Review of Research, Monitoring and Evaluation and Artificial Production Projects

Recommendations of the Council

Part 4: Council explanations addressing the formal requirements of Section 4h(10)(D) of the Northwest Power Act

July 2011

Introduction

Pursuant to Section 4(h)(10)(D) of the Northwest Power Act, the Northwest Power and Conservation Council has been engaged in a review of research, monitoring and evaluation and artificial production projects that implement the Council's *Columbia River Basin Fish and Wildlife Program*. This document contains and explains the Council's recommendations to the Bonneville Power Administration for the funding and implementing of these projects for Fiscal Years 2012 through 2016.

Part 1 below provides the background on the review, including the description of these two categories, the projects reviewed, and the review process.

Part 2 covers programmatic issues. As has been true in the past, the review of the individual projects illuminates a set of broader policy or programmatic issues that affect the Council's review and recommendations for a collective set of the projects. Part 2 describes these programmatic issues and the Council's recommendations for resolving these issues.

Part 3 of this document contains and explains the Council's recommendations for the funding and implementation of the individual projects, along with a description of the form and duration of the recommendations. Associated with this part of the decision document is a set of spreadsheets that list the projects reviewed in this category, with Bonneville's FY 2012 planning budgets and other information, and with comments about each project as developed during this review. The tables include a Council recommendation for each project, as well as conditions or comments to be considered a part of the recommendation, more fully explained in Part 3.

Finally, Part 4 will contain the formal explanations by the Council responsive to the specific requirements of Section 4(h)(10)(D) of the Northwest Power Act. This includes the written explanations required of the Council in those few instances in which the Council's project funding recommendations do not follow the recommendations of the Independent Scientific Review Panel. The Council will also explain how it complied with the requirements in Section 4(h)(10)(D) to "consider the impact of ocean conditions on fish and wildlife populations" and "determine whether the projects employ cost-effective measures to achieve program objectives" when making project funding recommendations.

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Explanations as to how the Council responded to the recommendations of the Independent Scientific Review Panel

Section 4(h)(10)(D) requires the Council to "fully consider the recommendations of the Panel when making its final recommendations of projects to be funded through BPA's annual fish and wildlife budget." If the Council "does not incorporate a recommendation of the Panel, the Council shall explain in writing its reasons for not accepting Panel recommendations." Finally, "[t]he Council, after consideration of the recommendations of the Panel and other appropriate entities, shall be responsible for making the final recommendations of projects to be funded through BPA's annual fish and wildlife budget." The Council has carefully and fully considered the project review reports of the ISRP, and with the few exceptions explained here, the Council has followed the panel's recommendations in formulating the Council's project funding recommendations.

Kelt Reconditioning and Reproductive Success Evaluation Research, Project #200740100, Columbia River Inter-Tribal Fish Commission

Steelhead Kelt Reconditioning, Project #200845800, Yakama Nation

The ISRP remains skeptical of the promise of the kelt reconditioning effort, recommending again against implementing these projects. This is not the first time the Council has faced this issue. These projects began just in 2007 and 2008, and each time the ISRP reviewed them unfavorably. The Panel understands the potential attractiveness of the kelt reconditioning concept. But the Panel has been concerned that the concept has not developed sufficiently to be able to project benefits to the fish populations and is concerned about the ecological and life history diversity issues raised by reconditioning. At the time the projects began, the Council reviewed all of the information, including the ISRP's conclusions and comments after a lengthy period of review, and decided that the concept had sufficient promise to recommend careful implementation of the research study design for a defined period of time, through 2014. *See, e.g.*, the Council decision on the review of the Yakama Nation kelt project (#2008-458-00), letter dated January 13, 2010, explaining why the Council chose to recommend implementation of the research despite the ISRP's negative review.

Because the review of these projects had been so recent, the projects were included in the category review only for reasons of context, that is, so as to be able to look at all the production and research projects together. The issues identified by the ISRP in this review are the same as before, and the Council considered and addressed those in its earlier recommendation. And the Council's project recommendations remain the same: Implement the research effort through 2014. Implementation beyond 2014 will be based only on ISRP and Council review of the results report and recommendation of future work.

Mid-Columbia Reintroduction Feasibility Study, Project #199604000, Yakama Nation

The situation with this project is similar to the kelt reconditioning project above. The mid-Columbia coho production initiative has been part of the Council's "Step Review" process for more than a decade. The latest decision by the Council in March 2010 asked the sponsor to move to the design phase even while addressing issues the ISRP still has with the conceptual master plan. The project was included in the category review for context only, to bring all production programs together at one time, and so the ISRP noted the issues to which it is still awaiting responses. That said, the development path the project is on was settled in the March 2010 decision, not in this review. *See* the Council decision on the review of this project, letter to Bonneville dated March 10, 2010.

Listed Stock Chinook Salmon Gamete Preservation, Project #199703800, Nez Perce Tribe

The project sponsor proposed two work objectives for this project -- to maintain secure storage facilities for cryopreserved gametes and to assist hatcheries with the use of cryopreserved gametes for broodstock management or population recovery. The ISRP concluded that the project met scientific criteria, albeit with technical qualifications that would need to be addressed before implementation, especially with regard to the second objective. The Council decided to recommend only the first objective for implementation. As the ISRP noted, the "most support is to keep the samples frozen in good shape in two local universities and now to also include the federal cryopreservation facility in Colorado." The technical concerns raided by the ISRP about the proposal to use the gametes added to the Council's inclination that implementing the second objective was too low a priority for Program funds at this time.

Assess Reintroduction of Anadromous Fish in Burnt, Powder & Malheur Rivers, Project #200820400, Confederated Tribes of the Umatilla Indian Reservation

The ISRP found this project to be qualified in part on technical grounds. The Council recommends not implementing the project given that reintroduction studies for these basins have already been performed as part of the Hells Canyon relicensing process, and so the proposed work here appears redundant and certainly not a priority for Program implementation at this time.

Impact of American Shad in the Columbia River, Project #200727500, U.S. Geological Survey

The project sponsor proposed to continue this research project into the future. The ISRP concluded that the project met scientific criteria, albeit a conclusion was "qualified" in certain ways. The Council decided instead to recommend not implementing this project further. The technical merits of the research may be adequate, but this is really a question of priorities. The Council approved this project originally for a defined study of a set number of years. The research as designed concludes in FY2011. More of the same research is unnecessary; the question now would be to review the project's final report and consider what has been learned and whether any particular management decisions are implicated justifying a further Program focus on shad.

Mitigation of Marine-Derived Nutrient Loss in Central Idaho, Project #200733200, Idaho Department of Fish and Game

Similar to the last project, the project sponsor here proposed to continue this research project into the future. The IRSP concluded that the project met scientific criteria. The Council decided instead to recommend against further implementation. This research project completed its original objectives, and the Council deemed it a low priority to evolve the study design further.

Coastal Ocean Acoustic Salmon Tracking (COAST), Project #200311400, Kintama Research

The project sponsor proposed to continue this ocean research project for another three years. The ISRP review yielded a Panel conclusion that the project meets scientific criteria, although that conclusion was "qualified" and the ISRP raised a number of technical issues with the project. The Council ultimately recommended that the project be funded in FY2012 only to participate with other ocean research projects in preparing a synthesis report on the state of the ocean research, and that no further research be conducted. The Council concluded that this has been an expensive research project that has already had six years of funding and research, and was intended to be a demonstration project only but it remains in the "proof of concept" stage after several years of funding. Moreover, the project is largely focused on what is now a lower priority issue of the delayed mortality effects of transportation vs. in-river migration. And those concerns are combined with the significant technical issues noted by the ISRP, technical issues that seem unnecessary to address unless and until a priority for the work is identified. Thus the Council concluded that it was best for the Program to recommend that "[i]n FY2012 implement only to participate in the completion of the coordinated synthesis report per programmatic issue #5. ISRP and Council review of synthesis report to determine if there is a critical need for new work beyond FY 2012."

Consideration of ocean conditions

Section 4(h)(10)(D) provides that "in making its recommendations" to Bonneville, the Council is to "consider the impact of ocean conditions on fish and wildlife populations." Congress provided no other guidance as to the meaning of this consideration. The Council's initial policy response to this charge came in an issue paper titled *Consideration of ocean conditions in the Columbia River Basin Fish and Wildlife Program* (Council Document No. 97-6; http://www.nwppc.org/library/1997/97-6.htm). This paper continues to guide how the Council responds to the direction to consider ocean conditions in its project funding recommendations.

Our regional understanding as to how ocean conditions affect Columbia River salmon populations in both the short- and the long-term continues to increase and yet is still quite uncertain. Our increasing knowledge does include greater appreciation for the impact of the ocean on salmon abundance and the degree of variation in the marine environment. As species and as groups of populations (meta-populations), salmon are sufficiently productive under natural conditions to cope with the mortality, and the variations in mortality, they experience during that portion of the life-cycle that takes place in the ocean. The key scientific principle guiding the Council's consideration is that salmon handle environmental variation throughout their life cycle and over time, including within the ocean portion of their lives, by having a broad array of biological characteristics within and between populations. This biological variation provides different options for salmon to survive environmental variability.

In addition, while the fish and wildlife program and projects cannot influence the ocean environment, actions can be taken to improve water quality and habitat in the estuary and near-shore environments. These transition zones are critical to the survival of young salmon.

Consequently, the Council's 2009 Fish and Wildlife Program describes the ocean environment as an integral component of the Columbia River ecosystem. The primary strategy called for in the program is to "identify the effects of ocean conditions on anadromous fish survival and use this information to evaluate and adjust inland actions." The Fish and Wildlife Program then included set forth two strategies to guide the program's activities with regard to the freshwater plume, the near-shore ocean, and the high seas:

1. Manage for Variability

Management actions should strive to help anadromous fish and other species accommodate a variety of ocean conditions by providing a wide range of life history strategies. Continue monitoring and evaluation of the Columbia River plume and ocean conditions for impacts on salmonid survival. Monitor salmon returns and climate-change impacts on ocean conditions in order to identify factors affecting survival in the ocean and plume.

2. Distinguish Ocean Effects from Other Effects

Monitoring and evaluation actions should recognize and take into account the effect of varying ocean conditions and, to the extent feasible, separate the effects of ocean related mortality from that caused in the freshwater part of the life cycle.

The Fish and Wildlife Program's biological objectives for population and environmental characteristics and its strategies for the mainstem, estuary, habitat, and artificial production add further consideration of relevance. Taken together, the three primary ways the Council acting under the program can take into account ocean conditions in general and influence salmon survival in the ocean are to evaluate proposals and recommending funding for projects that: (1) further improve our understanding of the effects of ocean conditions on salmon populations; (2) improve productivity and preserve and extend life-history diversity in salmon populations; and (3) improve estuarine and near-shore conditions.

Turning to this particular review, only the first two paths are at all relevant. With regard to the artificial production projects under review, we do not yet have enough information to synchronize artificial production activities neatly to ocean conditions for optimum management. But the Program sanctions the use of artificial production for salmon and steelhead only as part of a coordinated production and habitat effort aimed ultimately at improving the abundance, productivity and diversity of natural spawning populations. There are obvious challenges in meeting that goal. But the Council's recommendations to continue implementation of the production projects are based in part on a judgment that a rational hypothesis remains viable linking these production activities to ultimate improvements in productivity and diversity.

Most relevant, one central element of this review has been to evaluate the research and monitoring and evaluation projects (and other information) to evaluate whether we are making progress in "improv[ing] our understanding of the effects of ocean conditions on salmon populations." *See* the programmatic issues on the estuary (#3) and ocean research (#5). In both cases, the Council concluded that it is time for a synthesis of the monitoring and evaluation and research information on the ocean, near-shore plume, and estuary to uncover just what we are learning about the ocean and its effects on salmonid populations.

Cost-effectiveness measures

Section 4(h)(10)(D) further provides that in making the project funding recommendations, the Council is to "determine whether the projects employ cost-effective measures to achieve program objectives." As with the command to "consider ocean conditions," Congress did not provide any further explanation or guidance as to the meaning of this provision. The legislation did not specify any particular approach to cost-effectiveness analysis or define in any particular what is meant by a "cost-effective measure." The provision does not require, for example, the use of a single measure of biological effectiveness as a basis for comparison among projects, nor the use of strictly quantitative analysis. And while the logic of the Council's program might focus most of the cost effectiveness analysis among and between project proposals, the literal wording calls for a cost-effectiveness analysis only *within* projects, that is, whether any particular project employs the best of possible alternative methods to meet its objectives.

Given this context, the Council has worked over the years to understand the state of the art in natural resource economics and cost-effectiveness analyses to help guide the Council in making the determination required. Soon after Congress adopted this amendment to the Power Act in 1997, the Council, with the help of its staff economists and its newly-formed Independent Economic Analysis

Board (IEAB), developed an approach to the cost-effectiveness analysis in a document tiled *Methods of Economic Analysis for Salmon Recovery Programs*, Council Document No. 97-12 (July 1997) ("methods analysis"). The Council first used this methods analysis to initiate the cost-effectiveness determination in the project review process for Fiscal Year 1998. It remains the basis today for the analysis and determination.

The methods analysis concluded that several problems make it difficult for the Council to undertake a quantitative cost-effectiveness comparison between Columbia River fish and wildlife projects using a single, quantified measure of benefits to determine which projects produce the greatest benefits per dollar. The problems include the lack of agreement on measures of biological effectiveness; the fact that the complex life-cycle of anadromous and resident fish makes it difficult to isolate the biological effects of particular activities or to compare different biological effects of different kinds of projects; and the fact that in the project review process, different project sponsors propose vastly different types of activities, and thus different kinds of cost and economic information, which makes cost comparisons difficult.

These observations remain valid. Based on the methods analysis and the IEAB's concurring advice, and on the intervening years of experience, the Council continues to conclude that it is not able to undertake a classic, quantitative cost-effectiveness comparison of the projects, let alone of alternative measures available to an individual project. This is primarily due to the fact that we cannot directly quantify improvements (and especially direct projected improvements) to fish and wildlife populations in a single biological objective measure resulting from the physical effects of particular projects. There are sound reasons to believe projects produce benefits to fish and wildlife, as explained below, but not in a directly predictable single quantity. A quantitative cost-effectiveness comparison would require a far greater understanding of the direct biological effectiveness of individual actions than we have now.

The methods analysis noted, however, that there is much more to cost effectiveness than a quantitative comparison of the costs of alternative ways to achieve a single biological objective. Much can be done to review the efficiency of projects, to improve the likelihood that the projects selected will be the most cost effective, and to improve project management. Cost-effectiveness review drives toward procedures for project review, selection, and management that emphasize efficiency and accountability.

Based on these considerations, the methods analysis recommended four strategies to improve the likelihood that the projects recommended for funding are those that employ cost-effective measures to the greatest degree:

Strategy 1: The best assessment of the effectiveness of fish and wildlife projects comes from the review by the Independent Scientific Review Panel (ISRP).
Strategy 2: Improve the amount, quality, and comparability of project cost information.
Strategy 3: Evaluate the record of existing projects over time. Projects that have been ongoing for some time should have yielded some measurable effects or have contributed some concrete addition to the region's knowledge about fish and wildlife problems.
Strategy 4: Introduce selective audits on projects, oriented toward determining whether the contracting process contains the procedures necessary to manage the project's cost and effectiveness.

The Council's experience over the years has added to or elaborated on this set with three further strategies: (1) clarify, specify, and quantify program objectives as much as possible; (2) develop other elements of project review besides ISRP review that also provide accountability benefits; and (3) flag certain projects and programs for more in-depth review of benefits and costs.

The Council acted consistent with these strategies in the just-completed review of the research, monitoring and evaluation and artificial production projects. In particular, the Council relied heavily on the views of the independent science panel in shaping its recommendations, selected certain program areas for further synthesis and review in order to evaluate just how effective key program areas are, and used this review both to evaluate projects over time and also to call for improvements in reporting in order to have a better basis for evaluating projects over time.