

**Key Conservation Priority: Protect Key Coastal Habitats and Ocelot Corridors in South Texas**

**23 June 2015**

**Background**

The landscape of South Texas contains a complex and diverse suite of habitats for a very diverse wildlife community. The area supports key coastal habitats adjacent to the Laguna Madre, one of only seven hypersaline lagoons in the world. This biologically rich area is one of the most productive fisheries on the Gulf Coast and includes world-class nursery habitat for redfish, spotted seatrout and black drum. Small tidal basin islands support large colonies of nesting birds such as gull-billed terns, reddish egrets, black skimmers and brown pelicans, and the region also hosts wintering waterfowl including 85% of the world population of redhead ducks. Federally listed endangered sea turtles forage in nearshore seagrass beds in the Laguna Madre and nest on the adjacent Padre Island. Salt prairie and scattered yucca throughout the area support nesting endangered northern aplomado falcons, as well as long-billed curlews and migrating shorebirds.

Across the landscape are densely-covered thornscrub corridors that are vitally important to ocelot as well as a number of state-listed species and Species of Greatest Conservation Need. Currently the Texas ocelot populations have fewer than 50 ocelots, found in two separate populations in southern Texas. As of September 2014, there were 41 total known individuals in the two populations in south Texas. Habitat loss, fragmentation, conversion, and road-mortality comprise the primary threats to the ocelot today. The current threat to aplomado falcons is the loss of prairie and the conversion of these low prairies gradually becoming more dominated by invasive trees. The changed hydrology, previous poor land management practices, and the loss of natural fire are causing the falcon to lose habitat. More apparent to the untrained observer is the obvious conversion of the natural landscape to urbanization. The majority of the area needed to protect these trust resources into perpetuity is under a serious and rapidly-growing threat from various types of development such as roadway expansion, residential housing, oil and gas as well as wind energy infrastructure.

Corridors between conservation lands to facilitate species range shifts are strategies to adapt to climate change. The recovery goals for downlisting ocelots include increasing current populations in Texas to 200 and 1000 ocelots in Tamaulipas and maintaining them for at least 5 years. The ocelots in Texas should be distributed as either 1) a single core population of 150 ocelots with interchange between ocelots in Tamaulipas sufficient to maintain genetic diversity or 2) at least two core populations of 75 ocelots each in Texas, with interchange between each population and ocelots in Tamaulipas, as well as 50 additional ocelots that may or may not be part of a stable population. Conservation strategies that block-up and connect existing habitat through protected corridors are critical to recover ocelots in Texas.

The Bahia Grande wetland complex was once a very productive wetland with various freshwater, brackish, and saltwater marshes and lagoons. Nearby land managers changed the hydrology of the area,

which eventually converted the Bahia into a large dry basin of blowing sands that drastically affected the local people. The restoration of this basin involved flooding over 25,000 acres. This wetland today is on its way to being one of the most important wetlands restorations on the continent. This system is currently hyper-saline, however it is showing signs of beginning to support an amazing fishery again, and it now supports a large colonial waterbird rookery, including the largest recorded colony of nesting gull-billed terns. It also supports a healthy colony of black skimmers and brown pelicans and has become an important foraging area for thousands of waterfowl, shorebirds and wading birds.

### **Conservation Goal**

This priority will connect and protect important coastal habitats and ocelot corridors between important private lands, Laguna Atascosa NWR, Lower Rio Grande Valley NWR, and Boca Chica State Park. It would connect almost 2 million acres of intact habitat on private rangeland with the 1.3 million acre Delta del Rio Bravo Protected Area in northern Mexico, managed by the Comisión Nacional de Areas Naturales Protegidas, a federal counterpart to the Service in Mexico. This project will protect functional basins within the Bahia Grande System and key watershed areas needed for hydrological restoration and the maintenance of a healthy fishery. It will assist in the further development of partnerships with large private ranches to improve upon our knowledge of trust resources, and facilitate wildlife protection and conservation delivery, in particular for the ocelot and the aplomado falcon. Through this priority effort, the Service will be able to more effectively partner with local authorities to install ocelot crossings in roads to reduce vehicle-related mortality and ensure that corridors connect key habitats occupied by ocelots in Texas, or those which could allow ocelots in Tamaulipas and Texas to disperse between populations. By reestablishing ocelot connectivity across the landscape, this project would foster and then maintain the much needed genetic diversity and exchange that Texas ocelots currently lack.

### **Measurable Objectives**

The following measurable objectives could be achieved within 5 years if the Service and its partners use their resources collaboratively:

1. By 2017, complete a Landscape Conservation Design with the Texas Parks and Wildlife Department, the National Park Service and other stakeholders to focus efforts on protecting key coastal areas and priority habitats for ocelots and aplomado falcons in South Texas.
2. Permanently protect 6,000 acres of land between Bahia Grande and the main unit of Laguna Atascosa. This will include protecting 2,000 acres of existing or future ocelot habitat and 4,000 acres of aplomado falcon habitat that will benefit numerous other grassland bird species;
3. Restore freshwater hydrology to the Bahia Grande wetland complex and improve water quality of the surrounding community receiving water by rerouting of ditches to ensure water drains properly across the landscape and continues to cycle through existing natural basins;
4. Restore and manage 415 acres of seasonal wetlands by plugging drainage ditches and installing water control structures around the Bahia Grande wetland complex;

5. Enhance or restore 1,500 acres of prairie as suitable aplomado falcon habitat on Refuges through the removal of invasive huiscahe and mesquite using cut-spray methods, and maintain the prairie with 3-5 year prescribed fire treatments;
6. Restore 300 acres of dense thornscrub, connecting existing breeding ocelot populations;
7. Work with local road authorities to install 13 ocelot crossings in roads around Laguna Atascosa National Wildlife Refuge for expansion of the breeding ocelot population;
8. Modify the existing tour route within Laguna Atascosa NWR to prevent additional mortality of ocelots by vehicles;
9. Protect an additional 500 acres in south Texas of existing or future ocelot habitat around core breeding areas or in narrow corridors through the use of conservation easements, fee purchase or management agreements;
10. Develop incentives for ranchers to protect and manage important ocelot habitats in South Texas.

## Emphasis Area Key Conservation Priority Identification Template

June 22, 2015

- 1. Name of Emphasis Area:** Gulf Coast
- 2. Title of the Key Conservation Priority:** Strategic Habitat Conservation for the Mottled Duck and Associated Species on the Western Gulf of Mexico Coast
- 3. Description of the Key Conservation Priority:** The Mottled Duck (MODU) (*Anas fulvigula*) is a resident species with a primary range of Florida and the western Gulf of Mexico coast (WGC) portions of Alabama, Mississippi, Louisiana, Texas, and northeast Mexico. MODU in the WGC must meet all their life cycle requirements from their year-round home of the Gulf of Mexico coast marshes and associated habitats. The Gulf Coast Joint Venture (GCJV) MODU Working Group reviewed available population trend data and determined that WGC MODU warrant a degree of special attention that is consistent with their population status; namely approximately mid-way between stable and threatened with extinction. Declining population trends in Texas are of particular concern. MODU along the WGC face potential survival and/or reproductive stresses from coastal marsh degradation, declines in rice farming, lead exposure, harvest, disturbance, reptilian and mammalian predators, and variable precipitation. Available evidence points towards recruitment as the most likely source of current population limitation, but survival constraints also warrant attention. The challenge at hand is to design a future landscape capable of supporting Mottled Duck and other priority species using similar habitats at desired levels in light of predicted future changes.
- 4. Conservation Goals:** The GCJV MODU Working Group used the U.S. Midwinter Survey long-term coastal average (1971-2004) for MODU to set a population target for the Texas, Louisiana, and Mississippi portion of the WGC. The WGC target is 105,816 individuals; the Louisiana target is 70,132, and the Texas target is 35,322. Texas is currently 52% below target. Development of this target revealed the limits of current population data, leading to a recommendation to develop an improved range-wide survey (the WGC MODU breeding population survey). The highest priorities to improve WGC MODU populations are actions that increase nest success and brood survival. Actions to improve nest success include improving grassland conditions proximal to good brood-rearing wetlands, minimizing predation pressure, and maintaining optimal habitat sizes. Actions to improve brood survival include managing shallow low salinity wetlands from mid-April through July, minimizing predation pressure, managing a vegetative substrate to produce invertebrates for duckling food, and ensuring brood-rearing habitat connectivity with nesting habitat. Moderate WGC MODU conservation priorities are actions to increase adult breeding propensity and adult survival during molt. Breeding propensity may be increased through availability of wetlands near nesting habitat during February and March so that breeding pairs can forage and loaf. Adult survival during molt can be increased through availability of shallow wetlands from mid-July through mid-September, with low reptilian

predator populations, very short vegetation, and patches of denser, taller escape cover. Because these habitat recommendations are largely based on expert opinion as opposed to rigorous scientific documentation, implementation must occur in a strategic manner that facilitates evaluation, accompanied by appropriate monitoring.

**5. Measurable Objectives:** The following objectives are based on a 5 year time table, as specified in the Emphasis Area program guidelines:

- a. Complete the collaborative MODU landscape model by integrating sea-level rise projections and trend-based land-change models to evaluate future habitat suitability for MODU. Use this model in conjunction with the Gulf Coastal Prairie Landscape Conservation Cooperative (GCP LCC) MODU Decision Support Tool (DST), and the Gulf Coast Vulnerability Assessment to create a flexible DST to identify, compare, and prioritize current and predicted future MODU habitat through the year 2100.
  - i. Update the Sea-Level Affecting Marshes Model with site-specific aggradation and subsidence information to provide more accurate projections of vulnerability due to sea level rise by 2019.
- b. Continue current or increase level of monetary and in-kind support for the WGC MODU breeding population survey so that the relationship between it and the Midwinter survey can be estimated, and the current objectives for the WGC can be translated to and assessed using breeding population survey data.
- c. Complete large-scale coastal wetlands restoration efforts to benefit MODU.
  - i. Complete McFaddin National Wildlife Refuge (NWR) beach berm by 2016 [50,000 acres (ac) intermediate marsh benefitted].
  - ii. Complete planning and compliance aspects of McFaddin NWR freshwater siphons and seek funding; with projected 35% design and National Environmental Protection Act compliance completion by 2016.
  - iii. Develop proposal for beach nourishment project for Texas Chenier Plain Refuge complex and adjacent properties; locate sand source and complete permitting process for full project by 2018.
- d. Manage coastal marsh and prairies in the Texas Chenier Plain Refuge complex for the benefit and support of MODU reproduction; including:
  - i. 3,000 ac targeted as agriculture planted for wildlife over the next 5 years
  - ii. 11,250 ac targeted for flooding with fresh water and managed for waterfowl and other wildlife over the next 5 years
  - iii. 157,000 ac targeted for structural marsh management over the next 5 years
  - iv. 175,000 ac targeted for managed grazing over the next 5 years
  - v. 2,000 ac targeted for moist-soil management over the next 5 years
  - vi. 1,250 ac prairie managed over the next 5 years
  - vii. 100,000 ac targeted for invasive species management over the next 5 years
- e. Manage coastal marsh and prairies in the Texas Mid-Coast Refuge complex for the benefit and support of MODU reproduction; including:

- i. Annually supply 350 ac/feet of water on the Myrtle-Foester-Whitmire Unit, Aransas NWR
  - ii. Apply prescribed fire to approximately 10,000 ac/year on the Tatton Unit, Aransas NWR
- f. Band a minimum of 500 MODU/year for population monitoring purposes.
- g. Complete and validate the GCP LCC grassland DST. Use in combination with the collaborative MODU landscape model (see a. above) to determine potential for grassland establishment and restoration to benefit MODU and grassland-dependent species such as Eastern Meadowlark (*Sturnella magna*), Northern Bobwhite (*Colinus virginianus*), and Sprague's Pipit (*Anthus spragueii*).
- h. Complete and validate the GCJV King Rail (KIRA) (*Rallus elegans*) habitat model. Use in combination with the collaborative MODU landscape model to identify potential areas of high value for MODU and KIRA.

## Emphasis Area Key Conservation Priority Identification Template

June 22, 2015

**1. Name of Emphasis Area: Gulf Coast**

**2. Title of the Key Conservation Priority:** Successful recovery of the Aransas Wood Buffalo Whooping Crane (*Grus americana*) population.

**Description of the Key Conservation Priority.**

Shoreline and inland habitats of the Texas Gulf Coast encompass the wintering grounds for the only non-reintroduced and migratory population of whooping cranes (*Grus americana*) in North America; the Aransas Wood Buffalo population. Downlisting from endangered to threatened status for this species requires >1,000 birds with >250 breeding pairs, provided no additional self-sustaining flocks are established (Criterion 1B; Canadian Wildlife Service and United States Fish and Wildlife Service 2007). As the population grows it continues to expand. To plan for the continued recovery of the crane, we need to quantify habitat needs and diagnose the current and future threats its habitat faces and use this information to conserve those areas most likely to sustain cranes well into the future. Various attempts have been made to reintroduce other migratory and resident flocks but these have been largely unsuccessful (Canadian Wildlife Service and United States Fish and Wildlife Service 2007). Persistence of the species is contingent upon continued growth of the Aransas-Wood Buffalo Population thus elevating the importance of identifying and protecting crane wintering ground habitat for conservation. A key conservation priority for the southwest Region and the Gulf Coast Emphasis Area is ensuring the continued success of the Aransas Wood Buffalo population.

The whooping crane is a U.S. Fish and Wildlife Service identified surrogate species because of its representation for conservation planning and role as a flagship species. For conservation planning, cranes represent habitat that supports species reliant on shoreline and inland habitat on the gulf. As a flagship, the charismatic iconic nature of the crane is heralded as an example of a recovery 'success story' for an endangered species. Safeguarding the continuing success of the Aransas Wood Buffalo whooping crane population is a high priority for Refuges, Ecological Services and Migratory Birds. Refuges manage the federal lands on which Whooping cranes spend one third of their life cycle (Aransas National Wildlife Refuge) and Ecological Services are responsible for permitting. As whooping cranes migrates close to 4,000 kilometers across the Great Plains (Region 2 Emphasis Area) consideration and responsibilities for conservation during migration falls on Migratory Birds.

To ensure the continuing successful recovery of the Aransas Wood Buffalo population we need to protect enough habitats to support the downlisting population goal of 1000 birds.

**Conservation goals are:**

- 1) Expand the Refuge Acquisition Boundary. For the U.S. Fish and Wildlife Service to move forward with a refuge (i.e. Aransas National Wildlife Refuge) boundary expansion or land acquisition, we need to develop and produce a Landscape Conservation Design. A Landscape Conservation Design is a planning process and product that is scientifically driven to inform strategic acquisition of habitat for a suite of species. While the U.S. Fish

and Wildlife Service's conservation focus is to identify and protect habitat for the endangered whooping cranes part of a successful conservation design includes incorporating the habitat needs of multiple species.

- 2) Minimize potential losses of habitat and target important habitat for conservation and restoration activities.

**Measurable Objectives Goals 1:** a) Completion of a Landscape Conservation Design for Coastal Bend region of the Texas Gulf Coast centering on the habitat needs of whooping cranes and b) provide science support to the state in completing coast wide assessment of the entire Texas Gulf Coast which will identify other focal species for the Coastal Bend portion of the Gulf. Both measurable objectives will be completed by October 2017 however a number of interim products will be produced to facilitate ongoing land conservation and restoration projects.

Landscape Conservation Design and all associated documents: The Service and Texas Parks and Wildlife will co-lead the process to develop a Landscape Conservation Design for the Texas Mid-Coast and Coastal Bend areas of the Texas Gulf Coast.

Science support to inform the Landscape Conservation Design: We will refine and make available a robust and flexible decision support system to identify, compare, and prioritize shoreline and inland habitats that support sustained conservation for whooping cranes and other selected focal species in the Texas Gulf Coast. This product is under development for the whooping crane and as part of our measurable objectives, the Service will complete the whooping crane portion of the project.

We will identify the most important habitats for whooping cranes and selected species and predicted habitat shifts caused by sea-level rise using the Sea Level Affecting Marshes Model (SLAMM) and forecasted land conversion due to urbanization (and other anthropogenic stressors) over the next century. To accommodate the downlisting goal of 1000 whooping cranes, we will establish a habitat conservation target (hectare amount). We do this by combining estimates of whooping crane density with the prediction of sustainable habitats, to estimate the maximum number of cranes that could inhabit the project region inside and outside protected areas.

Completion of this current effort will include 1) ground truthing the model output, 2) expanding the study area to include Texas mid-coast National Wildlife Refuge Complex 3) model sea level rise to different rise levels (0.6m, 1.0m and 2m), and 4) incorporating current GPS telemetry data of crane movements.

A comprehensive decision support tool will need to integrate additional species to the prioritization exercise. To do this we will identify the species to include. This will be done in collaboration with partners (Texas Parks and Wildlife Department, The Nature Conservancy and other identified stakeholders). We will engage in a data mining exercise to determine the level of information available, this will determine a path forward. For other selected species it is unlikely we'll have the data similar to what was available for the whooping crane. Therefore, we will need to use a different approach than that taken for the whooping crane to develop species habitat relationships. Once we identify the level of information available we can systematically

determine how to approach each species (i.e. determine best way to model species-habitat relationships). By adding additional species, we aim to make the decision support tool more robust and inclusive of other focal species.

**Measurable Objectives Goal 2:** Minimize potential losses of habitat and target important habitat for conservation and restoration activities.

- a) Work with partners to develop three conservation/restoration projects in lands identified as sustainable habitat for cranes in the Coastal Bend
- b) Use decision tool to identify 5,000 acres of sustainable crane habitat and permanently place these acres under conservation protection.

## Emphasis Area Key Conservation Priority Identification Template

June 17, 2015

- 1. Name of Emphasis Area:** Gulf Coast
- 2. Title of the Key Conservation Priority:** Conservation of Coastal Prairies and associated wildlife
- 3. Description of the Key Conservation Priority:** Native coastal prairie grasslands are biologically one of the most diverse habitat types, yet also one of the most impacted. Historically, more than 6.5 million acres of coastal prairie habitat existed along the Texas/Louisiana Gulf Coast. Large expanses of grasslands and associated wetlands were threaded by wooded streams and rivers and collectively supported a wide variety of wildlife.

Today, less than 1% of this original grassland habitat remains in relatively pristine condition (Smeins et al. 1991) and, what little that remains is highly fragmented due to: 1) conversion to crops, 2) urbanization, 3) encroachment of exotic invasive species, 4) disrupted hydrology, and 5) overgrazing. With the decline of coastal prairie habitat, came the decline of several grass-dependent species including the economically important Northern Bobwhite, Mottled duck, Sprague's pipit, crayfish frog, and critically endangered Attwater's prairie-chicken (APC), an indicator species of the coastal prairie (Samson, 1980). Specifically for the APC, vulnerability to stochastic events makes recovery of this species even more challenging. During the last 30 years, findings indicate that grassland bird species have shown steeper, more consistent, and more geographically widespread declines than any other behavioral or ecological guild of North American species (North American Bird Conservation Initiative, 2009). In addition, Monarch butterflies and other pollinators have been declining at an alarming rate. Many ground-dwelling wildlife species have further been impacted, directly and indirectly, with the arrival of red imported fire ants (RIFA).

Providing the ability to protect, maintain, and restore coastal prairie habitat on both private and public lands through the use of prescribed fire, invasive species management, proper grazing, and restoration is critical to the survival of many species who call the coastal prairie home. Conservation activities involving private landowners, conservation groups, state and Federal agencies, and other partners are a must if the loss of coastal prairie habitat is to be stopped and reversed. Restoration and improvement of coastal prairie habitat will increase the chances of survival for struggling species such as the Attwater's prairie-chicken, Monarch butterfly, and other grassland-dependent species.

- 4. Conservation Goals:** The challenge at hand is to design a landscape capable of supporting priority coastal prairie wildlife species at desired levels in light of identified limiting factors. The following represent the highest conservation priorities for coastal prairie habitat and its associated wildlife species of concern:
- a. Develop, validate, and implement the Gulf Coast Prairie (GCP) LCC's Grassland Decision Support Tool (GDST) to prioritize conservation efforts for Attwater's prairie-chicken, Northern Bobwhite, and other grassland species of concern.
  - b. Refine IPM strategies to control or mitigate for adverse effects of red imported fire ants on Attwater's prairie-chicken brood habitat, including determination of most efficient and efficacious strategies while recognizing that permanent elimination of this invasive species in coastal prairie grasslands is not feasible. Many other species, including some of conservation concern, would also likely benefit.
  - c. Establish additional Attwater's prairie-chicken populations in geographically separate areas (as outlined in the 2010 APC Recovery Plan) to mitigate the potential for catastrophic effects of local weather events. *(Note: thousands of acres of suitable vacant habitat exists in Goliad County, and landowners are open to APC releases. It is expected that added capacity of the captive breeding program will provide additional birds for release within approximately 3 years, but funding will be needed to support logistics and monitoring for additional release sites.)*
  - d. Improve native pollinator habitat on public and private lands through restoration of native prairie grasslands.
  - e. Foster a constituency engaged in coastal prairie conservation.
- 5. Measurable Objectives:** The following objectives are based on a 5 year time table, as specified in the Emphasis Area program guidelines:
- a. Use GCP LCC Grassland Decision Support Tool to prioritize grassland areas for management of APC, Northern Bobwhite, and other grassland-dependent species. Protect, restore, or establish 10,000 additional acres of native grassland habitat in these priority areas through Refuges, Partners Program, Natural Resource Conservation Service (NRCS) landowner incentives, Texas Parks and Wildlife Department's (TPWD) Grassland Restoration Incentive Program (GRIP), and/or other programs as available.

- b. Treat 25,000 acres of coastal prairie to reduce or mitigate red imported fire ant impacts to APC brood habitat and other grassland species using most current IPM strategies.
- c. Establish an additional APC population in the Refugio/Goliad County area and provide for monitoring of post-release survival and reproductive success of that population.
- d. Promote coastal prairie conservation by working hand-in-hand with partners to educate and motivate an informed constituency to actively work towards accomplishment of Objectives a-c.

**Literature cited:**

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## Emphasis Area Key Conservation Priority Identification Template

June 22, 2015

- 1. Name of Emphasis Area:** Texas Gulf Coast
- 2. Title of the Key Conservation Priority:** Making nature relevant to urban populations
- 3. Description of the Key Conservation Priority:**

Texas' coastal plain supports a population of more than 7.1 million people. It includes some of the most densely populated areas of the state and two of the country's fastest growing areas, Houston and the lower Rio Grande Valley (RGV). Situated within this urbanized coastline are 13 of Texas' 20 national wildlife refuges and some of the most ecologically rich and diverse habitats in the state.

The density of people within the Gulf Coast Emphasis Area presents both a challenge and an opportunity; people who are disconnected from nature are less likely to be committed to, and involved with, the stewardship of our shared natural resources. Still, the U.S. Fish and Wildlife Service (Service) has an opportunity to reach out to urban residents in nearby communities and foster a connection to nature and ultimately the National Wildlife Refuge System (NWRS). To develop this conservation constituency, the Service must help urban residents define their own approach to nature; how to access, enjoy and learn about nature. To do this, the Service must provide opportunities that create relevance and encourages people to build upon their own conservation experiences.

Additionally, the Service's urban presence provides access to a new and vast cadre of non-traditional and potential partners, including the medical, corporate, and business communities. It also provides avenues for the Service to partner with city, county and state agencies that manage significant natural resources within the urban landscape. Some of these potential partners share our conservation interest and others are served by nature in a different capacity. Regardless, the Service has the opportunity to identify and work with previously inaccessible partners that bring new and significant resources to help the agency further its conservation mission.

- 4. Conservation Goals:**

Connect urban communities to nature within the Texas coastal Emphasis Area.

- Goal 1: Engage new audiences in urban communities to learn about and care for nature.
- Goal 2: Foster a better understanding of wildlife conservation and the role of the Service and the National Wildlife Refuge System.
- Goal 3: Increase capacity and sustainability of current conservation partners and build new partnerships with an emphasis on the Houston Metropolitan Area, Rio Grande Valley and Corpus Christi.

- Goal 4: Recognizing that different people have different levels of comfort in nature, lead urban residents to nearby national wildlife refuges through incremental experiences that build confidence and interest.

## **5. Measurable Objectives:**

Within the next five years, we will:

- a. Formalize seven MOAs with non-profit organizations, local, state and federal agencies to prioritize and accomplish mutual conservation goal.
- b. For youth, provide 10 internship and/or employment opportunities on NWRs, 12 urban volunteer community service projects, and three job shadow/leadership experiences.
- c. Provide technical assistance, materials, volunteers, and/or funding for eight urban habitat restoration projects that reflect a community need and a conservation priority of the Service.
- d. Reach 50,000 students by providing hands-on environmental education opportunities both on and off NWRs, including conducting 50 programs for Houston Park and Recreation Department's after school and summer programs; bringing youth from 15 Houston Park and Recreation Department community centers to visit a national wildlife refuge; 20 Environmental Education programs for students, parents and volunteers of the Pharr-San Juan-Alamo school district.
- e. Facilitate 10 train-the-trainer workshops to provide continuing education certification for teachers in a variety of conservation and outdoor education skills.
- f. Reach an estimated 75,000 kids through a mobile coastal environmental education interactive exhibit that highlights NWRs within the Emphasis Area.
- g. Utilize technology to bring nature to non-traditional and new audiences, including conducting 20 virtual field trips for the pediatric unit of University of Texas M.D Anderson Cancer Center; and develop a citizen science program using iNaturalist to connect urban residents to Texas' NWRs and urban wildlife.
- h. Create a 'sister site' partnership between three Houston-area refuges and three HPARD parks and their corresponding Friends organizations.
- i. Provide an online bilingual resource library specific to the Emphasis Area that includes curricula, activities, and wildlife and habitat resources to enhance educational, recreational, and restoration opportunities for teachers, community leaders, and the urban residents.
- j. Create awareness of opportunities to enjoy nature through websites, social media, and traditional avenues including participating in 50 special events and conducting 30 presentations over the next 5 years. Develop outreach materials, including banners and bilingual flyers and brochures.
- k. Implement a 2-year urban Put and Take fishing program in Houston and in the lower Rio Grande Valley.