

Individual Review Form

Proposal number: 2001-K211-1

Short Proposal Title: Health and physiological effects of elevated water temperatures on Merced R. juvenile chinook during the parr-smolt transformation: daily fluctuation and range representative of spring water temperatures in the San Joaquin River system and Delta

1a) Are the objectives and hypotheses clearly stated?

The hypothesis is not clearly stated, but may be inferred by re-wording the second to last sentence of the opening paragraph. In this case, the hypothesis would be stated: “Survival of chinook salmon is decreased by sub-lethal physiological dysfunction during the critical parr-smolt transformation” etcetera. Still, I would prefer to see a clear statement of hypothesis, since this may not be what was intended after all. The first sentence of the opening paragraph seems to indicate that the project’s mission is to gather data on the extent of dysfunction incurred, which is not a hypothesis.

Overall, I would prefer to see a definitive hypothesis stated--and an experiment designed to disprove that hypothesis--for any project that is to take the lives of 900 fish, to ensure that the best possible use of resources is being made.

The objective appears to be to increase “the confidence of water managers when modeling flow regimes” by providing them with adequate information on the effect of warming temperatures on parr-smolt transformation. This is clearly stated, but it fails to address how specifically the water managers would be helped by this data. For example, if the objective is to provide water managers with the data that will allow them to release water at higher temperatures with more confidence, then it should be so stated. In this case, a statement explaining why this would be needed should also be provided.

1b1) Does the conceptual model clearly explain the underlying basis for the proposed work?

A conceptual model as such does not appear to be presented. No underlying scientific basis for the proposed work is mentioned. The hypothesis is not clearly stated nor described. How system components respond to anticipated stressors or limiting factors is not discussed. Factors to be measured are only mentioned. No references are provided. Data analysis and interpretation are not discussed.

1b2) Is the approach well designed and appropriate for meeting the objectives of the project?

The design appears to be either incomplete or incompletely described. Many factors that these test subjects would be exposed to--unnatural conditions such a sudden change of diet, handling, and water quality issues--are apparently not controlled for in this project. How a diet of tubifex worms and freeze-dried krill mimics a natural Central Valley chinook parr’s diet is not clear. It is also unclear how the applicant would determine readiness of the parr to smoltify, or their readiness to be subjected to higher salinities. Exactly how the higher temperatures would “fluctuate”—how much and how often—is likewise unclear in this proposal. Finally, the temperatures to be used in the trials were based on actual “surface temperatures” recorded over an 8-yr period. Where these temperatures were recorded is not stated. However, it is clear that surface temperatures cannot properly indicate the temperatures that parr are enduring during smoltification, as they will seek out microhabitats with cooler temperatures when necessary.

1c1) Has the applicant justified the selection of research, pilot or demonstration project, or a full-scale implementation project?

The justification seems clear from a water manager's point of view. However, the need for this project is not convincing. If the fish cannot tolerate temperatures as high as 23° C (73.4° F), then they should indeed not be subjected to them—but it seems current knowledge that these temperatures are too high regardless. If the fish can tolerate the temperatures in this experiment, should they then be subjected to them in real life? This seems unacceptable.

1c2) Is the project likely to generate information that can be used to inform future decision making?

I think that it will provide information that with little doubt will be used to inform future decision making, and this is something that I believe may have negative effects on the fishes' survival overall. Water managers should preferably base decisions on providing conditions for the fish that are as natural as possible to that fish's genetic makeup, rather than on how high temperatures can be pushed in a laboratory setting without killing them. This seems to be drawing the line too narrow.

2a) Are the monitoring and information assessment plans adequate to assess the outcome of the project?

Yes.

2b) Are data collection, data management, data analysis, and reporting plans well-described, scientifically sound and adequate to meet the proposed objectives?

While data collection and management are not actually described, they may be adequate.

Planned data analysis is not described. However, with the many factors (diet, crowding, handling, water quality) apparently complicating the experiment, it is unlikely that an informative analysis can be made from the data.

Reporting plans appear to be adequate.

3) Is the proposed work likely to be technically feasible?

Without close attention to providing clean, well-oxygenated water, a "downstream" current, controlled lighting, a natural diet that the fish are accustomed to, adequate cover, and quiet, uncrowded conditions, it is doubtful that temperature can be singled out as the factor that decreases chances of survival during the parr-smolt transformation. While high temperatures may be shown to be a stressor, this is something that is already commonly known. Also, how an investigator will be able to determine whether the fish is ready to accept saline conditions—especially after a period of this kind of stress to the fish--is unclear.

4) Is the proposed project team qualified to efficiently and effectively implement the proposed project?

This is unclear, as the tasks of the GS-4 and GS-7 biologists are not listed. The applicant appears to have ample qualifications.

Miscellaneous comments

There was no mention made of humane methods that would be used. It may not be germane to the project, but I think that it is appropriate in these times to demonstrate that humane practices are observed while experimenting with animals.

**Overall Evaluation
Summary Rating**

- Excellent
- Very Good
- Good
- Fair
- Poor

Provide a brief explanation of your summary rating: This proposal has serious deficiencies. The hypothesis is not clearly stated, the project is not clearly described, confounding factors may preclude the ability to draw conclusions from the project, and I am unsure of the need for the project.