CALFED Science Program PSP Grant
Supplement Proposal
Technical Selection Panel Review

Grant Supplement Identification: *Sedlak*

Applicant Organization: University of California, Berkeley

Grant Supplement Title: Identifying the Causes of Feminization of Chinook Salmon in the Sacramento and San Joaquin River System

Original Grant (Year): Identifying the Causes of Feminization of Chinook Salmon in the Sacramento and San Joaquin River System (2004)

Review

The following review form has been broken down into three subsections: (1) technical review criteria, (2) value added review criteria, and (3) funding recommendation. It includes a review and summary rating for each of these subsections using all review criteria. Technical criteria is separated from the value added criteria because these issues will be weighed separately, but with equal importance. No supplement proposals will be funded that are rated inadequate in either criteria.

Subsection 1: Technical Review

Review about the technical merit of the supplement proposal. Criteria for consideration are:

Technical Review Criteria

- ***Purpose:*** *Are the goals, objectives and hypotheses of the supplement proposal clearly stated and internally consistent?*
- ***Background:*** *Is the underlying basis for the supplemental work clearly explained and well documented?*
- ***Approach:*** *Is the approach to the supplemental work well designed and appropriate for meeting the objectives of the supplemental project? Is it clear who will be performing supplemental tasks including management and administration of the project and are resources set aside to do so?*
- ***Feasibility:*** *Is the approach for the supplemental work fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives and within the grasp of authors?*
- ***Budget:*** *Is it clear how much each aspect of the supplemental work will cost*

including each task, salaries, equipment, etc.? Is the budget reasonable and adequate for the work proposed?

- ***Qualifications:*** *Is the project staff qualified to efficiently and effectively implement the supplemental project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?*
- ***Past Performance:*** *Unless informed otherwise by CALFED staff, reviewers should assume that the applicants have met the commitments indicated on their existing CALFED grant/contract.*

Technical Review Summary

The technical review of this supplement proposal is provided in the space below and addresses each of the technical review criteria (above), including strengths, weaknesses, and specific reasons supporting the evaluation.

The PIs, who are both top notch and productive researchers in the field of endocrine disruption and ecotoxicology in general, propose continuation of large ambitious sampling program for estrogenic compounds that can elicit feminization in Chinook salmon and other fishes. Because estrogenic compounds can come from diverse sources within the system (dairies, graze lands, feedlot farms, wastewater), a broad survey approach was justified. Bioassays were linked to the monitoring to ensure that estrogenic compounds were in fact causing relevant biological responses. Two bioassay approaches are proposed – in vitro and in vivo. Background on what these two different approaches was limited and caused some difficulty in reviewing the proposal.

A noteworthy discovery during this period--though not part of this award--was that feminization in California and north-west Chinook salmon had in fact not occurred, but was related to a Y-chromosome marker unassociated with gender expression. Still, evidence for other fishes indicates that estrogenic compounds could pose other types, threats to Chinook salmon and other native species.

To date 115 samples across 15 sites have been collected from the Delta region; most samples were apparently below threshold values for estrogenic compounds, but a few locations showed relatively high concentrations of estrogens, comparable to wastewater effluent sites. High estrogenic activity was observed at six of 15 sites in two different bioassays that the PIs argue could lead to feminization in salmonids in the Delta. They also conducted exposure studies that showed Chinook are much more sensitive to endocrine disruption in comparison to rainbow trout.

In new work, the PIs propose to (1) continue to investigate which particular compounds contribute to estrogenicity in the bioassays; (2) evaluate the extent of estrogenic contamination; (3) evaluate possible sources of estrogenic compounds; (4) explore management options. Two sites in particular have been identified to have shown high estrogenic activity, for which the PIs would like to sample in

additional years. Further, they propose to conduct an exposure study of in situ water in a laboratory rearing study on rainbow trout. Such a study could support future caging studies.

The observation of enhanced reproductive sensitivity to estrogenic compounds in Chinook is intriguing and potentially important and merits continued investigation. Still, there was insufficient evidence that additional sites and bioassays would lead to defensible inferences regarding sources of estrogenic compounds. Further, the exploration of management options was given no explication. The budget seemed reasonable, although additional justification for involvement of two postdoctoral scientists—their respective roles and interactions should have been provided.

Technical Rating Criteria

Rating of the technical merit of the supplement proposal based on the following scale:

- ***Superior:*** *Outstanding in all respects with no technical concerns. Complete confidence proponents will accomplish the project goals.*
- ***Above Average:*** *A very good proposal with no significant technical concerns. Very confident proponents will accomplish the project goals.*
- ***Sufficient:*** *A reasonable proposal with some technical deficiencies but nothing critical. Fairly confident proponents will accomplish most of their project goals.*
- ***Inadequate:*** *A technically deficient proposal with serious impediments or concerns. Little confidence proponents will accomplish many project goals.*

Please **X** the appropriate technical rating:
_____Superior
_____Above Average
___**X**__Sufficient
_____Inadequate

Explanation of rating and additional comments:

There was insufficient evidence that adding sampling sites and bioassays would lead to defensible inferences regarding sources of estrogenic compounds. Additionally, the exploration of management options was given no explication.

Subsection 2: Value Added Review

Review about the value added of the supplement proposal. Criteria for consideration are:

Value Added Review Criteria

- ***Purpose:*** *Is the new study justified relative to existing knowledge? Are new results likely to add to the base of knowledge? Is the supplemental project likely to generate novel information, methodology, or approaches? Is it clear how the purpose of the supplemental work differs from the work in the existing grant/contract?*
- ***Relevancy:*** *Is it clear how the supplement proposal evolved from and relates to the existing grant/contract? Does the supplement proposal clearly and directly address one or more of the objectives/priorities in the existing grant/contract? Does the supplement proposal identify new relevancies to CALFED priorities not identified in the existing grant/contract?*
- ***Timeliness:*** *Does the supplement proposal clearly illustrate the need for immediate funding before the next Science Program PSP cycle (1 to 2 years)?*
- ***Approach:*** *Is it clear how the approach of the supplemental work differs from and adds to the work in the existing grant/contract?*
- ***Products:*** *Are products of value likely from the supplemental project that differ from those proposed in the existing grant/contract? Is there a plan for widespread and effective dissemination of information gained from the supplemental project?*
- ***Budget:*** *Is it clear that supplemental funds are going to new or revised tasks or equipment relative to those proposed in the existing grant/contract? Considering the amount of funding requested in the proposed budget, is there a high value in terms of knowledge gained for the CALFED Program relative to other proposals you are familiar with (i.e. "bang for the buck")?*

Value Added Review Summary

The value added review of this supplement proposal is provided in the space below and addresses each of the value added criteria (above), including strengths, weaknesses, and specific reasons supporting the evaluation.

The issue of effects of estrogenic compounds to Chinook and other living resources in the Sacramento-San Joaquin River watershed is clearly relevant and a complex issue requiring the sophisticated bioassay approaches the PIs call for. Continued efforts to identify estrogenic compounds and conduct additional site-specific bioassays are feasible and in keeping with past performance and approaches. The exposure study is new and could lead to more ambitious in situ studies of exposure and effects, but was not adequately described. The supplemental work does not seem to depart much from the original course of work and as such, there was not a compelling argument related to timeliness or relevant new or emerging products from the supplement. The strongest justification seems to be to permit continued progress in applying the bioassays to evaluate possible sources of estrogenic compounds and initial development of in situ exposure studies that will permit PIs to address the feasibility of more ambitious in situ studies in the field.

Value Added Review Rating

Rating of the value added merit of the supplement proposal based on the following scale:

- ***Superior:*** *Outstanding scientific value with a pressing need for immediate funding and expected to add substantial new thinking/concepts to our knowledge/understanding on one or more highly relevant CALFED topics for a very reasonable supplemental cost.*
- ***Above Average:*** *At least high scientific value and a clear need for rapid funding. Expected to add solid basic new thinking/concepts to our knowledge/understanding on one or more highly relevant CALFED priority research topics for a very reasonable supplemental cost.*
- ***Sufficient:*** *A supplement proposal with a fair amount of scientific value and need for timely funding and expected to add some basic new thinking/concepts to our knowledge/understanding on one or more adequately relevant CALFED topics for a reasonable supplemental cost.*
- ***Inadequate:*** *A supplement proposal that has little scientific value or need for timely funding. Not expected to add significant new thinking/concepts to our knowledge/understanding on relevant CALFED topics or the supplemental cost is unreasonable for the knowledge gained.*

Please select the appropriate rating with an **X**:
_____Superior
_____Above Average
_____Sufficient
___**X**__Inadequate

Explanation of rating and additional comments:

It is good and important work, but not much is value added. A proposal such as this may be more appropriate later on as a full proposal after they have completed their first proposal. The applicants should continue their work on their existing proposal and these results could be valuable to inform their in-situ experiments and create a stronger proposal in the future.

Subsection 3: Funding Recommendation and Justification

Funding recommendation for this supplement proposal and a justification of this recommendation.

Select one of the following three funding recommendations with an **X**:
_____Fund in Full
_____Fund with modifications
Suggested Funding Amount: see below.
__X___Do not fund

Justification to recommendation. If the recommendation is to <u>fund with modifications</u>, modifications the applicants must make in order to receive funds are listed.

The panel was unsure that additional sites and bioassays would lead to defensible inferences regarding sources of estrogenic compounds. The proposed supplemental study does not add much value to the original project. Therefore, the panel recommends that a more limited study on a more strongly developed in situ exposure experiment be proposed in the future.