

# Houston Draw

## RIPARIAN DRAINAGE

by Jake McQueary

***A stream can almost be thought of as a living being; the stream lives, moves, thinks, and breathes on its own. A stream is an unmovable power that cannot be stopped - altered perhaps, but it will never be halted.***

A stream is constantly moving in and out of its given floodplain, reacting to different precipitation events of varying magnitude and frequency, and of erosion.

Streams can be altered in unfavorable ways based upon three main driving factors – precipitation magnitude, precipitation frequency, and erosion. Human alteration of any of these three factors can leave a stream to be unpredictable, and to behave in unfavorable ways.

Seasonality brings relatively regular weather patterns from year to year, and other than a few major events that may occur on a somewhat regular basis, precipitation and erosion remains the same. With the influence of man upon most of the Earth, these patterns have begun to change. On a local level, land alteration and improper land practices increase erosion.

Houston Draw, located within the Mogollon Rim district of the Coconino National Forest in Northern Arizona, is a small draw that contains a spring-fed perennial stream. The small valley is comprised of a series of narrow meadows that have been used in the past as corridors for cattle drives and fire breaks.

Over the past century or so, due to improper grazing practices and other unknown reasons, erosion has started to occur within the meadows and draw. As was mentioned, the alteration of this stream from man-made practices has caused the stream to change, which has lowered the water table in the area. Because of this, meadows have begun to dry out in the area.

Drying of meadows changes the entire meadow ecosystem, eventually to the point that the meadow is no longer present. Vegetation within meadows have dense rooting systems, reducing erosion from precipitation runoff and holding water within the meadow. With the lowering water table, this vegetation is transferring to plants with much less dense roots, increasing the amount of erosion. Like that of a snowball effect, as erosion occurs and causes the water table to drop, the rate at which erosion occurs increases steadily. In addition, as the meadow continues to dry, pine trees and other vegetation not suited for wet ground begin to invade into the area.

As erosion and runoff increases, the rate at which water moves downhill escalates into the channel, causing the channel to incise. Incision is defined as a channel that



no longer can reach its adjacent floodplain, or the deepening of stream channel. These incised channels continue to deepen, further lowering the water table and increasing the dryness of the meadows. With the water containing more force within the channel, erosive forces continue to increase until the meadow is completely dry, and incision is passed the point of being able to be fixed.

These issues were recognized in Houston Draw in the 80's, and wooden structures were installed in attempt to stop or slow down erosion and incision. Unfortunately, after about 40 years, the structures are no longer effective, and made erosion worse in some circumstances.

***Severe erosive features, such as nick points, headcuts, and incision have all been discovered within the Houston Draw system.***

As pine trees encroach into the once meadowed area, they begin to intake large amounts of water. As the trees continue to intake water, the water table is decreased even more, to the point that the incised channel no longer has running water, and the springs that feed the stream are dry. This affects the public in Payson and other northern Gila County communities. The Houston Draw system eventually flows into East Clear Creek, which then flows into C.C. Cragin Reservoir (formerly Blue Ridge Reservoir). This reservoir is an important water storage system by SRP, and is eventually led to the homes of residents within northern Gila County.

***Fortunately, however, there is hope. In 2018, the Arizona Elk Society partnered with the USFS, AZGFD, National Forest Foundation, and Natural Channel Design to investigate and produce treatment options for the Houston Draw drainage.***

In the Spring of 2019, the Arizona Elk Society began phase one of the process for treating Houston Draw. Machinery and hundreds of tons of rock was brought in to take care of large headcuts and to fix the wooden structures. In addition, AES volunteers built rock structures to begin taking care of erosion issues.

Rock structures are used to decrease energy and stop erosion, as these forces cannot erode carefully placed rock in a short amount of time. The structures slow and hold water in some situations, resulting in the increase of the water table in the area.

So, why should we care about the Houston Draw system? Houston draw supports many wildlife species, including habitat for elk, deer, and many other wildlife species. Using rock structures and treating the stream will stop or slow down erosive factors, lessen the amount of force the water carries, and raise the water table. Raising the water table will reestablish vegetation with more dense roots, allowing for these plants to hold water within the meadow again. This, combined with an increased water table, will allow for a restored and productive meadow that all wildlife will benefit from. Finally, there will be cleaner and more available water for SRP to allocate to the people of northern Gila County.



The Arizona Elk Society is excited to conquer this multi-year project. ***If you are interested in volunteering to help at Houston Draw, then be sure to sign up as a volunteer on our website at [arizonaelksociety.org/get-involved](http://arizonaelksociety.org/get-involved)***