

To: Sarah Yarnell et al. (Entrix)  
From: Amy Lind  
Date: 26 March 2007  
Subject: Review of AQ12-Special Status Amphibian and Aquatic Reptile Technical Study Plan (Rev 2, February 2007)

I have reviewed the above named study plan. In general, I found the plan to be a clear, well-organized approach to addressing the study objectives.

A couple of general comments - There is no reference to the overall length of the study (i.e. one year, two years, etc.) or whether there are "triggers" for adding additional years. Since some of the species (e.g. FYLF) are known to occur in the project area, for those species an important objective is to identify and document potential project effects. Make sure the links/logic pathways from the project nexus and goals/objects to methods/analyses are clear throughout the document.

Entrix response: The length of the study is intended to be one year. We added a table that shows each study site location and the study objective related to that site. The issue of "triggers" for additional study years requires further discussion with the Aquatic TWG.

The specific comments below are referenced by page number and section (as needed). Some of these may seem picky, but it is important for the study plan to clearly outline what you are doing.

Pg. AQ12-1

- For WPT, change the term "breeding habitat" to "nesting habitat" on this page and elsewhere (e.g., p.2). Turtles actually breed in the water and then females travel to upland areas to dig a nest and lay eggs. Also water temperature can be an issue for this species; as for frogs, colder temps negatively affect growth and potentially survival.

Entrix response: Changed breeding to nesting. Text was added that PCWA will compare the water temperature study results with WPT requirements as we plan to do with FYLF.

- Study objective for determining the timing and length of FYLF breeding season - How will this information be used? These dates will vary from year to year depending on climatic conditions, so be clear here (or elsewhere in the document) that determining this in one year is not likely to provide the earliest, latest, or maximum length of time of any future breeding season. Perhaps over the course of several different water year types, you might be able to make some generalizations about timing and length of breeding season. It seems more important to be able to relate the timing in a particular year to project operations.

Entrix response: Agreed. Data collected during 2007 starts to provide guidelines for MFAAR drainage, and could be compared to breeding onset in other Sierran basins (e.g. NF Feather, West Branch NF Feather, others). If these dates are similar to other regional subpopulations, then estimates on the range of length and timing of the breeding season could be made. The issue of additional monitoring of breeding season timing and length requires additional discussion with the Aquatic TWG.

In the study plan, we changed 'determine' to 'document' in the study objectives, and added a statement on pg 6 discussing how the data on timing of breeding will be assessed.

Pg. 2

- Table of project facilities and features and study area - Provide some rationale for the different study area sizes for each type of facility. Also the 100 foot buffer seems small (see Pg. 8 comments on WPT, below).

Entrix response: A discussion of appropriate buffer distances around project facilities and along the stream corridor will take place in the next Aquatic TWG meeting.

Pg. 3

- Bottom, "protocol-level surveys" - I assume the USFWS decontamination guidelines are for disease/fungus transmission. If so, say that here. This protocol really should be applied during all field work, not just red-legged frog surveys.

Entrix response: "Protocol-level" refers to following the complete USFWS guidelines for CRLF surveys. Decontamination guidelines are part of the larger survey protocol. Text was added that the decontamination guidelines will be completed after each survey for all species (including FYLF).

Pg. 4

- FYLF study sites – In this paragraph you first use the term **quantitative** sampling sites and later use the term **qualitative** sampling sites for sites located in areas that are difficult to access. I think you mean qualitative everywhere. Also define qualitative sites more clearly (as you do farther on) – e.g. "Qualitative sampling sites were selected in river reaches with difficult access." These sites represent likely breeding areas, but will receive fewer visits with less rigorous surveys.

Entrix response: Corrected the typo (changed to 'qualitative'), and added text for clarification.

Pg. 5

- "Complete a habitat characterization of the study sites and comparison sites" – It isn't clear how this is done. If in the field, it makes sense, otherwise, I'm not sure how you would do anything predators and food availability. I guess just be clear that this is field collected data.

Entrix response: Added text for clarification.

Pg. 6

- For data collected at each observation: I recommend including a gosner stage for egg masses and for representatives of tadpole groups or at least a gosner range. At a minimum, some categorical age class for these early life stages. See comments for Pg. 7 on HSC.

Entrix response: Agreed. This data is included on the field datasheet and in the survey protocol but was accidentally left out of the study plan. We made sure all fields listed in the protocol/datasheets are in the study plan.

- Kupferberg et al. 2006 (CEC interim study report) recommended using the term "young of the year" instead of "metamorph". In previous studies the term "metamorph" has been used to

describe more than just the first year individuals, so young of the year forces that distinction. Other standardized life stages are juvenile (2<sup>nd</sup> year to maturity) and adult (i.e. don't use sub-adult).

**Entrix response:** Changed term 'metamorph' to 'young of year' throughout the study plan.

- As I said above commenting on the objectives, the timing and length of breeding season will vary from year to year. This caveat should be stated in this section with a suggestion that a second year (or more) of data would be helpful for meeting this objective.

**Entrix response:** See response to comment above – clarified in text.

Pg. 7

- “Data will be collected on individuals at three study sites....” “In addition, two sites will be located in the MF American or Rubicon....” How do these two sites differ from the three sites selected from the Distribution and Abundance survey. Doesn't the Distribution and Abundance survey happen in the MF American and Rubicon. Are you trying to say that the selected sites must be from these reaches or that you will be adding additional sites not from the Distribution and Abundance survey? This approach needs clarification.

**Entrix response:** Added and modified text for clarification.

- “Data collected at each observation includes....” - I recommend including a gosner stage for egg masses and for representatives of tadpole groups. This info is helpful for habitat suitability modeling because it allows determination of habitat characteristics close to egg-laying date and assessment of different developmental stages of tadpoles. There is a great figure showing each stage of development from egg to tadpole to metamorphosis in Duellman and Trueb's Biology of the Amphibians. You can just copy and laminate it and take it in the field and it is possible to see most features with a hand lens. At minimum having a gosner range would be good.

**Entrix response:** See response above – all data on datasheet listed in study plan.

- “Hydraulic habitat availability.....” – This section needs a little more clarification. I think I know what you are proposing, but a more detailed example would be helpful.

**Entrix response:** Added text for clarification.

- Define what a life stage periodicity chart is and how it fits in to the HSC criteria.

**Entrix response:** Added text for clarification.

Pg. 8

- “Evaluate output from AQ4....” - Average and daily maximum may not be the best metrics for FYLF. Minimum temps may be more important relative to growth and survival. Another option is to modify metrics that are often used for fish (e.g. MWMT = the average of the warmest daily maximum temperatures for 7 consecutive days) to incorporate data on minimums.

**Entrix response:** Added minimum temperatures to average and maximum temperatures.

- WPT – In addition to nesting, pond turtles also use terrestrial environments for over-wintering. The 150 foot buffer is not large enough. Reese (1996 and also cited in Ashton et al. 1997) used radio-telemetry to study pond turtle movement in the Trinity River basin and found that nest

locations could be up to 400m from water and that over-wintering locations averaged 167m.

Entrix response: A discussion of appropriate buffer distances around project facilities and along the stream corridor will take place in the next Aquatic TWC meeting.

- Also, this section seems weak in general. I know your overall objectives don't include WPT-specific surveys, but prior to the re-licensing some more effort needs to be directed toward this species. If more thorough surveys will be done in a second year, then the study plan should state that.

Entrix response: Expanded the "analysis" to include an assessment of the water temperature study results in relation to WPT breeding and rearing temps (based on available data in the literature). Added text to clarify that at every study site will be looking for WPT when doing frog surveys.

Kupferberg, S., Lind, A., Mount, J., and Yarnell, S. 2006. Pulsed flow effects on the Foothill Yellow-Legged Frog (*Rana boylei*): Integration of empirical, experimental and hydrodynamic modeling approaches. First Year Interim Report. California Energy Commission, PIER., 76pp (April).

Reese D.A. 1996. Comparative demography and habitat use of western pond turtles in Northern California: The effects of damming and related alterations. Unpublished Ph.D. Dissertation, University of California, Berkeley. 253 pp.