Proposal Reviews

#64: PROTECT AND MANAGE ENDEMIC GABBRO-SOIL AT-RISK PLANT SPECIES

Environmental Science Associates

Research and Restoration Technical Panel Review	
Sacramento Regional Review	
External Scientific Review	#1 #2 #3 #4 #5 #6
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: 64

Applicant Organization: Environmental Science Associates

Proposal Title: PROTECT AND MANAGE ENDEMIC GABBRO-SOIL AT-RISK PLANT SPECIES

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	**This proposal is not recommended because of problems with both the regional fire history study and the demographic analysis. The aerial photography procedures described are inadequate to develop a map of fire history and the demographic analysis is poorly described and inadequate to develop management guidelines for the Sierra bedstraw. The linkage of these two components, although an important goal of this proposal, was not developed in a concrete way. An examination of the effects of fire on this species and habitat using an experimental approach based on smaller plot designs would be of much greater value for managers and decision makers.**
-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?

   This project attempts to link the fire history of the gabbro-soils habitat with the population dynamics of a endangered species, the Sierra Bedstraw. Although the goals are important and timely, there was concern as to how the fire history data (if obtained) would be linked to the demographic data and how a non-experimental descriptive demographic analysis would contribute to management of this 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?

There was significant concern that the proposed use of aerial photographs to construct a fire history for the site was flawed because the photographs would be too recent to be useful. In addition, the demographic analysis was poorly described as to how a population viability model would be constructed and tested. Finally, the linkage of the fire data and the population model, although a conceptual focus of the proposal, was never significantly developed.

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?

   Because of the methodological limitation of aerial photos in quantifying the fire history, it is unlikely that the proposed GIS map of fire history and plant population distribution would be created. The map of the site in terms of potential and risk for prescribed burns would seem very feasible and the most likely useful product from this project. The demographic work, because of its limited scope and lack of linkage to experiments with management techniques would be of limited value for managers.

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

   The primary negative here was the high cost and relative low management value of the demographic analysis.

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 Sacramento regional panel ranked the proposal Low. Although the panel recognized the importance of the gabbro soils habitat, the panel was concerned that the experimental design proposed in this project will not inform management decisions because there are no experimental treatments. They argued that the demographic data should be collected as part of a controlled, replicated experiment designed to address the benefits of different management practices, including prescribed fire. On the positive side, the panel felt the project is well linked with recovery planning efforts for federally listed gabbro soils plants and that the project directly involves agencies and organizations involved in gabbro soils protection.

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?

   There were no significant concerns regarding prior performance or budget issues. There was an issue regarding environmental compliance because of the proposed demographic study. Because the Sierra Bedstraw is a Federally Endangered species, in order to collect the plant they will need to conduct a Section 7 consultation or obtain a Section 10 permit. They will need a State Rare, Threatened and Endangered Plant Collecting Permit for the specimen excavation and a Plant Research Permit to collect seeds. Project applicants need plan in advance to obtain the appropriate permits prior to start of seed collection.

Miscellaneous comments:

None

Sacramento Regional Review:

Proposal Number: 64

Applicant Organization: Environmental Science Associates

Proposal Title: PROTECT AND MANAGE ENDEMIC GABBRO-SOIL AT-RISK PLANT SPECIES

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

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

Although the panel felt management of gabbro soil at risk plant species is a high priority, concerns about the design of this project led the panel to give it a ranking of low.

1. Is the project feasible based on local constraints?

   XYes **-**No

   How?

   The project as proposed is likely feasible. The investigators are well connected with agency and local organizational staff that would allow access and monitoring of gabbro soils habitats to conduct this study.

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

   XYes **-**No

   How?

   The project specifically addresses PSP regional priority 1, to protect and manage gabbro-soil chapparal habitat. However, this project does not propose to actively manage endemic gabbro soils plant species, but instead proposes to collect observational data and conduct correlational analyses.

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?

   The project is well linked with recovery planning efforts for federally listed gabbro soils plants. Agency staff from CDFG and BLM are included as project applicants, and both agencies are actively involved in recovery implementation projects for gabbro soils species.

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

   XYes **-**No

   How?

   The project directly involves agencies and organizations involved in gabbro soils protection. These agencies and organizations have been working with local stakeholder groups and public representatives to protect gabbro soil habitats.

Other Comments:

The panel was concerned that the experimental design proposed in this project will not inform management decisions because there are no experimental treatments. Collecting demographic data on these species is essential. This information should be collected as part of a controlled, replicated experiment designed to address the benefits of different management practices, including prescribed fire.

External Scientific: #1

Research and Restoration External Scientific Review Form

Proposal Number: **64**

Applicant Organization: **Environmental Science Associates**

Proposal Title: **PROTECT AND MANAGE ENDEMIC GABBRO-SOIL AT-RISK PLANT SPECIES**

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

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

none

Review:

Please provide an overall evaluation summary rating:

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

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
-Excellent	**This project will completely map, using state-of-the-art GIS, populations of 5 Federally listed rare plants, and 1 plant species of concern, and overlay these occurrences with vegetation and fire history. This will result in tremendously valuable scientific and baseline information that will be used into the foreseeable future to study and maintain these species. That the species are endangered is due to extensive residential development fostered and made feasible by water from the Central Valley Water Project - and thus the fate of these plants should be a concern of Calfed. A second, equally worthy goal of the project will more directly benefit these rare species as it will lay the groundwork for the development of fire management plans for all the rare plant preserves. The third task is not directly relevant to these first 2 goals and seems to be excessive in scope and cost.**
XGood	
-Poor	

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

   The goals of this proposal are to develop a fire map for, and map rare plants in El Dorado County; to delimit topographic/vegetation units at the Pine Hill preserve and assess their potential and risk for prescribed fires; and to develop a habitat and population model for

one of the endangered plants for which no information is currently available. These three goals will be used to develop a preserve management strategy for the Federally listed plant species. These goals are well articulated and the product of the research, a fire management plan for rare plant preserves in El Dorado County, is timely and important.

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

   I see little justification for a historical fire map of the entire county, or even of the gabbro soil areas. What makes better sense is to map the known and suspected locations of the rare plants, and examine the fire history of those specific sites, and to map the fire history of the established preserves. Then, this smaller data base can be queried as to correlations of rare plant populations with vegetation and with fire history. I would also suggest that the life stage of the rare plant species be monitored as sexual reproduction may slow down or cease under mature chaparral. The conceptual model brings together the overarching relationship of the rare plants to fire and vegetation, the population biology of bedstraw, and current conditions on Pine Hill Reserve to arrive at a model for preserve fire management. There are a few problems with this flow. First, missing is a discussion or experiments describing the response of bedstraw to fire, or even if the bedstraw habitat (in oak woodland) would have the same fire dynamics as the other rare species. Second, also missing is the explicit inclusion of the demographic response of the other rare species to fire. For example, Ceanothus roderickii could be driven to local extinction if fires were too frequent. This would be useful information in deciding whether to burn! The need to consult with biologists who have worked on these other species should be explicit in this research proposal. I think that preliminary investigations into bedstraw population biology focusing on probable causes of rarity, such as seed set and viability, should be done first, instead of the full-bore, investigate everything approach they have proposed (at a cost of over $290K!).

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 authors will be using state-of-the art GIS development and analysis to document and discern the relationship between fire, vegetation, and the rare plants - knowledge that will be critical to developing long term preserve management strategies. Using sophisticated statistical techniques of plant community analysis, coupled with intensive demographic monitoring, they will determine what makes El Dorado Bedstraw tick. Finally, fire management on preserves must satisfy not only the requirements dictated by species biology, but also incorporate feasibility and risk to surrounding sites. The process they propose to develop can be applied to the several other rare plant preserves in El Dorado County.

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 authors have the expertise and track record to accomplish this research and the techniques they propose should result in high quality substantive research that will result in the development of sound fire management plans.

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?

Table 1 lists specific outcomes for each task.

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?

   Maps, technical papers, and published journal papers are their expected products. While the development of an integrated fire management strategy for gabbro chaparral is not articulated as one of the project's outcomes, I have concluded that this research will directly lead to the development of such a plan, which is critically important to preserving these rare plant species. I view the development of a detailed population ecology model of bedstraw to be premature.

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 research team is well qualified to perform all aspects of this work.

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

   Mapping rare plant occurrence, vegetation, and fire history will be a valuable correlative overview in understanding population-level response of rare plant species to these dynamic process in their habitats. The process and development of an assessment of controlled burn potential on Pine Hill Preserve is an essential step in the development of a chaparral fire management plan for the rare plant preserves in El Dorado County. Both of these are worthy tasks promising large benefit for modest costs. On the other hand, developing a population model for bedstraw will not aid these developments (as it does not occur in fire-prone chaparral), and while the causes of rarity for this species need to be investigated, I would recommend a preliminary, focused approach on the most likely causes. This could be accomplished for substantially fewer dollars than the $291K in the proposal.

Miscellaneous comments:

External Scientific: #2

Research and Restoration External Scientific Review Form

Proposal Number: **64**

Applicant Organization: **Environmental Science Associates**

Proposal Title: **PROTECT AND MANAGE ENDEMIC GABBRO-SOIL AT-RISK PLANT SPECIES**

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

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

None

Review:

Please provide an overall evaluation summary rating:

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

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
-Excellent	**This project will provide a good base of information on how to manage this soil/plant community. Transfur of this information to other landowners could be stronger.**
XGood	
-Poor	

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

   Very good, yes, yes.

2. **<u>Justification.</u>** 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?

   Very good, yes, yes, yes.

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?

   Very good, yes, yes, yes.

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?

   Very good, yes, good, yes.

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?

   Very good, yes, yes.

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?

   Good, yes, yes, yes.

   This project could develop more products for other landowners/agencies.

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?

   Very good, Good, yes, yes.

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

   Excellent, yes.

Miscellaneous comments:

External Scientific: #3

Research and Restoration External Scientific Review Form

Proposal Number: **64**

Applicant Organization: **Environmental Science Associates**

Proposal Title: **PROTECT AND MANAGE ENDEMIC GABBRO-SOIL AT-RISK PLANT SPECIES**

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	**Goal 1 is poor. Goal 2 is good. Goal 3 is poor.** **See Approach and Feasibility sections for explanation.**
-Good	
XPoor	

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

   Goal 1: Fire history. This goal is clearly stated and is very timely for managing at-risk species. Objective 1, the correlation of historical fire history with the gabbro soils on which the at-risk species are found, is clear and internally consistent with this goal. Objective 2, the correlation of plant species and population data with the fire history of specific sites is too general given the distributions of the at-risk species and the small amount of biological information that is available for each species.

   Goal 2: Create GIS models to assess the practicality and efficacy of prescribed burning for at-risk species management. This is a clearly stated but extremely general goal. The lack of specificity may be due to the fact that most of the area of the proposed reserves falls on private property and there are no assurances that access will be granted to those areas. This is a timely and important goal for managing at-risk species.

Goal 3: Identify demographic and other ecological factors for an at-risk species (El Dorado bedstraw). This goal is clearly stated and is critically important for managing the at-risk species. Objective 1, the characterization of habitat and plant associations, is obviously important information for managing at-risk species. Objective 2, a demographic study, is not clearly stated and is extremely vague. Objective 3, the first half of the sentence, life history characteristics of El Dorado bedstraw, is clear but the second half of the sentence is unintelligible. A number of issues relating to this goal are discussed in the Approach section.

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?

   In principle, the stated goals are very important for the protection at-risk plant species on the Pine Hill geologic formation and El Dorado bedstraw in particular.

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?

   Task 1: Fire history. The proposal states that the GIS model will be based on a combination of historical and field data. The relevancy of historical data for establishing the fire regime the at-risk species have evolved with is suspect. The fire regime was interrupted before the historical data were recorded. Hunter and Horenstein (cited in the application) state that the vegetation and soils of the Pine Hill formation have been substantially altered since 1848 by the cutting of trees for wood, the clearing of land for agriculture, and the repeated burning of chaparral to create pasture. The acquisition of field data for more than a few populations may be impossible as most populations of the at-risk species are located of private land.

   Task 2: Assessing prescribed burn potential for topographic and vegetation units. The development and application of GIS models to assess the potential benefits of using prescribed burning as a management tool is a generally well designed section of the proposal. However, it is not clear what value this information will be for managing the populations of at-risk species that occur in the large areas of the proposed reserve that have already been subdivided and developed. Also, because there is very little information about the distributions of the at-risk species on private land, it will be almost impossible to obtain that data and incorporate it into the GIS models.

   Task 3: Develop a habitat and population biology model for El Dorado Bedstraw.

   1) Habitat characterization. Most of the habitat parameters that are specified in the proposal are useless for determining the habitat requirements of the species. Slope and aspect are reasonable factors to quantify. PAR levels will provide some information about the light environment experienced by adult plants but they will not provide any information about the light environment experienced by seedlings which presumably recruit after gaps are created in the woodland. Most of the proposed soil parameters are useless for accomplishing the goals of this proposal. This species primarily occurs in Dense Woodland vegetation as a rare understory species and is presumably well adapted to life on low nutrient gabbro derived soil (Rescue soil series). The Rescue soil series and its variants are well described in the _Soil Survey of El Dorado Area, California_. Physical, chemical and nutrient data are given for the A horizons (0-10), the clay hardpan B horizons (10-34), and the decomposing rock C horizons (34-66). Gross measures of the water holding capacity at each depth, which is closely correlated to soil texture, are given

in this book and also in _Water-holding characteristics of California Soils_. These type of soils data are useful for describing the general characteristics of a soil but they provide absolutely no information about what each plant experiences in its tree dominated competitive environment. Additionally, it appears that this data will only be collected for two populations that are on public land. If this is the case, there are no control sites to test the generality of the habitat characterization.

2) Plant community and plant associate characterization. This data will be obtained for the two populations of less than 50 individuals each that occur on public land. The area within the existing populations and an undefined area bordering each population will be sampled and described. Without control areas nothing can be said about the habitat requirements of the species.

3) Demographic study. This is not a demographic study. The proposal will only count the number of individuals in each population, determine if they are male or female individuals, and excavate a few plants to determine if the species can spread vegetatively.

4) Canonical correlation analysis. The proposal states that it will develop a habitat and population model for El Dorado bedstraw based on a correlation of abiotic and biotic characteristics of the habitat with demographic measurements and characteristics. Presumably, the analysis will use Redundancy Analysis techniques as the proposed hypotheses seek to predict multiple demographic variates from multiple environmental variates. In any case, there will be interpretation difficulties as CANOCO must standardize the data to unit-less values before performing an iterative series of Principal Component and Regression analyses. Finally, it is not clear how this analysis will be performed unless environmental data is collected for every square of the proposed sampling grid and then problem of no control sites will still exist.

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?

   Goal 1 is feasible but is not likely to provide critical information. Goal 2 is partially feasible but its ultimate success depends on the cooperation of a large number of landowners. Goal 3 is not feasible given the methods stated in the proposal.

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

   See Approach and Feasibility sections.

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?

   See Approach and Feasibility sections.

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?

See Approach and Feasibility sections.

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

   See Approach and Feasibility sections.

Miscellaneous comments:

None.

External Scientific: #4

Research and Restoration External Scientific Review Form

Proposal Number: **64**

Applicant Organization: **Environmental Science Associates**

Proposal Title: **PROTECT AND MANAGE ENDEMIC GABBRO-SOIL AT-RISK PLANT SPECIES**

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

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

none

Review:

Please provide an overall evaluation summary rating:

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

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
-Excellent	**Extremely important and compelling subject matter; excellent team of investigators; could be a little stronger on the details of hypotheses, analytic methods and specific likely outcomes.**
XGood	
-Poor	

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

   The goals are to (1) collate existing data on fire history, vegetation and rare plant occurrences on gabbro soils in western El Dorado County; (2) identify strategies for prescribed burning; (3) collect appropriate data to create a habitat and population model for a rare gabbro-soil plant, the El Dorado bedstraw. These goals are identified in the USFWS recovery plan for rare gabbro plants, and are relevant to the activities of the water district; thus, they appear to be timely and important. The goals are also reasonably clear and consistent. Although the project seems well conceived, it could benefit from a slightly more specific set of hypotheses and anticipated findings.

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 appears to target an important gap in existing knowledge of the fire ecology of an extremely threatened plant community. The conceptual model seems to be "fire is important to plants", which is undoubtedly true although again, it could perhaps be made a little more specific. I don't believe a demonstration project is appropriate for this study.

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 for task 1 was reasonable in principle, although it's not clear whether a large amount of information is going to be available on fire history, and thus, whether much information will be gained about the relation of fire history to rare plant distribution. The approach for task 2 (burn planning) seemed straightforward and likely to produce readily usable results. The field portion of the approach for task 3 (population and habitat modeling for the bedstraw) seemed reasonable; however, I'd have liked to see more about the analytical techniques the authors plan to use, citations to similar modeling studies, examples of the kinds of questions the models can be used to ask, etc.

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?

   See answer to 3. I think it's feasible, likely to succeed in producing valuable information about fire ecology of gabbro vegetation, and the scale is appropriate. In places, it could be better documented.

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 performance measures described in Table 1 seem reasonable, although a little vague and perhaps overly optimistic. It may turn out, for reasons beyond the authors' control, that the results are not clear or novel enough for peer-reviewed journal articles - even though they are still useful to managers of this particular habitat.

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 products are reasonably well described in Table 1.

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 qualifications of this group of botanists and ecologists are absolutely stellar - with the one exception of to population modeling. I'd suggest they add a modeler to their team.

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

   It seems a little high to me, although I wouldn't say this if it were absolutely clear that the "benefits" would include a high-quality, well-parameterized model that could be used to predict the impacts of fire regimes on the dynamics of the vegetation in general and the bedstraw in particular.

Miscellaneous comments:

I'm surprised that experimental burns are not being proposed as one of the tools in this study - although they have their limitations, and are probably a logistical nightmare, they seem an easier way to get more relevant information than historical air photos are likely to provide.

External Scientific: #5

Research and Restoration External Scientific Review Form

Proposal Number: **64**

Applicant Organization: **Environmental Science Associates**

Proposal Title: **PROTECT AND MANAGE ENDEMIC GABBRO-SOIL AT-RISK PLANT SPECIES**

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):

I served on Mr. Franklin's Masters thesis committee.

Review:

Please provide an overall evaluation summary rating:

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

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
-Excellent	**This proposal suffers from two major deficiencies in feasibility and approach. First, the applicants propose to create a historical fire map using aerial photography that is much too recent to be of value and at a spatial scale that will be too coarse to relate to the target plant species. Second, the demography study is purely descriptive and essentially unreplicated. The construction of the demographic model is only vaguely described and how the model will be linked to the fire data is not described at all.**
-Good	
XPoor	

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

   3 - Good The overall goals of this proposal are important and timely. However, the potential linkage of the various component of the project appear tenuous to me. The foci of the tasks cover very different spatial and temporal scales and it is not clear how these different scales will be integrated together.

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?

   4 - Fair Although it has been demonstrated previously in other plant communities that re-establishment of the natural fire regime (if it can be determined) can be important. However, the applicants do not make a very strong case for the linkage between Sierra Bedstraw population viability and fire. It is also not clear why the very broad scale map of fire history is necessary. It would seem that a much more direct and management applicable approach would be to conduct burn experiments. The description of fire risk using a variety of standard measures would seem fine for fire forecasting but the linkage to the Bedstraw population distribution would seem to be weak. Finally, I fail to see the real value in a descriptive demographic study of Bedstraw; the value of these types of studies for conservation management lies in the embedding of the demographic analysis within an experimental framework (which is not done here).

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?

   5 - Poor I think that it is very unlikely that an adequate characterization of fire history for this area is possible using aerial photographs that probably date from the '40s. The historical fire history would have to be obtained from records much earlier than that and there is no indication in the proposal where that earlier information might come from. In particular, creating an historical fire map at the detail required to relate it to the plant species of interest seems especially unlikely. The very limited number of populations of Bedstraw (2 or maybe 3) really reduces the value of even a descriptive demographic approach. The methods for creating this demographic model are unclear and at this point are just a list of potential parameters to be measured. From the description given, there is no indication that a true population viability model will be developed, so the usefulness of this very expensive demographic exercise is suspect. In addition, the laundry list of environmental parameters that will be measured appear very generic and do not take into account the biology of bedstraw. Finally, how the applicants will really link the various objectives measured at different spatial and temporal scales is never described in enough detail for critical evaluation.

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?

   4 - Fair As noted above, I think that it is highly unlikely that a detailed fire history map will be generated and in turn, I doubt that it will be possible to evaluate the importance of fire in the demography and management of the gabbro plant species.

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?

   4 - Fair The most likely performance criterion would be the development of a burn potential map for the reserve.

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?

   3 - Good I do not think that production of a detailed fire history map is likely and I think that the applicants are somewhat optimistic in assuming that the fire data and demography study will generate publications in peer-reviewed journals. An experimental approach would be much more likely to generate the studies that could be published in these types of journals.

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?

   3 - Good

   Although all the personnel appear to be well trained plant biologists, I'm not sure that they have the expertise necessary to 1) develop a fire history map, 2) develop a state of the art population viability model and then most importantly 3) link the various projects together into a overall management model.

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

   4 - Fair

   The allocation to the Bedstraw demography seems way too high given that there are few populations to study and there really is no replication for hypothesis testing and viability modeling.

Miscellaneous comments:

External Scientific: #6

Research and Restoration External Scientific Review Form

Proposal Number: **64**

Applicant Organization: **Environmental Science Associates**

Proposal Title: **PROTECT AND MANAGE ENDEMIC GABBRO-SOIL AT-RISK PLANT SPECIES**

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):

I personally know the applicant and one of the co-applicants.

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	**Important and relatively well-designed study, proposal somewhat vague, with no real performance standards; MUCH too expensive.**
XGood	
-Poor	

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

   Goals 1 and 3 are relatively clearly stated and consistent; goal 2, as formulated, is somewhat unclear and could be better defined. It should include, for example, reference to fuel-load mapping. The basic concept/intent of the proposed study is important

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 very much a hodge-podge of mostly fire-related tasks that are needed to be carried out to fortify the management plan for a series of small public reserves in the Pine Hills. The work is necessary and justified, but could be more frugally done using university-based researchers and graduate students. The amount of money being applied seems egregious given the simple nature of much of the proposed study. The population ecology modeling is somewhat more complicated, but well within the capabilities of a Ph.D. dissertation.

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 think in general the approach is well-designed and justifiable, and likely to result in important new information. However the appropriateness of the approach is sometimes difficult to judge, due to vagueness in the description. For example, the proposal does not specify how many acres of land are to be included within the study, nor does it refer to the locations of the sites, either in absolute terms or in relation to private lands and housing. In addition, the fire history segment vaguely refers to "other information" that will be used in addition to aerial photos to determine fire hisory. What "other info" will be used? What is available? Also, the process of overlaying fire history with rare spp occurrences to make inferences about rare spp association with fire seems fraught with assumptions.

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?

   I think the study is likely to succeed in most of its objectives, however the scale (specifically, the amount of money requested) seems far out of proportion to the scope of the objectives. Given the lack of info concerning the study sites and their proximity to, e.g. housing, it is difficult to determine if the products of this study will provide info that can be feasibly used in the future.

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 proposal does not include any explicit 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?

   It is pretty clear that the fuel-loading map will be an important management tool, especially when overlaid with the at-risk population locations. The fire history has the potential to be informative, but the proposal bases its determination of "natural" fire regime on aerial photos, which have only been shot since about WWII!

   A major problem with the proposed study is the fact that much evidence suggests that "natural" fire occurrence in chaparral is periodic and catastrophic, and not a constant, spotty phenomenon. Constant, small-scale under-burn type prescribed fire will NOT replicate this natural regime. Burning in these reserves also suffers from insecurity, in that housing density in the Pine Hills area is relatively high and constantly increasing. Much of the money asked for in this proposal may be better spent buying more buffer land around the public parcels.

One very valuable product would be the actual monitoring and evaluation of ongoing fuels treatments and precribed burns, but these are not included in the proposed project.

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

   The team as proposed is excellent and very well-rehearsed in carrying out this type of work.

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

   In my opinion, this is the most significant weakness of the proposal. The same study could be carried out in the same amount of time by one masters-level student (fire-related tasks) and one Ph.D.-level student (population ecology of Galium c. s.) for no more than 25% to 30% of the proposed budget. The population ecology study (for a single subspecies) is especially expensive - ca $300,000! I suggest the BLM and DFG managers seek a cooperative venture with one of the local universities (Chico State, Sac State, UC-Davis) to do this work rather than relying on expensive consultants.

Miscellaneous comments:

Prior Performance/Next Phase Funding:

New Proposal Number: 64

New Proposal Title: PROTECT AND MANAGE ENDEMIC GABBRO-SOIL AT-RISK PLANT SPECIES

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

   98-F23 South Napa River Tidal Slough Restoration this project was listed in table provided to me and also identified in the applicants proposal, but I have not administered any projects with this applicant. They functioned as a subcontractor in the prior contract listed.

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

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

   -Yes -No **X**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?

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

   If no, please explain any inaccuracies:

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

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

   If no, please explain deficiencies:

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

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

   If no, please explain deficiencies:

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

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

If no, please explain:

Other Comments:

Applicant was not primary contractor in previous project listed.

Environmental Compliance:

Proposal Number: 64

Applicant Organization: Environmental Science Associates

Proposal Title: PROTECT AND MANAGE ENDEMIC GABBRO-SOIL AT-RISK PLANT SPECIES

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

   -Yes **X**No

   If no, please explain:

   Project proponents state in the text that limited excavations of Eldorado Bedstraw will be done under the terms of permits from USFWS and CDFG, and that they will conduct a variety of seed studies. However, in the environmental checklist, they have only indicated the need for a Scientific Collecting Permit. In order to collect a Federally Endangered species, they will need to conduct a Section 7 consultation or obtain a Section 10 permit. They will need a State Rare, Threatened and Endangered Plant Collecting Permit for the specimen excavation and a Plant Research Permit to collect seeds. None of these permits should trigger CEQA.

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

   -Yes **X**No

   If no, please explain:

   Project proponents need to be sure they will have time to get the appropriate permits prior to start of collection.

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

   -Yes **X**No

   If yes, please explain:

   In order to complete Task 3, project proponents must obtain the permits mentioned above. If they obtain those permits, the entire project will be feasible.

Other Comments:

Budget:

Proposal Number: 64

Applicant Organization: Environmental Science Associates

Proposal Title: PROTECT AND MANAGE ENDEMIC GABBRO-SOIL AT-RISK PLANT SPECIES

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:

information well defined in budget summary/justification