

FINAL REPORT:

Dry Cottonwood Cross-boundary Trout Conservation

By:

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For:

Western Association of Fish and Wildlife Agencies
Western Native Trout Initiative
Small Grant Project Agreement No. 2016-SG11

January 31, 2018



Westslope cutthroat trout below a culvert barrier in Dry Cottonwood Cr.

Introduction: The Clark Fork Coalition is working on watershed-scale restoration of eight tributaries in the Deer Lodge valley area of the Upper Clark Fork river, including Dry Cottonwood Creek. Dry Cottonwood is a small cold-water stream which drains a 23-square mile watershed in Deer Lodge County, Montana, including National Forest lands, state lands and private lands. Dry Cottonwood Creek supports a conservation population of westslope cutthroat trout from near its mouth up to just below the continental divide, a total of over fourteen (14) fish-bearing stream miles. These trout are 95% to 98% pure westslope cutthroats, and are rated by Montana Fish Wildlife and Parks biologists as a “conservation population.” However, this drainage has several limiting factors for native trout: irrigation-related dewatering, sediment from forest roads, old placer mining damage, and fish-barrier culverts on US Forest Service lands.

During 2017, the Coalition used the Western Native Trout Initiative (WNTI) small grant funding to collect baseline monitoring data on stream health, stream habitat, trout species presence and abundance, and fish passage conditions. The key use of the WNTI funding was to match CFC dollars to hire a field intern for the entire summer season. The CFC worked with the University of Montana to hire Tanner Pedretti, a rising senior in the ecology and restoration biology, to perform field duties.

Results: The project accomplished the following key tasks:

- 1) Successfully assessed riparian and aquatic habitat quality on three miles of private lands within the South Fork of Dry Cottonwood Creek. The CFC just acquired permission to access these lands for the first time in 2017. Data showed that the South Fork of Dry Cottonwood has been altered by human interventions, including historic placer mining, relocation of a part of the channel to the perimeter of the valley, and construction of an earthen dam near the top of the watershed. These historical factors result in two stream reaches which scored “non-functional,” one reach which scored “functional at risk,” and one reach which scored “proper functioning condition.” Current land use is limited to some cattle grazing, and some reaches of the creek show signs of natural recovery, particularly where beaver are active. The Table 1 shows the results of riparian assessment in the four (4) main reaches of the South Fork. Stream habitat (R1/R4) was also assessed on two short (100 m.) reaches.

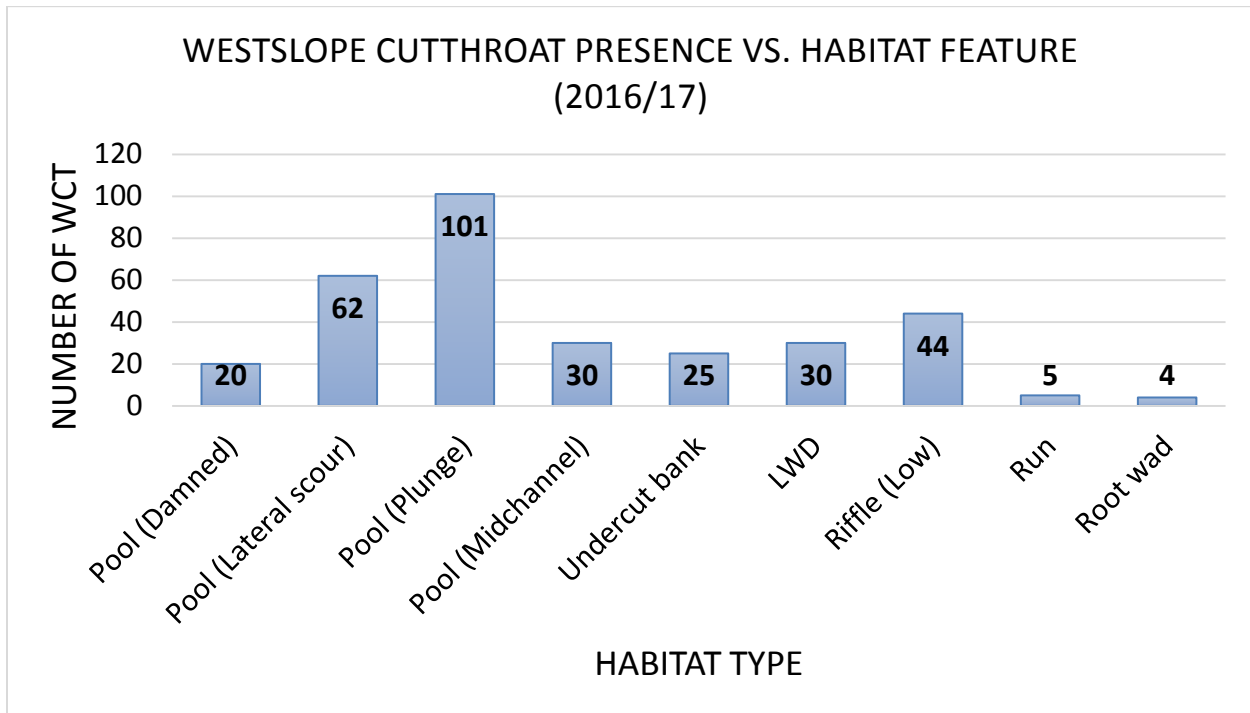
TABLE 1: RIPARIAN ASSESSMENT SCORES FOR SOUTH FORK DRY COTTONWOOD CREEK:

Reach Description:	Reach Number:	Length (miles)	Riparian Score (%)	Notes:
Road 8634 culvert up to rail fence gate	1	0.81	60- functional at risk	Includes active beaver pond complex
Rail fence gate up to lower end hay meadow	2	0.21	58- non-functional	Includes one small beaver pond
Lower end hay meadow up to upper rail fence (PL)	3	0.40	22- non-functional	Old hay meadow, creek has been ditched
Upper rail fence up to earthen dam/reservoir	4	0.83	80- Proper functioning condition	Old beaver ponds, now abandoned

- 2) The assessment of the North Fork of Dry Cottonwood was only qualitative, as severe summer thunderstorms and flooding interrupted field work in this area. Field work in fall 2014 had established that four reaches in that drainage had “non-functional” riparian assessment scores, five reaches had “functional at risk scores,” and one reach had “proper functioning condition.” Initial field inspection in 2017 indicated these scores are likely improving, but in-depth baseline aquatic habitat data collection (and repeat of riparian assessment) will have to wait until summer 2018. We also will schedule baseline fish population sampling on the North Fork before the culvert replacement fish barrier project in 2018.
- 3) The intern and CFC Restoration Specialist collected baseline fish population data on the mainstem and South Fork of Dry Cottonwood using snorkel survey techniques taught by Dr. Lisa Eby at the University of Montana. In the South Fork of Dry Cottonwood, we established our first snorkel survey reaches. These reaches revealed a low population of westslope cutthroat trout, with two (2) trout found in a 100 M. sub-reach of Reach 2, and twelve (12) trout found in a 100 M. sub-reach of reach 1. These are relatively low population numbers compared to sites on the mainstem of Dry Cottonwood, which vary from five (5) to twenty-one (21) fish as mean population count. This is not entirely unexpected, as this segment of reach 1 had more natural channel features, while the sampled sub-reach of reach two, with low apparent population, was an old placer mined site.

It is clear from snorkel survey data (see Table 2 below) that a habitat feature of great importance in the Dry Cottonwood drainage is frequency of pools, particularly deeper pools (plunge pools and lateral scour pools). Another habitat feature which we cannot adequately sample with snorkeling is beaver ponds. There is a large beaver pond complex on the mainstem of Dry Cottonwood about 2 miles above the river. Snorkeling and hook & line fishing has shown a good population of westslope cutthroat trout in this pond, including specimens approaching 300 mm. length, or about twice the length of adults which are found in the mainstem stream. But visibility and cover prohibit a good count of fish in these ponds by snorkeling. Another active beaver pond complex was discovered in the lower South Fork of Dry Cottonwood in 2017, during our riparian assessment stream walk. Although initial population counts in our South Fork sample sites were low, we believe the beaver complex is the best fish habitat in the South Fork, and combined with the other habitat available in the South Fork, helps provide justification for connecting this occupied cutthroat trout habitat with the habitat lower in the drainage.

TABLE 2: WESTSLOPE CUTTHROAT USE OF HABITAT FEATURES IN DRY COTTONWOOD CREEK



- 4) We evaluated the potential outward migration of juvenile westslope cutthroat trout from upstream populations to the Clark Fork River by snorkel surveying a large pool near the bottom of the Dry Cottonwood drainage (about 0.2 mile above the river) on three occasions in early summer when the stream was flowing (this pool is in the intermittent lower reach of Dry Cottonwood). We did not detect any westslope cutthroat trout in these forays. Our colleagues at Montana Fish Wildlife and Parks, at our request, did a single electro-fishing survey in the same pool this summer, and found one juvenile brown trout. The culvert above this pool forms a partial fish passage barrier, and the reach where this pool is located usually dries up by mid-summer each year. We believe these factors have inhibited brown trout invasion of this watershed. However, we have not to date found a convincing evidence of juvenile westslope cutthroat out-migration from this drainage to the Clark Fork River. Definitive information on juvenile out-migration will require a fish trap.

- 5) Our intern collected eDNA samples at four sites from near the downstream end of perennial flow in the stream (about 1 mile above the confluence with the river), up for about 2 more miles into the perennial flow segment. These eDNA samples were submitted to the USDA Forest Service Rocky Mountain Research Station laboratory on the University of Montana campus. They have provided us preliminary results which showed no evidence of brown trout presence in the Dry Cottonwood drainage to date (in the perennial reach sampling points). A final report from the USDA Forest Service laboratory is forthcoming. The Montana FWP did electro-fishing at their traditional sample site in Section 34 (State of Montana land), and found, once again, only westslope cutthroat trout.

- 6) The field intern also worked with a CFC volunteer from the University of Montana on nutrient and sediment impairment sampling on Dry Cottonwood Creek. This includes collecting macro-invertebrate samples for bio-assessment (looking at possible nutrient or sediment impairment of the stream). These samples were analyzed by Rhitron Associates, a speciality freshwater ecology consulting firm in Missoula. The results indicate that diversity and richness of aquatic macro-invertebrates is relatively high, and indications of impairment, due to sediment or other factors, is minimal to none in macro-invertebrate communities in the sampled reaches of Dry Cottonwood Creek.

TABLE 3: MACRO-INVERTEBRATE BIO-ASSESSMENT SCORES FOR DRY COTTONWOOD CREEK

Site:	IBI	MT Valleys/Foothills (Bollman, 1998)	MT DEQ mtns. (Bukantis, 1998)
DryC M-2A	88%	83%	71%
DryC M-3B	76%	83%	76%
DryC M-4	80%	94%	67%

- 7) Other tasks accomplished by CF Coalition on Dry Cottonwood Creek in summer, 2017: The field intern helped perform a full Water Erosion Prediction Program (WEPP) data collection and analysis of the road sediment issue along a key one mile reach of Dry Cottonwood Creek which parallels Forest Service Road 85. In this reach of Dry Cottonwood Creek, we had constructed slash-filter windrows in 2015 to capture road sediment as it left the road prism during storms, and washed towards the creek. The WEPP analysis showed that an average of at least nine (9) tons of sediment a year, on average, wash off the road and into the creek in this one mile reach. The amount of sediment estimated to have been captured in the roadside windrow structures by summer 2017 was approximately 10-15 tons (using rough field measurement of dimensions of sediment slugs behind windrows).
- 8) Clark Fork Coalition moved forward decisively in 2017 to remove the fish passage barriers on Dry Cottonwood Creek and improve degraded riparian habitat. In spring, 2017, the CFC put out a bid for replacement of the North Fork of Dry Cottonwood Road 85 culvert, to improve fish passage. The contract with the low bidder was signed in fall, 2017, and the construction is scheduled for summer, 2018 (full funding has been secured). The CFC hired an engineer to begin working on the design for a fish-passage friendly culvert on the South Fork of Dry Cottonwood Road 8634 crossing, which is a complete fish passage barrier. By January, 2018, this design was completed and full funding for construction was secured with State and Federal grants (working with the Forest Service). The South Fork culvert replacement will be bid out in spring, 2018 and constructed in fall, 2018.
- 9) Clark Fork Coalition also moved forward on a North Fork of Dry Cottonwood habitat enhancement project in 2017. The project will install a new off-stream stock water tank near the North Fork to draw livestock pressure away from the stream corridor. A second aspect of the project will fell beetle-killed trees along the stream corridor for two miles to prevent

livestock access to the stream banks and encourage natural channel forming processes and revegetation of banks with native woody plants.

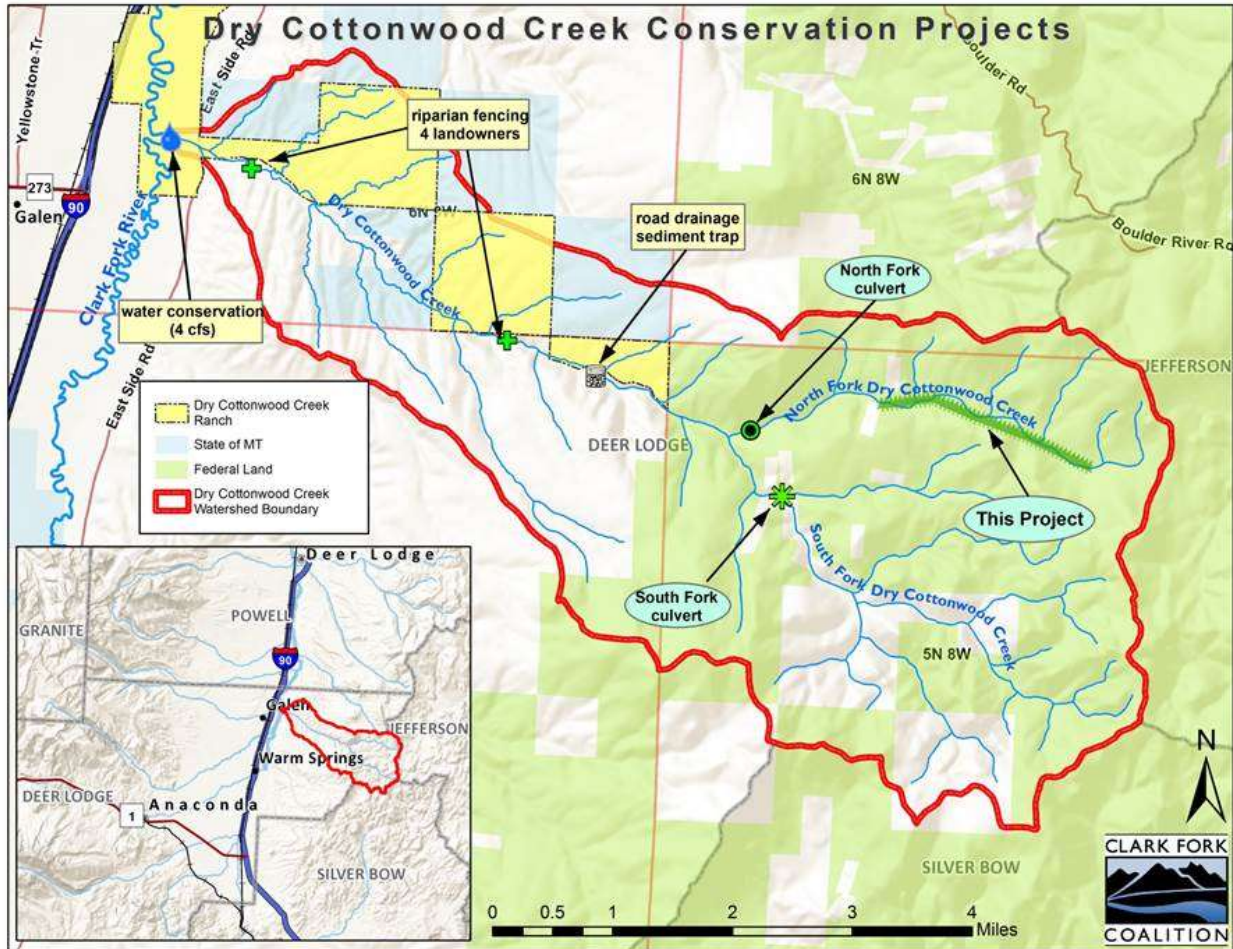
Discussion: This Project has allowed the Clark Fork Coalition to develop a better understanding of the habitat and the native fish population on private lands in the South Fork of Dry Cottonwood. This understanding encourages us to move forward in concert with the US Forest Service Beaverhead Deer Lodge National Forest in constructing the fish passage and habitat enhancement projects we have outlined for the drainage. This includes three major culvert projects to improve fish passage, habitat enhancement projects on the North Fork, road sediment reduction in the mainstem, and grazing management improvement projects throughout the US Forest Service allotment and the private lands of the basin. We would like to further study and document the importance of beaver pond habitat to the overall westslope cutthroat trout abundance and potential persistence in this drainage, and similar drainages. We are discussing the possibility of research on this topic with our collaborator, Dr. Lisa Eby at the University of Montana.



North Fork Dry Cottonwood Road 85 culvert to be replaced with AOP culvert in summer, 2018.



South Fork Dry Cottonwood culvert on Road 8634 scheduled for replacement in fall, 2018. Now in final design process, and full construction funding is secured.



Overall layout of projects the Clark Fork Coalition is working on in the Dry Cottonwood Creek drainage. The irrigation project at the mouth of the creek is key to reconnecting seasonal flow (April-July) in the lower mile of the stream, which is intermittent. The stream above the first mile is perennial, and essentially all of it is fish-bearing (14 miles of native trout water). This project allowed the study of watershed conditions and fishery to extend into the South Fork Dry Cottonwood (all private land inholdings), above the Forest Service Road 8634 culvert.