Proposal Reviews

#40: Frymire Ranch Project, Spawning Habitat Restoration in the Stanislaus River

Carl Mesick Consultants

Research and Restoration Technical Panel Review	
San Joaquin Regional Review	
External Scientific Review	#1 #2 #3 #4
Prior Performance/Next Phase Funding	#1 #2
Environmental Compliance	
Budget	

Research and Restoration Technical Panel Review:

CALFED Bay-Delta 2002 ERP PSP
Research and Restoration Technical Panel Review Form

Proposal Number: 40

Applicant Organization: Carl Mesick Consultants

Proposal Title: Frymire Ranch Project, Spawning Habitat Restoration in the Stanislaus River

Review:

Please provide an overall evaluation summary rating:

Superior: outstanding in all respects;
Above Average: Quality proposal, medium or high regional value, and no significant administrative concerns;
Adequate: No serious deficiencies, no significant regional impediments, and no significant administrative concerns;
Not Recommended: Serious deficiencies, significant regional impediments or significant administrative concerns.

Overall Evaluation Summary Rating	Provide a brief explanation of your summary rating
-Superior	**Three of four external reviewers gave this proposal a poor rating. The other review gave it a good rating, but identified a number of serious concerns. The panel felt that the proposed monitoring will not provide any meaningful information on the longevity of gravel additions and the potential benefits of gravel additions to fish populations.**
-Above average	
-Adequate	
XNot recommended	

1. **Goals and Justification.** Does the proposal present a clear statement of goals, objectives and hypotheses? Does the proposal present a clear justification and conceptual model for the project?

   No, three of the four external reviewers had complaints regarding clarity and inconsistencies in the goals, objectives, and/or hypotheses. One reviewer had trouble teasing out the goals and objectives of this project from the proposal that was rejected in 2000. One reviewer had trouble relating the hypotheses (optimizing gravel size, bolder placement) to the objectives (assessing the benefits of restoring riffles adjacent to floodplain habitat vs. riffle-only sites).

   Two of the reviewers were concerned that no information was presented justifying the need for spawning habitat for steelhead and the priority of this activity in the watershed relative to other potential limiting factors. The other reviewer thought this argument was fairly convincing, albeit based on anecdotal information.

2. **Likelihood of Success (Approach, Feasibility, Capabilities and Performance Measures).** Is the project likely to succeed based on the approach, feasibility and project team capabilities? Are the proposed performance measures adequate for measuring the project's success?

   Two of the four reviewers questioned whether this project could discern the effects of gravel augmentation from the escapement and smolt outmigrant data based on the description of the analysis provided by the proponent. One reviewer had concerns about the experimental design in terms of its utility for testing the hypotheses. One reviewer had concerns regarding the utility of the physical variables measured at the redds in terms of hypothesis testing.

   All four external reviewers considered the feasibility of measuring the projects success very low. Three reviewers complained that there was little detail to evaluate the geomorphological studies. They also had problems with the experimental design and lack of information on the methods used to design the riffles.

   Three reviewers considered the utility of the outmigrant data relatively low given the short study duration and likely high natural variation, coupled with small effect size. Two reviewers commented that the data being collected would not be sufficient to test the hypotheses.

3. **Outcomes and Products.** Will the project advance the state of scientific knowledge in general and/or make an important contribution to the state of knowledge of the Bay-Delta Watershed? For restoration proposals, is the project likely to contribute to ecosystem restoration or species recoveries in a significant way? Will the project produce products useful to decision-makers and scientists?

   Two of the four reviewers raised concerns regarding whether anything would be learned from this project.

4. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

   One reviewer felt the budget was excessive given the low probability of detecting a response

5. **Regional Review.** How did the regional panel(s) rank the proposal (High, Medium, Low)? Did the regional panel(s) identify significant benefits (regional priorities, linkages with other activities, local involvement) or impediments (local constraints, conflicts with other activities, lack of local involvement) to this proposal? What were they?

   No problems, given a High ranking. The only concern raised was the ability of the proponent to complete the work given his commitments on other projects.

6. **Administrative Review.** Were there significant concerns about the proposal with regard to the prior performance, environmental compliance and budget administrative reviews? What were they?

   Funds carried forward differ from the requested funding in 17A

Miscellaneous comments:

San Joaquin Regional Review:

Proposal Number: 40

Applicant Organization: Carl Mesick Consultants

Proposal Title: Frymire Ranch Project, Spawning Habitat Restoration in the Stanislaus River

Overall Ranking: **-**Low **-**Medium **X**High

Provide a brief summary explanation of the committee's ranking:

This sort of project has been previously completed by the applicant. Previous project have been successful and source of material for the gravel additions has already been identified.

1. Is the project feasible based on local constraints?

   XYes **-**No

   How?

   This sort of project has been previously completed by the applicant. Source of material for the gravel additions has already been identified. Permitting looks no more difficult than previous projects.

2. Does the project pursue the restoration priorities applicable to the region as outlined in the PSP?

   XYes **-**No

   How?

   The project will meet at least the first 4 priorities for the San Joaquin River.

3. Is the project adequately linked with other restoration activities in the region, such as ongoing implementation projects and regional planning efforts?

   XYes **-**No

   How?

   Applicant is currently involved in other restoration projects on this river and participates with the local watershed group.

4. Does the project adequately involve local people and institutions?

   XYes **-**No

   How?

Nearly all active groups on the Stanislaus River are involved in this project to some degree. Only major groups not involved are the local irrigation districts.

Other Comments:

The committee expressed a concern regarding work overload for the applicant from the volumne of work presently underway and proposed.

External Scientific: #1

Research and Restoration External Scientific Review Form

Proposal Number: **40**

Applicant Organization: **Carl Mesick Consultants**

Proposal Title: **Frymire Ranch Project, Spawning Habitat Restoration in the Stanislaus River**

Conflict of Interest Statements:
I have no financial interest in this proposal.
XCorrect
-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

none

Review:

Please provide an overall evaluation summary rating:

<u>Excellent:</u> outstanding in all respects;
<u>Good:</u> quality but some deficiencies;
<u>Poor:</u> serious deficiencies.

Overall Evaluation Summary Rating	Provide a brief explanation of your summary rating
-Excellent	**The overall concept of this project is good, however, there are some deficiencies that detract from the quality of the proposal. The strengths of the proposal are that it will likely result in an:** **1) Incremental increase in the available spawning habitat in the Stanilaus River** **2) Obtaining site specific information on feasibility and effectiveness of gravel augmentation as a restoration option in the Stanilaus River.** **3) Foster stewardship through local involvement.** **These deficiencies include:** **1) The objectives of the project are not clearly stated that is they were not explicit and concise** **2) The role of the program in the development of restoration activities in the Stanilaus River watershed is not well documented the current program does not be well integrated into a long term plan for improving chinook and steelhead habitat** **3) The geomorphologic assessment is not well described it was until the end of the proposal was the existence of the work really clearly identified.** **4) The experimental design for the biological monitoring program and hypotheses testing is incomplete and it is unclear if the proposed hypotheses testing is feasible.**
XGood	
-Poor	

1. **<u>Goals.</u>** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

   The proposal introduces the project as a revision of a previous proposal, and at some length goes in to reasons why past reviewers had misconceptions or complaints of reviewers about that proposal which detract from the transmittal of the objectives of the current proposal.

   The proposal provides does a section for Program Goals and Scope of Work but within that section there is no clear statement of goals, objectives and interrelationships with testable hypotheses. The reviewer is left to search through the text of other sections to find what the overall objective in relation to the hypotheses. I was looking for some kind of explicit statement to the effect that the objectives are: 1) To incrementally improve quality of spawning and rearing habitat in the Stanislaus River for chinook and steelhead. 2) Implement a demonstration project to improve the design of chinook and steelhead spawning and rearing habitat restoration projects in the Stanilaus River. 3) Test individual hypotheses about design criteria for gravel augmentation projects like the size of gravel to place, what the useful life of the restoration activities are, whether boulder placement will improve utilization by spawning fish, and will smolt survival increase as a result of the gravel placement.

Despite this lack of clarity, the stated hypotheses (p.6) being tested by the proposed work are internally consistent with the implicit objective of the project, and the concept of the project (if I have correctly interpreted them) is timely and important to achieving CALFED / CVPIA programmatic goals.

2. **Justification.** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

   The proposal provides a review of existing knowledge and a clear justification for the need for improve the quantity and quality of spawning habitat in the Stanislaus River. This justification is largely based on anecdotal evidence, however, the fact that it is anecdotal provides further justification to conduct scientifically defensible studies to resolve the key uncertainties in habitat restoration design criteria. However, additional clarity could be brought to the conceptual model for which the demonstration project is presumably embedded. For example, what is the recommended long term process for the Stanilaus River restoration: 1) demonstration/research projects to develop the habitat base, 2) full scale implementation to reach a desired habitat base; 3) ongoing monitoring to evaluate utilization and long term performance; and 4) periodic replacement/repair of channel habitats after flood events. My point is that the long term vision for restoration is not well laid out and should be to demonstrate understanding / relevancy.

   This project is properly identified as a demonstration project. I believe the augmentation of gravel has the potential to improve habitat quality and quality but there are significant uncertainties associated with the capability to provide robust inferences associated with the four key hypotheses. Hypotheses 4 (p7) is an example of this. I dont believe the proposed work has the capability to detect how the gravel augmentation project will incrementally improve smolt survival.

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

   The seven tasks identified for the work appear to be logical and appropriate for meeting the objective of the project. While the demonstration component of the work is not likely to provide new information that can be generalize to other rivers on the best way to design and implement gravel augmentation projects. However, it is anticipated that the project would valuable additional site-specific information about key design elements for Stanilaus gravel augmentation programs targeted at chinook salmon and steelhead.

   I have some reservations about experimental design for testing these hypotheses. The investigators have not clearly laid out the how the field data collection will contribute the data required to test the hypotheses nor the anticiapted difficulties for testing the hypotheses, nor the analtical treatment of the data. I recognize that it is not practical to expect this be done completely apriori, but experience with this type of study has demonstrated good tests of the hypotheses about spawning habitat selection are not clear cut. As the proposal stands with unclear statement of experimental design, I think there is low probability of successfully testing the proposed hypotheses. The work should provide

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

   A fundamental concern regarding this proposal is that there is incomplete disclosure of methods and experimental design proposed for 1) design of the individual riffles, 2) the methods used for fluvial and geomorphic assessments, and 3) biological evaluation of use and testing hypotheses about gravel size, useful life, cover utilization and impacts on smolt survival. In some cases the methods proposed on not technically appropriate. Some additional comments for each aspect are provided below:

   Design of Riffles: There is little information provided to demonstrate that the applicants will consider the flow regime of the river and the actual process for translating expect hydraulic characteristics into design criteria. It is expected that there will be differences among the sites and exactly how that will be accounted for in the design is not clear.

   Methods for Geomorphic Assessment Despite its apparent importance this is component of the work is poorly introduced, and not well documented.

   Biological Use Gravel Size General monitoring of spawning fish on the riffles is proposed to test the whether fish select small (15-20 mm dia.) as opposed to large size (>30 mm dia.). First, it is unclear how the spawning riffles will be constructed to avoid confounding effects of other habitat or biological factors (such as those mentioned early in the proposal) such as gravel permeability, proximity to physical cover, proximity to turbulence cover, how body size influences gravel selection etc. There is no apparent explicit experimental design and this will reduce the overall capacity to meet the proposed goal of testing what size gravel is best. Useful Life It is unclear how this hypotheses is going to be tested over the duration of the project. Is it anticipated that a sufficient flow to transport these gravel will be experienced during the project? It may only be possible to in an adhoc way to determine threshold discharge for gravel mobilization and that to the anticipated flow regime to determine useful life. This is based on luck and not really hypothesis testing Turbulence Cover It is unclear how observations will be conducted to differentiate use of turbulence cover as opposed to the cover provided by the boulders themselves or by other features of the channel. Again the experimental design appears adhoc, Smolt Survival First since the current proposal does not include funding for smolt monitoring it is not appropriate to consider this as part of the study. It can not be guaranteed that will even happen. Second, unclear how the proposed smolt monitoring will separate the effects of the gravel augmentation on smolt survival given the large variation in smolt survival, large number of other factors that impact smolt survival and the proposed study period (n=3). This hypotheses should not be in the proposal.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

   With respect to the objective of constructing spawning habitat and determining habitat features to restore spawning habitat I believe the perfromances measures are appropriate. As noted above the data collected on habitat use will provide emprical evidence but will not be (as they are currently describe) sufficient for rigorous hypotheses testing.

   With respect the the objective increasing salmonid production, I don;t beleive the data to be collected by others is sufficeint to test hypotheses or draw any conclusions about the influence of the project on salmonid production. Not only is there uncertainty that this will be done (i.e.

attached to a seperate unrealted proposal), it is niave to expect three yeears of data will be suffcient to do this given natural variation in production and the very real fact that the fish emerging from the new spawning habitats will not contribute to spawning adults until the project is completed. This is a very basic and fundamental error in logic.

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

   It is very likely that the proponent will successfully complete the gravel augmentation component of the work. The fundamental product of this program is to improve quality and quantity of spawning habitat for chinook and steelhead populations in the Stanilaus River. This is a valuable deliverable.

   It is unlikely that the proposed biological monitoring will provide scientifically defensible tests of the proposed hypotheses. It is likely that the monitoring component of the work will provide some qualitative information about biological use of the improved habitat and provide a better information base for design of spawning habitat restoration projects in the Stanilaus River. It is uncertain whether this information will be transferable to other rivers.

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

   The proposal provides information that suggests they have the capacity to successfully complete the project as it is described.

   The proposal provides information that the required infastructure is available to complete the study.

   The proposal does not provide extensive information on the proponent track record to efficiently and effectively complete the work.

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

   The cost for this program is large, however, given the scope of the restoration activities it appears warranted.

   The primary benefit of the program is increased quantity of spawning habitat for chinook and steelhead (endangered). The overall benefits are difficult to judge as there are insufficient information determine the incremental increase in spawning habitat in the watershed. The secondary benefit is additional information to aid future habitat restoration programs. For the reason stated above, it is uncertain exactly how much information will be obtained.

Miscellaneous comments:

External Scientific: #2

Research and Restoration External Scientific Review Form

Proposal Number: **40**

Applicant Organization: **Carl Mesick Consultants**

Proposal Title: **Frymire Ranch Project, Spawning Habitat Restoration in the Stanislaus River**

Conflict of Interest Statements:
I have no financial interest in this proposal.
XCorrect
-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

none

Review:

Please provide an overall evaluation summary rating:

Excellent: outstanding in all respects;
Good: quality but some deficiencies;
Poor: serious deficiencies.

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
-Excellent	**The wrong measures to assess population-level response of chinook and steelhead to gravel additions/floodplain habitat are being measured. Geomorphic studies are not outlined in sufficient detail to be evaluated.**
-Good	
XPoor	

1. **Goals.** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

   The concept of assessing the benefits of spawning gravel additions for chinook and steelhead populations is very sound. If found it difficult to determine the objectives of this project. The proponent reviews the objectives of their May 2000 proposal (which was not funded), but it was not clear whether the same objectives apply to the current proposal. The May 2000 proposals objectives were to evaluate the benefits of restoration floodplain, spawning and rearing habitats at the same location, and to determine why steelhead trout were not using the restored riffles for spawning. The objective of this project as stated on p. 7 are to construct riffle habitat and restore floodplain function and habitat. Note that these objectives are just restoration activities with little emphasis on the assessment. This is surprising because a good portion of the budget is related to assessment.

The proponent clearly states 4 hypotheses that will be tested, however three of them are of little use to management or do not clearly relate to the objectives. Regarding the first hypothesis, it is well known that smaller fish require smaller spawning gravel size (Kondolf and Wolman 1993). Do we really need to demonstrate this again? If the primary objective is to evaluate the benefits of restoring floodplain, spawning, and rearing habitat at the same locations? I do not see how any of the hypotheses that are stated relate to this objective. The first three hypotheses relate to details of how to construct the riffles (gravel size, bolder placement) and their longevity (as influenced by gravel size). The last hypothesis is important, but relates only to the second objective of assessing the overall effect of all restoration efforts on smolt production. It will be impossible to separate out the effects of the flood plain restoration site from the riffle-only sites from the smolt data that reflects the aggregate response to habitat changes upstream of the screw trap.

2. **Justification.** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

   I found the justification for the study and the conceptual model confusing, possibly indicating that these concepts are not clear in the proponents mind. The author states that adult returns to the Stanislaus River are likely controlled by mortality of fry and smolts in the deepwater ship channel between Stockton and the Mokelumne River. He also estimates escapement is insufficient to fully seed the river in approximately 50% of the years. These two points suggest that adding spawning habitat to the Stanislaus may produce little improvement to overall smolt production. An increase in the quantity of spawning gravels should have no effect in years when spawning stock is limited. In years where this habitat is limiting, high mortality in the shipping channel suggests that any improvement in production from improved spawning success will be largely lost. The conceptual model that is presented argues for investing in restoration and research focused on the limiting factor, survival in the deepwater channel.

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

   The project as proposed consists of measuring a number of supporting indicators; spawner preference, geomorphology, and redd location/D.O. levels. Continuing to document spawner use of restored riffles will add little new information, and the fact that fish are using these new substrates provides no information on whether more fry or smolts are produced from the system, it may simply reflect fish preference. Similarly, measurement of D.O. and redd location are difficult to make meaningful, population-level inferences from. I do not see how the proponents will distinguish the benefits between restoring riffle sites adjacent to floodplain habitat relative to restoration of riffle-only sites.

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

   There is virtually no description of the morphological studies (task 5a and b) to be conducted by the fluvial geomorphologists on this study. In the description of tasks 5a and b, there is no description of the type of hydraulic modeling and monitoring that will be conducted. The design of the bed mobility assessment is not specified. Will the assessments be done once before and after a large flood event, or will they attempt to do these activities over a number of events to determine the relationship between discharge, antecedent bed conditions, and gravel

movement?

I also have some concerns regarding the assessment of the longevity of the restored riffles. Measuring topography alone does not determine whether or not the gravel continues to function as spawning habitat. The gravel may move to some degree (and hence change the topography), but still function as a spawning riffle if depth, velocity, and substrate size is suitable By measuring the topography alone I am uncertain whether the proponent can determine whether the riffle is still functioning, short of very obvious circumstances where the entire riffle is lost. In addition, by not monitoring locations downstream of the restoration sites, one does not know about the fate of the gravel that has been moved. Perhaps the loss at one site results in the gain at another restoration site or a natural site. Measurements need to be conducted over large and representative areas to account for this dynamic. In other words, what is required is a survey of spawning habitat availability on a system-wide basis (or representative of the system) and whether adding spawning gravel is changing this availability.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

   I have addressed these issues in comments above. In my opinion, the linkage between fry and smolt production per spawner (the measure that should be assessed) and the performance measures that are proposed (documenting habitat preference and physical measurements such as D.O and gravel permeability) is highly uncertain. Hence it will be difficult to determine whether the gravel additions actually had an effect and to sort out relative production from riffles adjacent to floodplain habitat vs. production from riffle-only sites.

   The proponent provides sufficient detail on most measures, except the evaluation of the spawner and outmigrant data, which I consider to be the most informative to the overall assessment of whether the restored section of the river is producing more fish per unit spawner.

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

   Limited value. The key product should be a time series of smolt and spawner data before and after gravel additions, possibly supported by data showing that egg and alevin survival and outmigrant size is higher at restored sites. Thus the products from this proposal are of secondary importance relative to the population data.

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

   The applicant appears qualified to perform the work he proposes.

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

   Yes, the budget appears reasonable for the work proposed. The relevant question here is whether it is worth spending this amount to collect restoration assessment indicators that may have little relevance to the population-level response. Improving the precision of escapement and smolt monitoring would be a better investment for evaluating the population response to gravel additions. If the data are of questionable 'accuracy' (precision) as the proponent states, wouldn't

it be wiser to invest in the key performance measure?

Miscellaneous comments:

External Scientific: #3

Research and Restoration External Scientific Review Form

Proposal Number: **40**

Applicant Organization: **Carl Mesick Consultants**

Proposal Title: **Frymire Ranch Project, Spawning Habitat Restoration in the Stanislaus River**

Conflict of Interest Statements:
I have no financial interest in this proposal.
XCorrect
-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

none

Review:

Please provide an overall evaluation summary rating:

Excellent: outstanding in all respects;
Good: quality but some deficiencies;
Poor: serious deficiencies.

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
-Excellent	**This proposal is written in a way that many of the very important details are not provided. The nature of the models are not explained, there are concerns over the issues of scale, and the lack of information (or plan) to adequately assess flow and stream competence.**
-Good	
XPoor	

1. **Goals.** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

   This is a revision of the Six-Mile Bar proposal of 2000. The PIs respond to earlier concerns largely related to assessment of geomorphic parameters. In addition to their plans to add gravel to improve spawning and rearing habitat for steelhead, based on reports from fishing guides they have added a focus on in-stream habitat (fish cover). The focus has been switched to work on the Frymire ranch where they would reconstruct 6 riffles on a .5 mile reach in the Stanislaus River. The goals are generally clearly stated and they do acknowledge that many factors (pages 4 and 5) may be responsible for the low recruitment. They state their hypotheses clearly (largely related to the link between median grain size and spawning). While the proposal is clearly written, I am not convinced it is as timely and important as many of the other proposals. It is fairly small in scope but more importantly it exists within a larger (environmental) context that has problems which may swamp their

efforts at the riffle scale.

2. **Justification.** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

   They do document well that recruitment is lower than expected. However, the basis for what they actually propose to do (alter grain size) rests on observations by individuals of where spawning occurs and what areas fish prefer. i.e., the evidence they provide that grain size may be a critical factor is anecdotal (no references provided nor data tables included).

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

   The approach seems reasonable and they provide a clear explanation of what they will do (use clean gravel to construct riffles with a D50 of 15-20 mm AND riffles with a D50 of 30 mm.) While they acknowledge concerns that the gravel will be mobilized by spring flows and thus the shift to large median grain sizes. But they provide no information on stream competence nor mention of any intention to gage the stream (e.g., with inexpensive pressure tranducers) this is what they would need to really start to understand (be able to predict) bed mobility. Finally they propose (hypothsis 3) to add boulders to some riffles because they will create surface turbulence and nearby deep waters actually extensive work has shown that the presence of boulders can create very complex flow environments turbulent eddies may impinge all the way to the bed and depending on the density and spacing of the boulders, there may be enhanced erosion or deposition in the riffle. In short, the science behind this project is treated very superficially. I am not convinced the project is rigorous enough to add substantially to the base of knowledge (i.e. what might be of use to others).

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

   As stated earlier, I have concerns about the scale. I am not convinced it is technically feasible the gravel can be placed in the riffles but with little information on discharge/flow it is not clear it will stay long at all. They state that the engineers will conduct a flood capacity analysis (page 8) but provide no details on this.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

   This section (pages 8 &9) is fairly complete but there are a few exceptions: They describe how the gravel will be placed (but dont describe the flood capacity analysis), they mention they will evaluate gravel augmentation within the context of the sediment transport capacity of the current, regulated flow regime' but provide no details on what this evaluation will consist of. On page 10 they indicate one of their metrics is sediment transport rate but they do not explain how they will assess this (measure suspended load, bed load or simply show differences in D50 over time??) They state that McBain and Trush will assess the influence of the gravel on fluvial geomorphic processes with hydraulic modeling and monitoring but do not describe the nature of this modeling or monitoring.

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

   We will know if gravel of smaller grain size vs. large (and with and w/out boulders) will stay in the channel and we will know if trout spawner use has increased. We do not know what kind of statistical analysis (if any) will be used to test their hypotheses

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

   The PIs have admirable credentials.

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

   They request ca. $715k. This is a high request given the amount of work and the localized nature of the work. Again, my comments are made within the context of a comparative framework i.e., compared to other proposals in the competition.

Miscellaneous comments:

External Scientific: #4

Research and Restoration External Scientific Review Form

Proposal Number: **40**

Applicant Organization: **Carl Mesick Consultants**

Proposal Title: **Frymire Ranch Project, Spawning Habitat Restoration in the Stanislaus River**

Conflict of Interest Statements:
I have no financial interest in this proposal.
XCorrect
-Incorrect

In the blank below please explain any connection to proposal, to applicant, co-applicant or subcontractor or to submitting institution (write "none" if no connection):

none

Review:

Please provide an overall evaluation summary rating:

<u>Excellent:</u> outstanding in all respects;
<u>Good:</u> quality but some deficiencies;
<u>Poor:</u> serious deficiencies.

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
-Excellent	**This project is touted as a potential demonstration study, yet the results based on the response variables chosen will be ambiguous and/or difficult to obtain and interpret. No power analysis is provided, but one suspects that the abilty to detect a response, even if smolt production doubled as a result of this work, would be low, and less than that caused by natural variation or as a result of variation in escapement levels. A pilot scale approach is suggested, but only after a wartershed assessment, prescriptive rehabilitation plan, and program of monitoring and evaluation for the watershed has been developed, collectively.**
-Good	
XPoor	

1. **<u>Goals.</u>** Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the concept timely and important?

   The goal is to place gravel in a degraded river system that has been mined for gold in the past and is currently has a dam upstream. The objectives and logistics of gravel placement are clear, if not questionable in that gravel is moved within the river from one location to another and may not remain where placed. There does not appear to be an urgency to this work since conditions have prevailed for some decades, and the fish population continues to return, albeit at very low (endangered) abundance. It is difficult to judge the importance of this work from this proposal. Chinook salmon may be limited by spawning habitat, based on

the information provided on recruitment, but there was no evidence that steelhead trout are limited by spawning or rearing habitat. The latter is more likely, based on the fisheries literature on this species where there is evidence that stream habitat limits steelhead parr and smolt production. The number of steelhead spawners in the spring is (usually) lower than the number of salmon spawners which spawn in the fall, therefore steelhead (which may also repeat spawn) have a higher egg-to-fry survival rate - the life history strategies differ. Limits (both species) appear to arise from the smolt migration period and ocean harvest, according to this proposal, but are also a result of variable ocean conditions - unmentioned - that are currently poor (but perhaps improving, temporarily or otherwise).

2. **Justification.** Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full-scale implementation project justified?

   The justification for this work is weak and does not appear to be based on a watershed assessment, other than a chinook spawning survey done earlier by the author, nor is there evidence of a thorough plan for watershed rehabilitation that lists tasks by priority. Furthermore, the proposal indiates a weakness in the knowledge of steelhead recruitment. The priority of this work relative to other tasks within the watershed is unclear. From the proposal, it would seem that restoration of a more natural flow regime (i.e., reproduce the natural Q as much as possible given that it is dammed) should be a priorty, and may reduce or eliminate the need to move gravel around. Using mine tailings as spawning gravel may be questionable. A demonstration project is proposed, yet similar work has been done nearby that could serve, perhaps more usefully, as a demonstration, although it is unclear what is being demonstrated - the abilty to detect a fish response is weak given the response variables chosen.

3. **Approach.** Is the approach well designed and appropriate for meeting the objectives of the project? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology or approaches? Will the information ultimately be useful to decision-makers?

   Gravel placement is possible but the results to fish will remain elusive. An inability to detect a fish response adequately will reduce the likelihood of adding to existing knowledge. Steelhead may not be limited by spawning habitat. There life history differs from chinook salmon, which may be limited by spawning habitat, in that steelhead spend long periods rearing in freshwater, and it is that stage that the literature suggests the limit to freshwater production is likely. Here, further and key limits exist elsewhere (smolts and harvest). Available spawning habitat is also unlikely to limit the population if it is reduced in abundance by harvest. Riffle reconstruction in this manner is unlikely to acheive the desired results and ignores hydraulic and geomorphic features. See Newbury, R.W. and M.N. Gaboury. 1993, 1994 2nd ed. Stream analysis and fish habitat design: field manual. Newbury Hydraulics Ltd. 256p and Fish Habitat Rehabilitation Procedures, Slaney, P.A., and Zaldokas, D. [Editors] (1997), Province of BC Watershed Restoration Program Technical Circular Number 9. 341p. 7.1Mb http://srmwww.gov.bc.ca/frco/bookshop/tech.html

4. **Feasibility.** Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives?

   The method of gravel placement is adequately described and technically feasible but not without some disturbance of the stream benthos. Given that it similar work has been conducted elsewhere by this group which presumably has been effective, there is no reason to suspect it would not work again. However, the detection of success will be difficult to impossible, if

measured as an improvement in smolt or adult recruitment. A smaller scale project may be advisable, scaling up as lessons are learned; i.e., begin with a few riffle sites and focus on the evaluation of previous work before atempting new work.

5. **Project-Specific Performance Measures.** Does the project include appropriate performance measures to measure success relative to the project's goals and objectives? Is there enough detail as to how the performance measures will be quantified? For restoration projects, are monitoring plans explicit and detailed enough to determine if performance measures will be adequately assessed?

   Performance measures were to be determined by escapement surveys, angler surveys, and from smolt yield estimates from screw trap operations. None of these will provide useful response variables due to a high natural rate of variabilty, error in measurement, and an inability to separate the effects of several other factors in the response. No control:treatment measurement appears in the plans, thus there is a lack of an adaptive management approach despite the use of this term in the proposal. As a demonstration project, insufficient data will be generated to demonstrate results, if any.

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

   Products are of questionable value since the project is unlikely to be able to exhibit a biological response. Demonstration of a physical response may be possible, but should commence on a pilot scale.

7. **Capabilities.** What is the track record of applicants in terms of past projects? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

   The team has experience in gravel placement and the related science of salmon spawning habitat, including numerous publications. There is little experience with steelhead habitat rehabilitation. A well-rounded team of experts has benn chosen, however, who may be quickly capable of adapting to new techniques and the requirements of species other than chinook.

8. **Cost/Benefit Comments.** Is the budget reasonable and adequate for the work proposed?

   The budget for this habitat work appears excessive in light of the unlikely ability to detect a positive outcome. The project would benefit from a pilot scale approach in its first few years, at a much-reduced budget.

Miscellaneous comments:

The time line (up to three years) appears excessive. The technique of gravel placement is highly dependent on site geomorpholy and hydraulics, for which little information is provided, and from which it may be difficult to extrapolate to other sites as a demonstration project. The proponents mention steelhead adults feeding in winter, thus requiring feeding stations. This is unconfirmed, based on hear-say, and unlikely, based on observations in their northern distribution. Adult steelhead may require good quality habitat near spawning sites, such as large pools, as resting and holding areas. Very little detail is provided on the screw trap operations, but often the recapture rates are very low for accurate steelhead smolt estimation, particularly where there is not a separate capture and recapture location (Dempson and Stansbury 1993). Smolts placed back upstream presnt problems in the estimation procedure. A demonstration project might

grow out of the previous work of a similar nature by this group.

Prior Performance/Next Phase Funding: #1

New Proposal Number: 40

New Proposal Title: Frymire Ranch Project, Spawning Habitat Restoration in the Stanislaus River

1. Prior CALFED project numbers, titles, and programs: (*list only projects for which you are the contract manager*)

   ERP 97-N21 - Frymire Ranch Project, Spawning Habitat Restoration in the Stanislaus

2. Prior CVPIA project numbers, titles, and programs: (*list only projects for which you are the contract manager*)

   N/A

3. Have negotiations about contracts or contact amendments with this applicant proceeded smoothly, without persistent difficulties related to standard contract terms and conditions?

   XYes -No -N/A

   If no, please explain any difficulties:

4. Are the status, progress, and accomplishments of the applicant's current CALFED or CVPIA project(s) accurately stated?

   XYes -No -N/A

   If no, please explain any inaccuracies:

5. Is the applicant's progress towards these project(s)' milestones and outcomes to date satisfactory?

   XYes -No -N/A

   If no, please explain deficiencies:

6. Is the applicant's reporting, records keeping, and financial management of these projects satisfactory?

   XYes -No -N/A

   If no, please explain deficiencies:

7. Will the project(s) be ready for next phase funding in 2002, based on its current progress and expenditure rates?

   XYes -No -N/A

If no, please explain:

Other Comments:

Carl Messick's gravel replenishment project has provided successful spawning habitat for anadromous fish. His knowledge of the Stanislaus River landowners, hydrology, geology and fisheries research would be highly beneficial for a successful future gravel replenishment project on the Stanislaus.

Prior Performance/Next Phase Funding: #2

New Proposal Number: 40

New Proposal Title: Frymire Ranch Project, Spawning Habitat Restoration in the Stanislaus River

1. Prior CALFED project numbers, titles, and programs: (*list only projects for which you are the contract manager*)

2. Prior CVPIA project numbers, titles, and programs: (*list only projects for which you are the contract manager*)

   11332-1-J003 Spawning Habitat and Floodplain Restoration in the Stanislaus River at Two-Mile Bar Phase 1.

3. Have negotiations about contracts or contact amendments with this applicant proceeded smoothly, without persistent difficulties related to standard contract terms and conditions?

   XYes -No -N/A

   If no, please explain any difficulties:

4. Are the status, progress, and accomplishments of the applicant's current CALFED or CVPIA project(s) accurately stated?

   XYes -No -N/A

   If no, please explain any inaccuracies:

5. Is the applicant's progress towards these project(s)' milestones and outcomes to date satisfactory?

   XYes -No -N/A

   If no, please explain deficiencies:

6. Is the applicant's reporting, records keeping, and financial management of these projects satisfactory?

   XYes -No -N/A

   If no, please explain deficiencies:

7. Will the project(s) be ready for next phase funding in 2002, based on its current progress and expenditure rates?

   -Yes -No **X**N/A

   If no, please explain:

Other Comments:

Environmental Compliance:

Proposal Number: 40

Applicant Organization: Carl Mesick Consultants

Proposal Title: Frymire Ranch Project, Spawning Habitat Restoration in the Stanislaus River

1. Are the legal or regulatory issues that affect the proposal identified adequately in the proposal?

   XYes **-**No

   If no, please explain:

2. Does the project's timeline and budget reflect adequate planning to address legal and regulatory issues that affect the proposal?

   XYes **-**No

   If no, please explain:

3. Do the legal and regulatory issues that affect the proposal significantly impair the project's feasibility?

   -Yes **X**No

   If yes, please explain:

Other Comments:

Budget:

Proposal Number: 40

Applicant Organization: Carl Mesick Consultants

Proposal Title: Frymire Ranch Project, Spawning Habitat Restoration in the Stanislaus River

1. Does the proposal include a detailed budget for each year of requested support?

   XYes **-**No

   If no, please explain:

2. Does the proposal include a detailed budget for each task identified?

   XYes **-**No

   If no, please explain:

3. Does the proposal clearly state the type of expenses encompassed in indirect rates or overhead costs?

   XYes **-**No

   If no, please explain:

4. Are appropriate project management costs clearly identified?

   XYes **-**No

   If no, please explain:

5. Do the total funds requested (Form I, Question 17A) equal the combined total annual costs in the budget summary?

   -Yes **X**No

   If no, please explain (for example, are costs to be reimbursed by cost share funds included in the budget summary).

   Funds carried forward differ from the requested funding in 17A

6. Does the budget justification adequately explain major expenses?

   XYes **-**No

If no, please explain:

7. Are there other budget issues that warrant consideration?

   -Yes **X**No

   If yes, please explain:

Other Comments: