

RESTORATION

Riparian Woodland and Grassland Restoration to Increase Resilience to Drought



Terlingua Creek runs for 84.5 miles through the Chihuahuan Desert before reaching its confluence with the Rio Grande in Big Bend National Park, Texas. For nearly 35 miles Terlingua Creek is a perennial stream providing a critical source of water for the flora and fauna in this semi-arid region. Multiple organizations are working with public and private landowners to restore the riparian woodlands and enhance grassland habitats throughout the Terlingua Creek watershed in an effort to enhance ecosystem function and resilience to drought.



Project Location



Sediment Accumulation at a Willow Pole Planting Site

KEY ISSUES ADDRESSED

Riparian communities along Terlingua Creek have been disrupted by mining and logging of riparian forests. Deforestation and fragmentation has decreased the ability of the riparian woodland to slow flood flows, retain sediments and nutrients, and promote aquifer recharge. As a result, flood intensity and altered sediment supplies has increased bank erosion and decreased recruitment and reestablishment of cottonwoods and other riparian vegetation. has decreased, and baseflows, riparian aquifer levels, and aquatic habitat quality have declined. Drought intensifies and accelerates these negative impacts. Revegetating Terlingua Creek riparian areas is a critical step to limit the loss of species and ecosystem services.

PROJECT GOALS

- Increase riparian vegetation cover, specifically Fremont cottonwood and Goodding's willow
- Improve habitat for riparian wildlife and aquatic species to include the Rio Grande Silvery Minnow
- Increase sediment retention and storage capacity of the riparian aquifer
- Establish nurseries to generate sustainable native plant material for harvest

WILDLIFE BENEFITS

Rare and endangered species such as the Rio Grande Silvery Minnow, Yellow-Billed Cuckoo, and Mexican Stoneroller benefit from restored riparian woodlands.



Willow Poles Sprouting in the Spring of 2015

PROJECT HIGHLIGHTS

Watershed Approach: Riparian areas managed by public and private landowners are being revegetated to encourage natural recruitment and regeneration of riparian vegetation. In addition, practices that enhance grassland health are being implemented across the watershed.

Site Characterization for Successful Establishment: Initial revegetation efforts with larger riparian plant species were unsuccessful because the geomorphology and ecohydrology of the study area were not sufficiently taken into consideration. Studies of flow seasonality showed that revegetation efforts should begin during the late winter when base flows and the risk of high scouring events are low. In addition, test pits are used to identify moist soils with the right conditions for willow pole planting and successful establishment.

Plant Material Harvest: Collaborators developed a protocol to harvest willow and cottonwood poles from surviving riparian woodlands in Big Bend National Park that promotes stand recovery within a three-year period.

Revegetation Protocols: Planting pre-soaked willow poles in bundles of three in diamond-shaped planting areas has been shown to reduce scouring.

Collaborators and Funding Partners

- See online for full list of collaborators and funding partners.

Case study support provided by US Fish and Wildlife Service, US Bureau of Reclamation, US Forest Service, and Cross Watershed Network. Updated August 2018.

LESSONS LEARNED

Understanding the ecohydrology of Terlingua Creek improves the success of revegetation. Planting in the winter before major rainfall events reduces the risk that scour will harm plantings. In some areas, planting willow patches in a diamond-shape formation helps protect from scour. Though sites with wet soils are likely to support greater willow establishment, sites that are too close to the active channel tend to experience more scouring flows.

Successful willow establishment improves riparian and aquatic habitat. Revegetation has led to fine sediment accumulation and channel aggradation which improves the depth and extent of the aquifer. Revegetating degraded wetlands located on private land near the headwaters can create nursery conditions downstream and enhance natural regeneration of riparian woodlands.

Planting willow by hand increases establishment, but machinery or volunteer planting events may improve efficiency.

NEXT STEPS

- Install flow retention structures where willow establishment was unsuccessful
- Establish native plant nurseries
- Formalize revegetation and monitoring protocols
- Begin public outreach to educate a diverse audience on the benefits of wetland restoration

PROJECT RESOURCES

For more information on this project, contact Jeffrey Bennett: jbennett@abcbirds.org

For additional project resources and case studies, visit the Collaborative Conservation and Adaptation Strategy Toolbox:

WWW.DESERTLCC.ORG/RESOURCE/CCAST



Looking Upstream over the Terlingua Creek Restoration Site