Brazos River and Associated Bay and Estuary System
Basin and Bay Expert Science Team (BBEST) Meeting
Tuesday, August 16, 2011 at 10:00 a.m.
Freese and Nichols, Inc., Austin, TX

Meeting Minutes

[All BBEST members were in attendance.]

1) Approval of Minutes

Minutes from the July 19, 2011 meeting were approved without changes.

2) Budget Update

Mark Wentzel (TWDB) said that their board will be considering all carryover funding actions ($260,000 for four groups) on Thursday, August 18th. Kirk Winemiller said that the TWRI contract is coming along and that the timeline dictates that all the BBEST work be done by the end of 2011 in order to give TWRI enough time to put together the final report.

3) Discussion of Timeline

Kirk said that with the additional funding for next fiscal year, the timeline needs to be revised to reflect the additional time beyond August. He added that he'd like to start providing materials to TWRI in October. Members discussed what some of the next steps in the process should be (i.e., preliminary flow recommendations, overlay activities). The group also discussed the initial ten levels of output in HEFR and how/if they should be modified.

4) Ecology Subcommittee Discussions

The group briefly discussed aquatic life monitoring data that Jack Davis had previously put together to supplement assessments of ecological soundness throughout the basin as well as draft language on sound ecological environment. As discussed at an earlier ecology subcommittee meeting, all areas besides the middle Brazos appear to be in a reasonably sound condition. Kirk mentioned a forthcoming publication that found a strong pattern with longitudinal fragmentation and reduced plains minnows (fluvial specialists) populations, and said that this should be acknowledged in the report.

Tiffany Morgan updated the group on her continuing work on riparian vegetation. She said there probably isn't anything that would be used to influence the HEFR flows. The accumulated information and analysis will be presented in the report.

5) Hydrology Subcommittee Discussions

Tom Gooch said that he has completed his review of the flow separation data provided by Dan Opdyke (TPWD). Palo Pinto, Glen Rose, and Waco appeared to be the odd cases due to hydropower releases from PK and Whitney. The group discussed the merits of pre- and post-dams and full periods of record. Members looked at the flow separation results of the three gages. The Waco gage flow separation was only done on full period of record, so they decided

to have Dan to look at pre- and post-dam separately and see what difference there is from the full period analysis. Palo Pinto and Glen Rose gages would remain at full period of record.

Phil Price presented information demonstrating potential issues with HEFR pulse flow statistics and how they are implemented. He displayed analyses for the Brazos River at Richmond gage as an example (*posted to TCEQ website*). Phil showed that pulse flow frequency of occurrence changes depending on whether it's based on how often the peak is exceeded (typically used as a trigger) or how often the peak and either the volume or duration is achieved (often used a pulse achievement criterion) and whether you count individual events when multiple events happen in a given year. Since pulse flow volume and duration accounting most commonly begins after peak flow is achieved, another issue is whether the criteria are based on whole pulse or post-peak volumes and durations. Phil showed resulting post-peak volumes and durations for the same HEFR pulse magnitudes from the Richmond gage and how frequently they would be achieved based on the historical record. If the BBEST decides not to change the pulse volumes and durations, he recommended that they at least adjust the frequencies at which they are achieved. He also mentioned that he has done similar analyses for all of the Brazos basin gages (*posted to TCEQ website*). At the least, Phil wants to make sure the BBASC understands that default HEFR pulse flows, as typically implemented, may not occur as frequently as expected. The group discussed how they may want to depict and implement pulse flows in their recommendations. Phil and David Dunn agreed to look into how to best represent the true frequency of a pulse flow (i.e., dealing with multiple events in one year). Phil will evaluate a couple of pulse events using whole-pulse and post-peak volumes and durations to compare their implementation outcomes.

Phil next opened a discussion of hydrologic conditions. He explained that reservoir storage levels have been typically used as triggers for wet/dry/average base flow conditions. Phil presented information on the Palmer Hydrologic Drought Index as a potential hydrologic condition (*posted to TCEQ website*). He said that the index is calculated in 10 separate climatic zones in the state and showed which zones cover the Brazos Basin. He showed how the historical basin-wide index scores (weighted by zone coverage) and their categories (wet, normal, dry) match up with historical flows at the Richmond gage. The group discussed the merits of Palmer versus reservoir storage as hydrologic condition indicators. Phil will check on the hydrologic lag of the index. Members discussed whether use of the regional Palmer index would be better. The group agreed to move forward with the exploration of using the Palmer Hydrologic Drought Index in some form as a hydrologic condition.

Tiffany Morgan talked about analyses of duration of subsistence flows at each of the gages. The group discussed whether they wanted to come up with a rule limiting consecutive number of days at or below the Q95. Tom suggested coming up with a bar graph of the frequency bins along with average, maximum, and median consecutive day periods. Tiffany will send her draft write-up to the group for review and further discussion of whether to come up with a consecutive day limitation.

David Dunn went over his write-up of reservoir projects evaluated by the Brazos G Regional Water Planning Group (*posted to TCEQ website*). Of the 10 projects, only 4 are being

recommended: Cedar Ridge, Turkey Peak, Throckmorton, and Brushy Creek. David said that the Double Mountain Fork (2), Little River (2), and Millican (2) proposed reservoir projects could be good candidates to use. Tom said that it would be interesting to look at how the projects affect instream flows and how the flow recommendations affect the reservoir yields (for the BBASC). The members decided to use Double Mountain Fork-West, the smaller Little River, and the Millican-Panther Creek projects for evaluation.

David next discussed his handout on the geomorphology overlay (*posted to TCEQ website*). He pointed out the seven gages that were preliminarily selected to be evaluated for the overlay and mentioned that the list would need to be pared down to just a few gages to make the analysis more manageable. The group decided to focus on two gages: Brazos River at Richmond and Brazos River at Seymour. The BBEST will provide the daily flows out of FRAT to TWDB staff for them to do their geomorphic analysis. The three reservoir projects would be analyzed individually, and the Double Mountain project could be paired with one of the other two projects as a separate evaluation. David next explained three types of background information that could be developed to give indications of channel conditions and trends: comparison of annual flood frequency, long-term rating curve adjustment, and specific stage analysis. Historical aerial imagery analysis was also mentioned as a potential source of information. The group decided not to pursue these background activities due to time constraints and will simply cite and summarize previous work that has been done in these areas.

As the first step in the geomorphic analysis, David discussed the process of developing daily flows from monthly naturalized flows that is required to analyze the impacts of the recommended flow regimes on sediment transport. He then gave an overview of the next step, which would be the selection of scenarios for analysis. David recommended comparing sediment transport characteristics for the following scenarios: 1) current conditions – flows based on the most current TCEQ WAM Run 8; 2) baseline conditions – flows from TCEQ WAM Run 3 version used by the Brazos G Regional Water Planning Group which estimates some level of future return flows; and 3) candidates – where flow regime recommendations are evaluated against an infinite infrastructure scenario and/or a hypothetical project such as one or more of the three Brazos G projects selected earlier.

The group then engaged in a discussion of the need to decide on preliminary flow recommendations for the different gage sites. All members agreed that a subsistence flow and three levels of base flows are appropriate for each gage, and that overbank flows, though not specifically recommended, would be described for the ecological functions that they provide. Discussion centered on which of the five tiers of high flow pulses are necessary (2 per season, 1 per season, 2 per year, 1 per year, and 1 per 2 years), though there was uncertainty as to whether the 1 per 5 year tier was truly overbank for all gage sites. After looking at HEFR tables for several gage sites, the BBEST members agreed to remove the 2 per year pulse flow tier since its magnitude appeared to be somewhat redundant with the 1 per season pulses. Phil again pointed out that the pulse flow frequency tiers are based on the recurrence of the flow magnitudes only, and not the volumes and durations, and thereby offered to revise the HEFR tables to reflect the expected frequencies of all three components.

David discussed the scope of the geomorphic analysis of scenarios. He suggested using the standard sediment transport analysis techniques proposed by the SAC to compute average annual sediment loads and sediment load exceedance frequencies for each scenario. He also recommended refinements to the analyses including varying stream slope with discharge, utilizing bed load transport formulae (ignore suspended load), not using effective discharge as a measurement parameter, and ensuring that the daily frequency curve for each scenario is appropriately discretized. David proposed that TWDB perform the analyses, with review by the BBEST, and allowance for adjustments and re-analysis. Mark Wentzel agreed and said that they may have to go to the two gage sites and sample bed material, if that data is not already available. David said the BBEST should use its best judgment to decide how much change in sediment transport among scenarios is reasonable, rather than adhere to an unsupported rule of thumb (e.g., 10% change).

6) Estuary Discussion

George Guillen presented information regarding the Brazos River estuary. He said that a delta is forming and growing to the southwest of the river mouth. There are no oyster reefs, but shrimp, blue crab, and croaker have been documented users of the lower river as a nursery, depending on conditions. A previous study found lower benthic production compared to other Texas estuaries. George mentioned several possibilities as far as forming potential inflow recommendations, but the group agreed that it would be best to summarize the limited information available, acknowledge that it is not sufficient to make recommendations, and lay out work plan items that would get at filling gaps in the knowledge base.

7) Other Business

Phil Price agreed to give a BBEST update at the August 23rd BBASC meeting in Waco.

Tim Bonner gave an overview of his draft report Table of Contents and members discussed the overall layout. Tim said he would send out the draft again to everyone and encouraged members to review and comment.

The next BBEST meeting was set for September 21st in College Station from 10:00 a.m. to 6:00 p.m.