

**LCRA-SAWS Water Project
Scientific Review Panel Riverine Aquatic Habitat Committee Comments**

**Draft 2004 Activities Report
Colorado River Flow Relationships to Aquatic and State Threatened Species: Blue
Sucker**

The Scientific Review Panel Riverine Aquatic Habitat Committee found the Draft 2004 Activities Report: 'Colorado River Flow Relationships to Aquatic and State Threatened Species: Blue Sucker', indicates the project team is progressing well with the tasks of habitat mapping, intensive site selection, blue sucker activities and fish guild development.

Below we provide a few questions and comments to information provided in the report.

Habitat Mapping and Intensive Site Selection

1. SRP had original concern that the hydraulic modeling sites (representative reaches) over emphasized boulder and riffle areas (Table 3 compared to Table 1) were adequately addressed in the descriptions of each site. Wherein the project team explained that present information leads to the conclusion that such areas are likely favored or preferred habitat for the adult Blue Sucker, hence the overemphasis on boulder and riffle areas. Likewise in their description of the sites, they allayed concern of how they were going to take into account areas from a water quality perspective (see their list at bottom of page 7). Proximity to major wastewater treatment plants was mentioned as the way that was taken into account.

Response: No response necessary.

2. SRP still has some questions over project team's use of mesohabitat as a useful and consistently used ecological term in the context of the study. Reading the text on page 7 was confusing in that the terms, mesohabitat, major mesohabitat, habitat, reach of stream, representative reach of stream, overall segment, areas, special aquatic habitat features all were used. One questions then whether minor mesohabitats exist and what they are and how different they are from habitats. This meaning and terminology question becomes more confusing when Tables 1 and 2 are included and additional terms and "habitats" are presented. SRP suggests inclusion of a hierarchical table with exact terminology and specific spatial scale and examples be included to ease interpretation.

Response: The project team acknowledges that the use of multiple terms to define habitat on page 7 is confusing, and thus will do a better job of being consistent with habitat terms (including a hierarchical table) in upcoming reports.

3. Specific Comments:

The use of a 100 meter buffer should be justified in the mapping of the adjacent land use and riparian systems for the study (Page 4).

Response: The project team felt that the 100 meter zone was sufficient to characterize the riparian communities immediately adjacent to a river of this size. We felt a smaller zone would be inadequate for such a large river and a larger zone would extend past the riparian communities directly influenced by river flow.

Page 4 – “Field activities consisted of two biologists evaluating all major roadways and numerous minor roadways that cross or run adjacent to the river.” The SRP doubt that the biologists in fact evaluated roadways!

Response: Point well taken! Obviously we observed the instream and riparian condition at each of these crossings, although some of the actual roadways were quite interesting.

Page 5 – “...aquatic biologists who have experience or gained experience through this study..” We are a bit concerned that on the job training underpins the QA/QC step for the study.

Response: The bulk of this work was conducted by personnel who have extensive experience on this river (including myself). The reference to “gained experience” means those biologists who recently visited a site and had the most recent experience relative to the current condition of the river. Not at all “on the job training”

Page 8 – “On December 8, 2004, the project team conducted an aerial reconnaissance of the ten proposed sites to evaluate the post-flood condition of the sites. A qualitative evaluation of impacts to each site was conducted.” What was the result of this evaluation and its implication to the study?

Response: The purpose of that evaluation was to evaluate the impact inflicted by the flood at each of the proposed intensive sites. We did not want to pick sites that were totally devastated by a flood of that magnitude or pick sites that experienced no impact. Therefore the results of the evaluation were a confirmation that the proposed sites were impacted at various levels by the November floods but not completely devastated.

Table 3 and 4 need to have some type of linkage back to the reach level summary tables of habitat and riparian features with better justification that the habitat and riparian types are adequately represented at the study site level than given in the descriptions in the following section of the report.

Response: The project team made the assumption that Tables 1-4 and the following site specific descriptions provided sufficient information for the primary readers (LCRA/SAWS technical personnel, Resource Agency personnel, and the SRP), but would need further justification for the public (to be done verbally at Advisory Group meetings/presentations). As 1 of the 3 targeted readers expressed this concern, our assumption was not correct. Therefore, in

future reports, the project team will expand the discussion relative to the presentation of this type of information.

4. Study Site delineation boundaries:

Response: Some excellent points are raised in the following comments. Each of the comments on this section were addressed by the project team in the field prior to initiation of field activities. The sites were either adjusted or not based on our on the ground observations.

Intensive Study Site 3: The top end of site 3 may pose a problem in the hydraulic modeling if flow levels split the channel around the wooded island. Special care should be taken to ensure the flow split relationships are captured during the calibration data collections. Alternatively, the site could be extended around the corner into the single channel section to avoid this problem.

Response: Excellent point made here regarding split flow. At the proposed flows (0 – 4,000 cfs) for aquatic habitat modeling, flows do not split around the wooded island. Should this site be selected for sediment transport / riparian activities (1-D modeling) the site will be expanded to include the entire corner.

Intensive Study Site 4: The site boundary on the inside of the bend should be widened since it appears that some areas of the overflow channel may be missed as represented with the line work. I would also extend the upper right of the study site past the small wooded island strip into the single channel section (see notes on site 3 above).

Response: Again at the proposed flows for aquatic habitat modeling, overbanking of the inside of the bend or the referenced wooded island does not occur. Should this site be selected for sediment transport / riparian activities (1-D modeling) the site will be expanded as per the SRP recommendation.

Intensive Study Site 5: The upper right lower spatial extent of the study site should be extended to include the full overflow channel on the inside of the bend. It should also be extended on the right upper side to the single channel where the overflow channel begins.

Response: Same response as for sites 3 & 4

Intensive Study Site 6: The right boundary of the study site should not end on the split channel as this can be problematic for calibration and modeling. Efforts should be made to start and end the study sites in straight single channel sections to avoid potential calibration and simulation problems.

Response: Absolutely correct. The downstream boundary was moved up to avoid just this issue.

Intensive Study Site 7: The inside boundary should be adjusted to be sure the complete overflow channel is included.

Response: Same response as for sites 3, 4, & 5.

Intensive Study Site 9: The bottom end of the study site should be extended into the single channel section.

Response: Agreed. This was done.

Blue Sucker Tracking

1. Fixed Station. The SRP in October 2004 recommended consideration of more than one fixed station for tracking blue suckers. The report documents the installation the fixed tracking station in Altair. SRP notes that blue suckers were caught, tagged and released at various locations along the length of the Colorado River. The report also acknowledges difficulty tracking blue suckers at higher flows by plane due to deeper waters, but notes fish could be tracked under higher flows by land. The land/boat tracking of tagged blue suckers is important in that it provides location and more specific habitat use by suckers. However, logistically and time wise such tracking is expensive. Again, SRP questions why additional fixed stations are not used in the study and at least implemented close to the up- and down-stream boundaries of released tagged fish. This would ensure some degree of tracking of fish during high flow periods. If cost were a factor, SRP suggested at the October meeting that a reduction in frequency of land/boat tracking might be justified. SRP suggests the project team provide an ecological/economic cost benefit rationale for additional fixed stations.

Response: The project team agrees that an additional fixed station(s) would be beneficial. However, we disagree that an additional fixed station(s) warrants a reduction in the amount of manual tracking. Since this report, a wealth of information has been acquired regarding blue sucker migration and spawning areas that would not have been achievable via fixed stations. We are currently discussing the addition of a fixed station(s) with LCRA/SAWS.

2. Post tagging mortality of fish. Many studies of tagged fish indicate high mortality/expelled tags (as high as 50%) within several months of release. Does the project team have a plan/method to assess such mortality? For example, expelled tags can wash downstream indicating "fish" movement. Alternatively, caught tags/dead fish can appear not to have moved between sampling dates. Such occurrences can affect the ecological interpretation of the tagging study and requires consideration now that the tracking study is underway.

Response: During February 2005, the project team located 26 of 30 tagged fish. The majority of these fish moved upstream since their last detection. In fact several fish have moved over 50 miles up, some 100, and some over 150. We have also observed 3 fish (tagged at different riffles along the river) just below Longhorn Dam (Austin) spawning with a group of over 50 untagged blue suckers. Therefore, 5 months post-tagging we are confident that our fish are healthy and behaving normally. Even with our confidence and

excitement, we agree that post-tagging mortality (along with natural death) does occur and are key components that can influence results. Our method for manual tracking by boat includes recording the location of each fish. No matter if the fish is in the same location, upstream or downstream, we approach the fish and follow for a short time constantly lowering the gain on the receiver to detect fish movement. If we are not confident that the fish is moving, we have an underwater antennae that can pinpoint exactly where the tag is. On a previous study (NOT THIS PROJECT), I used the underwater antennae to dive down in 10ft of turbid water to retrieve a shed tag in 6 inches of silt. So, we are confident we can determine whether the fish is alive or not. So far, only 2 of the tags have not been detected in any of the tracking events. This may suggest several things like tag failure, post-tag mortality, these fish were caught, or these fish are extremely sneaky. Even if gone (although we are still optimistic we will find them), that would be only a 7% reduction 5 months after tagging which has included a major flood event.

3. Figures. With just a couple of tracking surveys completed, the summary data provided were clear and concise with regard to activity of tagged fish. However, as more sampling is done, activity of individual fish, activity of the group of fish tagged at each site and net activity of all tagged fish may be difficult to determine from written summaries and data in table form only. The project team should consider various types of ways to graphically present the data.

Response: Excellent point and we will do this in future reports

Fish Guild Development

1. The first paragraph (page 26) introduces the focus on 3 specific habitat types (backwaters, side channels and tributaries). And later states, “A total of 15 sites were selected, three of each habitat type.” SRP came up with a different distributional count of 8 creeks, 5 side channels and 2 backwaters.

Response: The statement should have read, “A total of 15 sites were selected, 5 of each of the three habitat types.” The breakout is 5/5/5. The second and third sentences in Section 5.1 describe how small creeks whose intersection with the Colorado River provides a backwater (i.e. Gilliland, Big Sandy, Gazzley) were classified as backwaters not tributaries. This is also noted in the individual site descriptions in 5.2.

Section 5.1 Although the report indicates that “Depth and velocity were the two primary factors, but substrate was also considered in selecting sites.”, no specific quantitative ranges are provided and the report should be modified to be clear on this important set of criteria. The report primarily focuses on depth in its descriptions.

Response: Although more specific data was collected (see next response), the site selection text (5.1) only included broad descriptions.

Section 5.2 The report indicates that “At each prospective site the depth and substrate were recorded along with GPS coordinates.” How many points were collected? What sampling strategy was used to locate measurement point(s)? It is somewhat unclear how

these sites were actually selected. Some rationale for selection of these sites need to provided and justified. In all the site descriptions, no velocity data is provided but is highlighted as key variable in site selection.

Response: The text should read, "...depth, velocity, and substrate..." Depending on the size of the area, the project team selected points throughout the habitat type. As these individual habitat types are predominantly uniform, qualitative and some quantitative measurements for velocity were taken. The velocity classifications used for site selection were backwaters (0-0.2 m/s), tributaries (0-0.5 m/s), and side channels (0.1-1.0 m/s). The project team will present selection criteria in a more detailed format in future reports.

Section 5.3 Utley site "...flows ranged from 0.01 to 0.10 m/s ..." is likely velocities and flow.

Response: Yes this is velocity. We will do a better job with velocity vs. flow in all future reports.

LaGrange site "... flows ranging from 0.03 to 0.07 m/s ..." velocity please.

Response: Again, you are correct in that this is velocity. We will do a better job with velocity vs. flow in all future reports.