

## ***5.0 Recommendations Regarding Potential Strategies to Meet Environmental Flow Standards***

Senate Bill 3 (SB3) mandates that each bay/basin area stakeholders committee: 1) develop recommendations on environmental flow standards, and 2) develop strategies to meet these standards. In the process of developing environmental flow standards recommendations for the Guadalupe, San Antonio Bay and Basin Area, the Bay and Basin Area Stakeholders Committee (GSA BBASC) reviewed the Bay and Basin Expert Science Team (GSA BBEST) report along with additional analysis and science that was commissioned by and presented to the stakeholders committee.

The GSA BBEST report recognizes that, based on the available science, with a few noted exceptions, a sound ecological environment exists in these rivers, bays and estuaries today. However, during the GSA BBASC deliberations, GSA BBEST members presented additional analysis regarding the potential impact full utilization of existing water rights could have on flows. The additional information raised concerns among GSA BBASC members that the “sound ecological environment” found today could change, particularly during lower flow times of the year, if all existing water rights are fully utilized as permitted.

The GSA BBASC recognized specific basin-wide flow recommendations were not in place prior to the SB3 process and would not have been included as water permit requirements. Both the GSA BBEST report and the GSA BBASC report will form the basis of new Texas Commission on Environmental Quality (TCEQ) environmental flow standards. The GSA BBASC developed and will submit its recommended instream and bay and estuary flow standards to the TCEQ for application to future permits, but also endorses the use of these same instream flow regime standards and bay and estuary seasonal attainment criteria as voluntary targets for current permit holders. The GSA BBASC recognizes that voluntary implementation of water use and management strategies will improve the effective use of limited surface water within the basin particularly during the driest times when water is in its highest demand and flow is at its lowest. Implementation of strategies is also a vital component toward reaching recommended flow attainment targets while achieving a balance between water supply and environmental needs.

The GSA BBASC requested the National Wildlife Federation (NWF), in association with Intera Geosciences & Engineering, to conduct a preliminary evaluation of three potential strategies: Wastewater Dedication, Dry Year Option and Purchase/Conversion of under-utilized water rights and a combination of these strategies. The report on this evaluation is included as Appendix H in the GSA BBASC report. In summary, the evaluation found that the strategies applied individually, or in combination, can produce additional beneficial flow to the bays and estuaries during the driest times.

During the development of the Adaptive Management Plan/Work Plan, the GSA BBASC will determine what additional science is needed to better link specific quantity of inflow to measurable improvements to the quality of the environment benefit in the rivers and bays. The GSA BBASC will also identify obstacles in State rules or laws that could impede the implementation of the strategy options listed and recommend steps to remove or modify these obstacles. In the interim, the GSA BBASC encourages the TCEQ, Texas Water Development Board (TWDB), Texas Parks and Wildlife Department (TPWD) and Region L, J and N Regional Water Planning Groups to aggressively promote the implementation of these or other water use

and management strategies to help achieve the GSA BBASC recommended flow standards for the Guadalupe and San Antonio river basins, bays and estuaries.

It is noted that the GSA BBASC narrative regarding the Strategies Addressing Environmental Flow Standards was adopted by a vote of 23 to 1, while the *Data and Tools Needed for Achieving Environmental Flow Standards* and *Strategy Options for Achieving Environmental Flow Standards* (listed below) were adopted by consensus.

### **Data and Tools Needed for Achieving Environmental Flow Standards**

The GSA BBASC were informed throughout its deliberations of gaps in data and information which exists today and serve as obstacles to accurately assessing current and future water use within the basin. These information gaps could also affect the ability to assess the effectiveness of environmental flow strategies toward meeting the instream flow regime and bay and estuary attainment criteria recommended by the GSA BBASC. Below is a list some of the data tools the GSA BBASC identified that should be explored by TCEQ. The GSA BBASC will also develop work on additional data needs during the upcoming work on the Adaptive Management Plan/Work Plan.

- **Secure agreement from TCEQ to perform a full accounting of all existing surface water use within the basin to allow for more accurate model projections of current and future water needs**
  - A more accurate accounting of actual surface water use, including an estimation of riparian and domestic and livestock (D&L) use will improve data used for water availability models while providing information to determine if existing water rights could be voluntarily repurposed to assist in meeting flow standards.
- **Improve access to and management of historical TCEQ data on wastewater return flows in order to improve understanding the role wastewater return flows have in providing flows for environmental purposes**
- **Explore the addition of streamgages in the lower basin to increase data to more accurately measure the contribution of river flows to the bay and estuary system**
- **Update the Guadalupe–San Antonio Water Availability Model (GSA WAM) used by TCEQ for permitting**
  - The current period of record for the GSA WAM is 1934 through 1989 (56 years). The exclusion of the most recent 22 years of data in the model causes credibility issues with the data because many of the recent high flow and drought events are not included in the model. Furthermore, a longer period of record would provide more complete data for the next round of GSA BBASC Recommendations regarding the attainment frequencies associated with the Environmental Flow Standards Recommendations for the Guadalupe and Mission-Aransas Estuaries (Section 4.2).

## **Strategy Options for Achieving Environmental Flow Standards**

Below, the GSA BBASC has provided a list of potential strategies that can be voluntarily implemented by current and future water rights permit holders and applicants, state agencies or others to assist in meeting the instream and bay and estuary environmental flow standards recommended by the GSA BBASC. These strategies can also serve as a menu of options to meet the requirements of the proposed 10 percent dedication recommended by the GSA BBASC for the bay and estuary (refer to Section 4.3.2). This list of strategies is not intended to be exhaustive and many other options may exist. Members of the GSA BBASC will explore the feasibility of implementing specific strategies during upcoming work on the Adaptive Management Plan/Work Plan by the GSA BBASC.

- **Explore the donation, sale or lease of new or under-utilized water permits**
  - Willing water permit holders donate, sell or lease all or part of their permit so that that water could stay in the stream for environmental flow protection. Permit would be changed to add instream and/or bay and estuary use. To be most effective, these permits would need to be firm water that is fairly senior.
  - Use of a water trust can be helpful for keeping track of water dedicated for environmental flow purposes.
- **Dedication of wastewater return flows**
  - Dedication of permitted wastewater return flow toward environmental flow needs. The wastewater could be generated by a new permitted project, an existing project or through agreement or voluntary commitment of wastewater generated by a municipality. Water quality should be considered.
- **Dry Year Option (for Irrigation Permit)**
  - Agricultural water rights holders could be compensated for not diverting water during dry years. Priority should be given to agricultural water rights that have recent historical use. This approach reduces instream water use during critically dry periods in order to increase flows.
- **Increase storage of water for releases for environmental flows**
  - Additional storage could be added to projects to store water during higher flows to allow for releases to support the river/bay system during low flow periods when flow is needed.
  - Develop project to store surface water during higher flows (surface storage or aquifer storage and recovery) to have a solely dedicated source for environmental flows during drier times.
- **Dedication of Conserved Water from Current Permits to Environmental Flows**
  - Permit holders could voluntarily commit water that is saved through conservation methods to environmental flows. Most applicable to agricultural or municipal water permit holders.
  - Possible Environmental Quality Incentives Program (EQIP) funding for agricultural conservation practice/s and other available federal funding.

- **Facility Optimization to Enhance Environmental Flows**
  - Modify a facility's operation and/or schedule of releases can help provide environmental flows. The amount and timing of releases can attempt to better mimic the natural flow patterns of the river system, thereby protecting environmental flows. This can be done to an individual facility or to multiple facilities in a watershed for an additive effect.
  
- **Water Right Management**
  - The existing location and timing of diversions of water rights in the basin may inhibit opportunities for better resource management that could help support environmental flows.
  - Combinations of opportunities may exist whereby water right diversion points could be relocated, older rights used in conjunction with new water rights, or new water rights used in conjunction with currently unused rights to improve delivery efficiencies to both water users and the environment. Contractual agreements will be necessary.
  
- **Set-Asides of Unappropriated Water**
  - Some or all of unappropriated flow within the basins could be left in the river or removed from the amount of water available for future permitting. SB3 contemplates set-asides of unappropriated water by TCEQ.
  
- **Reduction of Groundwater Pumping**
  - Reducing groundwater pumping can allow springs to provide river baseflows.
  
- **Land Stewardship Programs**
  - Local, regional, state, and federal incentives for landowners to use good land management practices which will put more water into the water table.
  - ***Riparian Zone and Wetland Restoration and Stewardship***
    - Proper stewardship of riparian zones on the basin's creeks and rivers can build up the in-bank water holding capacities which serve to maintain base flows during dry periods and provide a healthy riparian habitat for both aquatic species and other wildlife. Flood attenuation and improved water quality are additional benefits resulting from proper stewardship of riparian zones.
    - Restored and healthy wetlands on the rivers or on the Gulf provide very productive wildlife habitat, filtering and cleansing actions desirable for inflows, and protection for inland communities from hurricanes.
  - ***Watershed or Catchment Stewardship***
    - A well-managed, healthy watershed not only provides a desirable livestock and wildlife environment, but increases groundwater penetration and recharge, reduces floods and provides other benefits.

- Karst limestone watersheds are common across the Hill Country and Edwards Plateau, selective brush management and subsequent improved rangeland management has proven to sometimes increase ground recharge and springflows. Normally, ashe juniper (cedar, mountain cedar) has been the target brush species, but in other cases mesquite control has produced desirable hydrological benefits.
- **Water Dedication from Existing Permits**
  - Some permit holders may be willing to have conditions placed on their permits, such as a certain percent or set amount of the water being dedicated to provide environmental flows.
- **Municipal, Industrial, Mining and Agricultural Conservation to reduce water use and demand**
  - Each city, town and water utility, both large and small, should set goals to lower future surface and/or groundwater use using a conservation program which best fits their situation for both the utility and customers. The goal would be to reduce per capita water use and reduce demand for river diversions.
  - Effective conservation programs/strategies include: stringent leak detection, low water use appliances, inverted pyramid rate structures, customer education program, rainwater harvesting, use of recycled water and gray water, and others.
  - Agricultural irrigation conservation including installation of efficient of water delivery systems (canal, pipelines, etc.), improve center pivot systems, add in-ground moisture monitors, improve crop varieties and other farming methods.
- **Develop conjunctive use water projects**
  - To reduce reliance on surface water, water project developers should be encouraged to develop conjunctive use water projects using both groundwater and surface water. Better data on groundwater availability is now available for defined Groundwater Management Areas and modeled available groundwater reports to the TWDB increasing the certainty of groundwater use planning.
- **Develop alternate water supplies**
  - Alternative water supplies such as desalination of brackish groundwater or seawater desalination offer options to surface water usage and can provide additional water that could be stored and released for environmental flows.
- **Programs addressing logjam removal**
  - A logjam removal program could yield flow benefits to the bay and estuaries and improve stream bed conditions as well as riparian health in associated areas of the basin.