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MEMORANDUM

TO: Anne Wagner
Bob Haddad

FROM: Jim Chadwick

DATE: November 11, 2005

RE: Cabresto Creek Field Evaluation

Cabresto Creek was evaluated by Chadwick Ecological Consultants, Inc. (CEC) on October 4-6, 2005, from just upstream of the confluence with the Lake Fork upstream to its headwaters. The purpose of this survey was to determine segment boundaries and obtain estimates of fish species composition, density, biomass, and habitat conditions in each segment (Table 1). A single site in each segment was electrofished to obtain population parameters. Extended reaches of Cabresto Creek were evaluated by walking and continuous electrofishing to determine habitat conditions and define the distribution of cutthroat trout, brook trout, and brown trout in the upper Cabresto Creek watershed. Additionally, 20 fin clips were taken from Rio Grande cutthroat trout (RGCT) in two locations upstream of the furthest distribution of non-native salmonids to determine the genetic purity of Rio Grande cutthroat trout in the upper Cabresto Creek watershed. Results of the genetic analysis will be available by December 1, 2005. These activities were conducted to provide preliminary information on the viability of restoring Cabresto Creek to an allopatric population of RGCT by removing non-native trout species and reintroducing genetically pure RGCT.

Cabresto Creek upstream of the Lake Fork confluence contains four distinct segments (Fig. 1). Segment 1consists of a meadow-dominated, very small stream at its uppermost headwaters. This segment is approximately 1 mi in length and is almost entirely on private land. The stream had variable width and the gradient is essentially flat (<1%). Segment 2 extends from the downstream end of the meadow section downstream approximately 2.4 mi to the confluence with Jiron Canyon. The stream channel in Segment 2 averages 3 ft wide in the upper 1/3, 6 ft in width in the lower 2/3, and has a average gradient of 4.3%. Much

of this section is meadow with grass dominated banks. Habitat is limited to undercutting on meander bends and some plunge pools present.

TABLE 1: GPS coordinates of Cabresto Creek sampling sites and landmarks related to Cabresto Creek fish distribution survey.

Site	Latitude	Longitude	Elevation (ft)
Cabresto Park private property boundary	N 36° 47.016'	W 105° 21.448'	--
Bottom of Segment 1/Top of Segment 2	N 36° 47.136'	W 105° 21.743'	10,522
NRD-1 Top	N 36° 46.575'	W 105° 22.534'	--
NRD-1 Bottom	N 36° 46.566'	W 105° 22.568'	--
Bottom of Segment 2/Top of Segment 3	N 36° 46.046'	W 105° 23.518'	10,057
NRD-2 Top	N 36° 45.500'	W 105° 25.930'	--
NRD-2 Bottom	N 36° 45.472'	W 105° 25.963'	--
Bottom of Segment 3/Top of Segment 4	N 36° 44.586'	W 105° 27.205'	9,069
NRD-3 Top	N 36° 43.974'	W 105° 28.996'	--
NRD-3 Bottom	N 36° 43.946'	W 105° 29.050'	--
Bottom of Segment 4 (Lake Fork Confluence)	N 36° 44.137'	W 105° 30.375'	8,565

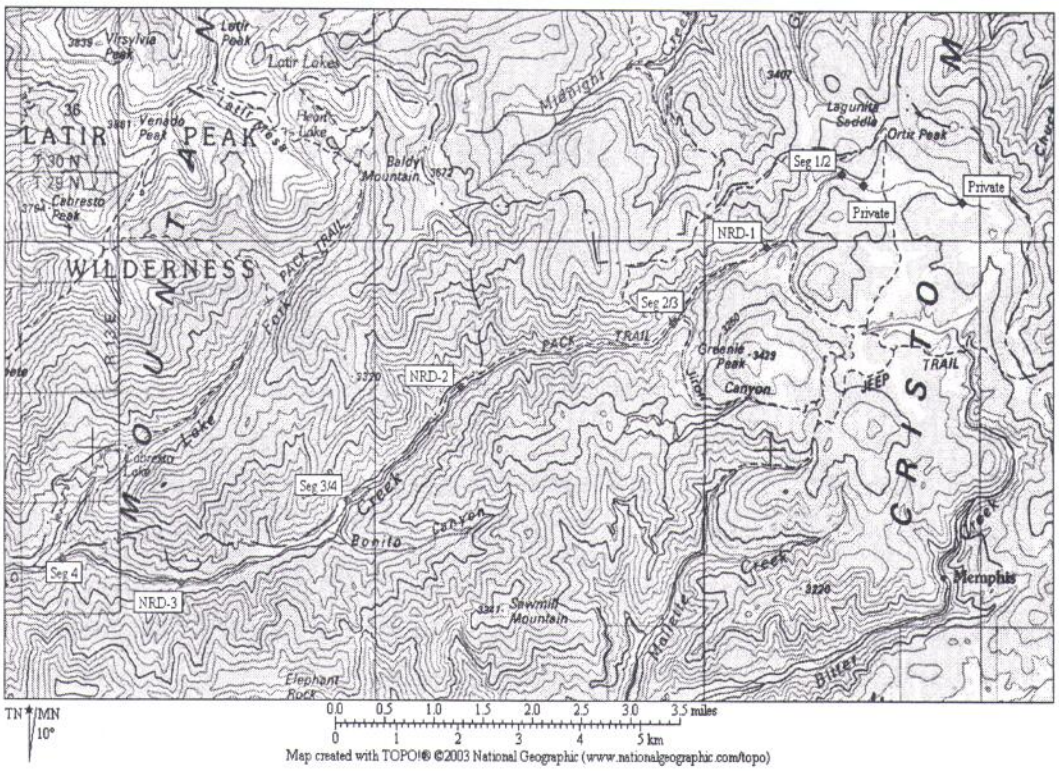


FIGURE 1: Map of upper Cabresto Creek, with four stream reaches indicated.

Segment 3 extends from Jiron Canyon downstream to the Bonito Canyon confluence. This segment is approximately 4.5 mi in length, averages 8 ft in width, and had a gradient of approximately 4.3%. Habitat is good, with plunge pools, undercutting banks, and good pool:riffle ratio. Segment 4 extends from Bonito Canyon downstream to the confluence with the Lake Fork, a distance of approximately 3.3 mi. Width averages 10 ft, and gradient is 3.4%, with habitat fair and consisting mostly of plunge pools. Table 1 presents significant GPS coordinates recorded during this investigation.

Segment 1

Segment 1 was not sampled extensively as it was mostly on private land, and we did not have permission to enter. This section is the headwaters of Cabresto Creek, and was dominated by a high alpine meadow (Photos 1, 2, and 3), with very low gradient. The stream meanders considerably through this section and likely does not constitute viable habitat due to very small stream size. The lowest portion of this segment contained only cutthroat trout (Photo 4), and densities appeared to be very low. We did not quantitatively sample in this segment.

Segment 2

Segment 2 was sampled both qualitatively and quantitatively. The quantitative site sampled for fish populations (Site NRD-1) was located 8.6 road mi upstream of Forest Service Road 134A (Lake Fork Road) and 3.6 road mi upstream of Site NRD-2. A total of 308 ft of stream was sampled. This reach of stream was characterized by a wide meadow downstream (photos 5, 6, 7, 8, 9, and 10), with a small, narrow canyon at the upstream end (Photos 11 and 12). Pool habitat was generally confined to the outside of stream meanders and undercutting in run habitat. Rocks and woody debris were uncommon. The riparian area was dominated by grass, and banks were fairly stable except where some evidence of cattle grazing was evident. Only cutthroat trout were found at this site (Table 2) and no obvious signs of hybridization with rainbow trout were observed. Density and biomass estimates were fairly low, due to the smaller stream size and less available cover than in the downstream segments.

Qualitative sampling was conducted through the entire length of this segment. This sampling indicated the predominance of Rio Grande Cutthroat trout (Photos 13 and 14); brook trout were present,

but rare, and were collected only in the downstream ½ mi of this segment. No significant barriers to fish movement were present in this reach, and brook trout distribution must be limited by elevation, available habitat, competition with cutthroat trout, or some combination of these three factors. Fin clips were taken from 20 RGCT from this segment only.

Segment 3

Segment 3 was sampled both quantitatively and qualitatively. The quantitative site sampled for fish populations (Site NRD-2) was located 5.0 road mi upstream of Forest Service Road 134A (Lake Fork Road) and 3.5 road mi upstream of Site NRD-3. A total of 271 ft of stream in this reach was sampled. In this segment, Cabresto Creek was more confined in the canyon, but the valley floor was generally wide enough to allow the stream to meander. Pool habitat was still dominated by scour pools formed by boulders, but pools formed by woody debris and bank undercutting were common. The riparian area was dominated by willow growth, and banks were generally stable, although some bank erosion was present at the bottom of the site (Photos 15 and 16). Only brook trout and cutthroat trout were collected at this site, and both were nearly equal in terms of density and biomass (Table 2). Densities (#/acre) were nearly four times as high as those seen at Site NRD-1, and biomass was also substantially higher. Cutthroat trout at this site did not show any obvious signs of hybridization with rainbow trout.

Qualitative sampling occurred in the top one mile of this segment, and brook trout populations were abundant within the canyon but became much less abundant near the top of the segment. There were no significant barriers to fish movement present in this reach.

Segment 4

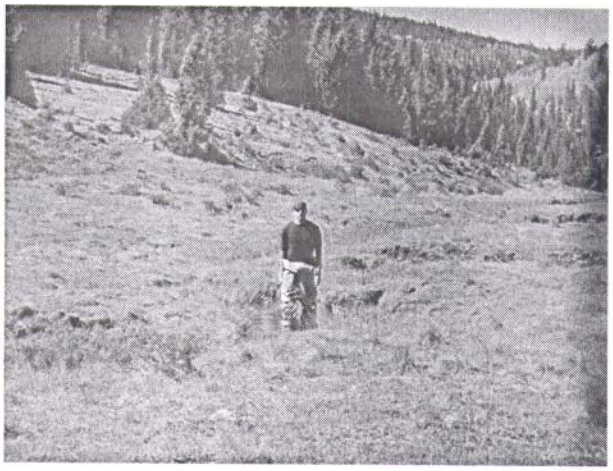
Segment 4 was sampled quantitatively. The site sampled for fish populations (Site NRD-3) was located 1.5 road mi downstream of Forest Service Road 597 (Bonito Canyon Road) and 1.5 road mi upstream of Forest Service Road 134A (Lake Fork Road). A total of 320 ft of stream was sampled. Habitat was similar to the CEC long-term monitoring site on lower Cabresto Creek. Pool habitat mainly consisted of scour pools formed by boulders, and large woody debris was uncommon. Some bank erosion was also present along this reach (Photos 17 and 18). Brook trout, brown trout, cutthroat trout, rainbow

trout, and cutthroat x rainbow hybrids were collected at this site (Table 2). Brown trout dominated the site in both density and biomass, while brook trout were also common.

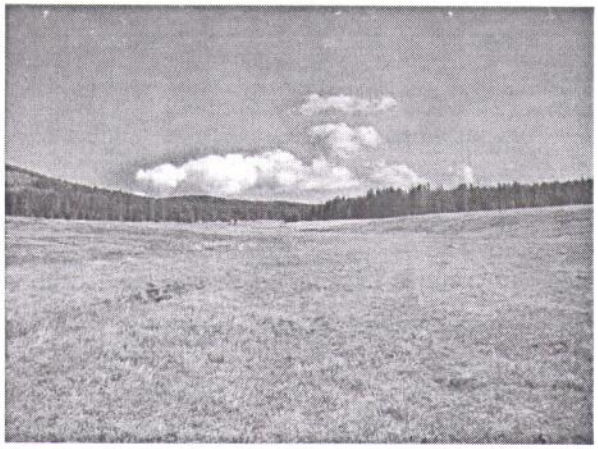
TABLE 2: Provisional fish population parameters from Cabresto Creek NRD sites. BRK = brook trout, BRN = brown trout, CUT = Rio Grande cutthroat trout, RBT = rainbow trout, HYB = cutthroat / rainbow hybrid.

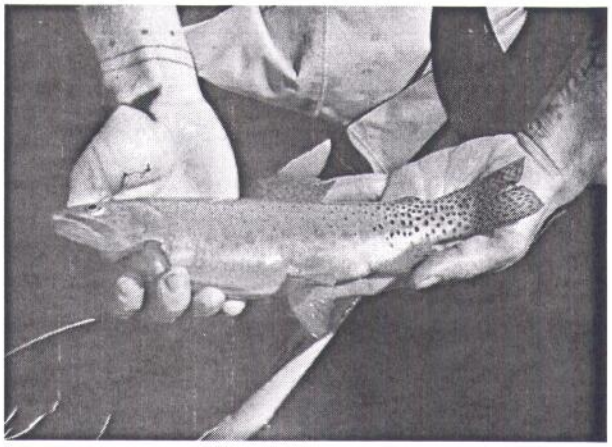
			Density		Biomass
Site	Species	# Collected	# / Mile	# / acre	lbs / acre
NRD-1	CUT	33	586	810	66.3
	TOTAL	**33**	**586**	**810**	**66.3**
NRD-2	BRK	61	1,196	1,173	65.4
	CUT	55	1,098	1,077	65.3
	TOTAL	**116**	**2,294**	**2,250**	**130.7**
NRD-3	BRK	23	377	319	26.7
	BRN	33	541	458	54.1
	CUT	2	33	28	6.5
	HYB	2	33	28	2.4
	RBT	2	33	28	4.9
	TOTAL	**62**	**1,023**	**861**	**64.6**

In summary, Cabresto Creek upstream of the Lake Fork sustained a viable and self-sustaining population of trout. Densities were higher than expected. Upstream of Bonito Canyon, no hybrids, rainbow, or brown trout were collected. In Segments 2 and 3, the cutthroat torut appeared to be the Rio Grande subspecies (*O. c. virginalis*), with all life stages common. Adults were captured up to 10 inches, and young-of-the-year and juveniles were common. Habitat in upper Cabresto Creek, especially Segments 2 and 3, was good. Standing crop of trout was average to above average.

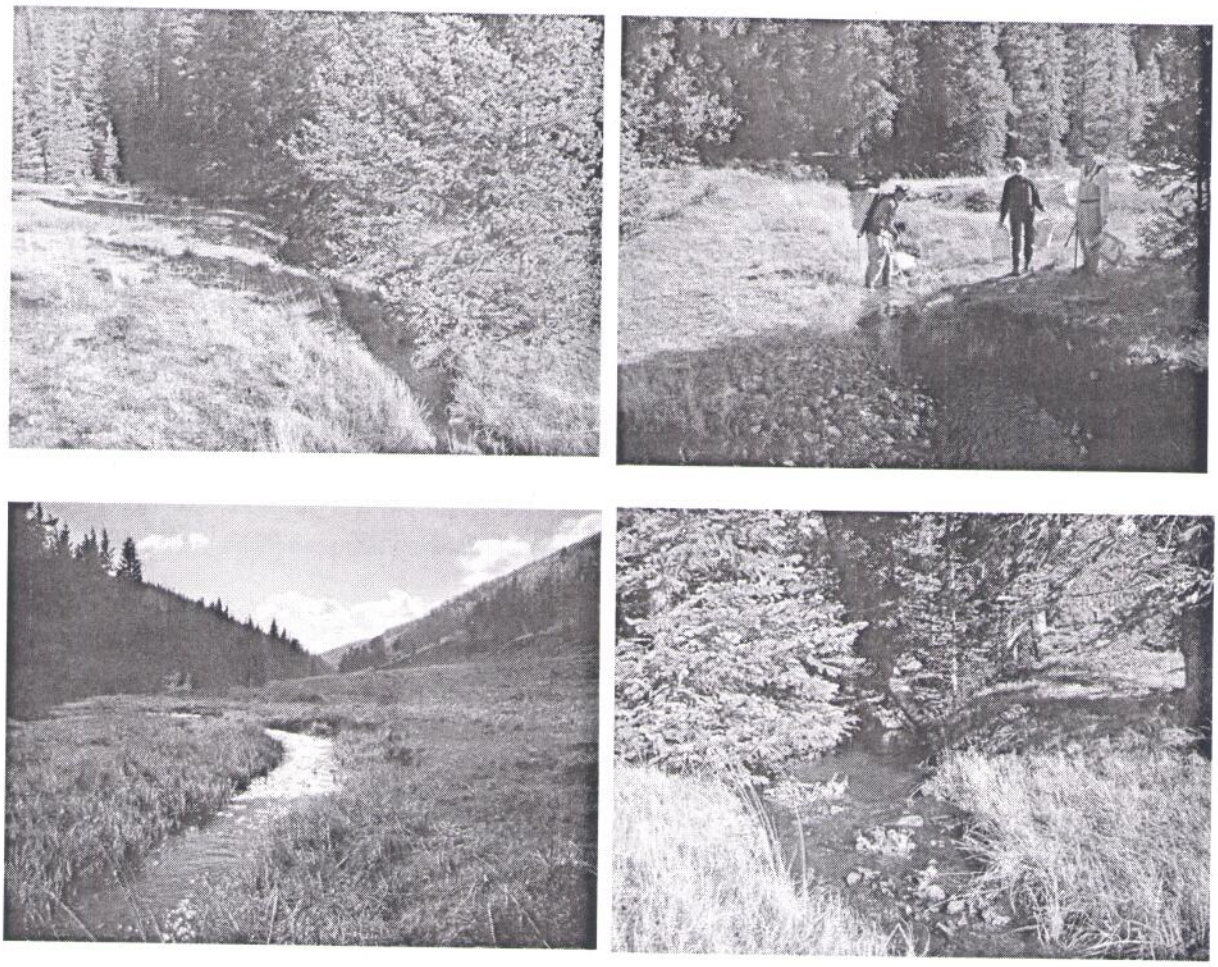


PHOTOS 1 AND 2: Cabresto Creek at the downstream end of Cabresto Park (left) and deep pool habitat in the Cabresto Park area (right).

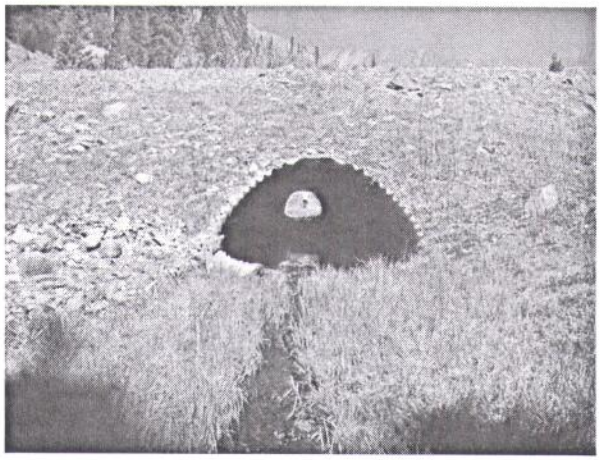
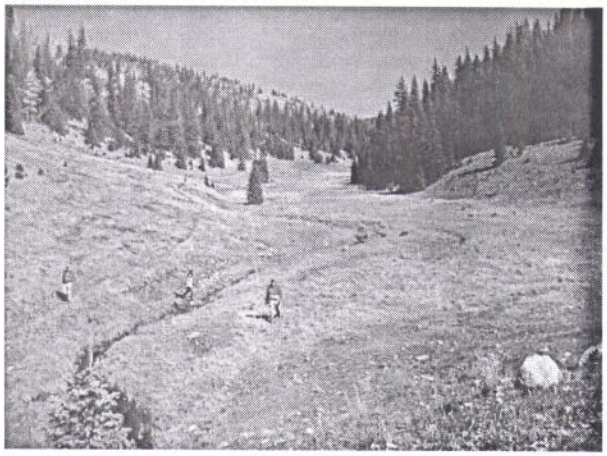




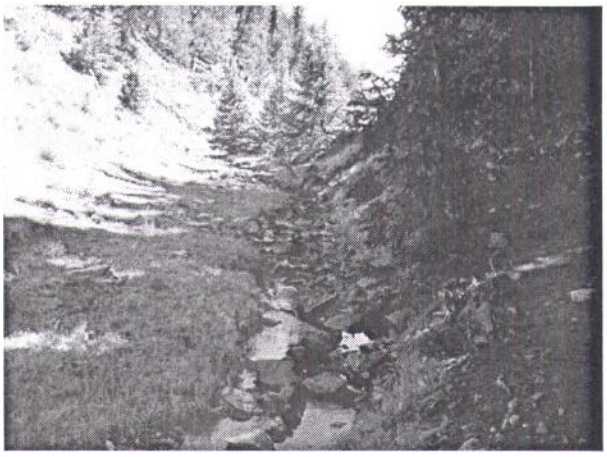
PHOTOS 3 AND 4: Cabresto Creek continuing through private property (left) and Cutthroat trout collected in Cabresto Park (right).



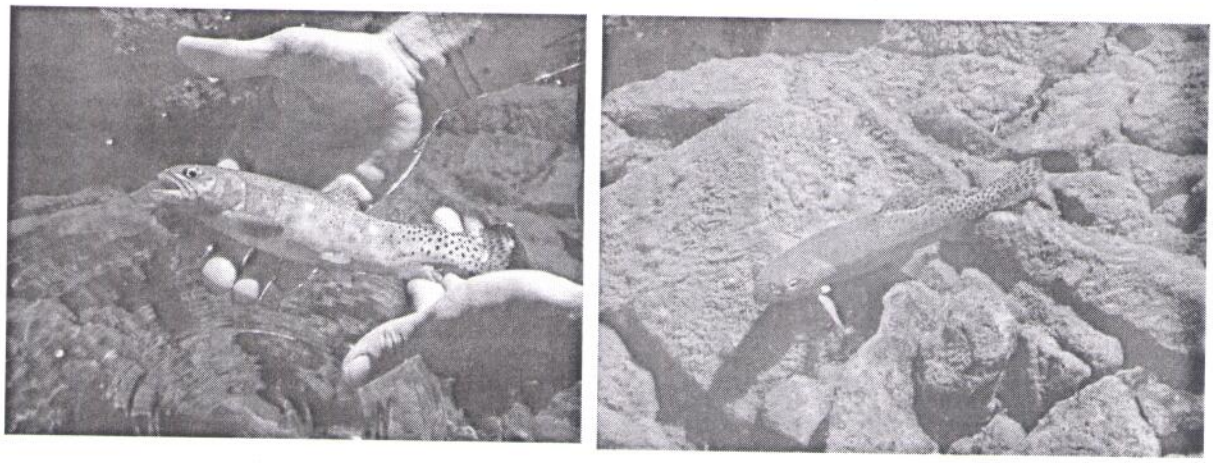
PHOTOS 5, 6, 7, AND 8: Site Cabresto Creek NRD-1 bottom of site looking downstream (top left) and upstream (top right) and top of site looking downstream (bottom left) and upstream (bottom right).

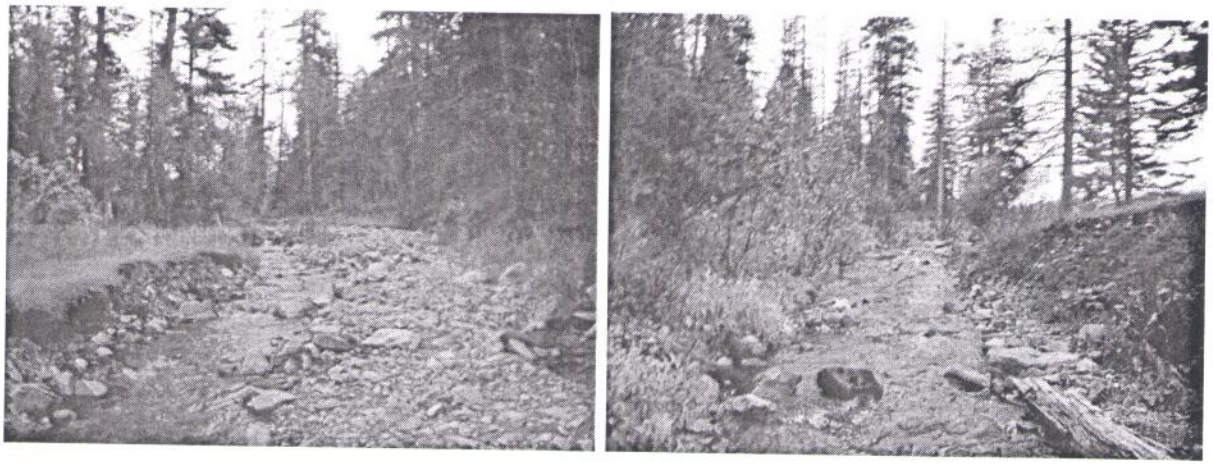
PHOTOS 9 AND 10: Last culvert on Cabresto Creek (left) and looking upstream from the last culvert on Cabresto Creek (right).

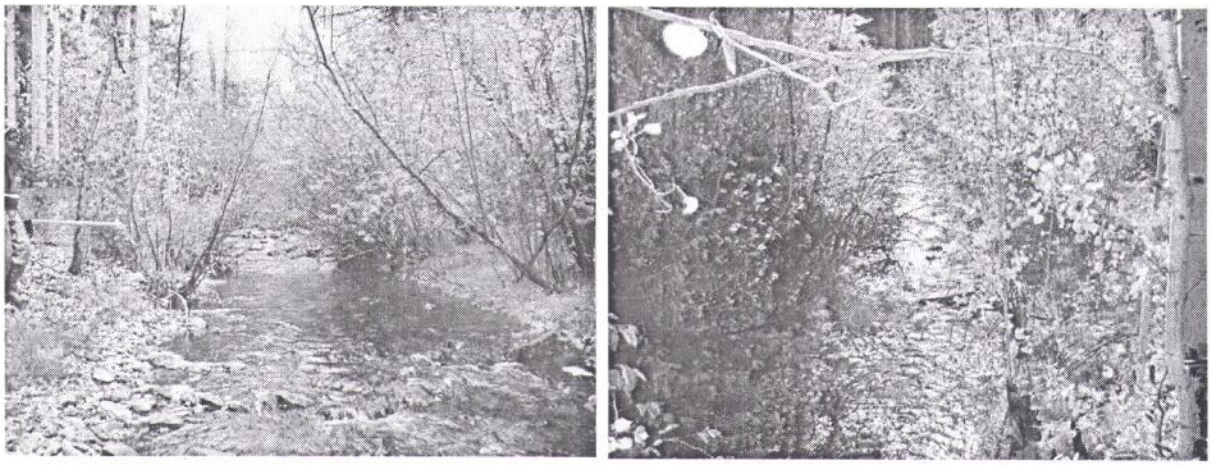
PHOTOS 11 AND 12: Cabresto Creek entering last short canyon section downstream of Cabresto Park (left) and within the last canyon section (right).



PHOTOS 13 AND 14: Cutthroat trout found in small pool upstream of last Cabresto Creek culvert in meadow area.



PHOTOS 15 AND 16: Site Cabresto Creek NRD-2 looking upstream (left) and downstream (right) from the bottom of the site.



PHOTOS 17 AND 18: Site Cabresto Creek NRD-3 looking upstream from bottom of site (left) and looking downstream from top of site (right).