

July 14, 2023

Forty Niner Country Club and HOA Proposal

The goals of this project are to preserve intermittent flows in Tanque Verde Creek and enhance the area’s riparian habitat through community-based restoration efforts. The project area falls within a shallow groundwater area that supports riparian habitats in Tanque Verde Creek.

This project will implement approximately 3 stormwater restoration projects near Tanque Verde Creek to reduce erosion and stormwater flooding impacts from adjacent parcels and neighborhood street landscape areas to improve water quality and increase stormwater infiltration to benefit the overall riparian health. Stormwater restoration features will consist of stormwater harvesting basins and native plantings.

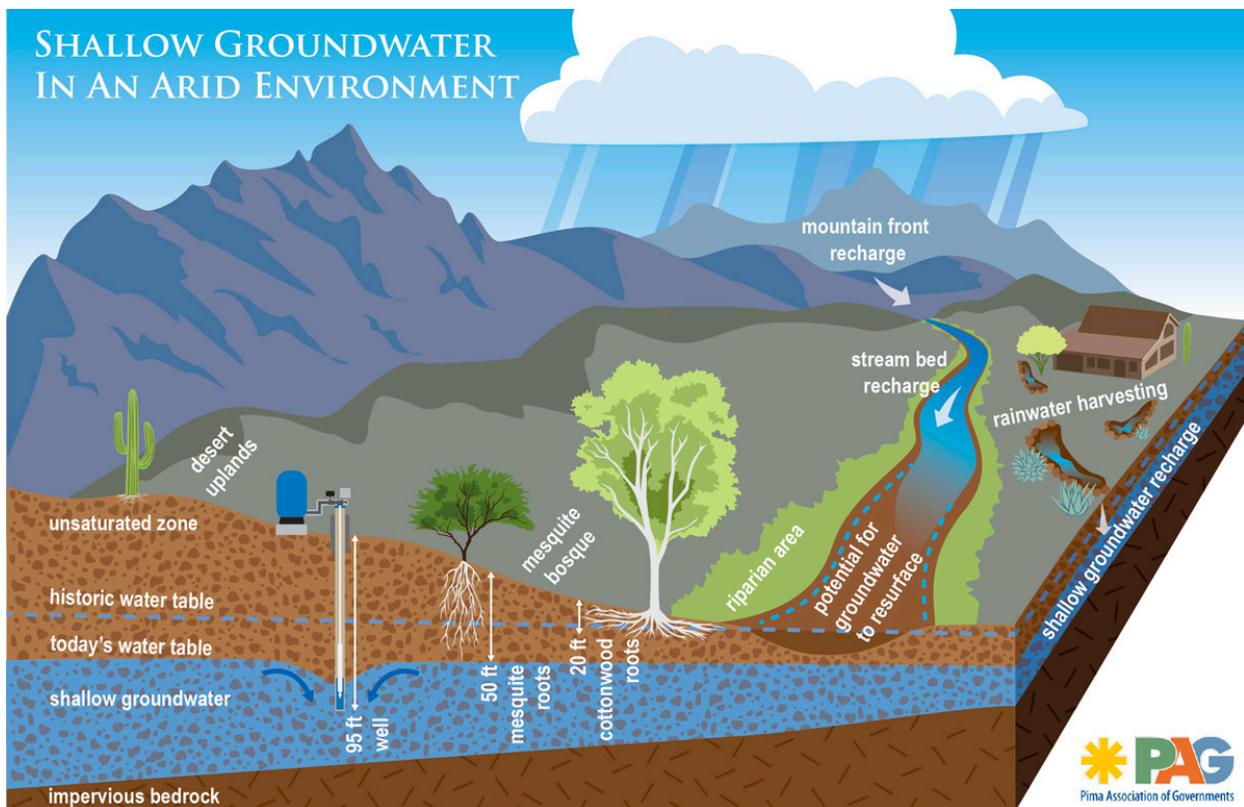


Figure 1. Informational diagram of the general hydrology related to shallow groundwater areas like the Tanque Verde area.



Figure 2. Examples of how practices in different settings can collectively benefit downstream creeks and rivers.

Proposed Projects:

Location 1: Northwest corner of E Cape Horn Drive and E Gold Dust Drive

Location 2: South of planted mesquite grove and southeast of hole # 4 at start of defined channel

Location 3: County maintained drainage downstream of location 2 through to confluence with Tanque Verde Creek



Figure 3. General locations of proposed projects.

Note that other areas may be considered in the future if property owners are excited and willing to support effort and maintain features.

Location 1:

At this site, water currently flows along E. Cape Horn Drive, and continues towards E. Gold Dust Drive. At the golf cart path crossing of E. Cape Horn Drive there is an opportunity to divert stormwater off the road, into a swale, and then into a series of infiltration basins planted with

native plants. Infiltration basins allow water to slow down and sink into the soil (see figure 4). This location is owned and currently owned and maintained by the Forty Niner Country Club.

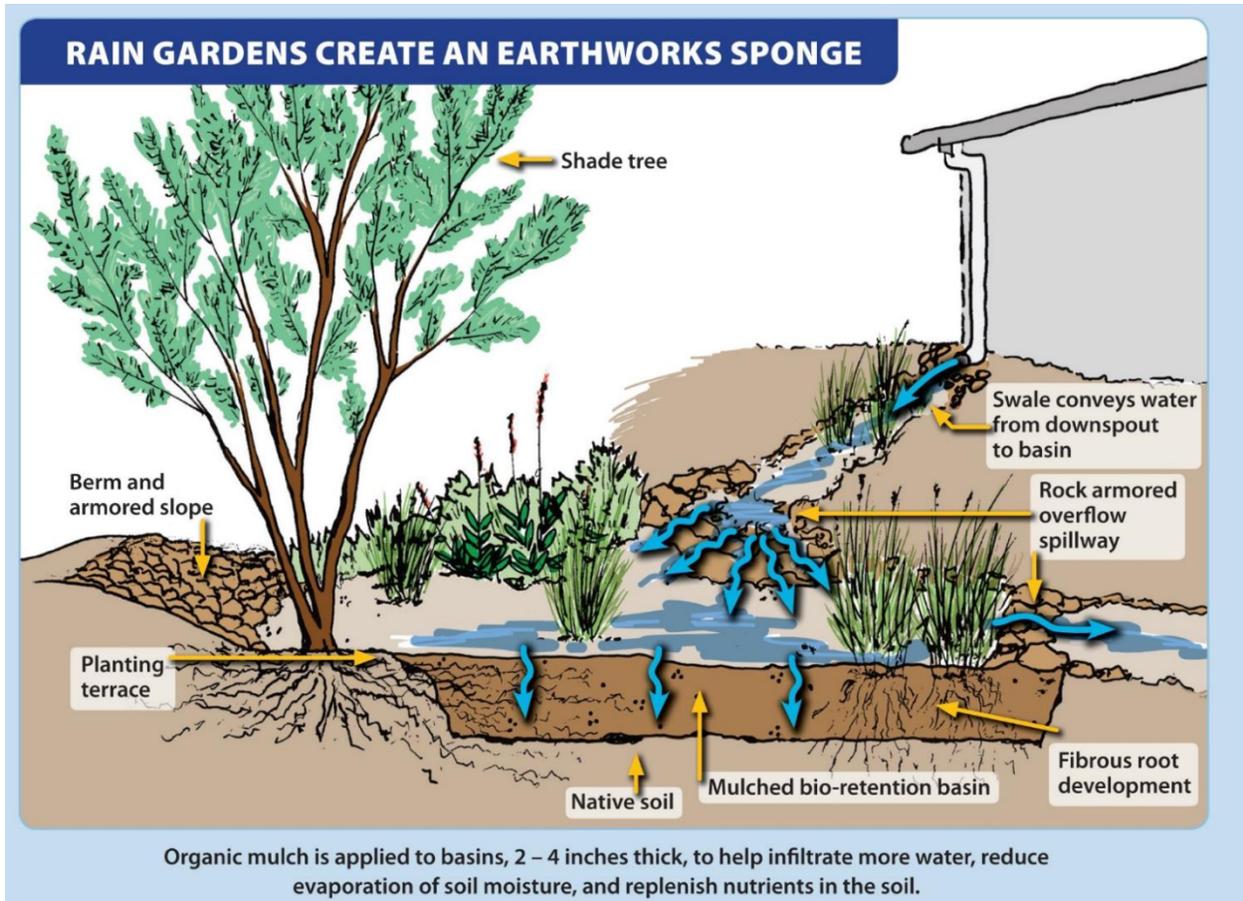


Figure 4. Informational diagram of various components related to stormwater harvesting.



Figure 5. Proposed stormwater harvesting project for location 1.

Proposal for this site:

- 1 day of contracted excavation work to dig basins, swale, and build berms. Excavation not to exceed 1 foot in depth.
 - WMG staff to oversee excavation. HOA volunteer (1-2 individuals) assistance requested to assist.
 - WMG will request 811 to mark utilities before excavating. Forty Niner Country Club will mark irrigation line locations.
- 1 half-day workshop with 6-10 volunteers to finish shaping basins, swale and berms, install rock overflows between basins, scatter native seeds, mulch basins, compact walking path along berm, and build a rolling dip where path crosses overflow area
- Materials: wood chip mulch, Catalina granite rock for overflow areas, native seed
- 1 day follow up work by WMG staff and assistant to wrap up any details
- Country Club to take over maintenance activities with guidance provided by WMG. To allow establishment of native seed mix, maintenance activities to refrain from using herbicides. WMG to provide printed copies of Rain Garden Care Handbook as a resource.
- Future Suggestion: Provide a bench for sitting (not included in WMG scope of work)

Location 2:

At this site water runs downhill from both the east and west along the boundary of the golf course and private residential properties. The slope to the west has small erosional rills. At this site our aim is to slow the water flowing downhill from the west by installing two rain basins, with rock filter overflows into the channel. Fifteen gallon native tree species can be planted roughly every 30 feet in the low area flowing from the northwest to the high water table drainage. One gallon native grasses can be planted in groups and interspersed among the trees. This will provide shade and a connective wildlife corridor between the shallow groundwater drainage and the previously planted mesquite trees. This location is partly owned by the Forty Niner Country Club, partly private, and partly Pima County easement.



Figure 6. An example of a series of one-rock dams along a neighborhood street to reduce erosion and enhance infiltration.



Rock Rundown

Figure 7. An example of a hand-placed rock rundown to control stormwater down a slope and into a channel.



Figure 8. Proposed stormwater project for location 2.

Proposal for this location:

- Half day of excavation work to dig rain basins and tree planting holes. Hire excavator. WMG staff and assistant or HOA volunteer on site to oversee excavation. This could be combined with excavation of proposed location 1 to reduce mobilization costs.
 - WMG will call 811 before excavating. Forty Niner Country Club will mark irrigation locations.
 - Excavation not to exceed 1 foot in depth
- Two volunteer days with 6-10 volunteers for 4-5 hours
 - Day 1: Finish shaping basins, install rock overflows between basins, scatter native seeds, mulch basins, and install rock filters.
 - Day 2: Plant trees and grasses. Finish any remaining tasks from Day 1.
- Materials: 15 gallon native trees, 1 gallon native grasses, Catalina granite for rock structures, native seed, wood chip mulch
 - 15 and 1 gallon potted plants are chosen to help protect plants from being eaten by wildlife and to have enough mass to withstand monsoonal flows.
- Request for Forty Niners’ Country Club to provide wood chip mulch to fill the basins if available.
- One day for WMG staff and assistant to wrap up any details and take monitoring measurements.
- County Club with assistance from HOA volunteers to follow care guidelines for establishing plants as per instructions in Rain Garden Care Handbook (provided by WMG). WMG to help provide guidance during grant term.

- Forty Niner Country Club to maintain area, refraining from using herbicides
- Access to right of way will be left open for Pima County

Location 3:

This site begins at the southern edge of E. Gold Dust Drive and winds south and west to the confluence with Tanque Verde Creek. This area is unique because the water table is high, allowing water to pool on the surface at certain times of year. Access to shallow groundwater allows plants to grow year-round, and attracts animals to the resource. The length and placement of the channel within the larger landscape creates an important corridor for wildlife to move from the Tanque Verde Creek area through the HOA and into upland habitats to the north and west.

Pima County requires this right of way be kept clear for flood control and maintenance access.

Sections of the wash are wide enough to allow native tree plantings on one or both sides. We propose starting in three wider locations (numbered on the map below) along the drainage, and working up and down from those locations as width allows.



Figure 9. Proposed phase 1 habitat enhancements along the channel within the neighborhood.



Figure 10. Proposed phase 2 habitat enhancements along the channel within the neighborhood.



Figure 11. Proposed phase 3 habitat enhancements along the channel within the neighborhood.

Proposal for this location:

- One day using an auger to dig tree planting holes. WMG staff and assistant or HOA volunteer on site to oversee digging.
- Assistance with use of an ATV by Country Club or HOA volunteer would be helpful for transporting trees.
- 6-10 volunteers for 4-5 hours to plant trees, scatter native seed and water planted trees.
- Materials: Native trees, native seed, buckets, hose, and access to water. ATV/UTV or sturdy golf cart to stage plants and move water and stage trees.
- One day for WMG staff and assistant to wrap up any details and take monitoring measurements. Could be combined with same tasks at location 1 and 2 as amount of work permits.
- HOA to follow care guidelines for establishing plants as per instructions in Rain Garden Care Handbook (provided by WMG)
- Pima County to maintain right of way for flood control purposes. HOA to maintain other needed aspects of tree health.
- Access to right of way will be left open for Pima County

Timeline

May-July 2023: draft proposal read, reviewed and finalized by all parties

September-December 2023: installation

2024-2027: monitoring

Estimated Budget

Watershed Management Group: \$29,000 towards costs of staff, excavating and permitting.

49er HOA: \$2,000 towards materials (plants, rocks, etc). Volunteers for workshops.

Forty Niner Country Club: Maintenance of stormwater installations on golf course land.

See MOU for more detail.