

## **Rio Grande Cutthroat Trout (*Oncorhynchus clarkii virginalis*)**

**Data: Rio Grande Cutthroat Trout Status Assessment - 2008; Conservation Agreement for Rio Grande Cutthroat Trout- 2013**

**Partners: Colorado Parks and Wildlife, New Mexico Dept. of Game and Fish, U.S. Forest Service, U.S. Fish and Wildlife Service, National Park Service, U.S. Bureau of Land Management, Jicarilla Apache Nation, Mescalero Apache Nation, Taos Pueblo, 15 CO County Coalition, Trout Unlimited**

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**Species Status Review:** The U.S. Fish and Wildlife Service received a petition in 1998 to list the Rio Grande Cutthroat Trout (RGCT) under the Endangered Species Act. In a 90-day finding, the agency concluded that listing was not warranted. However, in 2001 a candidate status review was initiated in response to litigation appealing this decision and new information, particularly regarding the presence of whirling disease within the native range of the sub- species (U.S. Fish and Wildlife Service 2002). The results of this review were published in 2002, and it was again determined that listing of this taxon was not warranted (U.S. Fish and Wildlife Service 2002). In 2005, a petition for Review of Agency Action regarding the ‘not warranted’ decision was denied. That decision was appealed to the 10<sup>th</sup> Circuit Court. After briefs were filed, USFWS settled the case and agreed to conduct a new status review. In 2014, USFWS determined that that listing under the Endangered Species Act was not warranted. The subspecies is recognized as a species of special concern in both Colorado and New Mexico, and as a sensitive species within USFS Regions 2 and 3 and the Bureau of Land Management. In 2006, the RGCT Conservation Team adopted the Inland Cutthroat Trout Protocol as a tool for assessing the rangewide status of RGCT. The first draft of a *Rio Grande Cutthroat Trout Rangewide Database* was completed by the RGCT Conservation Team in March, 2007. The RGCT Conservation Team created a 2008 Rangewide Status Report for RGCT; another is scheduled for completion in 2016. In addition, there is a signed Conservation Agreement (2013) and Conservation Strategy (2013) in place to identify partners and goals for RGCT conservation. Colorado and New Mexico have active conservation plans that outline strategies and implementation schedules.

### **Sportfishing Status of the Rio Grande Cutthroat Trout:**

Rio Grande Cutthroat Trout are considered a sport fish by all state, federal and tribal agencies that manage this subspecies. Harvest restrictions are in place for most conservation populations (usually catch and release, flies and lures only) but there are also many RGCT non-conservation populations managed for recreational fishing where standard regulations and bag limits apply. RGCT recreational fishing waters are frequently located in high- elevation lakes where cold water temperatures and lack of spawning habitat is expected to prevent natural trout reproduction. Some of these recreation populations have the potential to act as ‘genetic refugia’ for pure historic populations, but many also contain other *Oncorhynchus* taxa that are expected to hybridize with RGCT where opportunities for natural reproduction occur. Rio Grande Cutthroat Trout are considered to be easily captured by anglers, which could suggest its vulnerability to excessive harvest. However, over-harvest is not considered a problem to RGCT at this time. Special regulations requiring catch-and-release, limited harvest, and terminal tackle restrictions have demonstrated effectiveness in maintaining trout populations in the face of a wide range of fishing pressure, and have been applied to native cutthroat trout waters in the two states. Core RGCT populations are protected by fishing closures in some instances. The tendency for these populations to be composed largely of small-sized fish may also reduce interest by anglers wishing to harvest fish.

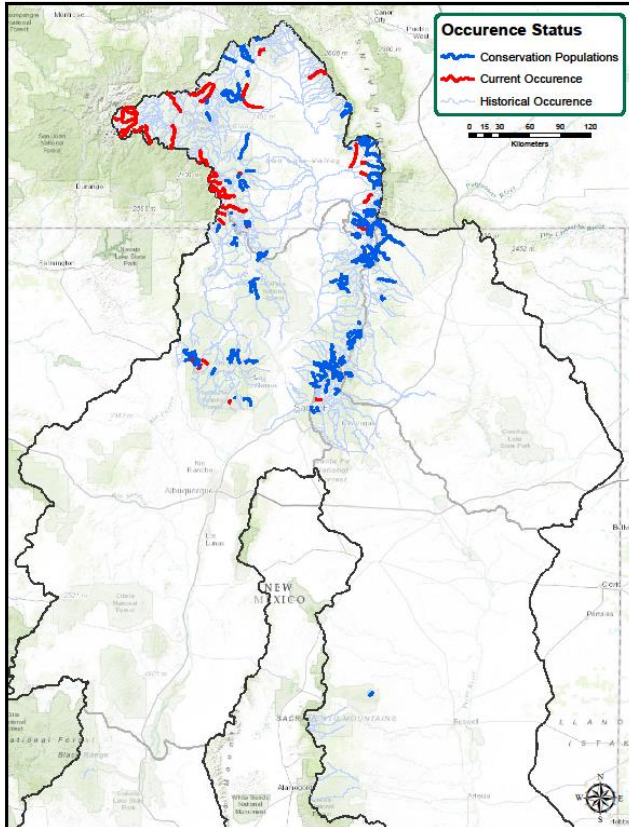
### **Rio Grande Cutthroat Trout Distribution:**

Rio Grande Cutthroat Trout are native to the Rio Grande and Pecos River drainages of

## Rio Grande Cutthroat Trout (*Oncorhynchus clarkii virginalis*)

Colorado and New Mexico. They are also believed to be native to the Canadian River drainage of Colorado and New Mexico, but no early historic specimens or written accounts are available to verify this.

### Range and GMU's of the RGCT



(Map: RGCT Rangewide Database 2013)

Based on the draft *Rio Grande Cutthroat Trout Rangewide Database* prepared by the RGCT Conservation Team, RGCT presently occupy 12.3% of their historic range in four of five Geographic Management Units (Canadian River, Lower Rio Grande, Pecos River and Rio Grande Headwaters). Rio Grande Cutthroat Trout are most abundant in the Lower Rio Grande and Rio Grande Headwaters GMUs. Rangewide there are 129 RGCT conservation populations that currently occupy 744 miles of stream habitat and 76 acres of lake habitat. Core RGCT populations (pure, genetically unaltered) exist in 111 waters.

### **Rio Grande Cutthroat Habitat**

**Requirements:** Rio Grande Cutthroat Trout habitat preference is consistent with typical cutthroat trout habitat. Cutthroat trout, in general, prefer clear, streams and lakes. Population densities are regulated mostly by stream size and morphology, over-wintering habitat, stream productivity, and summer cover for predator avoidance. Optimal cutthroat trout stream habitat is characterized by clear, cold water, a silt free rocky substrate in riffle-run areas; an approximately 1:1 pool-riffle ratio with areas of slow, deep water; well vegetated stream banks; abundant in-stream cover; and relatively stable water flow and temperature regimes.

Optimal lacustrine habitat is characterized by clear, cold, deep lakes that are typically oligotrophic, but may vary in size and chemical quality, particularly in reservoir habitats. Rio Grande Cutthroat Trout are stream spawners and require gravel substrates for reproduction to occur. Growth depends primarily on food availability, size of prey, competition, water temperatures, and the length of the growing season. Rio Grande Cutthroat Trout populations inhabiting small streams typically range in size from 2 inches at age 1 to 12 inches at age 7. However, RGCT inhabiting productive lakes can grow considerably larger.

### **Concerns and issues relative to the Conservation and Improvement of the status of RGCT:**

Habitat degradation, hybridization, and competition with non-native trout are the primary threats to the security of RGCT populations. Other concerns include lack of connectivity to maintain genetic diversity, potential for angler over-harvest, impacts of whirling disease, and catastrophic threats such as drought and forest fire.

## **Rio Grande Cutthroat Trout (*Oncorhynchus clarkii virginalis*)**

### **Genetic considerations**

Extensive genetic testing of RGCT has been conducted rangewide. Results of genetic analysis will be used to guide management decisions for the conservation of RGCT and where possible, the subspecies will be managed on the basis of each geographic unit. Genetic evaluation has been conducted, and will continue to be conducted, in order to make genetic distinctions between populations from the various geographical units.

Some isolated RGCT populations currently exhibit population sizes smaller than those recommended for optimum population viability and occupy shorter stream lengths than those recommended. However, all of these populations remain important elements in the conservation of the subspecies. For some of these populations, there may be opportunities to increase carrying capacity and the chance of long-term persistence by improving habitat quality, expanding available habitat downstream, and linking them with other isolated populations. Within Colorado, a blended brood stock of pure RGCT has been developed at Haypress Lake, in addition to a back-up brood stock at the Pitkin Hatchery. New Mexico has also developed brood stock at Seven Springs State Hatchery for restoration and recreational stocking.

### **Habitat Concerns**

A wide variety of land management practices have been suggested to threaten the continued existence of populations of RGCT, including overgrazing, heavy metal pollution, and water depletion and diversion. Some of these practices have served to isolate upstream populations of RGCT and protected them from invasion by nonnative salmonids, but they also serve to fragment streams and isolate populations. In addition, natural climatic events such as drought, floods, and fires can

threaten populations of RGCT, especially when stream populations remain fragmented, small and isolated. Fires also provide conservation opportunities for re-establishing RGCT in areas previously inhabited by non-native trout. Temporary habitat loss due to drought and/or water extraction in certain years also appears to be a threat to RGCT populations in Colorado. Habitat problems are viewed as site specific and not an overall threat throughout the range.

### **Disease Concerns**

Rio Grande Cutthroat Trout are susceptible to common salmonid diseases, including whirling disease which is caused by the myxosporidian *Myxobolus cerebralis* (*MC*). Native cutthroat trout, including RGCT, exposed to *MC* in sentinel fish experiments suffered greater mortality from the infection than other non-native salmonid species like brown trout. Transmission of diseases to wild cutthroat populations from non-native trout is recognized as a potential threat. Physical barriers (both natural and man-made) that serve to isolate RGCT populations also provide significant protection from transmission of fish diseases. Both Colorado and New Mexico have statewide policies and regulations that address fish health status, disease certification of stocked and imported fish, and stocking protocols, which are designed to reduce disease threats.

### **Introduced Species Threats**

Stocking of non-native salmonids was widespread since before 1900, and has been considered a primary threat to inland native cutthroat subspecies. Brook trout are known to replace most subspecies of inland cutthroat trout when in sympatry. Rainbow trout and other nonnative cutthroat trout subspecies hybridize with RGCT and produce fertile offspring. In New Mexico, only infertile triploid rainbow trout are stocked by the Department of Game

## **Rio Grande Cutthroat Trout (*Oncorhynchus clarkii virginalis*)**

and Fish to prevent hybridization with RGCT. The competition from non-native trout means that pure RGCT populations require protection by natural or artificial migration barriers. Construction, monitoring, and maintenance of such barriers are management priorities for all relevant agencies. Illegal stocking of non-native trout into RGCT populations and movement of fish by anglers are also a concern.

### **Overutilization Concerns**

Over-harvest is not considered a threat to this subspecies at this time. Special regulations requiring catch-and-release, very limited harvest, and terminal tackle restrictions have demonstrated effectiveness in maintaining trout populations in the face of a wide range of fishing pressure, and have been applied to native cutthroat waters throughout Colorado and New Mexico. Scientific collection of wildlife is regulated through permit systems in both Colorado and New Mexico requiring formal applications stating project objectives, sampling methodologies, sampling sites, and need for collecting.

### **Opportunities to Improve the Status of RGCT:**

The goal of the Conservation Strategy for the RGCT is to assure the long-term persistence of the subspecies within its historic range by facilitating restoration projects, preserving its genetic integrity, reducing habitat fragmentation, and providing sufficient suitable habitat to support adequate numbers of viable, self-sustaining populations. The conservation and enhancement of RGCT will depend on an approach that reduces threats to the subspecies. The specific approaches are described in both state and federal agency plans. Actions will need to be prioritized and implemented within the five RGCT GMUs. Typically the actions fall within these categories:

- Fish population inventory (surveys and analysis including genetics)
- Restoration projects (non-native removal, reintroduction, supplemental stocking, spawn-taking, maintaining broodstocks)
- Habitat manipulation (barrier placement or removal, in-stream structure, flows, increasing connectivity)
- Regulatory actions (fishing regulations, water use, land management)
- Developing educational and outreach efforts

### **RGCT Restoration Potential:**

In 2007, the RGCT Conservation Team completed the final component of the Inland Cutthroat Trout Protocol, which was to identify potential restoration and expansion opportunities for RGCT. Increasing the number of pure RGCT populations in streams and lakes by restoring them within their historic range is a key component of improving their conservation status. Sources of RGCT for restoration will include replication of currently identified pure populations, if possible, and development of appropriate genetically-mixed stocks from pure populations based on genetic information, and concepts of “nearest neighbor” and “similar ecological niche” for selecting genetic donors. Either of these approaches will be accomplished via transfers of fish from neighboring drainage basins or use of progeny from captive broodstocks of desired genetic heritage for restoration stocking of progeny. An additional goal of these restoration projects is to promote and restore connectivity of existing and restored populations where feasible to enhance metapopulation function.

## Rio Grande Cutthroat Trout (*Oncorhynchus clarkii virginalis*)

### Population Surveys, genetic analyses, and fish restoration projects

#### **Key actions include:**

- Continue to locate and assess RGCT populations.
- Conduct standardized surveys and genetic analyses to measure introgression or purity.
- Expand RGCT populations through restoration, reintroductions, and non-native fish control in priority watersheds.
- The Agencies agree to summarize existing distribution, population, genetics, and habitat data; and to summarize conservation accomplishments in a common and consistent format to allow range-wide, integrated data analyses, summaries and comparisons.
- Identify potential, unoccupied habitat for restoration with RGCT.

### RGCT Habitat Manipulations

Land use management considerations as part of this plan include: riparian buffer maintenance and protection, sedimentation abatement, mining and logging restrictions, proper placement of recreational trails, minimal impact grazing strategies, quantitative habitat monitoring, and development of in-stream and riparian habitat restoration projects. Coordination between the U.S. Forest Service, Bureau of Land Management, and state wildlife agencies to develop best management practices in regard to habitat concerns for the RGCT is an ongoing practice.

#### **Key actions include:**

- Inventory, maintain, protect and improve existing aquatic and riparian habitats.
- Improve hydrologic and fluvial processes associated with RGCT populations at a watershed scale.
- Address public and private land management, forestry, mining, agriculture and O&G development practices to protect habitat.

- Monitor and evaluate natural catastrophic impacts like fire and drought; implement controlled burns and forest thinning to mitigate wildfire risks.

### Regulatory Actions to enhance RGCT status:

Maintaining the sportfish status of RGCT and utilizing regulations to manage angling pressure will be an important component of maintaining the health of these populations. In addition, working with others to maintain appropriate regulations for prevention of disease, water quality impairment, and habitat disturbance are important considerations.

#### **Key actions include:**

- Maintain or enhance regulatory actions to prevent destruction of habitat.
- Enforce regulatory mechanisms that prevent impacts associated with recreational angling.
- Enhance and maintain regulatory mechanisms that prevent diseases or illegal introduction of nuisance species.

### Expand Education and Outreach programs to garner public support for RGCT:

#### **Key actions include:**

- Expand public education efforts regarding RGCT restoration actions to increase public awareness of specific restoration actions as well as responsibilities in conserving RGCT habitat and fish populations.

### **Highest Priority Objectives for the 5 GMU's for RGCT are:**

#### Rio Grande Headwaters:

- Secure and protect existing populations. For example, construct fish movement barriers at Wolf Creek, Miners Creek, and Alamosito Creek.

## Rio Grande Cutthroat Trout (*Oncorhynchus clarkii virginalis*)

- Expand the distribution of RGCT populations through chemical reclamation projects, electrofishing removal projects and stocking of vacant waters. For example, complete chemical reclamation projects at Trinchera Creek, Roaring Fork/Haypress Lake, and Sand Creek.
- Restore degraded habitat. For example, evaluate fish passage at culvert crossings on USFS and BLM roads, and install new diversion structures on Medano Creek that prevent emigration into irrigation ditches.

### Lower Rio Grande GMU:

- Secure and protect existing populations
- Construct barrier on Costilla Creek and evaluate effectiveness of existing barriers.
- Expand range of RGCT through chemical reclamation projects, electrofishing removal, and stocking of vacant waters. Conduct chemical reclamation projects in the Rio Costilla watershed. Conduct electrofishing removals on streams as necessary.
- Restore degraded habitat. For example, install riparian exclosures on Cañones Creek and Polvadera Creek.

### Pecos GMU:

- Expand range of RGCT through chemical reclamation projects, electrofishing removal and stocking of vacant waters. Site, design and construct barriers as needed. Evaluate subdrainages within the Pecos watershed for chemical restoration potential. Continue electrofishing removals where RGCT are sympatric with non-native trout. Replicate Pecos drainage populations into fishless waters.

### Canadian GMU:

- Secure and protect existing populations. Construct barriers on streams where RGCT exist such as Luna Creek and the Vermejo River.
- Expand range of RGCT through chemical reclamation projects, electrofishing

removal, and stocking of vacant waters. Site, design and construct barriers as needed. Evaluate subdrainages within the Canadian watershed for chemical restoration potential.

- Restore degraded habitat. For example, implement post-fire recovery actions to expedite post-fire revegetation in Ponil Creek system.

### Caballo GMU:

- Expand range of RGCT through chemical reclamation projects, electrofishing removal and stocking of vacant waters. Stock RGCT into Las Animas Creek watershed when habitat affected by wildfire improves.

### **Funding Needs:**

- Rio Grande Cutthroat Trout genetics analysis. \$15,000 per year is needed for genetic analysis of fish tissue specimens from known or suspected populations of RGCT in New Mexico.
- Purchase piscicides and supplies for stream/lake reclamation projects. \$25,000 per year is needed for RGCT restoration projects in New Mexico and another \$25,000 is needed per year in Colorado.
- Construct fish migration barriers. \$100,000 per year is needed to construct at least one manmade barrier per year within RGCT historic range in Colorado and another \$100,000 in New Mexico.
- Habitat restoration and protection. \$30,000 per year is needed to implement riparian best management practices and construct grazing exclosures.

### **Likely Future RGCT Joint Ventures:**

- Rio Grande Cutthroat Trout GIS database management services. \$15,000 per year is needed to hire consultant services to complete annual updates to the rangewide RGCT database.

# Rio Grande Cutthroat Trout (*Oncorhynchus clarkii virginalis*)

## WNTI completed or Ongoing Projects

- La Garita Creek (CO) native fish restoration project (2008) - \$63,000
- Wolf Creek Barrier Repair (CO) (2008) - \$22,500
- Protection of Alamos Creek (NM) population of Rio Grande cutthroat trout (2008) - \$75,000
- Restoration of Rio Grande Cutthroat trout in the headwaters of Santa Clara Creek (NM) (2009) - \$87,100
- Renovation of Barrier to Protect Rio Grande Cutthroat Trout in Rio Grande Creek, NM (2010) - \$64,000
- Tanques Creek, NM, barrier renovation (2011) - \$65,000
- Rio Ruidoso, NM, watershed native trout restoration (2011) - \$80,000
- Surviving Climate Change: Building Resilience for the Rio Grande Cutthroat Trout (2011) - \$3,000
- Genetic assessment of extant Rio Grande CT populations in Colorado (2012) - \$23,800
- Barrier construction on tributaries to the Rio Hondo, NM, for Rio Grande cutthroat trout (2012) - \$20,000
- Rio Grande cutthroat trout anger survey and educational materials (2013) - \$3,000
- Get to Know your Native (2015) - \$3,000

## References:

1. Rio Grande Cutthroat Status Assessment (2008)
2. Conservation Agreement for Rio Grande Cutthroat Trout (2013)
3. Conservation Strategy for Rio Grande Cutthroat Trout (2013).
4. Conservation Plan for Rio Grande Cutthroat Trout in Colorado (2004).
5. Long Range Plan for the Management of Rio Grande Cutthroat Trout in New Mexico (2002).
6. Rio Grande Cutthroat Trout Rangewide Database, Rio Grande Cutthroat Trout Conservation Team (2013).



This publication was funded (or partially funded) by Federal Aid to Sportfish Restoration Funds through the Multistate Conservation Grant Program (Grant WY M-8-P), a program supported with funds from the Wildlife and Sport Fish Restoration Program of the U.S. Fish and Wildlife Service and jointly managed with the Association of Fish and Wildlife Agencies, 2006-9.