Proposal Reviews

#62: DEVELOPMENT OF A POPULATION-BASED HABITAT SUITABILITY MODEL FOR SALT MARSH HARVEST MOUSE TO GUIDE RESTORATION EFFORTS IN THE NORTH BAY REGION

Environmental Science Associates

Initial Selection Panel Review	
Research and Restoration Technical Panel Review	
Bay Regional Review	
External Scientific Review	#1 #2 #3 #4
Environmental Compliance	
Budget	

Initial Selection Panel Review:

CALFED Bay-Delta 2002 ERP PSP
Initial Selection Panel Review

Proposal Number: 62

Applicant Organization: Environmental Science Associates

Proposal Title: DEVELOPMENT OF A POPULATION-BASED HABITAT SUITABILITY MODEL FOR SALT MARSH HARVEST MOUSE TO GUIDE RESTORATION EFFORTS IN THE NORTH BAY REGION

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:

The selection panel concurred with the issues raised by technical teams. The proposal did not clearly indicate how the habitat and demographic information would provide information for the metapopulation model. The proposal would also have benefitted by a clear delineation of how this effort would help guide restoration.

Research and Restoration Technical Panel Review:

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

Proposal Number: 62

Applicant Organization: Environmental Science Associates

Proposal Title: DEVELOPMENT OF A POPULATION-BASED HABITAT SUITABILITY MODEL FOR SALT MARSH HARVEST MOUSE TO GUIDE RESTORATION EFFORTS IN THE NORTH BAY REGION

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 felt that much habitat work has already been done. The metapopulation models are poorly described. The genetics should be used to address the metapopulation dynamics and this was not done. The panel felt that this project might not attain its goals because the techniques proposed do not measure the appropriate demographic or genetic parameters. The genetic analysis might not be able to provide the necessary information on patterns of adaptive variation that is necessary for guiding conservation and restoration efforts. There was concern that the habitat and demographic studies would not provide the information needed in a meta-population model. The regional reviewers gave it a low rank and felt that the current knowledge base is already adequate for the mouse.**
-Above average	
XAdequate	
-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?

   Goals. They will develop a habitat suitability model for the harvest mouse by examining population genetics and habitat relationships. They will use the model to identify habitat polygons that should have high restoration priority. They will analyze population genetics over time based on museum samples (from 1908 onward) and spatially based on samples collected in the various types of habitats in the Petaluma marsh. They may also compare Petaluma populations with those of Suisun Marsh.

The goals, objectives, and hypotheses are clearly stated. Many restoration proposals discuss restoring habitat for this species and results from such a study could be used to guide the restoration process and assure a successful outcome for this animal.

The large genetic study on molecular markers apparently assumes that these markers will indicate adaptive units in the mouse populations that will then guide restoration. However, these markers are neutral to selection and thus may not be appropriate for this purpose of measuring adaptive genetic variation. The only way this will work is if the molecular markers are tightly linked to quantitative traits under selection; the applicants do not know whether this tight linkage exists. The goal to develop a meta-population model is very poorly described because the authors never define exactly what they mean by a meta-population. Is this a meta-population in the classic Hanski sense where sub-populations periodically go extinct and then re-establish through colonization?

Justification. Recovery of the salt marsh harvest mouse is a CalFed goal and this research addresses a means of directing restoration projects to increase the chances of a successful outcome for this species. The conceptual model is clearly stated. However, the general habitat requirements of the mouse are fairly well known according to the literature cited section. The development of the meta-population model requires a long term, detailed study of spatial patterns of population extinction and re-colonization. The applicants do not provide the needed protocol for this type of study. The justification for using molecular markers to aid in defining spatial patterns in adaptive genetic variation for guiding restoration is questionable because the markers being used are neutral to selection. These neutral molecular markers are excellent for defining phylogeographic patterns and gene flow patterns but these approaches and linkages to goals are not highlighted or developed by the applicants.

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?

Approach. The completion of this research may generate some useful methodologies that can be used in developing restoration plans for various sites to protect this species. Following are some concerns of reviewers. To what use will the existing species occurrence data be put? Why canonical correlation analysis? A logistic regression model would be most appropriate. It may be best not to separate into four habitat categories. How will the genetics component be integrated with the GIS model? How will interspecific competition be analyzed?

The development of a meta-population model requires a long term, intensive demographic project that is spatially explicit. The time period of three years suggested to develop such a model is much too short and the scope of sampling is inadequate; these models require information of the demographics of entire sub-populations not just individuals. Feasibility. The approach is technically feasible. Reviewers feel that it may not be possible to accomplish the project in 3 years. The sampling for determining habitat suitability is feasible but does not address meta-population dynamics.

Capabilities. The team appears to be well qualified, however there are almost no peer-reviewed articles by the applicants.

Performance Measures. They say for each task they will have milestones but they dont list these specifically. The performance measurements for the genetic portion are easily quantifiable, but the rest is not so easy to quantify. The development of the habitat suitability map will also provide a reasonable measure of performance but this map does not really contribute to the

development of a meta-population model.

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?

   They list various reports, the model, GIS data sets, and maps. They should also publish a paper or two in a refereed journal. One reviewer feel that because both the genetic and habitat analyses are poor approaches to answering the general goals of the proposal, the products will not be helpful in the conservation and restoration of this species.

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

   The budget appears somewhat high, especially that for the genetics work. The salary portion needs more justification.

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?

   Rank = LOW

   The current knowledge base is adequate for understanding mouse habitat requirements. The collection sites should cover a wider salinity gradient. There is low coordination with other agencies.

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?

   Environmental Compliance no problems

   Budget all ok

Miscellaneous comments:

This is a well designed project that should result in a model that will be useful in directing future restoration projects that have as a goal the protection of the salt marsh harvest mouse.

External Scientific Review. 3 Excellent, 1 Good, 1 - Poor

Bay Regional Review:

Proposal Number: 62

Applicant Organization: Environmental Science Associates

Proposal Title: DEVELOPMENT OF A POPULATION-BASED HABITAT SUITABILITY MODEL FOR SALT MARSH HARVEST MOUSE TO GUIDE RESTORATION EFFORTS IN THE NORTH BAY REGION

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

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

Need for such a model low for guiding restoration actions for the species. Current knowledge base provides adequate understanding of Salt Marsh Harvest Mouse habitat requirements to guide restoration. Applicability of the model over the range of the species questionable.

1. Is the project feasible based on local constraints?

   XYes **-**No

   How?

   Proposed research and model development is feasable, altlhough proposed use of Wildlife Habitat Relationships (WHR) for habitat classification not appropriate. Sites for collection of danta on habitat preferences should cover a wider salinity gradient than proposed.

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

   XYes **-**No

   How?

   Bay Region Priority 8, new investigations to develop improved strategies for restoring Bay at risk species.

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?

   Proposal reflects guidance in the Recovery Plan and MSCS concerning the SMHM. Little apparent understanding of ongoing thinking about the species in light of restoration planning in the Bay region.

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

   -Yes **X**No

   How?

   Low apparent coordination with other agencies and investigators involved in SMHM management and recovery.

Other Comments:

Genetic research element of the proposal could provide useful information on viability of existing populations.

External Scientific: #1

Research and Restoration External Scientific Review Form

Proposal Number: **62**

Applicant Organization: **Environmental Science Associates**

Proposal Title: **DEVELOPMENT OF A POPULATION-BASED HABITAT SUITABILITY MODEL FOR SALT MARSH HARVEST MOUSE TO GUIDE RESTORATION EFFORTS IN THE NORTH BAY REGION**

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):

Dr. Villablanca has provided a reference to me for an intern I once employed.

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 project is likely to provide a significant contribution to long-term restoration efforts in the Bay-Delta.**
-Good	
-Poor	

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

   Good. The proposed concept of identifying habitat relationships and genetic thresholds to guide effective restoration is very important. However, the research proposed may not be the most timely for the CalFed Bay-Delta Program.

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?

Excellent. The need for the data likely to result from this research will fill some significant gaps in the understanding of successful recovery of Salt Marsh Harvest Mouse.

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?

   Excellent! The data likely to result from this research will provide a much higher degree of certainty to future investigators and agencies making restoration decisions.

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?

   Excellent. The proposal demonstrates a well thoughout approach with realistic goals and clear objectives.

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?

   Excellent. The research team proposes a support network of agencies and associate researchers who will be able to provide check/balance input at quarterly intervals.

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?

   Excellent. Types and format of deliverables appear to be of a nature to facilitate accurate interpretation and/or reproduction.

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?

   Excellent. A well-rounded, well qualified team.

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

   Good.

Miscellaneous comments:

External Scientific: #2

Research and Restoration External Scientific Review Form

Proposal Number: **62**

Applicant Organization: **Environmental Science Associates**

Proposal Title: **DEVELOPMENT OF A POPULATION-BASED HABITAT SUITABILITY MODEL FOR SALT MARSH HARVEST MOUSE TO GUIDE RESTORATION EFFORTS IN THE NORTH BAY REGION**

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 feel that there is a distinct possibility that the study could not be conducted in 3 years. Also, I find fault with the salary portion of the budget without more justification. Otherwise, this was an excellent proposal.**
XGood	
-Poor	

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

   The goals, objectives, and hypotheses in this proposal are clearly stated and internally consistent. All of the stated objectives lead to the development of a HSI model for the salt marsh harvest mouse. The concept is timely and important as the species of concern is endangered. The information provided by this project would meet many CALFED priorities.

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. All of the methods have undergone previous peer scrutiny. This type of project should be performed more frequently before large restoration efforts. The conceptual model is clearly stated in the proposal, and I found it to be a very helpful summary to the investigators' thought processes. The conceptual model was a good summary and showed all of the logic behind the research. The selection of research project is justified, but the results of the project should also be very useful in future restoration efforts.

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 and appropriate for meeting the objectives of the project. However, the tasks to be accomplished may be a little ambitious to be completed in only 3 years. The results will significantly add to the base of knowledge for salt marsh harvest mice. The project will likely generate novel information. New methodology may possibly be generated in the genetic portion of the study. New approaches to restoration efforts concerning endangered species could be developed. The information is being developed for decision-making so this project will be very useful to decisionmakers.

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 fully documented and is technically feasible. Some methods of genetic analysis may need to be revised as methods are tested, but I think that the research team is more than qualified to handle this task. The likelihood of success is high, but that success may not be reached in the allotted project time despite the best efforts of the investigators to account for potential delays. The scale of the project is consistent with the objectives (except for time scale).

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 project includes a sufficient number of performance measures. The performance measures for the genetics portion of the study are easily quantified, but the rest of the project is not so easy to quantify.

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?

   This project is incredibly important for the restoration of the salt marsh harvest mouse and its associated habitats. The GIS layers and model developed could be of significant value to many research and restoration projects. Interpretative outcomes are to be expected in this project to determine suitable habitat, current and historical genetic populations, etc.

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 applicants appear to be of the highest quality. I thnk that the project team is qualified to effectively accomplish the project. I feel that 3 years may be too short of a time period considering the number of steps and subsequent investigators involved. The infrastructure is in place to accomplish this task.

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

   I personally thought that the budget was excessive as far as salary is concerned. A more detailed justification needs to be given when average salaries range from $80-$105/per hour. This is of concern to me considering some of the workers are survey crews only.

Miscellaneous comments:

External Scientific: #3

Research and Restoration External Scientific Review Form

Proposal Number: **62**

Applicant Organization: **Environmental Science Associates**

Proposal Title: **DEVELOPMENT OF A POPULATION-BASED HABITAT SUITABILITY MODEL FOR SALT MARSH HARVEST MOUSE TO GUIDE RESTORATION EFFORTS IN THE NORTH BAY REGION**

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

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

none

Review:

Please provide an overall evaluation summary rating:

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

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
XExcellent	**The project is ambitious and has high potential to produce useful results. I have questions about some of the details of the approach, but I am fairly confident that these details can be worked out without too much trouble in the course of the project. The aspects of the proposed project that are most attractive to me are: (1) the attempt to integrate landscape and genetic analyses into a single management model, and (2) the focus on a spatial model of habitat suitability, accounting both for patch-specific variables and landscape level variables that might be important determinants of population viability.**
-Good	
-Poor	

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

   The goals and hypotheses are stated clearly and the concept is timely and important. The two main goals of the project are (1) to identify habitat relationships and genetic thresholds for the salt marsh harvest mouse in the North Bay region, and (2) develop a GIS-based "habitat capability model" to guide 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?

   To my knowledge the study will not reproduce work already completed and so is justified relative to existing knowledge. The conceptual model is fairly clear, though I do have questions about a few of the details (which I will address in my response to the next question). The authors provide a flow chart-type description of the broad research plan, but this does not constitute what I would consider a complete conceptual model of the ecological processes under investigation. The basis for the proposed work is clear and compelling nonetheless, so all in all the project is to my mind justified, for the specific application proposed here, but also for the general lessons that could be learned about the relative importance of genetic factors versus landscape factors when setting priorities for managing threatened species.

   The project will be based largely on field data collected in Petaluma Marsh. The habitat suitability model will be based on this data, then applied and validated at another site in the area (likely Suisun Marsh). This approach is justified, as data collection efforts on a larger scale would probably be infeasible. The out-of-sample validation will be important, however, so substantial effort should be directed towards this component of the project.

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

   The approach seems fairly well-designed, as far as I can tell, but I have questions regarding some of the details: 1. To what use will the existing species occurrance data be put (from the California Natural Diversity Database, for example)? Will this be used to develop the habitat suitability model, or just for background info? 2. Why canonical correlation analysis? If the main intent is to explain occurrances of SMHM (binary, zero-one, dependent variable) as a function of exogenous habitat variables, then it seems to me that a logistic regression model would be most appropriate. The statistical analysis will form the foundation of the habitat capability model, so this aspect of the proposed modeling strategy should be better explained. 3. The authors claim that occurrance data is easily accessible for Suisun Marsh - Does this mean that field collections will not be made in Suisun Marsh for the purpose of out-of-sample model validation? If so, then I would worry about this aspect of the validation process. The model developed from Petaluma Marsh data should be applied directly to Suisun Marsh data that was collected in the same manner. 4. The authors apparently plan to separate habitat into four categories: high capability, midium capability, low capability, and unsuitable. I would suggest not doing this; direct results from application of the statistical model, in terms of probability of occurrance (or an area-weighted sum of probabilities of occurrance for large patches) might be the most informative type of output. 5. It is not clear to me how the genetics component of the project will be integrated with the GIS habitat suitability model described in Task 1. Probability of occurrence makes for a useful endpoint for the landscape analysis. What is the analogous indicator of genetic viability? (I must admit to having very little experience with genetics, so this question may be more an indication of my ignorance than the authors' explanation of this component of the project.) In any case, this seems to me the most ambitious and interesting component of this project: the attempt at integrating the standard landscape level analysis of species occurrences with the (meta)population level analysis of genetics. Any success along these lines would likely be useful, but the project is justifiable even as a set of separate projects that may only end up partly integrated. 6. The authors briefly mention interspecific competition, but there is no indication as to how this might be analyzed in the statistical model or operationalized

in the GIS-based habitat capability model.

All in all, I think the project has a lot of potential to produce useful results for the SMHM in particular, as well as useful lessons for future research designed to prioritize areas for protection and restoration to benefit threatened species and integrate landscape and genetic approaches. As long as the statistical models are developed to predict some useful indicator of population viability (such as total population size, which as far as I can tell must be based on an area-weighted sum of probabilities of occurrence), then the resulting habitat capability model will be useful to decision-makers.

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 fairly well documented (short of the questions I posed above), and should be technically feasible assuming collection of SMHM occurrence data in Petaluma Marsh is successful (everything hinges on that). There are a number of goals here, and while fulfilling all of them will be difficult the likelihood of success for a substantial portion of the goals is, I think, high. Projects of this magnitude always require adjustments over the course of implementation, but the authors appear to have a sufficiently coherent and flexible plan to make those adjustments and ensure useful results in the end. This is a large scale that relies heavily on field data collection, but the three year time frame and the seven person team of experts should be sufficient to ensure success.

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 based largely on the amount of data collected. This is a useful starting point, as statistical analysis and subsequent habitat capability modeling will benefit by large sample sizes, but other measures could be used as well. In particular, at the model validation phase the within-sample fit of the statistical model for Petaluma Marsh data and the out-of-sample fit for data collected in Suisun marsh with both be important performance measures.

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 main products envisaged are: (1) a GIS-based habitat capability model, and (2) restoration priority maps. Both of these would be of high value to decision makers, ESPECIALLY IF the habitat capability model is designed to predict useful indicators of population viability (such as effective population sizes). The usefulness of the model will be limited if it is only designed to generate rankings of "low," "medium," or "high" habitat suitability. I mention this because the latter type of model is common (for a number of reasons I'll not speculate on here), but while models of this type can be used to prioritize restoration or protection efforts, they cannot be used to predict absolute impacts on species viability. This is especially limiting if scarce conservation resourses must be divided up among competing projects and among a number of threatened species (which is always the case).

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?

   I have no means to assess the track record of the applicants, but according to the brief bios in the proposal the team appears to have sufficient expertise to undertake the project as described.

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

   It is hard for me to comment on this. The total amount requested - $820,000 - seems high, but certainly three years of field work, plus a substantial amount of GIS data, plus genetics lab work cannot come cheap. And like I said before, I feel like the potential for this project to produce useful outputs is high.

Miscellaneous comments:

External Scientific: #4

Research and Restoration External Scientific Review Form

Proposal Number: **62**

Applicant Organization: **Environmental Science Associates**

Proposal Title: **DEVELOPMENT OF A POPULATION-BASED HABITAT SUITABILITY MODEL FOR SALT MARSH HARVEST MOUSE TO GUIDE RESTORATION EFFORTS IN THE NORTH BAY REGION**

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

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

none

Review:

Please provide an overall evaluation summary rating:

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

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
XExcellent	**This is a well designed project that I believe should result in a model that will be useful in directing future restoration projects that have as a goal the protection of the salt marsh harvest mouse.**
-Good	
-Poor	

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

   They will develop a habitat suitability model for the harvest mouse by examining population genetics and habitat relationships. They will use the model to identify habitat polygons that should have high restoration priority. They will analyze population genetics over time based on museum samples (from 1908 onward) and spatially based on samples collected in the various types of habitats in the Petaluma marsh. They may also compare Petaluma populations with those of Suisun Marsh.

The goals, objectives, and hypotheses are clearly stated. This is a very well written proposal and timely. Many restoration proposals discuss restoring habitat for this species and results of this study can be used to guide the restoration process and assure a successful outcome for this animal.

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?

   Recovery of the salt marsh harvest mouse is a CalFed goal and this research will result in a means of directing restoration projects to increase the chances of a successful outcome for this species. The conceptual model is clearly stated.

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 thought this was an excellent proposal with a well thought out approach and should be able to meet the objectives. The completion of this research will generate useful methodologies that can be used in developing restoration plans for various sites to protect this species.

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 well documented and technically feasible. It should have a high likelihood of success. Scale is consistent with objectives.

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 say for each task they will have milestones but they don't list these specifically.

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 list various reports, GIS data sets, and maps. I think they should also publish a paper or two in a refereed journal.

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

   The team appears to be well qualified and capable of completing a successful project.

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

   The budget appears reasonable.

Miscellaneous comments:

Environmental Compliance:

Proposal Number: 62

Applicant Organization: Environmental Science Associates

Proposal Title: DEVELOPMENT OF A POPULATION-BASED HABITAT SUITABILITY MODEL FOR SALT MARSH HARVEST MOUSE TO GUIDE RESTORATION EFFORTS IN THE NORTH BAY REGION

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

   XYes **-**No

   If no, please explain:

   Have obtained the necessary permits to conduct field work. No other permits or environmental documentation needed.

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

   XYes **-**No

   If no, please explain:

   N/A

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

   -Yes **X**No

   If yes, please explain:

Other Comments:

Budget:

Proposal Number: 62

Applicant Organization: Environmental Science Associates

Proposal Title: DEVELOPMENT OF A POPULATION-BASED HABITAT SUITABILITY MODEL FOR SALT MARSH HARVEST MOUSE TO GUIDE RESTORATION EFFORTS IN THE NORTH BAY REGION

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

   XYes **-**No

   If no, please explain:

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

   XYes **-**No

   If no, please explain:

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

   XYes **-**No

   If no, please explain:

4. Are appropriate project management costs clearly identified?

   XYes **-**No

   If no, please explain:

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

   XYes **-**No

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

6. Does the budget justification adequately explain major expenses?

   XYes **-**No

If no, please explain:

7. Are there other budget issues that warrant consideration?

-Yes **X**No

If yes, please explain:

Other Comments: