

FISHERIES AND OCEANS' "WILD SALMON POLICY":
A VIEW FROM THE PERSPECTIVE OF SCIENCE

On May 12, 2000, the Simon Fraser Institute of Fisheries Analysis convened a meeting of eight scientists, from a variety of Canadian and American fisheries agencies and universities, in order to review Fisheries and Oceans Canada's proposed Wild Salmon Policy (March 15, 2000 version). Two scientists who could not attend the meeting contributed in writing. Each scientist participating in this review has been involved in many years of research, management or policy with respect to *Oncorhynchus* and *Salmo* species.

What follows is our general consensus about the proposed policy.

To begin with, we are pleased that Fisheries and Oceans Canada is setting about the work of establishing clear policy to guide decision-makers in the protection and conservation of Pacific salmon. Under existing policy, Pacific salmon populations have declined over much of their range. We have lost unique genetic stocks and experienced the social and economic disruption of the closure of much of the fishery. It is essential, therefore, that Fisheries and Oceans put in place a new policy that will indeed achieve the protection and conservation of wild Pacific salmon.

Unfortunately, as presently constructed, the draft policy is a flawed document. Through several critical shortcomings, it fails to ensure the protection and conservation of wild ~~Pacific~~Pacific salmon. In addition, the "principles" set out in the March 15 draft are clearly weaker than the principles devised in the original draft, which was prepared last year by Fisheries and Oceans' scientists. These would have gone further in protection. We feel that this slippage is a dangerous precedent, not in keeping with our understanding of the objectives and mission of Fisheries and Oceans.

Among the shortcomings of the March 15, 2000 document are the following:

- The document lacks a clearly stated goal around which the principles must be grouped. This allows considerable ambivalence and may in fact be why the

principles themselves lack the clarity and strength to achieve the preservation of wild salmon. None of the six principles firmly and explicitly commit Fisheries and Oceans to the protection of wild salmon. Therefore, it is important that the document open with this as its goal. The principles should then be structured to show how this goal will be achieved.

- The policy anticipates the establishment of a "conservation unit" concept in salmon-fisheries management that will place local spawning populations beyond the scope of any specific protection, and without appropriate definition, may actually place entire aggregates of wild salmon populations, which contain irreplaceable genetic information, at considerable risk of extinction.

- The policy presumes a continued reliance upon hatchery programs which are based upon unproven technologies and that may also be placing wild salmon at considerable risk.

- The principles contain no explicit direction to decision-makers arising from clearly-stated objectives. In fact, the principles would seriously qualify the conditions under which wild salmon would have priority over salmon hatcheries and salmon farms.

It was also the consensus of the scientists participating in the May 12 review that successful implementation of sound policy depends upon operational objectives and mechanisms to ensure that Fisheries and Oceans Canada can be held accountable in the achievement of those objectives. The current "Wild Salmon Policy" document contains no such objectives or mechanisms.

What follows is a detailed commentary on each of the six "principles" proposed as the basis of a wild salmon policy.

Principle One (March 15 draft): "Wild Pacific salmon will be conserved by maintaining diversity of local populations and their habitats." *Original text proposed by Fisheries and Oceans science staff in 1999: "Wild Pacific salmon will be conserved by maintaining the greatest genetic diversity of local populations and their historic range, and through preservation of their habitats."*

Our consensus is that if Fisheries and Oceans Canada intends to conserve

genetic diversity in salmon, policy must focus on conserving genetically-based adaptations in salmon populations, and not simply "genetic diversity" at a level as broad as the conservation-unit concept discussed later in this document. We recommend that Fisheries and Oceans policy be clear in identifying, as its primary policy goal, the conservation of the genetically-based adaptations that occur within and among wild Pacific salmon.

To the general public, the importance of maintaining local spawning populations of salmon will be without controversy. But a federal policy that explicitly obliges fisheries managers to ensure that their decisions do not compromise the integrity of genetically-based adaptations in wild salmon might be difficult to explain. It would be helpful, in informing public debate about these issues, to provide specific illustrations of the consequences of policies and practices that are not designed to conserve genetically-based adaptations in salmon.

One such example is the history of fisheries-management practice on the Skeena River, where intense harvesting of artificially-enhanced sockeye runs bound for the Babine watershed severely impacted upon less-productive sockeye populations, and populations of other salmon species, to the point that drastic conservation measures had to be imposed. Thompson coho represents another example. Delays in reacting to declines in abundance eventually required similarly draconian measures. Upper Adams sockeye, meanwhile, is an example of how long it can take to rebuild a population when its local genetic adaptations have been lost.

We recognize that it is difficult to identify the ways in which salmon populations have become genetically-adapted to local conditions, and that indirect evidence of local adaptation must, in many instances, be relied upon, in the absence of direct proof. However difficult this may be, this is what it means to manage natural resources in a manner informed by the precautionary principle. To conduct itself according to the precautionary principle is also an obligation the federal government accepted when Canada committed itself to the 1992 United Nations Convention on Biodiversity.

Conserving the genetic diversity of salmon at the level of local genetic adaptations is paramount, and we urge Fisheries and Oceans to develop its 'goal' statement with this in mind. The fundamental goal of a wild salmon policy must state this explicitly. Genetic adaptations are necessary so that the

fish can thrive from generation to generation. Genetic diversity is necessary so that the fish can evolve in response to changing conditions. Both must be preserved so that, in the event of a conservation disaster, extirpated local spawning populations could be rebuilt from similarly locally-adapted populations that survived.

To effectively conserve genetic diversity in salmon (including genetic adaptations and genetic variants), it will also be necessary to maintain abundant populations of salmon in as wide a variety of spawning habitats as possible. The wild stock policy defers to existing habitat policy in providing protection for wild salmon populations. Reviewers familiar with those policies expressed deep concern about the obvious inadequacy of existing departmental habitat policy, and about shortcomings in the implementation of that policy.

The goal of conserving genetic diversity in Pacific salmon appears to be the fundamental goal of Fisheries and Oceans' proposed policy. The goal of conserving genetic diversity is addressed in the first of the six principles set out in the March 15 draft. We believe this goal should be stated clearly, along the lines we propose, with the subsequent five principles structured so as to outline Fisheries and Oceans' strategy for achieving this fundamental goal.

The original wording for Principle One, devised by Fisheries and Oceans' science staff, is far preferable to the March 15 draft wording. As a further alternative, we proposed that Principle One be stated as follows:

In order to maintain social and economic benefits, wild Pacific salmon will be conserved by restoring diversity of local populations and their habitat to the greatest possible extent, and by maintaining this over the long term.

The social benefits referred to in this statement are intended to mean the profound cultural, aesthetic, and heritage value that local aboriginal and settler communities place upon specific, local spawning populations of salmon. The social benefits associated with salmon are also clearly reflected by the broadly-based desire among British Columbians and Canadians to conserve wild salmon as a fundamental component of the landscape, and as an irreplaceable aspect of the British Columbia's environment. Salmon are a part of the landscape to which we all owe a particularly solemn duty of care and stewardship.

Principle Two (March 15 draft): "Wild Pacific salmon will be managed and conserved as aggregates of local populations called conservation units."
Original text: "Wild Pacific salmon will be managed and conserved as aggregates of local spawning populations which we are calling conservation units."

The March 15 "Wild Salmon Policy Discussion Paper" document proposes that Fisheries and Oceans' make management decisions to conserve what will be called conservation units, but there is very little in the document to explain the basis upon which conservation units in salmon will be defined.

There are more than 9,000 spawning populations of wild Pacific salmon in British Columbia. For more than 40 per cent of these populations, Fisheries and Oceans Canada has no reliable stock status information. The "conservation unit" approach, as proposed, would group B.C.'s 9,000-plus salmon stocks into fewer than 100 conservation units - 10-20 for chinook and coho, fewer than 10 for pink and chum, and somewhat more than 20 for sockeye. The West Coast of Vancouver Island would comprise a single chinook conservation unit, most of the coho populations of the Fraser Basin - those that spawn below Yale - would form a single conservation unit, and so on. Many salmon biologists believe that there are more genetically unique adaptations than would be preserved by this clustering of thousands of wild salmon populations into so few conservation units.

The March 15 document defines conservation units as "aggregates of closely related populations with similar productivity and vulnerability to fisheries." Reference is made to evolutionarily distinct lineages within geographic areas, and conservation units are proposed to be established on the basis of "available information on genetic stock structure and the desired level of diversity to be maintained." The 'desired' level is not specified, and we note that there is insufficient scientific information to provide a firm specification at this time.

We believe that the criteria for defining conservation units are inadequately specified.

We recommend that conservation units be defined by a two-stage process.

First, a conservation unit must be defined in such a way as to reflect genetic integrity to the extent that, in the event that a conservation disaster causes the loss of populations or a population with a conservation unit, surviving populations within the Conservation Unit can be readily used to re-establish the lost runs. This criterion should be used to develop basic units, which should then be further subdivided so that populations within individual conservation units tend to fluctuate together, and hence can be managed effectively.

Second, a conservation unit must reflect cultural, aesthetic and heritage values, and any designation of an aggregate of spawning populations as a conservation unit must take into account the evolution of scientific understanding, as well as changes to salmon populations, their habitats, and the ecosystems within which they occur.

Principle Three (March 15 draft): "Minimum and target levels of abundance will be determined for each conservation unit." *Original text: "Minimum wild salmon abundance levels will be established for each conservation unit to prevent the extirpation or extinction of local populations. To do this, limit reference points would be established for each conservation unit and target levels of abundance will be determined for each conservation unit."*

We recommend that limit reference points should not be based solely on aggregate abundance within a conservation unit. Abundant coho in the Upper Pitt River, e.g., could raise the aggregate abundance for Lower Fraser coho above the limit reference point even when all the stocks in the urban and agricultural sections of the region were on the verge of extirpation.

Any spawning-escapement target that would allow the extirpation of local spawning populations and the conservation of only one or two healthy local populations within the unit - either of which could conceivably be partly or wholly hatchery populations - is clearly unacceptable. It would be completely contradictory to any policy which purports to be based on the conservation of genetic diversity in salmon.

A variety of criteria should be established in determining limit reference points. These criteria should take into account the number of well-established local spawning populations within a conservation unit, their geographic range,

and their contiguity. Such criteria must also explicitly include the role salmon play in ecosystem functioning. Further, the objective of "maximum sustainable yield" appears to be given an inordinately high profile as a criterion for determining abundance levels in the March 15 document.

In establishing abundance targets, it is also crucial to focus on naturally-sustained populations, rather than artificially enhanced populations.

Principle Four (March 15 draft): "Fisheries will be managed to conserve wild salmon and optimize sustainable benefits." *Original text: "Once a limit reference point for conservation is achieved, the fisheries will be managed to conserve wild salmon and optimize sustainable benefits."*

In determining management action when the abundance of salmon in a conservation unit falls below its target reference point, policy should set out certain appropriate procedures, possibly involving intermediate reference points and "triggers" based on observed declines in survival rates, to generate remedial action well before abundance approaches a limit reference point.

Principle Five (March 15 draft): "Salmon cultivation techniques may be used in strategic intervention to preserve populations at greatest risk of extirpation." *Original text: "Salmon cultivation techniques may be used in strategic intervention, i.e. enhancement may be used when necessary to preserve populations at greatest risk of extinction."*

We recommend that the March 15 draft of Principle Five make it completely clear that salmon-cultivation techniques, to preserve at-risk populations, should only be used as a last resort, and should be intended to provide temporary support while factors limiting natural survival are addressed.

Any policy which purports to be in place to conserve wild salmon must formally acknowledge that the value of hatcheries as conservation technology is unproven. If salmon-cultivation techniques are ever employed as last-resort, temporary measures, further guidelines must be developed to govern such interventions. Those guidelines must take into account the uncertainties associated with hatchery initiatives, and must also include risk-assessment procedures.

Principle Six (March 15 draft): "For specified conservation units, when

genetic diversity and long-term viability may be affected, conservation of wild salmon populations will take precedence over other production objectives involving cultivated salmon." *Original text: "Conservation of wild salmon populations will take precedence over other production objectives involving cultivation salmon."*

On this final but critical point, we strongly recommend that Fisheries and Oceans remove the qualifying conditions under which wild salmon will take precedence over the production objectives involving hatcheries and salmon farms.

As the March 15 version reads, Fisheries and Oceans Canada would not be obliged to afford priority to wild salmon over cultivated salmon unless entire, broadly defined "conservation units" had been put at such risk that they were threatened with extinction. But even then, because of the addition of the words "for specified conservation units," there is no assurance that such conservation units would necessarily be afforded priority in departmental decision-making. What all this means is that on the West Coast of Vancouver Island, for instance, wild coho would conceivably take priority over other departmental objectives only if the entire complex of coho populations between the San Juan River and Cape Scott was at stake.

Irreversibly compromising the priority afforded wild salmon is not what one should expect from a policy purporting to guide decision-makers in the conservation of wild salmon.

Clearly and obviously, this principle should read as the original text intended: "Conservation of wild salmon populations will take precedence over other production objectives involving cultivation salmon."

In conclusion, we recommend that Fisheries and Oceans Canada revisit its proposed principles for a wild salmon policy guided by the original text provided by Fisheries and Oceans' science staff, as well as this document. In addition, in light of the significance of the development of a federal "wild salmon policy" for Canada's west coast, the general public must be afforded a significant opportunity to be engaged in "consultation" on the revised document. Finally, we note that there are many scientists across Canada working on salmon conservation issues, and their input should also be solicited to help ensure that the best knowledge available is incorporated into

the Wild Salmon Policy.