

Hereford Natural Resource Conservation District

CONSERVING - PROTECTING - PRACTICING WISE USE



Horseshoe Draw



Photo by Kathy Morris

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July, 2017 Newsletter

CHAIRMAN'S CORNER

The Horseshoe Draw Project is complete!

THANKS to all of the agencies and people involved with the project!

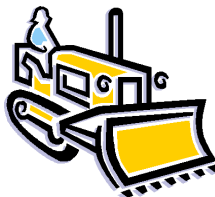
A SPECIAL THANKS to Arizona Department of Environmental Quality, Howard G. Buffet Foundation, Cochise County, and Granite Construction. Everyone should be proud of their involvement.

Construction of the project by Granite Construction took only 88 days, just to *get to* construction took several years. Well worth the time to help control the E-coli, erosion, and sediment into the San Pedro River. The added benefit being another project that helps with recharge of our local watershed (the San Pedro River) and the crossing of Paloma Trail road by local residents.

This project was a perfect example of why the Hereford NRCD works so hard toward the conservation of our natural resources.

THANK YOU,

Jim Lindsey, Chairman



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**Working Together to Enhance
Our Natural Resources**

Horseshoe Draw Ready for Monsoons

FROM THIS



Photos by Mary Darling and Jim Merrigan

TO THIS—IN 88 DAYS



Photos by Mary Darling and Jim Merrigan

The Conception

Horseshoe Draw, a watershed that extends from the Sierra San Jose Mountains in Sonora, Mexico, to the San Pedro River in Southern Arizona has historically had a problem with washing out and flooding in areas during the summer monsoon rains.

The Ladd family has been on their ranch (which Horseshoe Draw travels through) since 1896. In the early 1930s the CCC built dikes to try and control the washouts. Jack and John Ladd worked on the structures but with the passage of time it became obvious something new was needed.

Jack Ladd brought the problem to the attention of the Hereford Natural Resource Conservation District (HNRCD) in November 2010. Because of the major erosion and sediment issues caused by flooding the HNRCD and the local community realized the need for action. Recommendations were sought from engineers from Cochise County and a private, Phoenix firm.

In August 2014 the HNRCD was awarded a \$198,625 grant from the Arizona Water Protection Fund (WPF) to fund a concept and feasibility study. HilgartWilson, LLC performed that study. In 2016 The Arizona Department of Environmental Quality (ADEQ) awarded the HNRCD a \$993,880 grant to execute the design plans. But the “grant writing” wasn’t over for the HNRCD—the ADEQ grant required the District to obtain 40% matching funds to secure their grant. HNRCD submitted an application for a grant to the Howard G. Buffett Foundation and was awarded the necessary remaining funds.

The Construction

Granite Construction signed the contract to do the construction February 14, 2017, with work starting almost immediately. Darling Geomatics signed the contract February 21st to do an aerial monitoring survey with their UAV (unmanned aerial vehicle). A June post construction survey was done and a September flight is scheduled.

February/March

Through an ADEQ subscribed burn permit John Ladd, with the help of the Palominas Fire Department, burned the sacaton grass at the site, approximately 50 acres.

John Ladd improved the existing road to the site, making it passable for the big machinery necessary while survey crews were onsite setting project benchmarks and clearing limits.

Granite Construction laid a construction water line, installing 12,000 ft. of 6" hdpe pipe, built a holding pond for the water necessary for construction, cleared the site, and began the pre-compaction of the proposed fill areas.



Water holding pond.
Photo by Granite Construction



Road improvement and water line.
Photo by Granite Construction



Prescribed burn
Photo by John Ladd



Bringing in the water pipeline.
Photo by John Ladd



Filling the pond.
Photo by Granite Construction



Clearing and leveling site.
Photo by Granite Construction

The Ground Breaking Ceremony

March 25th the Hereford NRCDC hosted a project ground breaking ceremony at the site.

Speakers included Jim Lindsey-Chairman, HNRCD, Jack Ladd-Supervisor, HNRCD, John Ladd-Advisor, HNRCD, Senator Gail Griffin, and Karen Riggs-Cochise County Engineer, and Trevor Baggiore-ADEQ.

Approximately 35 people were present to kick the construction off.

With their golden shovels, from left to right—Trevor Baggiore, Congresswoman Becky Nutt, Senator Gail Griffin, Rachel Thomas, Karen Riggs, Ann English, John Ladd, Lucinda Earven, Jack Ladd.

Photo by Aubrey Thomas



Horseshoe Draw, The Construction, cont.

April

Granite crews continued operations. The cut to fill operation started April 3rd and continued throughout the month. Crews were running multiple scrapers, dozers, motor graders and compaction pieces in order to properly build the proposed grades. As crews focused moving the mass amounts of material, the spillway grades as well as corrugated metal pipe (CMP) grades were built. By month end, crews were nearing completion with the cut to fill operation placing over 190,000 cubic yards of dirt. Quality control testing took place on a daily basis to ensure embankment compaction requirements were met. John Ladd and Cochise County personnel continued to oversee and monitor the project.



Beginning construction.
Photos by Granite Construction



View of the draw prior to construction.
Photo by Kathy Morris

May

Granite crews completed the remaining earthwork and began construction on the two concrete spillways and 36" triple run of CMP. Once concrete structures were fine graded, crews installed wire mesh and shotcreted the spillways. To insure the spillways were not undermined by future flooding the 7' toe down was extended around the inlet and outlets of both channels. As the shotcrete work progressed, crews began installing the triple run of 36" CMP. The crews insured compaction was met as they laid and backfilled the culverts. Once the culverts were completely backfilled, crews began forming the headwalls for the pipe culverts. Crews formed, poured and stripped the headwalls with 8,000 psi concrete. Upon completion of the last structure, crews installed the 15" rip rap at both inlets/outlets of the southern spillway as well as the CMP run. As they were finishing the final grading, the dozers tracked walked the slopes to insure that the future hydro-seeding would set. All equipment was removed and the onsite pond was deconstructed.

This Hereford Natural Resource Conservation project is made possible by an Arizona Department of Environmental Quality Water Quality Improvement Grant, Howard G. Buffett Foundation Grant, and the Ladd Ranch.

Horseshoe Draw, The Construction, cont.

May, cont.

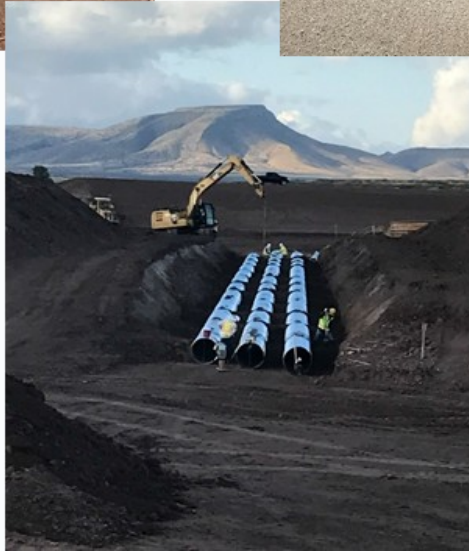


Construction crew working on the spillways.
Photo by Granite Construction

“Go back to the basics....if you protect the land it will protect you.”—John Ladd, speaking at the ribbon cutting.

The placing of the outlet pipes. Three pipes, approximately 300' long and 36" in diameter are buried at the inlet and outlet of the structure.

Photo by John Ladd



The partially completed spillways.
Photo by Granite Construction

“This has been a phenomenal project because it brought so many agencies together in a cooperative manner.”—Ann English speaking at the ribbon cutting.

Editor's Note

Much of the text in this article was reprinted with permission from the Granite Construction monthly and project-end

June

Friday, June 2, 2017 the project was completed. Post construction aerial topo survey was performed June 7th. The hydro seeding was completed June 26th. The monitoring survey was performed after the construction with another one scheduled in September after the rains.

The Ribbon Cutting

Thursday, June 15th Cochise County Board of Supervisors hosted the ribbon cutting ceremony.



With the completion of the project the site was turned over to Cochise County for upkeep and maintenance. Because of the added bonus that this project will greatly help the recharge value to the San Pedro River it has been added to the list of projects organized by the Cochise Conservation and Recharge Network (CCRN).

MCed by Cochise County Supervisor and HNRCD Advisor Pat Call, the ribbon cutting ceremony was kicked off by several speakers including: Jade Dickens-ADEQ, Stephanie Smallhouse- AZ WPF, John Ladd- HNRCD Supervisor, Jim Lindsey-HNRCD Board Chairman, Jack Ladd- HNRCD Advisor, Ann English-Chairman, Cochise County Supervisors, and Jake Buckley-Granite Construction.

Pat introduced many dignitaries that attended the event, followed by the speakers. The ceremony ended with the long red ribbon being cut by: left to right, Shay Saucedo-Senator McCain's office, John Ladd, Jack Ladd, David Greenberg, Ed Gilligan-County Administrator, Pat Call, Ann English, Lucinda Earven, Jake Buckley-Granite, Jade Dickens-ADEQ, Alesia Ash-Congresswoman McSally's office.

Horseshoe Draw Watershed Monitoring Plan

by Mary Darling, Darling Geomatics

As part of the Horseshoe Draw Erosion Control Grant Project, Hereford NRCDC is monitoring project effectiveness with unmanned aerial vehicles (UAVs) (also known as “drones”).

UAVs offer a new and versatile tool for monitoring rapidly changing and difficult to access terrain. By using SenseFly eBee RTK survey grade fixed wing UAVs for aerial capture of data, the Hereford NRCDC can quantify sediments captured by the newly installed erosion control structures. That data can be extrapolated to determine reductions in *E. coli* that would otherwise enter the Upper San Pedro River.

Background and monitoring objectives:

- a. Pollutant(s) of concern include sediment and *E. coli*;
- b. The monitoring will document any decrease in sediment and associated *E. coli* that enters the Upper San Pedro River from Horseshoe Draw due to the project;

The general method of data analyses is as follows:

- ◆ Low elevation aerial photogrammetry data will first be collected to obtain the baseline after construction.
- ◆ Additional low elevation aerial photogrammetry data will be collected after rain events and compared to the baseline data to measure sediment capture behind the erosion control structures.
- ◆ Topographic changes will be measured using automated change detection software and documented in AutoCAD drawings as contour changes. The amount of sediment retained by the erosion control structures will be quantified. The cubic yards of sediment retained will provide the necessary data to extrapolate *E. coli* transport reductions.

Detailed Methodology:

- a. Field measurements collected by the survey grade UAV will include overlapping true color photographs that can be processed into a 3D digital terrain model. The high-resolution aerial imagery will provide enough detail to identify and monitor stream channel geomorphology. Survey grade subcentimeter ground control targets placed throughout the drainage will facilitate repeatable data and allow change detection to plus or minus 2 inches within major visible portions of the stream channel.
- b. The digital photogrammetry data collected by the UAV will be used to capture changes in the shape of the erosion control structures, progress of head cutting and sedimentation buildup behind the erosion control structures. The sediment buildup data directly correlates to water quality data including *E. coli* reductions.
- c. Aerial targets and an accurate survey control network have been created to assure repeatability of data and ability to detect change over time.

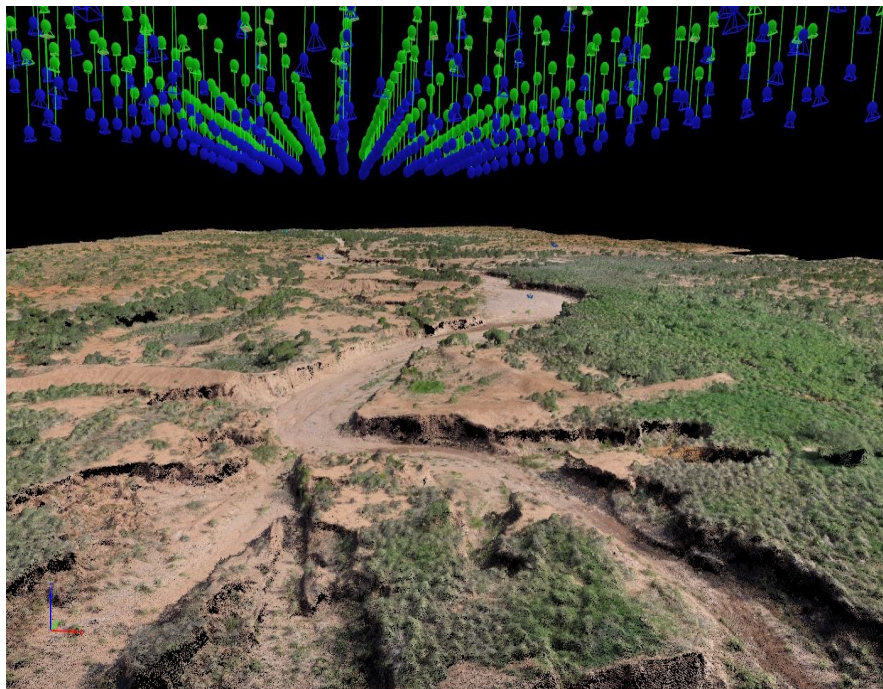


Figure 1. Survey Grade Pre-Programmed GPS Photo Points, Over Horseshoe Draw

The data will be collected for the area shown below. This analysis area includes the control structure location, the headwaters of the watershed and downstream to the confluence with the Upper San Pedro River.

The project area will be flown immediately after erosion control project construction in June 2017 and again in September 2017, after monsoons. Depending on additional funding, monitoring flights are recommended at least once a year in September.

Digital elevation models and analytical mapping software (Leica Cyclone, Polyworks and AutoCAD) derived from stereo imagery produced by the aerial photogrammetry will be used to monitor the changing sediment patterns after each flight.

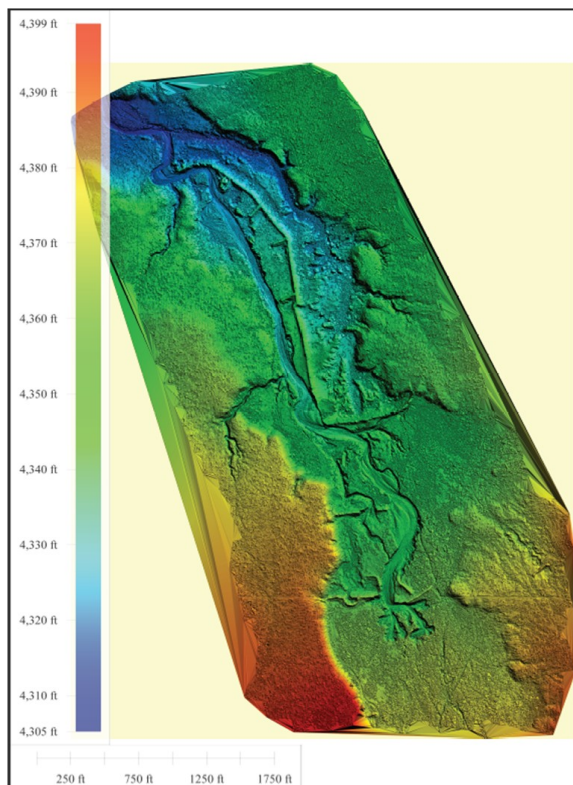
Horseshoe Draw Watershed Monitoring Plan, cont.



Figure 2. Horseshoe Draw Monitoring Area

Improvements in water quality are expected within two years after construction of the erosion control structure. This amount of time includes time to flush any initial sediment that was in the system prior to the installation of the structure.

Protocols, Equipment, and Sediment Change Quantification will be provided by Darling Geomatics. So long as the digital photogrammetry data remains at the same level of accuracy as the baseline data, change detection will be possible over time.



**Figure 3. Bare Earth Digital Terrain
Model of Horseshoe Draw**

HNRCD WELCOMES NEW BOARD SUPERVISOR

David Greenberg has been appointed as a Board Supervisor for the District following the resignation of Supervisor John Lohse.

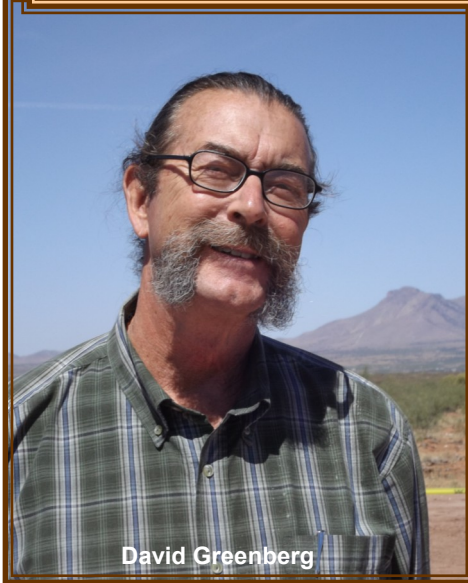
David has been a Cooperator with the District since 2010, and served as an Advisor to the Board for many years.

A Hereford resident since 1976 David has been a real estate broker since 1985 and a gun dealer since 2006. He has enjoyed raising pigs, cinnamon sheep, and Ameracauna chickens, as well as being an egg retailer since 2010.

David's wife, Sherri Greenberg is a loan originator. They raised five children and now enjoy at least seven grandchildren.

David currently serves on the Upper San Pedro Partnership, the Southwest Arizona Multiple Listing Service Board, and he is the CEO of the Real Wishes Foundation.

He is a welcome addition to the Board of Supervisors and he plans to expand the HNRCD Education Center.



David Greenberg

Hereford Natural Resource Conservation District Honors Rachel Thomas



Jim Lindsey presenting Rachel Thomas her plaque.

New Cooperators Join the District

Since the beginning of 2017 the District is honored to welcome several new cooperators.

Joy Banks of Hauchuca City joined the ranks in January.

Nancy Neumann of Hereford came aboard in April.

Chuck and Ivette Cunningham became members in May.

It is with the support of residents of the District that the HNRCD even exists. Their interest in responsibly conserving our natural resources, our economy and our way of life in Cochise County is sincerely appreciated.

The HNRCD honored Rachel Thomas for her immeasurable service to the District. The plaque reads:

RACHEL THOMAS

In Appreciation of Your Dedication
And Countless Hours of Work For
The Hereford NRCD And The
Horseshoe Draw Project.

Your Tireless Abilities Have Made
The Hereford District One of the
Top Districts In The State Of
Arizona And The Horseshoe Draw
Project A Success To The
Conservation Of Our Natural
Resources

June 15, 2017

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BOARD MEETINGS
Third Wednesday of every month
9:30 AM
Sierra Vista Cochise County
Complex Conference Room
Hwy 92 and Foothills Drive, Sierra Vista

Note: Date, location and time is subject to change.
 We invite District Cooperators and the general public's attendance and participation.

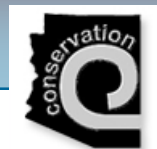
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