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CHAPTER 8.0 : UNIQUE STREAM SEGMENTS/RESERVOIR SITES/LEGISLATIVE RECOMMENDATIONS

In addition to making recommendations regarding strategies for meeting current and future water needs, TWDB rules for SB 1 regional planning allow the regional water planning groups (RWPG) to include recommendations in the regional water plan with regard to legislative designation of ecologically unique streams, sites for future reservoir development, and policy issues. The Rio Grande RWPG elected to consider recommendations in each of these areas, which are presented in this chapter.

8.1 LEGISLATIVE DESIGNATION OF ECOLOGICALLY UNIQUE STREAM SEGMENTS

TWDB rules for SB 1 regional water planning describe the process by which RWPGs may prepare and submit recommendations for legislative designation of ecologically unique river and stream segments. This process involves multiple steps with the Rio Grande RWPG, the Texas Parks and Wildlife Department (TPWD), the TWDB, and ultimately, the Texas Legislature each having a role. According to SB 1, the Rio Grande RWPG may recommend legislative designation of river or stream segments within the region as "ecologically unique." TWDB rules (30 Texas Administrative Code 357.8) state:

Regional water planning groups may include in adopted regional water plans recommendations for all or parts of river and stream segments of unique ecological value located within the regional water planning area by preparing a recommendation package consisting of a physical description giving the location of the stream segment, maps, and photographs of the stream segment and a site characterization of the segment documented by supporting literature and data.

According to state law (Texas Water Code Sections §6.101 and §10.053), state agencies and local units of government cannot develop a water supply project that would destroy the ecological value of a river or stream segment that has been designated by the Texas Legislature as ecologically unique. Also, the TWDB is prohibited from financing water supply projects that would be located on a stream segment that has been designated as ecologically unique.

TWDB rules provide that the RWPGs forward any recommendations regarding legislative designation of ecologically unique streams to the TPWD and include TPWD's written evaluation of such recommendations in the adopted regional water plan. The RWPG's recommendation is then to be considered by the TWDB for inclusion in the state water plan. Finally, the Texas Legislature will consider any recommendations presented in the state water plan regarding designation of stream segments as ecologically unique.

8.1.1 Criteria for Designation of Ecologically Unique Stream Segments

TWDB rules also specify the criteria that are to be applied in the evaluation of potential ecologically unique river or stream segments. These are:

- Biological Function: stream segments that display significant overall habitat value, including both quantity and quality, considering the degree of biodiversity, age and uniqueness observed, and including terrestrial, wetland, aquatic or estuarine habitats;
- Hydrologic Function: stream segments that are fringed by habitats that perform valuable hydrologic functions relating to water quality, flood attenuation, flow stabilization or groundwater recharge and discharge;
- Riparian Conservation Areas: stream segments that are fringed by significant areas in public ownership including state and federal refuges, wildlife management areas, preserves, parks, mitigation areas or other areas held by governmental organizations for conservation purposes, or segments that are fringed by other areas managed for conservation purposes under a governmentally-approved conservation plan;
- High Water Quality/Exceptional Aquatic Life/High Aesthetic Value: stream segments and spring resources that are significant due to unique or critical habitats and exceptional aquatic life uses dependent on or associated with high water quality; and/or
- Threatened or Endangered Species/Unique Communities: sites along streams where water development projects would have significant detrimental effects on state- or federally-listed threatened and endangered species, and sites along segments that are significant due to the presence of unique, exemplary, or unusually extensive natural communities.

8.1.2 Candidate Stream Segments

To assist each of the 16 RWPGs, the TPWD developed a list of candidate stream segments in each region that appear to meet the criteria for designation as ecologically unique. For the Rio Grande Region, TPWD prepared a report entitled *Ecologically Significant River and Stream Segments of Region M, Regional Water Planning Area* (May 2000) that presents information on four (4) stream segments within the region that meet one or more of the criteria for designation as ecologically unique. (The report is available on-line at http://www.tpwd.state.tx.us/texaswaters/sb1/rivers/unique/regions_text/region_m.htm).

The Rio Grande RWPG also received suggestions from the U.S. Fish & Wildlife Service, Zapata County, and the Texas Shrimp Association through two stakeholder "focus group" meetings during the previous plan. The focus group meetings were held in December 1999 and January 2000, and more than 200 individuals representing local, state, and federal agencies, environmental groups, and other

parties with a known interest in the subject received written invitations to attend and provide input. Nominations for stream segment designations, as well as support for TPWD-nominated segments, were received at both meetings. The information provided by the TPWD and through the focus group meetings is summarized in Table 8.2.

Subsequent to the last plan, a request for additional consideration of unique stream segments was made. An Environmental Subcommittee to the RGRWPG was formed to look in greater detail at various environmental issues related to water management strategies, unique stream segments and other items affecting environmental considerations. The subcommittee met on several occasions with discussion relating to the unique stream segments on the Rio Grande. The U.S. Fish and Wildlife Service and the TPWD made formal requests for designation of unique stream segments on the Rio Grande. A workshop was held by the RGRWPG for a presentation by the TPWD on January 25, 2005. No action was taken then. A meeting of the subcommittee was held February 16, 2005 to consider the proposals. A motion was made to accept the designation of the segment of the Rio Grande from the mouth of the Rio Grande upstream to the upstream boundary of the U.S. Fish and Wildlife Service Tulosa tract. The motion died for a lack of a second.

8.1.3 Recommendation

The Rio Grande RWPG reviewed the nominations submitted by TPWD and others with regard to legislative designation of river or stream segments as ecologically unique. The Environmental Subcommittee had no recommendation for the RGRWPG for inclusion in the plan. Designation would have the advantage of allowing entities to receive federal and state financial assistance for the preservation of lands adjoining these segments. The perceived disadvantage to the RGRWPG would be that a designation could cause that segment to be more susceptible to such issues as environmental flows and water quality issues upstream of the designation. Lack of action by the RGRWPG indicates a non-designation of unique stream segments recommendation at this time. It was agreed that the issue could be brought up and considered in the future.

Figure 8.1: TPWD Proposed Ecologically Significant Stream Segments

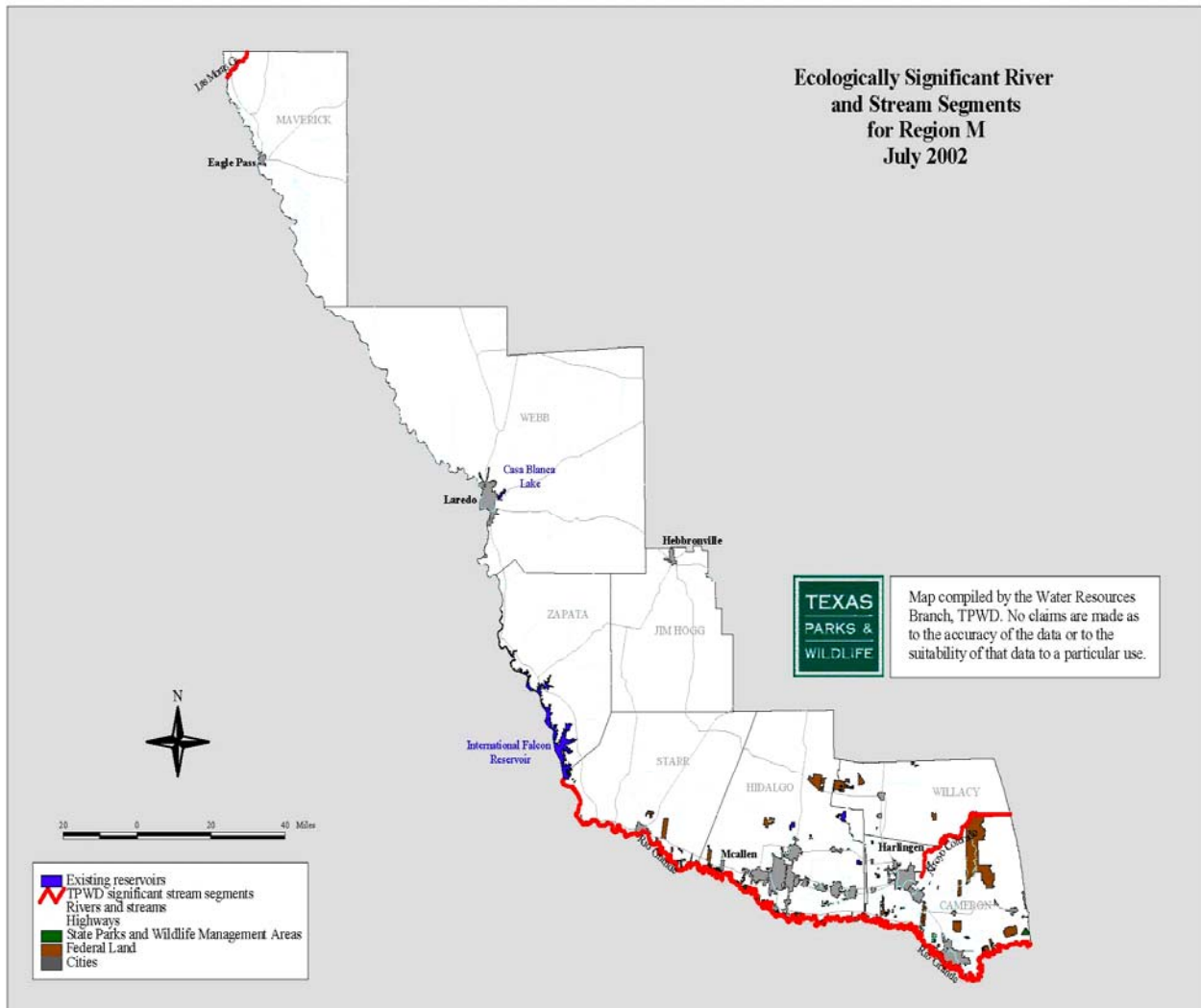


Table 8.1: Potential Ecologically Unique River and Stream Segments within the Rio Grande Region Group

River segment number	TCEQ segment ID number	Basin/Waterway	Location/Sublocation	Remarks and Nominating Entity	Functions B: Biological H: Hydrological RCA: Riparian Conservation Areas Q: High Water Quality, Exceptional Aquatic Life, High Aesthetic Value S: Threatened or Endangered Species, Unique Communities
1		Lower Rio Grande /Las Moras Creek	From confluence with Rio Grande in Maverick County upstream to Maverick/Kinney County line	Entire segment identified as significant, but primary area of concern due to spring-fed springs lies in Kinney County, outside Region M boundaries. Selection criteria from <i>Ecologically Significant River & Stream Segments of the Rio Grande (Region M) Regional Water Planning Area</i> (TPWD) Nominated by: TPWD	B: Riparian habitat with trees & shrubs; habitat & associated water very valuable for fish/wildlife H: Regulation & protection of baseflows, fisheries habitat, water supplies & groundwater RCA: None identified on this segment Q: Ecoregion stream, dissolved oxygen, benthic macroinvertebrates; aesthetic & economic value for fishing, birding, hiking, picnicking, camping S: wood stork, least tern, Proserpine shiner, ocelot, jaguarondi, several other state-threatened species
2	2301 2302	Lower Rio Grande/Rio Grande	From confluence with Gulf of Mexico in Cameron County upstream to Falcon Dam in Starr County	Selection criteria from <i>Ecologically Significant River & Stream Segments of the Rio Grande (Region M) Regional Water Planning Area</i> (TPWD) Nominated by: TPWD with support from FWS – Lower Rio Grande National Wildlife Refuge, Zapata County, and Texas Shrimp Association	B: Extensive freshwater and estuarine wetland habitat, resaca woodlands, lomas, emergent saltmarsh, seagrass beds in South Bay H: Flood control; regulation/protection of fisheries, water supplies, groundwater & baseflows in the river; freshwater inflow prevents saltwater intrusion RCA: Lower Rio Grande Valley NWR; Bentsen Rio Grande SP; Santa Ana NWR; Sabal Palm Sanctuary; Boca Chica SP; S. Bay Coastal Q: Overall use; benthic macroinvertebrates; high economic value for fishing, boating & birding; important for common snook population S: Texas ayenia, piping plover, Blackfin goby, several other state threatened species; Black Mangrove Series; Texas Palmetto
2A		Lower Rio Grande/Rio Grande	From confluence with Gulf of Mexico in Cameron County upstream to Falcon Dam in Starr County/ From Roma area upstream to Falcon Dam	No documentation submitted Nominated by: FWS – Lower Rio Grande National Wildlife Refuge	S: Wild muscovy duck, hookbill kite, breeding populations of brown jay and red-billed pigeon
2B		Lower Rio Grande/Rio Grande	From confluence with Gulf of Mexico in Cameron County upstream to Falcon Dam in Starr County/ From confluence with	No documentation submitted Nominated by: FWS – Lower Rio Grande National Wildlife Refuge	S: Unique marine organisms, including blue land crab & red land crab

			Gulf of Mexico upstream to just east of Brownsville		
2C		Lower Rio Grande/ Rio Grande	From confluence with Gulf of Mexico in Cameron County upstream to Falcon Dam in Starr County/ From Rio Grande City area upstream to south of Falcon Dam	No documentation submitted Nominated by: Project Coordinator, Zapata County	
2D		Lower Rio Grande/Rio Grande	From confluence with Gulf of Mexico in Cameron County upstream to Falcon Dam in Starr County/ From confluence with Gulf of Mexico upstream to Laredo area	No documentation submitted Nominated by: Texas Shrimp Association	B: Recruitment value/ productivity of estuary, importance to marine shrimp of Laguna Madre and Gulf H: Geology/function of the Rio Grande/ Nueces Basin and the Tamaulipan Plain
3		Lower Rio Grande/Rio Grande	Rapids in 3 to 5-mile stretch, from just south of Rio Bravo in Zapata County, near Laredo	No documentation submitted Nominated by: Project Coordinator, Zapata County	H: Water-quality data indicate aeration improves water quality below rapids
4	2201	Lower Rio Grande/Arroyo Colorado	From confluence with lower Laguna Madre upstream to Harlingen area	Selection criteria from <i>Ecologically Significant River & Stream Segments of the Rio Grande (Region M) Regional Water Planning Area</i> (TPWD) Nominated by: TPWD with support from Rio Grande RWPG member on behalf of Cameron County Commissioner; and Texas Shrimp Association	B: Unique because inflow from Arroyo provides main source of freshwater to Laguna Madre; recruitment value/ productivity of estuary, importance to marine shrimp of Laguna Madre and Gulf H: Downstream flood control; regulation of baseflows; protection of fisheries, water supply, groundwater; helps prevent saltwater intrusion upstream RCA: Laguna Atascosa NWR, Goat Island Wildlife Management. Area, City of Harlingen property Q: High water quality/exceptional aquatic life/high aesthetic value S: Brown pelican, piping plover, ocelot, jaguarundi, Texas ayenia, sheep frog, common black-hawk, Coues' rice rat, and several other state threatened species
5		Lower Rio Grande/Los Olmos Creek		Only upon confirmation that stream is not intermittent	

8.2 RESERVOIR SITES

TWDB rules (31 TAC, Section 357.9) for the preparation of regional water supply plans provide that the regional water planning groups "...may recommend sites of unique value for construction of reservoirs by including descriptions of the sites, reasons for the unique designation and the expected beneficiaries of the water supply to be developed

at the site.” TWDB rules further specify that the following criteria be applied to determine whether a site is unique for reservoir construction:

1. *site-specific reservoir development is recommended as a specific water management strategy or in an alternative long-term scenario in an adopted regional water plan; and,*
2. *the location, hydrologic, geologic, topographic, water availability, water quality, environmental, cultural, and current development characteristics or other pertinent factors make the site uniquely suited for:*
 - a. *reservoir development to provide water supply for the current planning period; or,*
 - b. *where it might reasonably be needed to meet needs beyond the 50-year planning period.*

Three reservoir sites have been considered by the Rio Grande RWPG: (1) the proposed Brownsville Weir and Reservoir; (2) the proposed Banco Morales Reservoir, and (3) the proposed Laredo Low Water Weir. Each project is briefly discussed below.

8.2.1 Brownsville Weir and Reservoir

An overview of the proposed Brownsville Weir and Reservoir is provided in Chapter 5 of this plan. The City of Brownsville Public Utilities Board (PUB) has acquired the required state water right permit and the federal Section 10/404 permit for this project and has obtained federal funding for engineering design and construction. Currently, the PUB is working with the U.S. and Mexican Sections of the International Boundary and Water Commission (IBWC) to develop an implementation plan for the project, including consideration of ownership, financing and operational issues. Implementation of the project will require approvals from the IBWC and Mexico. The PUB also is discussing a partnership with the City of Matamoros for the project whereby the two cities would share in the benefits of the project. There is currently no timetable set for this project.

The Brownsville Weir and Reservoir project is expected to provide approximately 20,000 acre-feet per year of additional dependable surface water supply for the City of Brownsville. This additional supply will play an important role in meeting Brownsville’s projected water supply needs through the planning period. The development of the project is included as a recommended water supply strategy in the first (2001) Rio Grande Regional Water Plan (Region M) and in the resulting (2002) State Water Plan. It is also recommended in this Regional Plan (2010).

8.2.2 Banco Morales Reservoir

The Banco Morales Reservoir is being proposed by the Brownsville Public Utilities Board (BPUB) as a surface water development project on the Lower Rio Grande in Cameron County. This project is proposed to provide additional dependable water

supply for municipal and industrial use for the City of Brownsville, by capturing and diverting “excess” flows of United States waters in the Rio Grande, as well as storing the City’s existing water rights. As it stands now, the excess water is currently allowed to flow through Brownsville and into the Gulf of Mexico. It will now have a chance to be captured and stored and pumped to future users. This Project is proposed to meet the future municipal and industrial water needs of the BPUB and the Region. Existing municipal and industrial water supply sources for BPUB cannot currently satisfy the anticipated future water needs for the region.

The Banco Morales Reservoir project is expected to provide approximately 238 acre-feet per of additional dependable surface water supply for the City of Brownsville. The additional supply will play an important role in meeting Brownsville’s projected supply needs through the planning period. The development of the project is included as a recommend water supply strategy for the first time in this round of planning.

8.2.3 Laredo Low Water Weir

Laredo has been investigating the feasibility of developing a low water weir on the Rio Grande approximately 200 feet downstream of the existing La Bota site. The project will not develop additional water supply. Rather, the project is proposed to improve water quality, provide a diversion location for a new regional water treatment plant, and provide hydroelectric power. Recreational amenities may also be developed. The proposed structure would be 56 feet high, which would provide a water surface elevation below the 100-year flood plain. The design and operation of the structure would not alter the normal flows of the Rio Grande. The weir would store approximately 66,007 acre-feet of water. Laredo intends to lease water rights for the initial filling of the reservoir.

At the request of Laredo, the Rio Grande RWPG has endorsed further investigation of the feasibility of the Laredo Low Water Weir. This would include more detailed evaluation of project costs, benefits, impacts, and permitting requirements.

8.2.4 Recommendations

Neither the Brownsville Weir and Reservoir, Banco Morales Reservoir, nor the Laredo Low Water Weir are recommended for designation as a unique reservoir site at this time.

8.3 REGULATIONS, ADMINISTRATIONS, AND LEGLISTALIVE RECOMMENDATIONS

Texas Water Development Board rules provide that regional water plans may include “regulatory, administrative, or legislative recommendations that the regional water planning group believes are needed and desirable to facilitate the orderly development,

management, and conservation of water resources and preparation for and response to drought conditions...." [31 TAC 357.7(a)(10)]

8.3.1 Recommendations for 2010 Plan

Recommendations on State Issues

- 1. The Texas Legislature should appropriate funds to the Texas Water Development Board to implement and provide assistance to water user groups in developing and implementing appropriate Advanced Water Conservation measure, including a statewide public outreach and education program.**
2. The region is projecting a shortage in water supply in the coming future. There are limitations for funding, but to overcome this, more state assistance is needed.
3. The State of Texas should consider factors other than merely population in funding the planning process in Region M because of the unique circumstances (i.e., 1944 Treaty, lowest rainfall, high tourism rates, high immigration rates) affecting water supply in the area.
4. The State should consider revising population for future planning rounds based on the most recent data available, including census data.
5. The State should consider revising its methodology towards Water User Groups that serve populations in more than one city, town, village, or unincorporated area. Further, the plan should only include Water User Groups that actually provide potable water to the populous. In the previous Regional Plan, population and water demand figures for Water Districts and Water Supply Corporations and the cities they serve were listed individually. Specifically, North Alamo Water Supply Corporation, East Rio Hondo Water Supply Corporation, Military Highway Water Supply Corporation, Valley Municipal Utility District No. 2, and Laguna Madre Water District had population and water demand projections, as did the cities they serve. This arrangement created confusion, and in some cases, double counting.

It is proposed to list the population and water demands of cities and their residents who are served by Water Districts and Water Supply Corporations as subsidiaries of these Districts/Corporations as opposed to individual WUGs. This will allow the Regional Plan to more accurately establish population and water demand figures.

6. The State should fully fund the revision and update to the Water Availability Model to include data up to the year 2005, thereby allowing for the full

investigation of a potential drought of record in the region from the late 1990s to the early 2000s.

7. The State should consider the impacts of climate change in terms of Regional Water Planning and future water supplies.
8. The State should continue considering the allocation of Rio Grande flows upstream of Ft. Quitman in terms of treaty compliance.
9. The State should investigate the true impact and treaty compliance factors associated with the construction of an aqueduct from Falcon Reservoir to Matamoros, Tamaulipas, Mexico.
10. The State should continue financing brackish groundwater projects and seawater desalination project as means to increase water supply alternatives in the region.
11. The State should authorize the Rio Grande Watermaster to manage the Rio Grande WAM and should fully appropriate to the Texas Commission on Environmental Quality fees paid by Rio Grande water right holders as specified in Section 11.329 of the Texas Water Code for the purpose of fully funding Rio Grande Watermaster operations.
12. The State should assist in finding new technical and financial resources to help the region combat aquatic weeds and salt cedar and thus protect its water supplies. The Rio Grande RWPG joins with the Far West Texas and Plateau RWPGs to encourage funding for projects aimed at eradicating salt cedar in the Rio Grande watershed and for ongoing long-term brush management activities.
13. The State should continue providing technical and financial resources to fully develop the regional GAM.
14. The Texas Commission on Environmental Quality should provide assistance to the Rio Grande RWPG as it reviews rules on converting water rights from one use to another and considers appropriate rule amendments, if necessary.
15. Entities within the region are encouraged to cooperate to resolve water issues through such means as regional water and wastewater utilities.
16. The formation of groundwater conservation districts is encouraged as a means to protect groundwater supplies, which are increasingly being tapped as a new water supply for municipal and industrial use.

17. The State should appropriate sufficient funds to the Texas Railroad Commission to allow for capping abandoned oil and gas wells that threaten groundwater supplies.
18. The Texas Legislature should provide technical and financial assistance to implement water management strategies identified in the regional water plans.
19. The Texas Legislature should appropriate funds to continue the regional water planning process.

Recommendations on National and International Issues

1. The International Boundary and Water Commission (IBWC) should renew efforts to ensure that Mexico complies with Minute 309 and set in place means to achieve full compliance with the 1944 Treaty, including enforcement of Minute 234, which addresses the actions required of Mexico to completely eliminate water delivery deficits within specified treaty cycles. Water saved in irrigation conservation projects in Mexico will be dedicated to ensure deliveries to the Rio Grande pursuant to the 1944 Treaty under Article 4B(c) and Minute No. 234.
2. The United States and Mexico should reinforce the powers and duties of both Sections of the IBWC pursuant to Article 24(c) which provides, among other things, for the enforcement of the Treaty and other Agreement provisions that "... *each Commissioner shall invoke when necessary the jurisdiction of the Courts or other appropriate agencies of his Country to aid in the execution and enforcement of these powers and duties.*"
3. The Minute 309 conservation projects funded by the North American Development Bank and other projects funded by national and international agencies to modernize and improve the facilities of irrigation districts in the Rio Grande Basin should be supported and given priority. In particular, both countries should support continued grant funding for conservation projects through the NADBank's Water Conservation Investment Fund.
4. The conservation irrigation projects are authorized through the Bureau of Reclamation for improvement to the irrigation systems of irrigation districts in the Rio Grande Basin in the United States should be supported and implemented.
5. For purposes of clarity, the IBWC should approve a Minute setting out the definition of "extraordinary drought" as that term is implicitly defined in the second subparagraph of Article 4B(d) as an event which makes it difficult for Mexico "... to make available the *run-off* of 350,000 acre feet (431,721,000 cubic meters) annually." A drought condition occurs when

there is less than 1,050,000 acre feet annually of *run-off waters* in the watersheds of the named Mexican tributaries in the 1944 Treaty, measured as water enters the Rio Grande from the named tributaries.

6. Accounting of water between the United States and Mexico pursuant to the 1944 Treaty should be consistent with the 1906 Convention, which provides that all waters measured at Fort Quitman, Texas, are 100 percent allocated to the United States. This is recommended by the "Special Study No. 1: Evaluation of Alternate Water Supply Management Strategies Regarding the use and Classification of Existing Water Rights on the Lower and Middle Rio Grande."¹
7. For better water management in the Lower Reach of the Rio Grande, downstream of Anzalduas Dam, both countries should reaffirm operational policies that Mexico continue to take its share of waters through the Anzalduas canal diversion at the Anzalduas Dam or account for its water at that point, including any diversions by Mexico from the proposed Brownsville Weir Project storage, to the extent of its participation in the project.
8. IBWC should convene a binational meeting of water planners and water use stakeholders in both countries within six months following completion of the annual water accounting in which an annual deficit in flows from the named Mexican tributaries in the 1944 Treaty occurs. This meeting would be designed to share data and information useful in planning for water needs and contingencies in the intermediate future.
9. IBWC should restore the Rio Grande below Fort Quitman, Texas.
10. The IBWC should assume all local and regional financial responsibility for upkeep and maintenance of El Morillo Drain.
11. IBWC should coordinate bilateral efforts to review and evaluate existing sources of data regarding groundwater development in both countries in the Rio Grande Basin below Fort Quitman to the Gulf of Mexico. This effort should be focused on the potential impact on surface water supply in the Rio Grande watershed, with the goal of pursuing such actions as may be necessary to evaluate present conditions and promote programs protecting the historical surface water supply in affected regions.
12. Regional watershed planning should be encouraged on both sides of the Rio Grande throughout the basin, including efforts to promote binational coordination of long-range water plans.

¹ Special Study No. 1 full report can be found in the appendix, as well as a brief summary can be found in section 1.13.

13. Interstate compacts between affected states in Mexico, similar to the Rio Grande Compact and Pecos River Compact between affected states in the United States, which deal with apportionment of available water supply from the Rio Grande and its tributaries to each state consistent with existing domestic and international law should be encouraged.

8.3.2 Issues Identified in 2005 Planning Process

In the second round of regional water planning, the TWDB emphasized “input from RWPGs for the policy portion of the 2007 State Water Plan” (Memo from William Mullican, then Deputy Executive Administrator, Office of Planning, July 2, 2003). The Board disseminated an “Initial List of Policy Topics” as a catalyst for discussion among the planning groups. In September 2003, Rio Grande Regional Water Planning Group members ranked each issue on the list as to level of importance in the region’s water planning efforts (“not at all important,” “somewhat important,” “important,” and “extremely important”).

The policy issues receiving top rankings from Rio Grande RWPG members fell into four major categories:

- A. International Treaty Compliance
- B. Competing Water Demands Between Agricultural & Municipal Interests
 - sustainable growth, including impacts of growth
 - assessment of the current water resources regulatory system to meet water management needs of the 21st century
 - impacts on water supply and quality resulting from conversion of agricultural lands to urban lands
 - protecting agricultural and rural water supplies, considering economic constraints and competing purposes
 - conservation of agricultural water for additional agricultural use, urban use or for environmental purposes
- C. Alternative Water Supply/Water Quality
 - integrating water quality and water supply considerations
 - watershed planning/source water protection
 - sustainability and groundwater management
- D. Technical & Financial Resources
 - state participation
 - potential funding sources for water supply
 - retail customer water pricing
 - incentives for planning implementation
 - improving groundwater availability data
 - education

The Rio Grande RWPG also approved a resolution encouraging the formation of groundwater conservation districts and greater oversight by of sales of groundwater produced from State-owned lands. The group also approved motions supporting the following:

- capping abandoned oil and gas wells
- improving the stretch of the Rio Grande known as the “Forgotten River”
- identifying and eradicating growing stands of salt cedar
- supporting Valley Water Summits

The Rio Grande RWPG firmly believes that these issues are tightly interconnected and that they cannot be discussed, much less resolved, in a vacuum.

Many of the issues and needs of the region arise from the fact that the Rio Grande is an international river whose waters are shared by the U.S. and Mexico. No other regional water planning area faces this reality. Water right holders in Texas lack any ready recourse to compel Mexico to observe the 1944 Treaty that apportions inflows between the countries. In addition, international protocols impact efforts to address water quality and resolve problems created by aquatic weeds, such as hydrilla and water hyacinth, and other invasive species, including salt cedar.

Although Mexico now has repaid its water debt, there are no enforcement mechanisms for preventing similar situations in the future.

Because of the unique way in which water rights are prioritized along the Rio Grande, the Mexican water debt has first and foremost directly impacted agricultural interests. However, repercussions from the debt also have affected municipal and industrial users. With the few exceptions of the Brownsville Public Utilities Board, Laguna Madre Water District (serving Port Isabel, South Padre Island and Laguna Vista) and the City of Laredo, municipal users of surface water depend on irrigation districts to pump and convey water supplies to their treatment plants. When irrigation flows are curtailed, municipalities must either find new ways to push raw water or turn to alternative sources.

Brackish groundwater resources have rapidly become a viable alternative for municipal suppliers located at a distance from the Rio Grande. In the first round of planning, the Rio Grande RWPG recommended that desalination be considered, but did not list it as a water management strategy for any water user group; in 2003, the plan was amended to incorporate desalination as a strategy for almost half of the 63 municipal water user groups in the region. Improvements in technology, coupled with the soaring cost of surface water rights, are making groundwater desalination an economical and reliable option. However, limited research has been conducted on the quality and quantity of groundwater supplies in the region. Furthermore, groundwater in certain parts of the region is threatened by abandoned uncapped oil and gas wells.

Irrigation districts also are looking to new technology and improved processes to minimize conveyance and evaporation losses attributable to an aging infrastructure. Districts do not have ready access to low-cost loans that are readily available to municipal suppliers. Several districts have secured funding from the North American Development Bank and the U.S. Bureau of Reclamation, but others cannot meet the local match requirements.

The water debt has created both challenges and opportunities for municipal and irrigation users to work together. The Rio Grande RWPG has supported initiatives such as the Valley Water Summits that bring different interests together to share problems and jointly create solutions.

The Watermaster Advisory Committee (WAC) also has proven to be an effective forum for addressing issues. Subsequent to the first planning cycle, the committee developed a rule change that freed up water in storage for irrigation use with no detriment to municipal supplies. Operations of the Rio Grande Watermaster are paid entirely by fees levied on water right holders. However, appropriations to the Watermaster are capped at a level that is significantly lower than revenues. This limits the ability of the office to provide services to meet changing needs, such as maintaining and updating the newly developed Rio Grande Water Availability Model.

Particular attention should be directed to rules pertaining to water rights. Currently, when the intended use of irrigation water rights is changed to municipal and industrial use, a conversion factor provided in 30 TAC § 303.43 is applied so that the municipal use after conversion will receive a "definite quantity of water in acre-feet per annum." This rule is consistent with the treatment of certain municipal, industrial and domestic allocations approved in the Final Judgment of the Valley Water Suit, which provided for a reserve of 60,000 AF/year to be held for domestic use and use by cities to support these allocations. This reserve was increased to 225,000 AF/year, under a conversion rule adopted by the then Texas Water Rights Commission on July 2, 1986, following the conclusion of the Middle Rio Grande Adjudication. Information developed through the WAM and as part of the Regional Planning process would indicate that this practice should be reviewed with respect to long term water management practices on the Lower and Middle Rio Grande downstream from Amistad Reservoir. Additional studies are required to analyze the long term impact of reducing authorized municipal and industrial reserves on two fronts: (1) providing a defined entitlement and (2) promoting water conservation in both Amistad and Falcon Reservoirs.

Environmental flows also have been critically impacted by the water debt and over-reliance on surface water supplies. During the second round of regional planning, the Rio Grande actually ceased flowing into the Gulf of Mexico.

As noted in Chapter 7, one possibility for maintaining and increasing environmental flows is the purchase of Rio Grande water rights by an environmental entity.

Deposited in a trust, these water rights could be managed to produce sufficient flows throughout the region. However, this option may not be viable because of the current water rights purchase and transfer structure. In addition, because of the WUG format currently being implemented by the TWDB, no option exists to formally allocate projected water supplies for environmental use. Environmental flows in the Rio Grande could be included as a separate WUG in the next round of regional planning to ensure minimums would be met in a manner consistent with all other WUGs.

International cooperation is critically needed to maintain flow levels. If the United States were to implement an environmental flow program without Mexico's participation, the desired effect would be significantly reduced.

Finally, international attention also could enhance water quality as well as safety. Lower valley water interests have been responsible for a significant portion of the construction and upkeep of El Morillo Drain, built in 1969 to divert salty water from the Rio Grande. Currently, The International Boundary and Water Commission has proposed to assume complete responsibility for the U.S. share of the upkeep, including maintenance of levees. The Rio Grande Regional Water Planning Group supports this move.

8.3.3 Recommendations from the 2005 Plan

Because issues identified during the 2005 planning process, the Rio Grande RWPG made a number of recommendations for action to address regional water needs. Some of these recommendations fall within the authority of the State of Texas; others were to be addressed through the auspices of the International Boundary and Water Commission and/or other international and federal agencies. Accordingly, the recommendations have been categorized, as follows.

Recommendations on State Issues

1. The State of Texas should consider factors other than merely population in funding the planning process in Region M because of the unique circumstances affecting water supply in the area.
2. The State should continue financing brackish groundwater projects and the demonstration seawater desalination project as means to increase water supply alternatives in the region.
3. The State should authorize the Rio Grande Watermaster to manage the Rio Grande WAM and should fully appropriate to the Texas Commission on Environmental Quality fees paid by Rio Grande water right holders as specified in Section 11.329 of the Texas Water Code for the purpose of fully funding Rio Grande Watermaster operations.

4. The State should assist in finding new technical and financial resources to help the region combat aquatic weeds and salt cedar and thus protect its water supplies. The Rio Grande RWPG joins with the Far West Texas and Plateau RWPGs to encourage funding for projects aimed at eradicating salt cedar in the Rio Grande watershed and for ongoing long-term brush management activities.
5. The State should continue providing technical and financial resources to fully develop the regional GAM.
6. The State should amend the planning process to allow for treating each irrigation district within the region as a WUG, rather than as part of "County-Other," in order to allow for development of individual water management strategies for the districts.
7. The Texas Commission on Environmental Quality should provide assistance to the Rio Grande RWPG as it reviews rules on converting water rights from one use to another and considers appropriate rule amendments, if necessary.
8. Entities within the region are encouraged to cooperate to resolve water issues through such means as regional water and wastewater utilities.
9. The formation of groundwater conservation districts is encouraged as a means to protect groundwater supplies, which are increasingly being tapped as a new water supply for municipal and industrial use.
10. The State should appropriate sufficient funds to the Texas Railroad Commission to allow for capping abandoned oil and gas wells that threatened groundwater supplies.
11. The Texas Legislature should provide technical and financial assistance to implement water management strategies identified in the regional water plans.
12. The Texas Legislature should appropriate funds to continue the regional water planning process.
13. The Texas Legislature should appropriate funds to the Texas Water Development Board to implement and provide assistance to water user groups in developing and implementing appropriate Advanced Water Conservation measures, including a statewide public outreach and education program.

Recommendations on National and International Issues

1. The International Boundary and Water Commission (IBWC) should renew efforts to ensure that Mexico complies with Minute 309 and set in place means to achieve full compliance with the 1944 Treaty, including enforcement of Minute 234, which addresses the actions required of Mexico to completely eliminate water delivery deficits within specified treaty cycles. Water saved in irrigation conservation projects in Mexico should be dedicated to ensure deliveries to the Rio Grande pursuant to the 1944 Treaty under Article 4B(c) and Minute No. 234.
2. The United States and Mexico should reinforce the powers and duties of both Sections of the IBWC pursuant to Article 24(c) which provides, among other things, for the enforcement of the Treaty and other Agreement provisions that “... *each Commissioner shall invoke when necessary the jurisdiction of the Courts or other appropriate agencies of his Country to aid in the execution and enforcement of these powers and duties.*”
3. The Minute 309 conservation projects funded by the North American Development Bank and other projects funded by national and international agencies to modernize and improve the facilities of irrigation districts in the Rio Grande Basin should be supported and given priority. In particular, both countries should support continued grant funding for conservation projects through the NADBank’s Water Conservation Investment Fund.
4. The conservation irrigation projects currently underway through the Bureau of Reclamation for improvement to the irrigation systems of irrigation districts in the Rio Grande Basin in the United States should be supported and implemented.
5. For purposes of clarity, the IBWC should approve a Minute setting out the definition of “extraordinary drought” as that term is implicitly defined in the second subparagraph of Article 4B(d) as an event which makes it difficult for Mexico “ ... to make available the *run-off* of 350,000 acre feet (431,721,000 cubic meters) annually.” A drought condition occurs when there is less than 1,050,000 acre feet annually of *run-off waters* in the watersheds of the named Mexican tributaries in the 1944 Treaty, measured as water enters the Rio Grande from the named tributaries.
6. Accounting of water between the United States and Mexico pursuant to the 1944 Treaty should be consistent with the 1906 Convention, which provides that all waters measured at Fort Quitman, Texas, are 100 percent allocated to the United States.
7. For better water management in the Lower Reach of the Rio Grande, downstream of Anzalduas Dam, both countries should reaffirm operational

policies that Mexico continue to take its share of waters through the Anzalduas canal diversion at the Anzalduas Dam or account for its water at that point, including any diversions by Mexico from the proposed Brownsville Weir Project storage, to the extent of its participation in the project.

8. IBWC should convene a binational meeting of water planners and water use stakeholders in both countries within six months following completion of the annual water accounting in which an annual deficit in flows from the named Mexican tributaries in the 1944 Treaty occurs. This meeting would be designed to share data and information useful in planning for water needs and contingencies in the intermediate future.
9. IBWC should restore the Rio Grande below Fort Quitman, Texas.
10. The IBWC should assume all local and regional financial responsibility for upkeep and maintenance of El Morillo Drain.
11. IBWC should coordinate bilateral efforts to review and evaluate existing sources of data regarding groundwater development in both countries in the Rio Grande Basin below Fort Quitman to the Gulf of Mexico. This effort should be focused on the potential impact on surface water supply in the Rio Grande watershed, with the goal of pursuing such actions as may be necessary to evaluate present conditions and promote programs protecting the historical surface water supply in affected regions.
12. Regional watershed planning should be encouraged on both sides of the Rio Grande throughout the basin, including efforts to promote binational coordination of long-range water plans.
13. Interstate compacts between affected states in Mexico, similar to the Rio Grande Compact and Pecos River Compact between affected states in the United States, which deal with apportionment of available water supply from the Rio Grande and its tributaries to each state consistent with existing domestic and international law should be encouraged.

8.3.4 Recommendations in 2000 Plan

In the initial round of planning that culminated with the 2000 regional plan, the Rio Grande RWPG identified 12 issues affecting water policy and planning. The group elected to make recommendations on 10 of those issues. These issues, the group's recommendations, and subsequent developments on the issues are presented in Table 8.2.

Table 8.2: RGRWPG 2000 Recommendations and Update

Issue	2000 Plan Recommendations	Status
Creation of a regional water management entity	The Texas Legislature create a regional water entity for the purposes of management of the waters of the Rio Grande, development of water conservation and water supply projects, water quality monitoring and planning, and other purposes and functions typically performed by agencies created under Article 16, Chapter 59 of the <i>Texas Constitution</i> .	The Lower Rio Grande Authority, created in 1951 reconstituted itself. Composed of irrigation districts in Cameron, Willacy, Hidalgo Counties; added nonvoting members representing municipal water interests. The LRGA was abolished in 2005 by HB 2639 Rio Grande Regional Water Authority created by SB 1902 by Sen. Lucio. Encompasses Rio Grande Regional Water Planning Area, minus City of Laredo and Jim Hogg County. Irrigation and municipal interests represented. Four vacancies remain unfilled.
Mexico's compliance with the 1944 Treaty	<ol style="list-style-type: none"> 1. The U.S. government take all necessary and appropriate actions to ensure full compliance by Mexico with the terms of the 1944 Treaty and Minute No. 234 governing the development and use of the waters of the Rio Grande. 2. The dialogue continue between the U.S. and Mexico with regard to the development of an operating plan for Mexican tributary reservoirs that will ensure full compliance with the treaty while also optimizing the amount of water supply available to Mexico for beneficial use. 3. The U.S. Section of the International Boundary and Water Commission continue to seek and provide opportunities for direct stakeholder participation in bi-national discussions regarding the management of the waters of the Rio Grande. 	<ol style="list-style-type: none"> 1. Mexico repaid the water debt in the fall of 2005. 2. No definite plan for ensuring compliance. 3. IBWC has organized stakeholder groups, including the Lower Rio Grande Citizens' Forum (LRGCF), to act as a focal point for the exchange of information between it and local communities regarding USIBWC projects in the area. The LRGCF Board has 11 members representing diverse interests and meets approximately four times per year.
Agricultural lands preservation	Municipalities and irrigation districts in the LRGV coordinate closely on matters of urbanization and its implications for both urban and agricultural water supply infrastructure planning and development because reduction of irrigated acreage as a result of urbanization has important implications for district operations and deliveries to municipalities as well as agricultural producers.	2004 and 2005 Valley Water Summits have created opportunities for dialogue between municipalities and irrigators and new understanding of issues. The parties are working together to develop list of mutually beneficial projects.
Regionalization of water & wastewater utility services	Further regionalization of water and wastewater utility services be investigated and implemented where appropriate, because regionalization of urban water supply and/or wastewater systems offers the potential for significant cost savings in acquiring water supplies for urban use, as well as the potential for reduced costs and improved reliability of water and wastewater utility services.	Several consortia are implementing regional projects, particularly brackish groundwater desalination. These include the Southmost Regional Water Authority and projects involving North Alamo Water Supply Corp.
Irrigation district water allocation policies	Irrigation districts review their water allocation policies, procedures, and practices to facilitate water transfers among agricultural users. In addition to providing a method for equitable water distribution during periods of shortage, water allocation by irrigation districts has also enabled an active water market within the agricultural sector.	The Lower Rio Grande Authority serves as a forum for districts to work together. The LRGA created an on-line Water Market to facilitate sales of wet water and water rights among all users. The Rio Grande Regional Water Authority may continue these initiatives.
Water availability models	State funding be provided for development of a state water availability model for the Rio Grande River Basin.	The Rio Grande WAM was completed in Sept. 2004, providing important data on inflows and firm yield.
Re-channelization/ Restoration of the Rio Grande	Federal funding be provided to the IBWC for an in-depth investigation of the costs, benefits, and impacts of re-channelizing a portion of the Rio Grande upstream of the Amistad Reservoir. The proposed study would examine whether periodic removal of salt cedar and other vegetation, along with channel improvements, would	

	increase water flows in this stretch of the Rio Grande and allow passage of more flows from upstream reaches of the river.	
Desalination	The State consider funding additional research/development of groundwater desalination projects and offer financial assistance and incentives for implementation.	TWDB has selected three groundwater desalination projects as demonstrations, including one coordinated by the North Cameron Regional WSC. Funding for the projects is expected in January 2006. The Board also funded feasibility studies for three potential seawater desalination projects, including a project of the Brownsville PUB. TWDB anticipates funding pilot plant for each of the three projects, beginning in the spring of 2006. In August 2003, the Rio Grande RWPG amended the 2001 adopted regional water plan to include brackish groundwater and seawater desalination as water management strategies.
Funding for data collection, review, reporting activities and for preparation of feasibility level studies	<ol style="list-style-type: none"> 1. TWDB provide funding for data collection activities in rural areas, including establishing and adequately funding the collection and distribution of groundwater availability data. 2. The Legislature provide funding for the cooperative, federal-state-local program of basic water data collection, including collection, assimilation and analysis of basic data needed to assess the ground and surface water resources of each region to a 90 percent accuracy level. 3. TWDB and Texas Natural Resource Conservation Commission (now the Texas Commission on Environmental Quality) facilitate access to water data essential for local and regional planning and plan implementation purposes. 4. TWDB and TNRCC expand activities in collecting, managing, and disseminating information on groundwater conditions and aquifer characteristics. 5. SB1 be amended to allow state funding of ongoing regional data collection activities that are sponsored by RWPGs. 6. TWDB study the effects of groundwater consumption on springflow. 	<p>TWDB currently has a water-level and water-quality monitoring program that covers the entire state, including rural areas. TWDB has obtained groundwater availability models for all of the major aquifers of the state and continues to develop models for the minor aquifers. TWDB provides GAM runs to groundwater conservation districts and regional water planning groups free of charge.</p> <p>The Legislature provides the TWDB with funding to monitor the flow in the state's rivers in cooperation with the U.S. Geological Survey and local cooperators. However, costs have increased while state funding has remained level.</p> <p>TWDB has placed all regional water plans on its web page for public access, plus some information from the plan databases. TWDB plans to place most if not all information from the databases for the 2007 State Water Plan on the web.</p> <p>TWDB continues to strive to collect, manage, and disseminate information on the state's aquifers. Through the GAM program, TWDB has collected considerable information on the state's aquifers. TWDB is working to organize this information is geodatabases to make available over the web. TWDB has also continued to support basic research in groundwater with work on brackish groundwater, recharge, and evapotranspiration.</p>
Modifications to planning process	<ol style="list-style-type: none"> 1. The grass roots regional water planning process enacted by SB1 be continued with appropriate funding. 2. TWDB and TNRCC evaluate the effect of groundwater withdrawal on surface water availability and streamflows. 3. The planning process provide for consistency in whether normal water conservation assumptions should be included in the supply and demand projections, or as water management strategies for conserving/developing water supplies. 	<p>The second round of water planning has included funding of activities necessary for grass-roots participation.</p> <p>The planning process also must consider impacts to natural resources and the environment and must consider water quality factors in developing water management strategies.</p> <p>Funding for implementation continues to be an issue.</p>

