

Proposal Reviews

#35: Biological Restoration, Improvements, and Multidisciplinary Monitoring in the Suisun Marsh/North San Francisco Bay Ecological Zone. Phase Two: Importance of Marsh Ponds, Algae, and other Features along Marsh Channels.

California State University, Hayward

Research and Restoration Technical Panel Review

Bay Regional Review

Delta Regional Review

External Scientific Review

#1

#2

#3

#4

Prior Performance/Next Phase Funding

Environmental Compliance

Budget

Research and Restoration Technical Panel Review:

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

Proposal Number: 35

Applicant Organization: California State University, Hayward

Proposal Title: Biological Restoration, Improvements, and Multidisciplinary Monitoring in the Suisun Marsh/North San Francisco Bay Ecological Zone. Phase Two: Importance of Marsh Ponds, Algae, and other Features along Marsh Channels.

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	The panel found this a poorly organized proposal that attempts to gain knowledge about restored intertidal marshes (especially small scale channels and ponds), and the fish that appear to use them. None of the reviewers recommended funding for the proposal as presented. Greater detail can be found in individual reviews.
-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?

The stated goal to identify and improve factors that enhance productivity and sustainability of dwindling native [fish] populations is connected to six objectives summed as restore, improve, monitor, maintain and teach about marshes. The hypothesis is that some marshes are better than others for at risk fish due to limiting conditions/resources at restored and natural marshes. Hypotheses stated in the hypothesis section of the proposal invoked multiple ideas and were confusing. These ideas address several CALFED uncertainties and support many of the ERP strategic goals. Recent work in restored and natural marshes indicates that some marshes appear to support many more at risk fish than others. Unfortunately, the conceptual model was never presented clearly. Though Figure 1 was used to illustrate the model, the information was extremely simplistic and did not provide a

context for the proposed research and construction. (Nutrients flow from marsh ponds to plants and then nutrients and energy flow through invertebrates to fish.) Examination of metals in marsh food webs was without context. Clearly, this work will increase what is known about the two fish species of concern. However, when implementation of physical alterations to marshes occurs to support one or two species, it is important that a comprehensive context is established so managers know what species or habitats will be negatively impacted. Part of this may be losses in populations of invasive species, which is a bonus. However, as managers and scientists, we also must have a good idea of impacts to other native species.

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 approach did not indicate which sites were to receive alterations and the intensity of construction activities at each. Appropriately scaled maintenance and construction activities are driven by an extensive monitoring program. It was unclear whether this was the only group and this request was the only funding to monitor the sites described. It seems that a complete suite of parameters will be measured. Some of the sampling methods are consistent with regional protocols, mechanisms are in place to rapidly summarize the data and make it available, and QA/QC procedures are in place. The project is feasible and likely to succeed in increasing habitat values for fish in restored marshes. It will also meet its educational objectives and produce information useful for other CALFED projects. The scale of the project is small and aims to enhance fish habitat in marshes already considered restored. The applicant has participated in CALFED restoration programs in the past and appears to have produced all the contracted products. He has peer-reviewed papers published on other projects and will likely produce papers from completed work as well as the proposed research. Performance measures were not given, but the project activities are focused on monitoring which drives the minor construction actions. We presume an appropriate performance measure would be greater numbers of fish (by species for the two species of interest) per area of marsh following structural improvements and compared to natural, unimproved marshes. This same approach could extend to other measures as well (water quality, animals constituting the supporting food web, etc.).

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?

The applicant promises to supply information about the projects and monitoring data on web sites, share information among agencies at regional meetings and present information at national meeting and journal articles. Sharing by the applicant was questioned by a regional review panel. There will also be training through a new college-level course and a short video documentary produced.

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

Considering that this work will not create newly restored intertidal marsh, but monitor eight sites (with a seemingly complete suite of parameters) and perform small-scale improvements for target fish, 1.3 million is large relative to the perceived benefits.

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 panel gave the proposal a LOW ranking because they felt the physical marsh alterations proposed were directed toward several fish species and not in support of natural conditions and dynamics in tidal marshes. These activities may be detrimental to different types of bird populations. Alteration details and sites are not given. Information sharing with DFG and USF&WS was not forthcoming from applicant. The Delta Regional Review panel ranked the proposal LOW because they did not feel this work applied to their geographic area, nor was the project integrated well with 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?

Prior performance review indicated no issues or problems in Phase I. The compliance review indicated some regulatory issues/permit processes were not identified adequately in the proposal, but they would not likely impair feasibility. Budget reviewer indicated the budget bottom lines did not match.

Miscellaneous comments:

None

Bay Regional Review:

Proposal Number: 35

Applicant Organization: California State University, Hayward

Proposal Title: Biological Restoration, Improvements, and Multidisciplinary Monitoring in the Suisun Marsh/North San Francisco Bay Ecological Zone. Phase Two: Importance of Marsh Ponds, Algae, and other Features along Marsh Channels.

Overall Ranking: ☒Low ☐Medium ☐High

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

The regional panel believes that one of the main hypotheses, and proposed actions, to connect marsh ponds to channels using weirs, is contrary to restoration of naturally functioning tidal marshes and may only benefit fish, possibly to the detriment of other taxa. The natural condition of stable marsh ponds (tidal marsh pans) is to be isolated from tidal channel connections. Channelized ponds are inherently unstable, rapidly fill with sediment and vegetation, and become marsh which lacks comparable functions for shorebirds and waterfowl, which are the principal management value of marsh ponds. The practical ecological management applications for pond channelization are very limited regionally, and would be detrimental to sensitive shorebird and waterfowl resources if applied to most tidal marshes. We also have concerns over permit compliance and coordination with agencies.

1. Is the project feasible based on local constraints?

☒Yes ☐No

How?

(Or probably)The applicants state that they have an alternative, easily permittable site if one of their restoration sites isnt permitted in time. Theyve secured access to private lands for their research and restoration work. Written permission is not included in the proposal, although the applicants state all landowners are partners. Maps showing the exact study sites are not included in the proposal, making evaluation of the appropriateness of the project to the site impossible.

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

☐Yes ☒No

How?

The proposal is unclear as to exactly what will be done in terms of restoration work. How many weirs? How many ponds will be created and/or attached to channels? For Ecosystem Restoration Strategic Goals (SG) SG1 (endangered/at-risk spp), the work will attempt to find and minimize local stressors (local salinity, temp, and food supply) at various life stages of delta smelt and splittail. Proposed restoration/habitat manipulation may increase/improve habitat for these species. However, the panel believes the proposed work in the marsh - -

creating linked marsh ponds - - is contrary to restoring natural marshes and is based on increasing fish abundance only, possibly (or probably) to the detriment of other taxa. For SG2 and SG4 (ecological processes, habitats)(and thus PSP 7, bullet 2, PSP 8 bullet 2), the project would study how to improve ...somewhat degraded reference marshes as well as restored marshes through removal and modification of bottlenecks (gates, pipes, silt deposits) and adding or connecting marsh ponds to channels in areas w/few aquatic animals (although the proposal doesn't give details), to improve habitat for splittail and other native fish. Improving reference marshes was controversial for the reviewers, especially if it involves creating unnatural linkages to marsh ponds. For SG5 (nonnative invasive species), the authors argue unconvincingly that this will be addressed by killing all non-native fish caught during sampling, and removing the pipes entering the tidal marsh at one site, which currently support a non-native hydroid that may reduce zooplankton and larval fish movement. For SG 6 (sediment and water quality), the project will sample sediments, fish and water in restored vs. reference marshes for nutrients, carbon flux and lead, mercury and copper; toxicity levels will be related to other ecosystems to determine if thresholds are exceeded; nutrient/carbon flux will be compared to determine limitations in (presumably) restored marshes. This may address Bay Region PSP priority 6, bullet #1, Multiregion PSP priority 5, bullet 2 in part and bullet 8. Their argument for a link between their marsh ponds and the Bypasses as Habitat goal of CALFED (e.g., Yolo and Sutter bypasses) is tenuous. In general, it was difficult to understand how the proposal would address the goals, given the ambiguity of the proposal and the seemingly contrary actions of creating unnatural linkages to ponds or in the marshes.

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

-Yes XNo

How?

The applicants state that they have begun to use their results from phase I to aid and advise other restoration efforts with regard to methods of habitat improvement and sampling species non-destructively particularly with USFWS San Pablo Bay NWR and EBRPD (at Big Break marsh, proposed for restoration by EBRPD). The authors state they are collaborating with SFEI on (an unspecified) monitoring proposal, and they're beginning to coordinate their sampling and reporting with IEP.

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

XYes -No

How?

There is no evidence that the applicants have coordinated with county or local governments or watershed groups. The applicants state they have the cooperation of all landowners and neighbors. Public outreach will be through CSUH Contra Costa Campus, where they will teach classes in estuary restoration. Outreach will be through an educational video (no discussion of non-English language outreach). Other outreach will include public presentations through IEP, SFEI, etc.

Other Comments:

The proposal is basically unclear in many essential areas.

Detailed maps referred to on page 6 were not included, nor were details (quantification) on pipe removal, etc.

Reviewers had concerns about the statement that CCMVCD is experienced with permitting for restoration near these sites. DFG has tried to bring CCMVCD into compliance with CESA/NPPA for work on a listed plant species (in a marsh restoration/creation project in Contra Costa County), and this issue still hasn't been resolved. Both DFG and USFWS have been unable to get reports on the restoration/reintroduction project from CCMVCD.

Delta Regional Review:

Proposal Number: 35

Proposal Title: Biological Restoration, Improvements, and Multidisciplinary Monitoring in the Suisun Marsh/North San Francisco Bay Ecological Zone. Phase Two: Importance of Marsh Ponds, Algae, and other Features along Marsh Channels.

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

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

This research to improve understanding of tidal restoration and ecosystems is most relevant to the Bay-Suisun region, not the Delta.

1. Is the project feasible based on local constraints?

XYes -No

How?

additional investigations of existing restoration efforts

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

XYes -No

How?

goals 1, 2, 4, 5, and 6

tidal restoration

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?

next phase tidal marsh monitoring

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

XYes -No

How?

agencies and stakeholders notified

Other Comments:

could be better integrated with other projects/research

more applicable to the bay and marsh region

External Scientific: #1

Research and Restoration External Scientific Review Form

Proposal Number: 35

Applicant Organization: California State University, Hayward

Proposal Title: **Biological Restoration, Improvements, and Multidisciplinary Monitoring in the Suisun Marsh/North San Francisco Bay Ecological Zone. Phase Two: Importance of Marsh Ponds, Algae, and other Features along Marsh Channels.**

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	A poorly organized proposal that attempts to gain knowledge about restored intertidal marshes (especially small scale channels and ponds), and the fish that appear to use them.
-Good	
☒ Poor	

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

The stated goal "to identify and improve factors that enhance productivity and sustainability of dwindling native [fish] populations" is connected to six objectives summed as "restore, improve, monitor, maintain and teach about marshes." The hypothesis is that some marshes are better than others for at risk fish due to limiting conditions/resources at restored and natural marshes. Hypotheses stated in the hypothesis section of the proposal invoked multiple ideas and were confusing. These ideas address several CALFED uncertainties and support many of the ERP strategic 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?

Recent work in restored and natural marshes indicates that some marshes appear to support many more at risk fish than others. Unfortunately, the conceptual model to support these observations was never presented clearly. Though Figure 1 was used to illustrate the model, the information was extremely simplistic and did not provide a context for the proposed research and construction. (Nutrients flow from marsh ponds to plants and then nutrients and energy flow through invertebrates to fish.) Clearly, this work will increase what is known about the two fish species of concern. However, when implementation of physical alterations to marshes occurs to support one or two species, it is important that a comprehensive context is established so managers know what species or habitats will be negatively impacted. Part of this may be losses in populations of invasive species, which is another bonus. However, as managers and scientists, we also must have a good idea of impacts to other native species.

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 did not indicate which sites were to receive alterations and the intensity of construction activities at each. Appropriately-scaled maintenance and construction activities are driven by an extensive and careful monitoring program. It was unclear whether this was the only group and this request was the only funding to monitor the sites described. It seems that a complete suite of parameters will be measured. Some of the sampling methods are consistent with regional protocols, mechanisms are in place to rapidly summarize the data and make it available, and QA/QC procedures are in place.

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 project is feasible and likely to succeed in increasing habitat values for fish in restored marshes. It will also meet its educational objectives and produce information useful for other CALFED projects. The scale of the project is small and aims to enhance fish habitat in marshes already considered restored.

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 are not given, but the project activities are focused on monitoring which drives the minor construction actions. I suppose an appropriate performance measure would be greater numbers of fish (by species for the two species of interest) per area of marsh following structural improvements and compared to natural, unimproved marshes. This same approach could extend to other measures as well (water quality, animals constituting the supporting food web, etc.). Although not presented in this section, the reviewer has confidence that applicant will meet quality control regarding experimental design and hypothesis testing.

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 applicant promises to supply information about the projects and monitoring data on web sites, share information among agencies at regional meetings and present information at national meeting and journal articles. There will also be training through a new college-level course and a short video documentary produced.

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 has participated in CALFED restoration programs in the past and appears to have produced all the contracted products. He has peer-reviewed papers published on other projects and will likely produce papers from completed work as well as the proposed research.

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

Considering that this work will not create newly restored intertidal marsh, but monitor eight sites (with a seemingly complete suite of parameters) and perform small-scale improvements for target fish, 1.3 million appears to be a stretch.

Miscellaneous comments:

This appears to be a proposal to support researchers to assess natural and restored tidal marshes and to work with mosquito control professionals to improve several marshes with respect to several at-risk fish species. Also included are water quality, food webs and sediments as well as a disconnected section examining contaminants that might affect marsh productivity with respect to fish populations.

External Scientific: #2

Research and Restoration External Scientific Review Form

Proposal Number: 35

Applicant Organization: California State University, Hayward

Proposal Title: **Biological Restoration, Improvements, and Multidisciplinary Monitoring in the Suisun Marsh/North San Francisco Bay Ecological Zone. Phase Two: Importance of Marsh Ponds, Algae, and other Features along Marsh Channels.**

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	I would have liked a more focused proposal and a bit more emphasis on examining how process level features change with these manipulations. However, the PIs have a lot of excellent data on these manipulations already and have some interesting finding that deserve follow up.
XGood	
-Poor	

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

This proposal has a number of objectives. The key objective of this proposal would seem to be to examine methods of aquatic habitat restoration with special emphasis on managing endangered species. This is being achieved through examining the special role of marsh ponds in providing both habitat and food resources for both endangered and non-endangered species. I feel this is a critical need an a project on this is both timely and important. The recent NAS study has shown that most wetland habitat restoration/mitigation projects fail in just a few years. Much more information is needed if these projects are to be sustainable. Endangered species presents a special challenge, especially those whose life history is poorly know. An additional part of the objectives entails

1) examining persistent metals and 2) designing novel new fish weirs. Both could be very important but there was no justification in this proposal on why they chose to study metals except to some passing reference of prior contamination. There has been some excellent work on metals in food webs in the past in similar systems. I would need much more information to know if this work will produce anything new. The novel fish weirs were not described in the proposal nor was the rationale for needing a new design clearly explained. This is not my field and I know many of the other designs have problems but again, I need more information to evaluate this aspect of the work.

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 new operating conceptual model involves the idea that marshes connected by ponds have higher productivity than natural marshes due in fact to greater algal production. The work will involve some alteration of previously constructed systems and monitoring. The initial work produced some interesting findings and it appears that follow up is justified. As stated above, I found less justification for the metals work, not because it isn't important but the reasons for including it in this study were not given. Do the PIs expect restoration to mobilize metals?

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?

I had a great deal of trouble following the approach. It seems like it was necessary to have read the previous proposal first. At times reference is made to replicated treatments, at other times the proposal talks about "three various marsh restorations". The results from phase 1 describe a "eutrophic" site, later there is reference to "two of our rich marshes" and there are descriptions of marshes of different salinities. While sample replication is explained in detail I never found a clear description of the sites and the exact manipulations. Obviously, this makes a full evaluation of the approach difficult. An additional problem is that the hypotheses have to do with food webs and energy flow but the critical question of carbon flow is being done "locally", outside of this effort. I would consider this a fatal flaw except that the investigators involved in the carbon flow work (Jasby and Cloern) are first rate. However, if this proposal is funded it will be important to know how large of a commitment these other investigators are willing to make and if it is sufficient. The metals work is going to document the metals in some components in the food web but examining only the sediment, plants and fish may not be enough to know what is going on. Details such as water column metal concentrations, metal release from sediments, complexation, rates of methylation, etc. would seem to be necessary to predict how restoration will affect bioavailability and biomagnification. At a minimum, simple examination of metal forms in sediments and waters should be employed.

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 previously explained, it is difficult to fully gauge the likelihood of success of this project because the experimental design is not well explained and some key components are not part of this work. The project also seems to include aspects that are only peripheral to the main goals. However, this is a continuation of a project that appears to have moved along well and accomplished many of its previous objectives so I am somewhat optimistic that the project will achieve some real successes.

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 is a fairly high level of monitoring and the previous study was able to document the treatment effects. One important reason to carry on this work is to determine if the short term effects change over time.

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 major products will be papers and articles on the utility of this type of restoration strategy. If the project meets all of it's goals a much better understanding of the coupling between marshes and open water will result.

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?

This is a strong team and the infrastructure and other aspects of project are in place. They have previously worked together and have a good idea of what they want to do.

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

I think this is an expensive proposal. It could be focused to the core objectives.

Miscellaneous comments:

This proposal was not at all easy to read or to follow. In many places I felt like I was expected to know information from the previous proposal or know more about the site than I did. Some of this may be the format required for a CALFED proposal. If this is the case CALFED should consider a format that makes it easier for outside reviewers to evaluate the work.

External Scientific: #3

Research and Restoration External Scientific Review Form

Proposal Number: 35

Applicant Organization: California State University, Hayward

Proposal Title: **Biological Restoration, Improvements, and Multidisciplinary Monitoring in the Suisun Marsh/North San Francisco Bay Ecological Zone. Phase Two: Importance of Marsh Ponds, Algae, and other Features along Marsh Channels.**

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	In my judgment, this is not a high quality proposal based on sound science that will help achieve high priority CALFED and CVPIA objectives. This is the worst CALFED proposal I have ever reviewed. It is poorly written, presents an inadequate scientific design, and is conceptually detrimental to existing wetlands. Elements of this project which propose connection of ponds with ditches and weirs within tidal marsh is an example of the type of tidal marsh habitat degradation we want to avoid. Proceed with caution with this effort. This project appears to have mosquito abatement as its highest objective at the expense of tidal marsh habitat quality, but it is packaged as tidal marsh restoration. The scientific community working towards tidal marsh recovery in this Estuary has growing concerns about actions implemented on the Contra Costa shoreline.
-Good	
XPoor	

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

Yes. The objectives are to increase tidal action in wetlands, connect tidal marsh ponds to channels with sills and fish weirs, monitoring and compare reference marshes with restored marshes both with and without experimental pond connections. The primary testable hypothesis is that particular conditions in reference and restored marshes will yield different population densities of resident fishes and fish food sources, and that rates of fish colonization in marshes will improve over time.

This concept is counter to the goal of tidal marsh restoration, has a flawed scientific design, and is conceptually ill conceived. The study is also focused on benefits to fish relative to ditching between ponds in tidal marsh, and does not consider ecosystem level effects of these proposed hydrologic manipulations. The potential jeopardy and take to endangered species such as clapper rails and rare plants in these marshes resulting from ditch construction activities, long term hydrologic disturbance, and alteration of tidal marsh plant community pattern is not addressed.

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?

This study is not justified relative to information provided about the first phase of the project. The applicants have not provided compelling evidence that this work is needed and beneficial. The outcome of the first phase is uncertain, and reported information only implies the methods proposed may benefit some species of fish. The analogy of the benefits of seasonal floodplains to fish compared to artificially connected ponds in tidal marsh is spurious and not substantiated. The title suggests an important link to algae and the proposal states Phase I suggested the direct or indirect importance of connected marsh ponds here, while moderate algae from marsh ponds may be a more direct effect. There is no explanation of this statement, and no substantiated link between the proposed hydrologic alterations and algae. The applicants do not tell us HOW their alterations change algal communities, they dont provide evidence that it is a positive effect, and they dont justify further study.

This study is not justified relative to existing general knowledge of tidal marsh ecology and historic tidal marsh structure. Historic data is available regarding tidal marsh pond occurrences within tidal marsh prior to extensive diking. Isolated marsh ponds were common in many Suisun Bay region tidal marsh. Most of these ponds were an important component of high tidal marsh as isolated pond systems without hydrologic channel connections. The proposal to artificially ditch between tidal marsh ponds and install fish weirs, no matter how novel, will perhaps benefit some native fish and some invertebrates. However, what we dont need is more tidal marshes with hydrologic alterations such as the proposed ditching. These hydrologic alterations change vegetation pattern, primary production, and alter food web structure. This work appears to be creative mosquito abatement disguised as tidal marsh restoration. In reality, it is likely a form of tidal marsh degradation. Many of our existing historic tidal marshes are not truly reference marshes because of the extensive ditching for past mosquito abatement activities. Lets not continue this trend. It is detrimental to the tidal marsh ecosystem and does not further CALFEDs goals.

The applicants present a central hypothesis that presence of ponds along constructed channels within tidal marsh increases the density of some aquatic animals. They present a diagrammatic model outlining trophic level transfers of energy within shallow water marsh habitat including marsh ponds and show that this links to deeper water estuary habitat. This simplistic model could be pulled from any introductory ecology text. They do incorporate their proposed channel construction between ponds. They do not include causative links between ecosystems factors that would justify the expensive proposed monitoring of sediment and water

chemistry. The conceptual model as presented does not provide strong support for this proposal and suggests the project has only been given cursory attention.

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?

One must attempt to read this proposal several times to actually figure out what is being proposed. The applicants are not clear, and the thinking is not presented in an organized and well-supported manner. Those familiar with the peer-reviewed literature will scratch their heads more than once. Often the cited references are not relevant to what the authors statements.

The scientific design of this study is seriously flawed. Aside from all other conceptual problems with this work, the significant problems with the scientific design indicate this application is NOT based on sound science, and not in the best interest of CALFED goals. The most significant design flaw concerns the reference sites. The applicants propose replicated experimental treatments (channel construction with fish weirs connecting marsh ponds) but they also PROPOSE TO SUBJECT THEIR REFERENCE SITES TO THESE SAME CONSTRUCTED DITCHES. There is no true reference for comparison as proposed. Furthermore, constructing artificial channels and fish weirs within tidal marsh is NOT tidal marsh restoration.

The authors present detail regarding sample collection methods and techniques. Statistical analyses of these data is mentioned, but specific methods are not explained. The project as designed does not have true controls for statistical comparison, and it will not be possible to provide scientifically defensible data to interpret experimental results.

The authors also raise this issue of introduced exotic invertebrates, and claim their project should alleviate this problem as they will remove invasive species. The best I can tell from the proposal is they plan to selectively remove any exotic animals that happen to end up in their sampling traps. They have not addressed the exotics issue in a comprehensive manner, although the project description suggests that digging ditches between marsh ponds will in some way solve this problem. There is not convincing evidence for this.

This project could be used to document the effects of artificial hydrologic alteration on tidal marsh, but the goal of the greater San Francisco Estuary restoration community is to reverse the damage caused by actions such as this in the past. We can assess the negative impacts of these actions in existing tidal marsh that has been degraded by mosquito ditching. This project doesnt make good ecological sense.

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?

It was difficult to determine if the approach was fully documented because this proposal was so poorly written. After spending the better part of a day trying to decipher this submittal, I can only conclude that the proposal is not fully documented. It is technically feasible to construct ditches to connect ponds and include fish weirs, but as proposed it is not possible to reach sound scientific conclusions.

It is hard to believe any regulatory authority will approve the construction of artificial channels in existing reference tidal marsh. This mentality hopefully died more than a decade ago.

The authors also completely ignore other ecosystem aspects of these marshes. It is not all about ponds, connecting channels, weirs, and fish. Some of these sites (particular Pt. Edith Marsh) are occupied by endangered clapper rails and rare plants. The construction activities will potentially result in take of clapper rails. The changes in hydrology and hence tidal marsh vegetation community structure may also impact rails and rare plants.

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?

The applicants propose comparative monitoring as a means to assess performance. In this case, comparative monitoring results may be problematic since the applicants propose to alter hydrology and construct ditches in the reference marshes.

The applicants propose an extensive water quality monitoring program to determine how the manipulations affect drinking water quality, fish viability, and suitability of fish for human consumption. The primary testable hypothesis for this project is that particular conditions in reference and restored marshes will yield different population densities of resident fishes and fish food sources, and that rates of fish colonization in marshes will improve over time. The extensive monitoring suggested goes beyond support of the proposed hypothesis and stated objectives. The hypothesis and objectives should be re-written to include broader objectives, or the monitoring should be reduced to more adequately reflect the stated objectives.

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 applicants propose the required quarterly and annual reports to CALFED in scientific paper format'with subsequent journal reprints. While many CALFED funded projects are conducted in a scientifically defensible manner which should result in peer-reviewed publications, these publications alone do not provide full value to CALFED. There will be significant data collection which could be useful to resource managers which will not be included in scientific journals. There may also be problems with paper acceptance by journals that excludes information important to resource managers. The applicants should be forthcoming with all information collected in the project. A suggestion which would be more useful to CALFED resource managers is to provide technical reports written in a style understandable to non-experts and managers that can be used for resource management decisions. In addition to these technical reports, peer-reviewed scientific papers written for a different audience should be encouraged. The applicants also propose to make oral presentations of their results.

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?

Without revealing my role as a reviewer of this proposal, I contacted state and federal resource agency personnel familiar with this work for their impressions of Phase I of this project funded by CALFED (98-C1042) and asked if useful information has been provided. Both state and federal biologists contacted said they have serious reservations about the project, and both

said the applicants have not been forthcoming with information. This should raise a red flag.

Furthermore, state agency personnel involved in CESA work indicated that the CCMVCD co-applicant of this proposal implemented an unauthorized translocation of a rare plant population without the necessary CESA rare plant research and rare plant collection permits. When DFG heard of this action, they requested a full report including methods and results, but never received the requested documents. Based on this track record, it appears at least one co-applicant has violated past regulatory requirements in place to protect sensitive species, and this project could be problematic for CALFED.

The applicants begin their proposal with the qualification: This proposal preparation was strictly on unfounded volunteer time, with little time available. The proposal, which follows, is one of the poorest I have ever reviewed. This indicates the available infrastructure and other aspects of support necessary to accomplish this project are not in place. If a State University and a public mosquito abatement district are asking CALFED for well over one million dollars for the second phase of an ongoing project, and support is not available within the institutions for adequate proposal preparation there is a problem with infrastructure support. I would be concerned that project implementation would also take a back seat to other time demands.

On an equally serious note, if the applicants have not taken the time to design a project with true controls for comparison there is a serious problem with the science. This work will not be defensible, and uncertainty will result. This will not further resource management decisions and restoration planning.

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

There are several aspects of this budget that seem highly inflated (i.e. CALFED meeting attendance, report preparation, and especially monitoring elements that go beyond support of the stated objectives and hypotheses). It appears that the applicants have pulled in everything they can possibly think of in a shot gun approach to generate as much funding as possible, but they have not strongly justified the expenditures relative to hypothesis testing and achievement of objectives. It makes me wonder if the water quality and metals analyses will satisfy some other regulatory requirement for the CCMVCD or research interest for the University author. Some expensive aspects central to the project budget (i.e. connecting ponds within tidal marsh with weirs/ditches including reference sites) are actually detrimental to CALFEDs objectives of restoring tidal marsh and should not be funded.

Miscellaneous comments:

There is a perception that if CALFED funding is already in place, future phases current projects will log-roll in. CALFED should take a serious look at this project. Perhaps the first phase slipped through without adequate science review. Existing projects need to demonstrate that they have contributed a high quality effort that should continue. This project does not provide that justification in the current proposal, and the current proposal does not merit the requested budget of over one million dollars.

External Scientific: #4

Research and Restoration External Scientific Review Form

Proposal Number: 35

Applicant Organization: California State University, Hayward

Proposal Title: **Biological Restoration, Improvements, and Multidisciplinary Monitoring in the Suisun Marsh/North San Francisco Bay Ecological Zone. Phase Two: Importance of Marsh Ponds, Algae, and other Features along Marsh Channels.**

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	I have serious concerns regarding the proponents abilities to: 1) implement consistent and unbiased scientific treatments to evaluate restoration options (as opposed to constant tinkering to improve the ecology); 2) quantitatively evaluate their hypotheses; and 3) communicate their results.
-Good	
XPoor	

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

The goals and objectives of the project are relatively well articulated. They are to increase tidal action, connect marsh ponds, monitor and compare reference and restored marshes, identify factors that limit primary and secondary productivity, assess the productivity and limiting factors for delta smelt and splittail, and to offer training. The central hypothesis is also reasonably well articulated; the presence of marsh ponds will increase population densities of most aquatic animals.

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 well justified in relation to existing knowledge and CALFED goals and priorities (p. 5).

The conceptual model is clearly stated, but it is incredibly simplistic. As I interpret what was written, energy flows up the food chain. If there is not enough food for native fishes, energy flow within the entire systems is stifled (don't get this part), and fish populations suffer (P. 3, middle paragraph). Other factors, like vigorous mixing may wash productivity out of the system and also influence fish populations. The other possibility is that migrating fish are not that dependent on marshes. The link between this 'model' and their hypotheses is weak.

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 of connecting ponds in restored marshes may be sound based on the anecdotal information provided in the proposal. The project in general, appears to be a strange mix of restoration and science. I get the sense that the proponents are constantly tinkering with various approaches and incrementally making improvements or adding habitat. At the same time, they are attempting to conduct a scientific study with replication and controls, etc. in order to quantify the responses to restoration and test specific hypotheses. I have little doubt that the project will provide interesting anecdotal information as evidenced by Appendix Table 2. However, quantitative results may be quite limited because the overall design is hindered by the constant tinkering, which leads ultimately to inconsistent treatments, and a relatively unquantitative approach. For example, on p. 7 second paragraph, the authors note the presence of invasive species such as yellowfin goby. I think they go on to state that they are going to selectively kill them through their intensive sampling. This may be beneficial to the marsh community at a very local scale, but don't such activities invalidate the comparisons with reference marshes (are they removing predators at these sites as well)?

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 proponents have demonstrated that it is feasible to restore marsh habitats in this area.

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?

The proponents specify their measurement techniques, but not the overall design of the monitoring program and how they will analyze the results to produce useful performance measures. For example, on p. 9, it is unclear how they will test the hypothesis that "suitably restored marshes will tend to accrue increased habitat value through time, and exceed that of our historical reference marshes". How are the proponents planning on quantifying habitat? How will the amount of habitat be standardized across locations? Many of the other criteria mentioned in this paragraph were qualitative. The only quantitative example they provide is suspect. The proponents state that herring and splittail densities are 50x higher in restored sites

relative to those reported by DFG, but that the latter measurements were made in deeper water. The proponents could simply be observing an ontogenetic habitat shift or changes in sampling efficiency driven by depth. The proponents are either fairly naïve about the effects of such factors on fisheries assessments, or are biased towards demonstrating how effective their restoration techniques have been. Either case is cause for concern.

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 project may increase our knowledge of marsh restoration techniques through anecdotal and natural-history information. The project may increase public support for such activities. I do not feel that data from the monitoring program will lead to quantitative tests of particular hypotheses or great advances in this discipline.

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 proponents have demonstrated that they are capable of conducting restoration activities and monitoring. They also appear very capable at mustering media and political coverage that will ultimately be beneficial for future restoration activities. However, on the scientific front, the proposal does not indicate a great ability of the proponents to synthesize their understanding or provide results that can be used to test hypotheses. I note that the majority of publications cited in the Partial Bibliography are conference presentations or unrefereed conference proceedings. This confirms my feeling that they have a limited ability to write a cohesive paper that is critical to disseminate information from this project.

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

The majority of the cost is associated with monitoring. Ordinarily I would support this prioritization, but I am not convinced from the proposal that the design and analysis of monitoring data will yield useful quantitative results.

Miscellaneous comments:

I found the proposal very difficult to read. The ideas were almost randomly scattered throughout the text. Restoration approaches, hypotheses, anecdotal observations, vague conceptual models, and emotional statements were all thrown together in a fairly incomprehensible mix. This does not bode well for the proponents ability to communicate their results to CALFED and the scientific community.

Prior Performance/Next Phase Funding:

New Proposal Number: 35

New Proposal Title: Biological Restoration, Improvements, and Multidisciplinary Monitoring in the Suisun Marsh/North San Francisco Bay Ecological Zone. Phase Two: Importance of Marsh Ponds, Algae, and other Features along Marsh Channels.

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

98- F22, Biological Restoration and monitoring in the Suisun Marsh/North San Francisco Bay , CALFED ERP

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

Environmental Compliance:

Proposal Number: 35

Applicant Organization: California State University, Hayward

Proposal Title: Biological Restoration, Improvements, and Multidisciplinary Monitoring in the Suisun Marsh/North San Francisco Bay Ecological Zone. Phase Two: Importance of Marsh Ponds, Algae, and other Features along Marsh Channels.

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

-Yes ☒No

If no, please explain:

The NEPA lead agency must be a Federal Agency. The applicant will need a 1601 from CDFG for widening the channels.

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:

I can not adequately answer this question. The applicant states that permits are completed and/or in the process of being completed but do not state which permits.

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: 35

Applicant Organization: California State University, Hayward

Proposal Title: Biological Restoration, Improvements, and Multidisciplinary Monitoring in the Suisun Marsh/North San Francisco Bay Ecological Zone. Phase Two: Importance of Marsh Ponds, Algae, and other Features along Marsh Channels.

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

☒Yes ☐No

If no, please explain:

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

☒Yes ☐No

If no, please explain:

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

☒Yes ☐No

If no, please explain:

4. Are appropriate project management costs clearly identified?

☒Yes ☐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 ☒No

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

Grand Total of 3-Year Budget Summary is \$1,308,089; total Federal funds requested is \$1,294,292, State request even less.

6. Does the budget justification adequately explain major expenses?

☒Yes ☐No

If no, please explain:

7. Are there other budget issues that warrant consideration?

-Yes ☒No

If yes, please explain:

Other Comments: