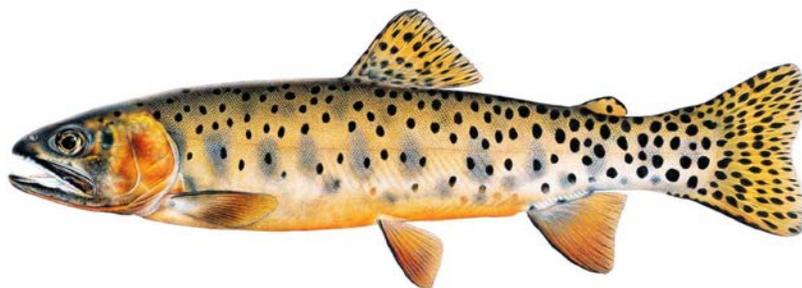


# Colorado River Cutthroat Trout

## HABITAT EVALUTATION FOR SPECIES IN COLORADO



© ILLUSTRATION BY JOSEPH TOMELLERI

Colorado River Cutthroat Trout (*Oncorhynchus clarkii pleuriticus*) is one of three recognized subspecies of native trout found in Colorado, and is the only subspecies indigenous to Colorado's West Slope. Stream-dwelling cutthroat trout generally inhabit mid- to high-elevation streams (> 7,500 ft.) with associated high gradients.

## Species Description

### Identification

Colorado River cutthroat trout are a member of the family Salmonidae, having a common anatomical feature of a small fin located in front of the tail, known as the adipose fin. Cutthroat trout are named for the orange or red stripe located on the lower side of the gill cover. Body coloration ranges from pale yellow to intense shades of orange and red and will change seasonally associated with spawning. Dark spots are concentrated on the upper and rear portions of the body. Stream-dwelling cutthroats are generally 6-10 inches as adults.

### Preferred Habitats

Stream-dwelling Colorado River cutthroat trout generally inhabit mid- to high-elevation streams (> 7,500 ft.) with high gradients flowing through healthy, intact riparian habitat.

### Diet

All cutthroat trout are opportunistic, sight-feeding predators. The majority of their diet is made up of aquatic insects (mayflies, caddisflies, stoneflies) and in the summer, they feed extensively on terrestrial insects, including grasshoppers. Fish are not a significant portion of the diet (small, forage fishes are rare in these streams).

### Life History

Cutthroat trout are spring spawning fish, occurring from April through July, with the peak typically in May and June. Under ideal conditions adult fish migrate from larger (winter habitat) rivers to small streams where juvenile fish have a greater chance of surviving after hatching. Eggs hatch and fry emerge from the gravel from August through October. Juveniles are recruited into the adult population typically at age 3.

## Species Distribution

### Range

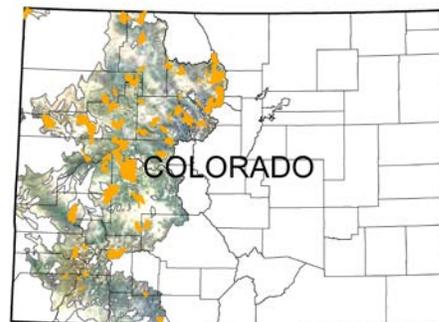
Colorado River cutthroat trout presently occur in portions of the Colorado River drainage in Colorado, Utah and Wyoming. It formerly inhabited portions of northern Arizona and New Mexico (CPW, 2015). In Colorado they are found in the following river basins of Colorado: Dolores, Gunnison, Upper Green, Upper Colorado, Yampa, White, and San Juan (CPW, 2015).

### Movement

Cutthroat trout are highly mobile. They migrate for spawning and intra-season movements by adults is common.



U.S. Range. Historic range is shaded. Data is provided by Trout Unlimited (tucsi.tu.org).



Colorado Range. Historic range is provided as shaded relief. Occupied range is at the 12-digit Hydrologic Unit. Data is provided by Trout Unlimited (tucsi.tu.org).

# Preferred Stream Habitat Conditions

Landscape context:	Mid- to high-elevation streams (> 7,500 ft.) with high gradients usually exceeded 4% slope, which flows through a healthy and intact riparian floodplain. Cutthroat appeared to reach highest densities in 2nd-4th order streams (Young, 2008).
Connectivity:	Ideally, stream connectivity would be provided between the larger, winter stream and the smaller juvenile rearing streams (CCRT, 2006).
Dominant vegetation:	Stream banks with overhanging native vegetation is critical for overall stream health, for stream shade/cover, and for providing habitat for its food base (insects).
Stream morphology:	Healthy functional streams with a high pool ratio (cutthroat favor pool habitats in nearly all seasons). No excessive amounts of fine sediments. Beavers present.
Channel complexity:	Although a number of geomorphic elements can influence complexity (i.e., boulders), abundant large wood plays a dominant role in cutthroat habitat.
Water quantity/quality:	Average 10-18 °C. Spawning occurs at 7-10° C. Summer temperatures less than 10° C reduce survival of juveniles, temperatures greater than 19.6° C can cause mortality. Average daily flows < 0.85 m <sup>3</sup> /s (30 cfs)

## Conservation Priority

The Colorado River cutthroat trout occupies only 7% of its historic range in Colorado (Hirsch et al. 2013), and is considered a species of special concern (CPW, 2015).

## Associated Species

Species often occurring in or near Colorado River cutthroat habitat include bluehead sucker (*Catostomus discobolus*), roundtail chub (*Gila robusta*), mountain sucker (*Catostomus platyrhynchus*), mottled sculpin (*Cottus bairdi*), and boreal toad (*Bufo boreas*) (CCRT, 2006).

### Acknowledgements & Suggested Reading

- CPW (Colorado Parks and Wildlife). 2015. State Wildlife Action Plan: A Strategy for Conserving Wildlife in Colorado. Denver, CO. [cpw.state.co.us](http://cpw.state.co.us)
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- Young, Michael K. 2008. Colorado River cutthroat trout: a technical conservation assessment. Gen. Tech. Rep. RMRS-GTR-207-WWW. Fort Collins, CO: USDA Forest Service, Rocky Mountain Station. [fs.fed.us](http://fs.fed.us)

## Threats

In addition to habitat loss or degradation of the preferred habitat conditions identified above, the following are known threats to the species.

Hybridization:	Genetic integrity is a conservation concern, specifically by hybridization with introduced rainbow trout (a species non-native to Colorado). Genetically pure populations (< 10% non-native genes) are defined as “Conservation Populations”.
	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Fig. 1 - genetically pure</p>  </div> <div style="text-align: center;"> <p>Fig. 2 - hybridized</p>  </div> </div> <p style="font-size: small; transform: rotate(-90deg); position: absolute; left: -40px; top: 50%; transform: translateY(-50%);">IMAGES BY USFS</p>
Competition/Predation:	Juvenile cutthroat trout are predated by, and out-competed for food and habitat resources, by introduced
Disease/Parasites:	Susceptible to infection and mortality of whirling disease.

## Overall Conservation Actions

Provide additional security for existing populations where needed (e.g., through easements, setbacks, landowner agreements, non-native fish passage barriers). Identify opportunities to restore and expand habitat for existing populations and, especially, to connect populations that are currently isolated. Pursue re-introduction opportunities within the species’ historic range. (CPW, 2015).



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# Habitat Evaluation for Colorado River Cutthroat Trout

*Evaluation of habitat before and after restoration or management actions*

Evaluation Location: \_\_\_\_\_ Acres Evaluated: \_\_\_\_\_

Assessors: \_\_\_\_\_ Evaluation Date: \_\_\_\_\_

Brief Description of Evaluation Area: \_\_\_\_\_  
*Required: clearly identify the evaluation area on a map.*

Action Evaluated: \_\_\_\_\_

Instructions: This evaluation will only be used on the species' preferred habitat within the species' occupied or historic range. Enter one value that best describes the summer conditions of each habitat variable.

HABITAT CONDITIONS	Value	Before	After
<b>Landscape Context:</b> Mid- to high-elevation streams (> 7,500 ft.) with high gradients (usually exceeded 4% slope).			
Overall stream health is in <i>excellent</i> condition; SVAP <sup>1</sup> results in a score of 9 to 10	1.0		
Overall stream health is in <i>good</i> condition; SVAP <sup>1</sup> results in a score of 7 to 8.9	0.75		
Overall stream health is in <i>fair</i> condition; SVAP <sup>1</sup> results in a score of 4 to 6.9	0.5		
Overall stream health is in <i>poor</i> condition; SVAP <sup>1</sup> results in a score of 3 to 4.9	0.25		
Overall stream health is <i>severely degraded</i> ; SVAP <sup>1</sup> results in a score of 1 to 2.9	0.0		
Stream flows through a healthy, functional and intact riparian floodplain.	1.0		
Stream flows through a functional yet compromised floodplain.	0.5		
Stream flows through a low-functioning, degraded floodplain.	0.0		
<b>Connectivity:</b> between the larger, winter stream and the smaller juvenile rearing streams.			
Stream connectivity is provided between the larger, winter habitat, stream and smaller spawning/juvenile rearing stream(s).	1.0		
Stream connectivity is provided yet compromised, or does not naturally occur.	0.5		
Stream connectivity would naturally occur but is inaccessible or severely restricted.	0.0		
<b>Dominate Vegetation:</b> ideally a healthy, functional and intact riparian floodplain with densely vegetated stream banks.			
Overall floodplain plant community has a riverine plant association appropriate to the hydrologic regime and geomorphic setting <sup>2</sup> .	1.0		
Overall floodplain plant community is largely composed of a riverine plant association appropriate to the hydrologic regime and geomorphic setting <sup>2</sup> .	0.5		
Overall floodplain plant community has a degraded riverine plant association, or is otherwise not appropriate to the hydrologic regime/geomorphic setting <sup>2</sup> .	0.0		
Streambank vegetation is dense (typically overhanging into the stream) composed of predominantly native herbaceous riparian plants (grass-like plants adapted to periodic flooding/saturation; this may be an understory to a woody riparian community).	1.0		
Streambank vegetation is moderately dense/dense composed of predominantly native herbaceous riparian plants on a majority (≥50%) of the stream bank edge (e.g., occurs on the inside bends but not on the outside bends of the stream).	0.5		
Streambank vegetation is sparse or patchy and/or is predominantly non-native.	0.25		
Streambank vegetation is predominantly bare ground or weeds.	0.0		
Streambank vegetation is un-manipulated (not grazed, mowed, burned or trampled).	1.0		
Streambank vegetation is altered (i.e., seasonal grazing, water gaps) but allowed to reach full plant height and maturity on at least 90% of the evaluation area.	0.75		
Streambank vegetation is altered (i.e., seasonal grazing, water gaps) but allowed to reach full plant height and maturity on at least 75% of the evaluation area.	0.5		
Streambank vegetation is altered (i.e., seasonal grazing, water gaps) but allowed to reach full plant height and maturity on at least 50% of the evaluation area.	0.25		
Streambank vegetation is altered along a majority of the bank.	0.0		
<b>Stream Morphology:</b> ideally a healthy stream with a high pool ratio.			
Overall, one step pool (water dropping vertically over, often, a large rock or large wood scouring out small yet deep depressions) every 1.5 to 4 bankfull channel widths.	1.0		
Overall, step pools are limited or compromised (i.e., filled with sediment).	0.5		
Step pools are largely absent.	0.0		

Overall deep pools are abundant (those that often have surface ice in the winter; where pool bottoms obscured from view in the summer). Two or more pool per stream reach, or as defined by a reference reach.	1.0		
Overall deep pools are present but not abundant. One pool per stream reach, or as defined by a reference reach.	0.5		
Deep pools are absent within a majority of the reaches.	0.0		
<b>Channel Complexity: high complexity, specifically abundant large wood.</b>			
Large wood in the stream (fallen trees or parts of trees that are submerged in the water and large enough to remain during normal flows) is abundant, as defined by a reference reach.	1.0		
Large wood is present but not abundant, as defined by a reference reach.	0.5		
Large woody debris are absent within a majority of the reaches.	0.0		
<b>Water Quantity/Quality: natural water quantity conditions with an average summer temperature of 10-18 °C.</b>			
Canopy cover (SVAP1 Element 6): overall, >75% of water surface is shaded.	1.0		
Canopy cover overall, 50 to 75% of water surface is shaded.	0.5		
Canopy cover overall, 20 to 49% of water surface is shaded.	0.25		
Canopy cover overall, <20% of water surface is shaded.	0.0		
No water depletions or depleting activities occur (within the evaluation area) and/or water quantity enhancements are in-place to offset depletions.	1.0		
Water depletions result in less than 0.1 acre-foot/year in flow and/or detention basins are designed to detain runoff for less than 72 hours.	0.5		
Water depletions result in greater than or equal to 0.1 acre-foot/year in flow and/or detention basins are designed to detain runoff off for $\geq$ 72 hours.	0.0		
<b>Non-Native Fish Threats: genetic integrity is a conservation concern, as well as competition and predation.</b>			
Non-native fish are not a conservation concern within the evaluation area.	1.0		
Non-native fish impacts have been mitigated (reduced) or are otherwise at an acceptable level for co-habitation.	0.5		
Non-native fish compromise the conservation of the species.	0.0		
Whirling disease is not present and precautions are in place to protect from infestation, such as signs to anglers, landowner agreements etc.	1.0		
Whirling disease is not present; no precautions taken to prevent infestation.	0.5		
Whirling disease is present within the evaluation area.	0.0		

## RESULTS

### Before Condition (benchmark):

Average "Before" score of  $\geq 0.5$  meets NRCS Planning Criteria, **if** no Habitat Limiting Factors are present.

### After Condition (post-action):

Average "After" score of  $\geq 0.5$  meets NRCS Planning Criteria, **if** no Habitat Limiting Factors are present.

### Overall Improvement Score:

(average 'after' score minus average 'before' score)

### Habitat Limiting Factors

Habitat limiting factors are briefly defined as being the physical, biological, and ecological conditions that limit the ability of the area to sustain species populations; as indicated by a habitat condition scoring low ( $< 0.5$ ).

Evaluate the habitat needs of other wildlife species that use similar habitat before implementing actions or conservation practices (i.e., multiple species' habitat evaluations may needed).

<sup>1</sup> The Colorado Stream Visual Assessment Protocol (SVAP2) is a visual field assessment required for NRCS conservation planning on or near streams. The assessment can be found on Colorado's Field Office Technical Guide (FOTG), Section II, Biology Technical Notes.

<sup>2</sup> Carsey, K., G. Kittel, K. Decker, D. J. Cooper, and D. Culver. 2003. Field Guide to the Wetland and Riparian Plant Associations of Colorado. Colorado Natural Heritage Program, Fort Collins, CO. [cnhp.colostate.edu](http://cnhp.colostate.edu)