Rio Grande Basin and Bay Expert Science Team (BBEST)
Environmental Flows Recommendations Report

INTRODUCTION

Section 11.02362(b)(3) of Senate Bill 3 (SB3) as enacted by the 80th Texas Legislature in 2007 identifies the river basin and bay system consisting of the Texas portions of the Rio Grande, the Rio Grande estuary, and the Lower Laguna Madre (collectively the Texas Rio Grande system) as a priority system for the purpose of developing environmental flow regime recommendations and adopting environmental flow standards. This report presents the findings and recommendations of the SB3 Rio Grande Basin and Bay Expert Science Team (BBEST) regarding these environmental flow requirements. Because of distinct differences in the aquatic environments across the Texas Rio Grande system, the associated different needs with regard to protecting environmental flows, and the unique water rights, water availability and institutional aspects of this system, this SB3 work has been conducted by two subgroups of the BBEST, a Lower Rio Grande BBEST and an Upper Rio Grande BBEST.

The Texas Rio Grande system as defined by SB3 covers a large geographical area characterized by extremely varied climatic and hydrologic conditions and correspondingly varied aquatic biological resources extending from the humid subtropical coastal environment on the lower end to the semi-arid middle basin and finally to the upper basin Big Bend desert region. In total, this system covers approximately 70,000 square miles within Texas, and the Rio Grande itself extends over 1,200 river miles along the international border between the United States and Mexico from near El Paso, Texas to the Gulf of Mexico. On this segment of the river, there are two major international reservoirs, Amistad Reservoir just upstream of Del Rio, Texas, and Falcon Reservoir downstream of Laredo, Texas, both of which are jointly operated by the Unites States and Mexico Sections of the International Boundary and Water Commission (IBWC). Water users in Texas are the sole beneficiaries of the United States share of water from these two reservoirs, and releases are made for Texas users at the request of the Texas Rio Grande Watermaster under the Texas Commission on Environmental Quality (TCEQ).

Downstream of Fort Quitman, Texas, to the mouth of the Rio Grande at the Gulf of Mexico, the flows in the Rio Grande are divided between the United States and Mexico by the provisions of the 1944 Treaty between the two countries, with portions of the inflows from some of Mexico's tributaries assigned to the United States. The IBWC performs daily accounting of inflows and ownership of the waters flowing in the Rio Grande for this segment of the river. Upstream of Fort Quitman, the Convention of 1906 defines the ownership of flows in the Rio Grande between the United States and Mexico. The Rio Grande Compact between the Texas, New Mexico and Colorado divides the inflows to the upper portion of the Rio Grande among these states. These multiple institutional arrangements and the various agencies and entities involved in their implementation can complicate the management of the flows in the river for purposes of environmental protection. For example, as noted in Section 11.02362(m) of SB3, it is specifically acknowledged that "For the Rio Grande below Fort Quitman, any uses attributable to Mexican water flows must be excluded from environmental flow regime recommendations".

There are over 1,500 surface water rights within the Texas Rio Grande system that authorize the diversion of about 3.5 million acre-feet of water per year for a variety of uses including domestic, municipal, industrial, mining and irrigation. Water rights on the middle and lower portions of the Rio Grande below Amistad Reservoir are supplied with stored water from Amistad and Falcon Reservoirs, to the extent it is available, and these water rights are subject to a class-based system of water rights administration that prioritizes the available supplies for these water rights based on their type of use, with domestic, municipal and industrial uses assigned the highest priority. Currently, the combined authorized annual diversion from Amistad and Falcon Reservoirs for these middle and lower Rio Grande water rights is about 2.15 million acre-feet per year, whereas the combined firm annual yield of these reservoirs is only about 1.05 million acre-feet per year, which creates a situation of substantial over-appropriation and periodic shortages for many of the lower-priority water rights, i.e., irrigation and mining. Other water rights in the Texas Rio Grande system that do not rely on Amistad and Falcon Reservoirs for their supplies are subject to the prior appropriation doctrine for the allocation of available streamflows during dry periods. Under this doctrine, the older water rights are allocated available streamflows first before the more junior priority rights, which again results in significant supply shortages for many water rights.

Because of the significant over-appropriation of available surface water supplies in the Texas Rio Grande system, the TCEQ, which is the water rights regulatory agency for Texas, generally considers that no unappropriated water is available within the system for the issuance of new water rights permits. Since the environmental flow standards adopted by the TCEQ under authority of SB3 apply only to new permits or certain water rights amendments issued by the TCEQ on or after September 1, 2007, there appears to be little or no need for specific environmental flow regime recommendations from the BBEST or environmental flow standards from the TCEQ solely for new appropriations of water within the Texas Rio Grande system.

Still, there is need to understand the aquatic biological resources that exist and have existed within key portions of the Texas Rio Grande system and their relationships to streamflows. For example, in the upper Big Bend portion of the Rio Grande basin, efforts are underway to acquire existing water rights that then can be dedicated to protecting environmental flows – the question is how much water is needed. Discussions with Mexico also have focused on the timing and magnitude of releases from Luis L. Leon Reservoir on the Rio Conchos near Presidio, Texas, in an attempt to maximize the beneficial effects of these additional flows on maintaining channel features downstream along the Rio Grande and supporting existing aquatic biota – again the question if how much water is needed. In the lower basin, studies are underway to assess the role of marsh grasses in the Laguna Madre for supporting a wide variety of marine organisms and processes, and one of the key aspects of this research is the importance of freshwater inflows from the Arroyo Colorado for maintaining conditions conducive to these marsh grasses.

Recognizing: (1) that no new water rights permits would likely be issued by the TCEQ within the Texas Rio Grande system, (2) that there are specific needs in some portions of the Texas Rio Grande system for pursuing SB3 environmental flow studies to investigate environmental flow requirements, and (3) the fact that initial funding for the BBEST's work was limited and of short duration, the Basin and Bay Area Stakeholders Committee (BBASC) for the Texas Rio Grande system determined at the outset of the Rio Grande SB3 process that the scope of activities of the

BBEST should be limited to a manageable portion or portions of the system area so that this work could reasonably be accomplished within the given timeframe and funding. To this end, the BBASC, through consensus action, identified the Rio Grande basin upstream of Amistad Reservoir and below Fort Quitman, including the Pecos and Devils river basins, as the Upper Rio Grande BBEST Study Area, and the segment of the Rio Grande below Falcon Dam, the Rio Grande estuary, the Arroyo Colorado and the Lower Laguna Madre as the Lower Rio Grande BBEST Study Area.

The work of these two BBEST subgroups is reported in this document as separate sections with separate recommendations.