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## PROJECT DESCRIPTIONS

### **Project: Cabresto Creek Fish Barrier and Rio Grande Cutthroat Trout Restoration; Aquatic**

**Objective:** To reestablish native Rio Grande cutthroat trout in the middle reach of Cabresto Creek by installing a fish barrier in upper Cabresto Creek, removing non-native trout, and introducing Rio Grande cutthroat trout; improving riparian habitat and water quality by installing grazing exclosures along the creek bank

#### **Description:**

##### *Fish Migration Barrier*

Rio Grande cutthroat trout (*Oncorhynchus clarki virginalis*) is the native trout species historically present in the Rio Grande drainage basin, including the Red River, Cabresto Creek, and Columbine Creek. However, due to a multitude of factors, including stocking of non-native brown, brook, and rainbow trout, this subspecies of the cutthroat has become rare. It is estimated that Rio Grande cutthroat now occupies only approximately 8% of its historical range (Pritchard and Cowley). This species, the state fish of New Mexico, is a species of special concern, and its federal status as an endangered or threatened species is currently in litigation. Restoration and reintroduction efforts are being encouraged to preserve this subspecies and to prevent it from being listed by the U.S. Fish and Wildlife Service.

At present, all fish species are able to migrate throughout Cabresto Creek including: rainbow trout, brook trout, brown trout, and cutthroat x rainbow hybrids. Non-native brook trout, and cutthroat x rainbow trout currently dominate the fishery in lower Cabresto Creek. These species are capable of migrating into the headwaters of Cabresto Creek where they can compete with a small residual population of Rio Grande cutthroat trout.

Reestablishing native Rio Grande cutthroat trout in the middle and upper reaches of Cabresto Creek (above the confluence of Cabresto and Lake Creeks) will require isolating these fish from populations in Lake Creek and lower Cabresto Creek. To accomplish this objective, a fish barrier will be constructed of reinforced concrete on upper Cabresto Creek, approximately 0.6 miles upstream from the Lake Creek confluence. The fish barrier is expected to be a weir approximately 4 feet high completely spanning Cabresto Creek at a deeply incised location. A concrete apron downstream of the weir will prevent formation of a scour hole that might hold adult fish and provide some opportunity for jumping over the weir. Hard armoring of the incised channel banks downstream of the weir and apron will prevent stream bank failure during flood flows and ensure that reach velocities are too high to permit upstream migration. Sampling in this area has found brook trout but no rainbow or hybrid trout. Brook trout will be removed by backpack electrofishing. The State Department of Game and Fish could choose to stock additional Rio Grande Cutthroat Trout in this reach in the future if this area fits into their management plans. This project as conceived, however, does not depend on supplemental fish stocking.

Electrofishing to remove non-native species is thought to be reasonably effective for this area, as long as the sites are selected carefully and long-term maintenance is adequately funded. The effectiveness of electrofishing in the removal of non-native species depends on factors including

the species being removed, the complexity of the habitat, and the timing and frequency of the treatments.

The USFS has conducted electrofishing for more than five years on upper Cabresto Creek to keep the numbers of brook trout low. The biologists we spoke with think that expanding the electrofishing effort in combination with the establishment of a barrier could help further benefit the RGCT population in the upper reaches of Cabresto Creek where the habitat is appropriate and there are no rainbow trout present.

### *Grazing Exlosures*

The project will install three grazing exlosures along Cabresto creek to improve aquatic and riparian habitat. The land surrounding Cabresto Creek is grazed twice a year with cattle. The cattle negatively impact the creek by injuring riparian vegetation and causing excessive sedimentation and turbidity.

**Benefits:** The environmental benefits of this project are to enhance the population of Rio Grande cutthroat trout in Cabresto Creek. Rio Grande cutthroat trout (*Oncorhynchus clarki virginalis*) is the native trout species historically present in the Rio Grande drainage basin, including the Red River, Cabresto Creek, and Columbine Creek. However, due to a multitude of factors, including stocking of non-native brown, brook, and rainbow trout, this subspecies of the cutthroat has become rare. This species, the state fish of New Mexico, is a species of special concern, and its federal status as an endangered or threatened species is currently in litigation. Restoration and reintroduction efforts are being encouraged to preserve this subspecies and to prevent it from being listed by the U.S. Fish and Wildlife Service.

The environmental benefit of the exlosures is the recovery of impacted aquatic and terrestrial habitat to a condition without grazing. Based on experience with similar projects, positive benefits from the structures will be seen within two years of construction. The positive effect of these structures has been documented to have beneficial stream stabilization effects for about 100 ft upstream of the structure and about 50 feet down stream of the structure (Personal communication, George Long, U.S. Forest Service, 11/14/06).

**Spatial Extent of Project:** The project is expected to reestablish native Rio Grande cutthroat trout in a 4.0 mile reach of Cabresto Creek upstream of the proposed barrier location. The proposed barrier location is: N 36 degrees, 44.902 minutes; W 105 degree, 26.633 minutes. One large enclosure will be located upstream of the barrier. It will be 1800 feet long and enclose approximately 6 to 6.5 acres. Two smaller barriers will be located close to the barrier and will be about 50-150 feet in length and enclose about 1/10 acre each.

**Time Frame:** Rio Grande cutthroat trout populations should be established within three years of the construction of the fish barrier and the removal of brook trout. Monitoring will have to be conducted periodically until it can be ascertained that a self-sustaining Rio Grande cutthroat trout population has been established. Recovery will not be able to be fully assessed for approximately five to seven years, at which time enough data should be available to determine if a stable Rio Grande cutthroat trout population has been established.

Positive benefits of the grazing exclosures are expected to be seen within 2 years of construction. The lifetime of the exclosures should exceed 20 with routine maintenance. (Personal communication, George Long, US Forest Service, 11/14/2006).

**Chance of Success:** The probability of success of this project is high. By removing a competitor species (brook trout) from a protected stretch of the creek, the habitat for Rio-Grande cutthroat trout is greatly enhanced, thus greatly increasing the likelihood of the cutthroat trout population increasing in size and remaining secure. This project allows for continuous removal of brook trout through repeat electroshocking if at first unsuccessful.

**Performance Criteria and Monitoring:** Success for this project will be measured through fish monitoring in the fifth, eighth, and eleventh year, in which fisheries biologists will conduct electroshocking and fish counting studies. If found, trout other than Rio Grande cutthroat trout will be removed by electroshocking. The fish barrier will require occasional monitoring to ensure that no structural failure or channel changes that would compromise the integrity of the barrier have occurred. Additionally, the removal of any large woody debris that might hang up on the weir is important to ensure that upstream migration is blocked.

## **References**

Personal communication, George Long, U.S. Forest Service, 11/14/06

Pritchard, V. L. and D. E. Cowley. 2006. "Rio Grande Cutthroat Trout (*Oncorhynchus Clarkii Virginalis*): A Technical Conservation Assessment." USDA Forest Service, Rocky Mountain Region. July 28.