Proposal Reviews

#174: Lake Natoma Temperature Curtains Pilot Project

The Water Forum

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

Initial Selection Panel Review:

CALFED Bay-Delta 2002 ERP PSP
Initial Selection Panel Review

Proposal Number: 174

Applicant Organization: The Water Forum

Proposal Title: Lake Natoma Temperature Curtains Pilot Project

Please provide an overall evaluation rating.

Explanation of Recommendation Categories: Fund

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

Consider as Directed Action in Annual Workplan (a proposal addressing a high priority action that requires some revision followed by additional review prior to being recommended for funding)
Not Recommended (a proposal not currently recommended for funding-after revision may be considered in the future)

Note on "Amount":

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

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

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

Amount: **$1,960,196.00**

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

None

Provide a brief explanation of your rating:

Although reducing temperatures on the American River is a high regional priority, the technical panel questioned whether the project was ready to proceed to pilot implementation and raised significant concerns regarding lack of modeling and appropriate monitoring of effects on fish. The Selection Panel recommends that the applicant revise the proposal to address the technical panels comments and submit the revised proposal for consideration as a directed action.

Research and Restoration Technical Panel Review:

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

Proposal Number: 174

Applicant Organization: The Water Forum

Proposal Title: Lake Natoma Temperature Curtains Pilot Project

Review:

Please provide an overall evaluation summary rating:

Superior: outstanding in all respects;
Above Average: Quality proposal, medium or high regional value, and no significant administrative concerns;
Adequate: No serious deficiencies, no significant regional impediments, and no significant administrative concerns;
Not Recommended: Serious deficiencies, significant regional impediments or significant administrative concerns.

Overall Evaluation Summary Rating	Provide a brief explanation of your summary rating
-Superior	**The curtain is feasible but the panel recommends a scale model curtain first be investigated. However, the panel questions whether the anticipated temperature reduction would have a meaningful impact on fish survival or spawning timing.**
-Above average	
XAdequate	
-Not recommended	

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

   Goals are clear, consistent and important: installation of curtains to pass cold water to Lower American River will benefit juveniles in the summer and conserve cold water stores for spawning in the fall. The project identifies an existing temperature problem and demonstrates how the screen will mitigate the temperature in terms of the mechanisms: water pass through and reduction of warm and cool water mixing. The justification as a pilot project is weak. The reviewers question the wisdom of installing a curtain without first investigating the screen dynamics with a hydraulic model. A scaled model will give information on how the curtain placement affects the flows. In addition, although the curtain may work as designed and lower the temperature downstream, it is unclear the reduction will be significant to fish.

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?

   Temperature curtains have been deployed in other reservoirs (Lewiston and Whiskeytown) and have been proven to reduce temperatures between 0.5 and 3 degrees. The team includes experts in temperature curtains. Based on the existing deployment the likelihood of water reduction seems high. However, the success on improving juvenile fish survival and spawning success is unknown. Performance measures were considered inadequate. Assessment of the change in temperature by comparing one year against previous years is problematic because year to year variations in temperature may be greater than the expected reduction with the curtain.

3. **Outcomes and Products.** Will the project advance the state of scientific knowledge in general and/or make an important contribution to the state of knowledge of the Bay-Delta Watershed? For restoration proposals, is the project likely to contribute to ecosystem restoration or species recoveries in a significant way? Will the project produce products useful to decision-makers and scientists?

   The product is the curtain and an assessment of its efficiency. Since two curtains are currently in operation in other reservoirs this proposal does not advance scientific knowledge. The question is whether a 1-2 degree F temperature reduction is sufficient to affect the spawning timing and extend the water budget by 20-days. This would be useful to managers but the proposal does not address this question.

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

   The budget is seems reasonable and adequate. Overhead at 60% of salaries seems high. Hourly salaries are very reasonable. The panel had doubts that the estimated temperature reduction would be of value for the cost.

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 review ranked the proposal high. Temperature is a significant limiting factor on the American River. The review questioned if the benefits to fish were significant. Cooperation and coordination is occurring.

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 not significant concerns.

Miscellaneous comments:

None

Sacramento Regional Review:

Proposal Number: 174

Applicant Organization: The Water Forum

Proposal Title: Lake Natoma Temperature Curtains Pilot Project

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

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

Temperature is one of the most significant limiting factors on the American River (AR). Much effort went into assessing the problem and this is one of the first projects to improve temperatures on the AR. There was some concern that the monitoring needed to be more comprehensive to attempt to link the benefits to the species (i.e., egg survival).

1. Is the project feasible based on local constraints?

   XYes **-**No

   How?

   The actions pursued are using techniques used successfully at other locations. Cooperation and coordination is occurring, and the team is qualified.

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

   XYes **-**No

   How?

   This pilot project is focused on reducing water temperatures May thru October, PSP priority Sac Region-2.

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 action came out of a larger planning and restoration effort (LAR Task Force) on the American River.

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

   XYes **-**No

How?

X

Other Comments:

X

External Scientific: #1

Research and Restoration External Scientific Review Form

Proposal Number: **174**

Applicant Organization: **The Water Forum**

Proposal Title: **Lake Natoma Temperature Curtains Pilot Project**

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

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

none

Review:

Please provide an overall evaluation summary rating:

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

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
XExcellent	**The details exhibited in the project design, their expertise, and the possibility of reducing temperature for juvenile and adult life stages makes this proposal excellent.**
-Good	
-Poor	

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

   Goals are clear, consistent and important: installation of curtains to pass cold water to Lower American River will benefit juveniles in the summer and conserve cold water stores for spawning in the fall.

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 identifies an existing temperature problem and demonstrates how the screen will mitigate the temperature in terms of the mechanisms: water pass through and reduction of warm and cool water mixing. This pilot project appears justified. They note the number of contingencies requires that the screen be tested in the field.

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

   The approach is good, well designed, and details are elaborated. The applicants base their work on previous temperature curtain projects. Eight objectives are identified from design and installation of curtains, through evaluations, ending with recommendations on establishing an annual program to install and maintain curtains. The information should be clear and of practical use to decisions makers.

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

   Temperature curtains have been deployed in other reservoirs (Lewiston and Whiskeytown) and have been proven to reduce temperatures between 0.5 and 3 degrees. The team includes experts in temperature curtains. Likelihood of success seems high. The scale of the project is relatively large as is the reservoir. The project seems in proportion to the need.

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 will compare the existing temperature pattern to the pattern with a curtain in place. This is a clear unambiguous measure. The performance will also be measured in reserved volume of cool water made available for a fall release. Although not stated directly as a performance measure, the performance measures will also include the recreational impact of the screen. Curtain longevity was not noted as performance measure, nor was the issue of screen handling. However, considering the detail and research in the proposal it is likely that the maintenance and operation will be evaluated at the end of the project, and which will become part of the de facto performance measures.

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

   The project is the curtain and an assessment of its efficacy. A monitoring component is included.

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 considerable experience in project management and technical expertise. Especially impressive is the Water Forums close working ties with stake holders (a diverse group of 40 stake holders representing business, citizen groups, environmentalists, and water managers)

and their experiences with hydraulics and other temperature curtain installations.

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

   The budget is seems reasonable and adequate. Overhead at 60% of salaries seems high. Hourly salaries are very reasonable.

Miscellaneous comments:

I like this proposal. It is well designed and they demonstrate expertise. This is very likely a cost effective temperature reduction method for both juvenile and adult salmon.

External Scientific: #2

Research and Restoration External Scientific Review Form

Proposal Number: **174**

Applicant Organization: **The Water Forum**

Proposal Title: **Lake Natoma Temperature Curtains Pilot Project**

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	**Despite my critical comments RE the hydrodynamical and ecosystem aspects of this proposal, I recognize that humankind has hammered the planet's watersheds, and that we must try to reverse the effects of fractured waterways. On the basis of such crisis, one might put aside cautious academic detail, and tackle the problem as best as possible. New ideas must be tried. For this reason I set some of my scepticism aside and rate the proposal as 'good' (with hopes that it is funded and its shortcomings addressed).**
XGood	
-Poor	

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

   The goals of the proposal - To (a) reduce LAR temperatures in order to improve the survival of anadromous salmonids and (b) increase the storage of cold water at Folsom Reservoir conserve for fall release to improve spawning conditions - are clearly stated.

   Likewise, the objectives to design, construct, install, monitor, access and modify (as required) thermal curtain barriers in Lake Natoma - are laid out in an orderly fashion.

However, the underlying hypotheses e.g. that the proposed structures will (a) reduce temperatures in the LAR by the predicted amount (1 or 2 oF) and (b) that such predicted changes will significantly improve fish habitat and productivity - are poorly supported, both conceptually and empirically. When the details of the hypotheses are discussed, the wording is vague and almost without exception leave the impression that the proponents do not really understanding hydrodynamical mixing processes (for example, with regards to plunge-line dynamics).

I cannot say from information in the proposal that their approach is timely and important. Why, for example, it is a better long-term solution that other selective withdrawal approaches. The initial cost of curtains may be low, but are the long-term (high maintenance) costs justified? I do not see a solid discussion cost/benefit or risk.

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 physical and biological justification for this pilot project is weak. The applicants state "...hydrodynamic and thermodynamic variables are so numerous that determining the curtains' optimum design from laboratory tests would be impractical." What are these 'numerous hydrodynamic and thermodynamic variables' and why aren't they discussed as confounding processes? In fact, this project would appear to be a classic case whereby simple textbook estimates could be applied 'a priori' and help considerably in judging the potential success of the project.

   But, the applicants give the reviewer almost no information on the hydrological and morphological characteristics of the system. For example, what is the annual flow? What is the annual temperature record at various sites along the system? What is the depth and volume and storage capacity of Lake Natoma? What is the lakes residence time, and what is the residence time of the throughflow? What is the temperature stratification within Lake Natoma? What is the annual exchange of heat at the air-water interface? (Only on page 17 - under Performance Measures - is useful information given.)

   Without this very basic and easily attainable information, the reviewer is left with little ability, even intuitive, to judge if the predicted results of the curtain structures. Admittedly, the applicants use comparisons to three other systems as evidence that the Lake Natoma idea will work, but with out giving morphological and hydrological characteristics of these systems, how can one know that the comparison is valid? Also, the curtains referred to in the proposal used elsewhere are quite a bit deeper, and this may make them better at trapping and storing the warm water overflow. (But, then, how do we know if not given temperature profiles upon which to judge?)

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 proposal is clear and well thought out in terms of its engineering (planning and design). The applicants give every indication of knowing their business in the construction of thermal curtains.

The proposal is weaker in terms of hydrodynamics. As noted in #2 above, the reviewer is given very little information upon which to base a decision. The fate of water trapped by the curtains is unclear. How much water can be trapped? and how quickly will it reach equilibrium temperature? (As an aside, the "references" given in this proposal are as weak and poorly documented as I have ever seen in a professional proposal, and this adds to the impression of a sloppy effort.)

The proposal is weaker still in terms of biological impact. We are left on our own to believe that because the system is close to 'critical' temperature, that even the small changes predicted (~ 1 deg-F) will have a measurable effect on the fish. The literature here (fish and temperature) is enormous, and yet we are left with statements much akin to the applicants saying, 'trust us'.

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

   The project is certainly feasible and there is no doubt that the proposed curtains can be constructed and operated. The likelihood that the two-step goal (lower T followed by more salmonids) is less certain - for the reasons stated 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?

   The applicants state that they placed thermistor lines in 6 (unspecified but still strategic) locations in spring 2001, but do not show data. (Such data would have been very useful to a reviewer trying to judge if the curtains would work.)

   They also state that permanent stations are located below Folsom and Nimbus dams. I suspect that this may be insufficient to monitor the target habitat.

   While temperature records are - indeed - critical, I see now mention of an approach to link the productivity of salmonids to the new habitat temperatures.

   Finally, how will the applicants sort the role of habitat temperatures on long-term trends in salmonid production from all the other confounding signals (e.g. climate, fish management, and habitat alteration. Without this effort, how can cost/benefit be judged?

6. **Products.** Are products of value likely from the project? Specifically for restoration projects, are products of value also likely from the monitoring component? Are interpretative outcomes likely from the project?

   The value, other that the obvious fisheries and recreational outcomes, would be that it may provide more empirical evidence on the behaviour and effectiveness of thermal curtains. But, I do not see this analysis as part of the present proposal.

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

The applicants appear a divers and capable team, combining water resource management, law and policy, engineering, and hydraulics and modelling. Given the strength of the team, the proposal is somewhat disappointing, but perhaps my expectations are too high. I am surprised that with a modeller (Yaworsky) and hydraulic engineer (Vermeyen), more attention was not give to hydrodynamics.

Missing from the team is a strong link to ecosystem response. How is this biological issue insured?

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

   The budget seems reasonable, but I admit this is not within my area of expertise.

Miscellaneous comments:

External Scientific: #3

Research and Restoration External Scientific Review Form

Proposal Number: **174**

Applicant Organization: **The Water Forum**

Proposal Title: **Lake Natoma Temperature Curtains Pilot Project**

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	**Overall a good project that will likely improve late summer storage of cool water in the upstream reservoir and hence expand options for release during critical late summer/fall salmon spawning/rearing. The value at other seasons from direct temperature reduction from Natomas outflows is uncertain. Use of temperature data within Lake Natomas to judge effectiveness was not fully explained.**
XGood	
-Poor	

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

   Yes, there is a clear connection to the problem of high temperature in the river below the reservoir and a proposed solution.

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 use of similar devices and their utility is clearly stated. The relative value of each curtain in this project to obtaining the temperature objective is not entirely clear, especially given the unknown openings in the upper curtain to meet recreational objectives on the lake. The data for existing temperature conditions are not fully developed although it is clear that the Lower American River (LAR) below Lake Natoma has temperature conditions that are stressful to salmon. One cannot judge from the data presented, however, whether the proposed project will lower temperature discharges sufficient to make any biological difference in the LAR. Thus, the project may meet the goal for the temperature curtains but still not significantly affect the downstream temperature regime for spawning and rearing condtions.

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 construction and installation of the curtains seems well designed. The upstream curtain #1 is to reduce mixing but the expected contribution to reducing temperature is unclear. The application of this general approach to a shallow lake may have value for other situations. Temperature data recording could be more fully presented. For example, how were the six stations chosen initially? Does a single depth line along the length account for horizontal temperature variations due to circulation or eddies in that region? If new locations are chosen, as suggested in the proposal, how will previous data be used to compare curtain function?

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

   The approach of temperature curtain deployment is fully documented and appears from previous work to be technically feasible. The question of success is not clear. The project may reach the objectives for these curtains but may not be important for the some of the needed downstream temperature reduction--data or explanation is needed. The late summer storage of water in the upstream reservoir (Folsom) appears to be a more certain outcome from the project and therefore may be a significant contribution to improving spawning/rearing conditions in LAR

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 is somewhat weak on developing the basis for measuring performance. The criteria apparently are whether the outflows will be lower than some readings for comparable periods of the season in previous years. Year-to-year fluctuations in temperature as a result of flow and weather make comparisons based on previous years a difficult prospect. There appear to be modelling approaches to judging performance but these were not mentioned in the proposal. Alternative criteria might be whether the LAR temperature regime has been changed sufficiently to improve habitat but this element was not explicitly described.

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 will likely be some value from applying this methodology to smaller, shallow lakes where temperature extremes are more common and mixing of layers more likely than in large, well-stratified systems.

The provision of "openings" in the curtain to allow surface-water recreation sounds interesting but the performance of the curtains under such circumstances may be reduced. Information on such modifications could have value in other situations.

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 of applicants has excellent experience and relevant expertise for this project. The support for contract management and oversight is complete. Ongoing measurement of reservoir temperature regimes adds strength.

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

   The cost is high for construction of two curtains. Relative benefit of the Curtain #1 for mixing control is not fully explained. The ecological benefits to LAR habitat at all seasons is incompletely developed to judge. The likely improvment of late summer storage of cool water in Folsom Lake appears a more quantifiable benefit.

Miscellaneous comments:

The proposal could be improved by more complete connection of LAR temperature regime and expected reductions from project operation. The curtains may lower water temperature but not significantly reduce river water below critical levels.

External Scientific: #4

Research and Restoration External Scientific Review Form

Proposal Number: **174**

Applicant Organization: **The Water Forum**

Proposal Title: **Lake Natoma Temperature Curtains Pilot Project**

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

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

none

Review:

Please provide an overall evaluation summary rating:

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

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
-Excellent	**The technique appears to have been successfully used at toher locations. However, the lack of hydraulic model studies ahead of time to ensure the selected locations are the best possible and unforeseen physical conditions won't bias or affect the results is a weakness. Also, the proposal needs to be strengthened by defining what test metrics and test statistics will be used in the analysis, and what are the criteria for deciding what is a "success."**
XGood	
-Poor	

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

   The overall goal of reducing fall water temperatures in the American River seems highly appropriate given the current water temperatures and that fact that temperature is such a critical and fundamental driver of spawning timing, embryo incubation, growth, and ecosystem function.

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 need to reduce water temperatures is justified.

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 proposal is scheduled to be a 1-year test. The proponents know the system better than I do certainly, but it struck me that often environmental variability requires that tests be conducted over a period longer than one season. If water temperatures are consistently high such that any year selected would be adequate as a proof-of-concept test, then the concern over testing for just one year is unwarranted.

   Are there any smolts in the reservoir? The way I read the proposal they are restricted to reaches below the dam. If they are in the reservoir, a number of issues regarding potential impacts of the curtains on passage behavior become a concern.

   I'm not sure I follow the logic of the statement in the Executive Summary that hydrodynamic and thermodynamic variables are so numerous that the optimum design can't be designed through lab (and I assume perhaps model) studies. The proposal implies that field testing is the most appropriate. However, the very nature of the complex interactions between hydraulics, temperature, the curtain structures, and bathymetry suggest that the field test may have a low probability of being lucky, and selecting the correct design and location a priori. Hydraulic model studies are often required to provide important insights into hydraulic behavior and responses to structures in the flow path. For example, the proposal is vague on what criteria were used to select the two test sites. Perhaps other sites would be more effective?

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 Executive Summary states the problem is out-flow temperatures are up to 5 degrees (I assume they mean F) warmer than inflow temperatures, and the goal of the project is to reduce the outflow temperatures by 1 - 2o F. Seems like the solution doesn't fully address the problem. The proposal addresses the issue from an engineering standpoint, or from a physical perspective. Without a more detailed discussion of the biological benefits associated with a 1-2o F reduction in out-flow temperatures, it's hard to tell whether the proposed project will meet any biological goals. Yes, the reduction will help, but is it a real solution?

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?

   No - The proposal is unclear as to what metrics will be used to judge whether the devices, locations, and tests have been "successful." Will temperatures in the years before and after be compared to temperature during the test year? Daily median temperatures? Annual mean temperatures? Spawning timing and success? How will the analysis account for inter-annual variation? While the proposal discusses how data loggers will be used to collect data, it lacks an evaluation plan and any discussion of test statistics that will be used or the null hypothesis being tested.

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?

   Are the products valuable? Yes and no. Certainly any reduction in outflow water temperatures will improve environmental conditions below the dam. The question is whether the 1-2 degree F reduction is sufficient to really affect spawning timing and extend the use of the cold water budget from Folsom by the 20-day period.

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?

   Yes - The approach has been employed elsewhere with success so the issue is whether it can be applied to this site successfully. The technical strength of the team lies in the Bureau of Reclamation personnel, which when combined with the administrative team from the Water Forum, appears to have the disciplines necessary to implement the project.

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

   It appears to be, but if the evaluation needs to be conducted in more than one year (see comment above) then costs will have to be increased.

Miscellaneous comments:

One benefit of temperature reduction is it controls and advances the onset of spawning, as discussed in the proposal. One potential benefit the proposal doesn't discuss is advancing spawning can also advance the smolt outmigration. In the Snake River warm outflows from Brownlee Dam delay the onset of fall chinook spawning, embryo incubation timing, emergence, and eventually the smolt outmigration. Later smolt migrations now occur in periods of decreased outflow, warmer temperature, high predator metabolic rates and consumption, and in general, reduced smolt survival. Advancing spawn timing to periods that are more traditional and based on periods the stocks evolved to, should also help juvenile outmigrant survival the following spring/summer.

Prior Performance/Next Phase Funding:

New Proposal Number: 174

New Proposal Title: Lake Natoma Temperature Curtains Pilot Project

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

   ERP 99-N21 - Development of a River Corridor Management Plan for the Lower American River

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

   N/A

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?

   XYes -No -N/A

   If no, please explain any inaccuracies:

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

   XYes -No -N/A

   If no, please explain deficiencies:

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

   XYes -No -N/A

   If no, please explain deficiencies:

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

   -Yes -No -N/A

If no, please explain:

N/A

Other Comments:

Environmental Compliance:

Proposal Number: 174

Applicant Organization: The Water Forum

Proposal Title: Lake Natoma Temperature Curtains Pilot Project

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

   XYes **-**No

   If no, please explain:

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

   XYes **-**No

   If no, please explain:

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: 174

Applicant Organization: The Water Forum

Proposal Title: Lake Natoma Temperature Curtains Pilot Project

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: