

Southern Boundary Restoration & Enhancement Fund: Call for Project Concepts for the 2023 Project Year

The Southern Fund Committee hereby issues its 2023 Call for Proposals for projects that support the implementation of the Pacific Salmon Treaty.

Private, non-profit, and public sector applicants are eligible and encouraged to apply. Ongoing projects and individual proponents that have received support from the Southern Fund in previous years must be in good standing to be eligible for further support¹.

The Southern Fund Committee (SFC) has reviewed investment performance and has determined that approximately U.S. \$3 million may be available for project funding in 2023. The final amount will depend on the status of investments and will be set in early 2023.

The SFC is seeking proposals which are consistent with the Strategic Goals and Objectives of the Southern Fund as identified in the Southern Boundary Restoration and Enhancement Fund Strategic Plan². The SFC has also identified specific priorities for the 2023 funding cycle and particularly encourages applications which are responsive to these priorities.

The Southern Fund's geographic area of interest encompasses southern British Columbia, the States of Washington and Oregon, and the Snake River Basin in Idaho. It is unlikely that funding will be provided to projects that propose activities located outside the Southern Fund's geographic area or that concern stocks which do not contribute significantly to fisheries within the Southern Fund's geographic area of interest. It is also unlikely that projects that address purposes outside the goals identified in the Strategic Plan or the stated priorities will be funded. The Southern Fund Committee works closely with the Northern Fund Committee on funding decisions. If your project is equally relevant to both funds in terms of the geographic area or fishery stocks, please submit your stage 1 application to both funds.

The SFC is not inclined to support routine / ongoing monitoring activities unless the project is designed to address gaps in the understanding of key mechanisms or management approaches.

If your proposed project spans multiple years, it is necessary to re-apply for funding each year. If you wish to apply for funds to continue an existing project, then you must submit a project concept form by the deadline. This ensures that the SFC will have an overview of every project seeking funding in 2023 and that project concepts are approved to the second round of proposals in a manner which is transparent and responsive to the priorities set out below.

¹ Stage 1 applications will not be considered if (a) the application is for an ongoing project that has overdue reports when the stage 1 application deadline passes, or (b) the lead proponent has previously received support for any project from the Southern Fund and there are outstanding reports associated with those projects when the stage 1 application deadline passes.

² The Strategic Plan has been published alongside this Call for Proposals on the PSC website.

Project priority areas for 2023.

Priority area 1: Habitat Preservation and Restoration.

The SFC encourages project concepts for on-the-ground projects designed to benefit wild stocks of salmon by preserving or improving the quality or quantity of their habitat, as described in the Strategic Plan. Projects will seek to:

- Restore salmon habitat in estuaries, supporting soft-shore initiatives by re-establishing eelgrass beds, restoring or reclaiming saltwater marsh benches, etc.
- Implement modifications of in-stream habitat to improve productivity, e.g., large woody debris structures, spawning gravel placement, boulder clusters and bank stabilization.
- Construct side channels and other off-channel habitat, including spawning and rearing channels or ponds, ox-bow reconnection, dike breaching, etc.
- Restore fish passage through such things as culvert removal / replacement, remediation of barriers to migration.
- Restore and protect riparian and upland habitat, through activities such as livestock exclusion fencing, riparian re-vegetation and re-planting, upland sediment source remediation, conservation easements, etc.

The SFC encourages and looks for co-ordination, collaboration, and partnerships between different stakeholders on proposed habitat preservation and restoration projects.

Priority area 2: Southern Panel recommendations

The Pacific Salmon Commission's Southern Panel has considered Coho Technical Committee and Chum Technical Committee advice on their research priorities for potential consideration and funding by the Southern Endowment Fund in the 2023 cycle. The Southern Fund Committee will be mindful of the following prioritized list of research and work topics when considering which projects to support in 2023:

Coho Technical Committee priorities:

1. Continued development of escapement estimates for the Lower Fraser and Strait of Georgia Management Units (MUs).

On-ground feasibility work to evaluate detection efficiency of PIT tag arrays and implement an assessment fishery (8 sample days over 8 weeks) was completed in 2020. Full implementation of the project to develop a whole system escapement estimate began in 2021 and will continue through 2023.

2. Incorporating the effect of environmental variability and change on salmon survival into management.

CoTC has implemented a seminar series on the impacts of environmental variability and change on salmon but is looking for approaches to address these topics at the data collection, analysis and management systems levels to support the implementation of the Coho abundance-based management agreement.

3. Establish new and improved data collection and sampling (for CWT/GSI) for coho MUs and component populations to address issues identified in PSC Technical Report 25 ("An Action Plan in Response to the Coded Wire Tag Expert Panel Recommendations") and the SFEC Coho DIT report.

Coded-wire tag data are a key input for the base period in FRAM and status determination of some coho MUs. Improvements to sampling and addressing bias will increase the reliability of these data.

4. Support for continued development of a coastwide coho GSI baseline.

Genetic stock identification (GSI) can be used to provide high resolution information on stock distribution and abundance within existing sampling programs but requires a standard genetic baseline for coho stocks and the application of methods shared by Canada and the United States. The information for genetic stock identification supplements and extends the coded-wire tag information used in Coho analysis.

5. Support efforts to evaluate and further improve the FRAM model.

The FRAM model is the key tool used by CoTC for pre-season fishery planning and post-season reporting of fishery impacts on coho MUs. Improvements in abundance forecasting, including better understanding of the impacts of environmental variability and uncertainty on forecasts for MUs and assessments of the sensitivity of pre-season exploitation rate projections and postseason exploitation rate estimates to the accuracy of mark rates, catch and release mortalities, all represent gaps in our current understanding of the model. Improved estimates of mortality inputs to FRAM including release mortalities in mark selective and non-retention fisheries, incidental fishing mortality (drop-off) are welcomed as are efforts to incorporate uncertainty in the model (input and output); may require updates to the model framework.

Chum Technical Committee Priorities

This table summarizes high priority research needs identified by the Chum Technical Committee for 2023 Southern Boundary Restoration and Enhancement Fund Proposals relevant to Southern BC and Washington State Chum Salmon. Background information, additional details, and specific criteria for each of these projects can be located at Annex 1 to this document.

Research need	Priority Rank	ChumTC Recommendation	Chapter 6 Requirement
Stock specific temporal and spatial distribution of migrating Chum in Strait of Juan de Fuca	1	Continued support for Juan de Fuca Chum Sampling Program (year 7 of 8)	Paragraph 1 (a), (b), (d)
Single Nucleotide Polymorphism (SNP) baseline development	2	Continued support to refine the Bilateral Chum SNP baseline	Paragraph 1 (b), (d); Paragraph 2; Paragraph 3
Ongoing module development and maintenance of the ChumGEM model	3	Support for proposals that align with the goals ChumGEM development including the fishery planning module	Paragraph 1 (a), (b), (c), (d), (e); Paragraph 2; Paragraph 5
GSI sampling of Chum in mixed stock fisheries	4	Continued support required to better evaluate stock composition variability: focus on under sampled and new fisheries	Paragraph 1 (b), (d); Paragraph 2

Improvement of Chum escapement assessments	5	Continued support for new escapement assessments (tools and technology)	Paragraph 1 (a), (b), (c), (d), (e); Paragraph 5
Methodologies for establishing escapement goals/reference points	6	Support for the development of Chum related goals/reference points	Paragraph 1 (c), (d), (e); Paragraph 5
Chum Wild and Enhanced Contributions	7	Support projects that assess methodologies to review and evaluate the contribution of hatchery and wild to escapement and fisheries	Paragraph 1(c), (d)
GSI of Chum from juvenile programs	8	Support sampling of juvenile collections in various areas (freshwater, estuarine, marine) to evaluate stock composition and distribution	Paragraph 1 (d)
Assess biological and environmental variables affecting Chum productivity	9	Support research on environmental and biological variables influencing Chum productivity	Paragraph 1 (c), (d), (e)(i)
Outreach on Chum Strategic Plan	10	Support outreach: interaction with user and stewardship groups on Strategic Plan	Paragraph 1 (a), (d), (e); Paragraph 2

Priority area 3: Fraser River Panel recommendations

The Committee has received advice about funding priorities from the Fraser River Panel which will inform SFC decisions about 2023 projects. The Fraser River Panel has not assigned a relative priority to the topics listed below.

1. Additional Fraser sockeye salmon juvenile monitoring.

Two types of projects addressing one or both of the two elements below are desired: (a) monitoring of juvenile sockeye in upstream locations in the Fraser watershed including either out-migrating smolts or lake surveys, and (b) monitoring of juvenile salmon in lower Fraser locations.

2. Examination of mechanisms affecting survival of Fraser River sockeye salmon, in particular the impact of the Big Bar landslide.

These projects would aim to understand and/or predict the current and future impact of the Big Bar landslide on sockeye stocks located above the slide and would take into account the priorities identified during the workshop organized by the PSC, and funded by the SEFC, to evaluate the key science activities related to the Big Bar landslide in support of the management of these stocks ([Ecofish-Big-Bar-SEF-Science-Workshop-Summary.pdf](#)).

3. Improvement of species composition estimates in the Fraser River during sockeye salmon migration.

Given the low returns of Fraser River sockeye salmon in recent years, species composition estimates and the possible bias they may create for both the daily and total sockeye abundance estimates require additional scrutiny. Proposals could include methods to improve the in-season assessment of the daily abundance of other salmon species comigrating with sockeye salmon within the Fraser River, methods to improve species composition estimates derived from test fishery data, or integrated multispecies assessment methods.

4. Further work to follow-up on the Test Fishery Workshop report's five recommendations.

2023 will be the ninth year of a return to 'use of fish' to fund test fishery programs used to assess the return abundance, timing and diversion rate of Fraser River sockeye salmon. This change increased the quantities of fish required relative to the 2007-2012 period when the majority of funds came from agencies (largely DFO). We greatly appreciated SEFC support of a two-year project to conduct two workshops related to this topic. This project resulted in a technical report (<http://www.psc.org/download/33/psc-technical-reports/10620/psc-technical-report-no-40.pdf>). The Panel supports proposals to conduct work in support of the report's five recommendations.

5. Improvement to in-season assessment of Fraser River sockeye and pink salmon stocks

For sockeye salmon, declining run sizes have made it challenging to obtain sufficient information from test fishing catches for stock assessment purposes. In addition, it has become increasingly important to limit the impact of the in-season assessment programs on the resource, both to support conservation needs as well as reduce competition with other user groups when harvestable surpluses are available. Proposals to explore alternative non-lethal and cost-effective assessment methods to obtain reliable abundance, species composition and stock ID information, even when abundances are low, are encouraged. For pink salmon, the 2019 and 2021 in-season challenges highlight the need for additional information regarding the migration speed, migration routes and delay behavior. Projects in support for pink salmon assessments would aim to improve current in-season assessment methods.

6. Work to restore salmon habitat that would be of benefit to Fraser River sockeye populations (and possibly also other salmon species).

Over the past decade or more a number of Fraser River sockeye stocks which used to contribute to important fisheries have experienced significant declines, and despite large reductions in fishing pressure, have not recovered. Consequently, fishing opportunities for the two countries have been affected. While marine survival is likely a factor, changes to freshwater habitats may also be contributing to conservation challenges. The Fraser River Panel is therefore interested in opportunities to restore sockeye habitat, with the objective of taking action to address persistent limitations to sockeye productivity in freshwater spawning and rearing habitats. In particular, with the possible permanent loss of Gates spawning channel and the effects on sample collection, the Panel is interested in proposals that would restore this spawning channel.

7. Projects that would help to further advance hydro-acoustic or other assessment techniques in the lower Fraser River, in support of continually improving in-season estimates of sockeye and pink salmon abundance.

To ensure that conservation needs are met for stocks of Fraser River sockeye and pink salmon the Fraser River Panel (FRP) requires accurate and cost-effective assessment of abundance. Furthermore, to ensure that appropriate fishery management actions are taken in a timely manner these assessments must provide actionable data to the FRP as early as possible.

Priority area 4: Chinook Technical Committee Priorities

The Committee has received advice about funding priorities from the Chinook Technical Committee which will inform decisions about 2023 proposals. The CTC has not assigned a relative priority to the areas listed below:

Priorities for CTC analytical improvements:

- PSC Coast Wide Chinook Model and Exploitation Rate Analysis development using contemporary modelling software (e.g., R).
- Improvement of methods for stock and fishery assessments (e.g., estimation of spatial/temporal stock-age distribution, projection of maturation rates for incomplete broods, systematic evaluation of current analytical methods using the Data Generation Model).
- Improvements to the forecasting tools (e.g., models and evaluations) used to inform CTC analyses.

Priorities for improvements in catch and escapement estimation:

- Continued or improved estimates of catch, terminal returns, and escapements to meet CTC data standards and support the Chapter 3 Catch and Escapement Improvement Initiative (CEII; e.g. development of more timely catch, terminal run and escapement data).
- Development of additional escapement goals and stock-specific exploitation rate management objectives needed to implement the Chinook management regime, targeted at stocks listed in Chapter 3 Attachment 1 of the Pacific Salmon Treaty.
- Examine the representativeness of exploitation rate indicator stocks for escapement indicator stocks and PSC Chinook Model stocks.
- Improve accuracy of escapement assessment programs.
- A rigorous, statistically designed field study to estimate hatchery composition of spawners in West Coast Vancouver Island (WCVI) aggregate population. This information could be used to provide estimates of natural production for the aggregate and perhaps for a domestic conservation unit on WCVI.
- Improve accuracy and precision in estimates of incidental mortality (e.g., improved methods used to estimate the incidental mortality using CWT data and to quantify releases, and studies to improve estimates of drop-off and drop-out mortality rates).
- Accelerate processing and reporting of CWT data for the pre-season planning process.

Application Process

The SFC uses a two-stage submission and review process. The initial review stage is designed primarily to evaluate the proposal's relevance and significance to the Pacific Salmon Treaty and the priorities outlined in the Strategic Plan and this Call for Proposals. Project proponents should focus on providing a clear description of project objectives and benefits in this first round concept stage rather than providing detailed information about project implementation and budgets. That information will need to be provided for those project concepts selected for second stage review.

The two-page "Project Concept" form that accompanies this Call for Proposals is the format that must be used by all proponents. **This form has been revised for the 2023 Call: you must use the updated form posted alongside this document.** The use of this format allows the SFC to conduct its first-round review of submissions in a fair and expeditious manner.

The first-round review of all Project Concept proposals will take place in September 2022. Those proponents whose Project Concepts best match the priorities described within this Call for Proposals will be invited to prepare a more detailed proposal for stage two. Projects approved to the second stage will have approximately one month to submit final, detailed applications on a form that will be provided. The detailed applications will be subject to an in-depth technical review. The SFC will make final funding decisions in February 2023.

Deadlines

Project Concept forms must be in MS Word or PDF format and must be received at the following address: southfund@psc.org by **midnight on Wednesday, August 17, 2022**. Late applications will not be considered; applicants are encouraged to submit proposals well ahead of time. You will receive an automatic notification that your proposal has been received: if you submit several applications separately you will only receive an automatic confirmation the first time.

Contact Information

More information and "Project Concept" forms may be accessed online at www.psc.org. Questions or points of clarification should be directed to the Grant Program Manager, Sascha Bendt, or the Fund Assistant, Victor Keong, via phone at (604) 684-8081, or email at bendt@psc.org or keong@psc.org.

Annex 1: Detailed Information on Chum Technical Committee priorities.

1. Temporal and spatial distribution of migrating Chum Salmon in the Strait of Juan de Fuca

A significant gap exists in our current understanding of the temporal and spatial distribution of Southern BC and Washington State Chum Salmon that return to and migrate through the Strait of Juan de Fuca. Understanding the magnitude and timing of Chum Salmon migration through this area is critical for generating accurate run reconstruction estimates using the ChumGEM model. For example, one fundamental parameter for the model is the proportion of returning Fraser River and Puget Sound Chum Salmon runs which use this migration pathway (diversion rate) instead of returning through Johnstone Strait.

The existing fisheries in the Strait of Juan de Fuca have limited effort (consistent with Treaty provisions outlined below) and a dedicated assessment project of limited duration is required to generate adequate samples for analysis to determine run timing by stock through this region and as input for diversion rates to ChumGEM.

In 2016, a pilot project successfully demonstrated the feasibility of this assessment program. An application has been submitted to continue this project in 2021. The genetic analysis portion of this project has now been operationalized within Canada. The Committee plans to seek funding to continue this assessment through at least two full brood cycles (through 2023) in order to evaluate inter-annual variability.

The Chum Technical Committee requests support for initiatives that improve our understanding of stock-specific temporal and spatial distribution of returning Southern BC and Washington State Chum Salmon migrating through the Strait of Juan de Fuca.

2. Single Nucleotide Polymorphism (SNP) Chum Salmon Baseline Improvements

In comparison to microsatellites, SNP technology is efficient and cost effective. SNP results to date indicate high resolution estimates of stock composition. The Washington Department of Fish and Wildlife (WDFW) laboratory, in collaboration with the University of Washington (UW), developed 500 candidate SNPs for Southern BC and Washington State Chum Salmon. WDFW worked 350 of these SNPs into a single SNP panel to genotype Chum salmon using the GTseq protocol. Fisheries and Oceans Canada (DFO) incorporated 300 of the SNPs in the WDFW panel and added another 200 SNPs for a single panel of 500 SNPs to genotype Chum salmon with the Ion Torrent protocol.

The WDFW and DFO labs now have 300 SNPs in common in their Chum salmon SNP panels and the genotypes constitute the foundation of the bilateral Chum SNP genetic baseline. Because of differences in genotyping protocols, the labs have worked together to standardize genotypic data produced in the two labs by genotyping a set of the same fish with the two protocols and creating a Rosetta Stone to standardize allele calls and genotypes. The standardization of the bilateral SNP genetic baseline using the common set of 300 SNP loci is nearing completion, which will allow consistency in analyses between DFO and WDFW labs and exchanges of data. The benefits of a standard baseline will further improve the coordination between Canadian and US labs for jointly managed fisheries under the PST. The

final component for standardization will be genotyping a common data set in the two labs with the two protocols. Analyzing the common data will confirm that DFO and WDFW labs produce identical results when conducting mixed stock fishery analyses and other bilateral research in the boundary area.

Further improvements to the bilateral SNP Chum baseline involve expanding the geographic coverage of Chum spawning sites that were previously unsampled, as well as increasing the number of samples genotyped per collection location. Currently, between WDFW and DFO, samples from roughly 180 collection sites have been genotyped for the SNP baseline, which is about two-thirds of the desired geographic coverage. However, the majority of these collections (166) have fewer than 90 samples and simulations indicate that 95 samples is the minimum number to adequately characterize a population. Increasing the number of collection sites in Southern BC and Washington State and the number of samples per collection site in the shared bilateral baseline will allow more accurate identification of individual stocks which would support more appropriate PST management actions. For closely related populations, the collection sizes should be increased to at least 150 individuals to better characterize the population and distinguish closely related populations.

The provision of funding for additional baseline development work should be contingent on proposal development in collaboration with the Chum Technical Committee to ensure the resulting product meets the bilateral requirements of the PST.

The Chum Technical Committee requests support for continued augmentation of the SNP baseline for Southern BC and Washington State Chum Salmon.

3. Ongoing module development and maintenance of the ChumGEM model

A central component of the Southern Chum Salmon Strategic Plan is the ChumGEM model, which incorporates genetic, escapement, fishery, and environmental components. The goal of Phase I of model development was to provide post-season run reconstructions for Southern BC and Washington State Chum Salmon. Phases II and III of the model aim to incorporate additional modules for annual fishery planning and long-term stock management.

Two projects were funded by the SF from 2013-2015 and 2018-2020. The result of these projects is a functioning run reconstruction model that is capable of estimating run size and harvest rate for 10 Chum Salmon GUs. For 2020-2021, work to finalize Phase I is being completed in-house with DFO. This includes: model testing and sensitivity analysis; documentation of the model (including a user manual); and, completion and reporting of run reconstruction and harvest rates by GU for 2008 to 2020. Additional funding is required for programming support of Phase II and III of ChumGEM, which will include: rebuilding GUI to improve model usability; addition of age data to support brood-year analysis; addition of environmental co-factors that may influence annual abundance; and, development of a forward-projecting fishery planning module. There is also a need for funding to support annual maintenance/updating of model as new data become available.

The provision of funding for additional work on this model should be contingent on proposal development in collaboration with the Chum Technical Committee to ensure the resulting product meets the bilateral requirements of the PST.

The Chum Technical Committee requests support for proposals that align with the goals of Phase II of ChumGEM development, which focus on developing additional modules for brood-year analyses and fishery planning and consider incorporating environmental data that influence Chum abundance.

4. Genetic stock identification (GSI) of Chum Salmon caught in mixed stock fisheries

Comprehensive sampling of data-limited fisheries is essential for determining the stock composition of Chum Salmon caught in the various fisheries that are relevant to the Chum Salmon Chapter and important to the development and maintenance of the ChumGEM model. GSI technology has now shifted to SNPs, which has the potential to provide finer resolution stock ID using a bilateral baseline. The new SNPS baseline may warrant revisiting GSI research in certain mixed-stock fisheries. Addressing fishery stock composition data gaps and assessing inter-annual variability in Southern Boundary area fisheries are both important for determining Chum Salmon migration timing and catch distribution, which is critical for implementing the ChumGEM model and the Chum Technical Committee Strategic Plan as a whole.

The Chum Technical Committee requests support for continued GSI sampling for documenting stock composition of Chum Salmon in mixed stock fisheries.

5. Improvement of Chum Salmon escapement assessments

Estimates of spawning escapement for Chum Salmon in Southern BC and Washington State are produced using a variety of different methods, most of which involve extrapolations that have typically not been re-evaluated since their inception. Recently, funding for Chum Salmon assessment has decreased, resulting in incomplete coverage and imprecise or biased estimates of spawning escapement. New technology and approaches for escapement estimation may have potential to improve escapement assessments in certain systems, while possibly yielding cost savings relative to existing programs.

One of the fundamental inputs to the ChumGEM run reconstruction module is stock-based spawning escapement. For ChumGEM to produce meaningful outputs, it is important that any gaps in spawning escapement data be addressed, and that existing methods are improved to enhance precision and reduce bias. To that end, the Committee supports proposals that explore the feasibility of using new approaches or technology to improve Chum Salmon escapement estimation.

The Chum Technical Committee requests support for proposals that assess the feasibility of using alternate assessment approaches to increase coverage and improve estimates of spawning escapement for Southern BC and Washington State Chum Salmon.

6. Methodologies for establishing escapement goals/reference points for Southern BC and Washington Chum Salmon

The Chum Technical Committee is interested in supporting projects that summarize the current state of stock assessment data, and that provide advice on appropriate methodologies for escapement goal/reference point development given the existing data.

The selection of a methodology for developing escapement goals/reference points depends on the quality and type of data available. Because of this, numerous approaches have been used in Southern BC and Washington State to establish fishery (or management) reference points (e.g. escapement goal) from biological benchmarks (e.g. MSY escapement), and there is little consistency in methodology across Chum Salmon stock groups. Additionally, many escapement goals/reference points currently being used were established over twenty years ago and may not reflect current trends in freshwater and ocean productivity. Habitat-assessment based methods for estimating appropriate escapement objectives have been used for other salmon species and could be explored for Chum Salmon populations that lack suitable spawner-recruit datasets.

The outcome of this activity would be a toolkit that can be used domestically and internationally to evaluate current, or establish new, escapement goals/reference points for Southern BC and Washington State Chum Salmon stocks.

The Chum Technical Committee requests support for proposals that summarize the current state of stock assessment data, and that provide advice on appropriate methodologies for escapement goal/reference point development given the existing data for Southern BC and Washington State Chum Salmon.

7. Chum Wild and Enhanced Contributions

This project would look at the impact of hatchery production on wild Chum salmon populations. Hatchery programs can be used as a conservation tool for wild populations and can increase the availability of fish for harvest. However, hatcheries present risks to wild genetic diversity that require evaluation and management to safeguard Chum salmon biodiversity. Typically, the proportionate natural influence (*PNI*) is used to evaluate and monitor the adaptive state of integrated hatchery populations and to identify hatchery-influenced populations. A number of tools can be evaluated to determine what are best suited for assessing Chum salmon hatcheries. Two methods that can be used to determine *PNI* include Parentage-based Tagging (PBT) and Otolith Thermal marking. PBT requires genotyping all the hatchery broodstock and then genotyping returning adults to determine which spawners were from hatchery parents. Distinctive otolith marks are applied in the hatchery by fluctuating water temperature during incubation to create a banding pattern in otolith bone deposition that can be read from otoliths removed from the returning adults.

The Chum Technical Committee is discussing possible applications of PBT and otolith-marking technology to understand hatchery contributions to Chum salmon fisheries and conservation. One area of interest and of bilateral importance is fisheries in the boundary region near North Puget Sound tributaries and the Fraser River. Tagging Chum salmon hatchery fish originating

in hatcheries on rivers in this region and analyzing their tags in fisheries and in spawners on spawning grounds would provide a means to manage hatchery programs to foster Chum salmon conservation and manage bilateral fisheries.

The Chum Technical Committee requests support for projects that assess methodologies to review and evaluate the contribution of hatchery and wild to escapement and fisheries.

8. GSI of Chum from juvenile programs

Looking at factors that affect Chum productivity, understanding of the stock specific spatial and temporal distribution of this species over its entire life history is key. From the freshwater residence to their outmigration into the estuarine habitats continuing through their marine migrations, the conditions encountered by Chum salmon need further evaluation. Programs focused on the early life stages of Chum salmon will improve our understanding by helping line up the various environmental and biological factors that may affect productivity.

The Chum Technical Committee requests support for sampling of juvenile Chum Salmon collections in various areas (freshwater, estuarine, marine) to evaluate stock composition, timing and spatial distribution.

9. Identify and assess biological and environmental variables affecting Chum Salmon productivity

Phase II of ChumGEM model development will include identifying a suite of biological and environmental variables that can potentially be used as indicators of relative productivity and distribution for Southern BC and Washington State Chum Salmon. Examples of indicators that have been identified for other salmon species include biological variables such as the amount of salmon prey, and environmental variables such as sea surface temperature. These indicators have been used in capturing the dynamics of changing ecosystems and in predicting the relative abundance and timing of adult salmon returns. Recognizing the primary environmental variables that drive Chum Salmon production and recruitment to fisheries will be of increased importance as the effects of climate change continue to become increasingly evident and complex. The Chum Technical Committee is not alone in seeking to better understand the various conditions and patterns that influence salmonid survival and abundance. The PSC Standing Committee on Scientific Cooperation has recently initiated an effort to comprehensively summarize how environmental factors are currently being used in assessments across salmon species and management units, and we expect there will be collaboration among the PSC technical committees on these topics.

The Chum Technical Committee requests support for proposals that look to relate biological and environmental variables to Southern BC and Washington State Chum Salmon productivity.

10. Outreach on the Chum Salmon Strategic Plan for Southern BC and Washington State

This Outreach Project will be providing an update on the status of the PSC Chum Technical Committee work to interested First Nations, Tribes, fishery managers, and community & stewardship groups in a workshop format similar to the initial workshops in early 2013

(January 18 in Vancouver, BC and February 15 in Olympia, WA). These workshops will provide feedback to interested individuals and groups of completed, ongoing and planned Chum Salmon initiatives that have been supported by the Chum Technical Committee. One key initiative is the Committee's Southern Chum Salmon Strategic Plan. This initiative has continued to develop since presented at the original 2013 workshops and the Chum Technical Committee wants to provide interested individuals and groups an update on the Chum Strategic Plan including the capabilities of current GSI (genetic stock identification) technologies and past, current and future activities to support the Plan. This outreach is also needed to help the Chum Technical Committee better understand the needs of First Nations, Tribes, fishery managers, and community & stewardship groups and receive input on the Committee's future work to continue the development and implementation of the Chum Strategic Plan.

The provision of funding for outreach by the Chum Technical Committee on the Chum Salmon Strategic Plan should be contingent on proposal development in collaboration with the Chum Technical Committee.

The Chum Technical Committee requests support for outreach on the Strategic Plan for Southern BC and Washington State Chum Salmon.