

# CALFED Science Program PSP Grant

## Supplement Proposal

### Technical Selection Panel Review

**Grant Supplement Identification:** *Ingram*

**Applicant Organization:** University of California, Berkeley

**Grant Supplement Title:** The Role of the San Francisco Bay Delta in Juvenile Rearing for Winter and Spring Run Chinook Salmon, to be Determined by Otolith Microchemistry.

**Original Grant (Year):** Chinook Salmon Rearing in the San Francisco Bay-Delta System: Identification of Geochemical Markers to Determine Delta Use (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 propose to apply developed otolith geochemical markers to general, but important questions, about how habitat use patterns in the Delta and Bay correspond to recruitment to the adult stage. The original proposal received high evaluations—TSP=above average; Technical reviews—excellent, largely based on their past successes in developing innovative tracers that showed exciting potential in delineating watersheds within the Delta. A hypothesis set forth in the supplemental proposal is that varied life histories, or habitat use patterns by juvenile Chinook salmon, may be critical to continued persistence of the Sacramento (meta) population. By discerning patterns of past juvenile habitat use from the otoliths of adults, the PI's argue that important habitat use patterns can be identified and presumably protected.

Much of the current award seeks to refine Sr isotope-ratio methods to discriminate among key regions of the Delta watershed, calibrating otolith tracers against sedentary “clam standards.” The group has also begun high resolution Sr profile analysis to infer habitats of differing salinities (overall Sr/Ca levels), using nanoSIMS, which is a novel application. Apparently, other otolith markers such as Se and C and S stable isotopes remain under development (these were not reported on in the supplemental proposal).

To date, 17 fish have been analyzed using profile analysis of Sr isotopes. The panel had difficulty interpreting results presented (Figure 5), but presented profiles suggested that this tracer may only provide coarse resolution of habitat use patterns through the Delta. Clearly, additional samples from other sub-populations – work now underway – will help evaluate the resolution of this approach in delineating past patterns of habitat use from adult samples.

In the supplemental, new work includes: (1) a continued look at past habitat use by juveniles (using Sr isotope-profile analysis); (2) comparison of hindcast patterns of habitat use to Delta juvenile salmon surveys; (3) Comparison of recent patterns of juvenile habitat use to historical ones. Some 300 spawner otoliths will be analyzed in two years from several carcass surveys across winter and spring runs and at least five creeks and hatcheries. Cohort-matched patterns of observed juvenile habitat use in the Delta will be undertaken in collaboration with a USFWS scientist who is engaged in a mid-water trawl survey that captures out-

migrating juveniles. They suggest that DNA data (performed by others?) will be used to provide improved resolution of out-migration patterns specific to certain sub-populations. No specific approach is given for the third objective other than looking at archived otolith samples. The budget is modest and principally devoted to laboratory analysis conducted by a technical scientist in Dr. Weber's laboratory.

### ***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  
 Sufficient  
 Inadequate

### ***Explanation of rating and additional comments:***

This supplemental proposal is based upon a very sound and interesting idea – to compare hind cast patterns of habitat use for juveniles to those observed in trawl and other surveys. This approach is in keeping with the nursery role concept (Beck et al. 2001) and one for which otolith tracers are quite appropriate. The PIs are leaders in their field in developing Sr isotope ratios, particularly as a profile analysis. Still, in this proposal there was not sufficient evidence that the profile analysis could be matched to observed survey patterns, nor was their sufficient detail on the complex challenge of matching observed and hind-cast patterns. The proposal would have been substantially strengthened with involvement of a population biologist or biostatistician towards this end. Reviewers recommend that the authors contact researchers conducting more detailed work in migration and habitat use, such as Peter Klimley, UC Davis, for potential collaboration.

## **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.*

Enhancement of the current award comes through additional opportunities to evaluate novel geochemical tracers, additional samples for profile analysis, and the new element of comparing observed to hind-cast spatial distributions of juveniles. Much of this work was contained in the current award and the new element required additional thought, expertise, and explanation that could be well developed in a full proposal in the next funding cycle. The time critical element in the proposal was related to the ability to match baseline data for the Delta (presumably the water and clam Sr isotope baselines) to concurrent otolith samples from adults. Sustained funding for Dr. Corey Phillis, was also listed as justification for sustained funding.

### ***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  
 Inadequate

***Explanation of rating and additional comments:***

Overall, this is a well written proposal. This proposal has an advantage of looking back in the past before all the plumbing of the system took place; they could gain some insights in how fish used the system in the past. There is more work to be done in employing these markers, especially because the Delta habitat issue may be so important.

Still, elements of the supplemental proposal were not compelling in terms of providing sufficient evidence for success (observed v. hindcast habitat-use patterns). Still, the original award was modest (about \$200,000), which would indicate that additional efforts are justified related to the objectives of the original proposal, which although not well delineated were apparently focused on development rather than application.

To overcome this gap, the PIs are encouraged to work with a population ecologist. In particular, they need to consider more carefully sample representativeness of juvenile and adults, and statistical challenges in analyzing longitudinal data.

**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 requested (see note below)  
 Do not fund

*Justification to recommendation. If the recommendation is to fund with modifications,*

*modifications the applicants must make in order to receive funds are listed.*

The applicants must identify population ecologist(s) knowledgeable about Central Valley salmon to work with and submit a revised proposal describing how they will work with this group.

Some suggestions: An umbrella group oversees all the tagging of salmon migrating. There may be some justification for augmenting this request to include a population ecologist, such as Brian Wells at Santa Cruz.