

Strategy 1- Standardized Monitoring of Wild Salmon Status

1. What advice do you have about the delineation of CU's and the protection of genetic diversity?

The creation or delineation of Conservation Units (CU's) does nothing to protect or recognize the need to maintain biodiversity within watersheds. Maintaining genetic diversity is not the same as maintaining biodiversity or the role of salmon in watershed functioning. The WSP does not recognize this difference clearly.

Safeguarding genetic diversity in a large CU may:

- Ignore the role of salmon in watershed functioning and biodiversity, and;
- Enable decision-makers to focus on specific salmon populations and habitat areas at the expense of other populations and habitats in the CU.

Salmon provide many ecosystem benefits, beyond their economic value and genetic diversity. They include:

- Marine-derived nutrients to freshwater and terrestrial ecosystems;
- Protein in the form of eggs, fry, smolts and adults to over 317 keystone species, including eagles, bears and other higher level predators, and;
- Stream substrate enhancement by removing fine sediment during spawning.

Delineating genetic diversity requires DNA testing. Does DFO Pacific Region have the financial and professional resources to accomplish comprehensive DNA testing? Does DFO have the resources to delineate CU's on the basis of genetic information? Separate and unique populations have not been well documented in BC.

There are also traits based on genetic differences (genotypes) versus those based on external appearance and learned behaviour (phenotypes), with the latter contributing to diversity but indistinguishable genetically. Currently, the only means of delineating these distinct populations may be through years of observation.

CU's must be a manageable size and be determined based on these distinct individual populations. The CU size will likely vary, and even a watershed may be too large a scale for protecting genetic diversity. Sub-basins and/or sub-areas can be managed effectively and may prove to be the largest unit in which a diverse population or populations can be delineated.¹

The WSP delineates a small number of large CU's for fisheries management decisions, as opposed to the current large number of management areas. This decision may be a direct result of the low quantity and quality of annual data for habitat, stock and spawning inventories and assessments available. Information-gathering resources have been strained for years and there do not appear to be any new funding initiatives. While CU's may be a legitimate management tool,

¹ For example, in the Tsolum River, coho in headwater tributaries (e.g., Pup Creek and Joshua Creek) appear to be separate and unique populations. No matter the number of coho observed entering the Tsolum system, Pup and Joshua Creek have nearly identical numbers of coho spawners year after year. It appears that Pup Creek and Joshua Creek coho are born, reared and return to these tiny creeks.

we are concerned that, with such little information available, the health of sensitive portions of the CU, if not the entire CU, may be threatened. Many of us feel that the WSP indicates that DFO is willing to write off salmon runs within individual small streams.

Recommendations –

- Use a large portion of the allocated funding to basic information gathering before delineating the CU's, and;
- Increase the A-based allocation for these tasks beyond the scope of this initiative.

2. What criteria should go into identifying the lower and upper benchmarks of biological status?

Recommendations

- For watersheds that have suffered habitat loss over the years, the upper benchmark should be considered an interim value, and only fully determined once concerted efforts have been made to restore habitat; otherwise the upper benchmark will be highly underestimated.
- The following criteria should also be considered:
 - o Protection of biodiversity in a watershed (clarify the use of terms “biodiversity” and “genetic diversity” in the WSP document);
 - o Protection of intrinsic values of salmon by stream or watershed (biological input, heritage, socio-economic factors, etc.);
 - o Differing status for each species²;
 - o Collection of escapement data for individual streams and species to safeguard both genetic diversity and watershed biodiversity, and;
 - o Establishment of optimum spawning escapement required to maximize juvenile production.

3. How can monitoring of biological status be done effectively and how could First Nations and local organizations be involved?

With deep cuts to federal and provincial budgets for Pacific salmon over the past decades, there is not sufficient monitoring of biological status. No management model can replace the need for habitat, stock assessment and escapement data. We are concerned that the available knowledge base of individual demes, populations, and even some CU's may be sacrificed in favour of using "indicator streams" or "proxies", as described in the WSP.

² Chum and pink salmon target "escapements" should be based on maximum use of available spawning habitat because these species do not compete for freshwater food and provide marine-derived and other nutrients to the watershed. Targeting these escapements by stream could safeguard both genetic diversity and the biodiversity of watersheds within the entire CU if chum and pink harvesting were confined to terminal fisheries. For species competing for limited fresh water resources, an optimum spawning escapement required to produce a percentage of maximum juvenile production should be used.

Recommendations

- Increase budgets and staff for fisheries managers and habitat and stock assessments sufficient to obtain a firm understanding of the monitoring foundation and the additional data required to implement the WSP, and to ensure that stocks and habitat are not lost during this crucial time.
- Mobilize First Nations and volunteer stewardship organizations through DFO's public participation programs; this strategy will provide fisheries managers with much needed high quality data. This community resource has the local knowledge, expertise and desire to assist in providing baseline data on spawner and juvenile numbers, in- and out-migration, water and habitat quality, riparian areas, and benthic invertebrate communities.

4. Have we missed any action steps in our proposed standardized monitoring of wild salmon status?

This document makes it clear that the Department will implement WSP using current funding and staffing levels. Most of us in the stewardship and enhancement community believe that successful implementation will require increased funds and personnel within DFO. We also do not see any commitment to fund SEP and other stewardship initiatives as the backbone of any partnerships.

There should be an iterative process (i.e., good feedback) between development of the benchmark and monitoring criteria and delineation of the CU's. Perhaps some sample CU's could be established with input from local stakeholders, then the criteria developed and applied to these CU's. This would be useful in refining the process for developing the rest of the CU's. Monitoring would follow as action 3.

The value of current Maximum Sustainable Yield (MSY) calculations is questionable. The downward spiral of some populations over the past 40 years suggests that harvest management methods used to date may be faulty. Human impacts continue to reduce the ability of salmon to survive, but current management methods fail to take this into account. Fisheries managers and local communities need enforceable legislation that it is upheld using adequate enforcement staff to address this issue. If we want sustainable salmon populations, fish must return to spawn first and, when targets are reached, harvest can be allowed. If attempts are made to manage to the level of the deme, then the deme should determine the MSY. Past documents speak of conservation first, with the rest of the balancing act to follow.

How will numbers of fish within CU's be determined? It takes a full lifecycle (two to five years, depending on the species) to make the first data point on a graph. Close monitoring will be required over several generations (e.g., twenty years) to provide more complete data on the effects of the WSP and other management decisions. It is not enough to look at population levels in the CU; individual populations (demes) may have similar genetics but different behaviours and run timing within individual streams, which have implications for their long-term sustainability.

Recommendations

- Strategically increase funds and personnel within DFO to guarantee the WSP’s success;
- Ensure that your community partners have the resources and voice to assist in WSP’s implementation;
- Establish an iterative process between development of the benchmark and monitoring criteria and delineation of the CU’s;
- Create and enforce legislation designed to protect salmonids and habitat from destructive human impacts, and;
- Clarify how numbers of fish within CU’s will be determined.

Strategy 2- Assessment of Habitat Status

1. What suggestions do you have for appropriate benchmarks and indicators of habitat quality and quantity?

Step 2.2 is misleading, as DFO biologists and Streamkeepers have understood habitat quality and quantity indicators for many years. The issue is not so much "to understand what needs to be measured to determine habitat fitness" but to consistently measure known habitat parameters over time.

Determinants of Freshwater Habitat Fitness	
water quality	spawning gravels
water temperature	dynamic substrate movement
riparian quality	LWD recruitment
food	sufficient water quantity at critical times
riffles	refuge
pools	protection from anthropogenic impacts

Each species has its own habitat requirements, which change through life stages, flow regimes and seasons. A “one size fits all” approach is not effective. Also, there is not enough current information on habitat quantity and quality, due to reductions in DFO funding and staff.

Recommendation

A simplistic mathematical formula may provide an appropriate benchmark for habitat quantity, for example:

Quantity of suitable fish habitat	=	Total length of all streams in watershed	-	[area not restorable due to existing land-use + areas above natural anadromous barriers]
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2. How can interested individuals and organizations be effectively involved in the assessment and monitoring of habitat status within CU’s?

The stewardship community is well aware of DFO’s commitment to protecting the salmon resource, but we are sometimes surprised by the Department’s lack of understanding of *our* commitment. SEP programming, including HRSEP and CA programs have already resulted in

effective partnerships between DFO and a number of First Nations and Community Involvement groups who are using DFO methodology to assess and monitor habitat status. These groups are poised, qualified and prepared to support habitat and spawner assessment and monitoring initiatives by conducting assessments and mapping to create baseline data, which can be used as a basis for monitoring.

Recommendation

- Engage the stewardship community in the process of data collection.

3. Have we missed any action steps necessary to the assessment of habitat status?

Action Step 2.5 mentions "fish production objectives", but the WSP does not mention an action step or assessment methodology to measure it. Establishing a "fish production objective" higher than the existing level would require a plan for habitat restoration or stock enhancement in that CU. Resources would then have to be dedicated to those initiatives. Given that this document states that the WSP must be implemented within existing Pacific Region resources, can existing habitat be assessed and its status improved with current financial and staff resources?

Recommendation

- Articulate the resources, policies, procedures and agreements needed for watershed-based planning.

Strategy 3- Inclusion of Ecosystem Values and Monitoring

1. What are your suggestions for a procedure to develop an ecosystem assessment framework and who should be involved in this procedure?

Recommendations

- Identify all sources of negative impacts.
- Involve all stakeholders.
- DFO's streamkeepers methodology was written to provide an ecosystem assessment framework for community use within watersheds. The WSP requirements would also need to incorporate "values" as listed below.
- Collect and share the data! The structured gathering of adequate biological information ("sound scientific information") and distribution to the public are prerequisites to achieving an understanding of freshwater and ocean ecosystems.
- Articulate freshwater ecosystem values. The WSP does not adequately express either these values or the relevance of salmon to healthy watershed functioning.

2. What do you understand the term "ecosystem values" to mean and how should they be measured?

"Ecosystem values" is an incredibly encompassing term, with international and global considerations. It may take years to develop a measurement system. Salmonids represent a keystone to freshwater ecological vitality.

Ecosystem values can be described as the understanding and protection of systems that encourage the interdependence of all living things and the land, air and water they inhabit. The values can also mean supporting a healthy relationship with the ocean and our watersheds. Objective 3 of the WSP stresses balancing maintenance of genetic diversity with benefits of the salmon catch, but does not mention biodiversity or the needs of the watershed.

Recommendation

- Ecosystem well being ("values") should be inserted and stressed in Objective 3 and the entire document.
- Effective enforcement of the Fisheries Act against all polluters and land-use proposals that negatively affect aquatic systems would provide a significant improvement to increasing the chances of survival of our salmon resource and show that we value ecosystems. As a first step, current habitat protection rules, which are based on known threats to ecosystem well being, and mitigative measures, should be enforced. This would require an infusion of funds to support habitat protection and monitoring programs both within DFO and with community partners. Then a program to measure ecosystem well being using "action steps" 2.1 through 2.5 should be implemented.

Strategy 4 - Integrated Strategic Planning

1. How can the range of interests be brought together to collectively develop integrated (habitat enhancement, fisheries, marine area) plans that reflect salmon conservation needs?

The most effective process is usually the simplest. Establishing common goals among the diverse stakeholders is essential. In freshwater systems, for example, the importance of riparian areas to stream health is well established. This could serve as a simple guide to freshwater conservation. A "wild zone" could be established along and around all freshwater and a dialogue opened with all stakeholders who affect riparian areas about the desired length and breadth of this zone and any restricted activities within it.

Other common goals relate to intrinsic recognition of "common assets" such as oceans, fresh water, air and terrestrial and aquatic life, along with those related to "property rights" of humans. The basic necessity to protect biodiversity has a priority beyond human needs and should be established, protected and monitored by persons familiar with the watershed and landscape. This information needs to be shared with all stakeholders to a much greater extent than it is now, so that stakeholders can be engaged in a meaningful way.

The WSP states "Considerations of biology and geography need to be brought together in an organized way"; however, it ignores the considerable lack of quality biological information. The WSP describes the key attributes of an effective planning process as inclusiveness, transparency, effectiveness, respect for existing processes and accountability. Not mentioned are the effective gathering of enough high quality biological information and its' dissemination, both of which are essential to planning and should be in place before those mentioned. Information gathering and dissemination about the delineation and status of the CU's needs to be increased considerably, otherwise the plan will be based on flawed information and cannot be firmly defended.

Recommendations

- Facilitate a process to establish common goals among stakeholders.
 - Recognize "common assets" such as oceans, fresh water, air and terrestrial and aquatic life, along with those related to "property rights" of humans.
 - Information gathering and dissemination about the delineation and status of the CU's needs to be increased considerably.
- 2. Stated another way, what organizational structure could be developed to achieve effective long term planning?**

Recommendations

Two organizational structures come to mind, top-down and bottom-up:

- Top Down – Specialists identify necessary common assets that are known to benefit wild salmon and develop educational and protective initiatives to guide local understanding. Protective legislation is passed. Policies are developed and enforced.
- Bottom up – Stakeholders contribute local knowledge on a subbasin (terrestrial) and subarea (marine) scale and, with the help of specialists, develop a list of actions or recommendations. Stakeholders deal with the action list in order of priority, on a local level using the appropriate and available funding.

3. What comments do you have about the adequacy of the planning process described in Action Step 4.1?

Planning Structure: It is hard to determine if the approaches mentioned would be the correct way to go, as they are new, fluid and, as yet, unproven.

Step 1 is inadequate because current resources cannot provide significant information on the status of CU's and their associated habitat and ecosystems. If significant DFO and community financial and human resources were provided for gathering of biological information, stakeholders could provide educated input and help prioritize.

Step 2, as described in "Planning Units for Pacific Salmon" in Appendix 4, is inadequate and omits biologically and socially significant stocks. For example, many people believe the current use of district, subdistrict and statistical areas as fisheries planning units for chum and pink stocks are superior to the use of larger planning units. For the purposes of protecting genetic diversity *and* biodiversity, the terminal net fisheries based on adequate stock assessment and spawner enumeration should be used. Unfortunately the services needed to provide this information have been cut by 80%.

Steps 3, 4, and 5 could unfold naturally and effectively.

Recommendation

- The WSP should state clearly what the bottom line is for protecting our wild salmon stocks. At the end of the day, the steps taken to implement salmon conservation will occur with the

understanding that the conservation of salmon and the need to ensure their sustainability are number one.

4. What comments do you have about the adequacy of the interim planning process described in Action Step 4.2?

"Response teams" are an excellent idea but where will funding come from to increase production if that is deemed the management strategy?

The document states "interim procedures would build on and improve the approach now used to develop Integrated Fisheries Management Plans (IFMPs) for salmon. The biological status of a CU or group of CU's vulnerable to fisheries in a region would be reviewed." If the improvement here means the reinstating of lost financial and human resources, this interim procedure could be adequate, but it should include the needs of the watershed and general biodiversity. The trick would be to ensure that more areas within the CU do not end up in the "red zone" while effort is focused elsewhere.

Recommendations

- Response team members need to be those dedicated to conservation, with a depth of knowledge and the authority to act firmly on decisions needed to ensure the successful rebuilding of the vulnerable CU.
- Improvement of interim procedures to restore CU's must include the reinstatement of lost financial and human resources and consideration of the needs of the watershed and general biodiversity.

5. What would constitute exceptional circumstances under which the Minister of the Department of Fisheries and Oceans might decide to limit activities to avoid losses of wild salmon?

Recommendations

- The Minister of Fisheries and Ocean should step in to support his staff and the decisions they make to avoid losses of wild salmon when the pressures from those who wish to exploit the resource beyond its ability to rebound becomes too great. Steep or remarkable depletions in numbers of returning salmon are obvious triggers.
- Staff from DFO, Environment Canada and other ministries are - or should be - mandated to restrict certain activities to avoid losses of wild salmon. In the face of already steep declines in wild fish populations, known and controllable threats should be limited immediately and some of the actions contemplated in the WSP implemented. Human-induced activities include, but are not limited to:
 - Acid mine drainage, industrial effluents and other industrial impacts;
 - Infringements on riparian function;
 - Clear-cut logging practices that impact freshwater resources;
 - Urban sprawl.

- Some recreational activities (ATV and 4X4 access); and
- Sea pen fish farming if evidence of the negative effect on wild salmon continues to be gathered.

- Response to natural landscape disasters such as landslides and floods should also be swift.

- Actions that could be put into effect include:
 - Moratoriums on sport and commercial fishing of certain species or stocks, such as that for the recent successful commercial fishing ban on coho;
 - Stringent licensing and monitoring of the commercial sports fish sector;
 - Establishment of protected riparian zones and effective legislation;
 - Identification of negative impacts, and;
 - Holistic restoration of habitat.

6. What information would you need in order to understand such a decision?

We would want to know how the decision would help rebuild the population, resource or ecosystem and protect it for all Canadians in perpetuity. This means we would be included in talks that led up to this decision, so would have a greater understanding of why it was being done.

Strategy 5 - Annual Program Delivery

Action Step 5.1 states "Under this policy, DFO will assume a leadership role in monitoring and assessing the status of wild salmon. Assessment will include field activities, which will build on existing programs as much as possible, and detailed stock assessments, which will identify the reasons for changes in status."

Recommendation

If this planning is to be effective it must actually "build on existing programs" to achieve "detailed stock assessments". This will require an infusion of previous funding levels and a return to previous or greater levels of stock and habitat assessment staff.

1. How frequently should the performance of the Wild Salmon Policy be evaluated and who should conduct the review?

Recommendation

- At least once a year by people with the most at stake - fishers, stewardship groups, First Nations, Local Fisheries Managers and "Response Teams".

2. How should the strategic and annual plans be communicated?

Recommendation

- Through a series of recommended actions and the funding to implement the actions. Once group consensus on recommended actions is in place, broadcast the plan. Each sector within

the stakeholders groups has its own communications tools - find these tools and get the information to them.

General

1. What is a reasonable time frame for full implementation of this policy?

Recommendation

- At a minimum, five years after detailed assessments take place, criteria for protection and enhancement established and CU's established. This would cover the full life cycles of progeny assessed at the baseline. Until then an adaptive management strategy would both inform and refine the policy.

2. Considering the wild salmon policy as a whole is there something that needs to be added to the policy or reassessed?

There is no consideration given to conservation management of feed fish, e.g., herring fishery assessment and conservation.

This statement gives us concern - "First, implementation must be accomplished within DFO's existing resource capability and will be phased in over time. Second, it will depend on the effectiveness of our sharing of responsibilities with First Nations and stakeholders" (page 52). The WSP may have some effective strategies in it but, without added resources, difficulties in assessment and implementation become insurmountable.

If Pacific salmon stocks are to be maintained at current or more plentiful levels, it will take effort, money and will. While Pacific salmon stocks are being systematically left to their own resources, the effort, money and will is going to salmon aquaculture.

The WSP suggests that Conservation Units, the unit by which we would make our most significant harvest and intervention decisions, become many times larger than the current management areas, which are based on geographic diversity. Genetic diversity, however, exists on a micro-scale and we have made the mistake of overlooking this in the past.

Instead of truly mapping a new future for Pacific salmon by focusing on the micro-scale and learning from nature, we again are asked to think of this incredible resource and foundation of BC heritage mainly as a commodity and not as an intrinsic basis of returning nutrients to the land, thereby promoting biodiversity.

The status quo for salmon stocks is not acceptable. Any DFO reorganization effort must concentrate on improving stocks. In this way the annual economic activity created through a wild fishery could compete and even surpass aquaculture. To reduce effort because the economic benefits of the aquaculture industry have surpassed the wild fishery condemns wild fish to a slow extinction.

How can we develop a wild salmon policy and reduce hatchery production without restoring habitat first? These two efforts must be intertwined and monitored or we will end up with no wild fish.

The WSP appears to reduce the importance of wild fish to our local watersheds and to rationalize reduced financial resources rather than applying resources to improve the state of wild salmon in BC.

Recommendations

- Address the issue of conservation management of feed fish, e.g., herring fishery assessment and conservation.
- Demonstrate that the Department is genuine in its intention to effectively manage wild salmon stocks by attaching the required financial and human resources to WSP assessment and implementation.
- Recognize and manage Pacific salmonids for what they truly are - a keystone species in the maintenance of biodiversity in many coastal ecosystems.
- Conversely, resist the notion that salmonids are a commodity whose significance is determined by market price and annual economic activity. The Department's interests in this issue are legal, ethical, biological and cultural – not corporate.