

# PSC Northern Fund 2009

## Stage II Detailed Application Form

### PROPONENT IDENTIFICATION

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<b>Title:</b>	Rivers Inlet Coho Enhancement		
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### PROJECT IDENTIFICATION

**Project Title:** Rivers Inlet Coho Enhancement

<b>Project Type:</b>	<i>(Check one)</i>
Development of <b>improved information</b> for resource management, including stock assessment; data acquisition & scientific understanding of limiting factors.	<input type="checkbox"/>
<b>Habitat restoration</b> ; rehabilitation or improvement.	<input type="checkbox"/>
<b>Enhancement</b> of wild stock production through low technology techniques.	<input checked="" type="checkbox"/>

**Project Location:** Rivers Inlet B.C (Central Coast DFO stat area 9)

**Start Date:** June 1, 2009

**End Date:** May 31, 2010

**Duration:** 12 months

**Total PSC Funding Requested:**

*(Specify currency)*  
\$CAN/US \$44,922.00

**Total Other Funding & In-Kind Contributions:**

\$CAN/US \$54,243.00

**Total Project Cost:**

\$CAN/US \$99,165.00

## Part 1. RELEVANCE AND SIGNIFICANCE

- 1. Relevance and Significance:** Provide a brief overview of the project: what is being proposed; what are the reasons for the project (purposes; goals; objectives); what issue is being addressed or specific problem is to be resolved. Describe the relevance and significance of these to the Pacific Salmon Treaty generally and /or specifically to the call for proposals issued by the Northern Fund Committee.

The main objective is to evaluate the harvest distribution for Rivers Inlet coho by application of CWT tags to enhanced fish. The decision to utilize enhanced fish to start the program is directly related to the fact that Rivers Inlet is remote and access to the rivers/creeks is difficult - making capture and marking of wild smolts a huge challenge logistically and financially. Though enhancement is not without its own challenges, it requires less time on the river and can take advantage of equipment, facilities and personnel that are either paid for by partner funding or already in place through ongoing operations (Snootli Hatchery and Community Advisor).

This 2009 proposal will add another brood year of information to what was started in 2007 when approximately 16k coho eggs were obtained from Johnston Creek in Rivers Inlet. The 2007 brood are currently rearing at Snootli Hatchery in Bella Coola. They have been vaccinated, adipose/CWT marked and are at target size (10gms) for this time of year. The survival to date is over 90% and the fish are in excellent condition. Rearing will continue at Snootli Hatchery until early April 2009 when they will be transported to a netpen in Johnston Bay for final rearing (target size = 20gms and release date = ~May 15, 2009). Funding for the 2007 brood rearing, marking and release and 2008 brood eggtake has been provided by NF-2008-I-36.

The 2009 proposal consists of two components, the first component would involve completion of the rearing, marking and release of the 2008 brood Johnston coho (eggtake and incubation part of 2008 project funding) and the second component would allow for broodstock collection and a 30k (for 25k mark group) eggtake for the 2009 brood year. Successful eggtakes and fish culture programs would mean two brood years of marked fish released and a potential for a third year (with the 2009 brood eggtake).

### Component One – 2008 Brood Johnston Creek Coho

This component involves extended rearing of 2008 brood fry to smolt stage. Rearing to April of 2010 would occur at Snootli Hatchery. At ~5gms average size the fry will be vaccinated against Vibriosis disease (August/September 2009). At 3-4 wks post vaccination the juveniles will be adipose/CWT marked. Rearing will continue to April 2010 when the ~15gm average size pre-smolts will be transported to a netpen in Johnston Bay in Rivers Inlet for final rearing and release (target size =20gms at Mid May 2010).

### Component Two – 2009 Brood Johnston Creek Coho

This component involves broodstock collection, eggtake, incubation, ponding and early rearing of 2009 brood Johnston Creek coho. The initial egg target would be 30,000 eggs to insure a 25,000 smolt group (for CWT marking and tracking of recoveries through marine fisheries).

- 2. Priority of Need:** Explain why you believe the needs or problems addressed by this proposal should be given priority over other possible uses of the available funds. Cite the source of any plan or prioritization scheme that you may have relied upon to assign priority to this need or problem.

The Canadian northern panel during discussions at the Feb. 2007 PSC meetings specifically indicated that a cwt group for Rivers Inlet coho was a priority N Fund project.

Although we currently assume this stock has a north migrating component and is caught to some extent in SE Alaska and northern BC the harvest distribution is unknown.

Application of CWT tags with AD clips – from more than one brood year and with a larger release number (25k), will provide an opportunity to track Rivers Inlet coho stocks through the various fisheries as well as providing a logistics framework for more extensive enhancement with these and other stocks in the area.

As well – it should be noted that once coho eggs are taken there is somewhat of an obligation to allow for rearing to smolt (component one of proposal), both to insure CWT marking can occur and to avoid any instream competition/impact with wild fish. The biological strategy is part of the transplant permit.

3. **Context:** Describe the relationship, if any, of the project to local or regional plans (e.g. watershed plans; sub-basin plans; recovery plans, etc.) and/or established management goals (e.g. enhancement plans; management models; research priorities, etc) and how these relate to the purposes of the Northern Fund and/or implementation of the Pacific Salmon Treaty.

This project will contribute to information needs that are identified in the Recovery Plan developed by the RSSEPS planning group and by sport fishery advisory groups in the north and central coast. Little is known about Rivers Inlet coho due to the remoteness of the area and related cost of assessment. While this project does not include a complete adult assessment that would enable calculation of harvest rates and exploitation at this time, it will allow for tracking of CWT marked adults through the various fisheries for establishing timing and distribution of catch. The project will also provide information to guide WSP implementation, future enhancement strategies and fisheries management in the area.

As recovery of marked adults gets underway early in 2010, there may be more interest and opportunity to discuss feasibility of a rigorous assessment program (adult counting fence) in 2011 and beyond.

## Part 2. TECHNICAL IMPLEMENTATION DETAILS

4. **Objectives:** Describe the specific objectives expected to be achieved by the end of this project.
1. culture 2008 brood coho and CWT mark at least 25k at Snootli Creek Hatchery in Bella Coola – 2008 brood
  2. final rearing and release of coho at natal system in Rivers Inlet (a 20gm smolt release of 2008 brood by mid May 2010)
  3. obtain 30,000 coho eggs from Rivers Inlet stock (Johnston Creek) in 2009
  4. incubate, pond and early rear 2009 brood Johnston Creek coho at Snootli Hatchery

5. **Approach:** Describe the techniques and methods to be employed.

### Component One – Extended Rearing, Vaccination, Marking and Release of 2008 Brood Coho

2008 brood Johnston Creek coho will be at Snootli Hatchery and at a size 2-3gms at the start of this project. Rearing at Snootli Hatchery will continue to April of 2010 at which time they will be transported to netpens in Johnston Bay in Rivers Inlet. While at Snootli – the fry will be vaccinated against Vibriosis disease at approximately 5gms average size. Vaccination will be through a 30 second immersion in an aerated bath of 1 part vaccine to 9 parts water. At 210 ATUS post vaccination they will be adipose/CWT marked. Transport to netpens in Johnston Bay will be done via fixed wing aircraft or barge, depending on logistics and cost. Netpen rearing will be done until fish reach a target size of 20gms (anywhere from late April to mid May of 2010). Two netpens of ~84m<sup>3</sup> will house the pre-smolts so maximum density of 5kg/m<sup>3</sup> is not exceeded at 20gms average size.

### Component Two – Broodstock collection, eggtake, incubation, ponding and early rearing of 2009 Brood Johnston Creek Coho

Johnston Creek will be accessed by helicopter at the landing site used last year and the new site that funding partners arranged – both located approximately 11.5km upstream of the mouth. The field crew (consisting of 4-5 persons) will use tangle gillnets to capture adult coho and place ripe and near ripe individuals in in-river holding tubes. Unripe adults will be operculum punched (punch kept for DNA sample) and released. Ripe adults will be spawned using Alaska protocol, either on the river or after being transported to a holding facility at Dawsons Landing where crew will be staying. Near ripe adults (within 3-4 days of spawning) will be kept in the holding facility until they are ripe and any that do not ripen will be transported back to Johnston Creek. During eggtakes samples of kidney tissue will be taken from all females so follow-up testing for BKD can occur. Eggs and sperm will be kept in coolers and transported to Snootli Hatchery. Equipment and gear will be given a disinfection rinse prior to entry to

any buildings on site. Fertilization will be done in a separate building and eggs will be placed in a surface disinfection solution at plant to prevent vertical or horizontal transmission of pathogens. Incubation from egg to swim-up fry will be done in Heath type vertical drip incubators supplied with well water. At the eyed stage of development, eggs will be shocked and picked and inventoried. At swim-up, fry will be ponded to Capilano style rearing containers where they will remain until 2-3gms in size.

- 6. Schedule:** Describe the schedule of key activities for the project and how progress towards successful completion will be monitored. Describe contingency plans, if any, to deal with unanticipated delays or problems.

Component One - June 1, 2009 – 2008 brood coho will be rearing at Snootli Hatchery. Daily fish culture records and routine sampling will allow for updated inventories and growth (average size) determination. This will provide mortality/survival and food conversion information that can be used to modify feed rates and fish culture strategy (vaccination and marking timing & numbers, density reduction transfers). Target size at time data from the 2007 brood will be used as a starting point for planning and provide insight on contingencies we may need to include. Adipose/CWT marking is easily assessed and will provide an exact inventory of juveniles on hand.

Component Two - November 17-21, 2009 – 2009 broodstock collection, eggtake, incubation, ponding and early rearing. Broodstock collection is the most difficult part of the project and is dependent on weather, aircraft, run timing and river conditions in the late fall when daylight hours are short and weather very changeable. Communications between DFO staff, Rivers Inlet crew and helicopter/fixed wing operators are key in insuring the best outcome possible. Operations in 2007 provided a timing window and location for broodstock capture and in 2008 we have also implemented an option for transport and holding of adults. This will allow for holding of females that are a few days away from spawning (quite possibly after helicopter time is used up) and for eggtakes in a more controlled environment at a time of day when there is a larger window for fixed wing transport to Snootli Hatchery in Bella Coola. Fertilization, incubation, ponding and early rearing procedures are standard and so far has worked well with the Johnston Creek stock (2007 brood).

- 7. Assumptions:** Describe any assumptions made in the development of the proposal and the effect and significance of these assumptions. Describe any risks or other factors which might affect the success of the project or must be taken into account during the project.

Component One - 2008 Brood – assumes broodstock, eggtake, incubation (fall and winter 2008), ponding and early rearing (spring 2009) success meets our targets. The primary risks are during the fall program when (as noted above); weather, daylight hrs, run timing variation, river conditions, aircraft limitations could all play a role. The program has been set up so there will be ongoing communication prior to and during field operations between key personnel (so timing can be adjusted as much as possible to account for weather and river conditions) – plus broodstock capture and holding options increased so can bring ripe fish off the river every day (do not have to hold fish in the river or take a chance that weather will prevent getting back into the system within the window of opportunity when helicopter is on site). There is some risk at Snootli Hatchery (catastrophic water failure, accident during transport) – but these are considered minimal and standard risks are mitigated by a highly qualified staff, alarm systems and stand-by programs at Snootli Hatchery.

The netpen operation in Rivers Inlet – the major risk here is Vibriosis disease which will be prevented by vaccination at an appropriate time prior to saltwater challenge. Predation can be a risk but guard nets overtop and hanging the nets from guard rails should minimize any problems.

Results of the 2008 brood success to fry stage will be known prior to obtaining funds for the extended rearing/marketing and smolt release detailed in this proposal.

Component Two – 2009 Brood – assume that our experience with the 2007 and 2008 brood will add to our strategies for the broodstock and eggtake program. The risks and operational contingencies so far are listed above.

## Part 3. HUMAN RESOURCES

- 8. Key Personnel:** Identify key project personnel, the nature and extent of their role in implementation, and summarize their relevant qualifications. (Detailed resumes are not required). If any component of the proposal will be provided by others, identify these persons, the nature of their involvement, and their relevant qualifications.

Sandie MacLaurin, DFO Community Advisor for Central Coast – contact person, logistics and planning, partner involvement, budget tracking/control and field level work

Russ Hilland, DFO Snootli Hatchery Manager – Project Planning and coordinating involvement of Snootli staff

John Willis, DFO Snootli Hatchery Operations Manager – Senior field technician to lead field program and coordinate fish culture operations at Snootli Hatchery

Dave Peacock, DFO Senior Fisheries Mgt. Biologist – Project planning, biological review, supervision of biological assessment staff

Cindy Hanuse, Wuikinuxv FN Fisheries Program Coordinator – Project planning, coordinating FN fisheries crew involvement and communications with the Band – as her time and experience with the AFS program increases. The AFS program has faced some challenges and undergone some changes so hope that there will be more involvement next year.

Jim Rough, Vice President of the Rivers Inlet North Coast Salmon Enhancement Association – Communication with lodge owners through the association and advisory processes and coordination of lodge contributions to the program

David Stevenson, Rivers and Smiths Inlet Ecosystem Planning Society – Project planning, contract management. communication with public.

- 9. Consultation; coordination and approvals:** Describe the steps taken during project planning to collaborate and consult with others where appropriate and to gain their support where needed. Describe applicable regulatory requirements and how these will be addressed.

This project involves satellite enhancement in/from a remote area with few settlements and difficult access. It involves two government agencies, a major facility, local residents and a diverse partner group(s) from outside the inlet that provide funding and in-kind support. Throughout the process we have tried to be inclusive and communicate with all parties (via partner group meetings, telephone calls, written communication). The intent is to increase understanding/involvement with the FN (Wuikinuxv First Nation) as the Fisheries program there gets re-established.

The project requires a transplant approval (this has been obtained) and a DFO review team approval and support. The project had to fit with WSP principles and has to follow SEP enhancement/transplant guidelines.

- 10. Partnerships:** Describe the extent to which the project may involve or foster partnerships with other agencies, organizations and/or other interested parties.

There is already a significant range of partnerships involved here. The intent would be to improve relationships and build capacity through success of the project.

## Part 4. BENEFITS

- 11. Measures of Success:** Describe any specific objective standards, quantifiable criteria and quality control measures that will be used to assess the actual performance of this proposal against expectations.

- achieve survival from egg to smolt to a minimum of the SEP bio-standards (coho = 72%)
- coded wire tagging of 25k 2008 brood juveniles with 2% or less tag loss
- release of 2008 brood smolts at target size and time (20gm smolts by mid May 2010)
- capture of sufficient females and males to meet the egg target of 30k for 2009 brood (it is estimated that 8-10 females and 8-10 males will be required)

- collection of up to 100 DNA and bio-samples for stock ID and disease background (we have some samples already from 2007 brood and will have more from 2008 broodstock/eggtake program)
- recovery of marked coho in fisheries improved technical and field capacity of local FN program and crew (first recoveries of adults will be in 2010)

**12. Monitoring and Assessment:** Describe the expected duration of the benefits of the project, and how the tangible results of the project will be monitored, maintained and protected over the long-term.

Data collected through the field work will provide baseline DNA and size (length) for Johnston Creek coho. With baseline DNA there is opportunity for sampling of other fisheries for incidence of Rivers coho even when no visible marks are encountered. Subsequent monitoring of commercial and sport fisheries will provide the foundation for ongoing planning processes (watershed and integrated management). Tangible results will be in the form of summary reports from enhancement and juvenile field work and collection/analysis of Head Recovery information in 2010 when age 3 coho will be migrating through the various fisheries on their return to Rivers Inlet. All data and subsequent reports will be kept in DFO files, distributed to partners and available to the public through the RSSEPS web page and Project Registry.

**13. Beneficiaries:** Explain who will benefit from the proposal and how they will benefit.

DFO and partners will benefit through improved knowledge about Rivers Inlet coho that will contribute to integrated fisheries management and watershed planning.

Residents and the local FN in Rivers Inlet will benefit from training and employment opportunities.

Fishers will benefit from increased angling success.

## Part 5. COST EFFECTIVENESS

**14. Costs:** From the budget template provided, describe the proposed budget for this project, including appropriate details about the larger cost items, especially capital acquisitions.

The largest single cost to the project is labour @ \$38,965.00. Coho require a full year of rearing prior to release and CWT marking is an added cost. Fortunately, the labour cost to PSC is only \$9,822.00.

The next highest cost item is charter aircraft for eggtake and for transport of juveniles back to Rivers Inlet. There may be opportunity to reduce the transport costs and every effort will be made to find efficiencies. The total transport estimate is \$20,000.00. It should be noted that the helicopter company that works with the partners is billing at a minimum and if the eggtake goes quickly any savings will be reported and offered back to PSC.

The netpen and rearing nets & towing are a large cost (\$15,000.00) but only the cost of one net and ½ the towing (\$3,000.00) is being asked for from PSC.

Fish food, vaccine and CWT tag cost is estimated at \$5,800.00

Equipment, materials, supplies, gillnet repair cost is \$2,800.00 of which only \$300.00 is PSC portion

Travel costs for staff and crew are estimated at \$5,300.00 of which \$1,000.00 is requested from PSC

Standby costs for the Snootli facility are estimated at a total of \$7,300.00 with \$5,000.00 from PSC

The estimate for administrative costs is likely low at \$2,000.00 but has been offered in kind so there is no cost to PSC.

Total Project Cost       =\$99,165.00

In Kind Contributions   =\$54,243.00

Request of PSC           =\$44,922.00

**15. Cost-sharing:** Describe the sources and amounts of any additional sources of funding or in-kind contributions that are being relied upon to support this proposal.

The initiation of this project was made possible by contributions from a lodge owner (and later endorsed by a sport fishing association) and local residents in Rivers Inlet. Accommodation, helicopter transportation, food and additional manpower for the fall program were supplied by this Association for 2007 and the accommodation, food, additional manpower, pick-up/set-up of adult holding unit and placement/operation

at Dawsons Landing, half the cost of netpen towing/anchoring and netpen unit supplied for 2008 brood final rearing. DFO also provides resources for the project in terms of staff, facilities and equipment.

For 2009 NF proposal:

Rivers Inlet North Coast Salmon Enhancement Association	= \$ 16,280.00
Department of Fisheries and Oceans	= \$ 35,163.00
RSSEPS Partner Group (admin)	= \$ 2,800.00
Cash and In-Kind Total	= \$ 54,243.00

**16. Duration of funding request:** Describe the full period (years) for which this proposal will continue using Northern Fund grant monies and the prognosis for obtaining funds from sources other than the Northern Fund.

The 2009 submission covers the period June 1, 2009 to May 31, 2010. The plan is to make a further submission in 2010 that would allow for rearing, marking and release of the 2009 brood smolts and complete a brood cycle of CWT releases. The 2010 submission would also include some sport fishery (creel survey) and in-river assessment in the summer and fall to recover marks.