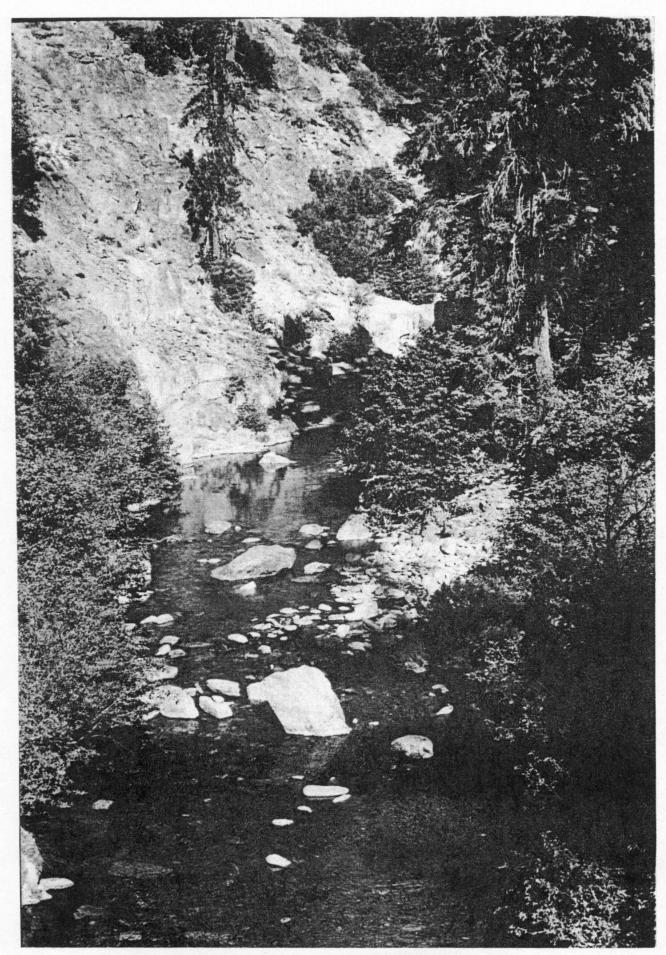
State of California The Resources Agency DEPARTMENT OF FISH AND GAME

NELSON CREEK WILD TROUT MANAGEMENT PLAN1

Inland Fisheries Branch

July 1979

 $[\]frac{1}{This}$ work was performed as part of Dingell-Johnson Project California F-10-R, "Salmonid Stream Study", supported by Federal Aid to Fish Restoration funds.



NELSON CREEK CANYON

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PREFACE

In 1966, the Department of Fish and Game in the <u>California Fish and</u>

<u>Wildlife Plan</u> recommended expansion of trout management activities to "protect and enhance wild trout fisheries." In response to this recommendation and to concerns expressed by the public, the California Wild Trout Program was established by the California Fish and Game Commission in 1971. The primary purpose of the program is to preserve attractive stream trout fisheries which are naturally sustained by wild strains of trout rather than artificially sustained by domesticated, catchable-sized trout stocked on a put-and-take basis. Emphasis is placed on protecting the aquatic environment to perpetuate natural production and on preserving the natural character of the streamside environment to provide a quality angling experience²/.

Since 1971, the Fish and Game Commission has designated eight backcountry and nine roadside streams as wild trout streams. Each wild trout stream is to have its own management plan and regulations which will emphasize individuality and diversity.

Specific management objectives for each stream will use the general objectives of the wild trout program as guidelines. The guidelines are:

- 1. To maintain wild trout populations at levels necessary to provide satisfactory recreational angling opportunities for wild trout.
- 2. To maintain and enhance where possible the habitat required for optimum wild trout production.
- 3. To preserve the natural character of the streamside environment.

 $[\]frac{2}{R}$ Remote with access largely provided by trails.

Management of backcountry streams such as Nelson Creek will also emphasize maintenance of the remote secluded quality of the angling experience, which generally involves minimizing angler encounter with man-made alterations or activity.

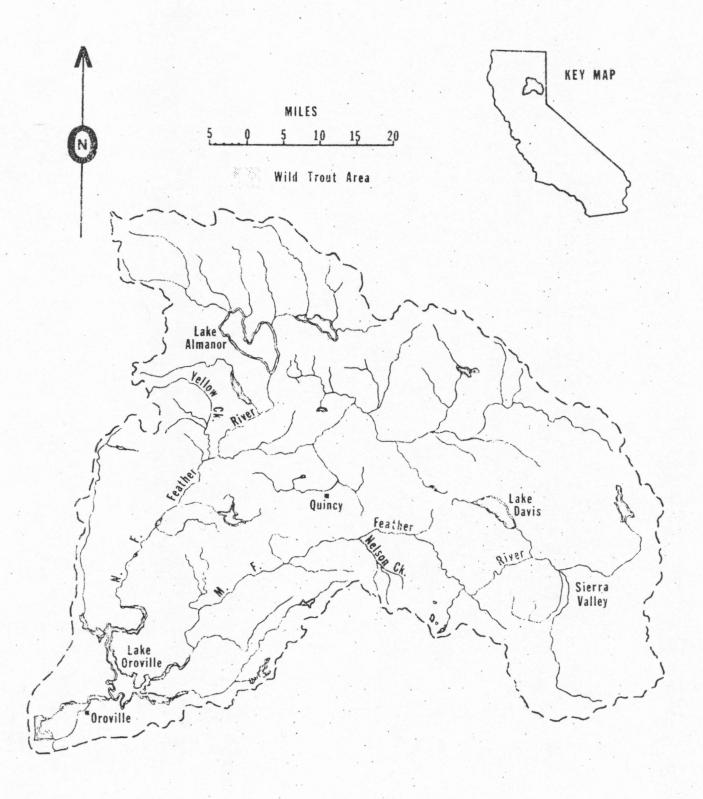
This plan is an in-house document written to identify the Department of Fish and Game's activities in the Nelson Creek drainage including the management direction to be taken in coordinating with agencies responsible for environmental protection. All land use planning is the ultimate responsibility of the U. S. Forest Service. As per the Memorandum of Understanding between the Department and the Forest Service, the Department will identify management direction which is intended to preserve and protect wildlife resources in natural forests and the Forest Service will recognize the Department's responsibilities and concerns along with those of the other users of the forest in their multiple use planning.

RESOURCE STATUS

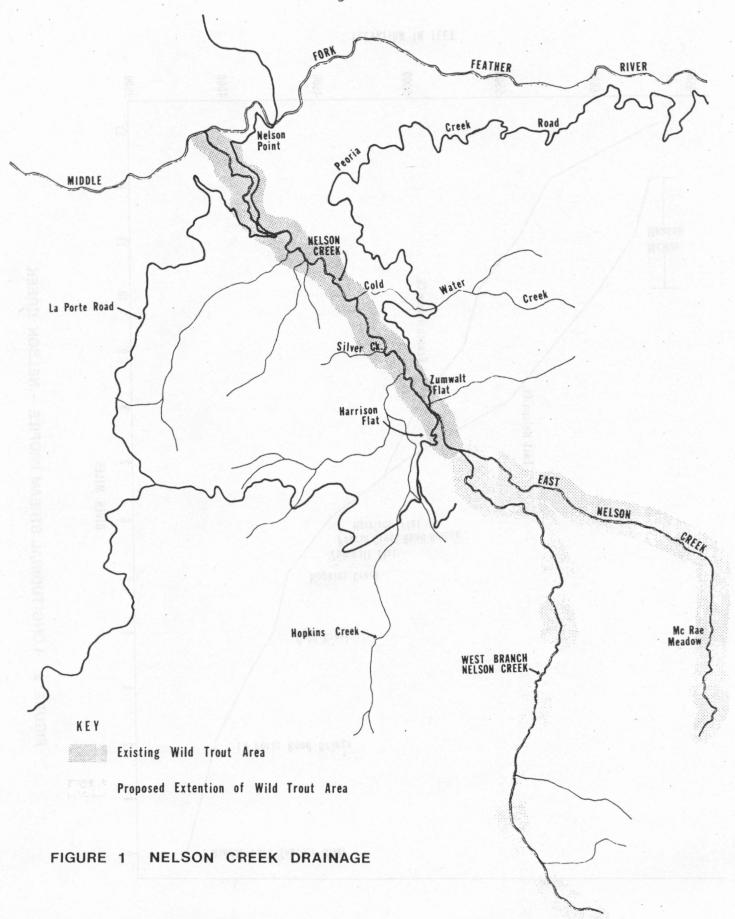
General Setting

Nelson Creek is a major tributary of the Middle Fork Feather River. It is located in the northern Sierra Nevada about 10 miles southeast of Quincy (Figure 1). The designated wild trout section is about 6 miles long, situated between the Middle Fork (elevation 3,820 ft) and the confluence of East Nelson and West Branch Nelson creeks (elevation 4,640 ft). The entire watershed is situated within Plumas National Forest.

Nelson Creek lies in a narrow, steep-walled, densely forested canyon which provides a well-shaded streambed. Water temperatures rarely exceed 60°F. Pools and cascades are frequent and water quality is extremely high. Stream gradient is generally steep except below La Porte Road Bridge (Figure 2).



GENERAL LOCATION OF NELSON CREEK .



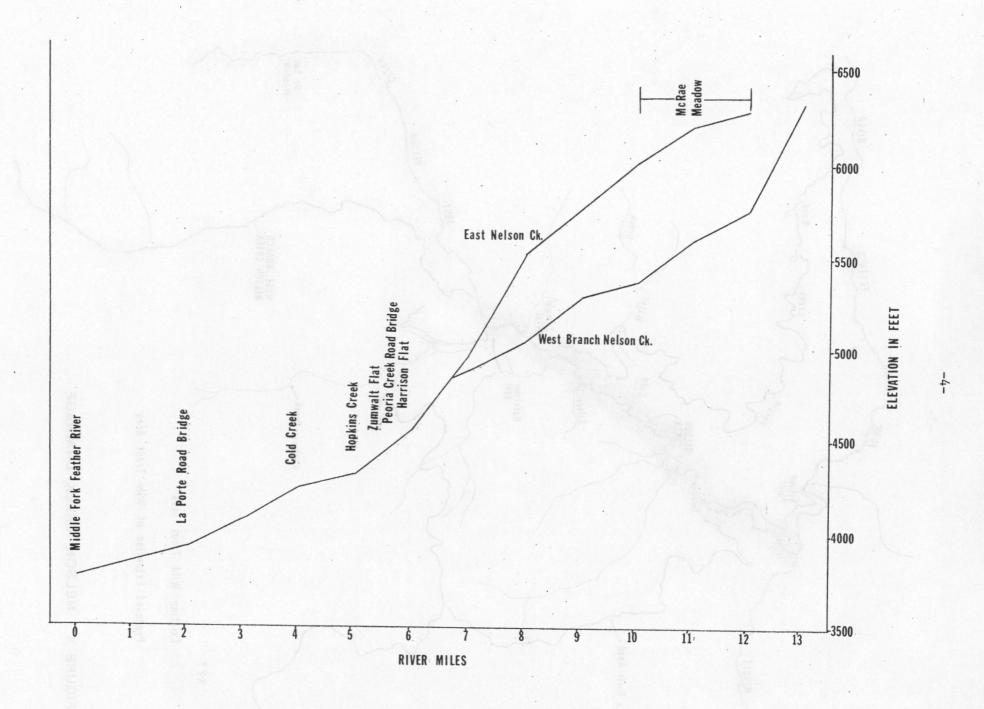


FIGURE 2 LONGITUDINAL STREAM PROFILE - NELSON CREEK

Geology of the Nelson Creek drainage is dominated by the Calavaris formation; slaty marine sediments of Paleozoic time. Soils are shallow and highly erosive in the steep canyon area (Figure 3).

The climate is characterized by moderately cold winters and mild summers.

Average annual precipitation varies from 30 inches at lower elevations to

75 inches at higher elevations. Precipitation is mainly in the form of snow in

the winter and rainfall in the summer and early fall (at 6,800 ft, snow accumulation

for an average year amounts to 47 inches of water).

Vegetation in the drainage is a mixture of forest and chaparral (Figure 4), with a small amount of meadow land in the upper extremity of East Nelson Creek (McRea Meadow). Greenleaf manzanita dominates the chaparral community. Ponderosa pine, Douglas fir, and white fir dominate the northern forested portions; red fir dominates in the southern portions. Logging activity has been minor leaving most of the watershed covered with substantial stands of old growth timber.

During the summer and fall, Nelson Creek contributes one-fourth to one-third of the Middle Fork's flow (at Nelson Point), helping maintain amenable temperatures for trout within the Middle Fork.

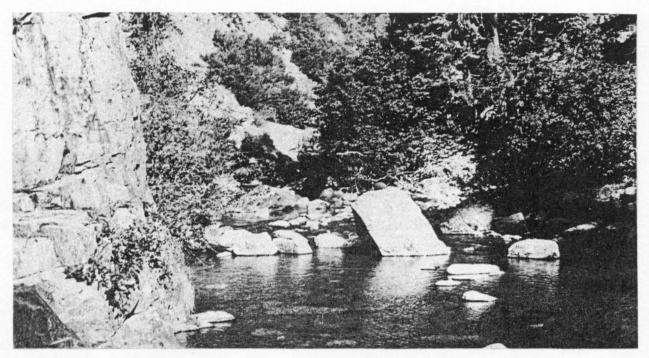
Land Ownership

The majority of land in the Nelson Creek drainage is public land administered by Plumas National Forest (Figure 5).

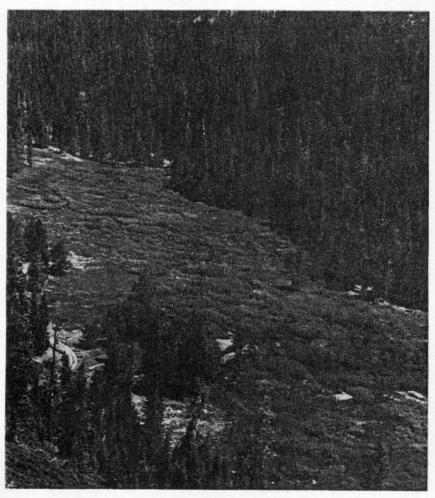
Fishery Description

The predominant game fish in Nelson Creek is the rainbow trout. Brook trout are found in McRae Meadow, and brown trout are occasionally caught in lower Nelson Creek.

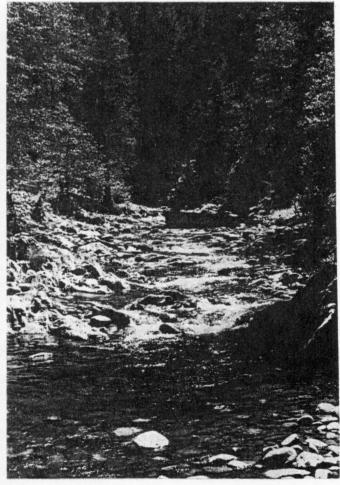
Several sections of Nelson Creek and its tributaries were sampled by electrofishing in August 1974 (only a single pass was made through each section so



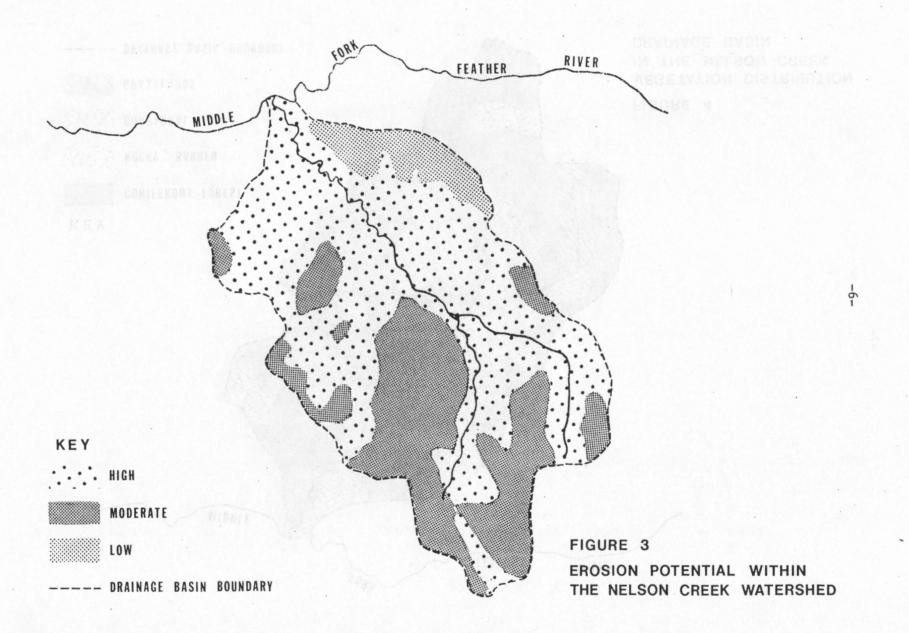
Nelson Creek above Harrison Flat is relatively narrow, 15 to 20 feet wide with a series of short pools, cascades and riffles.

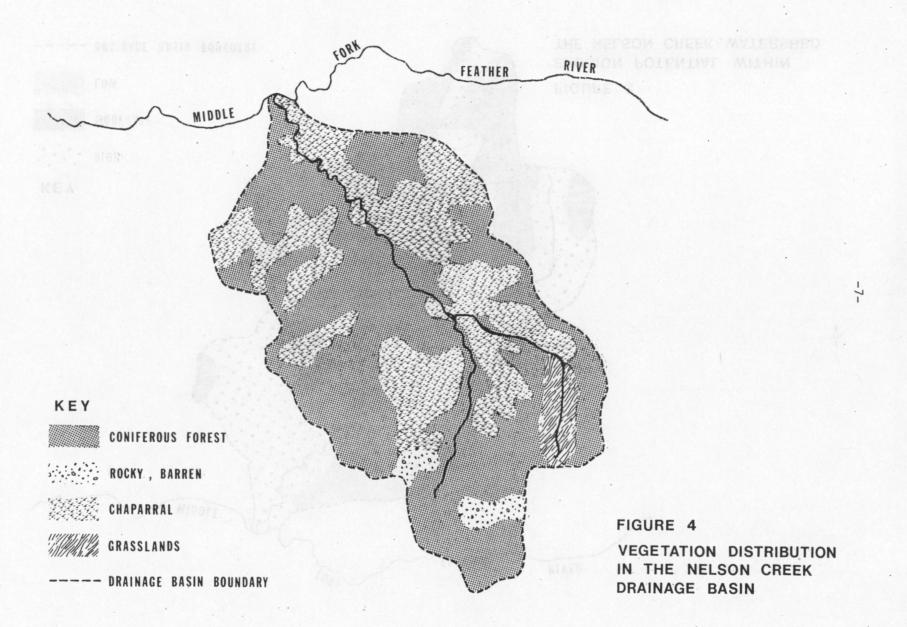


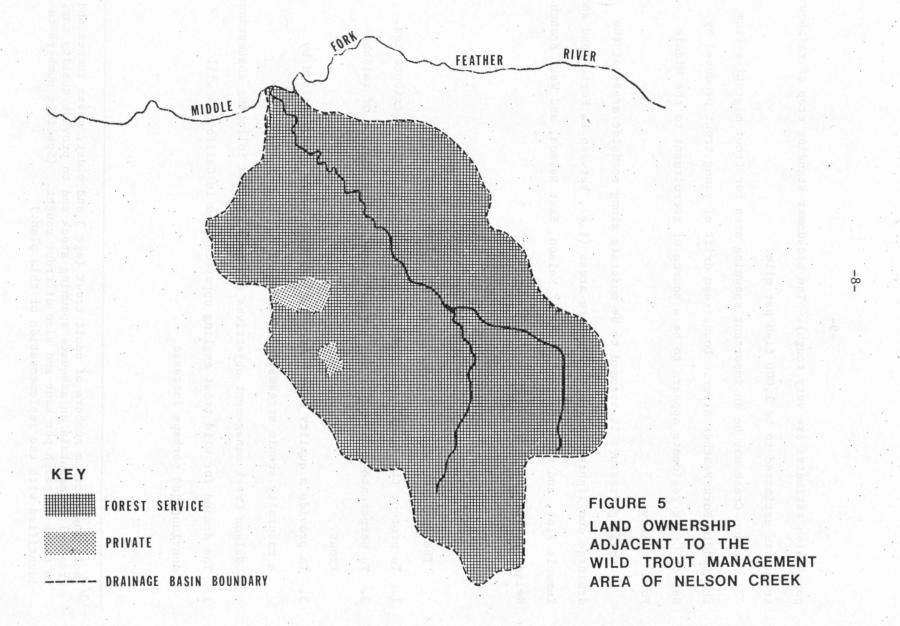
 ${\tt McRea\ Meadow\ -\ proposed\ addition\ to}$ the wild trout section.



Nelson Creek near Nelson Point.







population estimates are very rough). The midsummer standing crop of rainbow trout was estimated to be 1,000 fish per mile.

Nelson Creek may be an important spawning area for trout migrating from the Middle Fork Feather River. Downstream drift of young trout produced by Nelson Creek residents appears to be a source of recruitment to the Middle Fork fishery.

Angling pressure is assumed to be moderate along roadside areas of the drainage and lighter in the more remote areas (i.e., between La Porte Road and Zumwalt Flat, and near the confluence of Nelson, East Nelson, and West Branch Nelson creeks).

MANAGEMENT PROGRAM

Management Goals

The goals of wild trout management on Nelson Creek are:

- 1. To protect the aquatic environment of Nelson Creek and its tributaries.
- 2. To perpetuate a naturally sustained, balanced $\frac{3}{}$ population of rainbow trout.
- To provide a quality backcountry angling experience characterized by a naturally scenic streamside environment.

Nelson Creek management objectives are based on the following assumptions:

1. The demand for wild trout angling opportunities in California will continue and perhaps increase.

Including optimum numbers of adult trout (age 3 and older, seven inches and greater) to maintain an adequate spawning stock and to provide quality angling in terms of catch per hour and size of trout caught. (Specific numbers to be identified with the implementation of this plan.)

- 2. Wild trout anglers will continue to be more interested in the pleasure of fishing and in the challenge of catching larger "hard-to-catch" trout in attractive surroundings than in either angling convenience or the potential for creeling many trout.
- The Department of Fish and Game will continue to manage Nelson Creek for wild trout, and hatchery trout will not be planted.

Management Direction

- Determine the dynamics of the Nelson Creek fishery (including West Branch and East Nelson creeks) and make angling regulation changes, if needed, to achieve the objectives of this plan (page 9).
- 2. Monitor fishery as described on page 11 of this plan.
- Limit suction dredging to within 1/4 mile of the roadside areas of the stream.
- Conduct annual aerial surveillance of the watershed to determine if management objectives are being achieved.
- 5. Assure that all agreements entered into pursuant to Sections 1601-1603 of the Fish and Game Code are consistent with the implementation of this plan, and closely monitor the agreements to assure that the provisions are being met.
- 6. Expand the designated wild trout management area of Nelson Creek to include East and West Branch Nelson creeks.
- 7. Encourage Plumas National Forest to continue to emphasize protection of water quality and preservation of the existing natural quality of the streamside environment in Nelson Creek drainage as identified in the

 $[\]frac{4}{}$ Management Unit 1 of the Mohawk Management Unit Land Management Plan.

Mohawk Planning Unit Land Management Plan. Specifically, the Department should work closely with the forest in pursuit of the management direction identified for Management Unit 1 (see page 12).

- 8. Work with Plumas National Forest at the earliest possible stage of planning regarding:
 - a. All timber sales in the drainage (page 15).
 - b. All mining operations in the drainage (page 17).
 - c. All road construction and reconstruction in the drainage (page 18).
 - d. All recreational development (page 21).
- 9. Identify habitat problems in McRea Meadow and work with the Forest Service to rehabilitate damaged areas of the meadow (page 20).

Fishery Management

General trout angling regulations currently apply to the Nelson Creek fishery. The angling season extends from the last Saturday in April through November 15, the bag limit is ten trout but not more than 10 pounds and one fish.

Results of the 1974 electrofishing survey suggest that the general regulations may not be providing the objective fishery along the roadside areas where angling pressure would be expected to be heaviest. The estimated average number of larger trout (6 inches and longer) was about 250 per mile in the roadside sampling sites compared with well over 1,000 per mile in the remote sections. However, not enough information is available to determine if the apparent differences are the result of angling, poor environmental conditions, or a combination of both. Furthermore, it is not known if the lower number of trout in the roadside areas is unsatisfactory since the number of larger trout necessary to provide the objective angling quality has not been determined.

A comprehensive evaluation of the Nelson Creek fishery is outlined in Table 1. The information collected will allow development of numerical fishery management objectives. Also, a determination as to the need for special regulations can be made. A recurrent survey of the fishery will be conducted every fifth year (starting in 1983) to monitor for needed changes in management.

Environmental Problems and Land Use Management

Land use and development activities in the Nelson Creek drainage have included logging, road building, mining, cattle grazing, and recreation.

None of these activities have made serious inroads into the natural quality of the drainage.

In August 1977, Plumas National Forest completed the Mohawk Land

Management Plan which includes land use allocation for the Nelson Creek

drainage. The plan designates six management units within the drainage (Figure 6),

each with a specific management direction.

Management in Unit 1 will be directed toward the protection of water quality and the preservation of the natural character of the streamside environment. Specific management directions for this unit which are pertinent to wild trout management of Nelson Creek include:

- (a) Request the withdrawal of all the remaining land from Mineral Entry and Mineral Leasing.
- (b) Recreation facilities will be permitted to meet safety and sanitation requirements and not for public comfort and convenience.
- (c) Off-road vehicles will be limited to designated trails in the Nelson Creek, and McRae Meadow area.
- (d) Retain timber sale authority to only salvage catastrophic losses due to natural causes such as fire, insects, disease, windthrow, etc. No other timber harvesting will be permitted.



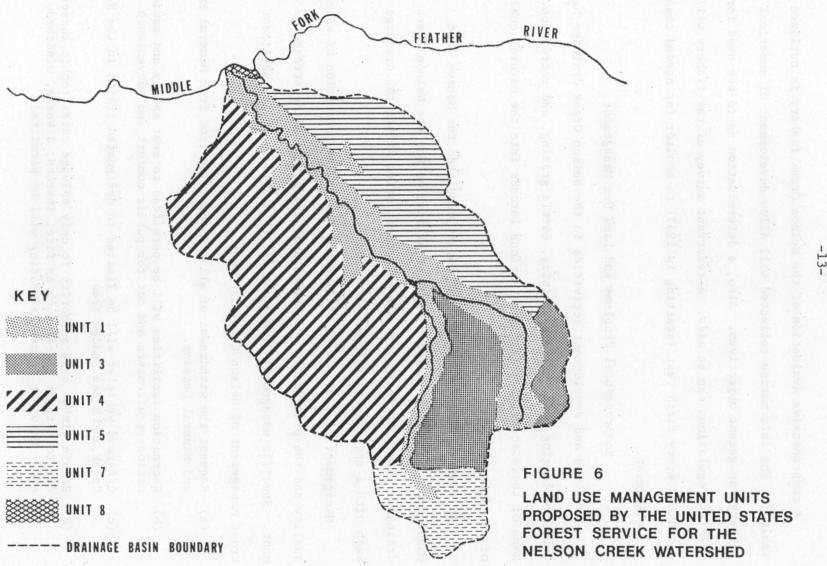


TABLE 1. Fishery Management Activities for Nelson Creek.

- I. Obtain baseline data.
 - A. Define dynamics of fishery (1978, 1979 and 1980) $\frac{1}{2}$.
 - 1. Establish 2 transects in the canyon between La Porte Road and Zumwalt Flat, 1 at Peoria Creek Road bridge and 1 each on the East and West Branch Nelson creeks.
 - 2. Sample using standard electrofishing techniques (mark and recapture, or diminishing return) to obtain:
 - a. population estimate
 - i. per surface area
 - ii. per mile some ligos and mass assessed
 - b. length/weight relationship
- c. age/growth relationship
 - d. size distribution
 - e. age class distribution
 - f. species composition, both game and nongame
 - 3. Tag at least 50 rainbow trout at each road crossing, 100 rainbow trout in the canyon and 50 each in the East and West Branch (≥ 6 inches).
- II. Monitor fishery.
 - A. Tag and conduct transect evaluation once every 5 years (1983, 1988, etc.)

 $[\]frac{1}{2}$ To be carried out for at least two consecutive years; three if the first two years' results differ substantially.

- (e) Overnight occupancy will be restricted to designated areas.
- (f) No additional new road construction will be permitted in the Nelson Creek portion of this management unit except on the Quincy-La Porte County Road. Road reconstruction is permitted.
- (g) The Hopkins Creek-Nelson Creek Road will be managed as a Forest utilization road.
- (h) The majority of the existing low-standard road down East Nelson Creek will be closed to wheeled vehicles. Motorcycles will be permitted.

In units 3, 4, and 5 management emphasizes maintaining production of forest products. Management direction in Unit 7 (the upper portion of the West Branch) is to preserve options and to manage in accordance with FSM 8260 (Roadless Area Guidelines). The area near the confluence of Nelson Creek and the Middle Fork Feather River lies in Management Unit 8 (the National Wild and Scenic River Zone). The area downstream from the mouth of Nelson Creek is within the Wild River Zone, the area upstream from the mouth is in the Scenic River Zone.

Steep terrain and highly erosive soils have made timber harvesting infeasible in the Nelson Creek drainage. However, as timber becomes scarce on the more operable areas of Plumas National Forest, logging operations could be shifted to the steeper areas of Nelson Creek which still possess substantial stands of old growth timber. Plans are presently being prepared for a large timber sale located on the west side of Nelson Creek, downstream of Harrison Flat (the Buzzard Roost Sale), and along the West Branch Nelson Creek (McRae Sale).

Removal of the dense timber cover within the canyon would reduce shade and potentially increase water temperatures. An increase in water temperature could also occur in the Middle Fork Feather River, resulting in degradation of both streams wild trout fisheries. The attractive surroundings of the densely shaded

canyon environment would also be degraded by streamside encroachment of logging. Angler encounter with logging operation along the stream would degrade the existing backcountry angling experience. Erosion and sedimentation from road building and other soil disturbing activities could also occur.

Road building and logging activities along Hopkins Creek, a tributary of Nelson Creek, has already resulted in landslides and stream habitat degradation.

Runoff-infiltration characteristics of the land surface can be altered by logging resulting in greater runoff. Greater runoff can decrease moisture storage, affecting low flow discharges. The pattern of forest cut can also influence spring runoff and low flow conditions by affecting accumulation of snow as well as the timing of snowpack melt.

The Mohawk Land Use Management Plan restricts logging within Management Unit 1 to maintain attractive conditions and prevent serious spread of insects or disease. Water quality protection is emphasized in all logging operations.

Recommendations. The restrictions placed upon timber harvesting in

Management Unit 1 are compatible with the objectives of this plan and should

be strongly adhered to. Logging operations in the remainder of the drainage

(outside Unit 1) should be designed to protect water quality and to maintain

the existing runoff and flow regime. Timber harvesting operations in areas of largely

level topography and on south facing slopes should be directed so that the cut

will not result in significant changes in spring runoff and summer and fall low

flows and is otherwise consistent with the objectives of this plan.

Timber harvesting should be restricted in areas possessing high erosion potential (Figure 3) and should only be allowed when operations employ the



Improper road construction along the steep canyon terrain of Nelson Creek could create severe erosion and sedimentation problems as has already occured along Hopkins Creek.



Most of Nelson Creek flows through a steep-walled, densely forested canyon.

most protective measures possible (e.g., logging which is designed to fly yarded logs free of the ground to areas of a more stable soil character).

Mining

Nelson Creek drainage is highly mineralized. Extensive gold mining activity has occurred there in the past. Numerous small claims, being worked with suction dredges, occur throughout the canyon. Each year, camps of miners spring up all through the canyon. Many camps are permanent, some with roads which lead down to the stream's edge. The operations have left large depressions throughout much of the canyon. Usually, the depressions are void of good aquatic habitat as are the evenly aggraded sections of stream below each dredge pit. Fish standing crop appears to be drastically reduced in the areas of routine dredge activity. However, further investigation (being conducted concurrently with the fishery management tasks) should result in a better understanding of the effect of dredging on standing crop.

In general, suction dredge mining causes short-term streambed alteration and turbidity which disrupt the normal nutrient and energy flow in the stream's ecosystem and tends to inhibit the survival of otherwise undisturbed benthic organisms. The noise and lodging facilities associated with some of these operations represent an intrusion into an otherwise natural environment which severely degrades the wild trout angling experience.

The Forest Service management plan includes a proposal to withdraw all land within Management Unit 1 (Figure 6), from mineral entry. There is no guarantee, however, that the Bureau of Land Management, the agency responsible for administration of mineral entry, will withdraw these lands. Furthermore, withdrawal of the area will only preclude filing of mining claims but may or may not exclude recreational mining, depending upon the language of the law

and court interpretation. Also, existing claims would predate withdrawal allowing continued operation of existing valid claims.

Mining in the adjacent upland areas of the stream (Units 3, 4, 5, Figure 4) would be allowed but only to the extent where visual degradation, erosion, and associated problems are precluded.

Recommendations. The Department should change the suction dredge regulations for Nelson Creek to restrict operations to areas within 0.25 miles of road crossings and to existing placer claims. The maximum dredge size restriction (4 inches) and the dredging season (June 1 through October 15) would remain the same in the open areas of the stream.

Department personnel (Region 2) should alert the Regional Water Quality Control Board, Central Valley Region of any mining operations within the drainage and work with the Board's staff and Plumas National Forest personnel to identify and implement safeguards against erosion, water quality degradation, and unreasonable destruction of the natural quality of the drainage.

Road Building

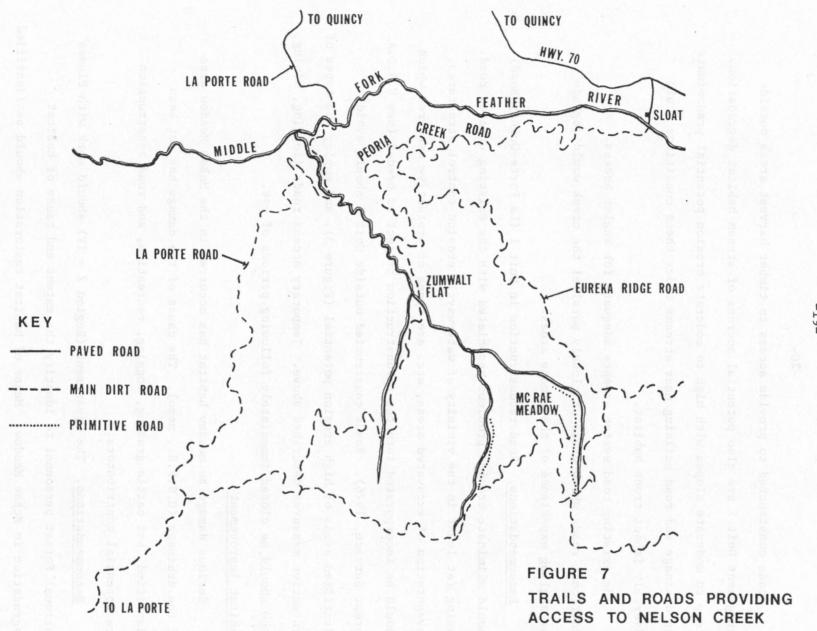
Several roads exist within the Nelson Creek drainage (Figure 7). The

La Porte and Peoria Creek roads cross Nelson Creek within the designated wild

trout area. Roads also parallel Hopkins Creek and portions of the east and

west branches of Nelson Creek.

Road improvement is proposed for La Porte Road to provide year-round access to the southern portions of Plumas County from Quincy and provide a more adequate haul route for timber and mineral resources. However, erosion potential is high in the vicinity of the Nelson Creek crossing posing a threat of stream habitat degradation. No new roads will be constructed in Management Unit 1 as per the Mohawk Land Use Management Plan.



Roads constructed to provide access to timber harvest areas outside

Management Unit 1 are also potential sources of stream habitat degradation.

Steep to moderate slopes with high to moderate erosion potential predominate the drainage and road building near streams under these conditions could adversely impact trout habitat.

The existing road system appears adequate for angler access. Any additional roads which cross or closely parallel the creek would degrade the angling experience of the remote areas.

Recommendations. Road reconstruction in Unit 1 (La Porte-Quincy Road) should eliminate erosion problems associated with the existing unpaved road. Paving (at least in the vicinity of waterways), erosion control structures, revegetation of excavated areas, etc. are types of protective measures which should be incorporated into the reconstruction project as needed (see U.S.D.A. Forest Service, 1976). Roads constructed outside Unit 1 should avoid identified areas of high erosion potential (Figure 3), and employ the types of protective measures described above. Temporary access roads (logging, mining, etc.) should be closed immediately following periods of use.

Habitat Improvement

Serious damage to meadow habitat has occurred in the McRae Meadow area of the drainage (U.S.F.S., memo). The cause of the damage has not been identified, but cattle grazing, logging, recreation, and road construction are potential contributors.

Recommendations. The Department (Region 2 - IF) should work with Plumas

National Forest personnel to identify the extent and cause of habitat

degradation in McRae Meadow. Means of habitat restoration should be identified
and implemented if feasible.

Recreational Development

The Nelson Creek drainage supports a diversity of outdoor recreation activities including angling, hunting, backpacking, camping, and sightseeing. Maintenance of such dispersed recreation is a specific management direction of the Forest Service's proposed land use plan. Additional developed recreation, concentrated public use on developed sites, such as campgrounds and picnic areas, would be precluded. A small developed campsite already exists at Harrison Flat.

Addition of East Nelson and West Branch Nelson Creeks to the Wild Trout Program

East Nelson and West Branch Nelson creeks are aesthetically attractive, support healthy wild trout populations, and meet the overall criteria of the California Fish and Game Commission for wild trout streams.

This plan already speaks to the environment and fishery management needs of East and West Branch Nelson creeks, including a proposal to rehabilitate habitat in McRae Meadow. Addition of these streams to the wild trout program would formalize the basis of the policies and programs being pursued for these streams as well as add several miles of quality wild trout waters to the wild trout program for the continued use and enjoyment of California's anglers.

Recommendations. Add East Nelson and West Branch Nelson creeks to the wild trout program.

MONITORING PROGRAM

An important element in the maintenance of the wild trout characteristics of Nelson Creek is an ongoing monitoring program. This should include periodic assessment of key qualities of the stream and its environment, and the monitoring of actions which can potentially affect the planning area. The two primary

elements of this monitoring program will allow the Department: to remain informed of planning, regulating, and permitting activities; and to the condition of the stream's environment and fishery.

The Department of Fish and Game should review, on an informational basis, plans and permits of local, federal, and other state agencies. This could be accomplished by informal understandings with each agency within already established frameworks.

These review and contact arrangements will provide constant and immediate feedback to the agencies who have regulatory authority within the planning area. By working closely and repeatedly with the various agencies, the Department should be able to directly help these agencies interpret and apply the intent of the management plan through careful use of their planning and approval authorities. If done on a basis which will allow the Department time to comment at the earliest planning stage, the process will have its maximum beneficial effect. This process will also allow a continuing evaluation of the Management Plan and the extent to which it anticipates and recommends solutions for potential conflicts. By providing for a flight surveillance, it would be possible for the Department to make general assessments of development activity, including mining, forestry, and road construction. Aerial photography can provide a historical record of those changes, constituting an irrefutable visual image of the past.

Monitoring of the fishery can be achieved following the program proposed in the Fishery Management Section of this plan.

Recommendation

Personnel of the Department of Fish and Game (Region 2) should remain in frequent communication with the USFS; Regional Water Quality Control Board,

Central Valley Region; and other agencies that may be actively involved in the planning area.

Aerial surveillance of the drainage should be conducted on an annual basis and black and white aerial photographs be taken of the entire basin every 5 years, at a scale of about 1:15,000.

The fishery monitoring program discussed above be initiated in 1983 and repeated every 5 years thereafter.

PROGRAM IMPLEMENTATION SCHEDULE

	k managaran	Department section responsible	Implementation date
1451	K.		
Α.	Timber harvest		
	1. Contact Plumas National Fores to establish timber sale reverse program.	iew	
	 Review and comment on all timber harvest plans. 	Region 2 - ES	Continuously
В.	Mining Operations		
	1. Change suction dredge	Region 2	1978
	regulation.		
c.	Road Construction		
	 Contact Plumas National Foresto establish road construction review program. 	st Region 2 - ES on	Immediately
	 Review and comment on road construction projects. 	Region 2 - ES	Continuously
D.	Habitat Improvement		
	 Determine extent of habitat deterioration in McRae Meadow. 	Region 2 - IF	Summer 1978
	 Implement rehabilitation of McRae Meadow, as needed. 	Region 2 - IF	Summer 1978

Tas	<u>k</u>	Department section responsible	Implementation date
E.	Fishery Management	illance of the drainage	
	1. Initiate survey of Nelson Creek fishery.	Region 2 - IF	Summer 1978
	2. Monitor fishery.	Region 2 - IF	Every 5 years starting in 1983.
F.	Monitoring		
	1. Aerial surveillance.	Region 2 - ES & IF	Annually
	2. Aerial photographs.		Every 5 years beginning in 1978.

REFERENCES

- Anonymous. 1976. Environmental Statement Land Use Plan for the Mt. Butler-Dry Creek Planning Unit. USDA Forest Service, Siskiyou N. F. 399 p.
- _____. 1977. North Fork American River Waterway Management Plan. Calif. Dep. Calif. Fish Game. 109 p.
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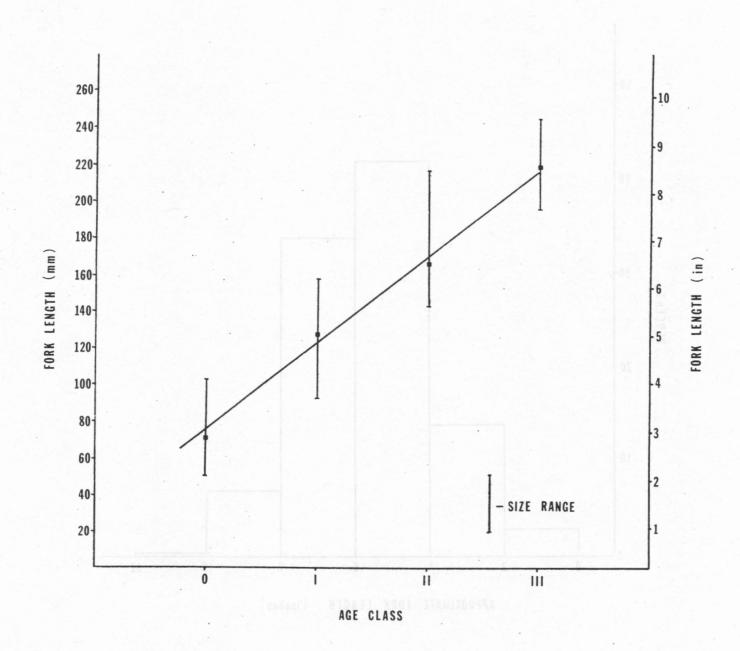


FIGURE 8 AVERAGE LENGTH OF EACH AGE CLASS OF RAINBOW TROUT COLLECTED AUGUST 1974.

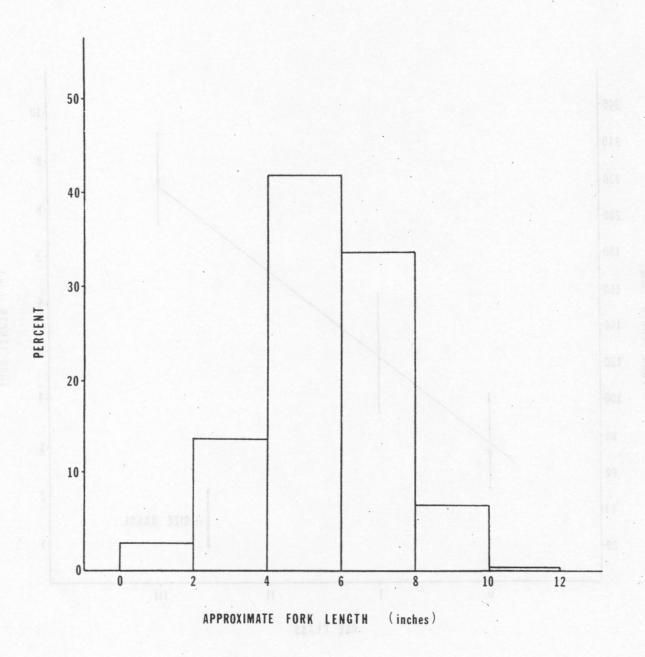


FIGURE 9 LENGTH FREQUENCY DISTRIBUTION OF RAINBOW TROUT COLLECTED BY ELECTROFISHING IN NELSON CREEK. AUGUST 1974.

APPENDIX 1. Summary of Fish Sampling Data Collected by Electrofishing in Nelson Creek, August 1974.

	Section		collected			(in)	Estimated no
Sampling Location	length (ft)	RT	EB BN	RT	EB	BN	> 6"/mile
E. Nelson Creek at McRae Meadow	75	.0	11 0	- 4	.5-6.9	-	280
E. Nelson Creek below McRae Meadow	175	- 52	1 0	3-8.5	6.2	-	1,050
W. Nelson Creek end of spur road	300	29	0 0	3.3-13.4	-	_	357
Nelson Creek at bridge near Zumwalt Flat	200	37	0 0	1.6-8.9	-	-	286
Nelson Creek between Silver and Coldwater Creek	175	47	0 1	2.2-9.6	-	21.9	1,200
Nelson Creek near La Porte Bridge	175	25	0 2	2.6-8.7	- 5	.6-7.6	330
Nelson Creek near mouth	200	20	0 1	1.0-8.9	-	2.4	130