

Proposal Reviews

#157: Effects of Predation Dynamics on Outmigrating Salmon in the Delta

Stillwater Sciences

Initial Selection Panel Review

Research and Restoration Technical Panel Review

Delta Regional Review

#1

#2

External Scientific Review #3

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#1

Prior Performance/Next Phase Funding #2

#3

#4

Environmental Compliance

Budget

Initial Selection Panel Review:

CALFED Bay-Delta 2002 ERP PSP Initial Selection Panel Review

Proposal Number: 157

Applicant Organization: Stillwater Sciences

Proposal Title: Effects of Predation Dynamics on Outmigrating Salmon in the Delta

Please provide an overall evaluation rating.

Explanation of Recommendation Categories: Fund

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

Consider as Directed Action in Annual Workplan (a proposal addressing a high priority action that requires some revision followed by additional review prior to being recommended for funding)

Not Recommended (a proposal not currently recommended for funding-after revision may be considered in the future)

Note on "Amount":

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

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

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

Amount: **\$0**

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

None

Provide a brief explanation of your rating:

The proposed project would assess salmon predation in the Sacramento River system -specifically in shallow water habitat in the Delta - and the relationship to preference/use of this type of habitat. This is an important question for CALFED (identify temporal and spatial scales of predation dynamics on juvenile salmon in the Delta) because of keen interest in creating additional shallow water habitat in the Delta in the absence of good understanding of utilization of that habitat by predators.

The proposal reviews ranged from excellent to poor. There was no agreement among reviewers as to whether the project would result in improved understanding of this key issue due to lack of information regarding procedures. Additionally, there was concern about the budget, and the absence of any discussion of how this project relates to other on-going in-Delta studies examining similar/related issues.

Research and Restoration Technical Panel Review:

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

Proposal Number: 157

Applicant Organization: Stillwater Sciences

Proposal Title: Effects of Predation Dynamics on Outmigrating Salmon in the Delta

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	Its tough to assign a rating to this proposal. The three external reviews gave ratings of good on a scale of poor, good and excellent. That rating scale would place this project squarely between adequate and above average. We have rated the proposal only as adequate, however, because of several factors: (1) the budget seems much too large; (2) sampling methods are inadequately described, especially for so-called opportunistic sampling that would seem by its very nature to impossible to predict or allocate a budget category; (3) predation sampling appears to take place over only a very short time window during spring; and (4) a tertiary reviewer on our panel gave the proposal a poor rating.
-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?

This is one of several submitted proposals that are devoted to assessment of salmon predation in the Sacramento River system and it shares many common field methods with other related proposals. This project is distinguished from other predation proposals two respects: location and relation to proposed habitat modifications. The project would be carried out in the delta area and have a special focus on moves to create additional shallow water habitat in the delta, thereby possibly creating new prime (?) habitat for predators of salmon.

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?

Three external reviewers all gave this proposal ratings of good and felt that project methods would likely deliver some reasonable notions of relative predation rates in various habitat types in the delta. Concerns were raised in all reviews regarding the sketchy nature of the presentation of sampling locations, sampling design, sampling frequency, etc. One reviewer was especially concerned about the large amount of money to be spent on opportunistic sampling, an undefined method.

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 project should deliver some notions of prey consumption rates by predators collected at various locations, but the proposal provides no convincing arguments that predator abundance could be determined. Therefore, it does not seem possible for the proposal to generate information about predator dynamics that would surely involve assessment of predator abundance, predator consumption rates, and temporal variation in these values (reflection of movements of predators, movements of prey, or variations in density of prey).

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

The budget seems exceptionally high. Since sampling details are not provided in this proposal, its tough to judge just how out of line the budget request is. If this project could deliver actual estimates of predator abundance in the delta, then perhaps such a huge budget might be justified. But the proposal provides no reason to believe that abundance could be estimated using proposed methods.

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 single Regional review gave a high rating to this project.

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?

Some permitting concerns not adequately addressed in proposal

Miscellaneous comments:

This proposal notes that there are two other ongoing studies of predation in the delta, but the proposal does not state how the proposed research differs from or improves upon other studies of predation.

Delta Regional Review:

Proposal Number: 157

Proposal Title: Effects of Predation Dynamics on Outmigrating Salmon in the Delta

Overall Ranking: -Low -Medium **XHigh**

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

This is a very important study, which would be helpful in determining predator habitat preferences to guide restoration. Builds on current monitoring, and exhibits good local involvement as well as linkage with other projects such as the Yolo Bypass study.

1. Is the project feasible based on local constraints?

XYes -No

How?

Stillwater will acquire their own permits and has allotted more than one year for the process. No land acquisition/restoration or special permission is required from property owners as this is a sampling program. Project is composed of standard methods previously utilized in the Delta for fish monitoring. Hanson Environmental has had excellent success with past Delta related fisheries studies and has many years experience working with IEP and CALFED.

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

XYes -No

How?

Ecosystem Restoration Program Strategic Goals This work addresses the effects of predation on an at-risk-species and is related to Goals 1,3,4, and 5.

Regional Implementation Priorities Knowledge gained from this study will help guide future restoration priorities and the reduction of non-native impacts. Relates to DR-1, DR-4, and DR-5.

CVPIA Priorities Applies to 3402(a) - protecting, restoring, and enhancing fish and wildlife and associated habitats in the Central Valley. Also relates to 3406(b)(1) which authorizes the AFRP to make all reasonable efforts to double anadromous fish by 2002.

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?

Results of this study could be related to a number of salmonid and restoration activities in the Delta. Results will be very helpful in interpreting survival rates of salmon and to fill gaps in salmon conceptual models. Understanding predation factors in the Delta will help avoid any cancellation of tributary restoration.

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

Yes -No

How?

This is a field experiment involving consultants and well qualified government managers and researchers (Stillwater Sciences, Hanson Environmental, CDFG). This project will also take advantage of existing salmonid monitoring involving the FWS, DWR, and IEP.

Other Comments:

None.

External Scientific: #1

Research and Restoration External Scientific Review Form

Proposal Number: **157**

Applicant Organization: **Stillwater Sciences**

Proposal Title: **Effects of Predation Dynamics on Outmigrating Salmon in the Delta**

Conflict of Interest Statements:

I have no financial interest in this proposal.

Correct

Incorrect

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

none

Review:

Please provide an overall evaluation summary rating:

Excellent: outstanding in all respects;

Good: quality but some deficiencies;

Poor: serious deficiencies.

Overall Evaluation Summary Rating	Provide a brief explanation of your summary rating
-Excellent	The project is valuable to management and the scientific methods are adequate. Lack of statistical details on sampling and analysis, plus high indirect costs limit my rating to Good
<input checked="" type="checkbox"/> Good	
-Poor	

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

The goals to identify temporal and spatial scales of predation dynamics on juvenile salmon in Delta is clearly stated and important. Predation has been identified in the Clifton Court Forebay as very important. Identifying other areas with predation is a cost effective way of improving survival without impacting competing use of resources. The focus on identifying predation in shallow water habitat is particularly valuable since restoration plans identify creation of new shallow-water habitat, which may potentially harbor predators.

Determining the significance of current shallow-water habitat prior to extensive habitat development seems reasonable and depending on the results could cause managers to rethink the approach to habitat creation. Finally identifying if predation is confined to hotspots like the Clifton court forebay or distributed uniformly over the Delta will be important for developing a predator control program. For these reasons the proposed work

is especially timely.

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 proposal notes a number of current predation studies what show predators may consume over one smolt per day during the outmigration. Studies in other regions have observed similar levels. The conceptual model identifies issues of impacts of smolt density on predation level, habitat type within a river system and differences between river systems. Given the goal of identifying significance of shallow water habitat the selection of multiple study habitats is important and justified. Four habitat types will be sampled to characterize the mosaic of types: emergent vegetation, marsh, open-water lakes and ponds.

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 generally well designed. Smolt monitoring to indicate abundance will be done by other monitoring projects from agencies CDFG, USFWS, IEP. The project will collect predators for food habitat analysis on a weekly basis. Collection methods are standard : electrofishing multi-mesh gill lends, fyke traps and hook-and-line. Some details of the sample size of protocol are identified for using the various collection techniques but sample size issues are not identified other than to say weekly sampling will be conducted. One diel sampling session is planned for each site to characterize diel patterns of habitat use. Sampling will be done for two years and will include weekly sampling of food habitats, opportunistic sampling and field tracking.

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 methods for capturing predatory fish, determining stomach contents, and radio tracking are all standard and feasible. I judge the likelihood of success high contingent on being issued permits. No sample sites are noted or statistical analysis is included, so it is difficult to assess if the scale is adequate. It seems that the weekly sampling program is the minimum needed. The sampling is projected over two months which gives 8 to 10 time at each site. A doubling of the effort would not be unrealistic and I expect it would not increase costs considerably. An analysis could be conducted to determine if more information at the spatial/habitat scale vs. the temporal scale is more useful. Currently no such analysis has been done. In any case the sampling in the second year should be designed based on an analysis of the first years work.

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 be identified as the project develops. Potential measured noted include predator abundance and prey habitat types. Natural performance measures, which were not mentioned, would involve the statistical criteria for testing the hypotheses.

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?

Products include data, some statistical analyses, and various interim reports and a final report. Interpretative outcomes have not been considered. However, a natural outcome should be some determination if predation hotspots can be identified, or if predators are widely distributed in the Delta. A resolution of this issue would influence design of any future predator control program. Such considerations are mentioned in the proposal in terms of the Science Program Goals but the proposal applicants have not explicitly identified any role or the value of their data in design future predator control programs.

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 teams of Stillwater and Hansen have considerable experience in similar projects. Many have Doctorates and two decades of experience. They have worked in other projects in California. They have few publications, but that is not unusual for applied science consultants.

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

The direct costs are reasonable. However the indirect costs approach 100% of the direct costs. This seems high by a factor of two. Many consulting firms have indirect costs on the order of 30%, and universities typically have costs on the order of 30 to 70%.

Miscellaneous comments:

Generally I liked the project. Similar work conducted in the Columbia River has identified areas for predator control. This project should provide similar information. It seems somewhat of an exploratory project. It could be directed more to providing data for the design of a predator control. Eventually predator monitoring needs to be included in a predator control program to assess the ecosystem response to predator control actions. In a larger perspective the proposed work will provide a foundation for developing this larger program.

External Scientific: #2

Research and Restoration External Scientific Review Form

Proposal Number: **157**

Applicant Organization: **Stillwater Sciences**

Proposal Title: **Effects of Predation Dynamics on Outmigrating Salmon in the Delta**

Conflict of Interest Statements:

I have no financial interest in this proposal.

Correct

Incorrect

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

none

Review:

Please provide an overall evaluation summary rating:

Excellent: outstanding in all respects;

Good: quality but some deficiencies;

Poor: serious deficiencies.

Overall Evaluation Summary Rating	Provide a brief explanation of your summary rating
<input type="checkbox"/> -Excellent	Good- The proposal has some merit and addresses CALFED goals but needs to be more comprehensive in the approach so that a satisfactory understanding of the predation problem can be reached.
<input checked="" type="checkbox"/> XGood	
<input type="checkbox"/> -Poor	

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

The goal is simple and clearly stated. They propose to study the predation dynamics of outmigrating chinook salmon at two sites in the Delta. The predation issue is a theme that recurs with regards to salmon recruitment in this system and this proposal seeks to address the issue.

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?

A clear conceptual model is outlined as text and in a figure and explains the basis for the proposal. This is a research project narrowly focused on one aspect of salmon dynamics in the Delta, predation. There has been quite a bit of work done on predation of salmon in this and other systems. This study seeks to refine the understanding for this Delta system.

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?

A significant strength of this proposal is the incorporation of different habitat into the analysis of predation effects. It is also noteworthy that they will coordinate their sampling with ongoing efforts to monitor salmonid movements. A significant weakness is the limited sampling. Only two stations and only 2 months of the year will be the focus of their efforts. Another weakness is that they offer no plan for estimating the overall impacts by predator. While they will estimate the relative abundance of the predators in their samples (CPUE) in order to calculate population level effects, they need some estimate of predator populations to make a comprehensive estimate of predator impacts on salmon escapement. They also make no effort to apply the data in a model or consider the many permutation that are likely to affect the outcome such as inter-annual variation in recruitment, river flow, and other factors known to affect escapement of juvenile salmon.

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 research plan as outlined is technically feasible. The scale of the project may not be reasonable for fully meeting the objective because they will only sample at two sites. They don't justify that this will be sufficient to meet the goals.

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?

A performance measures section is listed in the proposal that only speculates on performance measures for the project. No tangible performance measures are offered.

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?

Several products are listed. The proposal outlines no plan for interpretive outcomes such as predictions of predation effects on salmonids under different environmental conditions such as high flow, low flow, high escapement, low escapement.

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

This group has been involved in several projects related to salmonids and salmon and appear to be qualified to conduct the study as proposed. They also seem to have the appropriate infrastructure and contacts to make it happen.

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

The budget lists all the money for sampling predator guts in year 1 but then proposes to continue sampling stomachs in year 2. The work schedules show sampling in two month in 2003-2004.

Miscellaneous comments:

Someone needs to evaluate all the sampling that has been done to understand predation effects and coordinate efforts in this area of research. This should include salmon predation studies done in other similar systems. A major deficiency of all the predation studies is whether knowing predation rates will allow for management strategies to be implemented that will effectively reduce the problem or whether this is just part of the ecosystem landscape that you must live with.

External Scientific: #3

Research and Restoration External Scientific Review Form

Proposal Number: 157

Applicant Organization: Stillwater Sciences

Proposal Title: **Effects of Predation Dynamics on Outmigrating Salmon in the Delta**

Conflict of Interest Statements:

I have no financial interest in this proposal.

Correct

Incorrect

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

None

Review:

Please provide an overall evaluation summary rating:

Excellent: outstanding in all respects;

Good: quality but some deficiencies;

Poor: serious deficiencies.

Overall Evaluation Summary Rating	Provide a brief explanation of your summary rating
-Excellent	I find the objectives of this study to lack biological relevance and to be of low priority for funding. The study design is flawed and will make interpretation of the results difficult if not impossible.
-Good	
<input checked="" type="checkbox"/> Poor	

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

The hypotheses, goals and objectives of the study are clearly stated. The rationale for the importance of the study is less clear.

I do not find the research questions to be timely or important. 1. Hypothesis 1: Consumption of salmon is not influenced by changes in - this seems like a question with an obvious answer. I do not think that answering it will further CALFEDS needs. I also think they will have a hard time answering it with their study design (see feasibility)

2. Hypothesis 2: Consumption of salmon does not vary with habitat type. - this question is more interesting, but again I think they will have a hard time answering it with their study design (see feasibility).

3. Hypothesis 3: Consumption of salmon does not vary between Sacramento River and San Joaquin River system locations. - this question has no biological relevance and they are asking it simply because their data will allow them to do stats on it. Of course there are differences, the answer will simply depend on if they have collected enough samples to prove it at a desired p value.

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?

Examining how restoration of shallow water habitats changes predator relationships with outmigrating salmon is a timely question, but I do not believe that this study will answer this question.

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

I have multiple problems with the approach.

1. To answer question two, the researchers propose to sample in four different habitat types and to make comparisons between them. They however state "Four habitat types will be sampled, although all four types may not be present at each site." This could lead to unbalanced sampling and a lack of replication that will make statistical comparisons impossible. Prior to designing the study, they should ensure that they will have access to the necessary habitat to complete a robust survey.

2. The researchers are planning to collect fish for stomach contents in multiple ways, depending on the habitat sampled. One of the methods stated is Fyke net: "Fyke nets will be fished for longer time periods, along river banks or in channels, where fish in transit may be concentrated and captured." Past research has shown that traps such as Fykes and screw traps change diets of captured fish and therefore complicate diet analysis.

3. The methodology for stomach content analysis is not clearly stated. How are they planning to deal with partially digested fish species, will they examine otoliths...

4. They are planning to sample downstream from hatchery releases and yet do not want to address questions of predation on stressed or naive fish. How will they eliminate this issue from their data?

5. They are testing whether predation of chinook is higher during outmigration peaks and they are planning to sample more during high salmon density. Increasing sampling effort during high outmigration will likely bias their results because they will have more data points for high prey density than in low prey density.

6. I am not aware of methods for comparing CPUE between sampling gear (ie Fyke to gill net). Since they are collecting using multiple methods it may be hard to make concrete comparisons.

7. The researchers want to track predator site fidelity with radio tracking and mark and recapture surveys. I feel that their sample size is too small for them to get accurate measures. This is an expensive component of the project and I think they will get minimum returns for the expenses.

8. Very little information is given on how they propose to analyze the data that they collect. I am not convinced that the study will allow the researchers to answer the questions asked.

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

It is feasible that they can do all the work that they propose and the timeline seems reasonable. I do not, however, think that they will be successful in answering the questions of the study. See Approach above for more information about short comings.

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 vague on how success will be measured. They say that performance measures will be developed and that "Measures will likely include statistically reliable estimates of relative abundance (catch-per-unit-effort) of predators and prey for all habitat types selected in order to be able to test hypotheses." They do not state how they plan to compare CPUE between sampling methods and site locations. This is a difficult task and further explanation is needed to make their intentions clear. If they cannot make comparisons between sampling equipment they cannot achieve their project goal.

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?

I do not believe that the project will garner the information desired or that the information gathered will be worth the investment by CALFED.

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 researchers have the necessary knowledge and equipment to perform the tasks stated.

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

The cost of the project outweighs the knowledge gained.

Miscellaneous comments:

External Scientific: #4

Research and Restoration External Scientific Review Form

Proposal Number: **157**

Applicant Organization: **Stillwater Sciences**

Proposal Title: **Effects of Predation Dynamics on Outmigrating Salmon in the Delta**

Conflict of Interest Statements:

I have no financial interest in this proposal.

Correct

Incorrect

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

none

Review:

Please provide an overall evaluation summary rating:

Excellent: outstanding in all respects;

Good: quality but some deficiencies;

Poor: serious deficiencies.

Overall Evaluation Summary Rating	Provide a brief explanation of your summary rating
-Excellent	I give this project a D (poor) for an outrageously high budget and a B (good/very good) for project importance and overall proposal writing. I guess this would place my "overall score" somewhere near a low good. I believe that the project would be worth funding if it had a budget that was no more than 40% of that proposed. If they proposed to deliver actual abundance estimates for predators, rather than "relative abundance" (CPUE), then perhaps the huge funding might be justified. Estimation of total predator abundance in a system as complicated as the delta would, of course, be exceptionally difficult if not impossible.
<input checked="" type="checkbox"/> Good	
-Poor	

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

Predation on outmigrating smolts in the delta could obviously be an important source of mortality, e.g. from striped bass, and appears not to have been adequately studied. Two ongoing predation studies in the delta are noted, however, and it is unclear how Kramer et al.'s research will be better than or different than these already funded projects. This matter requires much more attention before funding of this proposal could be recommended.

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 authors do a good job of reviewing previous related work and providing a good justification for the proposed research. I was surprised that the authors did not propose that predators might "follow" mass releases of smolts downstream. Perhaps there are so many groups released that that phenomenon might not be expected.

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 proposed approaches seem reasonable although details of methods are a bit sketchy given the very substantial amount of money requested. In particular, I would be curious to learn what the authors mean by "opportunistic sampling" (undefined) and I would like to see a much expanded section on the radio-tagging of predators that is proposed. How can they use recoveries of FLOY-tagged predators to estimate "relative abundance" of predators at sample locations? What assumptions would need to be made wrt site fidelity of predators and/or absence of recruitment (movement) of predators from other locations? I don't think they can do much with this. What will e-fishing be used for? Can it provide valid catch-per-unit effort measures of predators when e-fishing selectively is known to vary according to fish size? (I don't recall citation of references on this topic.)

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?

Some useful data may be collected, but the project does not provide any clear ways to estimate predator abundance. It might be possible from collected study data to estimate daily prey consumption by various predators and perhaps also to determine how predator feeding habits depend on numbers of juvenile salmon migrating through the system. But I do not see how they can provide any valid estimates of total predator abundance and I am not sure that they can say much about predator "dynamics" without estimates of predator abundance. Estimated predator abundance would be needed to develop an estimate of predator-caused mortality rates.

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 (at page 10) is weak on this item.

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 usual reports and presentations of work.

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 project team and Stillwater in general has some capable folks with it.

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

Budget seems outrageously high to me and costs are baffling. For example, radio-tagging and tracking of predators (typically expensive) costs only about \$38k in year one, whereas "opportunistic predator sampling" costs \$155k and "weekly predator sampling" costs \$290k. I cannot imagine spending \$155k for "opportunistic sampling" when this term is not even rigorously defined. How can one even propose to budget for "opportunistic sampling" that would seem, by its very definition, to be unplanned?

Miscellaneous comments:

External Scientific: #5

Research and Restoration External Scientific Review Form

Proposal Number: **157**

Applicant Organization: **Stillwater Sciences**

Proposal Title: **Effects of Predation Dynamics on Outmigrating Salmon in the Delta**

Conflict of Interest Statements:

I have no financial interest in this proposal.

Correct

Incorrect

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

none

Review:

Please provide an overall evaluation summary rating:

Excellent: outstanding in all respects;

Good: quality but some deficiencies;

Poor: serious deficiencies.

Overall Evaluation Summary Rating	Provide a brief explanation of your summary rating
-Excellent	The project is rated poor due to the reviewers belief that the work is redundant and, as is, could not possibly deliever on its hope of quantifying the effects of predation dynamics on outmigrating salmon in the Delta.
-Good	
<input checked="" type="checkbox"/> Poor	

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

The goals and hypothesis are clearly stated and internally consistent. The goal of understanding the predator/ prey dynamics of the Delta is important for improved management of the Delta ecosystem.

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 reviewer believes the work is somewhat redundant of work currently underway (Nobriga et al) or already addressed. The determination of density dependent predation (HYP. 1) seems obvious and similar work has already been done (e.g. work by EA Engineering, Science, and Technology (EA) in the Tuolumne River showing increased salmon in predator stomachs below a hatchery release). Setting up point null hypotheses to retest our understanding of gape-limited predators seems unnecessary. So they reject the hypothesis that consumption is not influenced by changes in density, does this answer fulfil/help CALFED goals? Hypothesis 2, consumption does not vary with habitat type, is of similar vein. I would be amazed if their data did not result in significant differences, due to the reality of different habitat types and the effects of sample size on the test(s). The third hypothesis, regardless of the problems testing this from their design, does not, in the reviewers mind, seem like one CALFED would want to test and answer. I do not feel the project is justified in its current form.

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 reviewer has several questions regarding the approach and its ability to add to the base of knowledge. 1. Why adjust sampling to fit with changes in juvenile salmon densities? Shouldn't sampling be consistent through both low and high densities if comparisons of CPUE and habitat types will be made?

2. Four habitat types will be sampled, although all four types may not be present at each site. How can you compare across habitat types and sites?

3. They wish to look at several habitat types, but salmon abundance estimates come from: 1. Sites lending themselves to beach seines 2. Midwater trawls Seems difficult to correlate predators and abundance this way. Are predators moving and/or feeding in the habitat type Stillwater is sampling? On certain scales, predation is a rare event. Hence, correlation with habitat and time can be iffy, at best, especially with highly mobile individuals.

4. How can you standardize and then compare CPUE across different sampling methods? Can you assume electrofishing results in similar CPUE for different species and size classes, that is, fish respond to shocking equally (if at equal depths)?

5. Floy tag for mark recapture- will enough animals be recaptured, and will assumptions be met to their satisfaction?

6. Radio tagging might provide interesting information, but the authors are aware of their problems with depth/ conductivity. Expensive, and will ten fish per site be enough when hoping to extrapolate to the appropriate age-class/ population?

In the reviewers opinion, they are left with- species caught, enumerating what is in their stomachs (for which we do not have clear guidelines to assess their methods, eg. how is identification of partially digested prey carried out? otoliths, etc.), describe percent volume of stomach contents, and describe predators caught in each type of environment. While the data is worthwhile, the information could be gathered on a smaller scale project.

Based on their study design, I do not feel they could answer the three hypothesis in a manner that would pass scrutiny in a peer-reviewed journal. Im not sure anyone would be interested in spending the time and money necessary to answer their hypothesis. Yes, CPUE estimates, relative

abundance estimates, percent volume estimates, habitat preferences, and p-values for their hypothesis could be produced, but the reviewer feels their reflection of the biological parameters and mechanisms would be questionable.

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?

If the project is changed to a narrower focus (see #3 above) the approach is technically feasible. The reviewer does not believe the stated goals can be answered with their current approach.

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?

Due to the reviewers opinion the the goals and objectives can not be met with the current project design, the question of appropriate performance measures does not apply. The reviewer is unaware of "statistically reliable estimates of relative abundance (catch-per-unit-effort) of predators and prey for all habitat types selected" across different sampling gear used in different habitat types during different times.

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?

Products of value will likely come from the project. Monitoring of predator site fidelity and correlation with LOCAL juvenile salmon abundances would be worthwhile.

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?

Applicants appear fully qualified to implement the proposed project. The reviewer does not believe anyone has the infrastructure and other aspects of support necessary to accomplish the project of documenting the temporal and spatial scales of predation dynamics on outmigrating salmon in the Delta and whether predator species composition and predation dynamics varies between different Delta habitat types and locations.

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

The cost is high for the benefit of the project.

Miscellaneous comments:

Prior Performance/Next Phase Funding: #1

New Proposal Number: 157

New Proposal Title: Effects of Predation Dynamics on Outmigrating Salmon in the Delta

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

98-E09, Merced River Corridor Restoration Plan Phase II, 2000-E05, Merced River Corridor Restoration Plan Phase III, Ecosystem Restoration

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 contract amendments with this applicant proceeded smoothly, without persistent difficulties related to standard contract terms and conditions?

Yes -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 -N/A

If no, please explain any inaccuracies:

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

Yes -No -N/A

If no, please explain deficiencies:

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

Yes -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:

This is not a next phase project.

Other Comments:

Prior Performance/Next Phase Funding: #2

New Proposal Number: 157

New Proposal Title: Effects of Predation Dynamics on Outmigrating Salmon in the Delta

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

97-M05 Saeltzer Dam Removal Analysis

2. Prior CVPIA project numbers, titles, and programs: *(list only projects for which you are the contract manager)*
3. Have negotiations about contracts or contract amendments with this applicant proceeded smoothly, without persistent difficulties related to standard contract terms and conditions?

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

If no, please explain any difficulties:

no knowledge

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:

No knowledge

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

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

If no, please explain deficiencies:

No knowledge

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

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

If no, please explain deficiencies:

No knowledge

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:

Other Comments:

Prior Performance/Next Phase Funding: #3

New Proposal Number: 157

New Proposal Title: Effects of Predation Dynamics on Outmigrating Salmon in the Delta

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

00-F04, A Mechanistic Approach to Riparian to Riparian Restoration in the San Joaquin Basin; CALFED ERP

2. Prior CVPIA project numbers, titles, and programs: *(list only projects for which you are the contract manager)*
3. Have negotiations about contracts or contract amendments with this applicant proceeded smoothly, without persistent difficulties related to standard contract terms and conditions?

Yes -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 -N/A

If no, please explain any inaccuracies:

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

Yes -No -N/A

If no, please explain deficiencies:

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

Yes -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:

Other Comments:

Applicant has performed well in implementing previous projects.

Prior Performance/Next Phase Funding: #4

New Proposal Number: 157

New Proposal Title: Effects of Predation Dynamics on Outmigrating Salmon in the Delta

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

11332-0-MO09 - Stanislaus River: Smolt Survival

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

Yes -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 -N/A

If no, please explain any inaccuracies:

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

Yes -No -N/A

If no, please explain deficiencies:

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

Yes -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:

Other Comments:

Environmental Compliance:

Proposal Number: 157

Applicant Organization: Stillwater Sciences

Proposal Title: Effects of Predation Dynamics on Outmigrating Salmon in the Delta

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

-Yes No

If no, please explain:

For CESA compliance, a 2081 will be required. CEQA documents are necessary to obtain take permits. NEPA documents will be required for ESA compliance and take permits from NMFS and/or USFWS.

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

-Yes No

If no, please explain:

I cannot adequately answer this question. The applicant does budget approximately \$17,000 for permitting but I cannot predict what documents each regulatory agency will require.

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

-Yes No

If yes, please explain:

The applicant does state in the proposal that the project will comply with all regulations. If they obtain the proper funding to do so, the project is feasible.

Other Comments:

Budget:

Proposal Number: 157

Applicant Organization: Stillwater Sciences

Proposal Title: Effects of Predation Dynamics on Outmigrating Salmon in the Delta

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

Yes -No

If no, please explain:

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

Yes -No

If no, please explain:

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

Yes -No

If no, please explain:

Verify contractor fee cost applications.

4. Are appropriate project management costs clearly identified?

Yes -No

If no, please explain:

PM costs are not segregated, but rather incorporated into several tasks.

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

-Yes No

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

Applicant notes that online budget tables are not computing totals correctly. Proposal request is \$761,443.

6. Does the budget justification adequately explain major expenses?

Yes No

If no, please explain:

7. Are there other budget issues that warrant consideration?

Yes No

If yes, please explain:

Other Comments: