

DRAFT Response to the Sabine-Neches basin and bay system expert science team request to develop an outline of activities to guide development of their environmental flow recommendations for the Sabine Lake bay system.

### Introduction and Purpose

The Sabine and Neches basin and bay expert science team (BBEST) recently developed a draft outline of activities intended to guide development of instream environmental flow recommendations for rivers and streams within their basins. BBEST member Dr. Kirk Winemiller wrote the outline and explained that it is a synthesis of National Science Review panel recommendations, and methods recently applied in the Nature Conservancy's Caddo Lake Project. Since the outline does not address inflows into the Sabine Lake bay system the BBEST members requested Texas Parks and Wildlife to draft a similar outline of activities to guide development of their environmental flow recommendations for Sabine Lake, using Dr. Winemiller's outline as a guide. It is anticipated the SB3 Science Advisory Committee will soon release a guidance document about the topic of freshwater inflow needs for bays and estuaries which should be reviewed by the BBEST for consistency with their activities.

### SB3 Background

The legislature developed a process within SB3 with specific timelines to address environmental flow issues in the state's major basin and bay systems in order to provide certainty in the state's water management and development plans, and also to provide adequate protection of the state's water resources. SB3, among other things, emphasizes a consensus-based regional approach involving a balanced representation of appointed stakeholders and advisory groups. The regional stakeholders are appointed by a legislatively appointed committee who in turn nominate and appoint a basin and bay expert science team. The expert science team is tasked with developing science-based environmental flow recommendations for their region's river basins and bay system. The Sabine-Neches expert science team was formed in late 2008 and is composed of eleven members led by Jack Tatum (chair) of the Sabine River Authority, and Scott Hall (vice chair) of the Lower Neches Valley Authority. Other science team members are affiliated with universities (Stephen F. Austin, Lamar, Texas A&M) and/or consultant companies (AECOM, HDR, LBG, Gary Graham, Alan Plummer Associates).

The BBEST environmental flow recommendations are to be developed using reasonably available existing science and, at this stage, without regard for other water users such as municipal, industrial or agricultural water consumers. The SB3 process provides for input from the other water users through different channels. Environmental flow recommendations produced by the BBEST can be thought of as a starting baseline after which adjustments are applied by TCEQ based on input from the advisory groups, basin stakeholders, and the public.

After the BBEST submits their environmental flow recommendations to TCEQ, Commission staff will compile input from all the SB3-related groups, develop recommendations and conduct rulemaking which will establish final environmental flow standards. SB3 also has provisions for periodic re-evaluation of the environmental flow standards, suspension of standards during emergency conditions, and requirements to pursue market approaches when there are not sufficient quantities of water available to meet environmental flow standards.

D R A F T Sabine Lake Environmental Flows Science Team

Outline of Activities – 2009

1. Gather and summarize available information on:
  - a. Previous freshwater inflow studies for Sabine Lake (local and state developed studies)
  - b. Freshwater inflow hydrology (historical, naturalized, contemporary)
  - c. Bay system and coastal dynamics (circulation, currents, tides, historical conditions)
  - d. Alterations to the system over time
  - e. Salinity (seasonal differences, variability related to inflow hydrology)
  - f. Geomorphology, bathymetry, sediment dynamics
  - g. Estuarine life and their life stages (fish, shellfish, benthic organisms)
  - h. Bay system features and habitats (submerged aquatic habitats, marsh wetlands, oyster beds other key features)
2. Identify important guilds or species, along with their habitats, that are of ecological, economic and/or social importance.
  - a. Species that require certain conditions during certain periods to fulfill a life stage need.
  - b. Transient species that periodically depend on estuarine species and habitats for food and/or shelter.
3. Document goals and objectives for the freshwater inflow activities that are consistent with Senate Bill 3, available SAC guidance, and expectations of the Sabine basin and bay expert science team.
4. Gather and evaluate available salinity and freshwater inflow data (magnitude, frequency, duration, timing) for:
  - a. Very recent time horizon
  - b. Historical time horizons (pre-impoundment, post-impoundment)
  - c. Needs of key biological components of the bay system
5. Evaluate changes in bay conditions resulting from:
  - a. Changes in freshwater inflows
  - b. Increases in saltwater inflows (deepening and widening of ship channel, saltwater barrier)
6. Develop and employ a methodology consistent with SAC guidance to examine alternative scenarios of managed freshwater inflows for the benefit of:
  - a. Key biological components of the bay system
  - b. Key physical and chemical processes in the ecosystem (as they relate to key biological components, habitat maintenance, nutrients, sediments, water quality, etc.)
7. Examine commonalities and conflicts among biological components and physicochemical processes and attempt to find one or more flow regimes that benefit the greatest number of key components and processes.

8. Examine and discuss how alternative inflow scenarios could influence current and projected human uses of water (e.g. municipal water supplies, industry, agriculture) or aquatic/coastal habitat (e.g. fisheries, recreation). Examine and discuss potential tradeoffs and alternatives among components in an attempt to maximize important natural assets and socioeconomic interests within the basin and estuary.
9. Produce 1-3 acceptable freshwater inflow scenarios and compare them to previously developed freshwater inflow recommendations.