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***DRAFT FOR TEAM INPUT***

**Rio Grande Emphasis Area Key Conservation Priority 1 (3 pages max)**

**1. Name of Emphasis Area:** Rio Grande

**2. Title of the Key Conservation Priority:** Conservation and recovery of federally listed species, migratory birds, other trust resources, and species of greatest conservation need (SGCN).

**3. Description of the Key Conservation Priority:**

The Rio Grande supports unique fisheries and riparian ecosystems, including threatened and endangered species, migratory birds and butterflies, and other trust resources. There are 27 native fish species of which only 14 remain extant. New Mexico has identified 53 Aquatic SGCN and Texas has identified 33 species of fish and 15 species of aquatic mollusks and crustaceans as priority conservation species. Over 450 species of birds use the river corridor during breeding, migration or winter seasons, including 50 species of birds on the United States' watch list. The Rio Grande watershed provides overwintering habitat for many avian species including Central Flyway ducks, geese, 90% of the overwintering Rocky Mountain population of sandhill cranes, and summer and spring breeding areas for monarch butterflies. Federally-listed species in the emphasis area include the New Mexico meadow jumping mouse, Rio Grande silvery minnow, Southwestern willow flycatcher, yellow-billed cuckoo, jaguarundi and ocelot. Federally-listed plant species include the Pecos sunflower, Texas Azenia, Zapata Bladderpod, Ashy Dogweed, Star Cactus, Johnston's Frankenia, and Walker's Manioc.

Over allocation of water, invasive species, fragmentation, and other ecosystem pressures stress the Rio Grande and its tributaries. Drought and climate change disrupt ecosystem functions. We intend to advance the recovery of federally-listed species and the conservation of trust resources within the Rio Grande watershed by restoring and protecting functional ecosystems that can support these species.

Agriculture has had the most severe impact to the Tamaulipan brushland in the region. Since the 1920s, more than 95% of the original native brush land in the Lower Rio Grande Valley (LRGV) has been converted to agriculture or urban use. More than 90% of the riparian habitat on the United States side of the Rio Grande has been cleared. It is estimated that 98% of the lush, subtropical region of the delta has been cleared in the United States, and a large percentage of similar habitat has been cleared in Mexico.

The growth of border urbanization has been one of the main factors causing ecosystem deterioration within the lower Rio Grande watershed. This has resulted in brush clearing, and increased pollution, as well as considerable increase of water consumption. In addition, inefficient irrigation practices, domestic sewage contamination, industrialization and the liberal use of agricultural pesticides have altered both the quantity and quality of water in the reservoirs and watersheds. Water development, both for flood control and municipal use, has resulted in extensive clearing of brush, alteration of riparian habitats, and changes in water flow in the Rio Grande. Infrastructure impacts such as the construction of lakes, international bridges, new roads and expansion of existing ones, and intra-coastal canals and ports will cause future negative impacts.

**4. Conservation Goals:**

*Goal 1: Maximize persistence of imperiled species by increasing or maintaining population size and distribution.* Over the next five years, the Rio Grande Emphasis Area Team aspires to advance the recovery of federally-listed species, migratory birds, and SGCN, with an emphasis on the species listed in the table below.

<b>Species</b>	<b>Species Designation</b>	<b>Upper Rio Grande (Headwaters to El Paso)</b>	<b>Middle Rio Grande (El Paso to Falcon Reservoir)</b>	<b>Lower Rio Grande (Falcon Reservoir to Gulf of Mexico)</b>
Rio Grande silvery minnow	Endangered	x	x	potential reintroduction
Texas hornshell	Candidate		x	x
Salina mucket	Petitioned (FY16+ for 12-month finding)	?	x	x
False spike		?	x	x
Mexican fawnsfoot		?	x	-
Southwestern willow flycatcher	Endangered	x		
Yellow-billed cuckoo	Threatened	x	x	
Common black hawk	Surrogate	x	x	x
Bell's vireo	Surrogate	x	x	x
Common yellowthroat	Surrogate	x	x	x
Yellow-breasted chat	Surrogate	x	x	x
New Mexico meadow jumping mouse	Endangered	x		
Ocelot	Endangered			x
Pecos Sunflower	Threatened	x	?	
Texas Ayenia	Endangered			x

Priority actions to achieve Conservation Goals will be drawn from the following: Recovery Plans, Recovery Outlines, Saving Our Shared Birds: Partners in Flight Tri-National Vision for Landbird Conservation, and other relevant Federal or State conservation planning documents.

*Goal 2: Minimize non-native and invasive species and communities that adversely affect the priority species listed above.*

- Maintain and improve vegetative conditions for southwestern willow flycatcher and yellow-billed cuckoo by applying selective invasive tree removal within breeding areas (as per guidance available in Strategy for Long-term Management of Exotic Trees in New Mexico's Riparian Areas, U.S.D.A. Forest Service, March 2004.)

- Reduce non-native habitat to native habitat (concentrate on non-native species that are prone to wildfires or otherwise affect integrity of riparian ecosystem.)

Goal 3: Improve or maintain ecosystem function to support the priority species listed above. Protect and restore biodiversity of important integrated aquatic, terrestrial and wetland habitats where fragmentation and loss of connectivity have occurred.

- Concentrate on areas where perennial water can be restored.
- Have international wildlife connectivity of habitats along the U.S./Mexico border where we have shared species.
- Protect threatened habitats through fee title acquisition, conservation easements, conservation agreements or other programs.

**5. Measurable Objectives:**

Goal 1: Maximize persistence and expansion of native species habitats

*Objective 1:* Identify the most critical opportunities to maximize population size and distribution (within historic range) of the priority species listed above.

*Objective 2:* Create a funding and implementation strategy to address the most critical issues identified under *Objective 1*.

*Objective 3:* Secure funding and implement strategic actions.

*Objective 4:* Review and analyze the list of surrogate species above, add species (or ecological attributes) if needed, then test the hypothesis that these are actually effective surrogates.

*Objective 5:* A program of coordinated monitoring or modeling of the spatial amount of breeding habitat or the measured population abundance of the selected priority species listed above will be developed and conducted annually to review progress towards identified conservation goals .

Goal 2: Minimize non-native and invasive species

*Objective 1:* Determine which non-native and invasive species are having the most significant adverse effects on priority species (and where).

*Objective 2:* Create a funding and implementation strategy to address the most critical issues identified under *Objective 1*.

*Objective 3:* Prioritize projects and begin implementing the strategic plan developed under *Objective 2*.

Goal 3: Improve or maintain ecosystem function

*Objective 1:* Increase riparian acres protected through Conservation Reserve Program (or equivalent programs) in areas identified to be contributing to degraded perennial water resources.

*Objective 2:* Acquire, through fee title acquisition, conservation easement, or conservation agreement, riparian and upland habitat that contributes to Goal 1 above.

*Objective 3:* Prioritize projects that provide international wildlife connectivity of habitats along the U.S./MX border and projects that serve to restore habitat to support viable populations of the priority species listed above.

**1. Name of Emphasis Area:** Rio Grande Emphasis Area Team

**2. Title of the Key Conservation Priority:** Water Quality , Water Quantity

**3. Description of the Key Conservation Priority**

Water is the lifeblood of the Rio Grande Corridor and vital to the trust resources that the U.S. Fish and Wildlife Service manages within this emphasis area. The Rio Grande has undergone considerable change in the last 150 years and is no longer the highly dynamic system it once was. Several large dams and irrigation diversions have been built on the river, and the entire system is now operated to reduce flood threats and to supply water for irrigation and municipal and industrial uses. In many areas, channel incision has reduced overbank flows onto the floodplain. Channels have been straightened and deepened, eliminating meanders, oxbows, and other components of the historic habitat. Aquatic plants and snags have been removed to lessen hydrologic resistance and reduce retention time of water in order to pass water as efficiently as possible for agricultural irrigation and downstream deliveries. These changes have reduced the surface area and physical complexity of riverine and riparian habitats, reduced refugial habitats, prevented upstream movement of fish, and altered species interactions.

The quantity and type of sediment entering the river has also changed, due to changes in watershed conditions and retention behind dams. Alterations in the magnitude and variability of flow, plus extractions of water for consumptive uses, have resulted in river drying, have reduced the magnitude, frequency, and duration of peak-flow events, and have increased the magnitude, frequency, and duration of low-flow events. Climate change will continue to increase the stress on these already degraded systems by amplifying drought and altering seasonal timing of important eco-hydrologic cues. In short, ecosystem function with regard to Rio Grande riverine and riparian habitats has been severely altered and has resulted in significant impacts to Service trust resources.

The challenge we face as 21<sup>st</sup> Century conservationists is how to both preserve and improve the function of aquatic habitats while maintaining core societal needs. The Rio Grande Emphasis Area Team prioritizes activities that result in measurable improvements to the water quality and quantity of riverine, riparian and wetland habitats of the Rio Grande.

**4. Conservation Goals**

The conservation goals for water quality and quantity for the Rio Grande Emphasis Area Team are to: 1) establish environmental flows for Service aquatic trust resources and other species of greatest conservation need (SGCN), 2) improve water quality for river, riparian, and wetland habitat, and 3) update infrastructure to improve water delivery efficiency and river connectivity.

*Goal 1: Improved Environmental Flows “The restoration of key eco-hydrologic flow needs within the Rio Grande which will maintain and improve populations of aquatic trust resources.”*

Reservoir management has dramatically altered the timing, frequency, magnitude, and duration of flows within the Rio Grande. Flood control and floodplain modifications have diminished Rio Grande wetlands and wetland function. These dramatic alterations to our river systems have led to the decline of habitat

for native species and are at the root of many of the conservation challenges facing the Service along the Rio Grande. Climate change will continue to exacerbate these challenges. It is of paramount importance to restore key components of flow to the Rio Grande and its wetlands and tributaries. This goal spans all sectors of our agency including endangered species recovery, National Wildlife Refuge wetland and river management, native fish, and migratory bird recovery.

The Team envisions a future Rio Grande where there are: a) environmental base flows within the Middle Rio Grande, Rio Grande through Las Cruces, Rio Grande through Big Bend, and the Rio Grande below Falcon Reservoir, b) a restored spring run-off pulse from headwaters to Gulf, and c) adequate water for wetland management throughout the system.

*Goal 2: Improved Water Quality “Clean water in the Rio Grande and within its wetlands”*

The quality of the water in the Rio Grande is degraded by reduction in flows, stormwater run-off, municipal effluent, agricultural return flows, and airborne contaminants. Water quality is an integral part of the Rio Grande Ecosystem and is interrelated with efforts to improve water flows, manage return flows from agriculture, and filter stormwater in urban areas. Throughout the Rio Grande water quality is threatened by reduction in flows and amplification of salt from agricultural run-off. Urban stormwater treatment has historically been accomplished through hard-engineered designs; however, recent innovations are joining these treatment needs with wetlands. An example of this is at the Valle de Oro NWR, where urban stormwater treatment needs are being commingled with wetlands on the Refuge.

The Team envisions a future Rio Grande where; a) there are adequate flows to ensure water flows have levels of dissolved oxygen and salinity that are supportive of native aquatic species, and b) stormwater run-off in urban areas is managed to control for abiotic and biotic pollutants.

*Goal 3: Updated Water Infrastructure “Modern infrastructure that will allow for more efficient water management and improved river connectivity for the benefit of native aquatic species.”*

Improvements to water infrastructure will improve delivery efficiency and flexibility, giving managers greater ability to provide water when and where it is needed. The lack of adequate infrastructure inhibits the best use of available water and may increase conflict among water stakeholders. Additionally, infrastructure modifications within the Rio Grande itself will help to improve river and floodplain connectivity, and in-channel habitat features.

The Team envisions a future Rio Grande where modern infrastructure is utilized to both improve water efficiencies and address environmental flow needs and where modern engineering techniques are used to improve river connectivity and riparian habitat conditions.

**5. Measurable Objectives:**

*Goal 1: Environmental Flows*

*Goal 1: Objective 1:* Support efforts to reach consensus among restoration practitioners on the baseline flow needs for the river and associated wetlands in each reach.

*Goal 1: Objective 2:* Strategize with water management agencies and other key stakeholders on ways to obtain environmental flows specific to each reach of the Rio Grande to support the river and associated wetlands. This could include, for example:

- Identifying groups that work with improving irrigation efficiencies and using some of the conserved water to meet environmental water demand;
- A feasibility study for water markets for environmental flows.

*Goal 1: Objective 3:* Hold environmental flow workshops by reach. Coordinate Service programs in the Middle Rio Grande, Las Cruces, Big Bend, LRGV...

*Goal 2: Water Quality*

*Goal 2: Objective 1:* Identify water quality issues within the Rio Grande Corridor. Work with partners to identify specific threats and problems within each reach. Identify potential partners and programs for mitigating water quality problems.

*Goal 2: Objective 2:* Work with urban stormwater agencies to “green” their techniques for treating urban run-off. Use Valle de Oro NWR as a demonstration area for how stormwater treatment can be addressed through wetlands.

*Goal 2: Objective 3:* Work with Goal 1 Objective 2 (above) to address water quality problems through environmental flow programs.

*Goal 3: Infrastructure:*

*Goal 3: Objective 1:* Conduct an inventory of irrigation infrastructures at National Wildlife Refuges within the Rio Grande Corridor. Identify infrastructure improvements that will ease water shortages.

*Goal 3: Objective 2:* Identify at least 3 key infrastructure projects on NWRS to optimize water delivery efficiencies and coordinate means to finalize projects. One of these projects is to implement irrigation infrastructure improvements at the North Boundary of Bosque del Apache NWR.

*Goal 3: Objective 2:* Coordinate with Federal and State agencies to improve river connectivity for priority species. Improve in-channel diversions for fish passage within the Middle Rio Grande. Identify the need for similar projects within other reaches of the Rio Grande.

## Emphasis Area Key Conservation Priority Identification Template

1. **Name of Emphasis Area:** Rio Grande
2. **Title of the Key Conservation Priority:** Community Engagement, Education, Involvement and Promotion of Scientific Understanding
3. **Description of the Key Conservation Priority:** An educated and informed public who understands, values, and protects the Rio Grande corridor is key in achieving our conservation goals. This reach includes 7 national wildlife refuges in New Mexico and Texas – Valle de Oro NWR, Sevilleta NWR, Bosque del Apache NWR, San Andres NWR, Santa Ana NWR, Laguna Atascosa NWR, and Lower Rio Grande Valley NWR. By providing and supporting educational experiences in nature and engaging the local community in scientific understanding the Service can cultivate an awareness and sensitivity of local conservation issues. Encouraging these types of opportunities will help build awareness and long-term support for the work of the Service and other agencies that are tasked with land stewardship. Cultivating environmental awareness is a building block in the development of environmentally literate citizens, which is a requisite to creating a community that makes informed decisions about the future. Additionally, in order to ensure a future competent and engaged workforce for the Service, we need to support youth awareness of the Service and foster youth connections to the natural world.

The Service's Urban Wildlife Conservation Program's primary goal is "to create a connect conservation community." Furthermore, to garner broad support of conservation, the Service, must provide a reason, and opportunities, for urban residents to find, appreciated, and care for nature in their cities and beyond. Therefore, engaging our urban neighbors, and fostering a sense of stewardship, reflects the heart of the Urban Wildlife Conservation Program. The following conservation goals for community partnerships, community awareness and engagement, environmental education, and youth employment will initially focus on urban areas because that is where we have the opportunity to reach broad support for our conservation mission.

#### 4. Conservation Goals

##### **Community Partnerships**

Foster long-term relationships with partner organizations and entities to collaborate in support of the conservation goals of Environmental Education, Youth Employment and Community Awareness and Engagement.

##### **Environmental Education**

Work with partners to support formal and informal, and multidisciplinary environmental education to increase understanding of the need for conservation.

##### **Youth Employment**

Provide and support initiatives that expose local youth to on-the-ground experiences in nature to encourage awareness of local conservation issues and provide memorable experiences necessary to establish environmental stewardship.

### **Community Awareness and Engagement**

Offer opportunities that support long-term commitments to engage the community in actions on the ground that result in lasting connections with the resource and the work of the Service and its partners.

## **5. Measurable Objectives**

### Partnership Objectives

*Identify and foster XX number of partnerships within each reach of the Rio Grande Emphasis Area that will be conducive to developing quality environmental education, youth employment and community awareness and engagement programs.*

### Environmental Education Objectives

*Over the next 5 years, work with partners to reach XXX students in local school districts on and off-refuges, in all reaches of the Rio Grande, by providing long-term commitments to interdisciplinary and multi-agency approaches to education opportunities with all Service programs to acquire the knowledge, values, attitudes, and skills needed to protect and improve natural resources.*

*Develop activities and curricula for teachers (what grades? Perhaps will need to have an objective for every level – elementary, junior high, high school – in order to be measurable)*

*Offer XX curricula training workshop opportunities for teachers coordinating with local school districts as part of their continuing education requirements.*

*Offer XX workshops or presentations for parents/PTA in local school districts about the environmental education programs.*

*By 2017, develop and incorporate a place-based native-habitat-oriented environmental education program. It would teach high school students to grow native plants to restore native habitat, and mitigate specific urban problems with a curriculum that ties together the resources and communities along the Rio Grande.*

*By 2018 implement a pilot place-based native habitat oriented environmental education program at XX schools in collaboration with Valle de Oro and Santa Ana NWRs.*

*By 2020 explore opportunities to expand the place-based native habitat oriented environmental education programs to other refuges and Service program areas.*

## Youth Employment Objectives

*In the next five years, employ a minimum of 30 youth annually through the Middle Rio Grande Urban Conservation Corps, to engage in conservation projects, promote service learning, foster leadership, and create jobs.*

*In the next five years, employ a minimum of 20 youth annually through programs supported by the South Texas NWR Complex to engage in conservation projects, promote service learning, foster leadership, and create jobs.*

## Community Awareness and Engagement Objectives

*Host or participate in XX number of special events on and off site to create awareness of Service's mission and programs. (example: LRGV hosts yearly Rio Reforestation event.)*

*By 2018 develop a marketing strategy to create awareness about the Rio Grande Emphasis Area and how people can help (visiting a refuge, joining friends groups, etc.)*

*Over the next 5 year, host a minimum of 10 projects annually, in all reaches of the Rio Grande, that incorporate the local community in on the ground projects in conservation through all Service Programs.*