Colorado Plateau and Southern Rockies

Species Summaries

LISTING STATUS: red (ESA listed as Threatened or Endangered), yellow (not ESA listed but federal sensitive species or state species of concern (majority of states), green (not listed in majority of states)

CURRENT RANGE: red (10 percent or less), yellow (11-25 percent), green (>25 percent)

HISTORICAL RANGE: red (<1,000 miles), yellow (1,000-10,000 miles), green (>10,000 miles)

TROUT UNLIMITED

Colorado River Cutthroat Trout

Category	Status	Explanation
Listing status		Sensitive species (USFS, BLM) Species of Special Concern (CO, WY, UT)
Current range		~11 percent of historical habitat currently occupied by populations of conservation value
Historical range		Upper Colorado River Basin
Climate change		Stream warming and desiccation of headwater streams
Energy development		Oil and gas development in CO, WY, and UT
Non-native species		Introduced brook and rainbow trout have been widely stocked and rainbows hybridize with cutthroats
Water demand		Localized water demand can influence flows
Data issues		Current rangewide database exists, but some uncertainty exists with regard to genetic lineages due to historical stocking

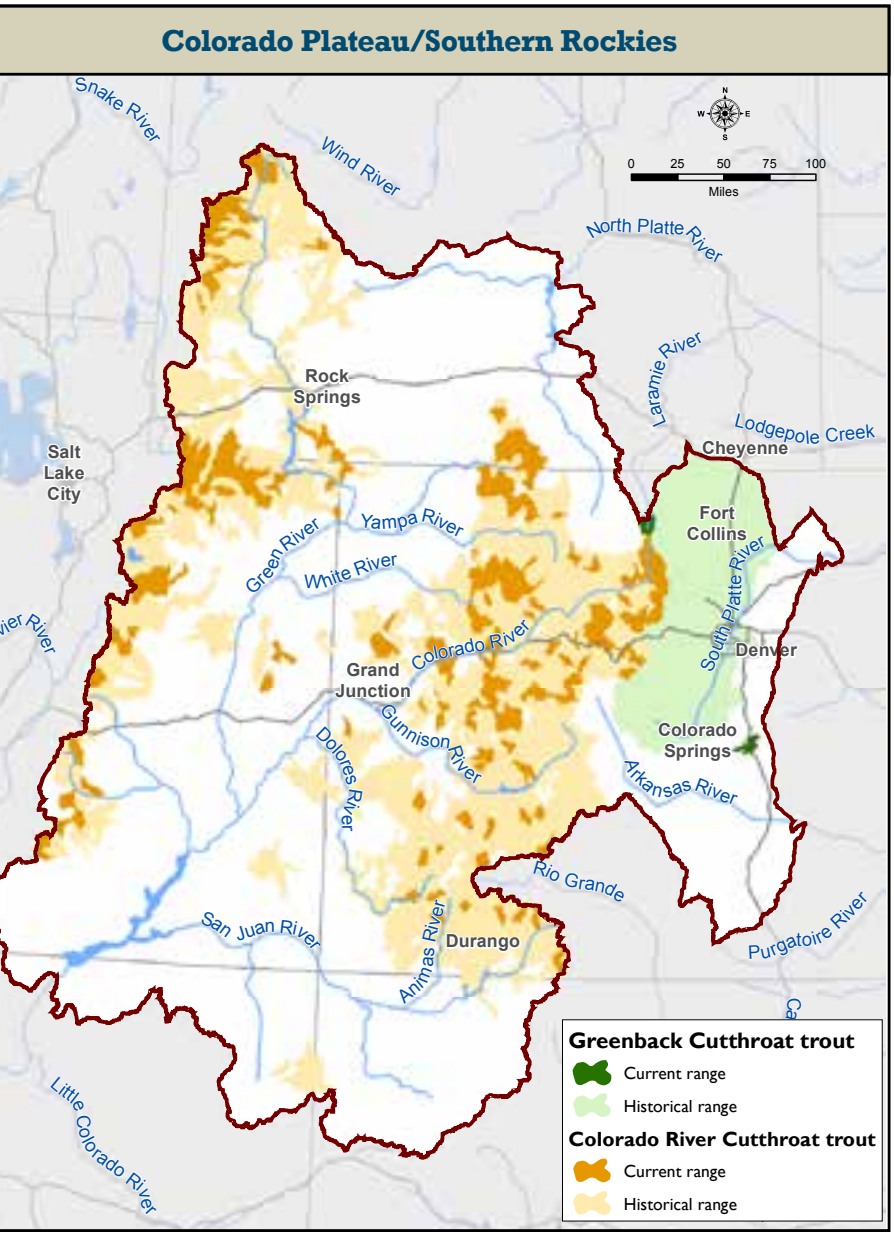
Greenback Cutthroat Trout

Category	Status	Explanation
Listing status		Listed as Threatened in ESA; Sensitive species (USFS, BLM), Species of Special Concern (CO, WY), currently under review by management agencies
Current range		Occupies only one stream, and recently reintroduced into one lake
Historical range		South Platte River basin
Climate change		Stream warming; reduced snowpack
Energy development		Populations currently protected
Non-native species		Introductions of non-native trout have greatly reduced the current range
Water demand		Populations currently protected
Data issues		The genetic identity of many cutthroat populations in Colorado has not been determined

Colorado River Cutthroat Trout *(Oncorhynchus clarkii pleuriticus)*

The Colorado River cutthroat trout was first described by Edward Drinker Cope in 1872 from a specimen collected in the Green River near Fort Bridger, Wyoming. The subspecies' historical range is thought to be bound to the west by the Escalante River, to the south by the San Juan River, to the east by the Continental Divide and to the north by the Green River. Within this general historical range, the distribution of Colorado River cutthroat trout was thought to have been very discontinuous because of the sediment-rich, warm nature of larger rivers in the Colorado River Basin. The most recent 2010 status assessment listed 361 conservation populations occupying 2,115 miles of stream (1).

While populations of Colorado River cutthroat trout were historically fragmented among the major tributaries of the Colorado River, land and water uses, introduction of non-native trout, and isolation management have further truncated and disconnected populations. This has relegated most populations as residents of small headwaters streams, whereas historically large cutthroat up to 12 pounds could be caught west of the Continental Divide. Although the most recent status assessment from 2010 listed 361 populations of Colorado River cutts, the most recent genetic and meristic studies suggest that many more Colorado River cutthroat trout populations, once thought to be greenbacks, now reside in streams on the east side of the Continental Divide because of well-intentioned stocking efforts (2,3). Although there is the appearance of more extant Colorado River cutthroat populations than originally thought, recent genetic and meristic studies suggest within the existing populations there is also more genetic diversity than once thought. This genetic diversity has also been clouded by stocking efforts and future management of these diverse 'lineages' is not yet clear but will likely provide opportunities to conserve a suite of genetic diversity within the subspecies.



Historical and current distributions of native trout in the Colorado Plateau/Southern Rockies.

Oncorhynchus clarkii stomias

Greenback Cutthroat Trout *(Oncorhynchus clarkii stomias)*

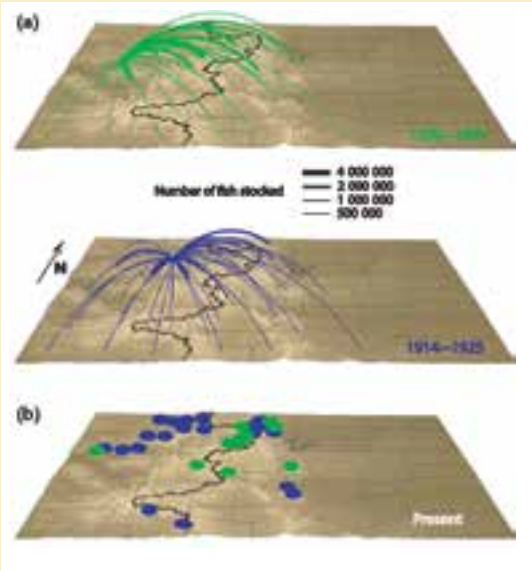
Greenback cutthroat trout were considered to historically have occurred in the South Platte drainage and with some debate the Arkansas River drainage, on the east slope of the Continental Divide. Most of this historical distribution is in Colorado, save for some small tributaries of the South Platte in southeastern Wyoming. There is confusion as to where greenbacks were first collected by W. R. Hammond during an Army expedition in 1856 and the subspecies was described by Edward Drinker Cope but redefined by David Starr Jordan in 1891. Historically, greenbacks were mostly small trout, but widespread introductions of non-native trout, in addition to mining, irrigation and harvest by settlers, resulted in the rapid disappearance of greenbacks from the Front Range. They were even thought to be extinct by the mid-1930's. However, in the late 1960's a few populations were found above barrier falls in small headwater streams – the last remnants of the subspecies.

Greenbacks were listed as Endangered under the Endangered Species Act in 1973, but by 1978 its status was changed to Threatened due to establishment of some new populations. Much early restoration of greenbacks was done in Rocky Mountain

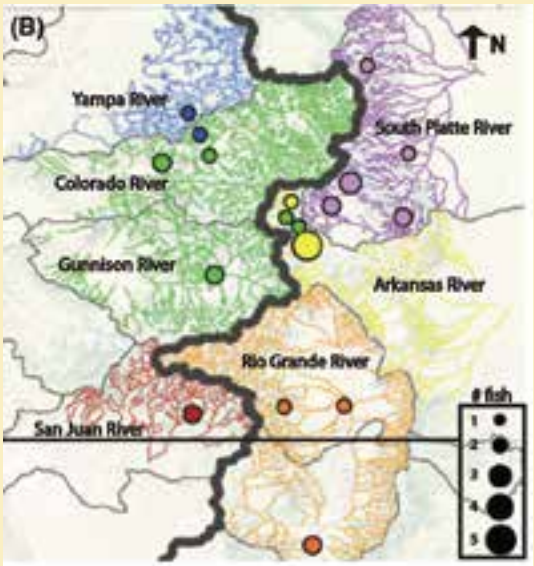
National Park using hatchery-raised fish from known remnant populations. As of 1998, the Greenback Cutthroat Trout Recovery Plan (4) listed 62 lakes (442 acres) and 102 miles of stream as occupied. Restored populations in some lakes were open to fishing. However, recent genetics studies of both existing populations and museum specimens have shown that stocked fish used in well-intentioned greenback restoration efforts were actually Colorado River cutthroat trout and the only greenback population currently in existence now resides in four miles of Bear Creek southwest of Colorado Springs above a natural barrier in a stretch of stream that was once fishless. Substantial effort has been made in the last year to replicate this population, including stocking into Zimmerman Lake in the South Platte River drainage.

Cutthroat Trout In Colorado: Genetics Reveals Multiple Lineages and Effects of Historical Stocking

Researchers at the University of Colorado-Boulder, along with other colleagues, recently revealed that well-intentioned, extensive stocking efforts of cutthroat trout in Colorado had led to Colorado River cutthroat trout being stocked across the Continental Divide into historical habitat of greenback cutthroat trout. A follow-up genetic study using both existing populations and museum samples showed that cutthroat trout in Colorado represented possibly six distinct lineages in Colorado, including Rio Grande cutthroats, the extinct yellowfin cutthroat and an undescribed lineage in the San Juan River. This study also revealed that greenbacks were now only found in a 4-mile stretch of Bear Creek, outside the subspecies' historical range and that the contemporary distribution of these lineages reflects extensive stocking efforts that began around 1900. Future management of these lineages is unclear. Will they simply be treated as separate lineages, or will they be elevated to the status of subspecies? Time will tell.



(Top) Effect of extensive stocking in Colorado on the present-day distribution of cutthroat trout from Trappers Lake and Grand Mesa.



(Bottom) Six different genetic lineages of cutthroat trout in Colorado, with points showing where stocking has moved those lineages across drainage boundaries. Figures from Metcalf et al (2,3).

Regional Trends

The Southern Rockies and Colorado Plateau includes the Upper Colorado River basin and basins east of the Continental Divide. The elevation change in this region is pronounced, ranging from the famous 14ers in Colorado to the deserts and canyons of the Colorado River and tributaries to Lake Powell. While the mainstem Colorado River and its larger tributaries become warm and filled with sediment as they leave the mountains, the clear and cold headwaters containing trout originate in the region's famed mountain ranges: Colorado Rockies, Wind Rivers, Wyoming Range, Uintas, Wasatch Range and high plateaus of eastern Utah. Historically, the Greenback and Colorado River cutthroat trouts thrived in these cold, clear streams.

Water use has and will continue to be an ongoing issue in the region. Most water within the Colorado River Basin is used for agriculture, municipal and industrial purposes; however, a substantial amount is diverted out of basin for use by cities such as Denver, Salt Lake City and Los Angeles. Rarely is water left in river for environmental purposes, such as sustaining fish and wildlife populations. Whoever coined the term "whiskey is for drinking; water is for fighting over" must have been thinking of the Colorado River. The appropriation of water to states through the Colorado River Compact was done in 1922 based on water yields computed during a wet climatic period. Since 2000, the climate of the basin has been hotter and dryer, resulting in less water and the river being over-appropriated. Not surprisingly, the water shortage has been a source of contention between states, Tribes and others in an arena where fish have no voice.

Increased population growth will continue to put pressure on native

cutthroat trout populations. For example, Colorado is the 5th fastest growing state in the U.S., particularly along the Front Range. Not only does this put added pressure on water resources of the Front Range, large metropolitan areas such as Denver receive water from the Colorado River Basin, too. The City of Denver is always looking to lengthen and enlarge its straw to sip from water across the Continental Divide, so the Colorado River and its namesake native trout are impacted as well by population growth. In fact, Trout Unlimited has been a critical player in the fight to keep Colorado River water in the Colorado River basin. Other water infrastructure projects have been completed in anticipation of population growth but to the detriment of cutthroat trout populations. For example, several Colorado River cutthroat trout populations in the Little Snake River drainage were isolated by a water diversion structure on the west slope of the Sierra Madre Mountains in Wyoming that captures water for trans-basin diversions used to deliver water to Cheyenne, Wyoming.

The Upper Green River basin and Colorado Plateau have recently been the focus of extensive oil and gas exploration, development and extraction. In fact, Wyoming and Colorado are the leading states for coalbed methane production in the United States, although fluctuating prices have led to some uncertainty as to future development of less-profitable reserves. The primary concerns from oil and gas development are water use, variable water quality associated with produced water discharge and sedimentation from well pads, among other impacts. Many concerns are associated with hydraulic fracturing used to extract gas from impermeable shale layers. While most of the development has been at lower elevations in the realm of warm water streams, some native trout populations occupy lower elevation streams, such as those in Piceance Basin. With all the energy development potential on public and private lands, it is hard to predict where new development proposals might threaten native trout populations.

SUCCESS STORY:

Roan Plateau – A Model for Balance

BY COREY FISHER, TROUT UNLIMITED

The Roan Plateau supports a host of natural values including scenic canyons and waterfalls, outstanding deer and elk habitat, and headwater streams harboring populations of Colorado River cutthroat trout. For nearly two decades, TU's Grand Valley Anglers chapter in Grand Junction, Colorado has worked on projects to improve trout habitat on the Roan Plateau, work that was threatened when these public lands were leased for energy development by the Bureau of Land Management (BLM) in 2007. With the future of the Roan Plateau and TU's conservation investments on the line, Colorado TU joined other conservation-minded groups to legally challenge the leasing.

Riparian planting along Colorado River cutthroat trout habitat. Photo: C. Fisher

Over the next six years, a series of negotiations led to a settlement agreement in which a limited amount of development could occur within a portion of the plateau that is less environmentally sensitive, while leases that encompass cutthroat trout drainages would be canceled. In short, all parties agreed to certainty for both conservation and development without conceding either one. Currently, the BLM is developing a new management plan for the Roan Plateau and TU is working to ensure that this plan reflects key components of the settlement agreement to ensure trout streams on the Roan Plateau are protected long into the future.

Throughout the course of the legal battle, Colorado Trout Unlimited and the Grand Valley Anglers continued on-the-ground restoration work, improving stream crossing, fencing riparian areas and planting vegetation. Much of the work is scheduled to culminate in the summer of 2015 with the reintroduction of Colorado cutthroat trout into the East Fork of Parachute Creek, a stream on the Roan that is the focus of an extensive, multi-year native trout restoration project.

Colorado River cutthroat trout from Roan Creek. Photo: C. Fisher

The Roan Plateau is an example of TU's restoration and protection work coming together to not only save a place, but to make it better. It also showcases the power of TU's grassroots to make a difference – without the time, sweat and money invested over the years by TU volunteers, the future of Roan Plateau would look much different and it might not include cutthroat trout.