

Structure Design and Description

Zuni Bowl



Constructed at the base of a head-cut, Zuni bowls (originally used by Zuni Pueblo) armor the substrate within the channel, preventing scouring action by water over the long term. The bowl shape acts as an energy dissipater as water flows into the structure, protecting the potentially erosive substrate. The bottom of the bowl also acts as a water harvesting feature which will maintain moisture for longer periods.

Rock Dam



Rocks are positioned in various ways, used not only to prevent erosion but also to aggrade the streambed creating viable habitat for plant life. Note; healthy vegetation thriving upslope of rock dam structure in photo to the left. Rock dams are commonly used in tributary headwaters within swallow eroded channels. Rock dams are often of varying sized depending upon channel width.

Log Drop



Log drop structure act similarly to rock dams, the log acts as a footer that is anchored into the banks of the incised channel. Rocks and dirt are manually placed upstream of the log and sometimes grass transplants are installed into the structure. All of these materials collaborate to collect sediment behind the log structure. The sediment collected contains rich organic materials such as seeds, animal manure, detritus material and other nutrients needed for healthy plant growth.

Log Diversion



Diversions are placed upstream or before a head-cut and/or an incised channel. Keeping the flow out of the incised channel, which mitigates the stress on a head-cut process preventing further erosion or head-cut growth. The water that is diverted out of incised channel has a longer flow path, increasing the time in which water is able to saturate into the substrate, creating seeps downstream in the channel. These seeps remain in the upper watershed for longer periods available for plant growth. The photo to the left also shows a dug out channel (conveyance swale) that will further cause water to be diverted around an incision downstream.

Bank Stabilization



Bank stabilization structures are often used to protect one stream bank while increasing lateral erosion on the opposite bank. These structures are used to stabilize very specific stream banks that are fragile or in danger of being eroded into other channels, which is the case in the photo to the left. Logs can be positioned to encourage plant growth and slow down water along eroded banks.

Log Mattress



Logs placed parallel, into the channel and are anchored in with rocks and dirt, protecting streambed from eroding. Log mattresses are versatile erosion control structures which are easy to construct and have great value to the recovering ecosystem both in the short and long term. In the short-term, these structures collect sediment and raise the streambed. In the long-term, log mattresses will decompose providing organic material encouraging plant growth.

Induced Meander



The main function of a meander inducing structure is to decrease vertical erosion and encouraging lateral erosion (which is a good thing) within a channel. Meander inducing structures increase the flow length which allows the water to slow and have more time to deposit sediment.

Head cut Mitigation



Head cuts are very problematic and can cause excessive erosion that continue to erode up drainage losing large amounts of soil. To prevent further head cutting, logs and rocks can be placed upstream to keep soil in place and stop a head cut from migrating further.

Vegetation Planting



Loss of vegetation due to the Las Conchas fire is the main reason for the restoration project within Santa Clara Canyon. Plants are our greatest stabilizers and the goal of all mentioned structures is to provide suitable sites for revegetation. Structures provide various niches for seed dispersal and germination. Transplants within log and rock structures will benefit from the accumulated nutrients from sediment traps and decomposing wood. Native grasses, forbs, shrubs and a variety of trees have been transplanted and incorporated in structural designs within the project area. Native bunch grasses were collected on-site and transplanted into this log and dirt dam as a living rundown (upper photo). Pockets of native Blue Stem Willows, very important plant for many native wildlife species and riparian habitat, were planted upstream of a log drop structure that acts to slow water flow and deposit sediment (lower photo).

Rundown



Made with either rock, wood or other living native material, rundowns slow the flow of water in low energy headcuts, small tributaries and arroyos. Rundowns stabilize the slope collecting organic material for encouraging plant growth.

Contour Felling



Felling trees along a horizontal contour is an easy and effective way to keep excess water out of main drainage. When properly placed, these structures encourage lateral water flow and captures significant ground water contributing to the water table. Naturally, over long periods of time, these structures will decompose, adding rich organic material into the system.

Water Harvesting



In areas where dirt is needed to build berm structures, a basin can be dug in a location where there is excess runoff. Basins collect and allow water to seep gradually into the subsurface instead of remaining on the surface where erosion can occur. There are many different types of water harvesting designs, the photo to the left, is a delta structure designed to encourage alluvial deposition.

Flow Splitter



Flow splitters work similarly to diversions keeping flow out of a main incised channel and can encourage sheet flow. These designs are most effective in wide valley bottoms where flow has space to spread and dissipate. (Refer to Log Diversion description previously mentioned.)

Sediment Trap



Sediment trap structures are placed often in highly active channels that are moving large sediment. Keeping large amounts of sediment out of the main Santa Clara Creek benefiting aquatic ecology.

Directional Felling and Bucking



In deep incised channels that are difficult or dangerous to work in, and in areas where there is an abundance of deadfall directional felling and bucking can be implemented to safely and quickly treat an erosive system. Ideally over long periods of time these logs will decompose adding organic material back into the system. Seeds can sometimes germinate within the various niches of these logs.