

GOSHUTE CREEK HABITAT IMPROVEMENT FOR AN ENDANGERED SUBSPECIES OF CUTTHROAT TROUT

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Abstract. Goshute Creek is a small stream in eastern Nevada that provides habitat for an endangered subspecies of cutthroat trout (Salmo clarki spp). A stream habitat survey in 1975 identified two sections of the stream in which intensive erosion was occurring. With monies received in association with the Sikes Act, the Bureau of Land Management in Ely, Nevada, constructed three large open-mesh wire gabions in the stream channel to stop headcutting of the stream bed. The upper gabion is 60 feet long, 30 feet wide, and 28 feet high. The lower gabion is 39 feet long, 30 feet wide, and 13 feet high with a metal fish pass secured to the outside panel to facilitate fish movement up and down the stream. The third gabion is 6 feet long, 30 feet wide, and 5 feet high. Construction was accomplished by awarding a contract to a private contractor for \$33,696 which included special environmental needs for Goshute Creek. These structures are designed to improve habitat on 3 miles of Goshute Creek.

INTRODUCTION

Goshute Creek is a small stream in eastern Nevada that provides habitat for a unique species of cutthroat trout (Salmo clarki spp) (Behnke 1976). Although officially unnamed, this species of trout is classified as endangered by the State of Nevada. Because its natural habitat is restricted to several small streams in eastern Nevada, Nevada Department of Fish and Game transplanted 54 of these trout into Goshute Creek in 1960 (Dodge 1974). The trout survived and reproduced in the stream but not as successfully as originally hoped. In 1967 in cooperation with Nevada Department of Fish and Game, the Bureau of Land Management developed three small ponds in the stream channel to improve the fish habitat. The ponds were formed by building small dikes across the stream channel. Unfortunately, the dike spillway failed with the first heavy spring runoff. By 1971, the spillway was ineffective. In 1973, heavy spring runoff completely washed the spillway out eliminating the ponds. The cut through the canyon dam was nearly 20 feet deep. In 1974, headcutting had progressed 200 feet upstream. Eroded soil and rock material carried downstream was deteriorating the fisheries habitat rapidly.

Fig. 1. Isometric drawings of the gabion (upper) and weir (lower) structures for the lower facility.

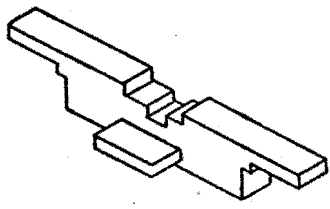
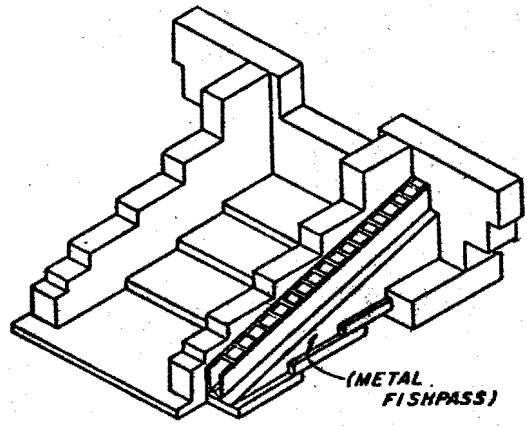
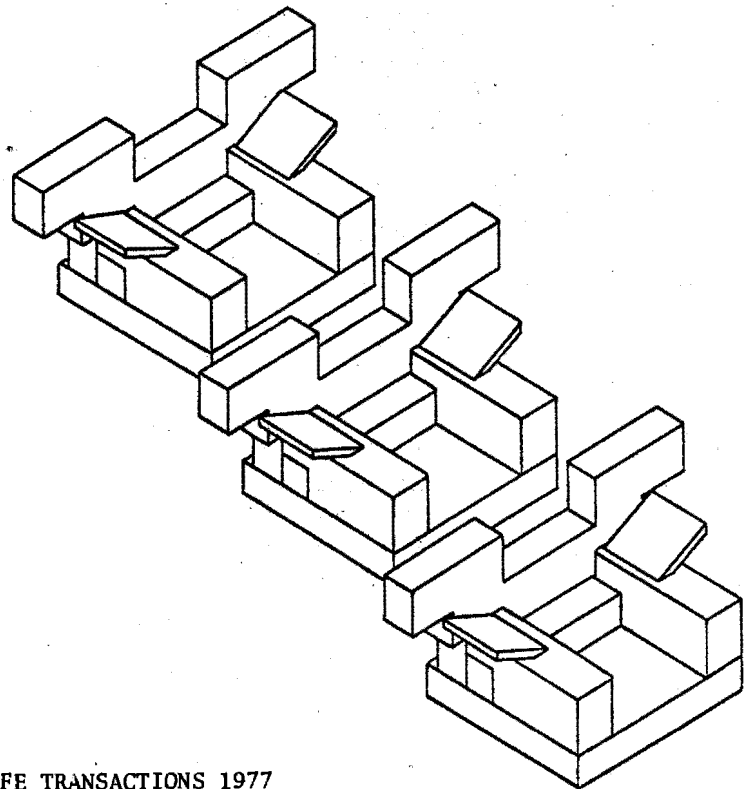


Fig. 2. Isometric drawing for the gabion constructed at the upper facility.



At the same time, a second headcutting area was occurring at the mouth of the canyon. This erosion created three falls totaling 15 feet high which were barriers to upstream fish movements.

In the summer of 1975, the Bureau of Land Management conducted stream habitat survey to document the deteriorated habitat conditions for the unique species of trout and to identify specific habitat improvement needs (Duff and Cooper 1976). Soon after the stream survey was completed, Ely District of the Bureau of Land Management began planning to do habitat improvement in the two headcutting areas of the stream channel. January 1976, in association with the Sikes Act, monies became available to accomplish the identified habitat improvements in Goshute Creek.

DISCUSSION

The objective of the habitat improvements was to stop the headcutting of the stream channel immediately. This was accomplished by installing several structures with consideration for special environmental needs of Goshute Creek (U.S. Bureau of Land Management 1976). Because the stream flows completely within a designated Natural Area, the structures installed were made of material to blend with natural surroundings of the area as much as possible. Open-mesh wire gabions similar to Behart Gabions were selected to meet this standard. The wire baskets were filled with 3-inch to 5-inch diameter rock material from the surrounding area. Construction was accomplished as late in the summer as possible to reduce damage to the trout's reproductive activities. The stream channel was diverted around each construction site to maintain water in the lower stream channel for fisheries needs and agricultural demands. All disturbed sites were cleared by a qualified archaeologist for any cultural resources. An Environmental Analysis Record was completed on repair activities on the access road for heavy equipment needed in construction of the gabions. The endangered status of the cutthroat trout in Goshute Creek required that all fish be removed from segments of the stream being diverted for construction activities. Nevada Department of Fish and Game removed fish by electro-shocking and transferring them to other areas of the stream.

Construction of the gabions was accomplished by private contractor. The contract included excavation of 1,170 cubic yards of earth in common excavation for gabion structures, placing 60 cubic yards of compacted earth embankment, 94 cubic yards of uncompacted earth embankment, 346 cubic yards of gabion structures, equipment rental and installation of a metal fish pass and riprap placement. The contract was awarded for a bid of \$33,696.

All surfaces of the gabion which come in contact with surrounding soils were covered with the fiber/fabric material (Mirafi 140). This fiber material prevents fine material from passing completely through the structure. Eventually, the fine material will fill the structural voids and allow the structure to become a solid earthen unit similar to the surrounding stream channel.

Three gabions were installed in the stream channel: upper gabion, lower gabion, and a small weir gabion.

The upper gabion is actually three structures stairstepped down the lower side of the canyon dam to lower the stream channel 21 feet. This complete structure is approximately 60 feet long, 30 feet wide, and 28 feet high (Fig. 1). It has a 10-foot wide spillway to accommodate heavy spring runoff. No fish passage is provided in this structure. This gabion was completed first.

The lower gabion is a single structure installed to lower the stream channel 9 feet. The gabion is 39 feet long, 30 feet wide, and 13 feet high. This gabion has an Alaskan steep fish pass securely fastened with anchor bolts to

Fig. 3. The upper gabion after completion of construction.



Fig. 4. One of the weirs completed at lower facility.



a side panel (Fig. 2). The fish pass is set at approximately 26° and placed so that all normal flow passes through the fish pass; only heavy spring runoff will flow over the spillway (Fig. 2).

The small weir is a gabion placed 30 feet upstream from the lower gabion to maintain the stream channel in a constant location as it approaches the lower gabion. This structure is 6 feet long, 30 feet wide, and 5 feet high; it was the last structure to be completed (Fig. 2).

The construction was completed by landscaping all disturbed areas and re-seeding this area and the road with a mixture of grass and forbs. The access road was closed to ORV use to prevent any unnecessary movement of silt into the stream.

RESULTS

The contract was awarded June 24, 1976, and construction began on July 26, 1976. Due to several delays, the gabions were not completed until October 27, 1976. Most of the disturbed areas have been reseeded, but very little snow is available to cover the seed. Because of the short time since completion of the gabions, no resurvey of the stream has been accomplished to evaluate the project. Inspection of the gabions is scheduled annually with a resurvey of stream habitat every 3 years.

To complete the project, the Bureau of Land Management, in cooperation with the Nevada Department of Fish and Game, will place an interpretive sign just below the lower gabion (Cain 1971). The sign will explain the purpose of the gabions and the status of the unique cutthroat trout that inhabit Goshute Creek. Biologists from Nevada Department of Fish and Game are going to tag several trout below the lower gabion to evaluate fish movements over the fish pass.

This is a very significant habitat improvement project accomplished by the Bureau of Land Management for an endangered species in Nevada.

LITERATURE CITED

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