Panel Scientific and Technical Review Form

(Note: Review comments will be anonymous, but public.)

Proposal number: 2001-B201 **Short Proposal Title:_Tuolumne River Restoration: Special Run Pool 10**

Project Summary:

Under the PSP Non-native Invasive Species topic area, the Tuolumne River Technical Advisory Committee (TRTAC) proposes to reduce in-stream and off-channel pits that harbor predators (primarily large mouth bass) of juvenile chinook salmon through reconstruction of channel geomorphology and riparian reforestation in the SRP 9 and 10 reach. The project will specifically involve filling in deep pools created by past in-stream and adjacent gravel mining and creating riffle-and-run patterns that follow the restored meander channel of the river. The proposal addresses two of the major issues for salmonid habitat restoration in the Tuolumne River—spawning and rearing habitat and predation by introduced piscivores. The hypotheses relate to ten attributes of a naturally dynamic riverine ecosystem: (1) spatially complex channel slope, (2) variable streamflow patterns, (3) frequently disturbed riverbed surface, (4) periodic riverbed scour and fill, (5) balanced fine and course sediment volumes, (6) periodic channel migration and/or avulsion, (7) a functional floodplain, (8) infrequent channel resetting floods, (9) self-sustaining, diverse riparian corridor, and (10) nuturally fluctuating groundwater table.

1a) Are the objectives and hypotheses clearly stated?

***Summary of Reviewers comments*:**

The three outside reviewers all felt that the objectives were exceedingly clear and detailed, as well as being "noteworthy" and "commendable." The goals and hypotheses were very effectively integrated with the hypotheses, especially through Table 2, which also identified monitoring parameters and data evaluation approaches.

***Panel Summary*:**

Both the broader and specific objectives are concisely stated and representative of similar approaches to restoration of natural fluvial geomorphology for juvenile salmon rearing and migratory habitat in other rivers and regions.

1b1) Does the conceptual model clearly explain the underlying basis for the proposed work?

***Summary of Reviewers comments*:**

There was no explicit conceptual model, in part because the proposal relied entirely on the prior habitat restoration planning. However, several of the reviewers did not feel that this was a major shortcoming.

***Panel Summary*:**

The existing proposal's conceptual premise is based considerably on the previous Habitat Restoration Plan for the Lower Tuolumne Corridor, and is reduced to the primary assumption that reducing the habitat of introduced centrarchid (small- and largemouth bass) predators will improve the survival of juvenile salmon. As a result, the fundamental processes that are involved in reducing predator habitat, and the attributes of restored stream geomorphology that will support increased juvenile salmon growth and survival, are not

discussed. Scientific evidence in support of successful enhancement of juvenile salmon production by restoring specific stream geomorphology attributes is completely missing despite a growing literature. While it is reasonable to assume that restoration of the natural channel, isolation of the channel from deep pools created by aggregate mining, and creation of riparian habitat will all contribute to increased juvenile salmon survival and productivity, examples and scientific citations were not provided. For instance, no examples or case studies are described in documentation of predation on juvenile salmon by largemouth bass in off-channel pits.

1b2) Is the approach well designed and appropriate for meeting the objectives of the project?

***Summary of Reviewers comments*:**

All reviewers commented on the pervasive lack of detail, either on the geomorphological and hydrological modifications or revegetation procedures.

***Panel Comments*:**

The actual design and actions of the project are exceedingly vague. There are no specific design specifications, or (other than the generic Figs. 2&3) illustrations of the desired end-point at landscape or finer-scale. In addition, justification of the need for manual revegetation was not provided.

1c1) Has the applicant justified the selection of research, pilot or demonstration project, or a full-scale implementation project?

***Summary of Reviewers comments*:**

Two of the three reviewers considered full implementation to be appropriate, while one reviewer was confused by contradicting information, and felt that neither approach was well justified.

***Panel Summary*:**

Full implementation appears to be justified on the basis of the successful (?) implementation of the SRP 9 segment, but the panel noted that results from SRP 9 are notably lacking from the proposal. If full implementation is dependent upon SRP 9 as a demonstration project, scaling up to full implementation of SRP 10 would appear premature.

1c2) Is the project likely to generate information that can be used to inform future decision making?

***Summary of Reviewers comments*:**

While two of the three reviewers noted that the project design includes pre- and post-project monitoring includes a variety of physical, vegetation and fisheries variables that should provide valuable information for

future decision making, one noted that the project lacked monitoring that was specific and focused for many more years (6-8 yr) than proposed (2-4 yr).

***Panel Summary*:**

Based on the inadequate information describing all aspects of post-project assessment and monitoring, and the lack of a true adaptive management plan, the panel wasn't confident that the critical information that could be derived from this project would necessarily result.

2a) Are the monitoring and information assessment plans adequate to assess the outcome of the project?

***Summary of Reviewers comments*:**

All reviewers noted the proposed monitoring and information plans were not described in sufficient detail.

***Panel summary*:**

Although some critical variables are identified for monitoring, the panel was not convinced that critical information, such as vegetation and fisheries population responses, was going to be effectively documented.

2b) Are data collection, data management, data analysis, and reporting plans well-described, scientifically sound and adequate to meet the proposed objectives?

***Summary of Reviewers comments*:**

All reviewers found this aspect of the proposal to be unclear to inadequate due to lack of detail.

***Panel Summary*:**

The proposal is deficient in all respects of describing data collection, management and analysis and reporting. The fact that it will be contracted out does not help clarify the adequacy of this important project component.

3) Is the proposed work likely to be technically feasible?

***Summary of Reviewers comments*:** All felt that the engineering and geomorphic approaches should be technically feasible, despite the inadequate details and technical specifications. Most found no problems with assessment of the biological responses to the restoration actions.

***Panel Summary*:**

The panel agreed that the physical modifications proposed in the restoration approach should be feasible, but noted that the lack of specificity in either restoration plans or methods jeopardized this assumption.

4) Is the proposed project team qualified to efficiently and effectively implement the proposed project?

***Summary of Reviewers comments*:**

While the reviewers acknowledged the fluvial geomorphologists were adequately qualified, one reviewer noted that expertise on fish species of concern in the project was generally lacking.

***Panel Summary*:**

Given the extensive use of subcontractors without any substantive statement of expertise and qualifications, the panel felt that it was difficult to objectively assess overall team qualifications.

Miscellaneous comments

***Summary of Reviewers comments*:**

One reviewer considered this a "superior proposal" despite some minor information gaps, while another stated that lack of plans for data management and dissemination, restoration and monitoring activities limited it's usefulness.

***Panel Summary*:**

The panel felt that the proposal addressed a critical project that should be supportable but lacked the quality to justify that. The panel was also confused about why this proposal was even classified under the Nonnative Invasive Species topic area even though it more explicitly addresses juvenile chinook salmon survival, and would logically be classified under the Special Status Species Surveys and Studies.

Overall Evaluation
PANEL SUMMARY COMMENTS

Summary Rating

- ☐ Excellent
- ☐ Very Good
- ☐ Good
- **X** Fair
- ☐ Poor

Outside Reviewers: The external reviewers ranked the proposal as either good (2) or excellent (1) based on the objective of returning the Tuolumne River to a "normative" riverine ecosystem, rather than on the inherent qualities of the proposal, which they considered somewhat lacking in detail and scientific rigor.

Panel Assessments and Recommendations: The panel considered the goal of this proposal admirable but deficient in many other perspectives. The overall panel consensus was that it ranked only **FAIR (**to POOR**)** because detailed information was largely lacking for both the restoration design specification and revegetation, the

minimalist approach to monitoring, no information on the qualifications of the extensive list of subcontractors, lack of information on results from prior actions in SRP-9, and inattention to corrective (adaptive management) actions that might be necessary with dramatic changes in the restored condition (e.g., as a result of floods, invasive species, etc.). Despite that this is a continuing (Phase 2) project that was presumably contingent upon successful preparation of a prior restoration plan, the panel considered this proposal did not justify a $4.6 million CALFED expenditure given the listed deficiencies.