Proposal Reviews

#19: ANALYSIS OF THE EFFICACY AND ECOLOGICAL EFFECTS OF THE CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE HYDRILLA ERADICATION PROJECT IN CLEAR LAKE, CALIFORNIA

California Department of Food and Agriculture

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

Research and Restoration Technical Panel Review:

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

Proposal Number: 19

Applicant Organization: California Department of Food and Agriculture

Proposal Title: ANALYSIS OF THE EFFICACY AND ECOLOGICAL EFFECTS OF THE CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE HYDRILLA ERADICATION PROJECT IN CLEAR LAKE, CALIFORNIA

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	**All external scientific reviews ranked it as either a low or good rating with major concerns. The regional panel review ranked it low. The budget is high for each sub-project. The team lacked the technical expertise to conduct the comprehensive ecological assessment component. The administrative review identified that the applicants need a scientific collecting permit.**
-Above average	
-Adequate	
XNot recommended	

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

   The project consists of four sub-projects. Goals and hypotheses are not clearly stated. The stated hypothesis is closer to a goal to completely eradicate hydrilla from Clear Lake. There is question whether the some components of project has sufficient justification because similar studies have been conducted on different water bodies. Therefore, is it necessary to test specificity on Clear Lake?

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?

Proposal 2 lacks the sufficient sample size. Proposal 3 does not justify the need for long-term monitoring of fluridone concentrations in the hydrosoil and boundary layer. Proposal 4 lacks the approach and methodology to assess ecological impacts.

The project failed to document the chemical/physical properties of the herbicide, fluridone as to why an ecological study is needed at Clear Lake? What is the existing environmental fate, aquatic and terrestrial toxicity data that may be available in the literature?

The approach for sub-project 4 to conduct the ecological assessments, failed to provide the testing procedures, test species and endpoints to be assessed. Would the researchers be following the USEPA ecological assessment guidelines?

The team is qualified to perform the sub-proposals 1,2 and 3. The team doesnt have the pertinent background to conduct a comprehensive ecological study

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?

   Some products may be of value. The applicability of the approach to other watersheds was not demonstrated for sub-project 1. For sub-project 2, having improved monitoring techniques would be valuable, however it is not clear how the evaluation of the monitoring techniques will lead to a better herbicide treatment protocol. For sub-project 4, it is questionable whether this work has been conducted elsewhere (e.g., other watersheds)?

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

   Budgets appear high for each sub-project.

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 regional panel ranked it low. The panel questioned the ability of the applicant, CDFA to conduct an objective study to evaluate the effectiveness of its own eradication program.

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

   No budget issues were identified. The applicant needs to obtain a scientific collecting permit for fish electroshocking.

   Prior performance indicates that applicants are professional, dedicated and responsible. They are very responsive to any inquiries/suggestions relating to the project.

Miscellaneous comments:

None

Sacramento Regional Review:

Proposal Number: 19

Applicant Organization: California Department of Food and Agriculture

Proposal Title: ANALYSIS OF THE EFFICACY AND ECOLOGICAL EFFECTS OF THE CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE HYDRILLA ERADICATION PROJECT IN CLEAR LAKE, CALIFORNIA

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

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

In general, the panel felt the priority for this project is low. However, there were several panel members who felt the priority was medium because it was mentioned specifically by CALFED, and because there is a significant need for Hydrilla eradication in the region.

1. Is the project feasible based on local constraints?

   XYes **-**No

   How?

   This is a qualified Yes. This proposal consists of four components: 1) quantify ecological and economic effects of Hydrilla infestation; 2) evaluate effectiveness of standard Hydrilla survey protocols; 3) determine effectiveness of current treatment protocols; and 4) evaluate ecological effect of treatment protocols. The first component of the project may or may not be feasible depending on how well published data can determine the economic and ecological impact of Hydrilla infestations in the Clear Lake region. The development of a model derived from local data might provide a more accurate assessment. Components 2 and 3 of the project are feasible, although component 3 seems to be well established from local observations and research in other systems. Component 4 may or may not be feasible depending on how well the methods test the hypothesis that eradication efforts have no effect. The methods rely heavily on an analysis of sites being released from treatment, but the proposal indicates there are few sites to use as untreated controls. Untreated controls would be a critical component of an experiment designed to detect the effect of eradication measures. Would it be possible to compare Clear Lake to a non-treated water body?

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

   XYes **-**No

   How?

   The project addresses PSP regional priority 5, to implement actions to prevent, control and reduce impacts of non-native invasive species in the region. The project is specifically addressed by PSP multi-region priority 1, to supplement the on-going CDFA Hydrilla eradication program.

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?

   This is a qualified yes. The project is directly linked to the ongoing Hydrilla eradication program at Clear Lake being implemented by the CDFA. However, the proposal does not mention any links to other ongoing implementation projects or regional planning efforts underway in the region.

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

   -Yes **X**No

   How?

   Although the project mentions connections with the Lake County Agricultural Commissioner, the University of California at Davis, the Big Valley Rancheria, and the California Department of Fish and Game, it does not mention the involvement of local private landowners or conservation organizations who are most likely to be affected by the project.

Other Comments:

It might be difficult for the CDFA to conduct an objective study of the effect of its own eradication program. A third party might be better suited to conduct this research, particularly the components addressing water quality and the biological effects of the eradication program. The need to determine the effectiveness of the current program may be low given the serious decline in Hydrilla observed as a result of the eradication program. Perhaps the best use of CALFED funds and the expertise of the CDFA would be to determine what types of management actions would best restore the native biodiversity of Clear Lake, or to explore alternatives to copper and fluridone in conjunction with local stakeholders.

External Scientific: #1

Research and Restoration External Scientific Review Form

Proposal Number: **19**

Applicant Organization: **California Department of Food and Agriculture**

Proposal Title: **ANALYSIS OF THE EFFICACY AND ECOLOGICAL EFFECTS OF THE CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE HYDRILLA ERADICATION PROJECT IN CLEAR LAKE, CALIFORNIA**

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

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

None

Review:

Please provide an overall evaluation summary rating:

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

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
-Excellent	**The project failed to document how this study is needed from other studies that have been conducted in the US. The project lacked clear approaches that will be followed in conducting the ecological assessments and this part of the project is expensive.**
-Good	
XPoor	

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

   The individual sub-project hypotheses are not clearly stated. The stated hypothesis is more closely to a goal statement to completely eradicate hydrilla from Clear Lake.

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?

The project failed to document the chemical/physical properties of the herbicide, fluridone as to why an ecological study is needed at Clear Lake? What is the existing environmental fate, aquatic and terrestial toxicity data that may be available in the literature?

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 study clearly outlines the tasks to be conducted over the 3year period. However, for sub-project 4 to conduct the ecological assessments, the proposal failed to provide the testing methods, test species and endpoints to be assessed. Would the researchers be following the USEPA ecological assessment guidelines?

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?

   All four components appear feasible.

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?

   Measures were not clearly stated in sub-proposal 4.

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?

   How will the data be used from the sub-project 4?

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

   The team has adequate experience as a collative whole to conduct sub-projects 1 3. However, it is not apparent that the team has the capabilities to conduct a comprehensive ecological study.

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

   No cost sharers were identified such as the registrants of fluridone. The costs to conduct the ecological assessments are $804,858. Is it necessary?

Miscellaneous comments:

External Scientific: #2

Research and Restoration External Scientific Review Form

Proposal Number: **19**

Applicant Organization: **California Department of Food and Agriculture**

Proposal Title: **ANALYSIS OF THE EFFICACY AND ECOLOGICAL EFFECTS OF THE CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE HYDRILLA ERADICATION PROJECT IN CLEAR LAKE, CALIFORNIA**

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	**There are important questions which need to be addressed in the approach of proposal #4 regarding "long-term" effects. More information is necessary to determine the capabilities of the investigators. A better detail cost/benefit for each proposal would be helpful. The budget is very detailed, but please relate that back to the objectives (e.g. what bang are you giving us for the buck?)**
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 and objectives for proposal 1 could be outlined a little better. It was a little difficult to tease apart, but it did a good job in laying the foundation for the rest of the proposal. Under the heading "problem" is helpful, but forthright stating goals and objectives would be more beneficial to reviewers to help cut to the chase. They hypotheses were very good--concise and convincing--and doable. I feel the concept is extremely timely and important given the current (and potential future) situation.

In Proposal 4, the hypothesis uses terminology "long-term"--this needs better definition--is this one month, one year, ten years? Long-term to a fish is much different, as you already know, than long-term to an annual plant or benthic macroinvertebrate. Please address this terminology question.

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

   The justification for the proposals was very well written. Based on current knowledge, the authors did an excellent job of justifying their intentions and clearly designed their plan to approach the questions.

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 approaches for proposals 1-3 are well written and easy to understand. They are appropriate to meet the proposed objectives and the liklihood of positive results adding to existing knowledge base is very favorable. I believe this research will establish novel information and improve currently used methodology. Decision makers will benefit from this research.

   The approach in proposal 4 is difficult because you don't know a true "baseline", which was before the eradication program and before copper and fluridone treatments. What type of measures would be analyzed in fish population changes? Would you focus on species diversity or size? Also, when you say, "Long-term effects of fluridone residues in the hydrosoil can be determined in the laboratory or greenhouse by...", are you referring to toxicity tests? If so, please give better descriptions of intended toxicity assessments and endpoints.

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

   There are no questions that given this approach, this research is fully feasible with a great liklihood for success, if some of the above-mentioned areas in the approach are addressed. The project's scale is consistent with the 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?

   The performance measures based on the study plan outline are good--thorough but flexible in case emergencies arise. There are appropriate performance measures throughout the individual proposals to measure the success of the project's goals and objectives as outlined.

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, if completed, will produce highly valuable products for states combating noxious and invasive weeds. Information collected will help wildlife managers, botanists, toxicologists, and ecologists make better decisions regarding eradication efforts.

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?

   More information is necessary on the capabilities of the principal investigators as to potential success / failure of this project. Based on the information given, it is not possible to draw an accurate conclusion at this time.

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

   The budget is rather large, but for basically a four-phased project, not exhorbant. It would be beneficial, however, if more specific cost/benefit information were provided for the reviewers. Specifically, each proposal should have a cost/benefit associated with it.

Miscellaneous comments:

External Scientific: #3

Research and Restoration External Scientific Review Form

Proposal Number: **19**

Applicant Organization: **California Department of Food and Agriculture**

Proposal Title: **ANALYSIS OF THE EFFICACY AND ECOLOGICAL EFFECTS OF THE CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE HYDRILLA ERADICATION PROJECT IN CLEAR LAKE, CALIFORNIA**

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	**I would rate this project on the good side of poor. Although some parts of the projects are worthwhile, they are asking for a lot of money to gather information that I think in some cases is already available, albeit for other locations. I don't believe it is necessary to do such projects on every water body that is affected by hydrilla. Studies from Florida or the Potomac for example are applicable to other locations.**
-Good	
XPoor	

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

   This project actually consists of four sub-projects. The first one deals with determining the economic and ecological impact of not controlling Hydrilla in Clear Lake. The second one deals with determining the efficiency of the standard survey technique. Project 3 would determine fluridone concentration in the hydrosoil and boundary layer in treatment areas and to determine the necessary concentration to achieve the desired mortality. Project 4 will monitor changes in plants and animals, as well as fluridone levels, as areas are released from the treatment program. They will also use dredged hydrosoil with adjusted levels of

fluridone to test ability of plants and invertebrates to grow.

The goals, etc. are clearly stated. I have some questions about the importance of some of the proposed studies. For example (last part of Project 3), there have been numerous studies published dealing with the fluridone levels necessary to kill Hydrilla (Macdonald et al. 1997, Netherland et al. 1993, Fox et al. 1994, Netherland and Getsinger 1995a & 1995b, Fox et al. 1996), therefore I question the need for funding another such study. Another example, in Project 4 the applicants state that available data indicate that the herbicides copper and fluridone do not cause long-term ecological damage but that no specific studies have been done on Clear Lake. I'm sure there have probably been many studies on the effects of fluridone on fish and invertebrates (e.g. Hamelink et al. 1986, Campbell et al. 2000) and I don't think it is practical to fund a study on every water body where Hydrilla is a problem.

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 don't believe that all of the proposed work is justified because I don't think it is necessary to put a lot of funding into studies that will likely show the same things for Clear Lake that have been shown already for other locations (see my examples above). Regarding Project 1, quantifying the economic and ecological damage that would occur if no control was conducted, the study is justified if there is growing concern that money going into control is not well spent. However, the applicants did not present evidence that there was a great need for this study in order to protect and justify the control program. I know that with Phragmites in the eastern U.S. there is growing evidence that the Phragmites-dominated wetlands are used by a lot of animals and so some people are questioning the need for the extensive control programs that are in place to eradicate Phragmites. But I don't see in the proposal a concern that Hydrilla eradication will be stopped and therefore I think most people must already buy the idea that it would cause great economic and ecological damage if it were allowed to spread unchecked. Apparently, studies in Florida have shown this to be the case. Regarding Project 2, I think it is justified to quantify the effectiveness of the survey protocol if this has not already been done in another location.

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

   Project 1: The approach is well designed and will meet the objectives. I don't know that it will generate novel information. It will provide information specific to Clear Lake.

   Project 2: I think this project has a well designed approach and it would be useful to know the effectiveness of the current survey program. My only question is how findings would be used to improve the protocol. I wish they had given an example of the type of findings they might expect and how they would use that information to improve the current protocol. Is it really practical to have a more intensive survey program than they already have and what would be the costs of such a program?

   Project 3: I think following fluridone levels in the sediment and boundary layer and in the water column over time in newly treated areas in Clear Lake would be worthwhile and also maybe sampling areas that have received various treatments at various times. They don't say how many areas they would test or how often. The rest of the project dealing with growing the plants in artificial conditions I feel is unnecessary. The field experiments will tell them whether

there is a concentrated layer at the bottom or not. I feel other studies have done work with varying concentrations of fluridone so levels for achieving mortality are already known. In addition to the studies I cited above under Goals, there must be studies done by the makers of fluridone which have established levels necessary for mortality etc. When doing the field work it would be nice to get copper concentrations too if that information is not already available.

Project 4: The approach of monitoring an area following release from treatment is good. However, details of sampling are not given. How many transects? How frequent the sampling of animals? How many invertebrate samples per transect? The part dealing with the effects of treated hydrosoil on aquatic life in laboratory or greenhouse experiments would seem to be getting information that is probably already available in the literature or from the company that makes fluridone. I'm sure there were many studies done to get fluridone approved for aquatic use.

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?

   All four projects are feasible and could be successful. Project 4 needs some more documentation regarding monitoring methods, etc. My big concern is whether or not some of them or parts of them are worthwhile as I have indicated above.

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 seem to be appropriate for all projects.

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?

   There would be some products of value. In my opinion, Project 2 is worthwhile if they will be able to come up with practical approaches to improve the survey method. I'm sorry they didn't give an example of how this could work. The field part of Project 3 is worthwhile and the field part of Project 4 might be worthwhile if no such studies have been done elsewhere. I believe articles for refereed journals should be added to their product lists.

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?

   From the information provided in the proposal the applicants appear to be well qualified. Had they cited more journal literature on studies that relate to the project I would feel more comfortable of their awareness of the information already available.

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

   The budgets for each project seem high to me.

Miscellaneous comments:

External Scientific: #4

Research and Restoration External Scientific Review Form

Proposal Number: **19**

Applicant Organization: **California Department of Food and Agriculture**

Proposal Title: **ANALYSIS OF THE EFFICACY AND ECOLOGICAL EFFECTS OF THE CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE HYDRILLA ERADICATION PROJECT IN CLEAR LAKE, CALIFORNIA**

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	**Proposals 1 and 3 are based on important research issues, but the researchers have not provided sufficient justification for the research in the context of eradicating hydrilla from Clear Lake. Proposal 2 describes a real need, but the scope of the proposed study may not be sufficient to prove successful. Proposal 4 requires much more thought regarding the complexities of assessing ecological impacts before the proposal should be funded.**
XGood	**Proposal 1: Poor** **Proposal 2: Good The researchers should provide better details on how they ensure they have a sufficient sample size. If they shift the focus to making sure they can improve the techniques to ensure they are not missing hydrilla where they detect none rather than the distribution surrounding where they document hydrilla exists, this proposal should be considered for funding.**
-Poor	**Proposal 3: Good If the researchers can provide details on the mesocosms to indicate they would adequately simulate the conditions in Clear Lake and the long-term monitoring is removed or better justified, this proposal should be considered for funding.** **Proposal 4: Poor**

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

   Proposal 1: No goals or objectives are explicitly stated. The implicit goal is to determine whether the ecological and economic damage that would occur should hydrilla be allowed to spread unchecked would exceed the costs of controlling hydrilla. The stated hypothesis that hydrilla would cause major ecological and economic losses, far exceeding the costs of eradication, were it allowed to spread unchecked . . . is not testable since an eradication program is in place. The time to study whether the costs to eradicate hydrilla would exceed the costs associated with its potential damage was prior to initiating the eradication program.

   Proposal 2: No goals or objectives are explicitly stated. The stated hypothesis is closer to a goal. If the program goal is to completely eradicate hydrilla from Clear Lake, ensuring that the monitoring program is capable of determining the lake is clean is extremely important. The current monitoring is adequate to find large mats, but is not likely capable of finding all newly germinated plants. It is not clear from the implicit goal or the hypothesis how the investigators intend to improve the monitoring to enhance its ability to find small mats or individual plants.

   Proposal 3: The goal is again provided in the hypothesis, and no objectives or testable hypotheses are provided. A goal of reducing the amount of pesticides applied to the lake is appropriate.

Proposal 4: No goal or objective is clearly provided. The hypothesis of no harm is not testable. To show harm, some indication of harm needs to be defined and tested.

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?

   Proposal 1: The conceptual model states the costs expended by Florida to control hydrilla and quote a vague estimate of the costs of damage to Florida if hydrilla was left uncontrolled. However no discussion of the rate at which hydrilla is known to spread is given to substantiate the assumption that it would spread into major waterways within a few years. Prior to a field assessment, a paper assessment could be completed to determine whether the expected costs anticipated from allowing hydrilla to spread unchecked is or is not similar to the costs of controlling it.

   Proposal 2: The need for documenting whether the current monitoring techniques are adequate to locate all hydrilla plants is sufficiently summarized. Conducting the work in the field is appropriate as long as the true goal of the program in Clear Lake is eradication and not control.

   Proposal 3: The need for long-term monitoring of fluridone concentrations in the hydrosoil and boundary layer are not well justified. Fluridone is not known to accumulate and has a short half-life in the hydrosoil of 90 days and aerobic half-life of 20 days in water. No evidence is given that these published numbers (out of The Pesticide Manual) do not apply to Clear Lake. No statement is provided to suggest how the laboratory or greenhouse studies will differ from those already published or how the published information is not applicable to Clear Lake.

   Proposal 4: The only justification for this research is that some members of the public have raised concerns about the safety of using fluridone. The researchers do not provide additional justification that an unacceptable risk to the use of fluridone exists.

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?

   Proposal 1: It is not possible to determine whether the approach is appropriate for meeting the objectives since no explicit objectives are provided. No rationale is provided for selecting concentric zones of one, five and ten miles around Clear Lake, and no criteria used to differentiate between small and large ponds are provided. No indication of what would constitute a representative number in each class of water body. More detail is necessary for sampling of each water body and Clear Lake to characterize it likelihood of being infested with hydrilla. A published reference or criteria are not provided for determining whether water bodies would be not likely to support hydrilla; likely to support sparse, non-economic populations; or likely to support dense populations that would serve as hot spots for further spread. Some indication of the manner in which published data should would be used to determine the effect on ecological and economic factors.

   Proposal 2: Focusing on the distribution of hydrilla plants near where the current survey methods documents hydrilla exists is less likely to improve the monitoring techniques than determining when the current methods fail to find hydrilla. Limiting the effort to only six study plots may be insufficient to provide the statistical power to show when the techniques are capable

of locating more of the existing hydrilla than the current techniques. Six plots are not likely to be able to model the total hydrilla load of Clear Lake. Improving the techniques is critical to being able to successfully eradicate hydrilla from Clear Lake, but the need to estimate the total load is not well-justified.

Proposal 3: Practically no details are provided for the laboratory or greenhouse studies. Therefore it is not possible to determine whether they would be well-designed or add to the base of knowledge. Since preliminary work in Clear Lake suggest there is a high level of mixing in the water column, and that considerable water flow occurred even near the bottom sediments, these issues would need to be incorporated in the mesocosm studies to accurately model the conditions in Clear Lake. Without an accurate effective target concentration required for hydrilla control in Clear Lake, even short-term monitoring will not appreciably assist to reduce the amount of fluridone used to control hydrilla in Clear Lake. Prior to monitoring concentrations in the lake, the effective concentrations should be established, either from the literature or from the proposed studies.

Proposal 4: Prior to expending efforts on monitoring fish or birds, impacts on plants and invertebrates should be evaluated. If food resources of birds, or cover for fish are not impacted, the argument is very strong that no population changes related to fluridone use will occur. The approach does not discuss how the researchers will be able to differentiate any changes related to fluridone from other environmental factors. Targeted studies on specific taxa are of greater value to determine risk than are unfocused broad ecological surveys.

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?

Proposal 1: The feasibility of this proposal is based on using known economic and ecological models and surveys to evaluate impacts, but no indication is provided to the availability or quality of these models. It is difficult to determine whether the scale is consistent with the objectives since no objectives are provided. A stated concern is to prevent the spread of hydrilla to the Sacramento Delta, but no discussion of how studying ponds around Clear Lake would indicate any risk of infestation of the Sacramento River.

Proposal 2: More than six plots should be considered to enhance the power of the study to ensure the techniques are capable of detecting all the hydrilla in the lake. There is no documentation that the divers will be able to locate all the hydrilla in the areas they search or how the researchers will check on the quality of the divers searches.

Proposal 3: Insufficient details are provided to determine whether the laboratory testing would differ from or add to the published literature on fluridone control of hydrilla. Other than stating flow-through conditions would be used, the details of the mesocosms are completely lacking so it is unclear how they will be able to simulate the mixing and flow regimen existing in Clear Lake.

Proposal 4: The likelihood of being able to document impacts on aquatic plants or invertebrates inhabiting the hydrosoil are greater than being able to assess impacts on fish or birds. The scale of the effort to document changes is not sufficiently defined to determine success. The approach does not adequately explain how treated and non-treated plots will be separated so that the two types of plots will be independent of each other.

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?

   Proposal 1: The performance measures listed are more analogous to expected products and outcomes than measures to ensure the project is successful.

   Proposal 2: Rather then focusing on distribution of hydrilla around finds, it is more important to determine whether there is hydrilla in the area where the standard techniques do not find hydrilla.

   Proposal 3: The performance measures listed are again products of the research as opposed to measures of success. There are no measures listed to indicate progress toward the goal of better understanding the concentrations of fluridone in Clear Lake. There is no discussion regarding whether they will assess changing only the nominal application rate or would consider reducing the number applications. Either would result in less fluridone applied to Clear Lake.

   Proposal 4: No measures are provided to suggest how the researchers will define an impact on populations of any taxon or how independence of plots will be assured.

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?

   Proposal 1: Determining the costs of not eradicating hydrilla from Clear Lake seems of limited value unless there is a possibility that the decision already made to eradicate hydrilla is to be reversed. The applicability of the approach to other clean watersheds was not sufficiently made to show that this exercise is of high value.

   Proposal 2: Providing an improved monitoring technique would be very valuable. Rather than attempting to provide statistical/probabilistic estimates of the current distribution of hydrilla in Clear Lake, more effort should be directed to testing whether the new proposed techniques are better than the existing techniques. It is not clear how evaluating the monitoring techniques will lead to a better herbicide treatment protocol.

   Proposal 3: Reducing the amount of pesticides used to control an infestation is always a valuable outcome. The value of the long-term monitoring effort is less apparent. The researchers do not provide any information to indicate that fluridone does not quickly dissipate as anticipated from published information in The Pesticide Manual.

   Proposal 4: It is not likely that products of value would derive from the study described by this proposal. The researchers acknowledge that the comparison among treated and untreated plots will not be exact because few untreated plots exist and they may not be similar to the treated plots. If the treated and untreated plots differ in ways directly related to the likelihood of infestation with hydrilla, and these differences also impact the establishment of other aquatic plants and animals, then any differences in populations may be completely unrelated to the treatment with fluridone. The researchers do not discuss how they intend to overcome this difficulty.

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?

   Proposal 1: The co-investigators have the expertise to perform the techniques discussed in the proposal. They have access to all the facilities of the required to complete the tasks discussed.

   Proposal 2: The co-investigators have the expertise to perform the techniques discussed in the proposal. They have access to all the facilities of the required to complete the tasks discussed.

   Proposal 3: The co-investigators have the expertise to perform the techniques discussed in the proposal. They have access to all the facilities of the required to complete the tasks discussed.

   Proposal 4: The co-investigators do not have the background to conduct a comprehensive ecological study. The budget indicates that they would rely heavily on outside consultants, but the qualifications of these consultants are not provided.

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

   Proposal 1: It is not possible to determine whether the budget is reasonable and adequate because the number of water bodies to be surveyed and the level of effort required to survey each water body is not sufficiently described.

   Proposal 2: The bulk of cost for this proposal are for diving time and direct labor hours. Without a more detailed description of the methods, it is not possible to determine whether the time estimates are appropriate. The direct labor hours increase slightly between the preliminary diving study and the first year of the diving study, but the consulting fees, presumably paid to the divers, quadruple. This discrepancy does not make sense.

   Proposal 3: Without a description of the sampling schedule and number of sample locations, it is not possible to determine whether the cost estimates are appropriate for the level of effort anticipated by the researchers. It is also not clear from the proposal how much of the efficacy work is simply a duplication of what has already been published and therefore of little benefit for the cost.

   Proposal 4: The methods to be used as part of this proposal are quite vague and the likely products are not justified for the costs proposed.

Miscellaneous comments:

There is a general lack of literature review to indicate the need for developing new information on these topics. It is not clear whether the need for the proposed research stems from the unique character of Clear Lake and the eradication program, or the published information is insufficient to make appropriate decisions without further, expensive field work.

Proposal 1: Prior to a full-blown field program, a modeling effort should be undertaken to document that there is a need to expend the effort described to determine whether the ecological and economic costs associated with not controlling hydrilla does or does not exceed the costs of controlling hydrilla. Unless the modeling lacks adequate certainty to ensure the costs of controlling hydrilla are not excessive, the field efforts are not necessary.

Proposal 2: Of the proposals, this is the most important to ensuring an eradication program is successful and likely the most applicable to other watersheds. There needs to be more justification that six plots are adequate to provide the statistical power to detect differences.

Proposal 3: The connection between the long-term monitoring and the mesocosm efficacy trials is not sufficient. The researchers need to better explain how they would use the laboratory information to go back to the field and test whether the new application rates or timings would be effective to eradicate hydrilla from Clear Lake.

Proposal 4: Determining ecological impacts of pesticides in a natural system such as a lake is quite difficult. Prior to attempting such a field attempt, an ecological risk assessment should be completed with targeted studies identified that would be important for better understanding potential risk. Considering the low toxicity of fluridone, the likelihood of direct impacts is not likely. Understanding how the Clear Lake system may be impacted in indirect ways through the food web, etc., would be important, but the researchers have not proposed how they would be able to detect such impacts.

Prior Performance/Next Phase Funding:

New Proposal Number: 19

New Proposal Title: ANALYSIS OF THE EFFICACY AND ECOLOGICAL EFFECTS OF THE CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE HYDRILLA ERADICATION PROJECT IN CLEAR LAKE, CALIFORNIA

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

   99-F08 Purple Loosestrife Prevention, Detection & Control in the Sac/SJ Delta and Associated Hydrologic Units.

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?

   XYes -No -N/A

   If no, please explain any difficulties:

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

   -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?

   XYes -No -N/A

   If no, please explain deficiencies:

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

   XYes -No -N/A

   If no, please explain deficiencies:

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

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

If no, please explain:

N/A this is not a next phase project

Other Comments:

Applicants are professional, dedicated, and responsible. Carry out tasks and duties above and beyond what is committed to in the agreement. Very responsive to any inquiries/suggestions relating to the project.

Environmental Compliance:

Proposal Number: 19

Applicant Organization: California Department of Food and Agriculture

Proposal Title: ANALYSIS OF THE EFFICACY AND ECOLOGICAL EFFECTS OF THE CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE HYDRILLA ERADICATION PROJECT IN CLEAR LAKE, CALIFORNIA

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

   XYes **-**No

   If no, please explain:

   Applicant needs to obtain Scientific Collecting Permit for electroshocking of fish.

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:

   No permit fee's necessary other than for a Scientific Collecting Permit.

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: 19

Applicant Organization: California Department of Food and Agriculture

Proposal Title: ANALYSIS OF THE EFFICACY AND ECOLOGICAL EFFECTS OF THE CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE HYDRILLA ERADICATION PROJECT IN CLEAR LAKE, CALIFORNIA

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 the budget summary/justification