

Proposal Reviews

#135: Amphipod (*Traskorchestia traskiana*) - pickleweed (*Salicornia virginica*) interactions in San Francisco Bay area salt marshes.

San Francisco State University

Initial Selection Panel Review

Research and Restoration Technical Panel Review

Bay Regional Review

External Scientific Review #1
#2
#3

Environmental Compliance

Budget

Initial Selection Panel Review:

CALFED Bay-Delta 2002 ERP PSP Initial Selection Panel Review

Proposal Number: 135

Applicant Organization: San Francisco State University

Proposal Title: Amphipod (*Traskorchestia traskiana*) - pickleweed (*Salicornia virginica*) interactions in San Francisco Bay area salt marshes.

Please provide an overall evaluation rating.

Explanation of Recommendation Categories: Fund

- **As Is** (a proposal recommended for funding as proposed)
- **In Part** (a proposal for which partial funding is recommended for selected project phases or components)
- **With Conditions** (a proposal for which funds are recommended if the applicant contractually agrees to meet the specified conditions)

Consider as Directed Action in Annual Workplan (a proposal addressing a high priority action that requires some revision followed by additional review prior to being recommended for funding)

Not Recommended (a proposal not currently recommended for funding-after revision may be considered in the future)

Note on "Amount":

For proposals recommended as Fund As Is, Fund In Part or Fund With Conditions, the dollar amount is the amount recommended by the Selection Panel.

For proposals recommended as Consider as Directed Action in Annual Workplan, the dollar amount is the amount requested by the applicant(s).

Fund	
As Is	-
In Part	-
With Conditions	-
Consider as Directed Action	-
Not Recommended	X

Amount: **\$0**

Conditions, if any, of approval (if there are no conditions, please put "None"):

None

Provide a brief explanation of your rating:

This proposal provides an interesting perspective of tidal marsh dynamics. The reviewers raised some concerns regarding the detail provided in the proposal. It is poorly linked to CALFED restoration goals and was ranked LOW by the regional panel. The selection panel agrees with the Technical Panel evaluation.

Research and Restoration Technical Panel Review:

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

Proposal Number: 135

Applicant Organization: San Francisco State University

Proposal Title: Amphipod (*Traskorchestia traskiana*) - pickleweed (*Salicornia virginica*) interactions in San Francisco Bay area salt marshes.

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	Although the proposal is based on a superb understanding for tidal marsh natural history, the panel had serious concerns about both the peer-reviewed validity of the potential mutualistic relationship between <i>T. traskiana</i> and <i>S. virginica</i> and the applicability of the results to tidal marsh restoration. Despite the extensive experience and background data from Muzzi Marsh, details of the approach to the proposed investigations are entirely deficient in detail, preventing effective evaluation of its feasibility.
-Above average	
X Adequate	
-Not 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?

Reviewers ranked this proposal between poor to excellent, based predominantly on different perceptions of how much the proposed study would or would not contribute to CALFEDs restoration science needs rather than necessarily the quality of the science. The background information, which forms the rationale for expanding and testing the results from one San Pablo Bay marsh to several others, was also considered by reviewers to be of variable value; in general, the preliminary, unpublished evidence of a mutualistic interaction between *T. traskiana* and *S. virginica* was thought to be provocative but had weaknesses and had not been subjected to peer-review. The proposal lacks a well-defined goal statement, hypotheses, a formal conceptual model and performance measures. But, despite the applicants protestation that their proposal is largely descriptive, not hypothesis testing., their background data and extrapolation of the amphipod-pickleweed interaction to tidal marsh

restoration actually argues to the contrary. In general, the proposal was distractingly disorganized, with missing features that are critical for effective review (two figures, citation, key phrases).

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?

The applicants are extremely experienced and have a most intimate field ecology understanding of a potentially novel mutualistic interaction. Their prior studies at Muzzi Marsh obviously provide them with the capability to redesign and tune their experimental design and methodologies. However, a lack of detailed descriptions of the sampling design, etc. is entirely inadequate given this background data, such that field sampling locality and other details will depend on preliminary surveys. This not only makes it difficult to thoroughly assess the experimental and statistical design but also suggests that their Muzzi Marsh pilot data did not provide them with adequate pilot data for assessment of statistical power, etc. Other technical details are also lacking, such as the food and feeding experiments.

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?

Products are straightforward and should be appropriate for scientific manuscripts and meeting presentations, although there is no explicit dissemination of the results to restoration scientists and CALFED managers.

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

Given that the proposal is based on validating a well-developed (although unstated) hypothesis, the cost (>\$292,000) is questionable given the lack of application to tidal marsh restoration. One-third support of two senior scientists, in addition to a 50% laboratory technician and a graduate student, seems somewhat excessive given the scope of the field, laboratory and analytical efforts

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?

The Bay Regional Review reviewer rated this proposal low based on conceptual weaknesses in the background (tenuous and speculative relationship between *T. traskiana* and *S. virginica*), justification (amphipod limitations on growth and establishment of *S. virginica*) and application to tidal marsh restoration techniques, designs and outcomes.

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?

No problems were indicated under the Environmental Compliance review. However, the panel noted that proposals with similar tidal marsh field sampling designs were potentially vulnerable to ESA permits and conditions relative to California clapper rail disturbance; the applicants need to verify whether they are subject to this permit. The budget review noted that

budget details were deficient or inconsistent in several respects

Miscellaneous comments:

none

Bay Regional Review:

Proposal Number: 135

Applicant Organization: San Francisco State University

Proposal Title: Amphipod (*Traskorchestia traskiana*) - pickleweed (*Salicornia virginica*) interactions in San Francisco Bay area salt marshes.

Overall Ranking: Low Medium High

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

The proposed research has substantial merit as pure basic scientific research on invertebrate/plant interactions, but isn't relevant to impending San Pablo Bay/Suisun marsh management decisions.

1. Is the project feasible based on local constraints?

Yes No

How?

x

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

Yes No

How?

The proposal identifies no substantial evidence or arguments that amphipod interactions indeed limit the growth or establishment of pickleweed in restored or natural tidal marshes. It does not address the fact that the greatest pickleweed biomass in the region is often or usually associated with well-drained, nontidal salt marshes (e.g. fallow dredge disposal sites, saline diked baylands) where no amphipods exist. Moreover, it identifies no reasonable potential manipulation of potential interactions between amphipods and pickleweed, or other specific applications to tidal marsh restoration. In fact, the preliminary identification of an actual relationship, other than co-occurrence, appears tenuous and speculative.

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

Yes No

How?

The proposal identifies no specific practical applications to restoration techniques or designs.

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

Yes -No

How?

Other Comments:

External Scientific: #1

Research and Restoration External Scientific Review Form

Proposal Number: 135

Applicant Organization: San Francisco State University

Proposal Title: Amphipod (*Traskorchestia traskiana*) - pickleweed (*Salicornia virginica*) interactions in San Francisco Bay area salt marshes.

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 authors propose to investigate the possibility of a beneficial relationship between an amphipod and <i>Salicornia</i>. The methodology and preliminary results have not been peer reviewed, which makes it difficult to evaluate the feasibility of the proposed research. In addition, the link between their research and CalFed priority research has not been established.
XGood	
-Poor	

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

Ultimate goals, and proximate tasks are identified, but the proposal lacks a well defined goal statement. They propose to examine a possibly mutualistic relationship between pickleweed and an amphipod. Even were such a relationship shown to exist, I'm not sure how this would be helpful to marsh restoration efforts.

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 have presented results from an unpublished study to justify further research, but the study needs to be peer reviewed to evaluate its credibility, as data relating amphipod abundance to pickleweed biomass look highly variable. They have not presented a formal conceptual model, but have sketched out a possible facilitation mechanism whereby the detritus-feeding amphipod provides available nitrogen to pickleweed.

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?

Their approaches are based mainly from previous work - as this work has not been peer reviewed, it is difficult to judge whether their methods are robust. Their previous data show a strong relationship between the amphipod abundance they can measure and tidal height - it is not clear how their proposed methods will incorporate this confounding factor as the figure used to validate their method is missing from the proposal (as is another figure, an internally cited reference, and key phrases throughout the proposal).

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 approach is described fully, but the methods have not been peer reviewed. However, the authors have several years of experience with this system and have collected numerous data with these methods. This means that they can accomplish what they describe, but I'm not sure that what is discovered will be well accepted by their scientific peers

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?

There are no performance measures given.

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?

They expect to have a database, experimental results, and basic information on the feeding biology of the amphipod.

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?

Both PIs have worked in this system since 1997 developing the methods and research questions they have described. Dr. Obreski has been a PI on many other grants.

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

The budget is reasonable for the work proposed.

Miscellaneous comments:

External Scientific: #2

Research and Restoration External Scientific Review Form

Proposal Number: 135

Applicant Organization: San Francisco State University

Proposal Title: **Amphipod (Traskorchestia traskiana) - pickleweed (Salicornia virginica) interactions in San Francisco Bay area salt marshes.**

Conflict of Interest Statements:

I have no financial interest in this proposal.

Correct

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	Excellent and provocative science but poorly justified and linked to CALFED needs.
-Good	
XPoor	

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

The overall goal of the proposal is to expand and validate an already well-developed suite of hypotheses about the mutualistic relationship between the amphipod *Traskorchestia traskiana* and pickleweed (*Salicornia virginica*). The research is acknowledgedly description and does not explicitly test hypotheses beyond refinement of those already developed for one marsh (Muzzi Marsh, Corte Madera).

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 study is understandably well developed and justified from the standpoint of an existing dataset from one (Muzzi) marsh, and the evidence and conceptual model (although not necessarily characterized as such) for the mutualistic association between *T. traskiana* and *S. virginica* are seductive. However, despite the elaborate argument for going beyond structure attributes of marshes to assess function directly, the proposal does not actually provide any ecosystem context to the fertilization effect of *Traskorchestia traskiana* on pickleweed. There is no indication of the prominence of pickleweed in Bay-Delta marshes, the trophic role of *T. traskiana* in marsh food webs, or any development of an argument why this mutualism would be a particularly important indicator of the status of 'successful' salt marsh restoration.

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?

Project objectives are approached through prior tested descriptive sampling. Because they constitute extensions of the known/verified approach, the benefit to be gained will primarily be a more rigorous test of the universality of the *T. traskiana*-*S. virginica* interaction and introducing a comparison between 'historic' marshes and restoring marshes into the documentation of the variability in this interaction. Other than strengthening and validating the existing hypothesis, it will not necessarily expand upon the base of knowledge per se, and no novel information, methodology or approaches are likely to emerge from the research. The direct utility of the project results to decision makers may be only marginal without better development of the significance of the fertilization interaction to marsh restoration at the marsh ecosystem scale. However, the lack of detailed descriptions of the sampling design, etc. is entirely inadequate given the background data which the applicants have. The fact that 'field sampling locality and other details' will depend on 'preliminary surveys' not only makes it difficult to thoroughly assess the proposal but also suggests that their Muzzi Marsh pilot data isn't very useful (hard to believe) or that they haven't done their homework in investigating the proposed new sampling sites (which are not that far from their institution!).

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?

Due to the prior sampling and experimentation at Muzzi Marsh, many of the technical issues have been worked out.

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?

Given the scientific rigor of the proposed study, the performance measures are implicit in the precision and interpretability of the results, which should be more than satisfactory.

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?

The value of the project's products to CALFED are marginal. As proposed, the results are considered to 'contribute' to the quality of science that is necessary to evaluate CALFED restoration but there are no explicit tests of restoration performance that will derive from the

project.

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?

Both applicants are superb field ecologists and rare experts in experimental/sampling design that promotes unequivocal results. However, they do not have much experience in applied restoration ecology and do not appear to be taking advantage of much of that (some CALFED supported) that is coming out of their own institution.

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

The total budget (\$292,365) is not unreasonable for a two year intensive field effort over the number of sites proposed.

Miscellaneous comments:

Well designed and informative science that is poorly linked to CALFED's needs for explicit performance measures of salt march restoration approaches, designs and monitoring.

External Scientific: #3

Research and Restoration External Scientific Review Form

Proposal Number: 135

Applicant Organization: San Francisco State University

Proposal Title: Amphipod (*Traskorchestia traskiana*) - pickleweed (*Salicornia virginica*) interactions in San Francisco Bay area salt marshes.

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
XExcellent	This is original research that is testing the presence of a newly discovered ecological interaction in an abundant native habitat type. The researchers clearly demonstrate their knowledge and objectives on the subject, and present a well thought-out scientific proposal. If CALFED thinks this is appropriate research that can be used in management decisions regarding restoration, then it would be a beneficial project to fund.
-Good	
-Poor	

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

The Goals of this proposed research project are very clearly stated, owing to the large amount of background data that has been collected in the last few years. The basis of taking a more-or-less completed research project and expanding it into the next step is important in the development of scientific concepts, and this will be achieved by their proposed research. This seems especially important since they are proposing the existence of a major mutualistic interaction among two highly abundant native marsh species. The objectives are soundly based on the data that they have collected so far, and will expand the body of knowledge into new areas that are currently not well known. They state in their proposal, the proposed

research is largely descriptive, not hypothesis testing; this seems appropriate to the issue, as it is hard to test strict hypotheses when the background descriptive data is not at hand. However, it does seem like some of their proposed experiments will address some basic hypotheses, dealing with specifics of the mutualistic interactions.

The concept seems timely and important to the development of knowledge related to the CALFED mission. Although their research question definitely focuses on a very specific realm in marsh ecology, such interactions will help us understand the functioning of the marsh on a grander scale, especially due to the prominence and importance of pickleweed. It seems that they have established that the mutualistic interaction of *Trachorchestia* and pickleweed does (can) exist in certain locations, and it seems appropriate to attempt to establish this interaction both on a larger spatial scale and in further defining the surrounding functional parameters.

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 study is justified relative to existing knowledge. They clearly state what the data has shown them from past research, and speculate from this how they expect the system works in areas that they have yet to fully study. Although figs. 10 and 11 were absent from the pdf file, it seems that they have a firm grasp of the underlying groundwork for the proposed work, and their conceptual model is based both on their past research and from numerous examples from the literature. Their discussion of the critiques of Zedler and Lindig-Cisneros (2000) in relation to structural and functional relationships seem especially appropriate, and the proposed research would significantly add to this debate on how or if underlying structural components of marsh systems signify functional relationships. If they can establish a widespread Nitrogen flux between *Trachorchestia* and pickleweed, then future samplings could possibly rely on merely sampling *Trachorchestia* and inferring values of nitrogen flux. A full-scale research project is the only direction to head at this point, as they have already accomplished the necessary pilot work.

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 is well designed for answering the questions of the project. Results will definitely add to the base of knowledge, which seems appropriate in order to either establish this mutualistic interaction as a viable wide-scale event, or as an interaction that is only present in certain specific circumstances. I think that the strength of this research lies in the novel question that they are asking, and the techniques which they have already developed. They seem well versed in Nitrogen measurement techniques and literature, which is not true for just any marsh ecologist. They have also already taken a new approach for amphipod size measurements, by developing image analysis techniques. These developments place faith in their ability to utilize techniques which they describe, and to develop any new techniques which may be necessary to answer their questions. I think the trick of their research will be to make their findings useful to decision-makers. Although it is a unique research approach that they have taken, it is sometimes hard to apply findings on such specific functional relationships to management issues. However, if they find that this functional relationship is a key component of native pickleweed communities, it will be important to preserve this functional habitat type.

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?

Since they have been developing this research question since 1996, it seems like they have accumulated plenty of pilot data, pertinent knowledge, and development of techniques to make this a successful project. The approach seems well thought out, and is defended by both background data and citations from the scientific literature. They have all of the experience in house, so don't have to rely on much outside knowledge. I think they have picked an appropriate spatial scale by focusing on San Pablo Bay and Petaluma River. This will expand their research to enough new sites to make the functional relationship well-established if such a relationship truly exists, but won't add too many conflicting environmental variables of salinity, temperature, etc.

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?

They give examples from already accomplished research on some aspects of how their new data will be analyzed. All of the unknown attributes of the study design lie in site-specific variables, such as choosing the location of transects that will be dependent on initial sampling and/or environmental characteristics. For each task, they lay out clear alternatives and cite numerous examples in the literature on how other researchers have quantified their results in relation to similar data accumulations. In Task 1, they outline 3 different trapping techniques; In Task 2, they outline how and what environmental variables they will measure, with techniques established in the literature; In Task 3, they outline their approach as well as defend via the literature why they are not using stable isotopes.

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 of ecological value seem definite from the project, in relation to the scale and parameters on which the functional relationship takes place. I think the interpretive outcomes are the most fuzzy aspect of the research, but that relates to the uniqueness of the project rather than to any lack of confidence. If their new findings support the presence of a widespread mutualistic interaction, then the interpretation of that will be applicable to restoration ecology at a large scale in the San Francisco Bay region. If their new findings show gradients in their measurements that can't be clearly defined to specific variables, then the underlying natural variation may make interpretation difficult.

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?

Past projects on the subject have pointed the researchers to the current proposal. Reviewing their development of the research project, it seems like they have been successful in recognizing a previously unknown ecological interaction, and have developed new techniques with which to collect and analyze pertinent data. I have no doubt that if funded, they could effectively undertake the research objectives which they have outlined, through completion of the project. It seems clear that they have at hand all of the expertise needed to accomplish the project, or have already researched in the literature how to accomplish tasks that they are not intimately familiar

with. I remember seeing Dr. Obrebski give a talk on this subject at I think the CALFED 2000 Science Conference, and being impressed with the originality of the research and his enthusiasm on the subject.

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

The budget reflects the proposed research project. A 2 year study seems appropriate to firmly assess the objectives. I am not familiar enough with nutrient analysis to determine what the \$6000 in equipment will be specifically used for, but they seem to have done quite a bit of review on the subject. The time of 30% for the two PIs and a 50% lab tech and grad student seem like a good breakdown of hours.

Miscellaneous comments:

I have come across beach-hoppers in invertebrate samplings and fish diet surveys in the past, and have always found a lack of data on the subject. The only time I have seen this amphipod in any abundance in fish diets is after a marsh was burned, which lends credence that they normally take refuge from predation in marsh vegetation.

This seems like an important interaction that could be important to aspects of restoration ecology on a large scale. The one caveat of the research may be that although the findings will probably relate well to ecological theory, they might be hard to relate to management decisions involving CALFED.

Environmental Compliance:

Proposal Number: 135

Applicant Organization: San Francisco State University

Proposal Title: Amphipod (*Traskorchestia traskiana*) - pickleweed (*Salicornia virginica*) interactions in San Francisco Bay area salt marshes.

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

Yes -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?

Yes -No

If no, please explain:

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

-Yes No

If yes, please explain:

Other Comments:

Budget:

Proposal Number: 135

Applicant Organization: San Francisco State University

Proposal Title: Amphipod (*Traskorchestia traskiana*) - pickleweed (*Salicornia virginica*) interactions in San Francisco Bay area salt marshes.

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

-Yes No

If no, please explain:

No cost included for PM. No Work Schedule included in Proposal.

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

-Yes No

If no, please explain:

In Budget Summary, except no Project Management costs.

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

-Yes No

If no, please explain:

No narrative, only mention of total cost for 1st and 2nd year.

4. Are appropriate project management costs clearly identified?

-Yes No

If no, please explain:

Narrative reads "Cannot imagine how to calculate all this."

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

-Yes No

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

Requesting \$297,864 (17a); Grand Total of Budget Summary for 2-year budget is \$292,365.

6. Does the budget justification adequately explain major expenses?

-Yes No

If no, please explain:

See notes for PM and Indirects, incomplete information provided.

7. Are there other budget issues that warrant consideration?

-Yes No

If yes, please explain:

Other Comments: