

## **Recent application of Scientific Panels as a tool for addressing complex issues in Fisheries**

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## **ABSTRACT**

The expert panel model shows promise as a tool to improve the science/management interface for fisheries organizations such as NPAFC in providing timely and rigorous answers to complex and contentious questions of science. In the paper we describe two such recent processes.

## **Introduction**

The past decade has seen the emergence of ecosystem-based management (EBM) and research frameworks evolve away from what has been (and predominantly still is), a single species driven approach to fisheries assessment and management. Aquatic resource managers are challenged with assessing and managing an increasing number of human activities that potentially affect one another within an ecosystem that is experiencing dramatic change as a result of climate change and other stressors. The complexity of the questions being asked challenges the conventional approaches to fisheries science and its application to management problems. Moreover, today's high-profile scientific problems are often played out in a politically charged atmosphere of distrust and conflict.

In the past, single species assessments could be conducted by a single researcher or by a small team/program. The ability to address a changing environment could be done by working with a small number of fisheries oceanographers to model the impact on productivity. A series of peer reviewed papers published in the literature or assessments reviewed by a small panel would form the basis for fisheries advice. Larger emerging scientific issues would be addressed through workshops/symposia that would solicit selected contributions on the topic. Again, peer reviewed papers and perhaps a synthesis paper would be developed on a scale of several to many years. This is an often slow and serendipitous process, and tends to focus on a discrete problem in isolation from other problems that may share causative factors.

In addition, fisheries agencies and organizations have targeted available funding to address emerging problems as they arose in priority. These competitive processes attract collections of researchers who propose and conduct research related to a stated priority issue. Again, however, the product more often than not is a collection of peer reviewed papers that may advance scientific knowledge on a particular issue but may not always address the broader problem at hand.

The modern science/management interface must have the capability to respond quickly to answer complex questions by engaging multiple scientific disciplines applied across broad geographic, interjurisdictional and temporal scales. Recently, salmon management agencies in Canada and the United States have been increasingly using jointly-appointed scientific panels to address very specific and complex fisheries science questions from an ecosystem perspective and in an open and transparent manner. Two examples are described below.

## **Fraser Sockeye Decline Workshop**

Many Fraser River sockeye populations have experienced a decline in productivity since the early 1990's. After an unprecedented poor return in 2009 the Canadian federal government initiated a judicial inquiry into the causes of the decline. Independently, the Pacific Salmon Commission (PSC), a bilateral body concerned with the state of sockeye in the Fraser, developed a scientific process to investigate what might be causing the decline in productivity. The process was designed by a small steering committee of science representatives from both countries, a facilitator with a strong science background and the chair of the proposed science panel. The process was designed around a six month timeline to convene a single 3-day workshop and produce a report that would identify the evidence supporting or refuting specific hypotheses about what might be causing the decline. A science panel with expertise in relevant disciplines heard presentations from researchers summarizing the available information on each of ten possible hypotheses that may have contributed to the decline. The panel would then evaluate the findings and assess the plausibility of each hypothesis. In addition to the expert panel and the presenters, a number of other scientists were invited to attend and participate in the discussion and to help critique the evidence and analyses. A number of observers from interested parties, First Nations and stakeholders also were invited to attend, but generally did not participate in scientific debate.

The three day workshop was held in June 2010 in Nanaimo, B.C. Two days of presentations and discussion were followed by a third day where the panel met in deliberation. Subsequently, the panel met through several conference calls and the report was released by the PSC in August 2010. Its release was timed such that it could inform both the PSC and the ongoing Canadian federal Inquiry. In follow up, the PSC has undertaken a collaborative research effort to gather additional information on the possible causes of the decline identified in the workshop. The entire workshop is supported by detailed documentation including meeting notes and submissions that allow detailed review and can serve as a starting point for identifying and prioritizing future work.

Keys to the credibility and success of the process were:

- In-depth bilateral planning of the process with a clear and detailed Terms of Reference
- Targeted papers where authors were given strict instructions around the questions to be addressed and the relevant data to be considered.
- An multidisciplinary panel of accomplished scientists led by a respected chair scientist.
- A facilitator with a strong science background and extensive experience in scientific process design.
- Strong administrative and logistical support of the PSC Secretariat.

- The presence of invited scientists to help critique the available evidence and analyses.
- Observers helped give legitimacy and transparency to the process and the advice as the report was considered acted on by managers and decision makers.

Despite the effectiveness of the process, there are challenges with broader application, in particular the costs of facilitation, participation and administration. Scaling this type of process up to multiple jurisdictions over an even broader scale would amplify these challenges.

Table 1. Description of Expert Panel Processes

<b>Process Attributes</b>	<b>Fraser Sockeye Workshop</b>	<b>Killer Whale/Chinook Process</b>
Issues	<p>Workshop Objectives:</p> <ul style="list-style-type: none"> <li>• Explore and evaluate the likelihood of various hypotheses for explaining the decline in Fraser sockeye productivity .</li> <li>• Identify next steps of investigation or analysis that may be required to reduce critical uncertainties relating to the various hypothesized causes.</li> <li>• Provide a summary report to the PSC</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluate the effect of salmon fisheries on endangered Southern Resident Killer Whales by reducing their available prey</li> <li>• Identify critical uncertainties and means for reducing them</li> </ul>
Approach	<p>A single 3-day workshop was designed by a PSC Can/US steering committee, the expert panel chair and the facilitator. Expert panel of 8 listened to 24 submissions that were specifically requested talks. Presenters were given questions and reference data and were expected to collaborate with others with knowledge or expertise. Observers were invited to watch but not actively engage in dialogue. Panel worked several follow up days to summarize their findings and recommend future research.</p>	<p>An expert panel is charged with interacting with researchers in three workshops approximately 6 months apart to evaluate the relevant data and improve the analyses pertinent to the issue.</p>
Duration	6 months; one 3-day workshop	1.5 years; three 3-day workshops

Panel composition	8 member panel with expertise in sockeye biology, stock assessment, conservation biology, oceanography, salmon biology, freshwater biology,  Independent in that they were not engaged in direct research on the decline	7 member panel with expertise in salmon biology, fishery management, marine mammals, and predator-prey dynamics. Independent in that none are employed by the lead management /science agencies.
Facilitation	Strong meeting design and facilitation skills PLUS strong scientific background.	Strong meeting design and facilitation skills PLUS strong scientific background.
Coordination / administration	Pacific Salmon Commission Secretariat provided administrative and logistical support.	NOAA and DFO
Steering Committee	Canadian and U.S. senior managers – two from each country, Panel Chair and Facilitator.	NOAA and DFO managers and researchers plus Panel Chair and Facilitator
Outcome / Deliverables	Comprehensive report that has informed the Cohen Commission, the PSC and managers in both countries. Research recommendations for a collaborative research program is being implemented	Process is in-progress at this time, but is charged with providing a report describing the extent to which salmon fisheries, in total or part, are affecting recovery of endangered killer whales, and recommend research to reduce critical uncertainties

## Conclusion

As noted above, the expert panel approach is currently being used by NOAA and DFO in a 1.5 year process to examine the impact of salmon fisheries on the Southern Resident Killer Whale population. This population ranges from northern British Columbia to California and is listed as endangered under both Canada’s Species at Risk Act and the U.S. Endangered Species Act. Over the course of three workshops the panel will interact with researchers to critique and improve their analyses relevant to the effect of salmon fisheries on killer whale recovery.

The NPAFC could consider the application of similar expert panel approaches to addressing complex scientific questions. In the recent NPAFC Review Panel report, the panel noted that the NPAFC Committee on Scientific Research and Statistics (CSRS) has an important role in drawing attention and providing advice to non-fishing related issue such as the impacts of climate change and synthesis of stock status. They further recommended that the CSRS seek opportunities to provide advice, both internally and externally in regards to issues affecting the conservation of anadromous stocks in the convention area. A panel approach could serve to implement the NPAFC Long-term research and monitoring plan. The impacts of climate change are of interest to all countries and multiple RFMO's and Commissions. Collaboratively supported investigative panels could serve to address questions around factors affecting productivity in the north Pacific.

The expert panel model shows promise as a tool to improve the science/management interface for fisheries organizations such as NPAFC in providing timely and rigorous answers to complex and contentious questions of science. By opening up the questions to broader and independent scrutiny, it may also help gain public understanding and support for difficult management actions that must be taken.

## **References**

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