Scientific Name: *Oncorhynchus clarki pleuriticus*
Common Name: Colorado River cutthroat trout
BISON No.: 010590

Legal Status:

- Arizona, Species of Special Concern
- ESA, Endangered
- ESA, Proposed Endangered
- ESA, Proposed Threatened
- ESA, Threatened
- New Mexico-WCA, Endangered
- New Mexico-WCA, Threatened
- USFS-Region 3, Sensitive
- None

Distribution:

- Endemic to Arizona
- Endemic to Arizona and New Mexico
- Endemic to New Mexico
- Not Restricted to Arizona or New Mexico
- Northern Limit of Range
- Southern Limit of Range
- Western Limit of Range
- Eastern Limit of Range
- Very Local

Major River Drainages:

- Dry Cimmaron River
- Canadian River
- Southern High Plains
- Pecos River
- Estancia Basin
- Tularosa Basin
- Salt Basin
- Rio Grande
- Rio Mimbres
- Zuni River
- Gila River
- Rio Yaqui Basin
- Wilcox Playa
- Rio Magdalena Basin
- Rio Sonoita Basin
- Little Colorado River
- Mainstream Colorado River
- Virgin River Basin
- Hualapai Lake
- Bill Williams Basin

Status/Trends/Threats (narrative):

Federal: FWS Species of concern. State NM: Endangered/threatened.
Pure populations of Colorado River cutthroat trout are gone from most of the expansive range they inhabited 100 years ago (Behnke 1992, Young et al 1996), however, Young et al (1996) estimated 318 populations of Colorado River cutthroat trout still exist within the historical range of this subspecies in Utah, Wyoming, and Colorado. Young et al (1996) reported that many waters that were included in their study have not been examined for over 20 years and may no longer contain Colorado River cutthroat trout. Minckley (1973) reported that Colorado cutthroat trout are rare in Arizona streams, and rarely stocked. Behnke (1979) stated that the Colorado River cutthroat trout occupied less than 1% of its historical range.
The now-familiar causes for the decline of Colorado cutthroat trout includes introductions of non-native fishes, habitat degradation, loss and fragmentation, and over harvest, were

widespread throughout the historic range of this subspecies (Young 1995). Young et al (1996) reported the most frequently identified problems causing the decline as grazing, stream dewatering, and roads for waters containing Colorado River cutthroat trout.
Non-native salmonids have been stocked in the historical range of Colorado River cutthroat trout for over 100 years (Young et al 1996). The native Colorado cutthroat trout rapidly disappeared from the main streams of the upper Green and upper Colorado Rivers and their major tributaries after nonnative trout were introduced (Behnke 1992). The introduction and subsequent spread of non-native trout may be the greatest threat to the continued existence of populations of Colorado River cutthroat trout (Behnke 1992, Young 1995, Young et al 1996). The Colorado cutthroat trout is vulnerable to hybridization with rainbow trout and to replacement by brook trout and brown trout (Behnke 1992, Young 1995, Young et al 1996). More populations of Colorado River cutthroat trout may have been lost through hybridization than through any other cause (Behnke and Zarn 1976). Only 26% of the remaining populations of Colorado River cutthroat trout were judged to be genetically pure (Young et al 1996).
Periods or years of low food availability could result in increased diet overlap and perhaps increased mortality of young trout (Bozek et al 1994). Colorado River cutthroat trout may be risking greater predation to focus on daytime foraging (Young 1995).

Distribution (narrative)**:**

The cutthroat trout has the greatest distribution of any western trout (Lee et al 1981). The original range of this species included coastal streams from Alaska to northern California (involving many sea-run populations, as with *S. gairdneri*), eastward through the intermontane basins to the upper Missouri, Arkansas, Platte, Colorado, and Rio Grande systems (Moore, 1968). Comprehensive descriptions of the historical range of Colorado River cutthroat are unavailable (Young et al 1996), however, the range of the cutthroat trout in early 19th-century included the upper Colorado River basin covering a large area, but it was discontinuous and probably had been for several thousand years (Behnke 1992). The natural distribution of the Colorado cutthroat trout is assumed to be bounded to the west by the Dirty Devil (Fremont) River of Utah (Behnke and Benson 1980) and to the south by the San Juan River drainage of Colorado, New Mexico, and Arizona (Behnke 1992). The Colorado River cutthroat trout historically occupied portions of the Colorado River drainage in Wyoming, Colorado, Utah, Arizona, and New Mexico (Behnke 1992).

Key Distribution/Abundance/Management Areas:

Panel key distribution/abundance/management areas:

Breeding (narrative)**:**

Spawning by Colorado cutthroat trout begins after flows have peaked in spring or early summer and ends before runoff subsides (Young 1995). Water temperature may also act as a cue for timing of spawning (Young 1995). Colorado River cutthroat trout spawn in substrate predominantly composed of gravel (Young 1995). After spawning and leaving tributaries, adults moved both up-and downstream tributary months (Young 1995). Water temperature, influenced

by elevation and annual climatic variation, controls the time of emergence of fry, which tends to be in late summer in streams still containing Colorado cutthroat trout (Young 1995).
Length and age at maturity are related to food abundance and the length of the growing season (Young 1995).

Habitat (narrative)**:**

Trout that resemble Colorado River cutthroat usually are found in isolated headwater streams (Behnke 1992). Formerly abundant in small rivers, gravelly streams, isolated alpine lakes, and estuaries (Lee et al 1981).

Breeding Season:

- January
- February
- March
- April
- May
- June
- July
- August
- September
- October
- November
- December

Panel breeding season comments:

Aquatic Habitats:

Large Scale:

- Rivers
- Streams
- Springs
- Spring runs
- Lakes
- Ponds
- Sinkholes
- Cienegas
- Unknown
- Variable

Small Scale:

- Runs
- Riffles
- Pools
- Open Water
- Shorelines

Panel comments on aquatic habitats:

Important Habitat Features (Water characteristics):

Current
- Fast (> 75 cm/sec)
- Intermediate (10-75 cm/sec)
- Slow (< 10 cm/sec)
- None
- Unknown
- Variable

Gradient
- High gradient (>1%)
- Intermediate Gradient (0.25-1%)
- Low Gradient (<0.25%)
- None
- Unknown
- Variable

Water Depth
- Very Deep (> 1 m)
- Deep (0.25-1 m)
- Intermediate (0.1-0.25 m)
- Shallow (< 0.1 m)
- Unknown
- Variable

Panel comments on water characteristics:

Important Habitat Features (Water Chemistry)

Temperature (general)
- Cold Water (4-15°C)
- Cool Water (10-21°C)
- Warm Water (15-27°C)
- Unknown
- Variable

Turbidity
- High
- Intermediate
- Low
- Unknown
- Variable

Conductivity
- Very High (> 2000 µS/cm)
- High (750-2000 µS/cm)
- Intermediate (250-750 µS/cm)
- Low (< 250 µS/cm)
- Unknown
- Variable

Panel comments on water chemistry:

Important Habitat Features (Structural elements):

Substrate
- Bedrock
- Silt/Clay
- Detritus
- Sand
- Gravel
- Cobble
- Boulders
- Unknown
- Variable

Cover
- Rocks, boulders
- Undercut banks
- Woody debris
- Aquatic vegetation
- Rootwads
- Not important
- Overhanging vegetation
- Unknown
- Variable

Panel comments on structural elements:

Diet (narrative)**:**

The diets of Colorado River cutthroat trout have not been comprehensively studied (Young 1995), however, Colborn (1966) noted that amphipods, other plankton, dipterans, and terrestrial hymenopterans were important components of the summer diet of Colorado River cutthroat. Bozek et al (1994) in their study reported that Dipterans were the most abundant Order in all three size classes of cutthroat trout with Chironomidae making up the bulk of prey. The greatest overlap of prey items occurred between young-of-year and juveniles, and between juveniles and adults (Bozek et al 1994). Salmonids also optimize their intake by selecting larger prey, which helps optimize their energy efficiency (Bannon & Ringler, 1986) with larger trout feeding on larger food items (Bozek et al 1994). If large prey items become scarce, adult salmonids may rely more on smaller prey (Bozek et al 1994). Under conditions of low food availability, cutthroat trout and rainbow trout have been shown to emigrate from low food areas, presumably because of increased competition (Wilzbach, 1985). Chapman (1966) suggested that space and food might limit salmonid populations in streams.

Diet category (list):

- Planktivore
- Herbivore
- Insectivore
- Piscivore (Fish)
- Omnivore
- Detritivore

Grazing Effects (narrative):

Binns (1977) considered many foothill streams in Wyoming that contained this subspecies to be degraded by overgrazing. Colorado River cutthroat trout may be negatively impacted by grazing since their feeding activity declines at night, but peaks at various times during the day (Young 1995).

Panel limiting habitat component relative to grazing and comments:
Panel assessment: Is this species a priority for selecting a grazing strategy? Throughout the species' distribution in New Mexico and Arizona YES NO UNKNOWN In key management area(s) YES NO UNKNOWN

Principle Mechanisms Through Which Grazing Impacts This Species (list):

May be Revised

- Alteration of bank structures
- Alteration of substrate
- Alteration of water regimes
- Altered stream channel characteristics
- Altered aquatic vegetation composition
- Altered bank vegetation structure
- Change in food availability
- Change in water temperature
- Change in water quality
- Habitat fragmentation
- Increased turbidity
- Other biotic factors
- Parasites or pathogens
- Population genetic structure loss
- Range improvements
- Trampling, scratching
- Unknown

Panel causal mechanisms comments:

Authors

- **Draft:** Magaña, H.A.
- **GP 2001:**
- **GP 2002:**
- **Revision:**

Bibliography:

Bannon, E. and Ringler, N.H. 1966. Optimal prey size for stream resident trout (*Salmo trutta*): tests of predictive models. Canadian Journal of Zoology 64: 704-713.

Behnke, R.J. 1979. Monograph of native trouts of the genus *Salmo* of western North America. U.S. Fish and Wildlife Service Publication, 215 pp.

Behnke, R.J. 1992. Native trout of Western North America. American Fisheries Society. Bethesda, MD. 275 pp.

Behnke, R.J. and Zahn, M. 1976. Biology and management of threatened and endangered western trouts. USDAFS General technical report RM-28. pp 36-41.

Behnke, R.J. and Benson, D.E. 1980. Endangered and threatened fishes of the upper Colorado River basin. Colorado State University. Colorado State University, Cooperative Extension Service, Bulletin 503A, Fort Collins, CO.

Binns, N.A. 1979. Present status of indigenous populations of cutthroat trout, *Salmo clarki*, in southwestern Wyoming. Fisheries Technical Bulletin No. 2. Wyoming Game and Fish Dept. Cheyenne, Wyoming, USA.

Bozek, M.A., DeBrey, L.D., Lockwood, J.A. 1994. Diet overlap among size classes of Colorado River cutthroat (*Oncorhynchus clarki pleuriticus*) in a high-elevation mountain stream. Hydrobiology 273: 9-17.

Chapman, D.W. 1966. Food and space as regulators of salmonid populations in streams. American Naturalist 100: 345-357.

Colborn, L.G. 1966. The limnology and cutthroat trout fishery of Trappers Lake, Colorado Dept. of Fish, Game, and Parks, Denver, CO. Fisheries Research Division Special Report 9.

Lee, D. S., Gilbert C. R., Hocutt C. H., Jenkins R. E., Callister D. E., and Stauffer J. R. 1981. Atlas of North American Freshwater Fishes: North Carolina, North Carolina State Museum of Natural History, 1981, c1980.

Minckley, W. L. 1973. Fishes of Arizona. Arizona Game and Fish Department. Phoenix, Arizona. 293 pp.

Moore, G.A. 1968. Fishes, In: Vertebrates of the United States. Blair, W.F. [Ed]. McGraw-Hill Book Co. New York, New York. Pp. 21-165.

Young, M.K. 1995. Conservation assessment for inland cutthroat trout. US Forest Service General Technical Report RM-GTR-256. Fort Collins, CO.

Young, M.K., Schmal, R.N., Kohley, T.W., Leonard, V.G. 1996. Conservation Status of Colorado River Cutthroat Trout. US Forest Service General Technical Report RM-GTR-282. Fort Collins, CO

Wilzbach, M.A. 1985. Relative roles of food abundance and cover determining the habitat distribution of stream dwelling sutthroat trout (salmo clarki). Canadian Journal of Fisheries Aquaculture Science 42: 1668-1672.