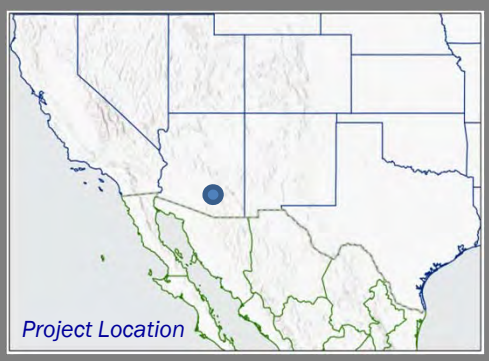
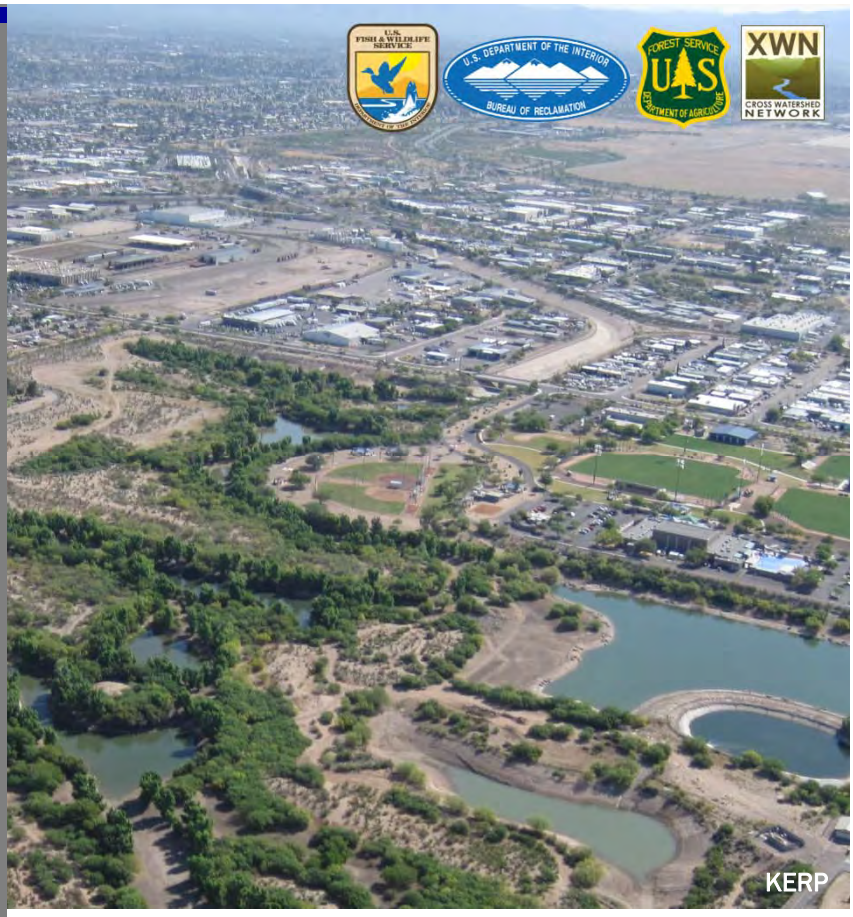
Water Conservation and Re-Use

Kino Environmental Restoration Project: Stormwater Capture to Support Urban Ecosystems

PIMA COUNTY

The Ed Pastor Kino Environmental Restoration Project (KERP) was created to restore natural areas by redeveloping an unlined stormwater detention basin in Tucson, Arizona. The detention basin protects downstream homes and businesses from flooding that would occur if water were allowed to flow unchecked from the east side of Tucson to the Santa Cruz River. The completed project resulted in a multi-purpose environmental restoration and stormwater harvesting system. Harvested stormwater is used to sustain open water habitat, riparian and upland plant communities, and to irrigate surrounding landscapes.





KEY ISSUES ADDRESSED

Over the past 100 years, rising demand for groundwater due to increased urban development and population growth has lowered water levels in the Tucson Basin aquifer in southeast Arizona. An increase in constructed areas with extensive impervious surfaces has resulted in more intense runoff events and decreased rainwater infiltration. This reduces the amount of water available to sustain riparian areas, and increases flooding risk to human lives and property. The KERP was successfully designed to meet three primary purposes – create sustainable native ecosystems, collect urban stormwater, and control flooding. It also provides community benefits through various recreational features.

PROJECT GOALS

- Develop and provide habitat for a range of riparian and upland species
- Capture stormwater during flood events to reduce flood impacts, sustain ponds and vegetation, and supply irrigation
- Create and promote recreational opportunities and community facilities

WATER HARVESTING

As Arizona's largest urban water harvesting project, captured stormwater re-use has saved over $5.5 million in irrigation costs since completion.

Open Water, Marsh, and Cottonwood-Willow at the KERP

PROJECT HIGHLIGHTS

Water Harvesting and Cost Savings: Harvested stormwater provides a low-cost alternative to using groundwater or municipal water and has resulted in an average water cost savings of $390,000 per year.

Recreation Benefits: A 2.2-mile paved path encircles the basin for walking, jogging, bicycling, and wildlife viewing. This path feeds into The Chuck Huckleberry Loop that connects multiple sections of recreation paths throughout the greater Tucson area.

Plant Diversity: The KERP was used to establish a variety of ecosystems: open water, emergent freshwater marsh, cottonwood-willow riparian gallery forests, mesquite bosque, grasslands, and Sonoran Desert scrub plant communities.

Habitat Creation: The KERP provides important wetland habitat with resting and foraging areas for resident and migratory waterfowl, shorebirds, riparian obligate birds, and upland birds. It also provides habitat for reptiles, three species of amphibians, small mammals, and invertebrates.

Federal Recognition: The project won the 2006 U.S. Army Corps of Engineers' Chief of Engineers Award of Excellence for Environmental projects.

Collaborators and Funding Partners

- U.S. Army Corps of Engineers
- Pima County Regional Flood Control District
- Pima County Regional Wastewater Reclamation Department

Case study support provided by the US Fish and Wildlife Service, US Bureau of Reclamation, US Forest Service, and Cross Watershed Network. Updated August 2018.
Photos courtesy of Jennifer Becker/Pima County Regional Flood Control District

LESSONS LEARNED

The KERP achieves multiple goals of flood control, water harvesting, sustainable wildlife habitat, recreation, cost savings, and environmental stewardship within an urban environment. The retention of stormwater and use of reclaimed water allows the facility to irrigate vegetation and the surrounding landscape without pumping groundwater.

This project substantially improved the environmental quality of the mudflats and shorelines in the basin while maintaining the original function of detaining and storing flood waters to minimize downstream flooding risks. The KERP achieved these goals while creating educational and recreational opportunities.

One challenge of the project was working through the regulatory issues surrounding the combined use of reclaimed water and stormwater. Constructing the facility within the jurisdictional "Waters of the U.S." poses continuing regulatory hurdles. Several permits were required for activity within the basin.

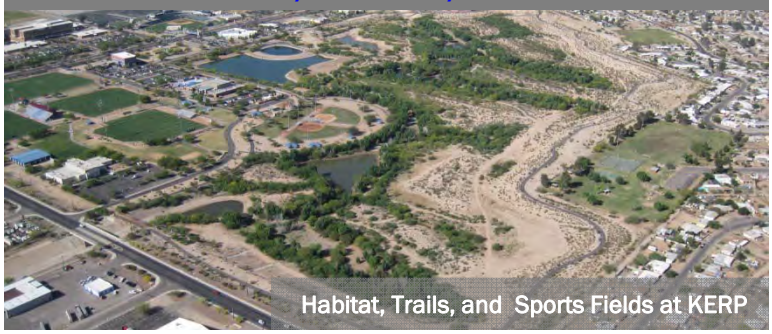
NEXT STEPS

- Continue wildlife, water quality, and vegetation monitoring to determine if environmental objectives are being met and to support a cost benefit analysis
- Maintain both flood control capacity and habitat quality, manage harvested stormwater, and implement mosquito control, as needed

PROJECT RESOURCES

For more information on this project, contact Jennifer Becker: jennifer.becker@pima.gov

For additional project resources and case studies, visit the Collaborative Conservation and Adaptation Strategy Toolbox: WWW.DESERTLCC.ORG/RESOURCE/CCAST



Habitat, Trails, and Sports Fields at KERP