

TPWD Responses to Issues Raised in Technical Peer Review

Introduction

Several external technical experts have previously reviewed the draft report entitled “Using Water Availability Models to Assess Alterations in Instream Flows”. Their comments and criticisms are summarized below. A revised draft report and these comments were prepared and posted to stimulate more comment and solicit additional review.

Purpose of the report

Several reviewers questioned the purpose for undertaking this effort. This effort was designed to assess statewide alterations to instream flows from a fish and wildlife perspective using readily available data. Information on the status of instream flow alterations was not currently available and the release of the water availability models (WAM) presented the opportunity to conduct a broad scale analysis. This information is useful to the Texas Parks and Wildlife Department (TPWD) internally (e.g., for water rights permitting review purposes). The original intent remains and with some modifications based on comments from reviewers the report meets that goal. We also recognized that the report might be useful for other purposes including conservation and water resource planning.

Which WAM run(s) to use in the analysis

Several reviewers have suggested alternate Water Availability Model (WAM) runs be utilized. The report depicts the level of instream flow alteration based on WAM Run 3 (full permitted use and no return flows), which represents the current state of water development from a legal, regulatory standpoint. One reviewer recommended, “that TPWD consider use of Run 1 (full permitted use and current return flows) as a more reasonable basis for classification of potential Instream Flow Alteration.” Another reviewer suggested that Run 2, which assumes 50% of current return flows, “might lead to better acceptance” Finally, another commented that WAM 3 presents an “alarmist’s view” and that Run 8 (maximum reported water use of the last ten years and minimum return flow ratio for the last 5 years) should be used “if one is assessing the actual alterations to instream flows.” We recognize the merit of these viewpoints and are not opposed to considering them.

Run 3 depicts conditions that would be expected if all users fully exercised their current water rights. No one expects 100% reuse in the future, but it is reasonable for a resource agency like TPWD to be conservative rather than begin our analysis assuming that reuse will not increase in the future. Run 3 is the run that the Texas Commission on Environmental Quality (TCEQ) uses for water rights permitting. Run 3 is not TPWD’s proposal for looking at future conditions. A run that best reflects future conditions could potentially be developed using information from the regional water plans. It should be noted that TCEQ only maintains Runs 3 and 8, since these are the runs that are used for determining water availability in the water rights permitting process. While the other runs may be updated in the future (TCEQ staff have indicated that the level of effort would be reasonable) the only WAM runs updated and available are Runs 3 and 8.

Conversion of the monthly WAMs to daily flows

Although the WAM models are based on a monthly time step, TPWD converted outputs to a daily time step because riverine biota responds to changes in flow conditions at smaller time steps. Further, flow changes at daily time steps (or less) are masked by analysis at larger time steps (e.g., a single high flow event may result in a very high monthly average when in reality flows were very low during most of the month). This is a reason that analysis using consensus environmental flow criteria (SB1 planning) requires a daily time step model to evaluate reservoir yield for new projects and why newer permits typically require that instream flow special conditions be met at all times rather than as a monthly average. For evaluating relative impacts between project alternatives a monthly time step may be sufficient. However, we believe that daily time steps are required for evaluating impacts of water management strategies on instream flows and fish and wildlife resources.

Several reviewers noted site-specific factors that should be used to improve monthly to daily conversions. These suggestions are being considered. However it was TPWD's intent to provide a consistent statewide approach using readily available data and these concerns might be better addressed in basin-specific evaluations should individual regions desire to conduct similar analyses. There has been concern related to occurrence of negative incremental flow resulting from the naturalization process and how these might affect the results of daily analysis. TPWD acknowledged this concern in the document, but noted that the method we employ to do the conversion is consistent with past and current water planning efforts to estimate reservoir yield, which, according to SB1 rules, requires a daily analysis.

Diversions may be not be modeled at actual diversion locations

In some cases, diversions that, in reality, occur at multiple locations are modeled as if they occur at a single location (i.e., single control point); usually these instances are related to contracted water from reservoirs. TPWD considers this a basin-specific issue and did not take on the role of "correcting" the WAMs. Putting aside the fact that correctly performing this task requires substantial knowledge of diversion rates and locations, it is not immediately clear that, at least for Run 3, that changes should be made unless there exists a regulatory instrument that ensures that diversion locations will not be moved. If a change is necessary perhaps it should be made consistently and universally by TCEQ.

Use of naturalized flows to determine flow benchmarks

TPWD used naturalized flows to calculate flow benchmarks because naturalized flows are the logical, available choice. Conceptually, naturalized flows reflect some semblance of pre-development conditions. The calculation of flow benchmarks used in the report is similar to the methodology used by TCEQ when developing water rights special conditions (i.e., Lyons method) with one major exception—TCEQ uses gage flows rather than naturalized flows. Naturalized flows were not chosen in order to replace TCEQ's default method or to argue that rivers need to be returned to their pre-development state.

While gaged data were considered for development of benchmark flows, naturalized flows were used for the following reasons. Naturalized flows were developed for each control point in the WAMs for the entire period of record modeled. Conversely, consistent historical gaged data are not available statewide. Gages have different periods of record and many are missing

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data for the periods that they do cover (e.g., some gages include severe droughts while others may only include relatively wet periods).

Using gaged flows presents a moving target for future evaluations. It would not make sense to base comparisons on a benchmark developed from a highly impacted flow regime, whether the flows increased (i.e., downstream of a major discharge) or decreased (i.e., downstream of a major diversion or storage project). On the other hand, naturalized flow statistics should remain constant over time.