

Enhancing flow in Sabino Creek Shallow Groundwater Area through a Holistic Community-based Approach

Project Summary

Watershed Management Group and partners have launched a community campaign (watershedmg.org/advocacy/rivers/restore-sabino-creek) to restore habitat and surface flow to the lower Sabino Creek watershed. Our project goal is to pilot a holistic community-based restoration model in lower Sabino Creek to further efforts to preserve and enhance surface flows in shallow groundwater areas throughout the Tucson basin.

The associated project objectives will be to:

- 1) develop a comprehensive riparian restoration plan for lower Sabino Creek
- 2) develop a dynamic Sabino Creek water balance and well inventory to understand potential water conservation and enhanced infiltration impacts
- 3) evaluate a restoration demonstration for actual impact to enhanced recharge and habitat

The lower section of Sabino Creek, located downstream of Sabino Canyon Recreation Area in northeast Tucson, passes through low-density residential development and joins Tanque Verde Creek. The riparian vegetation community supported along these lower reaches includes stands of velvet mesquite, Fremont cottonwood, Arizona sycamore, Arizona walnut and willow, and other mixed broadleaf species (PAG, 2000a).

The proposed project will have two phases. In phase 1 WMG and partners will conduct a feasibility study to identify and plan for a long-term multi-pronged restoration approach to benefit lower Sabino Creek surface flows and associated riparian habitat. The resulting study will inform phase 2 which will be the selection, design, implementation, and monitoring of a restoration site demonstration in partnership with local landowners.

This project complements recommendations in Pima Association of Governments Shallow Groundwater Areas in Eastern Pima County, Arizona: Water Well Inventory & Pumping Trend Analysis Report (2012). It aligns with Pima County's Sonoran Desert Conservation Plan (SDCP) for balancing the conservation and protection of our cultural and natural resource heritage with our efforts to maintain an economically vigorous and fiscally responsible community. In addition, the project will build off of gains in groundwater recovery realized through the discontinuation of pumping in 2006 from a nearby Tucson Water municipal well field and aid in regional groundwater security.

The proposed 3-year project includes extensive outreach to residents within and nearby to the Sabino Creek shallow groundwater area. Engagement of residents will consist of direct mailings, presentations, and on-the-ground restoration and monitoring activities. The goal will be to strengthen landowners' connections to and ultimately stewardship of the creek which is critical for long-term health of lower Sabino Creek and viability of the restoration features.

The feasibility study phase of the proposed project will:

1. Identify upland tributary and creek restoration opportunities for immediate and future projects to enhance habitat and local recharge of the shallow groundwater aquifer;

2. Conduct an aquifer characterization analysis to inform potential impact of restoration features to enhance recharge, preserve baseflow, and restore the natural hydrology;
3. Identify conservation opportunities to reduce local groundwater demand; and
4. Develop a long-term restoration strategy with site specific plans based on the best available science.

Based on the feasibility study findings from phase 1, phase 2 will select a pilot restoration site to demonstrate restoration practices which restore natural hydrologic processes. The restoration site will be intensively monitored before and after installation to measure impacts and inform future restoration strategies. The selected restoration site will be chosen to:

1. Enhance recharge of storm-event surface flows from neighborhood tributaries to the Sabino Creek shallow groundwater area to impact perennial base flow of lower Sabino Creek
2. Improve riparian habitat along degraded reaches
3. Provide a community-supported restoration demonstration to engage landowners and promote long-term stewardship of the creek.

WMG will work directly with Pima County Regional Flood Control District, Pima County, Tucson Audubon, Sky Island Alliance, Pima Association of Governments, University of Arizona, local residents, homeowners associations, businesses, Metro Water, Tucson Water, American Rivers, and consultants to develop and pilot a community supported restoration plan.

Year 1 Proposed Tasks:

Proposed Budget: \$110,000

- Conduct feasibility study to identify and select restoration site
- Develop a dynamic water balance model
 - Lower Sabino Creek aquifer characterization analysis using two 1/2mile electro-resistivity transect method
 - Develop a surface/groundwater based water balance
- Inventory private exempt and non-exempt wells and initiate monitoring of wells
 - Conduct well inventory and outreach
 - Create online module for well reporting on AZ Water Well Users website
- Select pilot restoration site and initiate site monitoring

Year 2 Proposed Tasks:

Proposed Budget: \$72,000

- Implement pilot restoration demonstration
- Monitor pilot restoration site
- Conduct conservation outreach to local residents and well users

Year 3 Proposed Tasks:

Proposed Budget: \$31,000

- Continued monitoring of pilot restoration site to evaluate effectiveness and impact on shallow groundwater region
- Refine restoration plan based on observed results
- Develop and submit final report and provide outreach to public and professionals