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Land and Water

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COLORADO CREEK RESTORED
for fishery enhancement

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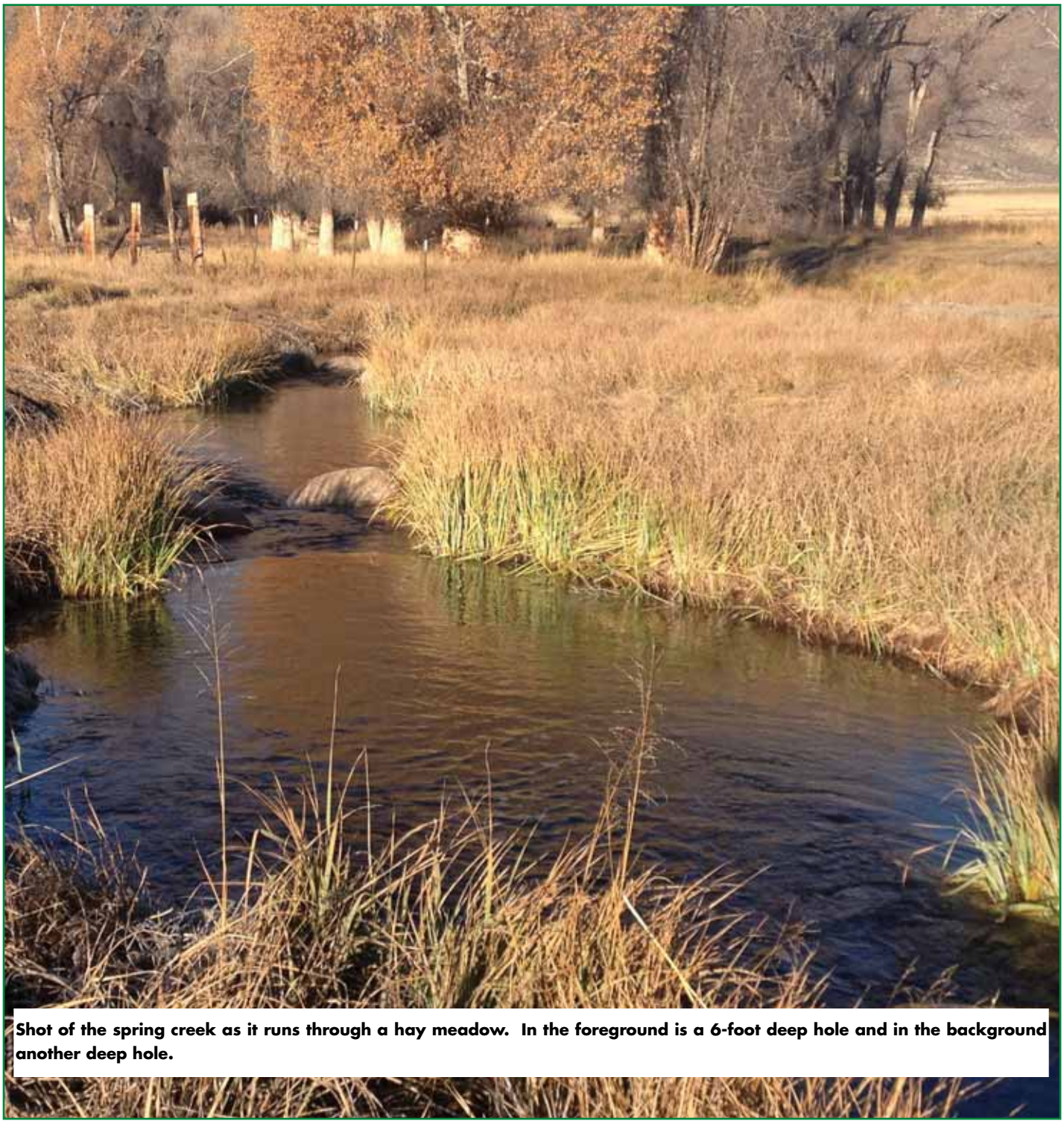
Restoring a Colorado Spring Creek for Fishery Enhancement



Shot of the spring creek as it runs through a hay meadow. In the foreground is a 6-foot deep hole and in the background another deep hole.

A spring creek near Gunnison, Colorado was experiencing serious erosion issues and was in need of restoration for suitable fish habitats. The current ranch owner recognized that the most valuable asset on the property was the extensive water rights and decided to develop them in a sustainable, responsible way. The previous ranch ownership viewed the streams strictly as conveyor systems for water to irrigate hay meadows and livestock. Over the last 80 years, the stream channels were purposely widened and the banks were armored with old machinery, tires, concrete and farm implements. Livestock overgrazing literally removed all of the beneficial riparian vegetation from the entire reach, causing thousands of feet of streambank to disappear annually. The fishery declined to a level that supported less than 2 lbs. of fish per acre.

The objectives of this project were to create a very high quality fishery (including ponds) from an unused spring creek and to restore and improve the fishery of an adjacent freestone creek, providing an exceptional angling experience throughout. CFI Global Fisheries Management, a science-based fisheries enhancement company based in Fort Collins, CO, was brought in to head up the project. Their passion focuses on the development and management of premier fisheries, land stewardship, and providing innovative environmental solutions to achieve client goals for fishery enhancement worldwide. The project was privately funded and CFI dealt directly with Colorado Parks and Wildlife and the US Army Corps of Engineers.

This is one of two ponds created on the spring creek. This pond is about 8 feet max depth and has littoral zones for beneficial aquatic macrophytes (plants), submerged logs and boulders. These ponds are intended to be fisheries and to be used by local waterfowl.

This project began with multiple on-

Before and after shot of Ohio Creek. Notice how featureless the creek is in top photo. After shot below shows how sinuosity has been restored, appropriate bars created, thalweg created, structures created, banks protected, etc.

site meetings with the landowner to gain an understanding of what he would like to have in the end. During these meetings many of the limiting factors were established (budget, water rights, landform, soils, riparian areas, productivity, allowable species, etc.), in order to make sure that he had a reasonable idea of what might be possible and where adjustments to either expectations or limiting factors could/should be made.

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Following these meetings additional data gathering (hydrology, sediment transport, existing fish and macroinvertebrate populations, riparian inventory and others) was performed and the conceptual drawings were produced. A series of revisions were made over the course of several months, using input from the client and additional data. These final drawings, along with other pertinent information were assembled into a permit application, which was then submitted to the appropriate state and federal agencies.

Permit approval took less than one month. Initial data collection for this project was a continuation of a project on an adjacent parcel from the fall of 2011. Actual construction began in June 2012 and was completed in October 2012. Construction consisted of the CFI stream team organizing all of the imported cobble and boulder materials in the staging area and according to individual size and dimensions, then assigning the materials to the appropriate habitat structures to be built. Team members then mobilized the required materials and delivered them streamside to each individual destination where trackhoe operators constructed each habitat structure in the stream with the assistance of one of the habitat engineers on the ground. The ponds were excavated with the spoils being removed and deposited in upland areas on the ranch, where spoils were then graded into the existing landscape and seeded. Once all habitat construction for the streams and ponds was completed, the team came back through and implemented the vegetation prescription for the entire project. This consisted of a combination of scarify / seeding, wetland plug planting, 1 and 5 gallon whip planting as well as transplanting of existing healthy woody specimens. All species were native to the region.

Initially, there were some concerns that this project would have an impact on water users of both creeks on the property. The other water users were additional shareholders on the multiple irrigation delivery systems (streams, creeks, ditches) in the region. It was critical that each share holder's water rights allocations were not to be negatively impacted as a result of the client's intentions to restore quality fisheries on his particular ranch. However, the client was very accommodating and made numerous goodwill improvements, such as privately funding the entire rebuild of a major irrigation head-gate structure that is responsible for delivering allocated water rights volumes to multiple landowners. Essentially, the surrounding neighbors

Top: Spring creek as it transitions through a slightly steeper section flanked by willows and cottonwoods. Below: Pulling some of the stream into a designed riffle area and point bar. This area was without a thalweg or suitable fish habitats.

and water rights owners received a brand new head-gate irrigation structure, which enabled all users to have super efficient delivery of irrigation water at no expense to themselves.

Machines and equipment for a project of this size and scope (less than $500K) consisted of large excavators (John Deere 320 class or larger), a large loader, backhoe, 2 UTVs (Rangers), equipment trailers, chainsaws, brush-cutters, pumps, welder, torches, etc. Silt fences were used in wetlands and other sensitive areas, and vegetable based oils and lubricants in the machines.

Mechanical problems such as broken hydraulic hoses and excavator teeth and a high water table while digging ponds popped up during the project. There was also a USGS gauging station on the property, making it necessary to be very careful with the structures and construction activities to ensure they did not affect the accuracy of the station. Also, the spring creek ran under a primary ranch road, which required temporary bridging.

Benefits to this property included an immediate and substantial jump in its value. Also, the client sought to establish a bit of an environmental legacy. While private, the public will ultimately benefit from this project as it provides a stable, healthy environment to rear juvenile and adult fish, as well as provide quality stock for public areas both upstream and downstream. The streams were not stocked after the habitat construction effort was completed. In order to ascertain qualitative and quantitative population recruitment and sustainability, CFI will study the project reach for multiple seasons to establish the baseline macroinvertebrate and fish populations, compare findings to the pre-construction inventories, identify any necessary adjustments, and institute land use and irrigation management strategies to accommodate and establish the long-term sustainability of this newly restored ecosystem.

CFI typically monitors projects for 3 years following construction. The created structures are self-cleaning and typically only require maintenance if there is a major flood event. On the spring creek, there may be some additional riparian plantings depending on how well the plantings take from last fall. The spring creek project ran quite smoothly but some adjustments had to be made in the revegetation plan for areas around the ponds to compensate for the drought conditions. **L&W**

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