

CLAVEY RIVER WILD TROUT
HABITAT MANAGEMENT PLAN

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I. INTRODUCTION

In 1971, the California Fish and Game Commission established the Wild Trout Program, the intent of which was to designate and manage selected streams for the "protection and enhancement of wild trout fisheries." Since 1971, the Commission has designated eleven trailside and seven roadside streams as wild trout streams. The Clavey River is included in the trailside group and was selected due to its remoteness and geographic location. (The Clavey represents a mid to low elevation, west slope Sierra stream.)

The purpose of the Wild Trout program is to preserve streams in which trout fisheries are naturally sustained by wild strains of trout rather than being artificially sustained by domesticated, catchable sized trout. Program emphasis is placed on protecting and enhancing the aquatic habitat as well as maintaining the natural character of the streamside environment in order to provide for a quality angling experience.

It is the purpose of this plan to provide the Forest Service with management direction and guidelines for maintaining (or improving where necessary) the integrity and quality of the aquatic and streamside habitat for which the Clavey River was designated.

II. PHYSICAL CHARACTERISTICS

The Clavey River is 33 miles in length and drains a watershed of 1440 square miles. Most of the entire river flows over granitic bedrock, rocks and boulders and as such is relatively low in dissolved minerals and nutrients (although typical for most Central Sierra streams). The river naturally separates into three sections based on geography, access, and land management activities (Figure 1).

The lower section (Section 1) is 18 miles long and is characterized by extreme ruggedness and inaccessibility. The canyon walls are very steep

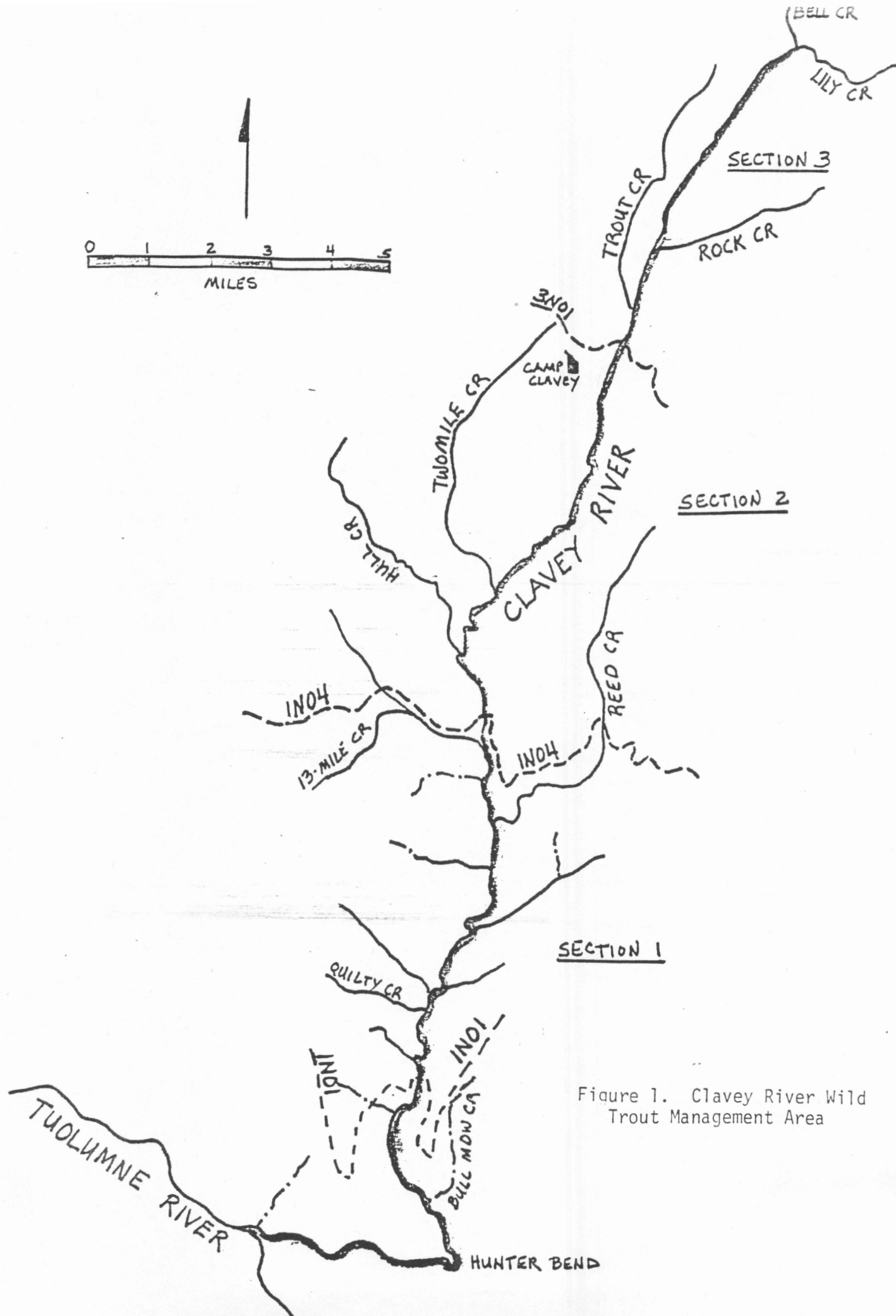


Figure 1. Clavey River Wild Trout Management Area

and are dominated by oaks, digger pine, grasses, and mountain manzanita. Small scattered stands of ponderosa pine present also. The river in this section consists primarily of large, deep pools (to 20 feet deep) separated by long riffle areas. Summer water temperatures range from 65 to 72°F.

The middle section (Section 2) is nine miles long with the only ready access being provided by road crossings at both ends. The canyon is steep and dominated by oaks and digger pines in the lower portion of the section; however, going upstream the canyon becomes progressively shallower and becomes dominated by conifers (ponderosa pine, white fir, and Douglas-fir). Pools and riffles in this section of river are smaller than those in Section 1. Summer water temperatures range from 60 to 68°F.

The upper section (Section 3) is six miles in length and has the most access of all the sections. The river is much smaller in this section, pools being long and shallow (less than 2 feet deep). The canyon is relatively shallow and is dominated by merchantable conifers. Summer water temperatures here are in the 60 to 65°F range.

III. BIOLOGICAL STREAM CHARACTERISTICS

The only trout native to the Clavey River is the rainbow trout (Salmo gairdneri). Brown trout (Salmo trutta) may also occur in the lower Clavey as spawning migrants from the Tuolumne River in the fall. Other fish species which are present include: Western sucker (Catostomus occidentalis), roach (Hesperoleucis symmetricus), riffle sculpin (Cottus gulosus), and hardhead (Mylopharodon conocephalus).

The Clavey River drains a granitic watershed and trout growth is typical of similar central Sierran streams. Three-year-old rainbow average seven to nine inches in length (fork length). Since relatively few stream-dwelling trout live beyond four years of age, the numbers of larger trout are small.

The overall quality of the trout habitat is good although warm water temperatures and low stream flows in the summer months may become limiting in the lower reaches of Section 1. Surveys conducted in 1984, however, found several year classes of rainbow trout, indicating that conditions in this lower reach have been tolerable in the recent past.

Trout are fairly common throughout the Clavey with populations near nursery tributaries tending to have a larger component of juvenile fish. Angler success in the more accessible areas is less than 0.3 fish per hour in comparison to an estimated rate of five fish per hour in the more remote areas.

IV. KEY PROBLEMS AND ISSUES

The issues of primary concern on the Clavey River are proposed water developments and future timber harvesting. Several proposals have been made recently concerning reservoir development on the Clavey. The Modesto and Turlock Irrigation Districts (MID/TID) and the City and County of San Francisco applied to the Federal Energy Regulatory Commission for a preliminary permit for a major water development on the Tuolumne River (FERC 2774, Ponderosa Project). Part of this project would have included a 2,040 acre-foot storage reservoir in Section 1 of the Clavey. However, the recent designation by Congress (Sept. 27, 1984) of the Tuolumne River as a Wild and Scenic River has resulted in a modification of the proposed Ponderosa Project.

Tuolumne County's Clavey River Project (FERC 5642) would consist of two power developments in Section 1 and would result in two large dams with storage capacities of 18,000 and 33,000 acre-feet. A May 1985 evaluation of hydroelectric potential on the Clavey River by MID/TID and Tuolumne County proposed a 65,00 acre-foot reservoir and power plant in Section 2, supplied with diverted water from Hull and Reed Creeks, and a forebay and power plant in Section 1. The Tuolumne Water District has also considered water supply reservoirs on Lily and Bell Creeks, both tributaries to the Clavey.

crops of timber, forage, wildlife, and water. They are intended, however, to put priority on managing this area to provide a quality fishery and angling experience, forage, wildlife, and water. They are intended, however, to put priority on managing this area to provide a quality fishery and angling experience. Other management requirements shall apply to a 100 foot riparian corridor (horizontal distance) on each side of the river:

1. No timber harvest objectives will be established. Measures to increase woody organic debris in the stream may be implemented if determined desirable by the Department of Fish and Game and the U.S. Forest Service.
2. Maintain stream surface shading of at least 70 percent between the hours of 1100 and 1600 for the period of July 1 through September 30 in all sections, where feasible.
3. Maintain a canopy closure of at least 60 percent unless it is less naturally.
4. No riparian hardwood vegetation shall be willfully killed, destroyed or removed unless for the improvement of the fishery or other riparian dependent resources (See FSM 2521, Stanislaus Supplement No. 4).
5. Maintain the existing live ground cover vegetation in its present state or enhance where desirable. Live ground cover consists of those living plants less than 5 feet high.
6. Limit road access and crossings of the Clavey River. All constructed roads shall have full slope stabilization treatment. Skid roads, skid trails, and landings shall not be constructed within the corridor. Existing skid roads, skid trails, and landings should not be reconstructed for use but should be

In addition to the above management activities, the Department, in cooperation with the Forest Service, will collect habitat quality data to determine habitat ratings similar to the Habitat Quality Index methodology developed by Binns and Eiserman (1979).

VII. HABITAT MANAGEMENT PLAN

In order to maintain or improve the existing wild trout habitat of the Clavey River, the following actions should be implemented jointly by the Forest Service and California Department of Fish and Game:

1. Complete a habitat evaluation survey of the entire Clavey River and identify those areas where problems are occurring and enhancement potential exists. To be completed by 1986.
2. Collect habitat quality and fish population data in cooperation with the Department of Fish and Game and develop a Habitat Quality Index similar to the methodology of Binns and Eiserman (1979). To be completed in 1984, 1985 and 1986.
3. Revise the fish habitat model for the Clavey River in accordance to number 2 above. To be completed in 1985 - 1987.
4. Identify those areas where improved or limited foot access may be desirable and develop a cooperative improvement program. To be completed by 1986.
5. Implement a monitoring program to evaluate the effectiveness of the standards and guidelines for maintaining the integrity of the wild trout habitat. This will be accomplished through a joint evaluation by the Forest Service and Department of Fish and Game, of future timber harvest activities along the Clavey which incorporate the standards and guidelines presented here.

APPENDIX 1

RESIDENT TROUT
(Rainbow, Brown, and Brook Trout)

Emphasis status: Harvest

Revised 9/13/82

Habitat Factor	Suitability		
	High	Medium	Low
CRITICAL PERIOD STREAM FLOWS (July-Sept) (1,3)	Water flow not limiting to trout, adequate to support moderate to large numbers of trout. Stream flow at this time > 55% of average daily flow.	Water flow adequate to support small to moderate numbers of trout. Stream flow at this time between 16 and 55% of average daily flow.	Water flow inadequate, will support only small numbers of trout. Stream flow at this time is < 10% of average daily flow.
TEMPERATURE (°F; summer maximum) (2)	55-57	51-54 or 58-65	38-50 to 66-75
PERCENT STREAM SHADED (between 1100 and 1600 hours, July-Sept.) (2)	60-90	40-59 or > 90	< 40
PERCENT INSTREAM COVER (1)	> 50	25-50	< 25
AQUATIC INSECTS (no./ft. ²) (3)	> 100	25-100	< 25
POOL/RIFFLE RATIO (% pools) (3)	45-55	25-45 or 55-75	< 25 or > 75
POOL QUALITY (2)	Pools > 3' deep with excellent submerged cover comprise > 50% of stream reach.	Pools 0.5 to 3' deep with good submerged cover comprise 25-50% of stream reach.	Shallow pools < 0.5' with little or no submerged cover dominate stream reach.
CHANNEL STABILITY (% total lineal distance stable) (3)	> 90	75-90	< 75

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Emphasis status: Harvest

Revised 9/13/82

Habitat Factor	Suitability
CRITICAL PERIOD STREAM FLOWS (July-Sept) (1,3)	Unsuitable Water flow inadequate to support trout. Stream flow at this time is < 10% of average daily flow.
TEMPERATURE (°F; summer maximum) (2)	< 37 or > 76

RESIDENT TROUT
(Rainbow, Brown, and Brook Trout)

References

1. Binns, N. A., and F. M. Eiserman. 1979. Quantification of fluvial trout habitat in Wyoming. Trans. Amer. Fish. soc. 108(3):215-228.
2. Brouha, Paul. Forest fishery biologist, Shasta-Trinity National Forest, Redding, California. Personal communication.
3. Robertson, Stephen R. Forest fishery biologist, Stanislaus National Forest, Sonora, California. Professional judgment.

APPENDIX 2

SUMMARY OF THE 1984 RAINBOW TROUT POPULATION SURVEYS
BY THE DEPARTMENT OF FISH AND GAME

LOCATION	DATE	WATER TEMP (°F)	Trout Population FISH/ MILE	Standing Crop lbs/ac
<u>Section 1</u>				
1. Approx. 3 mi. downstream of Hunter Bend	8/24/84	66	1622	14.8
2. Approx. 3 mi. downstream of Hunter Bend	8/24/84	66	1605	7.4
<u>Section 2</u>				
1. Approx. 150 yards upstream of Bull Meadows Road Cross- ing (1N01)	8/16/84	72	1086 ^{1/}	26.3 ^{1/}
2. Approx. 100 yards above Cottonwood Road (1N04) crossing	8/17/84	68	4064	73.9
<u>Section 3</u>				
1. Approx. 300 yards above Trout Creek confluence	8/15/84	67	2514	49.8
2. Trout Creek approx. 150 yards upstream of confluence with Clavey River	8/15/84	64	1830	27.9

^{1/} Estimate includes RT greater than 85 mm TL; many juveniles sampled.
Roach and western sucker not sampled above this point.