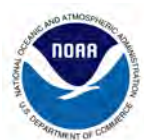


Hydrological Restoration Projects Inventory

October 2012-October 2013

Prepared by:
Karen Bishop and Karla Dunlap
Texas Sea Grant College Program
TAMU-SG-13-303





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Table of Contents

Introduction..... 5

Texas Hydrological Restoration Projects Inventory, 2012-2013..... 7

 Bahia Grande Channel F Freshwater Diversion..... 7

 Bahia Grande Railroad Crossing Removal 7

 Birding Station #14 7

 Cedar Bayou..... 7

 Corpus Christi Bay Habitat Conservation and Restoration Initiative 8

 Egery Flats 8

 Freshwater Siphon at Magnolia Cut on JD Murphree Wildlife Management Area..... 8

 Goose Island Marsh Restoration Levee Breaches in Aransas Bay 9

 Intersection of Brazoria CR 441A and Fisherman’s Isle Village of River’s End, San Bernard River,
 Brazoria County 9

 Little Bay..... 9

 Mad Island Slough 10

 Magnolia Inlet 10

 Modification to Keith Lake Fish Pass 10

 Port Alto 11

 Reopening the Mouth of the San Bernard River, Brazoria County 11

 Shell Reef Culverts 11

 Traylor Cut 12

 Unit 7 South Boundary Drain Freshwater Diversion 12

 Vadia Anche Restoration 12

Pending projects for the Hydrological Restoration Projects Inventory, 2012-2013 14

 JA Flatts 14

 Little Lake to East of San Martin Lake 14

 Paso Corvinas..... 14

 Slop Bowl..... 14

 Swan Lake..... 14

Analysis..... 16

Appendix A: Important Links..... 17

Appendix B: Contacts Listed by Organization, 2012-2013 19

Appendix C: Method of Approach and Lessons Learned..... 27

Appendix D: Table of Posted Projects..... 29

Introduction

Decades of development along the Gulf of Mexico coast have changed the natural hydrology and tidal flows of the region. In some locations, the installation of dikes, causeways, levees and other barriers, and inadequate culverts have resulted in reduced or restricted tidal or freshwater exchanges and have changed the structure and function of coastal habitats, endangering important nursery grounds for marine and coastal species. Fortunately, restoration efforts on relatively small projects, such as removing barriers to tidal flow or freshwater exchange, can have a positive impact on hundreds or thousands of acres.

The Hydrological Restoration Projects Inventory is a joint effort of the NOAA Restoration Center and the four Gulf of Mexico Sea Grant College Programs (Mississippi/Alabama, Florida, Louisiana, and Texas) to build a community-based partnership to identify these small-scale restoration opportunities. The inventory began in September 2010, with each Gulf state Sea Grant program working to find projects in their respective states in need of restoration. For projects to be eligible for inclusion in the inventory, they had to satisfy the following definition of hydrological restoration from the NOAA Restoration Center: “To remove or modify anthropogenic barriers to restore historic tidal estuarine and freshwater exchange to benefit coastal and marine fisheries habitat.” Projects are also required to include the restoration of at least five acres, have a budget of \$5 million or less, and have a lifespan of 20 years or more. Projects that are based solely on other types of restoration (*e.g.*, shoreline erosion, bird islands, marsh plantings, boat ramp construction) or that required mitigation did not qualify for the inventory.

Once it was determined that a project fit the criteria of the inventory, a project questionnaire was completed, ideally during a meeting with the project lead and other interested parties. The questionnaire and any supporting documentation was then uploaded to the Hydrological Restoration Projects Inventory website via Survey Monkey. Google Earth and GIS-based polygons and points were made to show the area to be affected by the restoration and the specific location of the proposed restoration project. The questionnaire, along with the Google Earth polygons and points and additional supplemental material, were then available online as a public resource.

Four projects (Birding Station #14, Little Bay, Cedar Bayou, and Port Alto) had already been submitted to the inventory by Texas Sea Grant extension staff members Granvil Treece, Rhonda Cummins, and Logan Respass when Texas Sea Grant hired two research assistants on a one-year contract to work solely on the inventory and increase the number of Texas projects listed. Karen Dunlap began working October 20, 2012, in McAllen, and Karla Bishop began working November 1, 2012, at the University of Texas Marine Science Institute (UTMSI) in Port Aransas. Bishop brought a network of contacts on the Texas coast, primarily in the Coastal Bend region, from her time with the Texas Chapter of The Nature Conservancy and from her work pursuing her master’s degree at UTMSI. Dunlap brought a wealth of institutional knowledge and Sea Grant experience from working at the Pennsylvania Sea Grant Program for five years before moving to Texas.

One of the goals of the inventory was to ensure that a large number and wide variety of different organizations knew about and could use the inventory to find projects that both aligned with their missions and that they would have interest in funding. These organizations in Texas included but

were not limited to Ducks Unlimited, the Texas Parks and Wildlife Department (TPWD), the U.S. Fish and Wildlife Service, The Nature Conservancy, and the Texas General Land Office. NOAA is also required to consider the inventory when identifying projects to fund. Recently, Magnolia Inlet, a project from Texas, was selected to receive funding through the Hydrological Restoration Projects Inventory NOAA funding opportunity. There is currently no end date for the inventory; projects can continue to be added at any time by Sea Grant personnel.

In compiling projects, it was evident that many groups are trying to accomplish similar goals with different levels of specificity. This may be an opportunity for Sea Grant — to collaborate with these organizations (namely the Gulf of Mexico Foundation, National Wildlife Federation, U.S. Army Corps of Engineers, and various other governmental organizations and non-profits) to create a master list of restoration projects on the coast that is both searchable and kept up-to-date. This would be extremely beneficial to increasing the restoration work along the Texas coast. Ideally, public users could post projects on their own, with Sea Grant or other partner organizations reviewing them (and obtaining more information if necessary) before publication. It is the authors' belief that with a list of funding sources and a database of searchable projects, Sea Grant could be instrumental in increasing restoration project work on the Texas coast.

Texas Hydrological Restoration Projects Inventory, 2012-2013

The following 19 Texas projects were added to the Hydrological Restoration Projects Inventory by October 2013:

Bahia Grande Channel F Freshwater Diversion

Project Location: Cameron County; 26.091221, -97.39520

Expected Cost: \$250,000-\$500,000

Acres Benefitted: Unknown

Historic Modification: Watershed and rainfall drainage North of Highway 100 historically flowed into Laguna Largo and the upper basins of Bahia Grande. A drainage ditch was dug on the north side of Highway 100, and now precipitation and overland flow go down the ditch and discharge into Laguna Madre just south of the City of Laguna Vista.

Goal/Design: Divert or “revert” freshwater drainage from the Highway 100 ditch into the Bahia Grande watershed.

Bahia Grande Railroad Crossing Removal

Project Location: Cameron County; 26.03729, -97.29711

Expected Cost: \$100,000-\$250,000

Acreage benefited: Unknown

Historic Modification: A railroad trestle constructed across the Bahia Grande severed and reduced tidal flow, leading to increased salinity levels. This decreased the ability of the primary producers (seagrass and mangroves) to grow, survive, and provide habitat and food for marine fauna.

Goal/Design: Ultimately, by decreasing salinities, this will increase the ability of primary producers to grow and provide habitat and food for recreationally and economically important marine fauna, including shrimp, crabs, oysters, and fish. This will be achieved by removing and/or dredging around the railroad trestle to allow increased water flow.

Birding Station #14

Project Location: Willacy County; 28.070043, -96.847363

Expected Cost: \$500,000-\$1,000,000

Acres Benefitted: 25

Historic Modification: It is believed that the construction of the road and development of Ocean Drive (Main North/South Street) caused salt flats to be cut off. A ranch road runs east/west and was constructed with culverts, but the culverts filled. The ranch road has stopped all water flow, except from rain.

Goal/Design: Restore historical tidal flow and restore fisheries habitat.

Cedar Bayou

Project Location: Aransas County; 28.41070, -96.50513

Expected Cost: \$1,000,000-\$5,000,000

Acres Benefitted: 197,412 acres

Historic Modification: The IXTOC oil spill caused the pass to be closed to prevent oiling of marshes. Corpus Christi ship channel widening and deepening also causes Cedar Bayou to silt in. 1995 modifications by TPWD dredging closed Vinson Slough. This stopped the water exchange between the Gulf and area bays and stopped fisheries recruitment.

Goal/Design: The goals are to restore form and flow between Gulf and bays in the area, increase aquatic recruitment, decrease salinity in the bays to help fisheries habitat, and improve circulation between Gulf and area bays. This can be accomplished through barrier removal (degradation of the entire levee wall) and/or through sediment grading and elevation alterations.

Corpus Christi Bay Habitat Conservation and Restoration Initiative

Project Location: Nueces County; 27.716361, -97.169644

Expected Cost: \$100,000 or less

Acres Benefitted: 50 acres

Historic Modification: Approximately 50 years ago, several roads were constructed across the tidal flats in this area to allow access to several oil and gas facilities near the Corpus Christi Bay shoreline. Iron pipe and concrete culverts constructed at several points along the roads were of improper size and construction and have collapsed. The roads act as levees, preventing the flow of water across the tidal flats and significantly altering ecological function. At the project site, northerly winds drive the tide to the road, where the water trickles through at least three collapsed culverts to the south side of the road. The minimum elevation of the flats is less than that of the culverts, and there is no other access back to the bay, trapping marine organisms.

Hypersaline and anoxic conditions often develop, resulting in fish kills and limiting vegetation.

Goal/Design: One of the undersized and collapsed culverts under the main road was replaced approximately 10 years ago, greatly improving the natural hydrologic regime of the area. The culvert is still functioning well with no sedimentation and no maintenance. This project will improve circulation in the tidal flats to the south of this area where old metal and concrete culverts will be removed and new, properly designed culverts will be installed. This will enhance fish/bird habitat and vegetation growth, and restore water quality/circulation/natural salinity. Phase 1 of this project is to replace one culvert, with other phases to follow.

Egery Flats

Project Location: Aransas County; 28.06545, -97.215644

Expected Cost: \$850,000

Acres Benefitted: 100 acres

Historic Modification: A road was built in 1945, and two sets of 24-inch diameter culverts were added in more recent years to facilitate a small amount of water exchange. Along the northern project boundary, construction associated with Egery Island Road permanently closed a historic storm wash-over channel that likely provided a periodic, but infrequent, connection to Copano Bay. In general, development upstream has also impacted river flows, water quality and sedimentation rates. A feasibility study conducted by HDR Engineering showed that loss of emergent salt marsh is likely due to a combination of factors, including reduced circulation and increase salinity through decreased tidal flushing with the creation of the roads. The culverts along FM 136 appear to be too low and/or too small. Water stacks up on either side of the culverts, depending on wind and tides.

Goal/Design: Restoration in the form of culverts on FM 136 (replace small round culverts with larger box culverts) and potential bridge construction with the aim to benefit all habitat types historically present.

Freshwater Siphon at Magnolia Cut on JD Murphree Wildlife Management Area

Project Location: Jefferson County; 29.791328, -94.013540

Expected Cost: \$1,000,000-\$5,000,000

Acres Benefitted: 7,000

Historic Modification: The Gulf Intracoastal Waterway (GIWW) severed sheet flow and natural channels that supplied freshwater to more than 60,000 acres of wetlands between the Gulf of Mexico and uplands of Jefferson County. Freshwater to marshes between the Gulf and GIWW now is from precipitation only. The reduction in freshwater inputs coupled with increases in saltwater entering the system has created conditions that stress wetland vegetation. As these plants die, soils erode and elevation falls below that needed for emergent plants to grow and reproduce, resulting in the conversion of emergent marsh to open water.

Goal/Design: The goal of this project is to restore freshwater inflows into the wetlands and re-establish a salinity gradient from freshwater near the siphon outlet to intermediate to brackish within the wetlands. By doing so, TPWD anticipates that habitat function and diversity will increase for aquatic and wetland dependent species.

Goose Island Marsh Restoration Levee Breaches in Aransas Bay

Project Location: Aransas County; 28.129814, -96.992234

Expected Cost: less than \$100,000

Acres Benefitted: 12 acres

Historic Modification: The original project goal was to restore 24 acres of eroded salt marsh on the north side of Goose Island. The project involved the construction of a breakwater and the use of *in situ* material to create levees forming two 12-acre marsh cells. After the cells were created, dredged material from the adjacent boat channel (beneficial use) was pumped into the cells to create mounds for vegetation, recreating the lost salt marsh habitat. The final step in the restoration, after the levees develop vegetation and stabilize, is to cut breaks into the levees to allow circulation of water and aquatic organisms in and out of the marsh cells. The levee walls prevent tidal exchange. This prevents the movement of aquatic organisms and causes salinity to increase and water quality to decline during periods of high evaporation and low rainfall.

Goal/Design: The explicit objective is to facilitate the circulation of water and aquatic organisms in and out of the marsh cells by creating breaches in the marsh cell levees.

Intersection of Brazoria CR 441A and Fisherman's Isle Village of River's End, San Bernard River, Brazoria County

Project Location: Brazoria County; 28.5238, -95.27176

Expected Cost: \$100,000-\$250,000

Acres Benefitted: 16 acres

Modification: When the village of River's End was platted, a bridge connected the Island of Fisherman's Isle to the subdivision, allowing the river to flow on both sides of the island through culverts. The culverts have filled in and collapsed over time, and water no longer circulates around the island. This has led to unanticipated flooding and stagnation in the surrounding canals.

Goal/Design: Rebuild the road that connects the island and the mainland, and put in a bridge to allow for better circulation around the island, lessen the severity of downstream flooding and allow for increased water flow.

Little Bay

Project Location: Aransas County; 28.025950, -97.046069

Expected Cost: \$1,000,000-\$5,000,000

Acres Benefitted: 500 acres

Historic Modification: Drainage from a sewer treatment plant has silted in Little Bay and covered grass beds. Grass beds have declined. Poor circulation has allowed solids to settle and silt to accumulate in the shallow bay.

Goal/Design: Improve circulation when culverts are opened, and improve grass beds and aquatic habitat when the bay is dredged after 20 years of siltation from runoff and sewer treatment plant discharge. This can be accomplished through culvert placement and sediment grading and/or elevation alterations.

Mad Island Slough

Project Location: Matagorda County; 28.674722, -96.108333

Expected Cost: \$1,000,000-\$5,000,000

Acres Benefitted: 627 acres

Historic Modification: Starting in the 1930s, numerous modifications were made in the form of channels and man-made crossings (dams) to capture inflows in impoundments for waterfowl. Modifications led to increased sedimentation and presence of invasive aquatic species. Emergent and submergent vegetation has been replaced with open water habitat while freshwater inflows to Mad Island Lake and West Matagorda Bay have been decreased.

Goal/Design: The primary goals of this project are to improve water control infrastructure to allow fresh and saltwater exchange, remove invasive species, dredge accumulated sediments, conduct prescribed fires on upland acres, and plant native plant species. This could be accomplished through a variety of mechanisms, including culvert or bridge placement, barrier breaches, water control structures, and/or sediment grading and elevation alterations.

Magnolia Inlet

Project Location: Calhoun County; 28.560069, -96.537922

Expected Cost: \$250,000-\$500,000

Acres Benefitted: 515 acres

Historic Modification: A groin and boat ramp north of the site has altered sediment littoral movement and allows sand accumulation to occur in the inlet. This inlet was forced to go under the adjacent road, Ocean Drive. A permanent small jetty system was installed to protect the entryway of the inlet from shoaling waves (from large shipping traffic in the bay), but this is too short and the waves are driving sediment up into the inlet. This is expected to worsen with the new LNG terminal being placed in this area. The inlet continues to shoal in and restrict tidal exchange between Old Town Lake and Matagorda Bay.

Goal/Design: The objective is to increase tidal exchange and reduce salt marsh loss within Old Town Lake and the associated marsh complex. To do this, the sediment blockage and dead oyster reef will be removed, and the jetty will be extended beyond the depth of closure to reduce sediment incursion.

Modification to Keith Lake Fish Pass

Project Location: Jefferson County; 29.772567, -93.945689

Expected Cost: \$1,000,000-\$5,000,000

Acres Benefitted: 10,500

Historic Modification: Originally conceived as a shallow meandering channel for marine organisms to enter the marshes around Keith Lake, the pass was dredged as a straight channel 150 feet wide by 5 feet deep. The pass has eroded to 300+ feet wide by 9+ feet deep. Now, the

volume of salt water entering the lakes and marshes in the area is leading to plant death and conversion of emergent marsh to open water and loss of soils within the system.

Goal/Design: The goal is to reduce the volume of salt water entering the system sufficiently to stop or reverse plant loss from stresses caused by high salinity. The objective is to bring the number of days during a year with typical rainfall and river flow in which salinity at the junction of Keith and Johnson Lakes exceeds 10 ppt. to 20 percent or less.

Port Alto

Project Location: Calhoun County; 28.666831, -96.407434

Already funded as of 10/2013

Acres Benefitted: 11 acres

Historic Modification: Historically, a wooden groin stabilized the beach; however, the groin was destroyed by a recent hurricane, and the shoreline is no longer protected. Dredging was conducted routinely in a nearby boat channel that started to fill in due to this erosion, but was stopped recently because of costs. The beach is eroding at a rate of 5 feet per year. Currently, the shoreline is in danger of being breached. With its integrity compromised, the beach will no longer protect the interior marshes, which will then be exposed to open bay. The sediments are accreting in the boat access channel, shoaling and effectively limiting natural tidal exchange to the bay at the same time.

Goal/Design: By reconstructing the groin, the shoreline will be stabilized, and by dredging the channel entrance, tidal exchange and water circulation will continue to maintain the life and productivity within the marsh.

Reopening the Mouth of the San Bernard River, Brazoria County

Project Location: Brazoria County; 28.853733, -95.439133

Expected Cost: \$1,000,000-\$5,000,000

Acres Benefitted: 23,784

Historic Modification: The Brazos River was diverted in 1929 to give Port Freeport a dead-water harbor to prevent flooding, silting, and logs from being brought down the Brazos River by very regular flooding. This led to 176,000 cubic yards of sand each year being washed from the Brazos River across the mouth of the San Bernard River, causing the mouth of the San Bernard River to close.

Goal/Design: The goal is to dredge open the mouth of the San Bernard River. This will restore recreational safety, natural tidal flushing, and improve the surrounding estuaries.

Shell Reef Culverts

Project Location: Aransas County; 28.173286, -96.761142

Expected Cost: \$100,000-\$250,000

Acres Benefitted: 170 acres

Historic Modification: In the mid-1950s, a network of roads, levees, and ditches was built in the area with the intent of management for private and commercial use (dewatering for farmland, cattle grazing, and oil and gas exploration). There is a decrease in hydrological connectivity in several locations, as well as altered circulation and drainage patterns. This has altered species composition in the area: fish are restricted from certain areas and there is an increase in non-native species. The state filed a lawsuit to reinstitute restricted water flow. As a result, some changes were made, and then the land was acquired by the Aransas National Wildlife Refuge; restoration staff are now completing the required work with partners.

Goal/Design: The goal is to restore hydrological connectivity via modifying and strengthening existing culverts. This will help to increase tidal exchange between the bay and marsh system, promote circulation and exchange between interior cells, reduce maintenance costs for the existing system of control structures, and maintain access via critical levee roads for monitoring and law enforcement.

Traylor Cut

Project Location: Calhoun County; 28.446739, -96.825242

Expected Cost: \$1,000,000-\$5,000,000

Acres Benefitted: 5,200 acres

Historic Modification: In the 1930s, a water diversion project was implemented to create water flow to Mission Bay and control flooding on farmland. Most of the water from the Guadalupe River (70-90 percent of total river discharge) is now flowing out to Mission Bay rather than down to the Guadalupe Delta. As a result, the ecological integrity of the system is declining due to a decrease in sediment deposition and nutrient transfer to the basin as well as an increase in erosion.

Goal/Design: The goals of this project are to restore salinity to natural conditions (reduce brackish marsh acres and increase freshwater and saltwater marsh acreage), and to re-divert water so a larger percentage flows down to the Guadalupe Delta, increasing sedimentation and nutrient flux to the basin.

Unit 7 South Boundary Drain Freshwater Diversion

Project Location: Cameron County; 26.15333, -97.310727

Expected Cost: \$100,000-\$250,000

Acres Benefitted: Unknown

Historic Modification: Watershed and rainfall drainage west of Buena Vista Road historically flowed into resacas and wetland depressions within the South Unit area of Laguna Atascosa National Wildlife Refuge. A drainage ditch was dug, and now precipitation and overland flow go down the ditch and discharge into the Laguna Madre.

Goal/Design: The project goal is to divert or “revert” freshwater into the resacas and wetlands within the South Unit of Laguna Atascosa National Wildlife Refuge.

Vadia Anche Restoration

Project Location: Cameron County; 26.034072, -97.226683

Expected Cost: \$1,000,000-\$5,000,000

Acres Benefitted: 600

Historic Modification: In the 1930s, the Brownsville Ship Channel was created to support the development of maritime commerce. The dredge spoils deposited along its banks blocked natural tidal exchange between the large tidal basins in the region. This turned a shallow water estuary into a tidal flat submerged only during storm events; it has now become a dust bowl and a source for drifting sediment deposits and dust storms onto Highway 48 and the neighboring community of Port Isabel.

Goal/Design: The goals of the project are to re-establish tidal exchange between the Brownsville Ship Channel and Vadia Anche, reduce the source of dust plaguing the community, and re-establish Vadia Anche as a shallow water estuary.

NOTE: Bahia Grande Channel F Freshwater Diversion, Bahia Grande Railroad Crossing Removal, and Unit 7 South Boundary Drain Freshwater Diversion are all listed in the inventory but it is recommended that more information be collected about them. All three projects are in the Laguna Atascosa National Wildlife Refuge. In Fall 2012, Dunlap met with Leo Gustafson, acting manager at Laguna Atascosa National Wildlife Refuge, about any projects in general at the refuge. Subsequent efforts to contact Gustafson have been unsuccessful.

Hydrological Restoration Projects Inventory

Texas Sea Grant Posted Projects, 10/2013

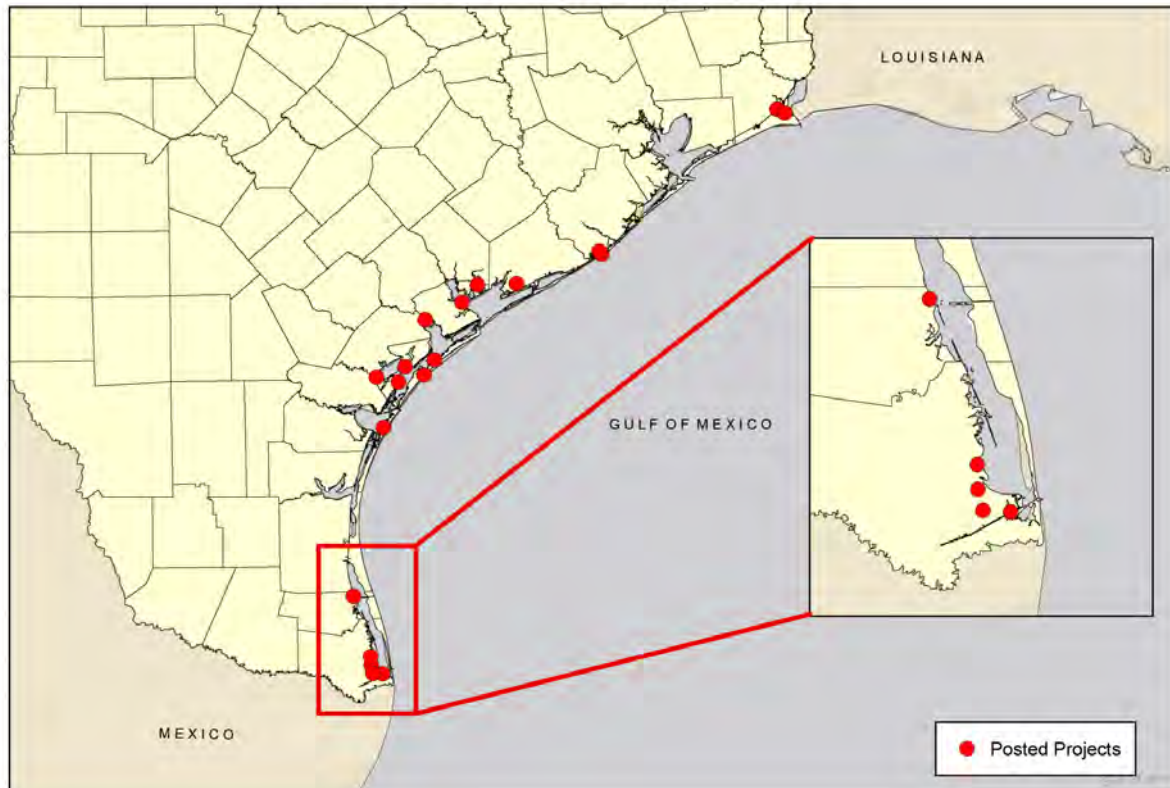


Figure 1. Map of locations, Hydrological Restoration Projects Inventory.

Pending projects for the Hydrological Restoration Projects Inventory, 2012-2013

The following projects were still pending at the time this report was completed. Additional information may enable these projects to be added to the Inventory.

JA Flatts

Contact: Rick Kline, Ph.D., University of Texas at Brownsville

Location: Cameron County; 26.013875, -97.252953

Status: Idea

Description: This project was briefly discussed in a meeting with Dr. Kline. It is located directly south of the Brownsville Ship Channel Mouth. The water has been cut off and no longer circulates through that area. No plans, budget, or partners have been identified thus far.

Little Lake to East of San Martin Lake

Contact: Rick Kline, Ph.D., University of Texas at Brownsville

Location: Cameron County; 26.011028, -97.293964

Status: Idea

Description: This project was briefly discussed in a meeting with Dr. Kline. The water no longer circulates through this lake as it did historically. No plans, budget, or partners have been identified thus far.

Paso Corvinas

Contact: Leo Gustafson, Laguna Atascosa National Wildlife Refuge

Location: Cameron County; 26.035351, -97.266245

Status: Idea

Description: A land barrier that has formed between Paso Corvinas and the Bahia Grande has reduced the tidally influenced water that historically passed through. This project was briefly discussed with Gustafson in Fall 2012, but attempts to contact him since then have been unsuccessful.

Slop Bowl

Contact: Jennifer Wilson, U.S. Fish and Wildlife Service

Location: Brazoria County, 29.011631, -95.268381

Status: Close to finalized

Description: Several of oil/gas industry roads need to be removed and/or culverts put in to allow for historic water flow. Studies are under way to investigate the issue at Slop Bowl and their effects on the surrounding wetlands. The project is located within the Mid-Coast National Wildlife Refuge Complex. Wilson has the questionnaire and was working to complete it before the government shutdown.

Swan Lake

Contact: Lalise Mason, Scenic Galveston

Location: Galveston County; 29.35527, -94.9061

Status: Close to finalized

Description: The TC Hurricane Canal takes surface runoff from Texas City and treated plant discharge water up into the Ship Channel rather than into Swan Lake. Several options for

restoration have been discussed but one hasn't been chosen. Options range from breaching the levee with box culverts or floodgates, to purchasing adjoining land, which would allow for several more options. The goal of the restoration is to reduce salinity in Swan Lake. Mason has the questionnaire and has answered most of the questions but does not want to list the project yet due to too many uncertainties.

Hydrological Restoration Projects Inventory

Texas Sea Grant Pending Projects, 10/2013

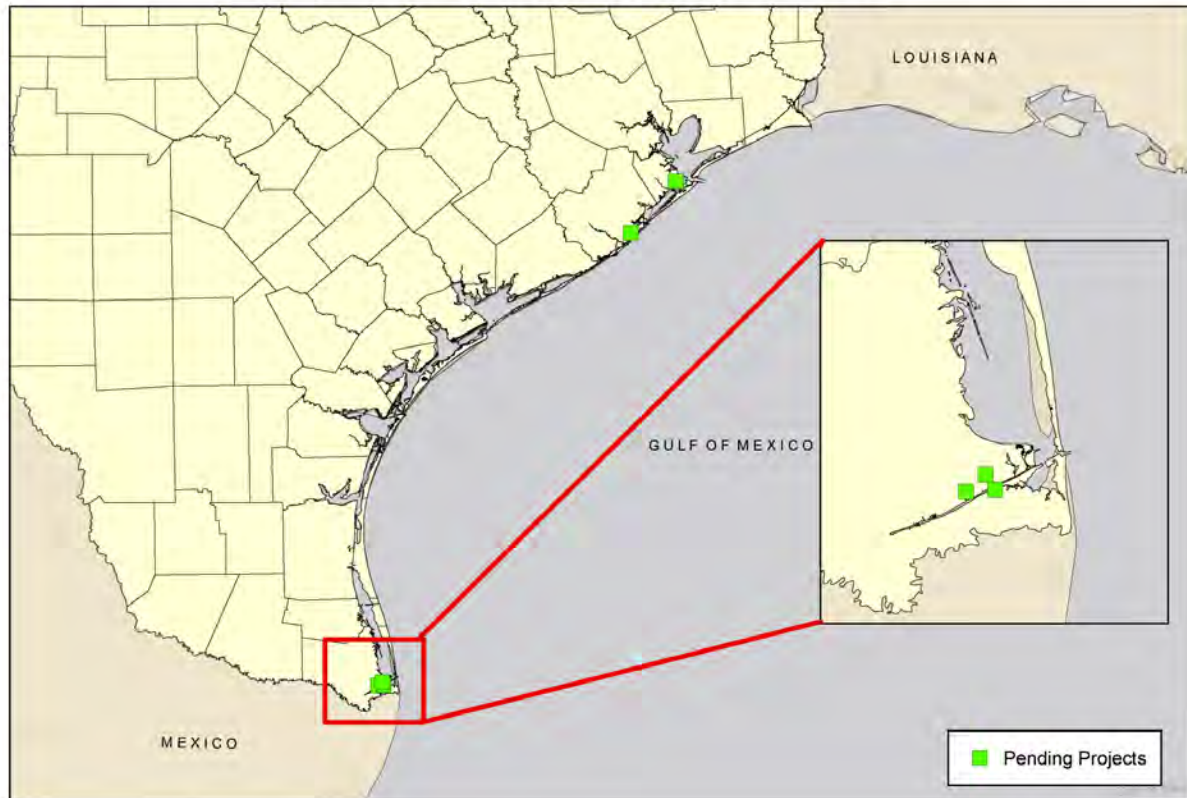


Figure 2. Map of locations, pending projects, Hydrological Restoration Projects Inventory.

Analysis

Number of Projects by County

Aransas County: 5

Brazoria County: 2

Calhoun County: 3

Cameron County: 4

Jefferson County: 2

Matagorda County: 1

Nueces County: 1

Willacy County: 1

Total projects listed in inventory: 19

Amount of Monies for Posted Projects

Less than \$100,000: 2

\$100,000-250,000: 5

\$250,000-500,000: 3

\$500,000-1,000,000: 2

\$1,000,000-5,000,000: 7

Total amount of monies for posted projects: \$9,250,000-39,950,000

Total amount of acreage for posted projects: 246,534*

Number of people reached through presentations/events: 10,133

Number of people reached through outreach materials: 17,289

Total number of contacts: 207

Total number of organizations: 67

- Acreage is unknown for three projects, so they are not included in this total.

Appendix A: Important Links

- Hydrological Restoration Projects Inventory:
<http://masgc.org/gulhydrorestoration/index.htm>
- Hydrological Restoration Projects Inventory Map of Posted Projects:
<https://maps.google.com/maps/ms?msid=200852967964615085153.0004e2abdfd021b73f198&msa=0>

Appendix B: Contacts Listed by Organization, 2012-2013

Aransas County

David Reid, Stormwater Management Engineer
Greg Harlan, Grants Administrator
Keith Barrett, Harbor Master, Naval District
Leslie Casterline, Commissioner
Tom Callan, WQ Committee, City of Rockport
Tom Rowe, Citizen

Aransas First

Earl Matthew
Linda Garcia

Armand Bayou Nature Center

George Remund, Stewardship Biologist

Atkins Global

Juan Moya

Audubon

Richard Gibbons

Bayou Land Conservancy

Stephanie Prosser

Brazoria County

Dianna Kile, Congressman Randy Weber's office
Dude Payne, Precinct 1 Commissioner
Jeff Strader, Port of Freeport
Richard Hurd, Parks Department and Shoreline Restoration Task Force
Scott Brook, Port of Freeport

Calhoun County

Bill Ball/Nancy Gardner (landowner/property manager)
Jack Campbell, Calhoun County Navigation District
Jack Labarge, Councilman, Seadrift
Keith Schmidt, citizen, Alcoa engineer
Michael Pfeifer, County Judge
Neil Fritsch, County Commissioner
Roger C. Galvan, County Commissioner
Susan Riley, Commissioners' Office

Cameron County

Marcie Oviedo, Rio Grande Regional Water Authority

CardnoEntrix

Bob Nailon, Senior Wetlands Scientist

Chambers County

Bob Hall

David Abernathy, Commissioner

Sarah Cerrone, Economic Development Coordinator

Sidney Lewis, Director, Environmental Protection

Citizens' Environmental Coalition

Page Slocum, Newsletter Editor

Rachel Powers, Executive Director

Coastal Bend Bays and Estuaries Program

Beth Becerra

Jace Tunnell, Project Manager

Lari Johnston, Environmental Educator

Leo Trevino, Deputy Director

Ray Allen, Director

Rosario Martinez, Project Manager

Coastal Conservation Association

Hector Mendieta

John Blaha

Ducks Unlimited

Greg Green

Todd Merendino

EIC

Aimee Marsh

Environmental Law Institute

Jordan Diamond

Friends of the River San Bernard

Mike Goodson

Nick Fratila, Co-Chairman

Roy and Jan Edwards, Citizens

Suzanne Goodson, Vice-President

Wayne Head, President

Galveston Bay Estuary Program

Linda Shead, Independent Consultant

Lindsey Lippert, Galveston Bay Council

Galveston Bay Foundation

Bob Stokes, Director

Jim Kachtick, member, retired from Petrochemical Industry

Galveston County

Lori Schwarz, City of Galveston Planner

Scott Tuma, League City Project Manager

Guadalupe-Blanco River Authority

Debbie Magin

Herb Witliff

Tommy Hill

Gulf Coast Bird Observatory

Cecilia Riley

Gulf of Mexico Foundation

Mike Smith

Suraida Nanez-James

Gulf State Marine Fisheries Commission

Jeffrey Rester, Habitat and SEAMAP Coordinator

Houston Wilderness

Holly Thorson, Programs Coordinator

International Crane Foundation

Liz Smith

Nikki Davis

Jackson County

Johnny Belicek, Commissioner

Kenneth Fojtik, Lavaca-Navidad River Authority

Larry Deyton, Commissioner

Sylvia Balentine, Lavaca-Navidad River Authority

Tim Andruss, Texana Groundwater Conservation District

Jefferson County

Ann Galassi, Sabine River Authority, Water Resources Manager

Dennis Becker, Lower Neches Valley Authority, Water Supply Manager

Kenedy/Kleberg Counties

Scott Murray, citizen near Baffin Bay

Susan Ivy, Kleberg County Parks and Recreation Director

King Ranch
Keith Johnson

Leister Consulting
Chad Leister

Master Naturalists
Diane Humes, Galveston Bay Chapter

Matagorda County
Ellen Dodd, County Auditor
Haskell Simon, Lower Colorado River Authority and rice farmer
Kent Pollard, Commissioner
Nate McDonald, County Judge
Willie Younger, retired Texas Sea Grant extension

Mission-Aransas National Estuarine Research Reserve
Chara Ragland
Georgia Neblett
Kiersten Madden, Stewardship Coordinator
Kristin Hicks
Sally Palmer, Reserve Manager

Naismith Engineering
Dave Sullivan, Aransas County
James Dodson, Refugio County
Jay Gardner, Nueces/San Patricio Counties

National Oceanic and Atmospheric Association
Heather Young, Fisheries Biologist
Jamie Schubert, NOAA Restoration Center
Kris Benson, NOAA Restoration Center

National Parks Conservation Association
Victoria Herrin, Texas Gulf Coast Campaign Director

National Wildlife Federation
Amanda Fuller
Jennifer Ellis, Senior Project Coordinator, Texas Living Waters Project
Ryan Fikes

NRG Energy
Bill Baker
Breck Sacra

Nueces/San Patricio Counties

Kristen Connor, City of Portland Parks and Recreation
Rocky Freund, Nueces River Authority
Sam Sugarek, Nueces River Authority
Scott Cross, Parks and Recreation
Sharon Bailey Lewis, City of Corpus Christi
Sid Walsh, citizen

Ocean Conservancy

Bethany Kraft

Ocean Trust

Thor Lassen

San Antonio Bay Partnership

James Dodson, Naismith Engineering
Dan Alonso, San Antonio Bay Foundation
Allan Berger
Steve Raabe, San Antonio River Authority

San Marcos River Foundation

Diane Wassenich, Program Director

Scenic Galveston

Lalise Whorton Mason

Sherwin Alumina

Tom Ballou

Texas A&M AgriLife

Ernie Edmundson, former Extension Agent, Aransas County
Michael Donalson, Extension Agent, Refugio County
Michael Hiller, Extension Agent, Jackson County
Miles Phillips, Extension Agent, ChaRT
Peter Woods, Extension Agent, Fisheries Specialist, Calhoun County
Roy Stanford, Extension Agent, Agriculture/Natural Resources Specialist, Orange County
Virginia “Ginger” Easton-Smith, Extension Agent, Aransas County

Texas Commission on Environmental Quality

Susan Clewis, Regional Director, Region 14

Texas General Land Office

Amy Nunez, Permitter
Kate Zultner
Kathryn Tunnell, Nueces County
Manuel Freytes

Ray Newby, Calhoun County
Tommy Mobley, Environmental Manager
Tony Williams, Professional Services and Leasing Division

Texas Parks and Wildlife Department

Andy Sipocz, Natural Resources
Bill Wilson, Goose Island State Park
Brent Ortego, Wildlife Biologist
Cherie O'Brien, Coastal Fisheries Division - Dickinson Office
Cindy Loeffler, Water Resources Manager (Austin)
Dusty McDonald, Palacios, Matagorda Bay
Jackie Robinson
Jan Culbertson, Coastal Fisheries Division
Janelle Rand, Park Interpreter, Goose Island State Park
Jim Sutherlin, Upper Coast Wildlife Management Area
Joel Anderson, Palacios
Kendal Keyes, Regional Natural Resources Coordinator
Leslie Hartman, Palacios, Matagorda Bay
Michael Rezsutek, JD Murphee Wildlife Management Area
Norman Boyd, Port O'Connor, San Antonio Bay
Paul Silva, Coastal Ecologist
Rebecca Hensley, Ecosystem Resources Program Regional Director
Robert Vega, Coastal Fisheries Hatcheries Program Leader
Ruben Chavez, Saltwater-Fisheries Enhancement Association Habitat Chair
Russell Hooten
Ted Hollinsworth, Land Conservation Director (Executive Office)

Texas Water Resources Institute, Arroyo Colorado

Jamie Flores

The Nature Conservancy

Aaron Tjelemand, Upper Coast Project Director
John Herron, Director of Conservation Programs
Jorge Brenner, Associate Director of Marine Science
Julie Sullivan, Coastal Restoration Coordinator
Kirk Feuerbacher
Mark Dumesnil
Max Pons, Southmost Preserve
Sonia Najera

U.S. Army Corps of Engineers

Adrian Ramos
Alice Ewing
Richard Medina
Tosin Sekoni

U.S. Department of Agriculture, Natural Resources Conservation Service

Leroy Wolff, Refugio County

Scott Alford

Terry Hanzak, Calhoun County

U.S. Fish and Wildlife Service

Beau Hardegree

Cody Dingee, Brazoria National Wildlife Refuge

Denise Ruffino, McFaddin National Wildlife Refuge

Ernesto Reyes, Santa Ana National Wildlife Refuge

Felipe Prieto, Aransas National Wildlife Refuge

Jena Moon, Texas Chenier Plain Refuge Complex

Jennifer Sanchez, Texas Mid-Coast National Wildlife Refuge Complex, Project Leader

Jennifer Wilson, Texas Mid-Coast National Wildlife Refuge Complex

John Huffman, Coastal Division-Clear Lake Office, Coastal Program Coordinator

Laurie Lomas, Trinity National Wildlife Refuge

Leo Gustafson, Laguna Atascosa National Wildlife Refuge

Mike Montagne, Project Leader

Pat Clements

Patrick Walther, Texas Chenier Plain National Wildlife Refuge Complex

Shane Kasson, San Bernard and Big Boggy National Wildlife Refuge

Sonny Perez, Aransas National Wildlife Refuge

Stuart Marcus, Trinity National Wildlife Refuge

Tim Anderson

Will Roach

Universities

Rice University

Frank Fisher, Professor

Texas A&M University

Rusty Feagin, Professor

Texas A&M University-Corpus Christi

Jennifer Pollack, Professor

Lee Smee, Professor

Michael Wetz, Professor

Paul Montagna, Professor

Wes Tunnell, Professor and Associate Director, Harte Research Institute

Texas A&M University at Galveston

Anna Armitage, Professor

University of Houston

Brad Hoge, Professor

University of Houston-Clear Lake

Cindy Howard, Professor

George Guillen, Professor

University of Texas at Brownsville

Heather Alexander, Professor

Rick Kline, Professor
University of Texas Marine Science Institute
Ed Buskey, Professor
Jim McClelland, Professor
Katie Swanson, Research Associate
Ken Dunton, Professor
Kim Jackson, Research Associate
University of Texas-Pan American
Hudson DeYoe, Professor

Victoria County
Roger Zimmerman

Willacy County
Hon. Dora Perez, Commissioner Precinct 4

Appendix C: Method of Approach

Method of Approach

The initial action step was to gather as many contacts as possible. This was done through connections with each Texas Sea Grant Extension Agent along the coast and forging connections with local extension partners at Texas AgriLife. In addition to numerous contacts, Bishop and Dunlap requested information about any restoration projects that were of interest to the community and strategies for success in networking (sometimes this involved an introduction by the extension agent to a particular project partner or a description of certain aspects of specific projects).

This method was lucrative from the beginning and initiated a cascade approach wherein a series of contacts resulted in a set of new contacts and project ideas. By the time Bishop and Dunlap concluded their work on the inventory, they had spoken with 207 people from 67 agencies and identified 39 potential projects (although not all projects met the criteria for listing in the inventory). As they worked through their contacts list, Bishop and Dunlap approached each contact first by email or telephone with a brief description of the Hydrological Restoration Projects Inventory and then a request for suggestions about potential project ideas or other contacts. This usually resulted in an appointment to meet with the contact, or in some cases, a discussion on the phone immediately. The enthusiasm and passion for restoration work was evident with every group Bishop and Dunlap worked with along the Texas coast.

Another huge resource for new project ideas and contacts was attending meetings and browsing priority project lists for counties or specific agencies (most notably the San Antonio Bay Partnership and the Coastal Bend Bays and Estuaries Program project lists). At meetings, Bishop and Dunlap were able to meet people face-to-face to discuss the inventory and answer any questions directly as well as learn about the contacts, their interests, and their focus. With in-depth descriptions of projects via priority project lists, Bishop and Dunlap were able to reach out to contacts with some prior knowledge about the project, catalyzing the process of listing the project in the inventory.

Bishop and Dunlap stayed organized throughout this process by frequent conversation and exchanging ideas with each other and initially the Hydrological Restoration Projects Inventory Team (Logan Respass and Granvil Treece of Texas Sea Grant and Steve Sempier of the Mississippi-Alabama Sea Grant Consortium). They created an Excel spreadsheet in Google Docs that identified all contacts by name and agency, and also included information about pending, completed, and unviable projects. This list provided, at a moment's glance, information about whether a particular person had already been contacted or if a particular project was already in the process of being listed.

Table 1: Meetings attended by Bishop and/or Dunlap, 2012-2013

Meeting Name	Date	Presented Y/N	Approx. Number of People
Arroyo Colorado Habitat Workgroup	4/25/2013	Y	12
Arroyo Colorado Steering Committee	4/25/2013	Y	18
Freshwater Inflows Meeting (MANERR)	1/17/2013	Y	45
Aransas First Meeting	1/23/2013	Y	13
San Antonio Bay Partnership Meeting	2/21/2013	Y	7
Mangrove Symposium (MANERR)	2/28/2013	N	50
TXSG Advisory Council Meeting	4/3/2013	N	50
Earth Day/Bay Day	4/13/2013	Y	10,000
Friends of Baffin Bay Stakeholders Meeting	6/12/2013	N	40
RESTORE Act in Texas – Port Aransas	7/16/2013	N	82
RESTORE Act in Texas – Port Lavaca	8/23/2013	Y	14
BBEST Meeting	11/15/2012	N	8
Coastal Issues Meeting	12/18/2012	Y	6
San Bernard River Mouth Meeting	8/26/2013	Y	10
Total			10, 341

Table 2: Publications including information about the Hydrological Restoration Projects Inventory, 2012-2013.

Publication Type	Primary Location Covered	Number of People Reached
Citizens' Environmental Coalition Newsletter (published twice)	Harris and Galveston Counties	10,000
Mission-Aransas National Estuarine Research Reserve Collaborative listserv	Aransas and Nueces Counties	185
San Antonio Bay Partnership Email List	Calhoun, Refugio, Victoria Counties	87
Texas Agrilife, Aransas County Email List	Aransas County	17
Texas Shores Magazine Summer/Fall 2013	State-wide	7,000
Total		17, 289

Appendix D: Table of Posted Projects

Table 3: Posted projects in the Hydrological Restoration Projects Inventory, 2012-2013.

Project	Initiator	Start Date	Main Contact	County	Acreage	Cost (\$)
Bahia Grande Channel F Freshwater Diversion	KD	4/19/2013	Greg Green	Cameron	N/A	250,000 – 500,000
Bahia Grande Railroad Crossing Removal	KD	4/19/2013	Greg Green/ Heather Alexander	Cameron	N/A	100,000 – 250,000
Birding Station #14	GT	2/13/2012	Logan Respass/ Peter Ravella	Willacy	25	500,000 – 1,000,000
Cedar Bayou	GT	5/25/2012	Judge C.H. Burt	Aransas	197,412	1,000,000 – 5,000,000
Corpus Christi Bay Habitat Conservation and Restoration Initiative	KB	1/29/2013	Kendal Keyes	Nueces	50	less than 100,000
Egery Flats	KB	5/2/2013	Jackie Robinson	Aransas	100	500,000 – 1,000,000
Freshwater Siphon at Magnolia Cut on JD Murphree Wildlife Management Area	KD	2/8/2013	Michael Rezsutek	Jefferson	7,000	1,000,000 – 5,000,000
Goose Island Marsh Restoration Levee Breaks	KB	7/3/2013	Kendal Keyes	Aransas	12	Less than 100,000
Intersection of Brazoria C.R. 441A & Fisherman's Isle Village of River's End, San Bernard River	KD	7/30/2013	Jan and Roy Edwards	Brazoria	16	100,000 – 250,000
Little Bay	GT	7/23/2012	Keith Barrett	Aransas	500	1,000,000 – 5,000,000
Mad Island Slough	KB	1/9/2013	Sonia Najera	Matagorda	627	1,000,000 – 5,000,000
Magnolia Inlet	KB	12/14/2012	Rusty Feagin	Calhoun	515	250,000 – 500,000
Modification to Keith Lake Fish Pass	KD	7/25/2013	Mike Rezsutek	Jefferson	10,500	1,000,000 – 5,000,000
Port Alto (edits)	RC/KB	1/14/2013	Juan Moya	Calhoun	11	250,000 – 500,000
Reopening the Mouth of the San Bernard River	KD	7/25/2013	Jan and Roy Edwards	Brazoria	23,784	1,000,000 – 5,000,000
Shell Reef Culverts	KB	1/15/2013	Dan Alonso	Calhoun/Aransas	170	100,000 – 250,000
Traylor Cut	KB	3/5/2013	Dan Alonso	Calhoun/Victoria	5,200	1,000,000 – 5,000,000
Unit 7 South Boundary Drain Freshwater Diversion	KD	4/19/2013	Greg Green	Cameron	N/A	100,000 – 250,000
Vadla Anche Restoration	KD	11/6/2012	Thor Lassen	Cameron	600	100,000 – 250,000

*GT = Granvil Teece, KB = Karen Bishop, KD = Karla Dunlap, RC = Rhonda Cummins