

# Arizona Department of Environmental Quality Water Quality Improvement Grant

## Erosion Control, Sediment Retention and Riparian Restoration in the Babocomari River Watershed

### EV16-0002 (18-006)

Borderlands Restoration Final Report May 2018

2016

The grant was awarded on 23 May 2016 and work commenced in July with three days in the field scouting work in Lyle, Hay and O'Donnell Canyons, Lyle Canyon had burned in March 2015 and revealed a large ~1 mile long cut, 2-4 feet deep and 2-4 feet wide. Walked this cut and determined spacing of structures and rock needs. The Babocomari Ranch owners had reported that they were concerned with a couple of spots in Hay Canyon and we walked the drainage from Babocomari Ranch Road to Canelo-Elgin Road and assessed needs there. Met with the Jelk's Ranch manager to discuss work in the ciénega just south of the Nature Conservancy's Canelo Hills Preserve. We agreed that removing parts of the berm and adding some Media Lunas above of the large headcut would be are best approach. This plan was written up and approved by ADEQ.

In August and September continued planning work on Babocomari work. After careful consideration have put off the O'Donnell ciénega work until we can survey the landscape with a laser level as it is a very complicated problem with a variety of elevations, levees and berm work. Determined structure locations and material needs for the Lyle Canyon and Pacheco Springs site work, developed short proposal for ADEQ approval and acquired quotes for material delivery. We finalized plans and ordered materials for work in Lyle Canyon and Pacheco Spring on the Babocomari Ranch. The crew started work in Lyle Canyon with 100 tons of rock.

In October planning continued on Babocomari work. The crew finished up in Lyle Canyon on 21 October 2016 with over a mile of eroded gullies treated with over 100 tons of rock. Had 40 tons of rock delivered to Pacheco Springs and crew started structure installation.

In November the crew finished work on the Pacheco Spring run at the end of the month and moved to a series of large headcuts in a tributary drainage to Vaughn Canyon that the ranch owners had concerns about.

In December continued planning work on Babocomari Ranch needs, with the crew working on the headcuts in the tributary drainage to Vaughn Canyon.

2017

In January continued work on the Babocomari Ranch and finished the work in Vaughn Canyon with eight juniper-post weirs installed. Began the installation of two Zuni bowls and media lunas in an active headcut above Vaughn Canyon near the Research Ranch boundary.

Met Josh Edwards and Heather West from Cornerstone Environmental at the O'Donnell Canyon site on the Jelk's Ranch near Canelo to conduct the cultural resources survey.

Met with Ron Tiller, Hans Huth of ADEQ, and Andrew Salywon, Desert Botanical Gardens at the O'Donnell Canyon site on the Jelk's Ranch near Canelo to go over the project and determine monitoring needs.

In February we finished the Zuni Bowl work above Vaughn Canyon near the Research Ranch boundary. Started work in O'Donnell Canyon on the Babocomari Ranch adjacent to previous work near the southern boundary. This site was brought to our attention by the ranch manager and is a multi-headed headcut above a stock tank.

The O'Donnell Canyon cultural resources survey report was completed and sent to SHPO, the headcut apparently is cutting through a layer that is full of artifacts and they are being eroded out, the proposed work will help stabilize the headcut and prevent further damage to the archaeological site and the surrounding grassland.

In March we started work in O'Donnell Canyon on the Diamond C Ranch just above the Nature Conservancy's Canelo Hills Preserve. The work is to stop a large headcut in the Sacaton grasslands adjacent to the drainage and associated ciénega. Over three weeks we used approximately 36 tons of rock to install five media lunas (flow spreaders) above the large headcut and one above the smaller headcut. A loose-rock check dam was installed in the large headcut, and a rock rundown was installed in the smaller headcut. In addition a large loader was rented from Empire Caterpillar and was used for one week to remove five 8-foot sections from two levees that were pushing water out its natural flow path towards the headcuts.

Finished work in O'Donnell Canyon on the Diamond C Ranch on 09 May. In June we went to the site to geolocate all the work and map it all in Google Earth for this report. Finished work in O'Donnell Canyon on the Babocomari Ranch adjacent to previous work near the southern boundary.

In August a large storm sent flood water into the first levee at an unexpected angle and widened the cut significantly and caused some erosion. Ron Tiller and Hans Huth made the first observations of this and Trevor Hare visited the site on 22 August to assess the damage and determine if we needed to do more work there. The conclusion agreed upon by all concerned including the landowner and manager was that no work was needed and the immediate site was stable. We will continue to monitor this site during and after the 2018 monsoon season.

In summary we used over 530 tons of rock to install over 200 rock erosion control structures in six tributary drainages of the Babocomari River. In addition we installed 8 juniper/oak post weirs in Vaughn Canyon as grade control structures where previously installed sandbag weir were washed out. In O'Donnell Canyon we also breached two levees that were directing water towards a large headcut.



Location of work sites



Lyle Canyon Worksite



Gullying in Lyle Canyon



Diamond C Ranch-O'Donnell Canyon Ciénega worksite



Levee cut on Diamond C Ranch-O'Donnell Canyon Ciénega



Levee cut on Diamond C Ranch-O'Donnell Canyon Ciénega after large storm event





Zuni bowl on the Diamond C Ranch-O'Donnell Canyon Ciénega



Boundary worksite



Zuni Bowl at boundary worksite



Pacheco Spring check dam locations and red polygons indicate previous work with media lunas and Zuni bowls



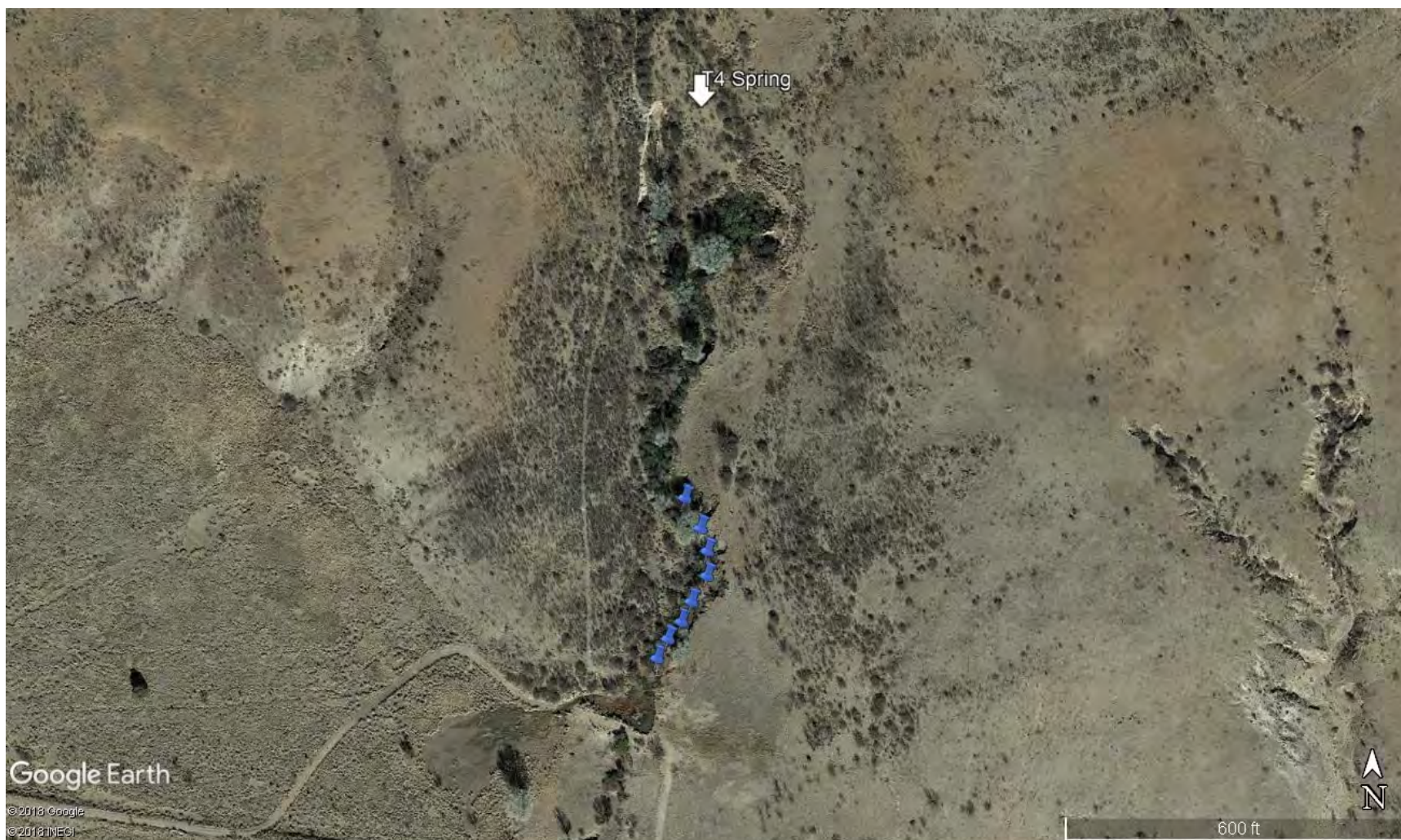
Loose rock check dams (trincheras) in the gully below Pacheco Spring



Babocomari Ranch O'Donnell Worksites



Zuni bowls and media lunas in O'Donnell Canyon on the Babocomari Ranch

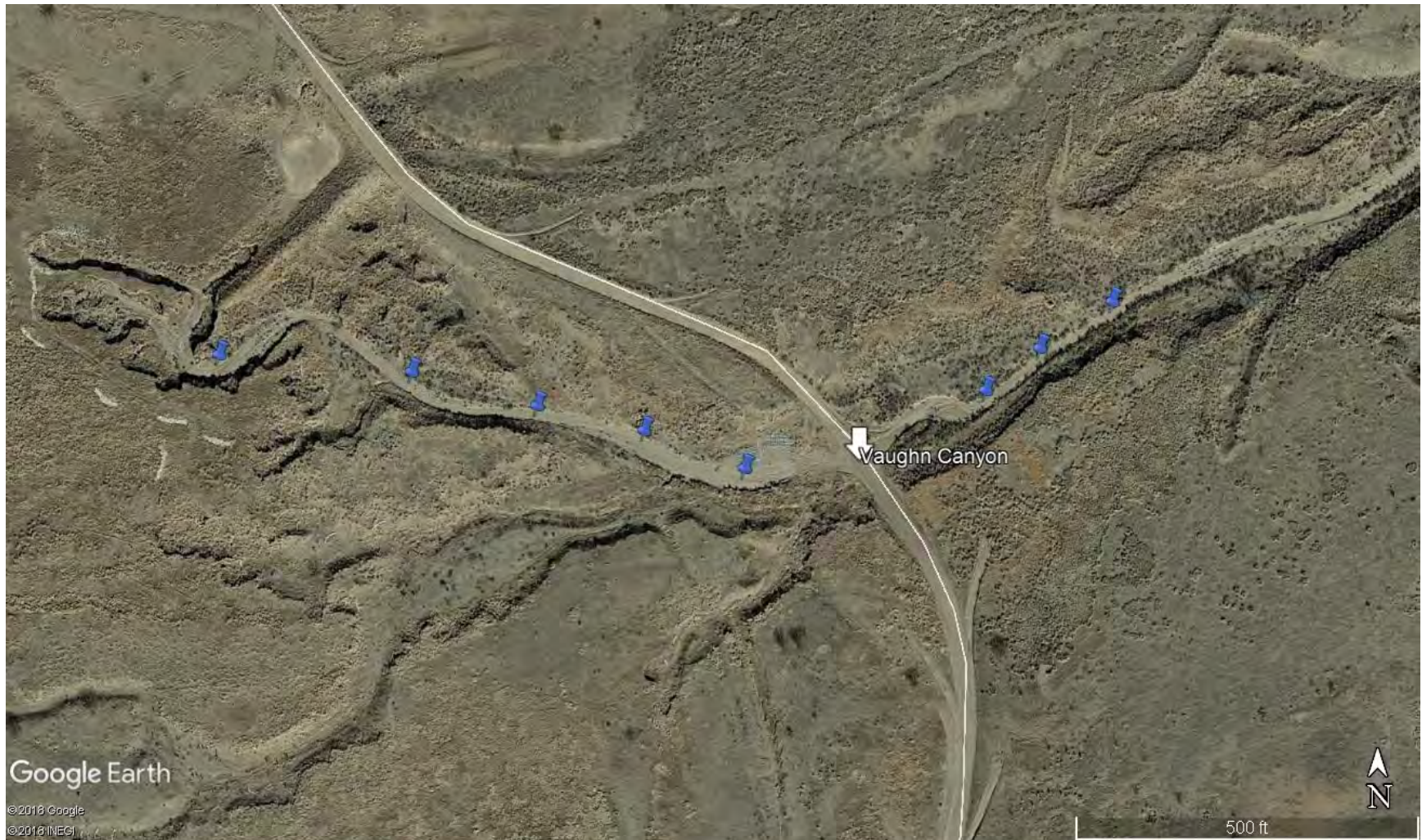


T4 Spring Worksites





One-rock dams in the T4 Spring run



Vaughn Canyon juniper-post weir locations



Juniper-post weir in Vaughn Canyon