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May 31, 2007

MEMORANDUM

TO: Council Members

FROM: Erik Merrill, ISAB Project Manager, and Steve Waste, ISAB Ex Officio

SUBJECT: Independent Scientific Advisory Board (ISAB) Assignment Request — Non-native Species Impacts on Native Salmonids and Guidelines for Use of Non-native Fishes in Resident Fish Substitution Projects

Summary

This item is included on the Council's agenda to seek Council feedback and support for a proposed ISAB review of non-native species impacts on native salmonids and guidelines for use of non-native fishes in resident fish substitution projects. Council discussion of the proposed ISAB assignment is intended to aid Chairman Karier in his deliberations on the ISAB's Administrative Oversight Panel. The ISAB will incorporate Council feedback on the proposed review and subsequently will seek Oversight Panel approval to begin the assignment.

ISAB Assignment Procedures

The eleven-member ISAB serves the Council, the National Marine Fisheries Service (NOAA Fisheries), and the Columbia River Basin Indian Tribes by providing independent scientific advice and recommendations regarding scientific issues that relate to the respective agencies' fish and wildlife programs. The ISAB is governed by an Administrative Oversight Panel consisting of the Council Chair; a senior representative of the Columbia Basin Indian Tribes (Olney Patt Jr.); and the Regional Administrator of NOAA Fisheries (D. Robert Lohn) and the Director of the Northwest Fishery Science Center (Usha Varanasi) as joint participants. The Oversight Panel's primary responsibilities are to appoint ISAB members and approve the ISAB's work plan.

The ISAB has terms of reference and review protocols that establish how ISAB assignments are generated and conducted. Generally, the Council, NOAA Fisheries, or Tribes request reviews. In addition, regional entities can make requests, and the ISAB can self-generate assignments. Review strategies and questions are developed in an iterative process between the ISAB and Ex

Officio representatives from the Council, NOAA Fisheries, and Tribes. The Oversight Panel has final approval authority on assignments.

The Proposed ISAB Review

This proposed non-native species review is essentially a self-generated project, but it has close ties to the ISAB's general charge to "evaluate the Council's Fish and Wildlife Program on its scientific merits in time to inform amendments to the fish and wildlife program and before the Council requests recommendations from the region."

For the review, the ISAB proposes to:

- review and describe biological impacts and risks to native salmonid populations from non-intentionally and intentionally introduced species;
- review and describe the current status of management actions taken towards reducing or eliminating such impacts (e.g., brook trout and lake trout eradication efforts);
- recommend strategies for protecting against or eliminating invasive species; and
- recommend scientific guidelines for using resident fish substitutions.

The review will focus on fish species but will also generally discuss other species such as invasive aquatic plants and invertebrates. Moreover, given the four month review time frame, the ISAB intends to cover invasive species issues at a general level and provide a more detailed review of non-native resident fish issues. The ISAB's proposed review is fully described in the attached memo below. The Council's input on the review scope and set of questions is requested.

In addition to Council input, the ISAB is seeking input from NOAA Fisheries and the Tribes. The ISAB is especially interested in feedback from the upriver tribes because of their interest in resident fish substitution programs.

Significance

The ISAB review should usefully inform the Council's program amendment efforts and help the Council develop guidelines for implementing measures in the Fish and Wildlife Program to minimize future impacts from invasive species. This report will also help to frame scientific guidance and propose criteria for deciding the limitations and appropriate use of non-native fishes to mitigate hydrosystem losses through resident fish substitution projects. The review should also be applicable to the Fisheries Service's and Tribes' management and planning efforts.

Budgetary

The ISAB operates on an annual budget, independent of the Council's budget, funded by the Bonneville Power Administration through the Fish and Wildlife Program. Costs associated with ISAB member services and travel to complete the reviews will be covered under the ISAB's existing budget of \$550,000 for Fiscal Year 2007. In the event the reviews are not complete by

September 30, 2007, costs will be covered under the ISAB's Fiscal Year 2008 budget. No additional funds are requested. Based on similar past projects, the estimated costs are \$35,000.

ISAB Work Plan Impacts

In addition to this assignment, the ISAB will continue to be available to conduct scientific reviews on pressing fish passage, biological opinion development, and recovery planning issues. Current ISAB assignments include reviews of the Salmonid Field Protocols Handbook, NOAA Technical Recovery Team's viability criteria and might include a follow-up review to previous ISAB reviews of NOAA's COMPASS model, if so requested. The non-native species review should not interfere with the ISAB's current or anticipated reviews.



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DRAFT MEMO - May 31, 2007

To: ISAB Administrative Oversight Panel
Tom Karier, Chair, Northwest Power and Conservation Council
Olney Patt, Jr., Executive Director, Columbia River Inter-Tribal Fish Commission
Usha Varanasi, Science Director, National Marine Fisheries Service, Northwest Fisheries
Science Center, and
Bob Lohn, Regional Administrator, National Marine Fisheries Service, Northwest Region

From: Nancy Huntly, ISAB Chair

Re: Independent Scientific Advisory Board (ISAB) Assignment Request – Non-native
Species Impacts on Native Salmonids and Guidelines for Use of Non-native Fishes in
Resident Fish Substitution Projects

Requested Action

The ISAB seeks the ISAB Administrative Oversight Panel’s approval to undertake a review with the following tasks and objectives:

- review and describe biological impacts and risks to native salmonid populations from non-intentionally and intentionally introduced species;
- review and describe the current status of management actions taken towards reducing or eliminating such impacts (e.g., brook trout and lake trout eradication efforts);
- recommend strategies for protecting against or eliminating invasive species; and
- recommend scientific guidelines for using resident fish substitutions.

The review will focus on fish species, particularly resident fish, but will also generally discuss other species such as invasive aquatic plants and invertebrates.

Any comments or additional questions from the Oversight Panel for the ISAB to consider are welcome. The ISAB expects that the ISAB Ex Officios can inform the ISAB of the Oversight Panel’s input and decision on the review. The ISAB would like to initiate this review as soon as possible in order to complete it by September 30, 2007, to inform the Council’s program amendment process.

Significance

The proposed report will summarize the state of knowledge of non-native fish species impacts on Columbia River ecosystems. A detailed discussion of this issue will help the Council develop guidelines for implementing measures in the Fish and Wildlife Program to minimize future impacts from invasive species. This report will also help to frame scientific guidance and propose criteria for deciding the limitations and appropriate use of non-native fishes to mitigate hydrosystem losses through resident fish substitution projects.

Background

Resident Fish Substitution

At its October 2006 meeting, the ISAB reviewed and discussed a memo received from the ISRP that described several resident fish substitution issues that arose during the FY 2007-09 project review. During the review, the ISRP examined a number of resident fish substitution proposals that contained elements that appeared inconsistent with scientifically accepted conservation biology practices and were also possibly inconsistent with the general guidelines of the Council's Fish and Wildlife Program.

The Council's Program recognizes construction of Grand Coulee Dam on the Columbia River in 1941 and Hells Canyon Dam on the Snake River in 1967 completely blocked 18,700 miles of streams that had been accessible to anadromous salmon. This blockage is believed to represent approximately 38% of 49,300 miles of stream habitat accessible before hydroelectric dam construction. The Council's Program provides that anadromous fish losses due to the blocked areas need to be mitigated in part by assuring that populations of resident fish species remain healthy. Guidance for the biological objectives of that mitigation includes:

Restore native resident fish species (subspecies, stocks, and population) to near historic abundance throughout their historic ranges where original habitat conditions exist and where habitats can be feasibly restored.

A part of that mitigation includes "Resident Fish Substitution," where non-native species are provided in lieu of extirpated anadromous species:

*Administer and increase opportunities for consumptive and non-consumptive resident fisheries for native, **introduced** [emphasis added], wild, and hatchery reared stocks that are compatible with the continued persistence of native resident fish species and their restoration to near historic abundance (includes intensive fisheries within closed or isolated systems) (2000 Council Program).*

Further, the 2000 Program adopts an artificial production strategy to "replace lost salmon and steelhead in blocked areas." These programs are to be executed consistent with the Council's Artificial Production Review policies that include:

Appropriate risk management needs to be maintained in using the tool of artificial propagation, and;

Decisions on the use of artificial production need to be made in the context of deciding on fish and wildlife goals, objectives and strategies at the subbasin and province levels.

The ISRP found that these broad Fish and Wildlife Program guidelines/elements do not establish the specific limits (i.e., how much risk) or the methods (i.e., risk management protocols) to evaluate whether a proposed project is reasonably benign and likely to provide benefits without undesired consequences. Clear risk management criteria are needed for sponsors to follow when developing proposals for resident fish substitution projects and for the ISRP to use when reviewing such proposals. The ISAB agreed that this was an important issue and that they would pursue this assignment and work toward developing these criteria and guidelines.

Invasive Species

In addition, the ISAB wished to expand this review beyond the resident fish substitution issues to include a discussion of invasive species, as well as the status of management actions taken to reduce or eliminate introduced species such as brook trout, walleye, and lake trout.

It is generally accepted that the current impacts and future threats from invasive species represent one of the major impediments to restoration of native salmonids in the Columbia River Basin. There have been many recommendations for the Council to address the invasive and introduced species issues, and several examples are given below:

(1) ISRP Retrospective Report 1997-2005 (ISRP 2005-14¹). In subsection Exotic Species as Salmon Predators and Competitors (pp. 51-53), Recommendation: “The Council should do all in its power to limit the introduction of exotic species into the Columbia River Basin and to explore ways that exotic species interactions with salmonids and other native species can be minimized.”

(2) Stanford et al. 2006², Return to the River, Status of Freshwater Habitats Chapter, Recommendation #5: “If the restoration goal of the Fish and Wildlife Program and other efforts includes conservation and enhancement of remaining native and naturally reproducing salmonids, all stocking of non-native biota should be stopped in habitats used by or hydrologically connected to habitats required by all life stages of native salmonids (resident and anadromous). Carefully evaluated mechanisms to reduce or eliminate the reproductive capacity or dispersal of non-native species in native habitats should be implemented if riverine controls (e.g., by restoration of flushing flows) prove ineffective in controlling non-native species.”

(3) Council’s Research Plan (2006-3³), in the Research Needs section the recommendation is made that “Research is needed to identify pathways of introductions and related preventative actions that can reduce the risks of introductions and spread of non-native species.”

¹ www.nwcouncil.org/library/isrp/isrp2005-14.htm

² Williams, R. N. (editor). 2006. Return to the river: restoring salmon to the Columbia River. Elsevier Academic Press, London. 699 p.

³ www.nwcouncil.org/library/2006/2006-3.htm

Questions to Address

The following questions will be considered in this ISAB review. Given the four month review time frame, the ISAB intends to cover invasive species issues at a general level and provide a more detailed review of non-native resident fish issues.

Invasive Species

- What is known about the history of invasive species in the Columbia River Basin? What are the major factors associated with expanding distribution of non-native species? What are the common vectors?
- What is known about the current status, in terms of population levels and locations, of non-native fish throughout the Basin?
- What geographic locations within the Columbia River Basin are at highest risk to threats from invasive species?
- What impact will climate change effects have on the spread and effects of introduced and invasive species?
- What impact will human population growth and development have on the spread and effects of introduced and invasive species?
- What about use of barriers in fishways to limit American shad passage at mainstem dams in the Columbia River Basin?
- What are the risks to native salmonids from farmed salmon (e.g. Atlantic salmon)?
- Are there instances where parasites or diseases were or are being transmitted to native species from introduced species? If there are examples, what is the prognosis for the disease in natural populations of native organisms?
- What are the risks to native salmonids from other non-fish invasive species, such as invertebrates and aquatic macrophytes?
- What are the effects and implications of non-native fishery management, including management of bass and walleye fisheries in the lower Basin?
- What are potential strategies for protecting against or eliminating invasive species? What are the limits to these strategies' effectiveness — can invasive populations reasonably be controlled?

Resident Fish

- What is known about the potential of non-native resident fishes to prey upon or compete with native species?

- What is known about the dispersal of substituted species to areas where they were not intended to be?
- What are the effects of non-native or hatchery resident fish species on the food webs of streams and lakes where they are stocked?
- What is the status of native fish in the blocked areas that are used for subsistence and sports fisheries? Given the altered habitat in the blocked areas, could these fish sustain subsistence and sports fisheries?
- How should habitat conditions in the blocked area be factored into a scientific analysis of whether to use non-native versus native species for mitigation purposes? For example, what is the potential for blocked-area habitats to support native fish?
- What are, and how extensive are, genetic effects from non-native species interbreeding with natives (e.g., bull trout and brook trout; hatchery rainbow trout and native redband or cutthroat trout)?
- How effective are barriers in reducing threats to bull trout from brook trout and what are the risks in using barriers?
- What are the goals for economic and cultural benefits of substituted species relative to the economic costs of the substitution program?

Impact on the ISAB's Budget and Work Plan

The ISAB review should take approximately four months. Based on similar past projects, the estimated cost for completion is \$35,000. For both components of the review, the ISAB may request briefings to provide background data regarding use of resident substitution species and updates of distribution data regarding invasive species. The review should not interfere with other ongoing or anticipated FY 2007 ISAB reviews.

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