required to complete the project. Several items were identified and the project budget and scope were reviewed and discussed with PSC.

Figure 7. April 2007 site visit with DFO, LWS and Cambria Gordon Ltd staff. Upper groundwater channel.

In May 2007, a second channel approximately 30 meters in length was excavated to capture additional groundwater flows and to connect an old established spring to the channel excavated in November, 2006. A fourth silt dam was installed downstream from the three that remained from the November construction. The three upstream dams and accumulated fine sediment were removed with the excavator in May 2007. A leak through which high water flows escaped from the excavated channel and flowed through the old logging road was contained. Large logs were placed at the ford to discourage/prevent All Terrain Vehicle (ATV) disturbance to the spawning areas near or at the ford.

Figure 8. Fine sediment removal in the downstream end of the groundwater channel.

2.3 Post-construction Assessment, Monitoring - Outstanding Issues

Asbuilt Survey

McElhanney Consulting Services Ltd. was hired to complete an asbuilt survey of the final project. The area was surveyed on March 15, 2007, using a total station instrument. The survey was drafted and provided to the project proponent in April, 2007.

Site Finishing Work

Several outstanding issues such as planting/seeding of disturbed soil and development of signage remain and will be discussed in more detail in the following sections of the report.

3.0 Results and Discussion

3.1 Pre-construction Planning and Preparation

Appropriate access and in-stream work permits were acquired in June and July of 2006. Designs were finalised and sources for equipment and supplies were identified and scheduled for delivery and construction during the fisheries work window for Scully Creek (mid-July to mid-September).

Project Delays

Project construction originally planned for the 2006 summer fisheries work window was delayed until the fall due to a number of factors. Liability issues became a concern for the project proponent, the Lakelse Watershed Society (LWS), due to problems arising with environmental monitoring and public safety on an LWS project managed by DFO earlier that summer. The LWS was hesitant to move forward with this project until those issues had been addressed satisfactorily by DFO. The fisheries work window passed and the DFO Resource Restoration Unit suffered staffing issues, leaving one employee to complete several projects simultaneously. In October of 2006, the liability issues were addressed, an appropriate environmental monitoring consultant was hired and the project was allowed to proceed. The Resource Restoration Engineer agreed to move forward on the condition that the project scope may have to be altered to accommodate winter working conditions and the project deadline would have to be extended to allow some finishing work in the spring of 2007. The Pacific Salmon Commission approved the project extension, but was not informed of the potential changes in project scope and budget until April, 2007. This was an unfortunate oversight, due in part to the staffing issues described above.

3.2 Construction

In November 2006, a sheet pile dam with a stop log outlet was installed to store water and control flow from a portion of the wetland area in the Scully Creek watershed.

Figure 9. Installed sheet pile dam with two stop logs in place.

Significant groundwater and some suitable spawning gravels were accessed during the excavation of a 200m long channel from the dam to Scully South.

Figure 10. This photo shows natural gravel deposits encountered during channel excavation.

Some areas of fine sediment were also encountered, making it difficult for channel features such as pools and stable stream banks to be created and also for the excavator to manoeuvre. The delayed construction timing coincided with heavy fall rains and a high water table, which made channel excavation and water management difficult and contributed to the decision to only install one of the sheet pile weirs.

Figure 11. A pool constructed in an area of fine sediment in November, 2007, has infilled with sediment.

In April 2007, a site visit with the DFO Resource Restoration staff, members of the Lakelse Watershed Society and Cambria Gordon ltd. was conducted to determine the remaining tasks required to complete the project. Several items were identified, including:

- the mechanical removal of silt that had accumulated upstream of each of the three silt dams at the downstream end of the project;
- removal of the silt dams;
- plugging a leak through which high water flows escaped from the excavated channel and flowed through the old logging road;
- connecting an upstream wetland 'spring' to the excavated channel to increase flows; and,
- planting and seeding the disturbed area with native seed and conifers.

Figure 12. April 2007 site visit. Accumulated sediment upstream from the three sediment fences at the downstream end of the groundwater channel.

The project budget and scope were reviewed and it became apparent that the entire budget allotted for the project would not be spent due to the changes in project scope. These revelations were discussed with the Fund Coordinator for PSC who expressed concern and wanted some assurances that the altered project was still a worthwhile endeavour. The DFO Resource Restoration Unit asserts that the resultant project, although altered from the original proposal, was not only a worthwhile project, but was also the best use of the funds provided under the circumstances. This will be discussed further in the conclusions and recommendations section of the report.

The project proceeded to complete final components in May 2007. A second channel approximately 30 meters in length was constructed in order to harness additional groundwater flows and to connect an old established spring to the channel excavated in November, 2006. This second channel doubled the water flow in the constructed channel to Scully South. The fine sediment that had accumulated at the downstream end of the channel constructed in November was removed. The site was trimmed and prepared for planting. The high water 'leak' from the main channel under the existing road was blocked off and as the excavator demobilised, the large logs used from the stream crossing were placed at the ford to discourage/prevent ATV disturbance to the spawning areas at the ford.

Figure 13. The newly excavated channel (May 2007) flows in the groundwater channel excavated in November 2006, doubling flows.

3.3 Scope Changes

The original plan proposed in 2005 was to increase baseline and 'freshet' flows in Scully South through the construction of three sheet pile weirs with stop log outlets to control water storage and releases to Scully South. These weirs were to be located within and adjacent to the wetland area, north of the upper reaches of Scully South. The wetland area mostly feeds channels on the Mt. Layton Hot Springs property and this project endeavoured to access/divert some of those flows to Scully South – the former mainstem. The storage ponds were to be developed with inter-connecting channels excavated into the groundwater table. Sockeye spawning gravel placements were also proposed for these channels which would then be connected to Scully South.

As the planning and preparation phases of the project proceeded during the early summer of 2006, further examination of the wetland during this uncharacteristically dry period showed that water percolation from some of the springs had decreased and some of the existing ponds had been abandoned by beaver populations. There appeared to be significantly less water available to capture in the storage ponds. The DFO RRU considered the possibility of adapting a combined approach of groundwater channels to access more subsurface flow and control of the single largest pool with only one weir (rather than three). The channels could in future be extended into the alluvial fan to increase flows if needed.

The field work portion of the project was delayed from July to November due to project delays described above. This resulted in construction difficulties due to heavy rains, snow and a high water table. These difficulties, combined with changes in the wetland and the expert opinion of Don Hjorth (an engineer with over 40 years experience working as a Professional Engineer and 20 years of experience in river hydrology, design and construction of hydraulic structures) all contributed to the decision to reduce the number of dams and storage ponds from one to three. Gravel was also not placed in the channel because of project delays and because suitable gravels were encountered during channel excavation. In addition, other areas were not suitable for gravel placement as these areas were dominated by fine sediments making equipment access difficult and gravel placements ineffective.

In January 2007, a project extension from March 31, 2006 to May 31, 2007 was requested and granted by the Pacific Salmon Commission and the Collaborative Agreement was amended to reflect the revised project end date. Unfortunately, a budget amendment was not requested at the same time to reflect reduced expenditures for some items such as gravel, sheet pile weirs and excavator time and increased expenditures on other services such as environmental monitoring and engineering surveys. Changes to the scope of the project were also not provided to PSC at that time because of staffing shortfalls within DFO for project administration.

4.0 Conclusions and Recommendations

The Scully Creek Off-channel Habitat and Flow Augmentation Project was initiated to increase baseline and 'freshet' flows in Scully South to improve sockeye spawning conditions that have been negatively impacted by habitat impacts such as water diversions and beaver activity.

Due to delays and complications described in previous sections of the report, the scope of the project was altered in order to ensure that an effective project was still completed within the allotted time and budget that satisfied the original project objectives.

Although the final product was reduced, the DFO RRU asserts that this smaller, more economical project was the best approach under the circumstances.

4.1 Post-construction Assessment, Monitoring and Outstanding Issues

As-Built Survey

An asbuilt survey to document completed works was completed on Mar 15, 2007 by McElhanney Consulting Services. This topographic survey will provide a record of the works completed and can also be used to monitor changes to the site over time. The asbuilt survey is provided in Appendix II.

Beaver Management

Site visits and discussions were held with the local trapper, Kolbjorn Eide who had no concerns about this project, but also had no interest in decreasing the numbers of beavers or dams upstream of Highway 37 on Scully South. Mr. Eide had no objections to dam removal and beaver control downstream of Highway 37, but did object to dam breaching upstream of the highway. DFO and the LWS are currently working with MOE to explore other options for beaver control in this watershed.

Assessment and Monitoring

The following years will involve the assessment of flows and the flushing capability from the channel and storage pond. There is a possibility that a Phase 2 project may be developed should additional flows still be required. The possibility of introducing flows from the surface water channel through a controlled structure in a more stable part of Scully mainstem is still an option that is being explored.

Fish access to the channel will be improved by hand work after the banks have had a season to rehabilitate and year-round flows have been assessed.

Figure 14. The excavated groundwater channel outlet to Scully South. Access to the channel will be improved in 2008.

Site Seeding and Planting

Native grass seed mix and conifers have been purchased; however, the disturbed areas still need to be seeded and planted. This will be completed by DFO and volunteers from the Lakelse Watershed Society in the summer of 2007.

5.0 LIST OF REFERENCES

Adam Engineering Ltd. 2002. Schulbuckhand Creek Stream Flow Estimate and Drawings. Terrace, BC.

Fisheries and Oceans Canada, Resource Restoration Team. 2002. Schulbuckhand (Scully) Creek Restoration Feasibility Study. Prince Rupert, BC. Unpublished report.

Karanka, E.J. 1994. Schulbuckhand (Scully) Creek Watershed Evaluation; Background Information. North Coast Division. Unpublished report.

Lakelse Watershed Society. 2004. Scully Creek Off-Channel Habitat / Water Augmentation Feasibility Study. Pacific Salmon Foundation Final Report for Project CSP-04S-028.

Maxwell, I. 2005. Personal Communications. Lakelse Watershed Society, Terrace, BC.

McElhanney Consulting Services, Ltd. 2005. Scully Creek Hydrology Study Report. Terrace, BC.

Triton Environmental Consultants Ltd. 1998, Scully Creek Level II WRP Assessment.

APPENDIX 1

Proponent Information

Proponent Information

Proponent Information

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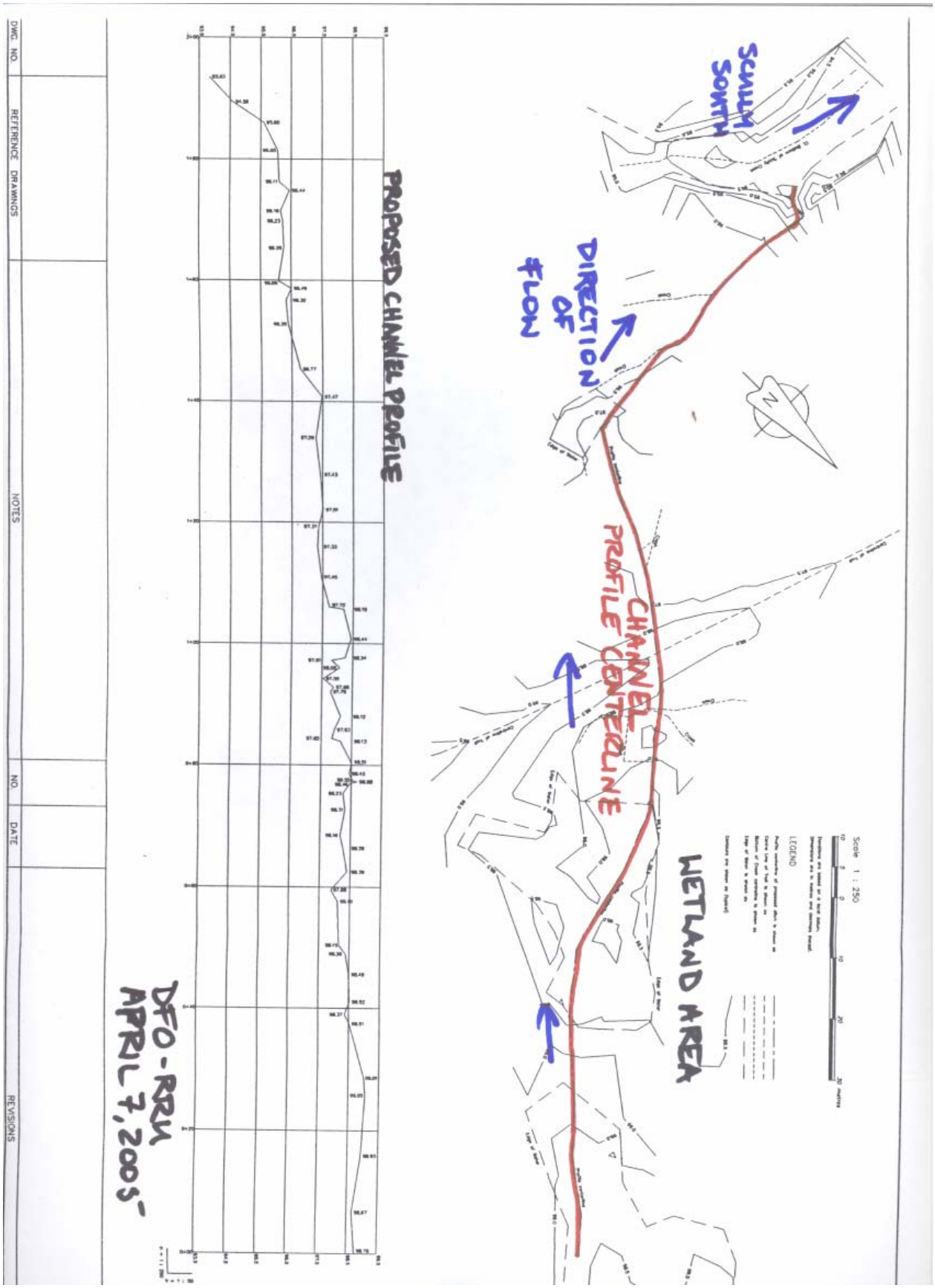
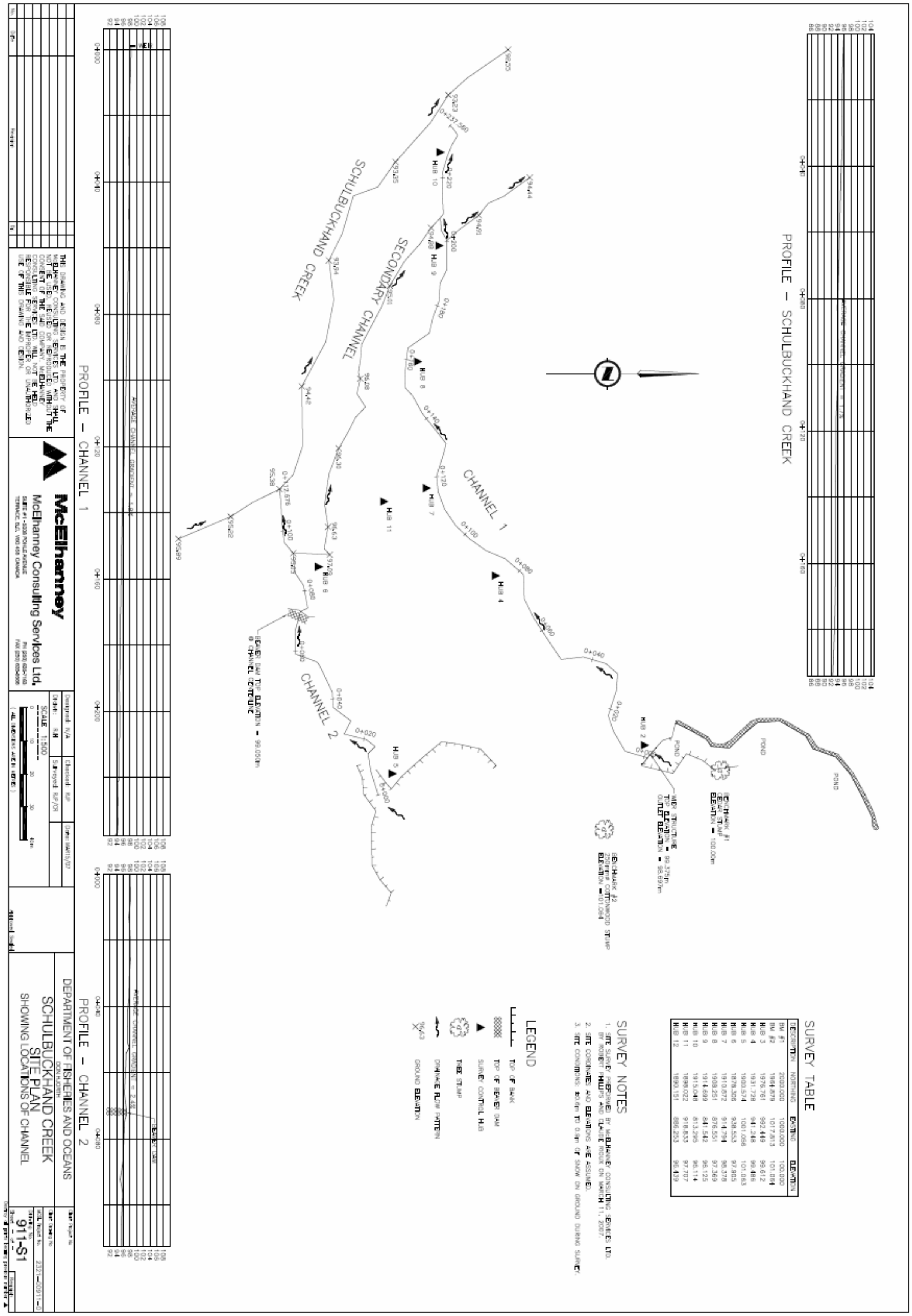
APPENDIX 2

Original Site Plan Drawing


SCULLY SOUTH
DIRECTION OF FLOW
CHANNEL PROFILE CENTRELINE
WETLAND AREA
PROPOSED CHANNEL PROFILE
DFO - RRM APRIL 7, 2005
DWG. NO.
REFERENCE DRAWINGS
NOTES
NO.
DATE
REVISIONS

APPENDIX 3

Asbuilt Survey


PROFILE – SCHULBUCKHAND CREEK
SCHULBUCKHAND CREEK
SECONDARY CHANNEL
CHANNEL 1
CHANNEL 2
POND
SURVEY TABLE
SURVEY NOTES
LEGEND
TOP OF BANK
TOP OF BEAVER DAM
SURVEY CONTROL HUB
TREE STUMP
DRAINAGE FLOW PATTERN
GROUND ELEVATION
PROFILE – CHANNEL 1
PROFILE – CHANNEL 2
McElhanney
McElhanney Consulting Services Ltd.
DEPARTMENT OF FISHERIES AND OCEANS
SCHULBUCKHAND CREEK
SITE PLAN
SHOWING LOCATIONS OF CHANNEL
911-S1

APPENDIX 4

Financial Report

Financial Report

Project Budget Form

Name of Project: Lakelse Lake Sockeye Rehabilitation Program: Scully Creek Off-channel Habitat/ Flow Augmentation Project

ELIGIBLE COSTS					BUDGET	OTHER FUNDING	CONTRIBUTION FUNDING	ACTUAL EXPENSES	VARIANCE	COMMENT
Labour										
Wages & Salaries										
Position	# of crew	# of work days	hrs per day	rate per hour	Total (PSC + In-kind + cash)	In-Kind & Cash	PSC Amount			
Engineer Don Hjorth	1	6	8	50	4,800	2,400				
Project supervisor	1	10	8	30	2,400	2,400				
Labourers (volunteers)	2	20	8	30	9,600	9,600				
Surveyor/drafting	2	3	8	60	1,440	1,440				
Environment monitoring project works	2	10	8	40	6,400	6,400				
DFO Biologist	1	25	8	40	8,000	8,000				
Local trapper hired throughout year	1	15	8	30	3,600		3,600	$0.00	$3,600.00	*1
Project administrator to assist LWS	1	30	8	30	7,200	-	7,200	$7,200.00	$0.00	
Person Days (# of crew x work days)		152		sub total	43,440	32,640	10,800	$7,200.00	$3,600.00	
Labour - Employer Costs (percent of wages subtotal amount)										
	rate	10%		sub total	1,984	1,984	-			
Subcontractors & Consultants	# of crew	# of work days	hrs per day	rate per hour						
								$5,861.38	$5,861.38	*2
Insurance if applicable	rate	0%								
				sub total				$5,861.38	$5,861.38	
Volunteer Labour	# of crew	# of work days	hrs per day							
Skilled	2	40	8	25	16,000					
Un-skilled	2	20	8	15	4,800					
Insurance if applicable	rate	0%								
				sub total	20,800	20,800				
				Total Labour Costs	66,224	55,424				

ELIGIBLE COSTS		BUDGET	OTHER FUNDING	CONTRIBUTION FUNDING	ACTUAL EXPENSES	VARIANCE	COMMENT
Site / Project Costs	**Detail** (use additional page for details if needed)	Total (PSC + in-kind + cash)	In-Kind & Cash	PSC Amount			
Travel (do not include to & from work)	Hotels, meals, travel to and from work site, mtgs	6,500	5,500	1,000	$1,000.00	$0.00	*3
Small Tools & Equipment	Shovels, bars, wire rope, whinch rental	1,100		1,100		$1,100.00	*4
Site Supplies & Materials	Gravel, sheet pile, rock, filter cloth, plastic, seed, etc	31,500		31,500	$6,394.49	$25,105.51	*5
Equipment Rental	Excavator, welder, mobilization and demob	37,100		37,100	$11,379.92	$25,720.08	*6
Work & Safety Gear	safety gear, waders, bear protection	2,000	1,000	1,000	$1,150.58	-$150.58	*7
Repairs & Maintenace						$0.00	
Permits						$0.00	
Technical Monitoring	Pressure gauge (Aquarod) to monitor water levels	2,500		2,500	$2,733.21	-$233.21	*8
Other site costs	Signage	2,500	1,500	1,000	$311.85	$688.15	*9
	Total Site / Project Costs	83,200	8,000	75,200	$22,970.05	$52,229.95	

Training (e.g Swiftwater, bear aware, electrofishing, etc).					
Name of course	# of crew	# of days			
		Total Training Costs			

Overhead / Indirect Costs (not to exceed 20% of PSC Amount)						
Office space; including utilities, etc.	2,000	1,000	1,000			
Insurance						
Office supplies	1,000	500	500			
Telephone & long Distance	1,000	500	500			
Photocopies & printing	2,000	500	1,500			
Other overhead costs	2,000	500	1,500			
Total Overhead Costs	8,000	3,000	5,000	$3,568.57	$1,431.43	*10

ELIGIBLE COSTS		BUDGET	OTHER FUNDING	CONTRIBUTION FUNDING	ACTUAL EXPENSES	VARIANCE	COMMENT
Capital Costs / Assets	**Detail** (use additional page for details if needed)	Total (PSC + In-kind + cash)	In-Kind & Cash	PSC Amount			
Assets are things of value that have an initial cost of $250 CAN or more and which can be readily misappropriated for personal use or gain or which are not, or will not be, fully consumed during the term of the project.							
N/A							
	Total Capital Costs						
	Project Total Costs	157,424	66,424	91,000			
			Ammended	79,235	$39,600.00	$39,635.00	

Budget Summary

(PSC + in-kind + cash)

Total Labour Costs		66,224
Total Site / Project Costs		83,200
Total Training Costs		-
Total Overhead Costs		8,000
Total Capital Costs		-
	Project Total	157,424

Explanation of variances between projected expenses and actual expenses - please see discussion and conclusion sections of the final report for more detailed explanations of changes in project scope, etc.

*1 $3,600.00 budgeted, but none spent. This funding was intended to hire a local trapper throughout the year to try to control beaver populations in Scully Creek that are negatively impacting sockeye spawning habitat. Discussions with the local trapper did not yield positive results as he is not not supportive of attempts to reduce beaver populations in this area of his trapline.

*2 $0 funding budgeted and $5961.38 spent. No PSC funding was requested for surveying and drafting expenses as this was supposed to be provided in-kind by DFO. The DFO RRU did not have the capacity for surveying or drafting due to the temporary loss of the engineering technician and the inability to find a suitable temporary replacement.

*3 McElhanney travel expenses associated with survey work

*4 $1100.00 was budgeted for small tools and equipment these were provided in-kind by DFO and LWS.

*5 $31,500.00 budgeted and $6393.59 spent on site supplies and materials. $3750.58 - Armtec sheet pile; $1692.01 - Uplands Nursery plants/seed; $951.90 - Bandstra Transportation for trucking the sheet pile to Terrace. This funding was originally planned for the purchase of three sheet pile weirs, spawning gravel, plants/seeds for site finishing and other supplies. The large difference in expenditures was due to the change in scope of the project in which only one sheet pile weir was installed and no spawning gravel was purchased.

*6 $37,100 budgeted and $11379.92 spent on equipment rentals such as excavator, welding and pumps, etc. $3133.56 - Johnny's Welding to weld the sheet pile weir together; $8246.36 - Nechako North Coast excavator operations in May and November. The large difference in expenditures was due to the change in scope of the project in which much less excavator time and welding was required for the installation of only one weir and no spawning gravel.

*7 $1000.00 budgeted for work and safety gear such as waders, bear protection, gloves, etc. $1150.58 has been spent on these supplies - slightly more than originally budgeted due to significant bear issues, etc. on site.

*8 $2500.00 was budgeted for technical monitoring for the purchase of an aquarod to record water depths. Due to a lack of available DFO - RRU staff to provide environmental monitoring (EM) services during project construction, these funds were diverted from technical monitoring equipment to technical monitoring services during construction. A total of $2733.21 was spent on these services provided by Cambria Gordon. Additional EM costs were paid for by DFO and some were provided in-kind during project completion in May 2007.

*9 $1000.00 was budgeted for signage and $ 311.85 were spent on initial sign development which will be completed with in-kind funding in 2007.

*10 $5000.00 was budgeted for LWS overhead and $3568.57 was spent on various items such as office supplies and office expenses.

Signature of Lakelse Watershed Sociey Treasurer:

Kelly Kline, Lakelse Watershed Society Treasurer