San Simon Valley Tour
2015
Provided to AVCA by Larry Humphreys

Background Information

Historical mention of the San Simon Valley in the early 1800s gives conflicting pictures of the nature of the valley. Will C. Barnes, an Arizona pioneer, cattleman, cavalryman, and Congressional Medal of Honor winner, who visited the valley in the early 1880s, remembered it as a grassy, well-watered area about 60 miles long and 40 miles wide. He remembered the stream as being intermittent, with cottonwoods and willow thickets along its banks. An 1879 map of southeastern Arizona marks the San Simon as the "Rio de Sauz" or River of Willows and illustrates the stream as being underground for much of its course.

Parke, in 1854, described the stream as having no trees or bushes to indicate the course of the stream. The surrounding valley was vegetated by creosote bush, saltbush, and yucca with grass being scarce. Hutton, in 1859, described the San Simon as being intermittent and flowing for about six months of the year.

Historical research and scientific knowledge of soils, climate, and vegetation leads one to believe that the San Simon Valley was a broad grassy plain bisected by an intermittent stream with little apparent erosion. At any given time some areas would have active erosion in short gullies and other areas would be filling. The broader, flatter areas were probably covered by sacaton and tobosa grass with few tress. Some willows may have grown in the wetter areas and cottonwoods were certainly present at San Simon Cienega, near the Arizona-New Mexico state line. There is little evidence that the stream flowed on a perennial basis. It is fairly certain that little channel erosion was present and the bottom was well vegetated. Early cattlemen have described the valley as a sea of grass with unlimited potential for raising livestock.

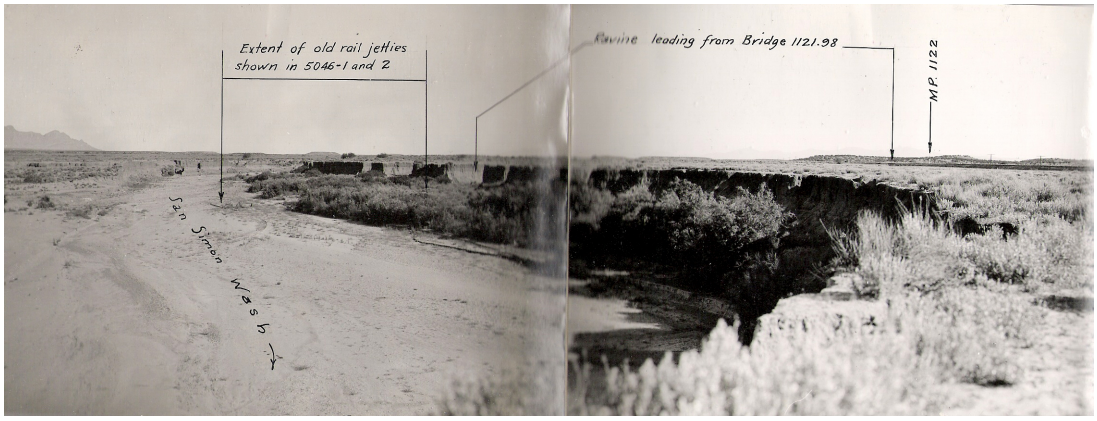
By 1919, the San Simon was recognized in U.S. Senate Document 436 as needing extensive restoration. From 1883 to 1916, in the short span of 33 years, headcutting (gullying) of the San Simon advanced some 60 miles up the channel and ranged from 10 to 30 feet deep and 40 to 800 feet wide.

What happened in a mere 33 years to change a grassy bottomland into a series of deep gullies with almost no vegetation? Several theories have been proposed. The most widely espoused proposal is that overgrazing initiated changes in vegetation and runoff patterns. Some researchers have given more credence to a combination of man's discrete activities, such as development of wagon roads, building railroads, and alteration of stream channels. Another hypothesis is that the erosion was geological, caused by the earthquake in northern Sonora in 1887, and the land is trying to regain equilibrium. A third theory places blame on climatic change with minor changes in rainfall patterns and frequencies initiating the erosional sequence. Cooke and Reeves, in their book "Arroyo and Environmental Change in the American Southwest" (1975), have proposed that each of

the theories probably had a contribution to the rapid erosional sequence. Cooke and Reeves discount any one action as being solely to blame. They cite similar erosional sequences occurring in New Mexico on the Rio Puerco, in Arizona on the San Pedro and the Santa Cruz, and on several California streams during the same time period.

Discrete actions that contributed to the rapid erosion include:

- Overgrazing by livestock in the 1880s (an estimated 50,000 head were grazing in the valley at one time.
- Extended drought, broken by intense thunderstorms (1890s).
- Construction of a drainage ditch from the Gila River up the San Simon Valley in 1883.
- Increased freighting traffic and wagon roads from development of copper mines in the area (1880s).
- Construction of the Gila Valley, Globe, and Northern Railway (1884) channeled several desert washes together to reduce numbers of culverts and bridges.



In 1934, the Soil Erosion Service (later to become the Soil Conservation Service) and the Civilian Conservation Corps (CCC) began numerous erosion control measures on the San Simon watershed. Numerous CCC camps in the area, under both the Soil Erosion Service and the Grazing Service (which later became the Bureau of Land Management) began work on diversion dikes, water spreaders, detention dams, rangeland seedings, and gully plugs. The Grazing Service, in 1949, became the Bureau of Land Management and responsibility for erosion control work on public lands passed to it.

The first major structures on the watershed were constructed in 1940 by the Civilian Conservation Corps. Two dams, Cienega No. 1 and Cienega No. 2, were built near the

Arizona-New Mexico state line at the head of active channel erosion to protect the still-existing San Simon Cienega. These dams were drop-type structures designed to prevent further headcutting up the channel and to slow the water as it passed into the eroded portions of the channel. The San Simon Barrier was also designed in 1940, but wasn't built until 1980. Goat Well Drop structure was built in1940 and the San Simon Fan structure was built in 1953 and rebuilt in 1955.

By 1956, seven side channel structures had been completed, including Creighton and HX. In 1957, a "Stop Work Order" was imposed by the Secretary of the Interior due to claims from downstream water users that detention dam construction was reducing amounts of water delivered for irrigation purposes.

The San Simon Community Watershed Plan, completed in 1963, analyzed effects of existing and proposed structures on rehabilitation and effects on water availability for downstream users. Consequently, the "Stop Work Order" was lifted in 1965 when the Secretary was convinced that losses of water to downstream users was minimal compared to the need to control erosion and rehabilitate the San Simon watershed.

Between 1967 and 1972, seven additional side channel structures were completed: Ryan Dam (1967), Ryan Dike (1968), Whitlock Dam (1968), West Doubtful (1969), Cove Dam, "111" Dam, and Sands Draw Dam (1971-72). Several upland seedings were tried during this time period. Due to the erratic nature of the climate, seedings in upland areas have not been successful. Even areas that appeared to be a success for a few years later died out and returned to a pre-treatment state. A total of 17 structures have been built on the San Simon Watershed since 1940.

Stop 1. Contest Well

This 600-acre seeding was root-plowed to a depth of 18 inches to eradicate a dense stand of mesquite and salt cedar. In 1966 it was aerially seeded to Giant Blue Panic grass and Bermuda grass. This seeding is located on the sediment that has filled in behind the San Simon Fan Structure. The seeding has prevented the reinvasion of salt cedar, but the area has been invaded by Johnson grass. This seeding receives periodic flooding and has become highly productive since the Fan Structure was built, producing up to 9,000 pounds of air-dry forage per acre. It also provides habitat for mule deer and javelina, and supports a prey base for raptors. Cottonwoods and willows have been planted to provide perches and nest sites for raptors.

The 600-acre seeding provides six-month winter grazing for up to 170 head of cattle. Prior to Fan, only 4 to 6 head of cattle could graze the same area. During the summer months, the seeding is rested and conditions are favorable for a large buildup of rodent populations. In winter, the rodent escape cover is grazed off and the rodents are susceptible to predation by migrating and wintering raptors in the area.

Stop 2. San Simon Fan Structure

The Fan Structure was built in 1953 by the Soil Conservation Service. It washed out in 1954 and was rebuilt in 1955 at a cost of $271,000. As a result of the structure, the formerly eroded channel has been filled for 44,000 feet upstream. Evidence of channel regrading is evident for over 10 miles upstream. Studies completed in 1989 revealed that the structure had trapped 19 million tons of silt since its completion. The area is included in an allotment management plan for livestock and the regraded channel is capable of supporting about 150 head of cattle per section for six months.

From strictly a mechanical or engineering standpoint, the dam should have affected the channel for only a few thousand feet upstream but vegetation established above the dam allowed floodwaters to slow down farther and farther upstream and drop their silt load, causing the effects of the dam to be magnified upstream.

Stop 3. Timber Draw Dam Site

Proposed site of the Timber Draw Detention Dam. This dam, the last major structure proposed on the San Simon River, is expected to cost about two million dollars. The structure will consist of 400,000 cubic yards of compacted earth fill and 2,100 cubic yards of reinforced concrete. It will be about one mile long and the average height will be about 30 feet. The drop structure will be ll0 feet wide and will allow the water to drop 31 feet. It was estimated to cost $1.9 million in 1988.

Stop 4. Goat Well Drop Structure

The Civilian Conservation Corps, with technical assistance from the Soil Conservation Service, built this structure in 1940 to stop headcutting up Slick Rock Wash. This area is typical of the highly erodible soil conditions present on much of the San Simon watershed. The Goat Well structure has effectively stopped headcutting up the Slick Rock floodplain. Perennial grasses and mesquite tress thrive on the flooded area on the upstream side of the dike. The channel below the structure has also become vegetated by trees, shrubs and grasses in the last 20 years.

It originally cost $13,000 to construct. Using "Stimulus" money the structure was repaired in 2010.

Stop 5. San Simon Barrier Structure

San Simon Barrier, October 1983

Built in 1980 by BLM for erosion control and watershed rehabilitation of the San Simon Valley, construction cost was $1,300,000. The structure contains 224,000 cubic yards of compacted earth fill and 2,684 cubic yards of reinforced concrete requiring 313,000 pounds of steel.

Within the first two years, the channel silted in to the level of the spillway (17 feet). To date, the channel has been completely regraded for 1,900 feet upstream and effects of the structure can be measured for over 19,700 feet upstream. The dam has trapped, as of 1989, over 4 million tons of silt. Although not specifically designed for flood control, this dam and other dams on the watershed reduce peak flows and protect the town of Solomonville and nearby farmland.
Starting in 1982 and continuing for several years, about 500 cottonwoods and willows were planted within the floodplain. For the first 10 years, about 50 percent survived during the wet period of the 1980s and early 1990s. With the onset of drought, most of the surviving trees have died. In 1983, about 30 acres were root-plowed, disked, and seeded to replace invading seep willows and salt cedar with more desirable species. The goal is to eventually have the floodplain exhibit a mosaic of about 80 percent grasses and 20 percent riparian trees and shrubs. The rehabilitated area (about 300 acres) was excluded from livestock grazing for over 10 years, but livestock are now allow to graze the area. The area provides excellent habitat for mule deer, javelina, dove, and quail.

Major San Simon Watershed Projects
Excluding Civilian Conservation Corps Projects
(Cost is at date of construction)

DETENTION DAMS	**COST**
San Simon Barrier	1,300,000
Slick rock	232,000
San Simon Fan	271,000
Creighton	140,000
South Well and Creosote	133,000
111 Dam and Cove	113,000
Whitlock	193,000

HX Dam	93,500
Sands Draw	70,000
West Doubtful	63,000
Ryan	20,000
Goat Well	13,000
West Olsen	4,000
Halfway	10,000
West Halfway	1,000
Olga	10,000
DIKES	
Olsen	27,000
Reservoir	17,000
Rock House	21,000
Ryan	40,000
SEEDINGS	
Contest Well	5,853
New Well	22,551
Antelope Well	26,297
Ryan	17,264
Ryan Dike	2,717
Timber Draw	13,987
Van Gausig	17,622
WELLS	
Construction Well	13,000
Barrier Well	15,000
FENCING Estimated cost for all fencing	50,000