

Status of the Trinity River Restoration Program's Phase 1 Review

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The Phase 1 Review has progressed to a point where we can report our progress, problems, and what lies ahead. The review, which is better characterized as a study, began in October 2011 with a scope of work that outlined the major steps and timeline. This was revised four times, with the last revision on March 30. The Program provided a support contractor to help us with data collection, preparation, analysis, and modeling, and we are now in the midst of analyses. Progress to March 30 was conveyed to the Program and its partners by David Bandrowski around April 2 and included a revised scope of work, summary of Calls (i.e., scopes of work) 1 through 9 to the support contractor, and our treatment of review comments from the TRRP and partners. Here, we provide an update since that time.

The three main steps of the review are:

- 1) formulating potential questions, hypotheses, and associated analyses;
- 2) cataloguing of available data, refining hypotheses, and structuring the data to facilitate analyses;
- 3) conducting the analyses, interpreting the results, and making recommendations.

Other important steps are supporting the development of a decision-support system, and an external review of our Phase 1 report.

Much of the data collected by the TRRP Weaverville staff was available in January, the US Fish and Wildlife Service provided the newest fish habitat data in February, and the US Geological Survey's geomorphic mapping data became available at the end of April, with a revision in May. There is a considerable amount of available data; the Weaverville office's data up to January alone totaled to 4663 gigabytes; TRRP partners, and the Weaverville staff have added to that in the intervening months. The latest riparian vegetation and associated bed movement data and reporting were provide in mid-May. We have no data for wildlife investigations yet, and may not get them in time (Ernie Clarke, personal communication, June 2012).

Structuring of the available data into a framework that is tied to a spatial reference to the river began in early April. We call this structure "the data frame". The Program has used a similar framework for sampling and some analysis, referred to as a 'GRTS panel' (TRRP and ESSA 2009, Pickard 2011). The program's GRTS sampling frame, or list of potential sampling units to choose from, consists of 400-meter line segments drawn down the center of the main channel. For the SAB analysis, these segments were split into 200-meter segments to better-capture spatial variability. As requested in Call 9, the first version of the data frame was provided by the support contractor in on April 20, and our analysis began shortly thereafter. Four revisions followed, with the latest on June 1. While working with the May 16th version, a spatial reference error was discovered that required correction of several sub-sets of the data frame. The June 1 version of the data frame is being corrected by the support contractor, and the SAB has asked the support contractor to conduct quality control as well. Correction of the data frame is part of Call 10, to be approved soon. The data frame will be valuable asset for the Program partners and must be as error-free as possible.

The project and feature scale analysis of the channel rehabilitation projects continues from Call 9 into Call 10. The scope of this analysis changed as we adjusted to new information pertaining to the on-going US Fish and Wildlife Service's efforts on quantifying habitat, because we did not want to duplicate that

effort. A key link for estimating total river habitat is to develop a flow-to-habitat relationship, so habitat in reaches that have no direct habitat observations can be estimated. This has been a difficult task for the Service and we have some candidate models that we want to try.

The report is taking shape. The support contractor provided a 144-page draft on June 1 that has as much information as possible at that time, and we will be adding to it as analyses are done.

Data gaps and time constraints prevent some preferred analyses. For example, lowered flood plains (usually to around the 6000 cfs stage) have high construction costs, and we wanted to assess how much habitat they provide at high flows. Because there are no direct field observations, this would require hydrodynamic modeling that requires more time than is available. Another objective for the lowered flood plains is to allow channel migration and natural shaping of the channel. We plan to assess this planimetrically (e.g., changes shown on aerial photography), but detailed changes in topography require working with digital terrain models (DTM), the database for which is currently limited. Consequently, it is more efficient to look for such changes in plan-view (aerial photography) and follow up with the available DTMs if changes have occurred. The pool-filling and adult-holding habitat assessments could have been part of our review, but some Program staff are using DTMs to assess the former, and there are data gaps (cover, velocity) that compromise the latter. The Program proposed doing an adult holding assessment in 2011 that would have provided the required data, but it was not funded.

Administrative tasks have taken more of our time than we anticipated. Science is an iterative, open-ended process, and contracting steps tend to be linear and closed, so using a traditional contracting scheme, even the flexible one that we have, has been difficult and has not been as productive as anticipated. The first 7 calls to the support contractor were relatively straight forward and were accomplished efficiently with little administrative time required of the SAB. Calls 9 and 10, which deal with more substantial analysis and data preparation, have taken a considerable amount of time to prepare and the accomplishment of some of the tasks have not been fully acceptable or completed. The time required and number of drafts per call pertaining to the SAB has increased over time, as the following table shows. The model of the support contractor doing the "heavy lifting" of the review has not been fully realized; the SAB has spent more time than expected directing the development of the analysis framework for the review, and will spend considerable time this summer conducting many of the analyses ourselves.

Call	Date started	Date approved	Number of drafts	Date tasks were accomplished
8	12/7/2011	12/19/2011	4	2/29/2012
9	3/2/2012	3/20/2012	9	Partially complete
10	3/29/2012	6/20/2012	41 (and counting)	

The question "Are the projects working?" is simple to ask, but not easy to answer. From a built-habitat perspective, the monitoring data answers it adequately, but an original objective of the Program was to use channel rehabilitation projects as a catalyst for flow- and gravel-driven habitat creation along the rest of the river. This aspect motivated the inclusion of a system-wide scale to our review, not only to assess how much habitat is being created along non-constructed reaches, but to document the extent that projects influence channel process beyond their borders. There are many complicating factors that could obscure the projects' geomorphic signal, but it is worth investigation and is central to the TRRP mission.

High-level indicators such as fish production and stock recruitment dynamics along the upper Trinity River and nearby rivers can inform us on the holistic effectiveness of the restoration, which includes the whole gamut of actions such as prescribed dam releases, gravel augmentation, temperature control, and channel rehabilitation projects. The support contractors suggested this strategy and are making progress.

We appreciate the urgency of the Phase 1 review and SAB recommendations. Because of the unanticipated delay we are considering a two-part report, with the first one containing all we can muster

by the time new project plans need to start, and the second augmenting the first by assisting development of a decision-support system to facilitate adaptive management. The external review has been delayed so that panel members have our best effort in front of them.

Finally, it is worth noting that our task is substantially more than a "review", in that we must first synthesize and analyze available data before we can begin to assess the effectiveness of the Phase 1 projects. This is a tall order that is made even more challenging by the short time line that we've been given. We appreciate your patience and the assistance that has been provided to date.