

Implementing the GBRA-TAP Agreement

In 2016, the Guadalupe-Blanco River Authority (GBRA) and The Aransas Project (TAP) reached agreement to work together on habitat and inflow issues surrounding San Antonio Bay and the endangered whooping crane. This agreement was forged out of hard fought litigation over water for San Antonio Bay and the endangered whooping crane flock and sets out a vision of working with each other and other interested parties to find a pathway to shared success.

During 2017, under a grant from Mitchell Foundation, GBRA and TAP worked with a consulting firm, Ross Strategic, to flesh out key concepts and tasks for moving forward to implement the promise of the agreement. To this end, Ross Strategic interviewed numerous stakeholders and met several times with GBRA and TAP representatives to offer various ideas about what research and action areas might be pursued. Out of this process, four key concepts emerged that will form the foundation for work under the GBRA-TAP agreement. The four areas are (1) whooping crane habitat expansion, (2) realizing the potential of the Guadalupe delta, (3) ensuring sufficient fresh water inflows to maintain a refugium area in San Antonio Bay during drought conditions and (4) working with landowners within the watershed to establish a market for buying and selling ecosystem services that would, among other things, augment base flows in the Guadalupe and San Antonio River systems.

In the paragraphs that follow, each of these ideas will be explored in detail, both with respect to the work that needs to be done and with respect to ideas about getting that work done. For each of these ideas, the intent is to identify stakeholders to help in the development and implementation of these ideas.

1. Whooping Crane Habitat Expansion

The greatest opportunity regarding the last wild flock of whooping cranes in the world is to expand the range beyond the traditional boundaries of Aransas National Wildlife Refuge. If the flock can be brought into other bay systems, the flock will have much more resilience against droughts affecting one watershed or another. To date, the flock has expanded into Copano Bay and Powerderhorn Lake and Oyster Lake on Matagorda Bay. But as the flock approaches 500 individuals, more habitat will be needed, and that requires analysis, coordination and working with landowners whose lands may become the habitat of the future.

The US Fish and Wildlife Service (USFWS) estimates that, depending on the quality of protected habitat, 84,000 to 323,000 additional acres of habitat are needed by 2100 to meet the downlisting criteria from endangered to threatened status for supporting 1,000 wintering whooping cranes.¹ These estimates consider a range of factors including projections for sea level rise along the Texas coastal bend. USFWS has identified a near-term goal of protecting 20,000 acres of wetland and estuarine habitat for wintering whooping cranes.² GBRA and TAP are committed to working together to make these habitat goals a reality as soon as possible. Near-term work to achieve that objective will include: (1) developing a shared understanding of priority habitat locations and types; (2) developing and launching a new Habitat Preservation and Enhancement Initiative to support habitat conservation including acquisition, easements, purchase of development rights, and landowner commodity contracts; and (3) increasing resources available for habitat conservation and restoration.

¹ US Fish and Wildlife Service. *Texas Coastal Bend Landscape Conservation Design*. Draft dated December 22, 2016. p. 13.

² Correspondence with USFWS, August 17, 2017.

The USFWS and the Texas Parks and Wildlife Department recently completed the Coastal Bend Landscape Conservation Design (LCD) that will help to identify habitat in the Coastal Region, from roughly Corpus Christi to Houston, that will be crucial to protect sufficient habitat to meet population goals for whooping cranes and other focal wildlife species. The LCD is based on modeling of projected sea level rise impacts to coastal habitats along with a growing whooping crane population. With the assistance of the LCD, USFWS will begin the development of a Land Protection Plan that would help to narrowly focus future habitat protection efforts.

In this effort, the International Crane Foundation (ICF) will be a key partner. ICF has undertaken substantial research related to priority habitat for whooping cranes and has added key personnel to their Rockport office to undertake more intensive habitat analysis and work with landowners.

GBRA and TAP will develop a new Habitat Preservation and Enhancement Initiative that complements USFWS land protection efforts and will work toward implementing as many tools as possible to support habitat expansion. Traditional tools such as donated or purchased conservation easements and development rights will be pursued, but our focus will also be on developing tools that may work better for landowners, many of whom are not interested in long-term easements or sales.

GBRA and TAP want to be creative. Working with USFWS and ICF, we will develop new tools that will be added to existing concepts. Many landowners worry about endangered species such as whooping cranes expanding into their property. We will study and understand tools such as Safe Harbor Agreements that remove certain of the regulations and restrictions that usually accompany the presence of an endangered species. If the landowner works voluntarily to make their

land more useful and attractive to the cranes, then there are ways to protect these landowners from the sting of these regulations.

Further, we will work to develop creative pricing mechanisms to pay landowners for maintaining habitat conducive to cranes. Our initiative will consider establishing a set price-per-acre for placing conservation easements on private lands that have high habitat value. GBRA and TAP may also explore implementation of a donated easement program that includes a pooled fund to offset transaction costs and/or to establish a stewardship endowment for secured easements. Properties participating in the initiative might also qualify for habitat restoration or enhancement funding from GBRA and TAP and their partners.

GBRA and TAP also will work together to explore development of new funding mechanisms to support conservation and restoration activities associated with the initiative, such as commodity contracts and exchanges. A new market is emerging where landowners are paid for managing their properties in a certain manner. For example, if a land area is being affected by sea level rise and *Spartina alterniflora* grasses are planted to enhance habitat value, the landowner could be paid on a yearly basis for enhancing that habitat for cranes. In this way, the landowner and the cranes could benefit, yet the property remains in private hands with a safe harbor agreement in place. This would be the same concept discussed in Section 4 below, except in this case, it would payment for managing land to benefit whooping cranes. In summary, GBRA and TAP will focus their organizational resources on protecting priority whooping crane habitat and will work together to attract funding to increase the resources available for permanent habitat protection and conservation activities. This will include exploring opportunities with RESTORE Act funding and other public funding sources, as well as creative strategies that explore market-based and philanthropic approaches. GBRA and TAP, in partnership

with the Guadalupe Blanco River Trust, a land trust affiliated with GBRA, will work with other land trusts, organizations, and other partners to accelerate progress in protecting whooping crane habitat. In the short term, the following steps will be pursued:

- Convene a working session with the USFWS, the State of Texas, and the International Crane Foundation (ICF) to understand their priorities and planned activities for protecting and expanding whooping crane habitat, including their habitat priorities and criteria that are appropriate for targeting land conservation efforts.
- Develop plans to fully utilize the increased staffing available to the International Crane Foundation.
- Reach out to innovative private sector efforts to protect habitat through commodity contracts.

2. Restore the Guadalupe River Delta

The Guadalupe Delta is a poorly understood area that has both problems and opportunities. At the top of the delta is the salt water barrier, an inflatable dam that keeps salt water from moving up the river. It also creates a reservoir that allows water rights to be fully used during lower flow conditions and helps divert water to various users by a system of channels. Further, understanding the flow of water into and through the delta is needed to implement strategies that benefit the regional economy and ecosystems.

From a habitat standpoint, the delta is home to Green Lake, a major potential recreational and habitat resource owned by Calhoun County. Additionally, the Texas Parks and Wildlife Department owns the Guadalupe Delta Wildlife Management Area and several private landowners own and manage key tracts. With sea level rising in the future, much of the habitat in the delta will be changing in one way or

another. It is important to understand these forces for change and work with them to achieve long-term in-flow and habitat goals.

At the current time, there is a need to better understand many physical aspects of the delta. We need to know topography and the key water channels. We may need to place gauges at key locations to understand current flows and ensure that the waters eventually dedicated to the bay actually are delivered. On a related note, GBRA has just issued a request for qualifications (RFQ) for a seasonal ecological assessment to collect data within the upper Guadalupe Delta relative to wetland plant productivity, freshwater tidal macroinvertebrates, and juvenile shellfish and finfish utilization. The purpose of this effort which is not to exceed \$75,000 is to initiate the process to better understand marsh and tidal zone productivity as a nursery habitat, including freshwater tidal macroinvertebrates, juvenile shellfish and finfish life cycles and habitat utilization in areas of the upper estuary where limited to no sampling has occurred over the years. The goal of this research is to correlate species abundance in relation to physical habitat and salinity found in the freshwater tidal zone and Guadalupe Delta with similar data collected in other Texas estuaries, and support a validation evaluation of the TCEQ Environmental Flow Standards.

In short, the delta is where the water meets the bay, and in that zone, there is both important habitat and the need for critical information relative to inflows. Not surprisingly, there are numerous stakeholders who should be involved in this effort to understand and restore the function of the delta. In addition to GBRA and TAP, key parties to this area of study include Calhoun County, various water users including Dow Chemical, private landowners, birding organizations and various non-profit organizations with an interest in the bay. Of all of the research areas under this agreement, this may be

the most interesting and difficult one due to the physical and institutional complexity.

3. Drought, Water Delivery and Refugium concept

There will likely never be enough water flowing in the Guadalupe and San Antonio River systems to avoid tough trade-offs with regard to meeting the needs of people and wildlife ecosystems during times of drought. However, enough water may be available to meet the needs of people and ensure that critical environmental flows are maintained during drought years to prevent collapse of key estuarine habitat and the San Antonio Bay food web. In this regard, the idea of a nursery refuge, or refugium, for fish and shellfish populations during dry years, along with the identification of a minimum amount of water that is needed in those places to sustain fish and shellfish, has emerged. In some respects, this concept originated in the problems faced by Nueces Bay as set out in the BBEST study from 2010 that identified that the bay had lost ecological productivity. Since that time, much effort has gone into finding sufficient inflows to maintain flow during the worst drought conditions. And while recovery of Nueces Bay may prove difficult, this process has a much better chance for success on the San Antonio Bay system that does not exhibit, to date, the problems observed in the Nueces Bay system.

The basic concept of the refugium is that the Bay's natural ability to replenish fish and shellfish populations after drought can and must be maintained to protect against catastrophic collapse of fisheries and ecosystems. On the other hand, this amount of inflow is much less than is identified as desirable under ideal conditions and likely will be less than inflows suggested by the bay and estuarine programs under SB3. In short, this is a concept of keeping the bay on life support during the worst of times. This is not a desired end point but rather a concept to keep collapse from occurring during high stress drought situations.

This work has three elements: (1) identifying the minimum flow amounts and inflow locations to best preserve critical bay processes; (2) creating sets of tools and incentives that bring more water to the table to improve and sustain flows, especially during dry years; and, (3) completing purchase of an initial increment of water and storage capacity to ensure the ability to supplement environmental flows during dry years.

Along this line, Harte Research Institute (HRI) has been engaged in an effort to analyze the minimum flows necessary to ensure that the San Antonio Bay survives through drought by maintaining a natural hatchery and refuge in the upper end of the Bay so that when rainfall does occur again, the Bay can repopulate. Whooping cranes primarily use the lower Bay system, but they utilize resources that require the upper Bay system, like the blue crab, and it is therefore also critical to understand salinity levels and impact on the food web. HRI is also working to develop an alternate data set on what defines San Antonio Bay health and the estuary conditions of the Bay, and how understanding how those conditions change at smaller temporal or spatial scales might help to manage for critical flows during droughts.

The Texas Environmental Flows (E-Flows) Working Group, coordinated out of The Meadows Center for Water and the Environment at Texas State University in San Marcos, is conducting a range of scientific and technical analyses to set the stage for successful water transactions in the Guadalupe River and San Antonio Bay system. These transactions would involve purchasing sufficient water rights to ensure necessary inflow to the bay and having a way to deliver that water at the necessary times. The strategies that the E-Flows Working Group plan to utilize to identify transactions include:

- Identify candidate water rights for potential acquisition by willing sellers
- Assess the reliability of the water right

- Assess the ecological benefits of candidate water rights
- Estimate the market value of candidate water rights
- Negotiate a transaction
- Secure needed amendments to the candidate water right
- Secure funding and execute the transaction

GBRA has also identified the possibility of developing an off-channel reservoir in the lower basin that could be used to store freshwater for targeted, pulsed releases into the system to implement this protected ecosystem “nursery” concept in the upper portions of San Antonio Bay to ensure the resilience of the ecosystem. In this regard, GBRA and TAP will support further research to: (1) establish priority freshwater flow regimes and locations needed to protect nursery areas for crab, fish, and other species during dry years in the upper segments of San Antonio Bay and to establish the minimum amounts of water needed in those locations to make a difference; (2) conduct analyses to determine the cost to purchase the rights to water that could be stored in a potential off-channel reservoir for use during dry years; and (3) continue work with the E-Flows Working Group to identify sources of funds, including RESTORE Act funding, for purchasing water rights.

Finally, James Dodson has brought an interesting storage mechanism to the attention of both GBRA and TAP. According to James, it may be possible to draw near-surface groundwater adjacent to the Guadalupe or San Antonio Rivers in a manner such that major impurities are removed by natural sand filtration. This water would technically be considered surface water and would be “scalped” during higher flow conditions. This treated water could then be stored in the Gulf Coast Aquifer and extracted when needed. This mechanism, if feasible, could be quite useful and important as a water management technique. Funding should be secured for future research on this interesting and creative proposal.

4. Ecosystem Service Payments for Water And Carbon

The Severe Storm Prevention, Education and Evacuation from Disaster (SSPEED) Center has been researching and developing a system to pay landowners for improving habitat and ecological services provided by their property. This concept, called the Texas Coastal Exchange, was originally developed to find ways to pay landowners along the coast to keep their lands natural in order to keep hurricane surge damages down. Over time, this concept has been shown to be quite versatile and has a significant potential role to play in the Guadalupe and San Antonio River watersheds.

The SSPEED Center has determined that restored prairie grasslands can provide enhanced water storage in the soil. As the carbon content of the soil increases and the root system penetrates deeper into the soil, rain falling on this land is taken into the soil in much higher quantities than in many improved pastures. This enhanced water holding capacity can shave the peak off of downstream flooding and can store water in the soil that in many cases can enhance seeps and springs. If this were done at the watershed scale, base flow in the Guadalupe and San Antonio River systems should be enhanced during times of the drought.

At this time, the Texas Coastal Exchange is in the development stage with a new name – the Soil Value Exchange or SVX. SVX is now being developed as a private, non-profit corporation that is just beginning efforts to recruit and work with ranchers in Texas and throughout the central United States to create, at least initially, a carbon transaction system that could also include water-based transactions. Currently, SVX is soliciting potential buyers of carbon dioxide storage capacity in soils – soils that are owned by private landowners throughout the Guadalupe and San Antonio basins. To date, two major oil companies have indicated an interest in helping

develop and implement this system, and SVX will, upon closing of initial contracts with these companies, begin seeking landowners to enroll in carbon testing that, over time, may lead to sales of carbon storage rights.

Under the SVX system, a landowner must establish a starting carbon content of their soil. Under the SVX system, no sales will occur until a few years have passed and the soil carbon content is tested a second time. At that point, the landowner may choose to sell the carbon that has accumulated in the soil if the price is right. On the other hand, if there is no accumulated carbon, there is no carbon to sell. It is a bit like growing potatoes; if you grow them, you can sell them.

Certain ranching techniques are likely to cause much more carbon to become sequestered in the soil. Of particular interest to the SSPEED Center research team is adaptive multi-paddock (AMP) grazing, a type of grazing that puts intensive grazing pressure on a smaller land area and then leaves that area to grow for a significant amount of time, after which it is again subjected to another rotation of grazing. AMP grazing is not required to participate in the SVX program. Indeed, preliminary research indicates that restoration of natural systems alone will be beneficial. However, the key is to develop plants with deep roots.

Anecdotal evidence indicates that water supply can be enhanced if the soil is improved and the grasslands restored. To date, there is little quantitative research about the potential benefit of soil and grassland ecosystem improvement on seeps and springs that supply base flow to rivers such as the Guadalupe and San Antonio. That research needs to be funded to determine the viability of this concept for enhancing water supply and freshwater inflows.

The potential impact of this system on farm and ranch economy is huge. Potentially, the oil and gas industry will be seeking carbon

storage capacity in soils as global pressure mounts to address carbon dioxide emissions. This SVX system is landowner friendly and totally voluntary and is philosophically consistent with Texas values and principles. If the water supply component can be documented, then this additional water supply may create a commodity opportunity. Further research will be needed to determine if this “created” water would represent a new type of water right or if it is just contributed to the pool of available water for usage. Either way, the hope is that the landowner can receive some compensation if in fact they are contributing to a more dependable water supply during droughts.

Conclusion

Implementation of the GBRA-TAP agreement is not envisioned to be another basin-wide planning and management framework. Instead, it is a focused, but important, interface between two key parties in the basin to catalyze support for broad-based efforts to ensure whooping crane habitat and sufficient freshwater flows to the Guadalupe Rivers System and San Antonio Bay.

GBRA and TAP recognize the critical role of other partners in the Basin as well as the need for effective multi-partner coordination mechanisms that can contribute to progress in this region. In the next several months, various stakeholder groups will be formed around these four different subject areas. Some of these may be limited in the number of participants and others may be much larger. All of this work will be overseen by the leadership of GBRA and TAP and an advisory board selected for their overall involvement and interest in these issues.