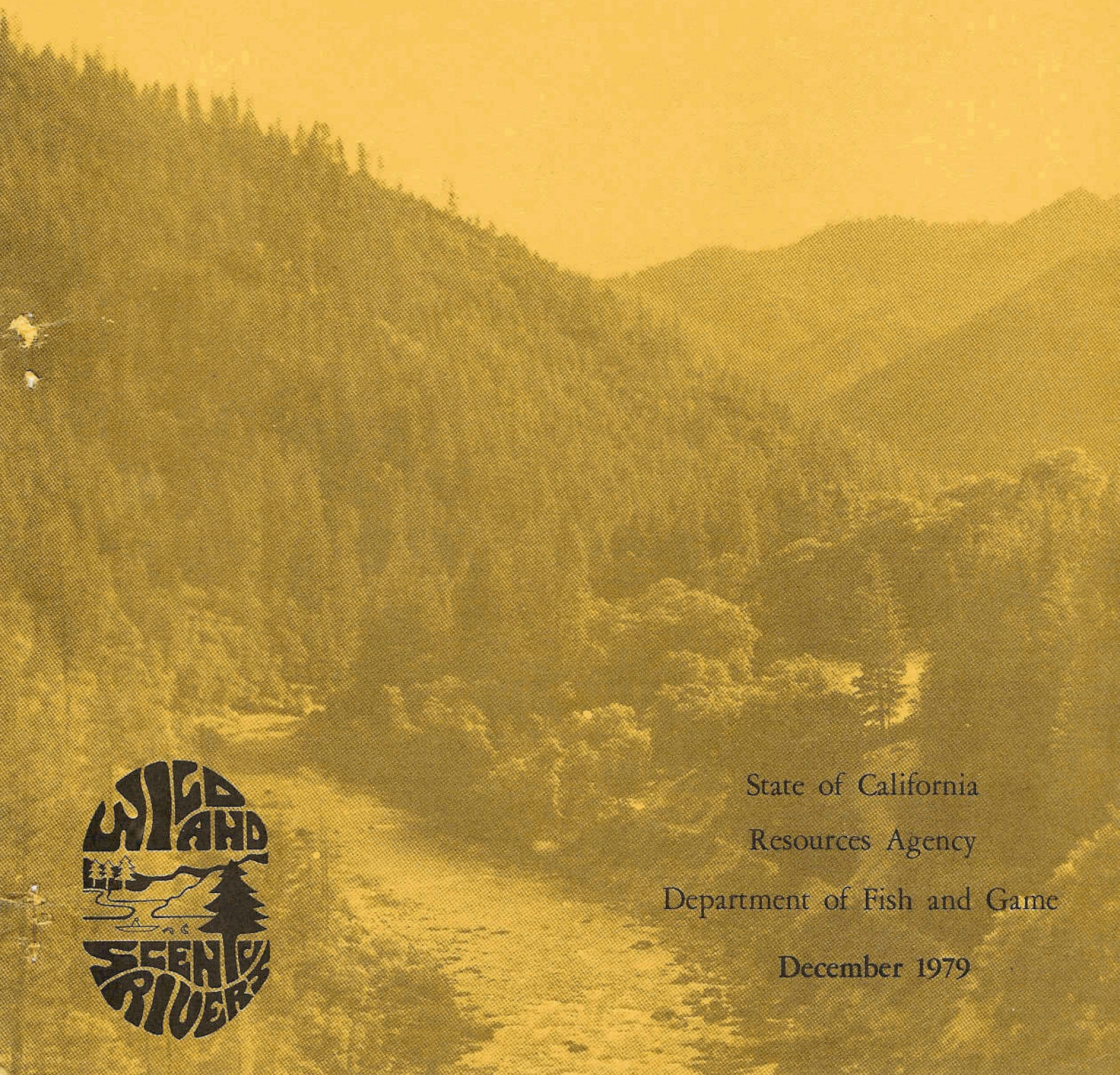
SCOTT RIVER

Waterway Management Plan



State of California
Resources Agency
Department of Fish and Game

December 1979

SCOTT RIVER

WATERWAY MANAGEMENT PLAN

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EDAW, INC.

In Association With

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State of California

The Resources Agency

Department of Fish and Game
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November 1979

"A TREASURE MANIPULATED, BUT NOT LOST"

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CHAPTER I. INTRODUCTION AND OBJECTIVES

Michel La Franboise stood on the south bank of the Klamath River and stared thoughtfully at the river which rushed to join it. He looked upstream, past row upon row of pines and firs, to where this new river rounded a bend in the mountains and came into view. He smiled with anticipation - here was somewhere to go, to explore. There would be beaver pelts here, and marten and fisher as well. Slowly he began to work his way up this river, watching for Indian trails, and for the signs of elk, grizzly, deer, black bear, and beaver.

This was the Beaver River, and the long beautiful valley which it drained was known as Beaver Valley. In 1835, Michel La Franboise was one of the first white men to set foot upon the banks of this river. But at the time of his coming, the river and its valley had already long been the homeland of another people, the Iruaitsu. These people belonged to the Shasta tribe, and lived in a series of nine villages along the banks of the river. They fished, hunted, gathered nuts, and lived in round, semisubterranean homes known as ûmma. The date of their arrival on the river's banks is not known, but it is now suspected that the Iruaitsu were predated in the area of Beaver River by still another culture now known only as the "Early" race. Before the Early people, if they ever were there, no other offshoot of the diverse groups who once pioneered their way from Asia across the Bering Straits is known to have resided near the river.

Michel La Franboise, and others like him, found their pelts, carried on cursory trade with the Iruaitsu, and probably moved onward to explore other rivers yet unnamed. Then in 1850, John Scott, with a company of men, descended the river, and at a place now known as Scott Bar, came upon gold. Although Scott and his party were immediately chased off by Indians, the word spread, and in no time miners from far and wide were congregating on the banks of Beaver River.

The river turned out to be one of the most productive gold sites in California. Fortunes were made, first by individuals, then by groups and corporations. As surface gold became harder and harder to find, mining went underground. Then hydraulic systems were utilized to wash away entire hillsides and reach down into gold-bearing rock. A several-mile-long trench, known as the San Jose Ditch, was built by Chinese labor to carry water away from the river's bed, so that the bed itself could be mined.

By the end of the 19th Century, the gold boom was on the wane, although mining on a small scale continues to this day. Most of the miners had come to the area, found whatever gold they could, and then left. A few stayed, perhaps to farm in the valley or along the Klamath. Gradually a small resident population built up along the river, which had long since been renamed in honor of John Scott.

After mining, the next industry to make use of the Scott River area was logging. The forest near the river had already been extensively cut for mining uses: supporting timbers, flumes and chutes, and housing. But on most of the watershed stood virgin expanses of douglas and white fir, ponderosa pine, and cedar. As logging technology advanced and the market for timber grew, more and more roads were pushed into the high country above the river. The tempo picked up speed after World War II, and continues to this day, with a cut of 15 million board feet scheduled in the study area for each remaining year of the 1970s.

Today, the year-round resident population of about 400 in the Scott River planning area roughly equals that of the Iruaitsu a century and a half ago. Many of today's residents are retired; a few work in the logging industry or raise cattle and forage crops. A few mine, usually more for recreation and for the hope of a good strike than for day-to-day income.

The region which surrounds the Scott River is known for its beauty and the relative isolation which it affords. Finding its source in the Scott Mountains south of the town of Callahan, the river meanders northward across the long Scott Valley, past the town of Etna, surrounded by irrigated farmland, range, and forest. West of the small community of Fort Jones, the river turns westward, and shortly thereafter leaves the valley for the thickly vegetated, narrow Scott River Canyon. It flows some 20 miles through the canyon, bending northward then westward again, past the historic gold discovery site of Scott Bar, to its confluence with the Klamath River (Figure 1-1).

The anadromous fishery associated with the Scott River represents a significant in-stream recreational resource value in terms of sport fishing in the Scott and Klamath rivers, a recreational and commercial resource value in terms of ocean fishing, and a resource value for the Indian subsistence fishery within the Hoopa Valley Indian Reservation. However, there has been a decline in the Scott's fishery resource in recent years, however, and a number of causes have been put forth for this decline. The major causes discussed are low flows in the river during fall spawning runs and diversions from the upper Scott River or from its tributary streams. These low flows result from extensive groundwater pumping and accelerated irrigation in the Scott Valley upstream from the area covered by this management plan. During the winter months, seasonal rains augment these flows considerably, occasionally resulting, as in 1964, in major floods which cause damage to public and private property and may alter the bed of the river. Because rains are seasonal and summers in the region are warm and dry, the area is highly suitable as a recreation destination for hiking, pleasure driving, rafting, trout fishing, and swimming. A third major cause is from excessive rates of sediment production resulting from improper road construction and past dredging operations in the upper Scott Valley.

In the 1960s, the State and federal governments considered the north coastal area the "water bank" of California and were looking at the North Coast counties for future reservoir sites to meet burgeoning demands for hydroelectric power and water supplies for agricultural and municipal needs. A number of sites were evaluated on the Scott River and its tributaries. However, none of these projects were actually undertaken.

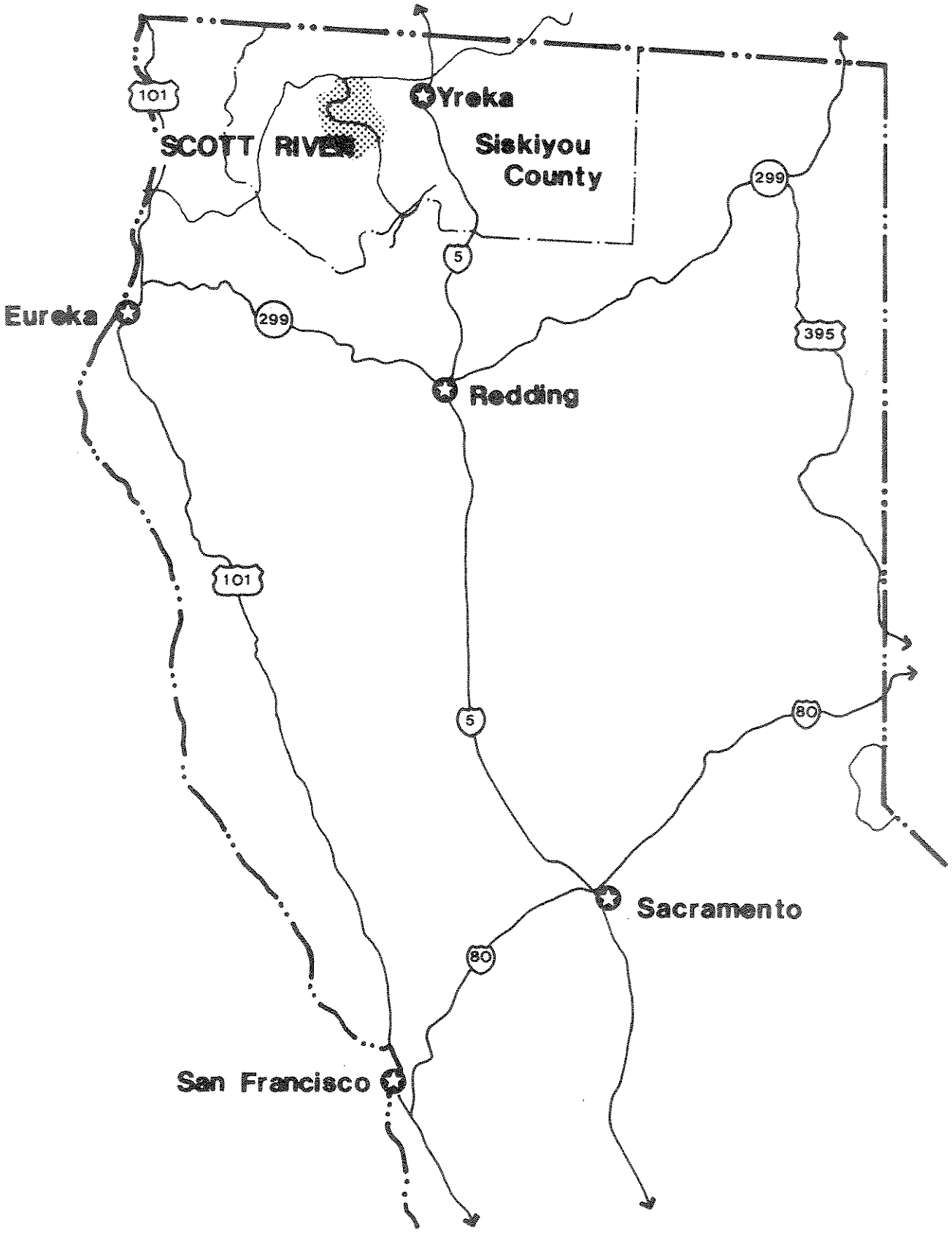


Figure 1-1

SCOTT RIVER
Preliminary Waterway Management Plan

LOCATION MAP
EDAW INC.

Guidance

The basic guidance for the approach and intent of this Waterway Management Plan comes from the legislation which established the Wild and Scenic Rivers System, of which the Scott River is included. In order to define specific objectives for the Scott, it is helpful to review the provisions of the Act to ascertain the values and approaches envisioned by the Legislature.

The Act, passed in 1972, appears to recognize that many of the rivers in the State have been altered from their free-flowing environment by water impoundments, and that other man-induced changes have adversely affected natural values of the streams. The Legislature spoke to the desires of the State in this regard.

5093.50 Legislative Declaration

> It is the policy of the State of California that certain rivers which possess extraordinary scenic, recreational, fishery or wildlife values, shall be preserved in their free-flowing state, together with their immediate environments, for the benefit and enjoyment of the people of the state. The Legislature declares that such use of these rivers is the highest and most beneficial use and is a reasonable and beneficial use of water within the meaning of Section 3 of Article XIV of the State Constitution. It is the purpose of this chapter to create a California Wild and Scenic Rivers System to be administered in accordance with the provisions of this chapter.

In interpreting this declaration, it may be surmised that rivers chosen for inclusion in the system exhibit outstanding values in one or more of the stated categories: (1) scenic, (2) recreational, (3) fishery, and (4) wildlife.

Additionally, the Legislature defined a set criteria to differentiate between types of rivers. Section 5093.53 provides that:

> Those rivers or segments of rivers designated for inclusion in the system shall be classified by the secretary as one of the following:
>
> (a) Wild rivers, which are those rivers or segments of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted.
>
> (b) Scenic rivers, which are those rivers or segments of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

(c) Recreational rivers, which are those rivers or segments of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

Planning and management for the rivers are addressed in Section 5093.58:

(b) Prepare a management plan to administer the rivers and their adjacent land areas in accordance with such classification.

Thus, the various reaches of a Wild and Scenic River are to be classified as wild, scenic, or recreational, depending on the current level of access and the relative degree of development. The various reaches are then to be managed in such a way as to maintain the natural character of each river reach: a Wild reach should remain wild, a Scenic reach should remain scenic, and a Recreational reach should remain recreational.

Figure 1-2 shows the classifications determined appropriate for the Scott River. The Scott River from the mouth of Shackleford Creek (R.M. 23.9) to Gold Flat (R.M. 11.4) is designated Recreational, from Gold Flat to Scott Bar (R.M. 3.6) is designated Scenic, and from Scott Bar to its confluence with the Klamath River is designated Recreational.

In Sections 5093.55 and 5093.60, the Act provides for compatible resource utilization, as follows:

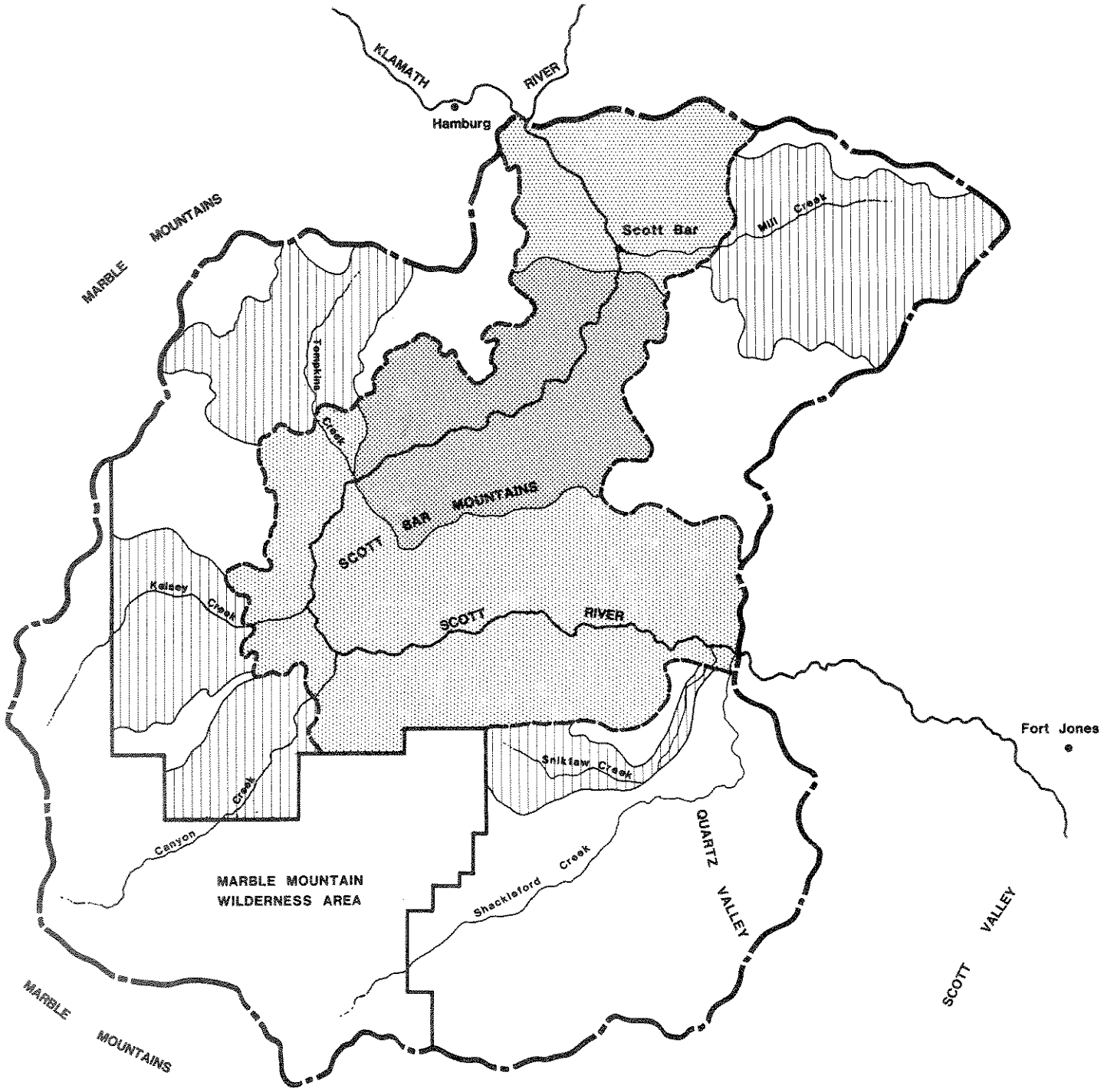
...(no) water diversion facility (shall) be constructed on any such river unless and until the Secretary determines that such facility is needed to supply domestic water to the residents of the county or counties through which the river flows, and unless and until the Secretary determines that facility will not adversely affect its free-flowing conditions or natural character.

and

Each component of the system shall be administered so as to protect and enhance the values for which it was included in the system, without unreasonably limiting lumbering, grazing, and other resource uses, where the extent and nature of such uses do not conflict with public use and enjoyment of these values.

Therefore, the Act provides that if a local domestic water supply is needed and that a diversion on a Wild and Scenic River would not affect the free-flowing character of the stream, facilities could be constructed. Secondly, resource utilization may not be unreasonably restricted where the utilization does not represent a threat to the values of the river.

Early in the planning process, public input was solicited at public meetings and through distribution of questionnaires to property owners within the planning area. Feedback from these sources has helped identify and define specific natural resource values of the river and has helped in the formulation of objectives specific to the Scott River.



SCOTT RIVER CLASSIFICATION
Waterway Management Plan

Scale Miles
0 1 2 3

North

EDAW inc.

- Drainage Boundary of Designated Reach
- Planning Area Boundary
- Recreational
- Scenic
- Areas of Special Concern

Figure 1-2

These plan objectives provide for resource uses in manners which do not degrade other river values.

In 1971, SB 1285 (Chapter 761) was passed by the Legislature which set up the Protected Waterways Program. This act is a broad planning program requiring provisions for flood control, water conservation, recreation, fish and wildlife preservation and enhancement, water quality protection and enhancement, streamflow augmentation, and free-flowing river segments or tributaries on a number of rivers, including the Scott River. This plan also treats those aspects of that planning program which are compatible with the Wild and Scenic Rivers Act.

Designated Planning Area

Senator Behr's Subcommittee Report on River Management Plans contains several recommendations which are to be used as guidelines in the preparation of waterway management plans for each wild and scenic river. One of these recommendations was to help resolve the issue of what area should be encompassed within the planning area for each management plan. The Subcommittee's recommendation suggested that the planning area boundaries be based on a variety of factors such as unstable soil, critical wildlife or fisheries habitat, and impacts of current or allowed land uses.

To comply with the Wild and Scenic Rivers Act and to meet the criteria set forth in the Subcommittee's report, approximately 73 square miles have been included within the Scott River planning area. This includes only that area in which inappropriate or poorly conceived actions could result in a direct and immediate detrimental impact on the river, because sediment produced in this area by landsliding and fluvial erosion could be transported rapidly and directly into the river channel. This sediment, particularly when due to landsliding directly into the channel, would likely involve large volumes which could overload the river's transportation capacity. In general, to satisfy this need, the area defined would encompass a corridor which extends outward from the river to the first adjacent ridgetop or major break in slope along the Scott River.

The new planning area boundary has been adjusted from the previous ridgetop-to-ridgetop concept to include only known areas of past or present instability and presently stable areas which are considered to have a potential for future instability. Areas of obviously high stability were excluded where possible. In addition, water quality, fish and wildlife resources, recreational values, and scenic qualities were considered when delineating the planning area boundary.

The planning area is only for planning purposes in which the various resource values are identified and recommended actions necessary to maintain the resources of the river are identified. Except where explicitly noted otherwise, the provisions of this plan are limited to this planning area.

Inappropriate land uses along major tributaries have the potential for producing significant impacts on the main river channel, although there would likely be some delay between the initial action in the tributary basin and the eventual impact on the river. However, the impacts would directly affect the fishery resource of the Scott River drainage; therefore, several tributaries have been designated as areas of special concern (Figure 1-2) and are as follows: Mill Creek, Tompkins Creek, Kelsey Creek, Sniktaw Creek, and Canyon Creek.

These tributaries should receive special consideration by the appropriate agencies as there are several recommendations included in this plan which, if implemented, will help protect the fishery resources of these tributaries and ultimately the Scott River.

National Forest Lands

National Forest lands included within the planning area are managed by the Klamath National Forest. Several federal laws, including but not limited to the Multiple Use-Sustained Yield Act, the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA), and the National Forest Management Act of 1976 (NFMA), assign the responsibility for planning and administration of the development, protection, and use of the National Forests to the Secretary of Agriculture. The Multiple Use-Sustained Yield Act specifically recognizes "the jurisdiction or responsibilities of the several States with respect to fish and wildlife on the National Forests." The RPA, as amended by NFMA, provides for development, maintenance, and revision of land and resource management plans, coordinated with the land and resource management planning processes of state and local governments and other federal agencies. Within the context of the above, this river plan recognizes that the ultimate responsibility for the planning and administration of the National Forest system is assigned to the Secretary of Agriculture and by the Secretary to the Forest Service. Recommendations in this plan for Forest Service action will constitute the State's early input to coordinated planning for the area.

The State does not have the authority to plan and manage National Forest system lands. Therefore, the recommendations applying to National Forest system lands are advisory but, in the spirit of cooperation, will be considered by the Klamath National Forest in preparation of the Forest Land and Resource Management Plan and project planning.

Objectives

The objectives presented below follow from the Legislative statements in the California Wild and Scenic Rivers Act, from public input, and from those special conditions found on the Scott River.

The Legislative mandate on which the plan is based is:

To preserve the Scott River in its free-flowing state, together with its immediate environments, for the benefit and enjoyment of the people of the State.

Specific objectives consistent with the Legislative mandate and the primary objective follow:

To maintain the free-flowing character of the Scott River.

The Act essentially provides this protection at the present time. (Although State laws do not preempt the Federal Government's ability to construct a dam on the Scott, it is unlikely that a federal impoundment would be constructed on a State Wild and Scenic River. Full achievement of this objective would be realized with inclusion of the Scott River between Shackleford Creek and the Klamath River into the Federal Wild and Scenic Rivers System.)

To protect the water quality and flow of the Scott River.

Low flow periods occurring in the summer are critical periods for maintenance of water quality. It does not appear possible to achieve this goal without provision for increased flows within the Scott River.

To preserve the scenic character of the Scott River.

Portions of the Scott River Canyon contain high quality scenic resources. Through much of the area, the presence of human disturbance is minimized.

Scenic resources are sensitive to a variety of actions and activities. In order to accomplish this objective, all activities which occur should be consistent with this objective.

To provide for recreational needs.

Recreational uses of the river should be oriented towards uses and levels of use consistent with protection of other values. Provision should be made to allow the greatest possible uses consistent with other plan objectives.

To protect and enhance fish and wildlife resources.

The Scott River is an important area of fish habitat for anadromous fish, including steelhead and king salmon. The upper reaches and tributaries provide spawning habitat, while the lower river provides spawning and rearing habitat. These resources make a recreational and economic contribution locally as well as statewide.

While not of overall unique nature, the wildlife resources of the Scott River area also provide recreational and economic contributions. Habitat is also provided for some threatened or rare species.

To provide for the development and use of natural resources at levels and in a manner consistent with protection of river characteristics.

Section 5093.60 requires that each component of the Wild and Scenic Rivers System be administered in such a manner that the resources of the river are protected and enhanced without unreasonably limiting natural resource uses.

It is conversely implied that where resource utilization conflicts with resource values, or the public enjoyment of them, resource utilization may be restricted.

CHAPTER II. GOALS OF THE CITIZENS

There is a long tradition on the Scott River of familial pride and interest in the river and its surrounding environment. Many of the families presently residing in the planning area can count their ancestors, their parents, grandparents, and even great-grandparents back to the time when the first miners and then the white families moved into the area. This feeling of ancestral connection with the place stirs strong feelings of affection for it and gives rise to deep feelings of concern about the future of the river and its environment.

Many other families in the planning area have recently moved there from other places and do not share a common ancestral heritage. Because of the nature of the place and because of the reasons for which they came to the river, these residents, too, have developed profound feelings of affection for the place and concern for its future.

Other residents are seasonal, spending vacations and long weekends on the river, and living the remainder of the year in places like the Bay Area, Los Angeles, and Sacramento. These residents generally value the planning area as it is, cherishing the qualities which make it unlike their normal home, and express the hope that it will remain as it is so that they can continue to enjoy it for the years to come, and perhaps retire to live there year-round.

It would probably be difficult, in fact, to find a place where citizens' interest in its welfare was higher. Both those tied to the Scott River by familial tradition, and those who have moved there more recently, remain because of the rare and valuable attributes of the place, and for the pleasure which comes of living there.

Jobs in the Scott River area are few. Some roads are slow, and distances between towns are great. There are few or none of the large-town amenities like movie theaters, restaurants, libraries, sports and cultural events, and shopping centers. Anyone living in the planning area has nearly an hour's drive to reach Yreka, where the area's only metropolitan conveniences can be found.

Thus, there are certain shortcomings, from the viewpoint of many people, to living in the planning area. For most of the planning area residents, however, these shortcomings bring definitive advantages for which they remain in the area, and which they hope to maintain. These advantages are tied to what many residents speak of as the Scott River area's quality of life.

When asked to define this quality of life, the residents respond with a variety of definitions, chiefly including:

1. Nature and the beauty of the area;

2. Fish, wildlife, and vegetation;

3. The right to live in peace and quiet;

4. One's privacy and the rights of undisturbed private property;

5. Recreation of all types.

During extensive private interviews with residents, and during two public meetings held in Scott Bar, these five values were expressed, in one form or another, time and time again. The initial reluctance of a few Scott River planning area residents to support the Waterway Management Plan seems based primarily on the fear that the plan would in some way alter or diminish the area's quality of life. Most residents, however, immediately saw the plan as protecting, rather than threatening, their region and its attributes.

Central to the planning process was a 2-page questionnaire mailed to all planning area property owners listed in the Siskiyou County Assessor's rolls. Of the 131 questionnaires mailed, 81 were returned, giving a response percentage of 62%. The 13 questions were specifically chosen to air the broadest possible cross-section of opinions and attitudes.

The following summation of the questionnaire has been included because the citizens' goals have played such an important part in this planning process. The questionnaire gave each family in the Scott River planning area the opportunity to formulate and set down its opinions and preferences, and these opinions and preferences have had substantial impact on this plan and its recommendations.

For 11 of the 13 questions, percentages have been computed for the responses. One question, Number 11, simply asked for names and addresses of people to contact, and so, obviously, yielded no percentages, Likewise another question, Number 13, which asked for things people wanted to see preserved in the Scott River drainage, did not yield percentage responses. Responses to the questionnaire were as follows:

1. What uses or qualities of the river are most important to you and your family? Please number in order of preference.

   First Choice

Family residence	50%
Fishing	24%
Irrigation	9%
Hunting	6%

Sightseeing, Camping	4% each
Tourist visitation, Rafting	2% each

Second Choice

Fishing	40%
Sightseeing	21%
Hunting	11%
Family residence, Rafting	6% each
Irrigation, Tourist visitation, Camping	4% each
Mining	2%

Third Choice

Sightseeing	24%
Fishing	18%
Family residence	13%
Camping	11%
Tourist visitation	9%
Rafting, Hunting, Irrigation	7% each
Mining	4%

2. In an area as beautiful as the lower Scott River, there is a continuing possibility for population growth. Would you like the current population along the river to:

a.	Stay the same	61%
b.	Increase slightly	31%
c.	Increase a lot	2%
d.	Decrease	5%
e.	Don't care	1%

3. Do you and your family earn your livelihood directly from the lands surrounding the river and the river itself?

   Yes: 22%

   a. By ranching 42%

   b. Lumber industry 32%

   c. Tourist industry 5%

   d. Mining 21%

   No: 78%

4. One of the concerns of this plan is the amount of visitors to the river. Would you and your family like to see the total of these visitors:

   a. Stay the same 67%

   b. Decrease 16%

   c. Increase 15%

   d. Increase slightly 2%

5. Do you plan to divert water from the Scott?

   Yes: 16%

   No: 84%

   Do you plan to do so within the next 10 years?

   Yes: 37%

   No: 63%

6. Do you feel that present salmon and steelhead populations in the river are:

   a. Too few 77%

   b. Enough 23%

   c. Too many 0%

7. Do you feel present game and nongame populations near the river are:

a. Too few 71%

b. Enough 27%

c. Too many 2%

8. Do you and your family want the present river road from Meamber School to Hamburg to:

a. Stay the same 51%

b. Be widened 18%

c. Be paved 29%

d. "Curves taken out to make it safer" 2%

9. What, if any, conditions do you feel are presently harming the Scott and its adjacent natural resources?

a. Sedimentation and poor water quality 11%

b. Riverbank erosion 9%

c. Roadside erosion 12%

d. Low water flows 21%

e. Vegetation changes 0%

f. Human visitation 16%

g. Mining 3%

h. Logging 13%

i. Irrigation 10%

j. Road construction 5%

10. Do you plan to change the use of your land during the next 10 years?

Yes: 31%

No: 69%

11. Do you wish to meet with planning team personnel?

Yes: 37%

No: 33%

No answer: 29%

'Not unless you want to meet with me": 1%

A number of questionnaires returned carried comments relating to the preliminary plan or to specific questions:

Question #9

"I see no great problem there. Just scrap that planning team and nature will take care of it."

"While most high dams appear to be environmentally destructive, we believe a small water conservation dam on the upper Scott could increase summer-fall flows, enhance fishery."

Question #10

"I plan to reconstruct the access road that was washed away during the last flood. My lot is in the Canyon Creek area."

"Build new residence, plant orchard, develop Placer mining."

"Build small cabin or small trails."

"Agriculture."

Comment accompanied by 1 "No" vote:

"Possibly increase work to clean up debris left on past irresponsible logging - depends on $."

Question #13 (What things do you most want to see preserved in the Scott River drainage?):

"Fish, water flow, game and nature's natural condition."

"Steelhead and salmon fishery, deer population."

"The freedom of the people living or visiting there."

" (1) People, (2) Wildlife."

"The natural beauty of the River and the Scott Valley."

"(1) Status quo. (2) Rights of property owners. (3) Mining rights. (4) No dams. (5) The right to use river water for irrigation in the future with the proper use."

"The property rights which the property owners already have. Riparian rights to the River, etc. If your plan becomes too restrictive, the chances of all private ownerships among the River becoming a rich man's paradise will be increased."

"Fish, wildlife and fresh water. Also vegetation."

"Wilderness/undeveloped qualities; scenery."

Perhaps the most consise statement of the citizens' goals was given during one public meeting by a man whose family has lived on the Scott River for three generations:

"I'll tell you," he said, "what we'd like is to see this place stay as it is, with the River going by the door and the salmon in it and the deer in the hills and the green trees left on the hillsides, and the air clean and everybody keeping to his own business. We don't mind visitors, but we'd prefer if the whole world didn't come and visit us all at once. We're here because this place is what it is, and we'd like it to stay that way."

CHAPTER III. RESPONSIBLE AGENCIES

Many governmental agencies have land use and resource management responsibilities and permit or licensing authority for the public and private lands in the Scott River planning area. Siskiyou County is responsible for land use planning for those lands under private ownership, and the U.S. Forest Service has land use planning and management responsibilities on the Klamath National Forest lands. Other State and federal agencies have licensing or review authority over specific land and resource uses that do or could occur along the Scott River. These include the following:

- U.S. Bureau of Land Management
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- Soil Conservation Service
- Environmental Protection Agency
- California Department of Forestry
- California Department of Fish and Game
- California State Water Resources Control Board
- North Coast Regional Water Quality Control Board
- California Department of Water Resources
- California Department of Boating and Waterways
- California State Lands Commission

This chapter describes the management activities and authorities of these agencies as they presently do, and may in the future, affect the Scott River planning area.

Environmental Review

Under two acts, the National Environmental Policy Act of 1969 (NEPA) and the California Environmental Quality Act (CEQA), environmental quality is to be protected through cooperation of many agencies in reviewing proposed projects which may affect the environment. NEPA requires every proposal for a major federal action which affects the quality of the human environment to contain a detailed statement of the environmental impacts of the proposed action, including an accounting of alternatives to the project. Under CEQA, a project proposal (that requires discretionary approval by a State or local agency) must

undergo the environmental review process. This may lead to the preparation of an Environmental Impact Report, including discussions of growth-inducing impacts and mitigation measures for unavoidable adverse impacts.

Siskiyou County

Siskiyou County is a political subdivision of the State of California and, therefore, is responsible for the planning and regulation of the use of privately owned lands in the Scott River planning area. Nearly 40% of the planning area is under the jurisdiction of Siskiyou County.

Siskiyou County has a general plan, with the nine elements required by State law: land use, circulation, housing, conservation, seismic safety, noise, scenic highways, safety, and open space as well as public services and facilities element. The land use and circulation elements of the County's original general plan, adopted in 1968, have recently been revised. The revised versions are expected to be adopted in mid-1979. The new land use element provides land use policies based on physical limitations relating to geologic hazards, soils, slope, water quality, flood hazard, surface hydrology, groundwater recharge areas, deer wintering areas, wildlife hazard, woodland productivity, and historic resources. Specific policies are outlined for use in evaluating a development proposal or land use activity in relation to the constraints listed. In addition, an Activity Effects Matrix provides for evaluating the cumulative effects of any of 35 different activities in a particular location.

State law requires that the County's zoning ordinance be consistent with its general plan. Siskiyou County is in the process of preparing a zoning ordinance for the entire County. The Scott River planning area is still zoned as A-1 (Unclassified) and probably will not be zoned for several years. In unclassified areas, all uses not prohibited by law are allowed.

Much of the private land in the planning area is forested and has been given the Timberland Preserve Zone designation. Under the Forest Taxation Reform Act of 1976, the County has designated Timberland Preserve Zones on forested parcels with the equivalent of 40 acres of prime timberland (Class 1, 2, or 3). Uses in the zone are restricted to timber production and compatible uses, including recreational and educational uses. Conditional use permits may be granted for certain other uses, provided they do not significantly detract from the timber production use. These include timberland and wood processing, mineral exploration and extraction, energy resource exploration, and buildings ancillary to such uses.

In exchange for committing the land to timber production, the land is appraised and taxed at timberland values, and the annual ad valorem tax on standing timber is deferred until the time of harvest. Timberland Preserve Zones are automatically renewed annually for rolling 10-year terms.

In addition to land use control through zoning, the County can designate certain lands as preserves of various kinds that guarantee a specific use of the land in return for tax advantages. These include open space easements and agricultural reserves. If upon application by an interested and willing landowner the County Supervisors find that the property is of value to the public in its undeveloped condition, a 25-year or longer term easement can be arranged. This does not entail the purchase of the surface easements, but rather involves an agreement that can be terminated in the future on 10 years' notice.

Agricultural lands can receive designation as Agricultural Preserves under the Williamson Act. Upon application by the landowner and approval by the Board of Supervisors, agricultural lands can be placed under a long-term agreement guaranteeing agricultural use and providing land taxation will reflect the agricultural value rather than other potential uses. Once under Williamson Act provision, a parcel cannot be withdrawn in less than 10 years from the time a decision to withdraw is made, and substantial property tax increases are payable during the 10-year withdrawal period.

In 1975 the State Legislature passed the Surface Mining and Reclamation Act. This Act directs each county to integrate a surface mining reclamation policy and permit system into the county general plan. The policy must provide measures to be employed by local governments in regulating grading, back-filling, revegetation, and soil compaction, as well as providing for soil erosion control, water quality and watershed control, waste disposal, and flood control. Siskiyou County recently (June 1979) adopted a mining reclamation ordinance as required by State law.

The Siskiyou County Health Department is the enforcement agency for solid waste disposal sites, overseeing all health-related issues for all solid waste disposal sites in the County. They also enforce the Fish and Game Code provisions that no garbage disposal is allowed within 150 feet of a stream. The Siskiyou County Sewage Disposal Ordinance provides for compliance with Regional Water Quality Control Board regulations, with requirements for location and capacity of sewage disposal systems.

The County Agricultural Commission is responsible for issuing permits for the purchase and use of pesticides on both private and public lands. In reviewing an application, the Commission considers potential environmental effects and, except for application on public lands, may deny the use of a particular pesticide, recommend an alternative, or prescribe conditions for use. The Commission also enforces the permit and may inspect the application procedure. Pesticides used in the County are approved by the California Department of Food and Agriculture under EPA regulations for proper use.

United States Forest Service/Klamath National Forest

The Forest Service's activities are organized into three general categories: (1) managing the National Forest system, (2) assisting and advising the State and private forest operations, and (3) conducting a broad-based

program of forestry research. Land use planning and management, as well as permit and regulatory functions for the Klamath National Forest, are the direct responsibility of the Forest Supervisor, who administers the National Forest through District Rangers and teams of management specialists.

The Klamath National Forest is responsible for approximately 60% of the Scott River planning area. These lands are managed using the concept of multiple use and sustained yield, in order to provide the greatest benefit for the largest number of people from the basic forest resources: timber, water, forage, wildlife, and recreation opportunities.

Under the Forest and Rangeland Renewable Resources Planning Act of 1974, and as modified by the National Forest and Management Act of 1976, long-range renewable resource programs and resource assessments are submitted to Congress every 10 years for timber, water, wilderness, outdoor recreation, fish and wildlife, and rangeland grazing resources. The assessment must include analysis of present and anticipated uses, supply, and demand for the resources. Also, the Congressional policy direction includes requirements that restocking of timber resources be carefully managed and that regeneration is maximized in context with other resources, that timber harvesting operations provide for the protection of all forest land resources, and for the continued public use of forest lands that includes those other than strictly timber harvesting.

The Forest Land and Resources Management Plan provides policy direction for management of the forest resources. Individual project plans are based on an extensive series of Forest Service Manuals, and an Environmental Assessment (EA) is developed by an interdisciplinary team. The EA, which is part of the Forest Service's response to NEPA, recommends a course of action for the project, including management requirements and mitigative measures where needed. An EA is required on any "significant" project, including gravel extraction, construction of logging roads, a change in management zones for off-road vehicle use, and many other forest activities.

The Land and Resource Management Plan will be prepared for the Klamath Forest within the next 4 years, and will include elements for each of the forest resources. In the interim, Ranger District Multiple Use Plans provide general guidance. Along the Scott River, the Scott River Ranger District Multiple Use Plan calls for environmental and visual protection. This plan, prepared in 1972, will be superseded by the Forest Land and Resource Management Plan, in which the separate resource elements will be based on updated resource inventories and assessments.

The Forest's Visual Resource Management data will be incorporated in the Forest Plan. Currently, the visual inventory and recommended visual quality objectives are being finalized. The final adopted visual quality objectives will be developed as a part of the Forest Land and Resource management planning process.

As part of the interagency water quality management program required under Section 208 of the Federal Water Pollution Control Act (PL 92-500), the Pacific Southwest Region of the Forest Service has cooperated with the

State Water Resources Control Board to develop a document entitled "Water Quality Management for National Forest System Lands in California" (April 1979). This document recommends "Best Management Practices" for water quality, which have been compiled from Forest Service manuals, contract and permit provisions, and policy statements. These are administrative, preventive, and corrective practices aimed at improving water quality and mitigating impacts while meeting other resource goals and objectives. Best Management Practices have been identified for timber harvesting, road and building site construction, mining, recreation, vegetative manipulation, fire suppression and fuels management, watershed management, and grazing. The document provides for perpetual implementation of these management practices through training programs, job performance requirements, and effectiveness evaluations. Implementation is, of course, contingent on the required levels of funding and personnel. A Water Quality Problem Assessment on Klamath National Forest was developed in 1978 as an input to the statewide document. This assessment identified potential water quality problems associated with ongoing management activities. Existing water quality problems resulting from past activities which have since been modified were also discussed. Old roads and old timber sales were identified as factors in water quality problems on the Klamath National Forest.

The Klamath National Forest Supervisor's office maintains a Five-Year Plan for Timber Sales, which is annually updated and which identifies each proposed sale over the next 5-year period. The plan designates sale area boundaries and tentative road networks, estimates timber volumes and road construction costs, and notes necessary right-of-way acquisitions, reviews Environmental Assessment status, and gives the tentative sale advertisement date. Timber sales on the Klamath National Forest average about 270 million board feet annually. A Ten-Year Timber Management Plan is also maintained by the Forest, documenting their annual estimates regarding the overall productivity of the Forest over the 10-year period, and the probable timber cutting techniques that will be used to realize predicted yields. This plan, developed in 1974, will be updated as part of the Forest Land and Resource Management Plan. Under the Knutson-Vandenberg Act and amendments, a timber sale contract may include projects to protect and improve the future productivity of the sale area's renewable resources, to be funded through the timber sale. The projects must be covered in the sale's Environmental Assessment.

Logging roads are developed under timber sale contracts after development of an Environmental Assessment, which identifies management requirements and constraints for construction and maintenance.

Mining operations involving National Forest lands are administered by the Forest Service. Prior to the commencement of any significant mining-related activities, a plan of operation must be reviewed and approved by the Forest Service to ensure that the mining operations will not be in conflict with any other approved activity in the National Forest or degrade the quality of the environment. Inspections are conducted by the Forest Service to ensure conformance with the plan of operation and any prescribed protection requirements.

The Forest Service has authority over recreational activities in the National Forest and uses this authority to reduce the incident of conflict that might occur between the various groups of the recreating public, as well as between these users and the forest resources. The Klamath National Forest Off-road Vehicle (ORV) Plan, developed in 1977, classifies the Forest into areas which are open, closed, or restricted for ORV use. Restricted areas may include restrictions on times and kinds of use. Steep slopes limit the use of ORVs in the Scott River area. The Forest has a policy not to designate as closed those areas which are in practice closed by their topography and, therefore, the Scott River area is classed as open.

Other activities proposed in the National Forest by private entities and other federal, State, and local agencies are reviewed by the Forest Service using Environmental Assessments, land use plans, multiple-use plans, and special management plans as criteria. Under the National Forest Management Act of 1976, the Forest monitors all types of its ongoing activities to ensure compliance with these plans.

United States Bureau of Land Management

The Bureau of Land Management (BLM), part of the Department of the Interior, was established in 1946 by the consolidation of the General Land Office and the Grazing Service. The Bureau is responsible for the management of National Resource lands which are public domain lands not reserved for national forests, parks, wildlife protection areas, or Indian reservations. BLM also has management authority over the surface and subsurface resources associated with these public domain lands, including timber, minerals, livestock forage, wildlife habitats, endangered plant and animal species, recreation and cultural values, and open space. BLM is responsible for managing the quality of the watershed, including the protection of soil and water quality and the development of recreational opportunities.

The Federal Land Policy and Management Act of October 1976 provides BLM with land use planning responsibilities and enforcement powers. This act provides that management of public lands is to be conducted using multiple-use and sustained-yield precepts, in coordination with the land use plans and management practices of other federal, state, and local authorities.

Within the planning area, most of the public lands are within the National Forest system. BLM has jurisdiction over approximately 120 acres of forested land in two parcels, administered by BLM's Redding District office under the Scott Valley Planning Unit Management Framework Plan (MFP). One parcel of 40 acres borders the Klamath National Forest and is being included in a Forest Service timber sale plan. The other parcel is subject to the broad statements of the MFP, which will be updated and made more site specific in approximately 1981. Under the existing MFP, timber sales and roads are subject to an environmental analysis by the BLM District staff. Provisions are made for watershed protection through logging and mine reclamation procedures.

United States Army Corps of Engineers

The Corps of Engineers is responsible for implementing an extensive construction and maintenance program, including planning, design, construction, and operation of water development, flood control, and navigation projects. The Corps has permitting authority over structures and operating activities in navigable waters under the River and Harbor Act of 1899, specifically for the design and placement of dams and dikes, removal of obstructions endangering navigation, identifying danger zones and other restricted areas.

Section 404 of the Federal Water Pollution Control Act requires a permit from the Secretary of the Army, acting through the Chief of Engineers, before dredged or fill material may be discharged into navigable waters. More specifically, "navigable waters" are defined as "All tributaries of navigable waters of the United States up to their headwaters and landward to their ordinary high water mark." The term "headwaters" is defined as "The point on the stream above which the flow is normally less than 5 cubic feet per second." The selection of disposal sites for the dredged or fill material will be in accordance with guidelines developed by the Environmental Protection Agency in conjunction with the Secretary of the Army. The Environmental Protection Agency holds the right to veto any application for such a permit.

In evaluating an application for a permit, the Corps must consider a number of issues, including effects on fish and wildlife, water quality, and areas with recognized historic, cultural, scenic, conservation, recreational, or similar values. In the fish and wildlife area, the Corps must consult with the California Department of Fish and Game. As for water quality, the Corps will not consider a permit unless the Regional Water Quality Control Board has first issued its permit. In all permit reviews, officially adopted state, regional, or local land use policies must be considered in addition to the national issues. The regulations note that a state may designate a single agency to provide coordinated state comments on permit applications. The regulations also allow for the establishment of joint federal and state processing of permit applications.

United States Fish and Wildlife Service

Another part of the Department of the Interior is the Fish and Wildlife Service (USFWS), formerly the Bureau of Sport Fisheries and Wildlife, renamed by an Act of Congress in 1974 (88 Stat. 92). The main objective of the USFWS is to assure the maximum opportunity to realize benefits from the country's fish and wildlife resources. Toward this objective, the USFWS is responsible for guiding the conservation, development, and management of these resources.

The USFWS is involved in biological monitoring and research regarding fish and wildlife populations, including the surveillance of pesticides, heavy metals, and thermal pollution. The USFWS also administers the Endangered

Species Act, participates in river basin studies and environmental impact assessments, and reviews permit applications for stream modification projects. Under the Fish and Wildlife Coordination Act, federal agencies or agencies under federal permit must consult with the USFWS before making stream modifications. The recommendations of the USFWS must be addressed in the project plans.

Soil Conservation Service

The Soil Conservation Service (SCS) is primarily a technical assistance agency responsible for developing and implementing a national soil and water conservation program for privately owned lands. The SCS works with state and local agencies as well as other federal agencies to prepare watershed and river basin studies, including flood hazard analysis and floodplain management programs. The SCS also administers other cooperative activities, including the installation of planned works for reducing erosion, floodwater and sediment damage, flood prevention, the development of recreational facilities, and the improvement of fish and wildlife habitat. In the Scott River basin, the SCS has been involved with streambank protection projects. They also provide soils suitability and capability information to the Siskiyou County Planning Commission for proposed development projects.

Environmental Protection Agency

The Environmental Protection Agency (EPA) is an independent agency of the Federal Government created in 1970 to protect and enhance the country's environment and to preserve it for future generations. The mission of the EPA is to control and abate air, water, solid waste, noise, radiation, and toxic substance pollution. EPA sets federal standards for air and water quality and cooperates with state and local governments, who develop implementation plans and enforce the standards.

California Department of Forestry

Timber harvesting and related activities in the Scott River planning area on private lands are regulated by the Z'berg-Nejedly Forest Practice Act of 1973 (Pub. Res. Code 4511 to 4628). The State Board of Forestry develops and adopts forest practice rules and regulations to execute the intent and provisions of the Act. The planning area is within the Northern Forest District which has its own set of forest practice rules and regulations contained in Title 14, California Administrative Code 931 through 940.

Timberlands are defined as nonfederally owned lands that now bear, have borne, or have the capability of bearing designated commercial forest tree species. The Department of Forestry's administration of the Forest Practice Rules within the planning area is handled through the Sierra Cascade Regional Office in Redding and a field office in Yreka.

Owners and operators proposing to cut and remove solid wood forest products from nonfederal timberlands must submit a timber harvest plan prepared by a registered professional forester (RPF) to the Department of Forestry for review by the regional office. The plans are first reviewed by the Timber Harvest Review Team, which includes representatives from the Department of Forestry, Department of Fish and Game, and Regional Water Quality Control Board. If the review team determines additional information is required in order to analyze the effects of the plan and ascertain that proposed mitigation measures are adequate, a preharvest inspection is conducted. The Department of Forestry can also conduct additional inspections during and after timber operations to ensure the operation conforms with the Forest Practice Act and the Forest Practice Rules.

Timber harvest plans are exempt from State environmental impact report requirements because the Timber Harvest Review Team process is the functional equivalent of an EIR.

The Northern District Rules specify the type of logging operation allowed and regulate activities related to timber harvesting. This includes silvicultural methods, logging practices, erosion control, stream and lake protection, hazard reduction, fire protection, and stocking standards.

In the Forest Practice Rules (Title 14, CAC 895.1), the only specific protection afforded the wild and scenic river resource values of the Scott River is a 200-foot "Special Treatment Area" designation as measured along the surface of the ground. The Northern District Rules (Title 14, CAC 933.7) only provide that "Special consideration in 'Special Treatment Areas' will be given to selection of a silvicultural method compatible with the objectives for which the special area was established."

In response to a recent request of the Secretary for Resources, the Board of Forestry is currently considering amending the Forest Practice Rules to provide more specific protection of designated wild and scenic river resource values.

California Department of Fish and Game

While the Forest Service generally has management responsibility for fish and wildlife habitats, the Department of Fish and Game has management responsibility for fish and wildlife species in the Salmon River basin. This includes enforcing hunting and fishing regulations established by the Fish and Game Commission and the issuance of agreements to modify the beds of rivers or streams. The Department has also been delegated the responsibility for preparing management plans for the State's Wild and Scenic Rivers. The Department also performs an advisory function reviewing and recommending action on projects under the State and federal environmental review process.

Under Sections 1601-1606 of the Fish and Game Code, any governmental agency proposing to change the bed of a stream or any person who substantially diverts or obstructs the natural flow or substantially changes the bed of a stream requires a Stream or Lake Alteration Agreement with the Department of Fish and Game. These agreements generally apply to any work undertaken within the mean high-water mark of a body of water containing fish and wildlife resources or where the sponsor of the project will use materials extracted from the streambed.

The Department enforces Fish and Game Code regulations prohibiting the discharge into water of any substance harmful to fish, plant, or bird life as well as sawdust shavings and certain other substances. It also issues suction dredge permits after determining that such activity will not adversely affect fish and wildlife resources.

The Department has responsibility for inventorying, studying, and recommending to the Fish and Game Commission those plants or animals that should be classified as rare or endangered. The Department enforces laws regarding take or possession of any of these plants or animals, and cooperates with other agencies in the protection of rare end endangered plant and animal species when projects threaten their existence at any location.

State Water Resources Control Board/ North Coast Regional Water Quality Control Board

The North Coast Regional Water Quality Control Board (Regional Board) is a regional subdivision of the State Water Resources Control Board. It has the authority to regulate the discharge of wastes to the surface waters of the Scott River drainage. This authority extends to actions on federal lands through the Federal Water Pollution Control Act of 1972, which directs federal agencies to comply with federal, State, and local substantive and procedural requirements relating to the goals, objectives, and intent of the Clean Water Act as amended. The definition of "discharge of waste" is not limited to the point sources, but includes increased sedimentation and turbidity through erosion, slash, changes in water quality parameters through changes in land use, and any other activity which may adversely affect the beneficial uses of the waters of the State.

Through the Basin 1A Water Quality Control Plan (Klamath River drainage), the Regional Board has identified the beneficial uses of the Scott River as agricultural supply, groundwater recharge, freshwater replenishment of lakes and streams, contact and noncontact recreation, coldwater fish habitat, wildlife habitat, migration route for anadromous fish, and fish spawning habitat. Specific water quality objectives have been set forth in the 1A Basin Plan that will ensure that these beneficial uses are not jeopardized. The State Water Resources Control Board has adopted in Resolution 68-16 a nondegradation ruling that states:

"Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the state that any change will be consistent with maximum benefit to the people of the state, will not unreasonably affect present and anticipated beneficial use of such water, and will not result in water quality less than that prescribed in water quality control plans or policies."

Additionally, Resolution 68-16 states:

"Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained."

In the Klamath River and its tributaries, including the Scott, all waste discharges are regulated. Any activity which proposes a discharge of waste that may degrade the quality of the surface waters of the region must be brought to the attention of the Regional Board through application for permit or through review by interagency communications. The Board inspects the proposed operation site to assure that the operation provides for no discharge to the river. For a gravel operation which involves washing, a National Pollutant Discharge Elmination System (NPDES) Permit is required. This permit also calls for no discharge of waste, but some turbidity is allowed.

Diversion of surface water for use on nonriparian land requires a Permit to Appropriate Water from the State Water Resources Control Board. This permit is also required for diversion of groundwater flowing in a known and definite subterranean channel, except where the water is used on the overlying land.

Other indirect activities that may affect surface or groundwater quality are to be regulated through the land use and management control authority of counties, State agencies, and federal management agencies. This interagency activity is achieved on an informal basis. Based on the review of individual actions, the Regional Board may impose specific water quality protection safeguards. The Regional Board has the authority to issue cleanup and abatement orders, as well as cease and desist orders.

The State Board conducts a program of water quality monitoring on 28 major streams identified as Priority 1 streams based on beneficial uses, population levels, and potential for water quality problems. The State Board contracts for the monitoring work with the Department of Water Resources, the U.S. Geological Survey, and the Department of Fish and Game. The Scott River is not part of this system.

Department of Water Resources

The Department of Water Resources (DWR) has the responsibility for the management of California's water resources. California's constitution requires that the State's water be put to the fullest possible beneficial use and that waste and unreasonable use of water be prevented. DWR's policy on water management is that water resources already developed shall be fully used before new sources are considered; all sources of water shall be considered; and water conservation, reuse of water, and conjunctive use of ground and surface water shall be maximized. The policy expresses concern for balancing instream recreation, fish and wildlife uses, and other uses.

The Department of Water Resources monitors wells, rivers, and groundwater for water quality, extent, depth, and quantity. On the Scott River, a monitoring station is located approximately 10.8 miles downstream from Fort Jones, where data have been collected since December 1958. Currently, the water is tested every other month for temperature, dissolved oxygen, pH, turbidity, etc. Complete mineral testing is run when an unusual finding indicates it is appropriate. When an anomoly is found, the cause is sought and a recommendation is made, usually informally, to the appropriate agency for correction.

DWR also conducts continuing investigations, often in cooperation with other agencies, to determine how much water is available for use and to discover new potential sources of water in the State. They administer water master service on adjudicated streams to enforce the amount, timing, and use of water diversions. This service may be implemented at the request of 15% of the owners, which has not yet occurred on the Scott River.

Department of Boating and Waterways

The Department of Boating and Waterways has responsibility for boating safety, identification of navigation hazards, planning and design for boating facilities, beach erosion control, and developing the Boating Trails System. The Department ensures that all boating-related projects for which public money is expended are feasible from an engineering, economic, financial, and environmental standpoint.

Under the California Recreational Trails Act of 1974, the Department was directed to coordinate with the Wild and Scenic Rivers Program and to study all Wild and Scenic Rivers for their potential for inclusion in the State Trails System. Rafting, kayaking, and canoeing uses, needs, and other data are being developed as a basis for management planning for the boating trails. Encouragement of river running is a thrust of the program. Issues being addressed are the provision of safe, guaranteed access, including parking and launching facilities where appropriate, and the provision of sanitation facilities and camping areas.

State Lands Commission

The State Lands Commission is the State agency responsible for administering statutory lands which the State has received from the Federal Government. These lands include vacant public school lands, tidelands, submerged lands, swamp and overflow lands, beds of navigable rivers and lakes. In the Scott River planning area, the State has no interests except for the streambed, where the extent of the State's interest is undetermined. The State Lands Commission is authorized to sell, lease, or otherwise dispose of land under its jurisdiction with the proviso that the transaction is in the best interest of the residents of the State. The State Lands Commission is also authorized to approve or disapprove permits for private use of State lands.

Dredging permits are required for dredging operations in the beds of navigable waters where the State has mineral rights. Dredging permits are also required for reclamation activities, including activities to improve navigation, provide flood control, construct groins, jetties, seawalls, breakwaters, bulkheads, or levees.

Land Use Leases must be obtained from the State Lands Commission for projects intending to use State-owned lands for purposes other than dredging, mining, and exploration for oil, gas, or geothermal resources.

Prospecting permits are required for exploration for minerals other than oil, gas, or geothermal resources on State-owned lands. Some lands, classified by the State Lands Commission as containing commercially valuable materials, are leased through a competitive bidding process rather than requiring Prospecting Permits.

CHAPTER IV. RESOURCE USE AND RECOMMENDATIONS

Water and Aquatic Resources

Water Resources

The entire Scott River drains a number of ranges within the Klamath Mountains. The northern portion of its watershed is dominated by the Scott Bar Mountains. The Marble Mountains comprise the northwestern part of the watershed, with the Salmon Mountains to the west and south. The south fork Scott River and the east fork Scott River drain the Scott Mountains to the south and southeast, respectively.

The confluence of these two forks at the town of Callahan forms the main stem of the Scott River (R.M. 56.1). From here the river meanders at a gentle gradient through its floodplain valley for about 25 miles. Downstream from Meamber Gulch (R.M. 22.3), a few miles below the beginning of the planning area, the river leaves the northwest corner of the Scott Valley and flows for another 25 miles to its confluence with the Klamath River. Much of this lower reach of the Scott River cuts through steep-walled canyons as it winds around the Scott Bar Mountains. A much steeper gradient, averaging 50 feet per mile, exists after the river leaves the valley.

Water Flow and Quality. Because the Marble Mountains receive more precipitation than the Scott Bar Mountains, planning area tributaries draining from the south and west are more numerous than those from the north and east, which, except Mill Creek, tend to be intermittent.

The Scott River watershed receives an average of 35 inches of precipitation per year. Actual amounts vary widely in different areas. The divides of the Salmon and Marble mountains receive 70 inches on the average, while the Scott Valley and uplands to the east receive only 20 to 30 inches per year.

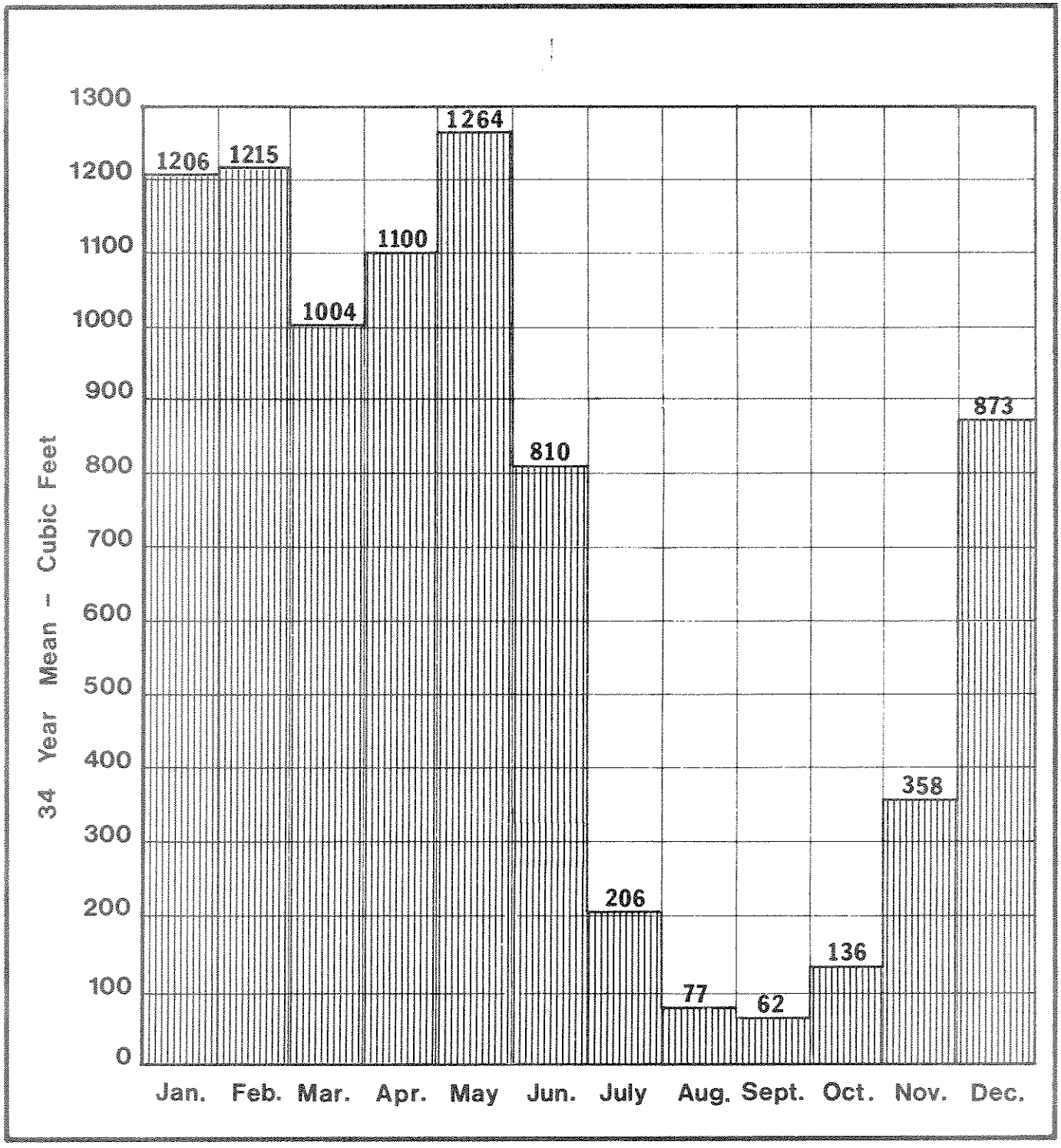
Average annual natural runoff for the entire Scott River Basin is estimated at 654,000 acre feet. Maximum runoff is generated by snowmelt, generally in the spring (see Figure 4-1). Minimum runoff occurs in August and September, with as little as 2% of the annual total occurring in either month.

The Scott River has been described as a gaining stream, because of the evident increase in volume of flow in a downstream direction. Several perennial streams which head in Marble Mountain subalpine country augment the main stem. In addition, the groundwater system in the watershed contributes variously to the surface water system, depending on subsurface conditions and the depth of adjacent water table.

For instance, there is thought to be a surfacing of groundwater at the bedrock "dike" at the northern end of Scott Valley, which may contribute significantly to the flow of the river. This contribution would be particularly evident from mid-July through September.

FIGURE 4-1

Mean Monthly Discharge in Cubic Feet Per Second
Scott River At USGS Gage #8195.



During the management plan preparation, instantaneous discharge measurements were taken at 2-week intervals at two locations in the planning area. It was found that there is an apparent increase in cubic feet per second from the mouth of Shackleford Creek to the USGS gaging station downstream of Meamber Gulch during the baseflow period, and an average gain of 60% of total flow between Shackleford Creek and the mouth of the river at the Klamath.

Temperature is a very important aspect of water quality and has a substantial impact on aquatic life, particularly on the river's value as a spawning and feeding area for fish (see also Aquatic Resources). In most years, the river reaches its maximum temperature in late July and early August, when air temperatures are also greatest. Records for the period from 1950 to 1968 indicate mean temperatures of 68 to 70 F for these months with maximum of 77 to 79 F.

Measurements carried out in 1976 indicated a diurnal pattern of a late afternoon peak and a midmorning low temperature following the air temperature pattern with a lag time of a few hours. Stream temperatures varied both temporally and spatially between the high 50s and low 70s Farenheit.

During the 24-hour period, the Scott River at the mouth of Shackleford Creek had the highest maximum temperature (74 F) and the greatest temperature fluctuation (16 F). The higher temperature is probably a result of heating as the river flows through the largely exposed Scott Valley. Exposure also enhances re-radiation of heat energy, thus a greater temperature loss at night. The inflow of cold groundwater from the Shackleford Creek system and the Scott Valley system as it intersects the surface may also enhance the cooling of the river.

During this period, temperatures near the confluence of the Scott and Klamath rivers remained fairly constant and peaked at 66 F. The canyon walls along most of the river in the planning area may aid in regulating water temperatures. Near Kelsey Creek, the temperature fluctuated 5.8 F, while at the Klamath, it fluctuated only 2 F in a 24-hour period. The cold mountain streams that flow into the Scott River below Shackleford Creek may also account for the cooler river temperatures.

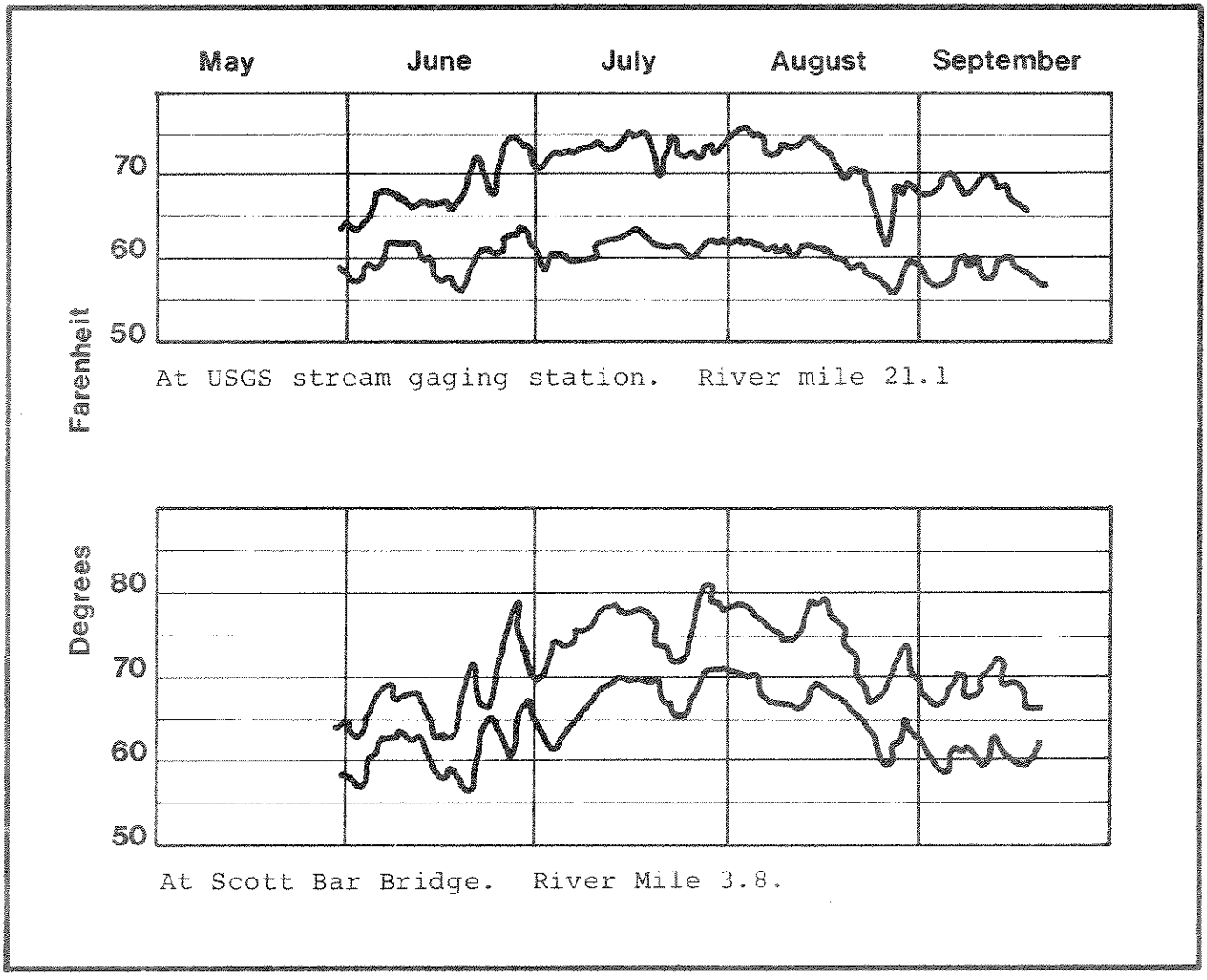
The importance of water temperature to the survival and development of the salmon and steelhead cannot be overstressed. Suitable water temperatures are particularly crucial to the adult king salmon fall spawning migration (maximum temperature is 56 F), and to the rearing of juvenile steelhead and salmon (optimum temperature is 55 to 60 F). Figure 4-2 shows maximum and minimum Scott River summer water temperatures for two locations in 1973.

Water quality analysis data most useful for complementing the fishery information for the Scott River are presented in Figures 4-3 through 4-5. These tables summarize data published since 1967 by the U.S. Geological Survey and the California Department of Water Resources. U.S. Geological Survey data for the Scott River exist for the time period 1958 to 1969. Although not included

FIGURE 4-2

1973 Maximum and Minimum Scott River Water Temperatures

Source: California Department of Fish and Game.
Draft Report on Minimum Instream Flow Needs
for Anadromous Salmonids, Scott River, 1974.



At USGS stream gaging station. River mile 21.1

At Scott Bar Bridge. River Mile 3.8.

FIGURE 4-3

Fishery Related Water Chemistry Data for the Scott River, Averaged for Water Years 1965-1969 [1/]

N [2/]	Month	Mean Discharge (cfs)	pH	Hardness Ca, Mg (mg/l)	Bicarbonate HCO_3 (mg/l)	Electrical Conductivity (micromohos/cm)	N [2/]	Temp. (deg. C)	Alkalinity $CaCO_3$ (mg/l)	Dissolved Oxygen (mg/l)
5	Oct.	66	8.3	145	168	290	2	14	146	11.6
4	Nov.	102	8.4	134	143	264	2	8	117	11.6
3	Dec.	372	8.2	97	152	202	1	4	117	12.4
5	Jan.	1202	8.1	99	114	197	2	1	93	12.4
4	Feb.	1078	8.2	99	116	198	1	7	95	11.5
5	Mar.	856	8.1	96	112	191	2	6	93	11.7
4	Apr.	1003	8.1	80	94	163	1	8	71	10.6
5	May	1464	7.9	72	84	148	2	16	58	10.2
5	Jun.	590	8.0	90	102	178	2	16	106	9.2
4	Jul.	231	8.4	126	143	253	1	24	129	11.3
4	Aug.	65	8.2	145	196	284	1	24	135	11.3
5	Sept.	47	8.2	136	163	281	2	14	132	7.4

[1/] Sample location 10.8 miles downstream from Fort Jones near U.S.G.S. gaging station (R.M. 21.0).

[2/] N equals the number of water years for which data was available for calculating the averages shown in the columns to the right of N.

Source: U.S. Geological Survey. 1967-1971. "Water Resources Data for California 1965-1969, Part 2: Water Quality Records." U.S. Department of the Interior, Geological Survey Water Records, Menlo Park, California.

FIGURE 4-4

Fishery Related Water Chemistry Data for the Scott River, Averaged for Water Years 1973-1974 [1/]

Month	Discharge (cfs)	pH	Hardness Ca, Mg (mg/l)	Bicarbonate HCO_3 (mg/l)	Electrical Conductivity (micromhos/cm)	Temp. (deg. C)	Turbidity (JTU)	Dissolved Oxygen (mg/l)
Oct.	-	-	-	-	-	-	-	-
Nov.	955	7.4	52 [2/]	61 [2/]	197	8	9	11.7
Dec.	-	-	-	-	-	-	-	-
Jan.	1766	7.2	-	-	164	4	46	11.8
Feb.	-	-	-	-	-	-	-	-
Mar.	1049	7.6	-	-	193	8	15	11.1
Apr.	-	-	-	-	-	-	-	-
May	2240	7.4	72	86	100	12	21	10.2
Jun.	-	-	-	-	-	-	-	-
Jul.	206	8.0	-	-	243	21	1	12.2
Aug.	-	-	-	-	-	-	-	-
Sept.	48	8.0	141	163	283	16	0	11.6

[1/] Sample location 10.8 miles downstream from Fort Jones near U.S.G.S. gaging station (R.M. 21.0).

[2/] Data was available for 1974 only.

Source: California Department of Water Resources. 1974-1975. "Hydrologic Data: 1973-1974, Volume 1: North Coastal Area." Bulletin Nos. 130-73 and 130-74. Department of Water Resources, Sacramento, California.

FIGURE 4-5

Water Chemistry Data Concerning Heavy Metals, Pesticides, and Nutrients in the Scott River 1973-1974 [1/]

HEAVY METALS [2/]

Month	Arsenic	Cadmium	Copper	Iron	Lead	Manganese	Zinc
March 1973	0.00	0.00	0.00	0.22	0.01	0.02	0.01
May 1974	-	0.00	0.01	3.50	0.00	0.08	0.01

PESTICIDES

Month	Chlorinated Hydrocarbons	Organic Phosphorous
March 1973	None detected	None detected
May 1974	None detected	None detected

NUTRIENTS [2/]

Month	NO_3	Org. N	H_3PO_4	Tot. P
March 1973	0.30	0.1	0.01	0.01
May 1974	0.11	0.1	0.01	0.10

[1/] Sample location 10.8 miles downstream from Fort Jones near U.S.G.S. gaging station.

[2/] Values are expressed in units of milligrams per liter (mg/l).

Source: California Department of Water Resources. 1974-1975. "Hydrologic Data: 1973-1974, Volume 1: North Coastal Area." Bulletin Nos. 130-73 and 130-74. Department of Water Resources. Sacramento, California.

in Figures 4-3 through 4-5, additional U.S. Geological Survey and California Department of Water Resources data exist for various months and years for the following parameters:

Calcium	Boron
Magnesium	Dissolved solids
Potassium	Noncarbonate hardness
Carbonate	Sodium
Sulfate	Sodium absorption ratio
Chloride	Silica
Nitrate	Turbidity

All water samples analyzed by these two agencies were collected near the U.S. Geological Survey station approximately 10.8 miles downstream of Fort Jones.

McKee and Wolf (1963) state that the best waters supporting diversified aquatic life are those with a pH of 7-8 and a total alkalinity 100-120 milligrams per liter (mg/l) or greater. Alkalinity and pH values for the Scott River (Figures 4-3 and 4-4) are generally within these approximate boundaries indicative of good fish-supporting water. Nutrient levels in the Scott River are not excessive; no pesticides have been detected in the river; and with the exception of one relatively high value for iron, heavy metal concentrations are low (Figure 4-5). Even should iron concentrations be occasionally high, oxygen and pH levels will cause it to precipitate out of solution. The iron precipitates will not be in great enough quantity to cause a problem by smothering fish eggs.

Water Diversion. In order of importance, the human activity having greatest immediate effect on the free-flowing and natural condition of the section of Scott River included in the Wild and Scenic Rivers Act is water diversion. It is important to understand that low flows in summer and fall complicate the problems which the river already faces with regard to sediment deposition from erosion and landsliding. In critical years such as 1976-77, when rain- and snowfall were far below normal, flows in portions of the river were extremely low.

In addition to the agricultural losses occasioned by these two dry years, the loss in fish and terrestrial wildlife has probably been sizable. Such loss has an economic effect on the people of Siskiyou County due to reduction on the numbers of fishermen, hunters, campers, rafters, and tourists drawn to the area, and a resultant lessening in demand for goods and services. Also, the Department of Fish and Game has a significant investment in the Scott River through its fish screen installations, temporary fish traps for fish salvage, and maintenance of these facilities.

On March 13, 1970, the Scott Valley Irrigation District petitioned the State Board for an adjudication or determination of the water rights in the Scott River stream system under the provisions of Sections 2500 to 2866 of the State

Water Code. The Board granted the petition and ordered that investigation of the Scott River system upstream from the U.S. Geological Survey gaging station near Fort Jones begin on May 1, 1972.

The California Department of Fish and Game filed a proof of claim for specific amounts of water for instream use of water for fish. As the basis for the right to the use of the water claimed, the Department referred to the water policy of the State and the fact that the State has a property interest in fish and wildlife. To support their proof of claim, the Department cited CEQA and Article 14, Section 3, of the State Constitution.

In disallowing the Department's proof of claim, the Board stated that under existing State law, the only basis for a right to the use of surface water are riparian ownership, a valid appropriation, and prescription. The Department's proof of claim states no facts which entitle it to any of these types of water rights. It does not claim to own any riparian land, to have appropriated water in accordance with provisions of the Water Code, or to have acquired any rights by prescription.

On January 7, 1974, the Board received from the U.S. Forest Service a petition to expand the adjudication to include all rights on the main stem of the Scott River between the gaging station and the confluence of the Scott River with the Klamath River. The petition stated that the Forest Service is the predominant riparian owner in this 21-mile reach of river, and that it has the responsibility to administer National Forest lands for many purposes, including maintenance of fish and wildlife. It was the Forest Service's concern that sufficient water be allocated to the lower 21-mile reach of the river for instream flows to maintain an adequate fishery. The Board granted the petition on April 18, 1974.

The adjudication proceedings culminated in 1978 in a decree issued by the Superior Court of Siskiyou County, defining all elements of each water right, including: (1) the amount of water each user is entitled to divert from surface streams or by pumping from groundwater supplies that are interconnected with the Scott River, (2) the area where such water may be used, (3) the priority of each water right as it relates to other water rights on the same source, (4) the purpose for which the water is used, and (5) the diversion season.

The Forest Service has requested that certain minimum flows in the Scott be preserved as "in-stream uses" for the retention of fishery habitat. The California State Water Resources Control Board, in their Draft Order of Determination released in 1977, has stated:

> "The U.S. Forest Service has a right to stream flow in the Scott River measured at the USGS gage below Fort Jones in the following amounts for instream use for fish and wildlife within the Klamath National Forest.

Period	Allotment, in cubic feet per second
January	200
February	200
March	200
April	150
May	150
June 1-15	150
June 16-30	100
July 1-15	60
July 16-31	40
August	30
September	30
October	40
November	200
December	200

"These amounts are necessary to provide minimum subsistence-level fishery conditions including spawning, egg incubation, rearing, downstream migration, and summer survival of anadromous fish, and can be experienced only in critically dry years without resulting in depletion of the fishery resource."

The priority of such rights is "equal and correlative with" the first priority rights of allotments to claimants from Diversion 576 to the USGS gaging station at Fort Jones. The Order of Determination defines priority class as:

"...a class of rights each one of which is equal in priority and correlative in right with all other rights of the same class appearing within the same schedule, so that in the event of a supply of water sufficient to supply only part of the entitlement of any specific priority class, said available supply shall be prorated in accordance with allotments in that priority class. No priority class is entitled to the use of any water until all rights of all priority classes with lower numbers have been fully satisfied."

The Determination also states:

"In addition to the allotment above, the U.S. Forest Service has a right to stream flow in the Scott River measured at the USGS gage below Fort Jones in the following amounts for instream uses within the Klamath National Forest for incremental fish flows and for recreational, scenic, and aesthetic purposes:

Period	Allotment, in cubic feet per second
January	226
February	226
March	226
April	276
May	276
June 1-15	134
June 16-30	184
July 1-15	132
July 16-31	152
August	47
September	32
October	96
November	158
December	226

The priority of this right is defined as superior to all second priority class rights and inferior to all first priority class rights between Diversion 576 and the USGS gaging station at Fort Jones.

"Naturally occurring high instantaneous flows at the USGS gaging station below Fort Jones during the winter and spring months at approximately five-year intervals are beneficial in maintaining the wild and scenic features of the reach of Scott River downstream from said gaging station designated for protection in Public Resources Code Section 5093.50 et seq (The California Wild and Scenic Rivers Act) and to the Scott River fishery resources in flushing, cleaning,

and renewing spawning gravels. In acting on future applications to appropriate water the State Water Resources Control Board shall recognize the principle that there is a finite limit, undetermined at this time, to the amount of impairment to flows upstream from said gaging station that can take place without damaging these benefits and shall give consideration to conditioning permits so as to protect the benefits derived from such flows."

Also, the Determination provides that:

"Diversion structures shall be constructed and operated so as to pass stream flow in excess of the diversion allotment directly to the stream channel to allow passage by fish during the spring months ending about June 1. Pump intakes and diversion dams must meet the requirements of the Department of Fish and Game as provided by the applicable Fish and Game Sections. The claimants shall breach gravel diversion dams at the end of the irrigation season each year to allow adult fish to ascend to their spawning grounds."

Aquatic Resources

The Scott River is famed throughout northern California for the quality of its anadromous fisheries resource, plus it also has a resident brown trout population. Most anglers fish the river during the fall and winter steelhead runs; for local residents, the river and its tributaries offer a continuing recreational fishing value (Figure 4-6).

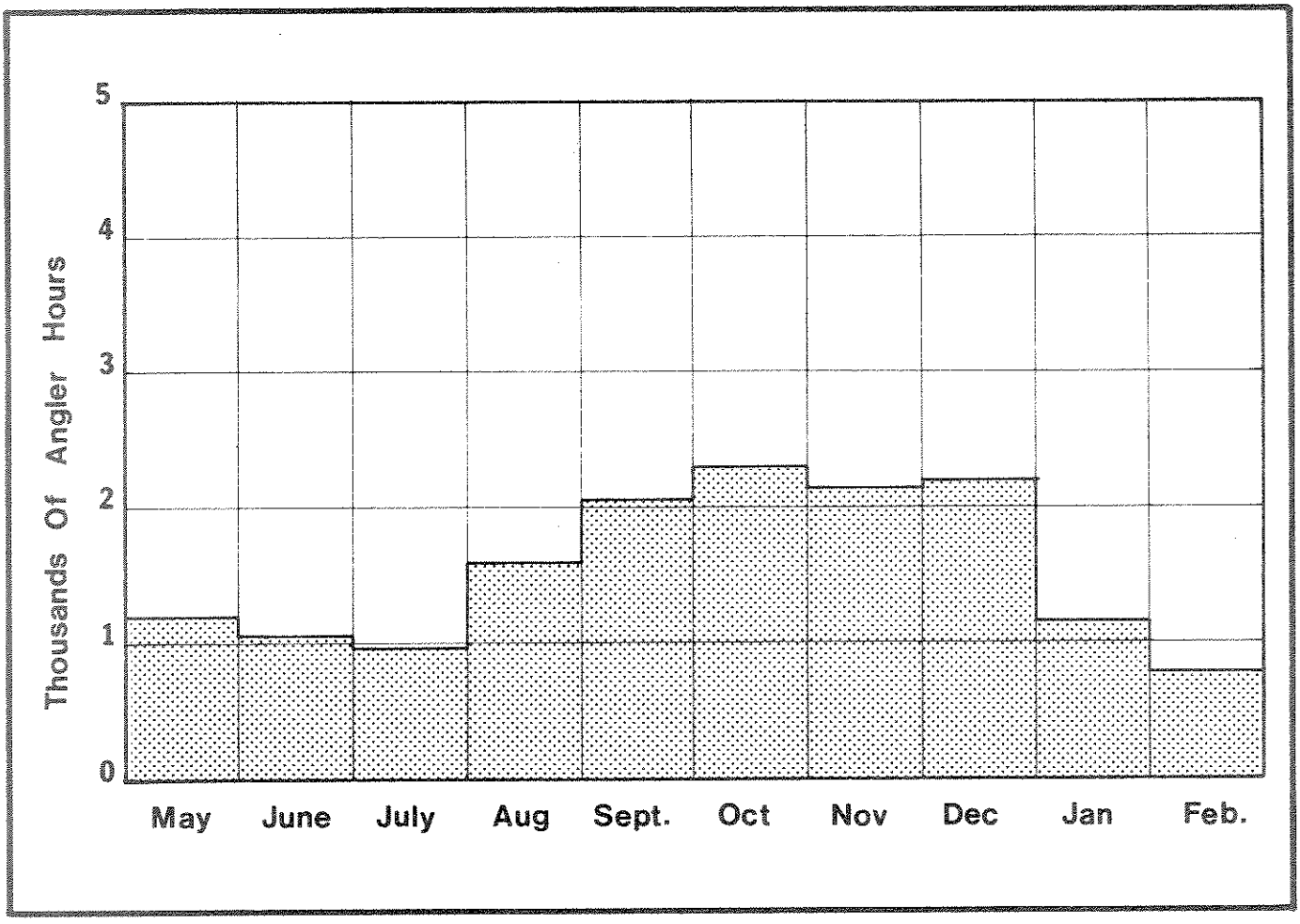
Critical Elements of the Scott River Anadromous Fishery

1. River flow. The primary and most critical concern regarding the anadromous salmonid fishery is the quantity of water in the Scott River. Water flows available for fishery maintenance are now at the base level necessary to sustain present population numbers. Further appropriation of water can only damage the Scott River fishery. Adequate river flows are critical to the following phases in the anadromous salmonid life cycle (also see Figures 4-7 and 4-8):

    a. Migration. Usually, flows of 150 to 200 cfs are necessary for adult king salmon to navigate the Scott River safely and reach the best spawning grounds. The fall migration of these fish coincides with general cessation of irrigation demands and the occurrences of early fall rains. Temporary diversion dams constitute barriers to upstream and downstream migration of fish. During the irrigation season as many as 40 of these gravel dams have been noted by Department of Fish and Game field personnel.

FIGURE 4-6

Angler use, Scott River, canyon area.
Source: Lanse, 1972a.



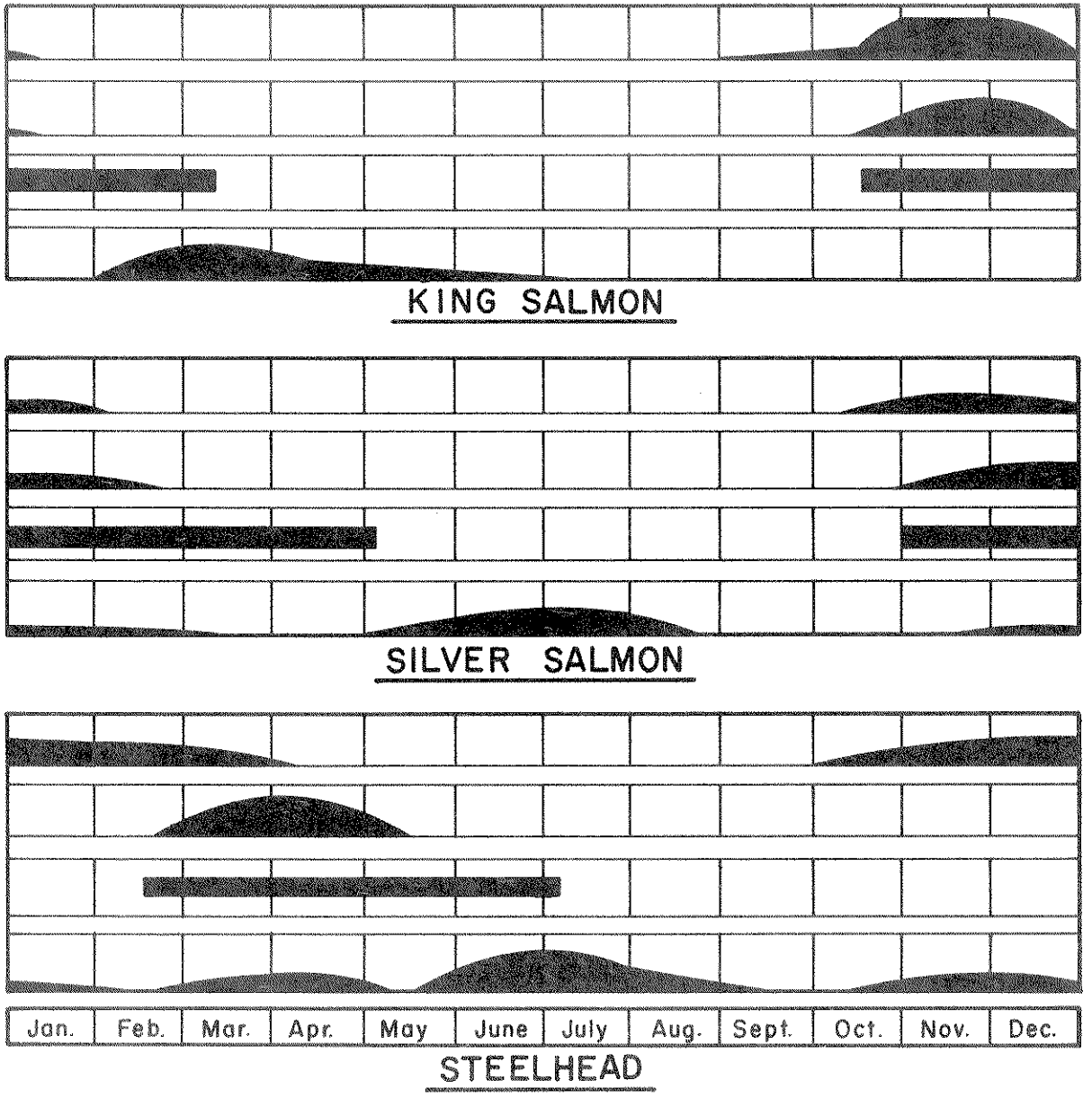


Figure 4-7

SPAWNING, EGG INCUBATION, AND MIGRATION PERIODS
OF ANADROMOUS FISH FOR THE SCOTT RIVER

FIGURE 4-8

A Qualitative Summary of How River Flow
and/or Temperature Conditions Meet the Needs
of the Anadromous Salmonid Populations in the Scott River

Species and run	Holdover of adults prior to spawning	Spawning	Juvenile rearing
Steelhead	Good	Good	Poor
Silver salmon	Fair	Fair	Poor
King salmon			
Spring-run	Poor	Poor	Fair
Fall-run	Poor to fair	Poor to fair	Fair

Source: Compiled from unpublished data and personal communications with the California Department of Fish and Game.

b. Rearing habitat. Physical space for juveniles to feed and find shelter is a limiting factor for the Scott River anadromous salmonid population. Low flows reduce the amount of suitable rearing habitat available to young fish.

c. Spawning success. Low flows fail to flush silt and sand from the spawning gravels. The silt and sand fill the voids in gravels, reducing the rate of oxygen delivery, ultimately causing greatly increased mortality among the developing embryos and emerging fry.

2. Water temperature. Water temperatures in the Scott River are influenced by river flow rates, irrigation return flows, groundwater, and tributary input. Suitable water temperatures are particularly crucial to the adult king salmon fall spawning (maximum temperature 56 F) and the rearing of juvenile salmonids (optimum temperature 55 to 60 F). Adequate water temperature can be preserved by maintaining river flows, protecting groundwater supplies, and protecting a shade zone of trees along each side of tributary streams to reduce solar radiation evaporation, and to hold back sediments and debris.

3. Sedimentation and siltation. High concentrations of suspended solids and excessive sedimentation in the Scott River are usually the result of natural occurrences such as seasonal input from tributaries such as McGuffy Creek (R.M. 6.3) and slide areas in the gorge, disturbances in the upper watershed, and also man-made disturbances like road construction, logging, mining, and residential development. Logging, improper road construction, and poorly planned development can greatly increase sedimentation, particularly in areas of sandy and unstable soils. High concentrations of suspended solids, if prolonged, can affect fish in the following ways:

   a. Raising water temperatures by particulate absorption of solar radiation.

   b. Abrading gill tissue and causing a reduction in respiration efficiency.

   c. Reducing fish visibility necessary for feeding.

   Siltation is the more serious problem in the Scott River as it has a permanence alleviated only by periodic flushing of the river by high flows. Excessive sand and silt affect fish by permeating and clogging spawning gravels, and reducing food supplies by smothering aquatic invertebrates and filling the crevices invertebrates need for shelter.

4. Egg deposition and development. The salmonid eggs are buried in permeable gravels that allow the developing eggs adequate supplies of oxygen and the removal of metabolic wastes. This interchange of fresh water between stream and gravel bed is affected by streamflow, gradient, curvature of the streambed, and coarseness and permeability of bed materials. Sand and silt can fill the voids in the gravel and reduce the flow of intergravel water, causing a reduction in the delivery rate of dissolved oxygen and the rate of metabolic waste removal. King salmon egg mortality can be as high as 85% when 15 to 30% of the voids in the gravel beds are filled with sediment. Pacific salmon egg mortality associated with low dissolved oxygen can range from 60 to 90%. The intragravel flow and available dissolved oxygen is also affected by water velocity.

5. Rearing habitat. Shelter and water temperature are the two critical elements of rearing habitat in the Scott River. The term "shelter" constitutes physical space that provides salmonid fry or fingerlings a reasonable degree of protection from predators during their 1- to 4-year residence in the river. Diminished flows in a river greatly reduce the amount of shelter available to fish. This lowers the number of fish the river can support. Abundance of food is a limiting factor in the Scott River because low flows decrease food supply by exposing portions of the streambed, and also by reducing water velocity, thereby causing a reduction in invertebrate productivity.

6. Primary uses. Within that portion of the Scott River which is included in the Wild and Scenic Rivers System, spawning, rearing, resting, and migration of anadromous fish takes place throughout this entire reach; however, individual uses can be concentrated in certain sections; e.g., the first 5 miles of the Scott River are most notable for sections of good spawning habitat. The section covering river miles 5 through 10 (Scott River gorge area) is a major rearing area for juvenile salmonids and has many pools providing suitable resting habitat for adult steelhead and salmon. The next 10 river miles serve mainly as migration water. Medium size boulders have created temporary resting habitat for migrating salmonids. The upper 5 miles to Meamber School contain the most extensive spawning gravels in this portion of the Scott River. These gravels are, however, deteriorating in spawning suitability as they become permeated with sand. The excessive quantity of sand moving through the Scott River Valley into the planning area is a result of former mining and past and present logging on unstable soils of the upper Scott River tributary system. Important anadromous salmonid spawning and rearing habitat is provided by the lower Scott River tributaries of Mill Creek, Tompkins Creek, Kelsey Creek, Sniktau Creek, and Canyon Creek (Figure 4-9).

   Aquatic invertebrate production, providing food for anadromous salmonids, is greatest wherever riffle areas combine a rubble substrate with a swift current. This combination creates optimum conditions of shelter, dissolved oxygen, and food necessary for a dense invertebrate population.

FIGURE 4-9

Miles of Tributary Waters
Accessible to Anadromous Salmonids

Tributary to Scott River	Steelhead		Salmon	
	Public	Private	Public	Private
Canyon Creek	2.8	0.2		
Kelsey Creek	0.6			
Mill Creek	1.3	4.2		1.0
Tompkins Creek	2.9	0.6		
Sniktaw Creek[1/]		2.5		

[1/] Experiences complete dessication annually at its mouth on the Scott River.

Source: Adapted from Lanse, 1972b.

Critical Aquatic Habitats. Low flows in the Scott River during late summer make suitable rearing space for juvenile salmonids a limited commodity. Portions of the river and its tributaries that currently provide summer rearing habitat are critical to the welfare of the anadromous salmonid fishery.

Mill Creek, Tompkins Creek, Kelsey Creek, Sniktaw Creek, and Canyon Creek provide valuable anadromous spawning and rearing habitat. Summer water temperatures are 10 to 15 degrees F cooler than the Scott River and are more suitable for salmonids. The tributary inflow of cooler water into the Scott River also benefits fish residing below the confluence.

The interior gorge portion of the Scott River (river miles 5 through 10) appears to support the highest concentration of juvenile salmonids in the planning area. Moderately deep pools and the relative inaccessibility of the gorge shelter the fish from excessive fishing pressure. These same conditions also shelter migrating adult salmon and steelhead.

Water and Aquatic Resources Recommendations

Anadromous fishery runs of the several Klamath River Basin species have historically been substantially greater than indicated by current data. Historical data indicate that approximately 300,000 to 400,000 king salmon were produced annually from the Klamath River drainage during the period 1915-1928, while the estimate for 1960 was 100,000-125,000 and for 1967 was 168,000. The preliminary estimate for 1978 was 139,000.

Many causes for this decline can be identified as contributing factors. Reservoirs inundate spawning habitats, prevent upstream migration to historic spawning areas, and alter downstream annual flow regimes which affect flows during upstream migration of adult salmon. Diversion of water put to human use, such as interbasin export and local irrigation, also alter flow during upstream migration. In addition, land use activities have been undertaken which can alter the annual flow regime by altering the runoff/infiltration condition of the land surface. These land uses probably have had more effect on salmon by increasing the sediment input to the river system through accelerated erosion. The combined effect of land use alterations and major dams can result in habitat loss greater than the simple sum of the two individual processes due to increased sediment discharge of tributary streams with the lack of an annual flushing peak flow.

There is some evidence that the anadromous fishery of the lower Scott River has been affected by the use of upstream groundwater which reduces late-season streamflow due to reduced groundwater discharge to the river at the lower end of Scott Valley; increased sediment production due to land use activities which has resulted in some accumulation in the main-stem channel; and increased water temperature resulting from streamside land uses, low flows, and widened channels.

Low flows in the Scott River generally occur July through October. Because king salmon normally enter the river September through early January, this species' spawning migration is often hindered by low flows and high water temperatures. Flows of 150 to 200 cubic feet per second (cfs) are preferred for adult king salmon to navigate the Scott River safely.

As a result of declining salmon production of the region and the designation by the State Legislature of the Scott River as a State Wild and Scenic River with high fishery values to be protected and enhanced, it is recommended that:

> *The Department of Fish and Game shall, in cooperation with the Forest Service, participate with the Departments of Boating and Waterways and Water Resources to evaluate fishery flow needs and determine boating recreational flow needs on the Scott River.*

If the results of this study indicate that fish flows and water temperatures are less than would provide unimpeded upstream migration of salmon and successful spawning, it is recommended that:

> *The Departments of Water Resources and Fish and Game, along with the Department of Boating and Waterways (provided that the Boating Trail evaluation indicates the advisability of designation), shall, in cooperation with the Forest Service, be authorized to conduct studies to determine methods and the feasibility of augmenting fishery and recreational flows in the Scott River.*

In April 1979, the State Resources Agency unveiled a proposal for implementing a Renewable Resources Investment Fund for California. The Fund's primary objective is to increase the State's renewable resources and to maintain them in perpetuity. Emphasis in this program is being placed on fisheries, forests soils, parks and recreation, and water. With respect to fisheries, one of the key proposals is to undertake a comprehensive anadromous fishery habitat restoration program in the Klamath River basin. This program recognizes that one of the critical factors in restoring anadromous fishery runs is to enhance degraded habitat conditions in the Klamath's various river systems and their major tributaries. It is therefore recommended that:

> *The Department of Fish and Game shall, in cooperation with the Forest Service, implement an action program for enhancing anadromous fish habitat within the Scott River and its major tributaries.*

The excessive harvest of adult anadromous fish during low population levels can lead to further declines and even accelerate the rate of decline. The commercial catch of ocean-caught salmon off the Pacific Coast has been reduced through actions taken by the Pacific Fisheries Management Council in an effort to increase the number of adult anadromous fish returning to spawn. If an intensive, relatively unregulated, and very effective net fishery continues in the lower Klamath River, population levels of anadromous fish in the upper Klamath River system can continue to decline. It is therefore recommended that:

The Resources Agency shall cooperate with federal agencies and Indian tribes in the Klamath-Trinity basin to esnure that excessive harvest rates by the ocean, sports, and Indian fisheries do not deplete the anadromous fishery resource.

As stated previously, groundwater use in the upstream Scott Valley can have an effect on the low flow characteristics of the reach of the Scott River designated as part of the State Wild and Scenic Rivers System. The Water Quality Control Plan Report covering the north Klamath River Basin was published by the State Water Resources Control Board in September 1975. It states:

"The 92,000 acre-feet of agricultural water presently used in Scott Valley comes from stream diversion and groundwater pumping. Groundwater supplies about 5,000 acre-feet per year and the remaining 87,000 acre-feet comes from the Scott River and its tributaries. By the year 2000 irrigated agriculture is expected to increase to 38,200 acres, requiring a supplemental water supply of 23,000 acre-feet annually.

"Studies of possible surface water developments have been made by state and federal agencies but the cost of water would exceed the payment capacity of the crops to be grown. Additional groundwater development, used conjunctively with existing surface supplies, appears to be the most favorable source for meeting future water demands in Scott Valley. Preliminary estimates indicate that about 36,000 acre-feet per year could be obtained from the Scott Valley groundwater basin."

Substantial evidence exists that groundwater plays an important part in recharging the Scott River's diminishing summer and fall flows as the river leaves Scott Valley. Because of the importance of this discharge in maintaining base period streamflow, it is recommended that:

Any studies by State agencies directed at additional groundwater development shall establish and determine that the amount and timing of groundwater discharge to the river will not be lessened or impaired by such groundwater development.

Not only are low flows of concern on the Scott River, but also are the lack of annual peak flows that flush the spawning gravels, entrain received sediment and transport it out of the basin, and incise narrow deeper channels into broad gravel bar area, all of which tend to improve spawning activity. The condition of spawning gravels are of prime importance to anadromous fish. Care should be taken to maintain the quality of the spawning gravels in the Scott River if spawning success is to be insured.

Examination of substrates and the aerial counting of king salmon redds (California Department of Fish and Game, unpublished data) show the best salmonid spawning grounds in the Scott River planning area to be located between the USGS gaging station and the mouth of Shackleford Creek (river miles 21.0 to 23.9). Deposition of sand and inadequate flushing of the spawning gravels endanger this prime spawning area.

The Department of Fish and Game shall, in cooperation with the Forest Service, seasonally inspect these spawning gravels to insure that flushing flows as allocated by the Order of Determination are sufficient for preservation and enhancement of salmonid spawning potential.

As stated earlier, stream temperatures are important parameters in the success of upstream migration and spawning success. The preferred summer temperature range of a good salmon stream is 50 to 60 F. However, summer water temperatures in the Scott River are often in the low 70s (degree F). Elevated stream temperatures can result from several factors; e.g., decreased streamflows resulting in greater substrate heating and conductive heating of the overlying water, increased sediment discharge and aggradation resulting in wider-shallower channel with increased heating, warm flood irrigation return water increases the river temperatures, and increased insolation resulting from loss of shading from streamside trees. The first two are addressed in other portions of this chapter while stream shading is addressed here. The importance of streamside shading by trees varies with several factors. Channel characteristics, shallower streams are more susceptible to heating through loss of shade. Stream reach and bank orientation, trees west of streams cast long shadows during warm afternoons and are most significant; trees south of streams cast short shadows during the peak insolation period of noon and are second most significant; trees east of the streams cast long shadows in the morning cool hours and are third most significant; and trees north of the stream cast no shadows into the stream and are least important. Also an east-west stream reach is shaded predominantly by trees to the south while a north-south stream reach is shaded by both trees to the east and west but not by trees to the south.

Under the Northern Forest District Rules, a Stream and Lake Protection Zone (SPZ) provides measures by which stream shade-producing trees may be harvested on private lands. The zone allows a 50% or less removal of shade-producing canopy and allows for greater removal where it is necessary to achieve stocking standards; it can be reasonably expected that there will not be substantial adverse effects on soil erosion, wildlife, aquatic life; it can be shown that the remaining streamside shrubs will still provide adequate protection; stream orientation is such that the east- and north-facing slopes are involved; the depth and narrowness of the canyon at stream level is such that no substantial increase in insolation will result; a combination of "inherent" temperature, depth, rate of flows, and volume of water is such as to prevent significant heating or temperature higher than normally required for the survival of trout or anadromous fish, or the length of stream affected by canopy decrease is less than 200 feet.

It has been the determination of this waterway management plan that the Northern Forest District Rules for shade canopy retention under Stream and Lake Protection Zone provisions are generally adequate with the following exceptions.

During the development of the background data for the waterway management plan, it was determined that five major Scott River tributaries contain high fishery values and are susceptible to adverse impact, in terms of heating, due to the removal of streamside canopy vegetation. These streams are noted as "shade

tree buffer zone tributaries" on the Sensitive Habitat Areas Map (Plate 1). The shade canopy retention levels provided for by the Northern District Rules pertaining to the Stream and Lake Protection Zone are not adequate to protect these particular tributary spawning habitats that are important to the Scott River fishery. This is because some of the trees that provide shade canopy for these tributaries occur outside of the SPZ provided under the current Rules. Therefore it is recommended that:

> *The Board of Forestry shall amend the Northern District Rules pertaining to the Stream and Lake Protection Zone (SPZ) to provide for maximum retention of shade-producing streamside canopy vegetation. This should include a provision for allowing site-specific increases, beyond the 50% increase already allowed in the Rules, in the width of the SPZ, and the degree of shade canopy retention within the SPZ. This recommendation applies only to those streams noted as "shade tree buffer zone tributaries" on the Sensitive Habitat Areas Map.*

Activities of other local, State, and federal agencies are of potentially equal importance to the disturbance of riparian shade vegetation. Therefore:

> *Prior to approving any project or action in the riparian zone of those stream reaches noted as "shade tree buffer zone tributaries" on the Sensitive Habitat Areas Map, all State agencies shall, and all local and federal agencies and departments should, provide for the retention of shade-producing streamside vegetation to the fullest extent possible.*

The following sections of this chapter address various aspects of slope stability, erosion, and sedimentation.

Areas of slope instability, which include slopes over 50% which can be highly erodible landslide areas and other types of geologic hazards, have been identified on the Geologic Hazards and Impacts Map (Plate 2) and the Management Recommendations Map (Plate 4). These areas represent present or potential trouble spots for excessive sediment production that can seriously impact aquatic resources in the Scott River system that are highly susceptible to degradation from erosion and sedimentation. It is therefore recommended that:

> *Prior to approving any project or action in areas of slope instability occurring in the planning area along the main stem Scott River or in "areas of special concern" along its major tributaries, all State agencies shall, and local agencies should, take special precautions to prevent erosion and implement measures to improve the surface conditions, relative to erosion, where possible.*

For the purposes of harvesting timber on private lands: (1) containing areas of slope instability (landslides and highly erodible slopes over 50%) and occurring either in the planning area along the main stem Scott River or in "areas of special concern" along its major tributaries; and (2) occurring

within the existing 200-foot "Special Treatment Area" along the main stem Scott River, due to their high value and sensitivity and the fact that the existing Northern District Rules do not adequately protect against excessive erosion in such areas, it is recommended that:

> *The Board of Forestry shall amend the Northern District Rules pertaining to silvicultural methods, logging practices, erosion control, stream and lake protection, and hazard reduction in order to provide for minimizing erosion to the maximum extent possible. This shall include appropriate provisions being developed under the State Water Resources Control Board's 208 program (Best Management Practices), proposed rule changes submitted on April 24, 1978 by the Department of Forestry to the Board of Forestry (including the Northern District Technical Advisory Committee's review of them), and the Department of Forestry's December 22, 1978 guidelines for evaluating THPs containing all or a portion of the 200-foot Special Treatment Area (STA) along the Wild and Scenic Rivers. In addition, the following provisions shall also be included: (1) increasing the width of the SPZ or 200-foot STA on a site-specific basis where necessary to ensure resources protection; (2) applying to road design and construction the next higher Erosion Hazard Rating than that determined by ground conditions; (3) treating all areas of bare mineral soil created during the harvesting operation to minimize erosion prior to November 15 of the year of disturbance; and (4) no soil, silt, bark, slash, sawdust, or other organic and earthen materials shall be placed or disposed of at locations where it could enter streams or drainages, ephemeral or otherwise.*

Although not documented as a significant problem within the planning area, the increased use of off-road vehicles (ORVs) for recreational purposes on certain public lands has created interest on the part of both users and nonusers. Off-road vehicle use can cause a loss of vegetation and soil or soil compaction. Such damage increases runoff and lowers water quality. Accelerated gully and sheet erosion resulting from off-road vehicle use can change some types of habitat sufficiently to cause the associated plant communities to vanish. Herbaceous plant communities are particularly vulnerable to destruction by the impact of vehicular traffic.

Wheel ruts can channel water runoff and can cause damages which require rehabilitation and control of use. These kinds of damages are detrimental to water quality and result in adverse impacts upon fisheries, wildlife habitat, recreation, and the visual resource.

The Klamath National Forest currently has an approved ORV plan and will be reviewing the plan during the preparation of the Forest Land and Resource Management Plan. The Forest is required to monitor use in the area and effect changes if unacceptable resource damage occurs. For the purpose of planning and management of off-road vehicles, it is recommended that:

Klamath National Forest should monitor ORV use in the planning area and in "areas of special concern" for unacceptable resource damage, effect changes if unacceptable resource damage occurs, and consider the State Wild and Scenic designation in the review of the ORV plan during the Forest Land and Resource Management Planning process.

Not only will appropriate land uses and human actions tend to reduce the rate of erosion of the Scott River planning area and in turn reduce the rate of sediment input to the river, but also many actions could be undertaken to improve the existing land surface condition. Many effective methods exist that involve small, labor intensive projects using local materials of relatively low cost. Labor intensive projects conducted at low, but continuous rates can also provide a positive economic impact both in terms of providing jobs and improvement of the resource base of the planning area, as well as improving the commercial economic value of the anadromous fishery of the region. It is therefore recommended that:

The Resources Agency shall investigate the feasibility, advisability, economic impact, and possible funding sources for a labor intensive, watershed improvement program for State Wild and Scenic Rivers planning areas.

It is also important that the long-term effects of actions on the river's resources be evaluated. It is therefore recommended that:

The current water analysis program conducted by the Department of Water Resources at the Ft. Jones USGS gaging station shall be continued to provide additional information on long-term trends.

Currently, the State Water Resources Control Board maintains a statewide water quality surveillance and monitoring program. This program is generally oriented toward the surveillance of streams of high beneficial use near population centers with present or expected industrial, municipal, or agricultural sources of water quality degradation. The State Legislature has determined that the Wild and Scenic Rivers have water quality characteristics of high value and they they are to be managed so as to maintain or enhance their water quality. This is the case even though, for example, the streams currently within the system have annual sediment rates of extreme variety.

It is recommended that:

The Department of Water Resources and the State Water Resources Control Board shall develop an action program to establish selected sampling stations on rivers within the State Wild and Scenic Rivers System as part of the primary network of the statewide water quality surveillance and monitoring program so that long-term trends may be established on the effect of land use activities on water quality.

Road Alignment, Construction, and Maintenance

Background

Probably the second most significant and ongoing danger to the free-flowing and natural condition of the Scott River are the activities of road construction and maintenance.

Two basic road types are present in the Scott River planning area. The first, and the most heavily used, are the improved public roads under the jurisdiction of the Siskiyou County Department of Public Works. These roads are used primarily for public transit and for log truck access to logging roads, and consist of the Scott River Road and its adjacent spurs like the Mill Creek Road.

The second basic road type is the public or private logging road. This type represents the majority of travel routes in the planning area. It is used primarily by log trucks for access to and from logging sites, but is also used by hunters during deer season, by off-road vehicles, and occasionally by hikers driving to backcountry access points.

Appendix VII (Plates A-7) shows most of the road network within the planning area.

Logging roads also have the potential to impact adversely the river's free-flowing and natural condition. Their construction can lead to landsliding, erosion, gullying, vegetation and wildlife disruption, and visual scarring. During and after construction and use, they remain a potential source of sedimentation, turbidity, wildlife disruption, and visual impact.

County roads represent impacts in terms of widening, reconstruction, and upgrading. Because they are designed for relatively fast travel, they often demand high wall cuts and substantial fills, as well as precipitation runoff gathering devices, bridges, and other engineered structures. Their impacts relate to erosion, landsliding, water quality degradation from road surface runoff, gullying, effects on visual quality and property values, and vegetation and wildlife disruption.

Private roads associated with private land developments, such as subdivisions, recreational developments, etc., represent impacts in terms of new construction, reconstruction, upgrading, and maintenance. Because private roads can be poorly designed and maintained, they have the potential to result in significant adverse impacts on the river. Such impacts are similar to those listed above for County roads.

Logging and road construction are present in the Scott River planning area on both public and private lands. Plate 3 shows the proposed U.S. Forest Service timber sales, the amounts, and proposed dates. Major logging operations on private lands are carried out on properties owned primarily by International Paper, United Fruit Growers, and Southern Pacific.

Agencies managing or overseeing such activities are:

1. Logging and haul road construction on private lands:	The California Department of Forestry and the individual timber company
2. Logging and haul road construction on public lands:	The U.S. Forest Service
3. County road construction and maintenance:	Siskiyou County, Department of Public Works
4. Land clearing and road construction for residential subdivisions:	Siskiyou County, Planning Department

Geologic Impacts and Hazards

In order to understand the nature and location of actual and potential geologic impacts due to road construction, road maintenance, and logging in the Scott River planning area, it is necessary to study Plate 2, the Geologic Impacts and Hazards Map.

The map is a composite of several data maps. The Slope Map was used to locate areas of steep slope, where logging and road building lead more easily to landsliding. The Landslides and Surficial Deposits Map was used to locate areas where old or potential landslides exist, including areas where unstable surface materials are susceptible to landsliding, slippage, or other forms of failure which can have negative impacts upon the free-flowing and natural condition of the river.

In particular, this map shows:

1. Identified active gullies and channels which are major sediment producers and transporters.

2. Landslides. These can supply sediment directly to a watercourse, block it, create visual scars, and cause revegetation problems.

3. Surficial deposits. These are bedrock materials which have been transported from one place and deposited in another, such as alluvial deposits of sediment eroded from the watershed.

4. Channel and floodplain deposits. These are areas which may be inherently unstable or susceptible to erosion.

5. Areas of extensive surface erosion. These are places that produce, in their present state, substantial amounts of sediment, much of which finds its way into the river.

6. Glaciated areas. These areas have been altered by glaciation and may be unstable.

7. All other areas with slopes greater than 50%. These areas, because of their steepness, present problems related to landsliding and surface erosion.

The purpose of locating such areas of potential or actual impact or hazard is to provide advance notice that activities such as improper road building and logging in these areas can have detrimental and degrading effects on the river's free-flowing and natural condition. However, not all potential hazards are depicted on this map, and further investigation is necessary for specific projects.

In discussing the relationship between these activities and the geologic impacts and hazards covered above, the geologist's report, which was part of the development of this plan, states:

> "Most of the impact sites which have been denoted on the Geologic Impacts and Hazards Map of the Scott River planning area are locations of active or potential mass-wasting, including all mapped landslides and questionable landslides, active gullies and channels, and areas of high erosion. Areas of large landslides and landslide complexes are common throughout the planning area. While most of these are not active under present tectonic and climatic conditions, they must be considered only moderately stable and therefore subject to reactivation, at least in part. It has been already established by studies in many regions of northern California that most active or recently active landslides are located within or adjacent to older, larger landslides and therefore future landslides are more likely to occur in these areas.
>
> "While some of these active slides are the result of natural processes, such as the removal of protective vegetation from steeper slopes by fire combined with subsequent intensive rainfall, or the undercutting of marginally stable slopes by lateral stream erosion, many of them are related to activities of man.
>
> "The upper, headscarp areas of the large, older landslides are often oversteepened and surficial deposits, and their soils are generally thin and marginally stable, with closely fractured or weathered bedrock near the surface. Some of these scarps are near vertical and contain active rock falls. Rock falls are also common in glaciated areas where bedrock is often exposed on near vertical slopes. Logging activities on these steep slopes, or other activities which remove or change vegetation types, alter surface drainage patterns, or change groundwater conditions, may result in renewed landsliding in the scarp areas and adjacent previously stable areas.

"The older landslide deposits in the planning area are generally more internally disrupted and structurally complex than the adjacent bedrock, and are sensitive to changes in conditions which destabilize the material. Such changes include the removal or change of vegetation types, as by logging, which tends to remove the vegetation canopy that protects surficial and soil materials from erosion by impact from intense rainfall, and which tends to destroy root systems that act to stabilize near-surface materials. There is often a delay of three to five years in the destabilizing effects of the loss of root systems.

"In addition to the removal or change in vegetation types, the alteration of surface drainage patterns, change in groundwater conditions, artificial oversteepening of slopes, or excessive loading of slopes may induce slope instability and landsliding, both in the immediate area and downslope of these changes. In the Scott River planning area, logging, road construction, and development are the major causes of all of these changes.

"Active or recently active landslides cover a smaller total area than the larger older landslides. They are generally individual slides with maximum dimensions of about 2,000 feet. Rather than being evenly distributed throughout the watershed, they tend to be concentrated in the inner canyons or on oversteepened portions of slopes adjacent to the Scott and its major tributaries, and in upland areas within or adjacent to recently logged areas. Many of the active or recently active landslides are clearly reactivated older landslide deposits resulting from changes due to logging and road building. A good example of this situation is the active debris slide located in the northeast side of the Scott River, just north of Spring Flat Campground. The undercutting of the toe or downslope parts of marginally stable older landslide deposits by streams is also a major or contributing cause of landsliding in the inner canyon area.

"Landslides have, and have had, a major impact on the Scott River environment. They modify the ground surface, creating visual scars; they destroy vegetation and timber, alter drainage patterns, and are probably the major contributor of soil and surficial debris to the Scott River and its tributaries. The costs of landslide damage and control are significant.

"High erosion areas are present in many parts of the upland areas where natural vegetation has been removed or changed and natural drainage patterns have been altered, primarily by logging activites. These include extensive logged areas both within older landslides and in areas underlain by upland soils with a moderate to high erosion hazard. Significant surface erosion of these soils by impact from intensive rainfall, soil creep, and rilling occurs in these areas. Such erosion often destroys economically valuable soils, creates visual scars, and increases downstream siltation that affects the free-flowing and natural condition of the River.

"Active gullies and channels are common throughout the Scott River planning area. While a few of them at higher elevations may be due to snow avalanche activity, most are closely associated and probably related to logging activities and road building. They are common in areas of older landslides and in high erosion areas, and characterized by vegetation scars.

"Gullying in areas of marginally stable surficial deposits or sensitive soils, once initiated, is particularly difficult to stop, and gullies rapidly grow by headward erosion and lateral slumping. Active gullies and channels are not only areas of erosion but are also areas of soil transport during periods of high runoff, and are areas of soil deposition during other periods. Roads, bridges, and culverts are often damaged or destroyed during such periods of high soil transport.

"The area of channel and flood plain deposits includes the active channels and areas adjacent to the Scott River and its major tributaries which show youthful features suggestive or historic or very recent erosion and deposition. The existing river conditions of the active Scott River channel are shown in detail on the River Conditions Map. The boundaries of the area of channel and flood plain deposits generally outline the major areas that might be subjected to flooding during large floods such as occurred in 1964 when peak stages of a little more than 25 feet were measured at the U.S. Geological Survey gaging station located about five miles upstream from Indian Scotty Campground. However, other areas not included within these boundaries may be subject to flooding under unusual circumstances or combinations of rare conditions.

"Flooding in the Scott River drainage basin is more or less at the whim of nature, since no flood control facilities exist on the River. Although there has been some suggestion that recent floods have been "larger" due to logging activities, a recent study suggests that floods which occurred in the early 1500's and mid 1600's were equal or greater in magnitude than the 1964 flood. There is some suggestion, however, that the frequency of large floods has increased since logging began. Impacts in these areas include the erosion and deposition of alluvial deposits, bank slumping, rearrangement and scour of channel deposits, and resulting damage or loss of habitat, alternation of channel courses, and removal of riparian and other vegetation. Associated hazards include injury and loss of life, damage or loss of agricultural soils and crops, and damage or destruction of man-made structures, with attendant maintenance and replacement costs.

"All the other types of surficial deposits, mapped separately on the Landslides and Surficial Deposits Map, have been combined into one unit on the Impacts and Hazards Derivative Map. These include alluvial deposits, alluvial fan deposits, older alluvial fan

deposits, River terrace deposits, and colluvial deposits. In general, these deposits are flat to gently sloping, and are relatively stable under existing conditions. The natural processes that form and modify these deposits generally act slowly over geologic time, with little short-term impact. However, man's activities can accelerate or modify these processes sufficiently to impact the environment and pose hazards or potential hazards.

"The remainder of the planning area, not included in one of the categories discussed above, has been divided into two categories based primarily on percent slope. These areas have relatively few impacts and hazards under existing conditions. However, areas with slopes greater than 50 percent generally are more susceptible to landsliding or soil erosion where thicker accumulations of surficial deposits or sensitive soils occur. Most of the soils in the upland areas do have a moderate to high erosion hazard. Debris type landslides particularly are more likely to occur on steeper slopes, particularly those greater than 75 percent, where thicker accumulations of surficial material are present."

Road Alignment and Construction Recommendations

Within the California State Wild and Scenic Rivers Act, it is stated that the rivers shall be managed such that their character will not be degraded. Access is a prime determinant of river classification; wild reaches are generally inaccessible except by trail with watersheds or shorelines essentially primitive; scenic reaches have shorelines or watersheds largely primitive and shorelines largely undeveloped but accessible in places by roads; and recreation reaches are readily accessible by road or railroad that may have some development along their shorelines.

Therefore:

No State agency shall, and no local agency should, approve or construct any road or improved river access that would result in degrading the classification of a designated river segment.

And that:

The Forest Service, in its land management planning process, should consider not allowing any road construction which will reduce the existing wild and scenic river classification of the designated segments of the Scott River.

The following recommendations apply primarily to logging roads on private lands. They would equally apply, however, to major alterations and upgrading of the Scott River Road or other County routes by the Siskiyou County Department of Public Works and Caltrans and to private residence access roads. They are compiled from the best knowledge available in this country today in terms of understanding the relationship between human activity in a watershed and the potential consequences of that activity upon rivers and their tributaries.

Where feasible, roads in the planning area and in "areas of special concern" shall avoid crossing active or inactive landslide scarps and deposits. However, where this is impossible, detailed protective measures should be required as provided for in the Northern Forest District Rules, or mitigation measures detailed in the appropriate environmental documents. Such mitigation measures shall be implemented on the ground.

The scarps (the steep, higher portions of landslides) and deposits (the unstable rock and earth derived from the slide and lying below the scarp) are both easily reactivated into new slides, particularly by the impact of road construction and use, or by the erosional activity of runoff generated by a road. The Landslides and Surficial Deposits Map shows the location of all known active and inactive landslides in the lower watershed.

The inner gorge is that part of a river or stream canyon which is narrow and relatively steep. Depending on the size of the stream and the surrounding topography, this river canyon area can extend a quarter mile above the stream or more. Recent studies by the Forest Service on the Six Rivers National Forest in northern California indicate that any road located in this inner gorge area is more likely to lead to substantial landsliding and erosion. Therefore it is recommended that:

Roads shall not be constructed in the inner gorge or on lower, oversteepened portions of slopes adjacent to tributary streams, nor shall they be constructed in stream channels themselves.

The following provisions of the California Forest Practice Act, dealing with road construction and maintenance on private lands logging operations in the Northern Forest District, are taken from Article 5, Section 935:

"Logging Roads - Logging roads shall be laid out and constructed in such a manner that the general contours of the land are utilized to the fullest extent practicable to avoid excessive cuts, fills, and road grades. Unless indicated in the Timber Harvesting Plan, roads shall be constructed to single lane width with turnouts at reasonable intervals. Both roads and turnouts shall be no wider than necessary to permit safe passage of logging trucks and equipment. Logging roads shall not exceed a grade of fifteen (15) percent except that pitches of up to twenty percent (20%) will be allowed, not to exceed 500 continuous feet in length. These percentages may be exceeded only where it can be clearly shown that there is no other feasible access for the harvesting of timber, or the use of gradient in excess of twenty percent (20%) will serve to reduce soil disturbance. Said road will be indicated in the Timber Harvesting Plan. New road location shall avoid, where possible, soil with high erodible characteristics, old or active slides, and identifiable potential slide areas."

Therefore it is recommended that:

> *Within the planning area and in "areas of special concern", the California Department of Forestry shall carry out Article 5, Section 935, of the Northern Forest District Rules in accordance with the Landslides and Surficial Deposits Map prepared as a part of this waterway management plan.*

Due to the complexity of the geology of the Scott River planning area, the inherent slope instability, and the significance that mass wasting has on the resources of the Scott River and its planning area, it is recommended that:

> *Where a road is to be located in any area of the planning area or in "areas of special concern" that involves or can reasonably be considered to involve an area of slope instability or potential slope instability as shown on the Geologic Impacts and Hazards Map, the approving or constructing State agency shall, and local agency should, certify that a qualified engineering geologist licensed by the State has reviewed the plans, conducted an on-site inspection, and that his recommendations have been incorporated into the project planning and design.*

During the development of this waterway management plan, the following concerns developed over the alignment and construction of roads:

Slopes steeper than 50% in the planning area are particularly susceptible to landsliding and excessive erosion. Thicker surficial deposits increase the distance between bedrock and the surface of the ground. Because surficial deposits have been derived elsewhere and transported to their present location, they are generally more unstable in mountainous areas than bedrock.

At present, many active gullies and channels in the planning area have been "left hanging" high up on slopes when high wall cuts were engineered directly beneath them, particularly along the Scott River Road. Almost all of them are plugged with coarse debris during much of the year. This debris is then flushed onto the roadway during high winter runoff, with resulting traffic hazards and high road maintenance costs.

Present grading practices on nonsurfaced roads represent serious potential negative impacts, in terms of sedimentation and landsliding, upon the free-flowing and natural condition of the Scott River. Some of the most serious impacts relate to the practice of cutting and filling to create reasonable grades and alignments. It has been shown that a cut-and-fill operation can provoke failure of an entire slope, even though the operation itself may not fail.

The advantage to minimal cut slopes, as opposed to high cut slopes, is that they reduce the amount of new surface exposure (thus lessening erosion and sediment production), and they are less destructive to slope stability.

Therefore it is recommended that:

The reviewing engineering geologist's consideration shall include, but not be limited to, the following:

- *Roads crossing slopes steeper than 50% (see Slope Map, Plate A-4) shall be reviewed for potentially accelerated erosion and mass wasting, particularly where thicker surficial deposits are present or slopes less than 50% where special problems may occur. Recommendations shall include alternative routes and alignments.*

- *Active gullies and channels shall be carefully noted before selection of road alignments and, in particular, before locating upslope cuts. In the future, all such gullies and channels shall be crossed by roads at or above grade.*

- *All cuts and fills shall be engineered in terms of overall slope stability rather than solely the retention or failure of a simple cut or fill.*

- *Cuts and fills shall be designed to contribute, where possible, to overall slope stability by reducing slope gradients. They shall be designed to avoid adverse impacts on slope stability, particularly in landslide terrain.*

- *High cut slopes shall be avoided, particularly in landslide terrain, and especially so in the toe (bottom) area of certain landslides known as debris-type slides. Also, cut slopes shall be avoided in areas with thicker surficial deposits on steeper slopes (which thus combine two instability factors), and in areas of outsloping bedrock structure (where the bedrock itself lies in planes which angle downward toward the road, thus making it susceptible to dislocation and instability).*

One of the major forces shaping the contours of the earth's surface has been the action of running water. It is obvious that the same flow and gradient of water will erode or wash away different types of materials at different rates. Thus a small rivulet which shows no obvious immediate erosion of a granite channel will show steady movement of soil particles when placed in a channel composed of sandy or loose soil.

Graded materials are susceptible to erosion because they have been broken up, moved or exposed, may have been cut at a steep angle, and have lost vegetative ground covering and humus, and probably have lost the cohesive support of vegetative root systems.

These graded materials must be particularly well protected from the impact of falling and running water. Furthermore, a road which is placed in a natural drainage system should be designed so that its own drainage system conforms to or meshes with the natural system. It is therefore recommended that:

Where road construction is imperative in landslide or potential landslide terrain, State agencies shall, and local agencies should, require the use of adequate and appropriate drainage devices to provide for surface drainage and subsurface seepage in order to stabilize the slope. These devices should include horizontal and cross drains to divert the majority of such drainages into appropriate channels out of the slide area.

The practice of collecting the runoff from several channels into a single drain which empties in one channel usually results in erosion of that stream channel below the collection point as it modifies its profile to accommodate the increased flow. It is recommended that:

State agencies shall, and local agencies should, require that appropriate facilities (culverts, fords, bridges, etc.) be provided at all stream crossings to provide natural flow patterns, rather than blocking the channels, in order to maintain the existing distribution of gathering channels.

Similarly:

State agencies shall, and local agencies should, require that no drainage outfalls be allowed on cuts, fills, borrows, and critical soil and landslide deposit areas that are susceptible to erosion and instability. Nor that outfalls be allowed to project out above a channel ("shotgun") because the amount of resulting erosion and sedimentation increases with the distance which the water has to fall and its force upon impact. Downdrains shall be used with energy-dissipating natural materials placed in the channel beneath them.

Where graded and cleared lands are subject to precipitation and runoff, certain measures can and should be taken to minimize sediment transport and landsliding. These measures can have a substantial effect in mitigating, or lessening, several impacts associated with the human activities in the planning area.

Principally, these measures relate to the direction and containment of flowing surface water, in the form of either runoff or in stream channels. Minimization of the effect of this flowing surface water can be the greatest single step in reversing the negative impacts associated with road work and logging.

One of the most valuable protective devices which a river can have is a vegetative buffer, usually of deciduous riparian plants, shrubs, and trees, and potentially a variety of evergreen species as well. Such a buffer provides shade for the stream channel and filters out some of the sediment transported from upslope areas and from nearby roads.

On recent road construction projects in Colorado, the Forest Service has shown that it is possible to conduct erosion control planting on a phased basis during construction as each cut and fill is made. Because roads are rarely constructed in the planning area during the winter rainy season, when most

surface runoff occurs, it should be possible to undertake this planting prior to the rains, and thus somewhat stabilize soils before they can be washed away.

Therefore for erosion control purposes on road cuts and fills, it is recommended that:

State agencies shall, and local agencies should:

- *Maintain a buffer of native vegetation between roads and stream channels.*

- *Provide for the planting of deep-rooted native vegetation where this vegetation is lacking.*

- *Requiring that the clearing of vegetation alongside new roads be minimized to maintain its effectiveness in filtering road runoff and stabilizing roadside areas.*

- *Require that all possible cut-and-fill slopes be planted prior to the fall rainy season with deep-root native vegetation or hydromulched (spraying a grass seed, mulch, and water mixture) to stabilize surface materials and mitigate visual scarring.*

Erosion and sedimentation often occur during and immediately following road construction, particularly during the early fall rainy season in California. Therefore:

Permitting agencies should require that operators monitor water quality parameters, particularly turbidity and sediment load, at all streams in close proximity to major road construction projects. If adverse conditions are discovered, corrective actions shall be taken to alleviate the problem.

Road Maintenance Recommendations

Many locations along the Scott River Road show evidence of recent sidecasting, as do many logging roads in the Klamath National Forest, and on private logged lands. This practice can lead to substantial surface erosion and sediment deposition. Upon reaching the river, this material can clog spawning gravels and reduce or eliminate their availability for fish production.

It is recommended that:

Except for emergency road openings, excess material from cuts, fills, and landslides (maintenance spoil) shall be endhauled (removed by truck to a proper disposal site). Sidecasting should not occur as a routine practice.

And that:

Caltrans shall, and Siskiyou County should, immediately select and begin use of appropriate and ecologically sound debris and disposal sites. Siskiyou County Public Works should immediately cease using Scott River terraces and other areas directly adjacent to the river for such sites in order to avoid the resultant sedimentation during heavy runoff and high water or flood situations.

Logging

Logging on public lands is done by private logging companies under agreement with the Forest Service. The process begins with the Forest Service Timber Management Plan, which sets a volume target, in board feet, for a given 10-year period. The present Timber Management Plan for the Klamath National Forest, for example, runs from 1974 to 1984, and has a total goal of 2,700 million board feet for that 10-year period. In addition to this plan, the Forest Service every year updates a Five-Year Sales Program for each district, at which time generalized boundaries are set for individual sales.

Logging on private lands in the planning area is overseen by the California Department of Forestry. Private landholders must file a Timber Harvest Plan with the Department prior to logging, and must conform to the requirements of the California Forest Practice Act of 1973. Detailed information on projected harvest on private lands is not available.

Logging Recommendations

Of specific interest to the private timber lands within the planning area and to timber harvesting operations on them are various provisions of the Northern Forest District Rules as administered by the California Department of Forestry. These rules provide for stream and lake protection, protection of streamside shade trees, erosion control, restocking levels, silvicultural methods, and various aspects of road construction and operations. If fully implemented, these rules and procedures would generally provide adequate protection to the planning area.

The State Legislature, however, in designating this portion of the Scott River as a State Wild and Scenic River, identified it as an area of unique resource value of statewide significance, and prescribed that it should be managed so as to protect and enhance its scenic, fish and wildlife, water quality, and recreational values. Special Treatment Area classification within the rules provides for special timber harvesting techniques and criteria within 200 feet of features which have designation as unique natural resource value. As a result of this designation, private timber lands within 200 feet of the stream transition line are now included within Special Treatment Areas under the Northern Forest District Rules. Because of the wide diversity in the character of features of natural resource value, ground conditions, and forest conditions, practices for each Special Treatment Area were intended to be developed on a case-by-case basis.

In addition, the Wild and Scenic Rivers Act calls for the protection of the designated rivers and adjacent lands, including the rivers and their environment, and declares the resource values of both are of statewide value.

Due to the wide variety of resource values for which the Scott River was designated as a Wild and Scenic River, the inherent instability of the topography of the planning area, and the sensitivity of the river and its fishery to changes in watershed conditions, it is recommended that:

> *The Timber Harvest Review Team shall conduct a preharvest and postharvest inspection of each THP submitted for lands within the Scott River planning area and in "areas of special concern" with special emphasis on the scenic segment of the planning area, the 200-foot Special Treatment Area along the main stem Scott River, areas of slope instability shown on the Geologic Hazards and Impacts Map, and "shade tree buffer zone" tributaries shown on the Sensitive Habitat Areas Map.*

And that:

> *A representative of the Department of Fish and Game shall be present at these preharvest and postharvest inspections to provide technical assistance and to represent the concerns of this plan.*

Due to the susceptibility of slopes to landsliding in the planning area through inadvertent actions and inappropriate land uses, which often result in resource degradation, it is recommended that:

> *An engineering geologist licensed by the State shall participate in the preparation of all timber harvest plans and in all preharvest inspections in cases where the Geologic Hazards and Impacts Map, or other information sources, indicate a potential slope stability problem from the harvest activities, new logging road construction, or logging road reconstruction. The recommendations from the engineering geologist shall be incorporated into the THP and implemented on the ground.*

With the passage of the California Wild and Scenic Rivers Act, the Legislature recognized the resource values associated with the Scott River to be of statewide public interest and significance. Thus public involvement in the timber harvest review process is essential in ensuring the broad public interest in protecting the Scott River is realized. Under the existing Forest Practice Act and Forest Practice Rules, there is often insufficient time available for the general public to obtain, review, and comment on THPs affecting a wild and scenic river. It is therefore recommended that:

> *The Board of Forestry shall amend the existing Forest Practice Rules to provide a greater degree of public participation during the review process of all THPs within the planning area of this management plan. This should include proposed regulation changes submitted by the Department of Forestry to the Board of Forestry on May 23, 1979.*

In addition to the environmental impact assessment called for in other sections of this chapter, the California Department of Forestry is exempt from the formal State environmental impact assessment process by the language of the California Environmental Quality Act because the timber harvest plans formulate an equivalent process.

> *Despite the limitations upon the environmental impact analysis process under CEQA for logging and road building on private lands, the California Department of Forestry shall take particular care when approving timber harvesting plans for logging operations within the planning area. The Department of Forestry shall assure that these plans, as approved, will not have a degrading or deleterious effect upon the free-flowing and natural condition of the river.*

In April 1977, the State Board of Forestry authorized the formation of a Standing Advisory Committee on Research Programs to make recommendations regarding research needs and priorities in the area of forest-related management activities. The Committee's basic charge was to advise the Board on research needs and priorities and on how an adequate program of research may be provided most effectively. The Committee makes recommendations to the Board within the area of research policy and program, including but not limited to particular items of research which have high priority from the standpoint of the needs of the State.

The Board took this action to fulfill its mandate under Public Resources Code Sections 640 et seq, 4553, 4671, and others. These sections generally deal with the Board's responsibilities for developing policies to guide the Department of Forestry in managing the forest and wildland resouce, determining the State's needs for forest management research, developing a statewide data collection base, and continuous review of forest practice rules and regulations.

After almost 2 years of work, the Committee's efforts culminated in the publication of a report entitled "Wildland Research Program Needs and Policies for California" (June 1979). The main thrust of the report is research proposals that have been prioritized based on importance to the State as a whole and on importance to the Board, given its specific responsibilities for recommending research needs relative to forest management. Several of these research proposals deal with recognized problems associated with logging operations and road construction, which have also been recognized as problem areas of concern within wild and scenic rivers. Research into developing methods for solving these problems has the potential to result in increased protection of resources associated with wild and scenic rivers. It is therefore recommended that:

> *The Resources Agency and the Board of Forestry shall actively seek funding sources for implementing the high priority research programs contained in the Standing Advisory Committee on Research Program's report. Emphasis shall be placed on those programs directly applicable to resource concerns associated with wild and scenic*

rivers. This shall include but not be limited to research programs involving soil-water resources, wildland rivers and lakes, riparian zones, forest wildlife-fisheries, interaction among forest uses, and timber management.

Other recommendations for logging are found in the sections on water resources, roads, visual quality, and natural systems.

Forested areas of the western United States have become subject to the use of various chemical compounds developed and used to control disease, insect infestation, and noncommercial plants. Many of these compounds have had a doubtful history in terms of the compatibility with the forest ecosystem and the human population of these areas. Recently, the Environmental Protection Agency has placed a temporary ban on the use of the herbicides 2,4,5-T and silvex, both of which contain dioxin, which is at least preliminarily linked to health problems in humans. Currently, the Environmental Protection Agency, the State Water Resources Control Board/North Coast Regional Water Quality Control Board, and the State Department of Food and Agriculture control the use of sprays through policy and the Klamath River Basin Water Quality Control Plan (1975) and Agency policy. No recommendations are made here as to the use of pesticides and herbicides for the Scott River planning area. However, because of potential adverse effects of these chemicals in the forest ecosystem and the waters of the area, and because of the possible positive economic result of labor-intensive manual control methods, it is recommended that:

As part of the watershed improvement study, the State Resources Agency shall investigate the feasibility, advisability, economic impact, and possible funding sources of programs for labor-intensive manipulation of brush and insect infestation control for State Wild and Scenic River planning areas.

Mining

This plan recognizes legitimate prospecting and mining operations. Such operations will be subject to the 1872 Mining Law and its amendments. These mining operations can be conducted in a manner that protects the area values without unduly hampering the operations.

At present, mining in the planning area represents a relatively insignificant level of impact, being frequently pursued for recreational reasons more than monetary ones. The majority of accessible gold deposits located in the planning area seem to have been exhausted, and the possibility of a major extraction activity within the planning area remains unlikely.

If a major commercial mining operation started within the planning area, it could have substantial impacts upon the free-flowing and natural condition of the river. These impacts could include sediment transport and deposition, leaching of toxic substances, loss of soil productivity, visual quality

degradation, turbidity, slope instability, increased traffic, increased noise, loss of solitude, loss of privacy, and increasing local demand for goods and services. Also, anadromous fish spawning could be severely damaged by any of these actions, which would eliminate spawning areas or make them unsuitable for proper egg hatching and juvenile habitat.

Increased sedimentation from mining-related earth-moving operations that disturb the protective soil and vegetative cover constitutes a significant water quality threat. Suction dredging has probably had only a short-term effect on increased suspended sediment in the stream, but its impact upon fisheries, insects, and other aquatic habitats has not been adequately documented to date. Stream sections immediately downstream from areas of intensive suction dredging activity may be temporarily affected by some increase in stream turbidity and the consequential loss of transparency. Hydraulic placer mining of surface alluvium could also contribute to water degradation. Other threats to water quality from mining include potential leaching of foreign mining chemicals, especially from lode mining, and decreases or changes in water flow characteristics caused by dams or diversions.

Mining Recommendations

All mining operations on National Forest system lands are subject to the 1872 Mining Law and its amendments, regulations promulgated by the Secretary of Agriculture, and the recently developed Section 208 Best Management Practices for mining. In addition, mining operations involving suction dredges are regulated by the Department of Fish and Game by means of a suction dredge permit process. In most cases, these provide sufficient guidelines for mining operations. These regulations cover permissible discharge of pollutants, preparation of surface areas disturbed by mining, locations where no discharge policies exist, revegetation programs, and similar concerns. If fully implemented, these provisions will adequately protect the resource values of the Scott River from possible degradation from mining on National Forest lands.

U.S. Forest Service administrative procedure requires that operational plans be filed and approved by the Forest Service prior to undertaking mining on public lands under their control. To provide for the necessary river protection, it is recommended that:

> *The Forest Service should consider the intentions and objectives of the Scott River Plan and coordinate with the Department of Fish and Game when evaluating plans for mining operations to be conducted on National Forest lands.*

And that:

> *Siskiyou County should coordinate as necessary with the Department of Fish and Game and North Coast Regional Water Quality Control Board to ensure that plans for mining operations or surface extraction activities are consistent with the intent and provisions of this waterway management plan prior to their approval.*

This should particularly include evaluation of access, structure, tailings, wastes, trash, and effects on scenic and other resources of the planning area. Plans of operation should be critically reviewed by the affected agencies and the operator required to modify the project as necessary to ensure the protection of the river's resources.

Surface excavation and extraction activities, particularly the sand and gravel "borrow" operations which supply material for road maintenance and reconstruction projects, create additional potentials for adverse water quality and visual impacts. Associated vegetation removal and surface disturbance in an area with poor geologic, topographic, and climatic conditions can produce sediments which are easily transported to streams by runoff from heavy rains. Visual scarring can also result, disrupting the area's predominant natural setting. If a gravel extraction operation is necessary, and where it is feasible, such operations are better suited for river bars where the gravel can be renewed and is less disruptive, rather than mined from nonriver sites.

In 1975 the State Legislature passed the Surface Mining and Reclamation Act. This Act directs each county to integrate a surface mining reclamation policy and permit system into the county general plan, which is to provide resource protection of surface mining operations on private lands. The policy must provide measures to be employed by local governments in regulating trading, backfilling, revegetation, and soil compaction, as well as providing for soil erosion control, water quality and watershed control, waste disposal, and flood control. Only surface mining operations that involve the removal of a total of more than 1,000 cubic yards of minerals, ores, and overburden, or involve more than 1 acre in any one location, and only prospecting and exploration operations where more than 1,000 cubic yards of overburden is removed in any one location of 1 acre or less are covered under this Act.

Siskiyou County recently adopted (June 1979) a mining reclamation ordinance as required by State law. This ordinance was developed based on the provisions of the Surface Mining and Reclamation Act and a sample ordinance developed by the Division of Mines and Geology. Consequently, this ordinance is general in nature and does not provide for site specific protection of wild and scenic river values. It is therefore recommended that:

Siskiyou County should amend its surface mining and reclamation ordinance to provide for the protection of the resource values as identified in this waterway management plan. This should include specific protection for the following within the planning area:

1. *All tributaries and streams from adverse water quality impacts such as increased sedimentation, debris, etc.;*

2. *All salmonid spawning, egg incubation, and rearing habitat;*

3. *All recreational and aesthetic values from long-term impacts; and*

4. *All principal travel routes (roads and hiking trails), settlements, and concentrations of recreational activity from prolonged intrusion or disruption by the mining-associated truck traffic, dust, and noise.*

And that:

The Department of Fish and Game shall, if requested by the County, provide technical assistance during ordinance revision and shall, when requested, provide planning area on-site inspection assistance to the County after ordinance enactment.

Residential Development

Development Concerns

In addition to the activities listed above (water diversion, road work, logging, and mining) which have posed or can pose the greatest negative impacts on the Scott River's free-flowing and natural condition, several other activity types and processes can also have serious impact on the river and its adjacent lands.

A variety of recent studies point to the fact that major rapid development of rural areas and communities may have its most serious effects upon those communities and areas themselves. Often the results of a development boom are higher prices, less social harmony, more population, more and bigger roads, and higher taxes to pay for an increased level of services. A community or area which grows and evolves at a less intensive rate is usually free from serious impact in these areas.

The majority of the inhabitants of the planning area have expressed their opposition to growth. In their responses to the planning questionnaire, 61% stated they wished the current population along the river to "stay the same", and 67% preferred the amount of visitors to the river to stay the same.

To date, development in the planning area has been almost entirely on an individual unit basis. The area has so far escaped the spread of second-home subdivisions, which has occurred in so many similar scenic parts of California and which is becoming an issue in Scott Valley. One of the citizens' most insistent goals (see Chapter II) is that such subdivisions be minimized, if not totally avoided, in the planning area.

Planning and Zoning

Development in a region such as the Scott River is to some extent managed and directed by two powers of the County government - general planning and zoning. The purpose of a general plan is to identify certain types of activity applicable to certain specific areas. An example would be agricultural lands being identified for agricultural use, or city neighborhoods being identified for residential use. The general plan tries to anticipate what future change in such use is to the benefit of the citizens, and how that future use can be directed in accordance with the goals of the citizens.

Zoning is the process of assigning specific criteria to each type of use. For instance, a zoning ordinance would provide information on what kinds of agricultural use could be undertaken on agricultural lands, or how many buildings could be built on a given parcel.

The present Siskiyou County general plan was approved in 1968; however, a new draft County general plan may be adopted by December 1979. There are six zoning districts which do or could presently apply to the Scott River planning area:

1. Unclassified (A-1): This district includes most of the lands to the east of the National Forest boundary near Jones Beach, and allows for all uses not prohibited by law, some of which additionally require a permit.

2. Agricultural Forest (AF): Most of the private lands in the planning area are in this district, with a 40-acre minimum. This district is presently being superceded by the TPZ (Timber Protection Zone) designation, which has a 160-acre minimum. Both are directed primarily at timber production.

3. General Agriculture (A-2): Some of the private lands at the entrance to Scott River canyon are in this district. It allows for all general agricultural use, including livestock, tree farming, and residence.

4. Residential Agricultural (RA): This district allows for single-family dwellings, small acreage farming, and accessory uses. Presently, this zoning covers two potential subdivisions in the northwest corner of Scott Valley.

5. Open Space (O): This zoning allows all uses synonomous with open space, including crop farming, livestock and timber production, certain structures with permit, not including single family residence. There is no present "O" zoning in the planning area.

6. Planned Development (PD): This district allows for development in response to the natural constraints of the land and to prevalent concerns for residential density. Developers holding land in this zone are required to submit development plans to the County Planning Department, which has leeway in establishing densities, open space, and other factors. No "PD" zoning presently exists in the planning area.

The planning area contains County zoning of TPZ and A-1 lands. Under the A-1 zone, any use which is not specifically prohibited may be allowed if approved by the Planning Commission. Thus, a density as high as 2 1/2 acres per parcel is possible in the planning area. Large subdivisions of this density can pose

major impacts relating to water quality, population density, sedimentation, wildlife, transportation, services, and visual quality, particularly when adjacent to a wild and scenic river, where these impacts degrade the values for which the river was included in the wild and scenic system.

Residential Development Recommendations

Recommendations to provide for conformance of Siskiyou County planning and zoning with the goals and requirements of the California Wild and Scenic Rivers Act are as follows:

> *Siskiyou County, through its general plan and zoning procedures, should consider protection of the Scott River's wild and scenic river values by maintaining 20-acre minimum densities on lands suitable for residential agricultural use and by protecting existing open space and timber reserve uses.*

Private land parcels which are maintained at 20-acre minimum densities will then not be available for subdivision below one single-family dwelling unit for each 20 acres. This restriction does not mean that presently existing parcels less than 20 acres could not be built on, but it would prevent the dense form of subdivision which planning area residents oppose and which could have serious long-term effects on the socio-economic structure of the Scott River area.

General recommendations relating to Siskiyou County approval of construction projects in the planning area are:

> *Siskiyou County should make use of the Geologic Hazards and Impacts Map contained in this plan to limit construction to those lands which do not pose or contain hazards to life and property. These hazards include areas subject to flooding, landslides, and areas of slope instability.*

Visual Quality

The visual, or aesthetic, quality of an area has to do with many factors. It is dependent upon the variety of the land, its vegetation, and water. It can be degraded, like any other resource, by mismanagement or by harmful activities. Activities potentially harmful to the aesthetic qualities of the Scott River planning area are widespread road construction, extensive clearcutting, and widespread development.

Chapter II describes the high value placed upon the visual quality of the area by a majority of Scott River planning area residents. It could be assumed that for visitors to the area, visual quality is at least as important as it is for the residents.

The planning area has a high degree of visual quality; therefore, it becomes important to ascertain what this quality is composed of, where it exists or where it is absent, and how the area can be managed to retain this quality.

In the past it has been difficult to effectively manage the visual resources of an area; however, the U.S. Forest Service has recently developed an extensive system (a visual management system) to ascertain the relative values of visual resources and apply various management goals to these resource values on National Forest lands. This system is quite new and, as a consequence, has not been applied to all National Forest system lands. Klamath National Forest is utilizing this system and will have the visual mapping completed on the Scott River Ranger District by mid-1979. This visual quality management data will be considered along with other resource values during Klamath National Forest's upcoming development of its Forest Land and Resource Management Plan.

This system is perhaps the most sophisticated visual management program in effect today for major resource use over wide areas. Its applicability could apply not only to public lands, but to private lands within the planning area as well. The recommendations in this section have been prepared to integrate with this visual management system, so as to minimize disruption of ongoing management policies.

Readers wishing a detailed understanding of the Forest Service Visual Resource Management system should consult Volumes I and II of "National Forest Landscape Management", available from the Forest Service.

Visual Quality Recommendations

To provide input to the ongoing Klamath National Forest visual management planning effort within the waterway planning area, because this has been designated by the California State Legislature as an area of high scenic quality and value and to be managed to maintain that quality, it is recommended to the Forest Service that:

> *For the purposes of protecting the scenic values of the Scott River, the Klamath National Forest, in its land and resource management planning process, should give maximum consideration to implementing and adopting fully their recently completed recommended Visual Quality Objectives without trading away protection of visual resources in favor of other resource value development.*

And that:

> *The Visual Quality Goal of Rehabilitation should be considered in highly visible cut-and-fill slopes and any future wildfires within the planning area.*

The existing Northern District Rules do not provide for adequate protection of scenic values within the entire planning area. Therefore it is recommended that:

The Board of Forestry shall amend the Northern District Rules to provide for protection of scenic values associated with the main stem Scott River. Such rules should be compatible with the visual quality goals and objectives applied to Forest Service lands within the planning area.

Recreation

Activities

River recreation in the planning area is primarily restricted to public lands and to the river and its immediate banks and major tributaries. Some public recreation does take place on private lands in the planning area, in the form of hunting on major timber holdings owned by Southern Pacific and others.

Major public recreation activities which should be protected and enhanced in the planning area include:

1. Hiking
2. Sightseeing
3. Fishing
4. Hunting
5. Rafting and kayaking
6. Nature investigation and appreciation
7. Camping, picnicking, and swimming

At present, no new recreation facilities are planned on the Klamath National Forest, as available facilities are being used to 20 to 40% of capacity. The Forest Service estimates that these existing facilities will be sufficient for at least 15 more years.

Recreation Recommendations

As part of its responsibilities under the Recreation Trails Act of 1974, the California Department of Boating and Waterways is evaluating designated State Wild and Scenic Rivers for inclusion in the Boating Trails System. This study is to determine boating quality and safety, access problems, and overall suitability. As part of this evaluation, it is recommended that:

The Department of Boating and Waterways shall cooperate with the Departments of Fish and Game and Water Resources in the study of the flow needs of fish and boating recreation within, but not limited to, the planning area of the Scott River.

If the boating recreation flows are found to be inadequate, but the reach is otherwise found suitable for designation as a State Boating Trail and that fish flows are found to be inadequate:

The Department of Boating and Waterways shall cooperate with the Departments of Fish and Game and Water Resources in studies to determine methods and feasibility of augmenting fishery and recreation flows in the Scott River.

The Scott River is paralleled by a road for much of its planning area length, thus making quality steelhead fishing accessible. However, the canyon area from Sunny Slope Ranch to Scott Bar is rather inaccessible, except by descending a steep slope from the road. This area offers excellent fishing and swimming and scenic beauty to those willing to go to the trouble of getting there. Turnouts along the Scott River Road are used as parking for river user access and momentary vista points by area visitors. Therefore:

Siskiyou County Public Works should evaluate off-road parking needs along the Scott River Road and provide and maintain sites where necessary.

In no case should the development of river access for recreational purpose degrade the classification of river reaches. Therefore it is recommended that:

Siskiyou County should avoid and prohibit the development of any recreation roads or public facilities in this area which will alter the river classification, as provided for in this waterway management plan, or degrade river resources. Also, the Department of Boating and Waterways shall take this into consideration in the Boating Trails evaluation study.

And that:

The Forest Service, in its land management planning process, should consider not allowing any road construction for recreational purposes which will reduce the existing scenic river classification of designated segments of the Scott River.

Natural Systems

Important Habitat Elements

The Scott River planning area is comprised of a wide diversity of habitat types and a substantial amount of edge habitat. This can be attributed to the natural variety of soils which support a variety of vegetative communities, and also to logging activity which has created a variety of successional stages in the forest. Such diversity provides for the needs of many wildlife species and, therefore, a complex and relatively stable wildlife community.

Riparian Habitat. Riparian habitat is regarded by many ecologists as the single most important habitat to wildlife. It is one of the rarest habitats in terms of total acreage within the State. Riparian habitat is defined as streamside vegetation growing in immediate proximity to stream courses and is

comprised of such species as willow, alder, and wild grape. It is also important to the Scott River fishery because of the role it plays in preventing soil erosion, providing shade, producing insects, and supplying nutrients in the form of dead leaves. Significant disturbance to this habitat could have seriously adverse and far-reaching impact to both aquatic and terrestrial wildlife. Although riparian habitat along the Scott River is not extensive, that which is present should be preserved in its entirety for the above reasons.

The present Northern Forest Rules of the State Board of Forestry provide for timber harvesting and silvicultural methods used on private lands in the planning area and prescribe the actions allowed within the Stream and Lake Protection Zone. The rules provide for the protection of nonmarketable vegetation along streams indicated on standard USGS maps. There are, however, areas of riparian-related deciduous trees and other riparian vegetation forms in the planning area of high wildlife value not protected during timber harvest operations.

Therefore it is recommended that:

> *The California Department of Forestry shall require that all areas of riparian vegetation be identified on Timber Harvest Plans within the planning area and shall require that the THPs provide for the harvest of timber with minimum disturbance of these areas. Roads and skid trails shall be so located as to minimize the crossing of riparian vegetation areas, provided that this is otherwise consistent with erosion protection provisions of this waterway management plan. The Department of Fish and Game representative on the THP Review Team shall provide assistance in the identification of areas of riparian vegetation, if necessary, to ensure their protection during logging operations.*

Siskiyou County currently has no provisions for the protection of riparian habitat. High value riparian habitat could be lost by the insensitive placement of structures and the alignment of private and County roads.

Therefore it is recommended that:

> *Siskiyou County should enact a riparian vegetation protection ordinance for the planning area portion of the County. Such ordinance should require the identification of areas of riparian forms of vegetation on maps to be submitted to the County for development permits for structures or roadways. Such ordinance should also require the protection of riparian vegetation within the project area provided that this is consistent with erosion protection provisions of this waterway management plan.*

And that:

The Department of Fish and Game shall provide technical assistance to the County, if requested, during ordinance development and shall, when requested, provide planning area on-site inspections assistance to the County after ordinance enactment.

And that:

New Siskiyou County road alignments should provide for the protection of riparian vegetation areas provided that this is otherwise consistent with erosion protection provisions of this plan.

Brush Habitat. As is true with dense forests, wildlife benefit from partial clearing of dense brush fields.

Landowners who desire to clear areas of brush and also retain wildlife values should leave islands of brush stands to provide cover and browse. This is particularly desirable in the area designated as deer winter range where retention of browse is important. Landowners should request advice from California Department of Forestry, California Department of Fish and Game, and the U.S. Soil Conservation Service for methods to be used to protect land values through erosion control measures and to provide wildlife habitat enhancement.

Hardwood Forest Habitat. A primary consideration in this type should be preservation of the oak trees. They provide important nesting areas for a variety of birds and a highly nutritious source of food (acorns) for deer, squirrel, and other animals.

Landowners who desire to harvest firewood or otherwise remove trees from relatively dense oak stands should conduct selective cutting. Landowners should request advice from the California Department of Fish and Game for methods that will provide for wildlife and habitat protection or enhancement.

Critical Wildlife Elements

There are several wildlife elements or concepts which may be regarded as critical factors in maintaining the integrity of the wildlife resource in the planning area. Areas associated with these elements that can be illustrated geographically are shown on the Critical Waterway Areas Map.

Osprey Nesting. Significant osprey nesting activity takes place from March to September at selected sites along the entire length of the Scott River within the planning area. Because of the population decline this species has experienced in the past and its high aesthetic appeal, there is much concern for the protection of the bird. To afford this protection, the Klamath National Forest has developed an Osprey Habitat Management Plan (1974).

The plan establishes a River Management Zone on public land for osprey along the Scott River, which includes all public land areas within 1/2 mile of the river (see Sensitive Habitat Areas Map, Plate 1). Within this zone, management guidelines have been established to provide annual monitoring of nesting success and maximum protection.

According to the Osprey Management Plan, observations of nesting success indicate that the sensitivity of nesting birds varies with the location of the nest and the point in time at which disturbance begins. Nests that are located near a road or other area where an established level of disturbance is present when nesting begins and continues at the same level are as likely to be successful as any other nest. However, if a pair of osprey are subjected to significant increased disturbance, such as logging operation, after nesting activity has begun, the pair will likely fail to produce young. An important general management guideline, therefore, is to avoid increasing the disturbance level near existing osprey nests, particularly between March and August.

Currently the Northern Forest District Rules provide for the removal of snags for various hazard and lumber production purposes; however, Section 937.1 provides for the protection of identified nest trees of eagles, hawks, owls, etc., and snags that may represent important habitat elements.

Therefore for timber harvesting on private lands, it is recommended that:

> *The Board of Forestry shall amend the Northern District Rules to provide additional protection to osprey nesting territories within the planning area in accordance with the criteria of the Klamath National Forest's Osprey Management Plan.*

And that:

> *The Department of Fish and Game representative on the Timber Harvest Plan Review Team shall identify and mark nests and snag trees to remain unharvested in accordance with the criteria of the U.S. Forest Service Osprey Management Plan for areas of proposed timber harvest within the Osprey Management Zone, as shown on the Sensitive Habitat Areas Map and areas outside of this zone if they are determined to be significant osprey habitat elements.*

For the protection of osprey habitat on private lands within the identified Osprey Management Zone, it is recommended that:

> *All State agencies shall, and local agencies should, adopt the boundaries of the Osprey Management Zone as shown on the Sensitive Habitat Areas Map and provide for:*
>
> *1. the retention of snag and nest trees in accordance with the U.S. Forest Service Osprey Management Plan criteria, as determined through consultation with the Department of Fish and Game; and*

2. *the exclusion of road construction activity between March and August unless it is determined that there is little likelihood of impact to the osprey population, as determined through consultation with the Department of Fish and Game, and that this is otherwise consistent with erosion protection provisions of this plan.*

Deer Winter Range. Wintering range is generally one of the most important limiting factors in deer herd populations. These areas also are used for agriculture and livestock production, as well as residential development. In areas designated as deer winter range on the Sensitive Habitat Areas Map, it is important to maintain or improve existing conditions for the deer herds. In areas where dense or decadent brush stands exist, forage conditions for deer can usually be improved by partial mechanical clearing or controlled burns. It is recommended that:

All State agencies shall, and local agencies should, in cooperation with the Department of Fish and Game, implement their management activities within the planning area in a manner preserving or enhancing forage conditions for deer on the winter range as much as possible.

Critical Fisheries Elements

The fisheries value in the Scott River is of particular importance, and its protection and enhancement is a prime objective of this waterway management plan. In addition to the provisions and recommendations presented in previous sections regarding streamflows, logging, and road construction practices, it is recommended that:

The feasibility of constructing and operating a salmonid rearing facility in the Scott River canyon area for rescued juveniles shall be investigated by the Department of Fish and Game. This type of rearing unit would supplement the overcrowded rearing habitats of the Scott River despite the effects of diminished flows. The rearing facility must be located in the lower Scott River so that salmonids released from the facility for seaward migration would not be endangered by irrigation diversions.

Critical Vegetation Elements

At the present time, two rock cresses occur within the planning area that are of concern to the California Native Plant Society (1974) (see Vegetation Map, Plate A-5). The modest rock cress *(Arabis modesta)* is found on rocky walls and bluffs at about 1,500 feet in elevation. The other rock cress *(A. organa)* is found in habitats similar to modest rock cress, but at slightly higher elevations. These species currently are not officially classified as rare or endangered by either the State or the Federal Government. However, the State and the scientific community recognize these plants as species of such limited distribution that extinction could result from insensitive land use actions.

Therefore it is recommended that:

> *All State agencies shall, and local agencies should, upon proposing or approving operations in the areas where these plants are located, contact and cooperate with the Forest Service on National Forest system lands and the Department of Fish and Game on all lands to develop plans to protect these plants whenever possible.*

General Recommendations

Because of the significance of the Scott River area as a designated wild and scenic river and because of the importance of roads and access in the maintenance of the area's character, it is recommended that:

> *All State agencies shall, and local agencies should, ensure that any activity taking place under their jurisdiction and consent in the planning area be analyzed to ascertain that its net impacts will not be significant in terms of the criteria presented in the California Environmental Quality Act of 1970.*

And that:

> *All State agencies shall, and local agencies should, ensure that their actions do not degrade the classifications of the Scott River as classified in this plan. Particular attention shall be given to roads and river access improvements.*

CHAPTER V. MANAGEMENT PLAN IMPLEMENTATION

It is imperative that agencies implementing the Scott River Plan both recognize and reconcile the many existing policies, regulations, and activities in effect here and supplement them where necessary. To achieve this end, the implementation program is composed of two elements: (1) a proposed management framework and (2) recommended regulatory activities for the various federal, State, and local agencies.

Proposed Management Framework

The management framework for the Scott River is based upon several premises:

A. All levels of government have an important role to play, and coordinated and cooperative planning and management will be in the best interests of all parties which will produce more effective, expeditious, and consistent administration of the waterway management plan.

B. Local levels of government will have the major role in the management system for private land, but this management activity should be consistent with the California Wild and Scenic Rivers Act and this plan.

C. The Forest Service is responsible for the planning on and management of National Forest system lands and such planning and management should reflect the concerns of the State of California as expressed in the California Wild and Scenic Rivers Act and this plan.

Implementation

State Legislature

The Legislature should adopt the Scott River Waterway Management Plan.

The Legislature should amend this plan as necessary.

The Legislature should require all local agencies, prior to commencing a project, to make a written determination for each action affecting lands within the planning area, that such action is consistent with this plan and the Wild and Scenic Rivers Act. Each determination shall be filed with the Siskiyou County Planning Director within 30 days, and the Planning Director shall transmit copies of these determinations through the Board of Supervisors to the Secretary for Resources on an annual basis.

The Legislature should require all State agencies (except CDF for the THP process), prior to commencing a project, to make a written determination for each action affecting lands within the planning area that such action is consistent with this plan and the Wild and Scenic Rivers Act. Each determination shall be filed with the Secretary for Resources within 30 days.

The Legislature should recommend, by Resolution, that the Forest Service and other federal agencies consider, in their land management planning process, the recommendations contained in this plan.

The Legislature should amend the Forest Practice Act as appropriate according to the recommendations contained within this plan.

The Legislature should amend the Surface Mining and Reclamation Act to provide for greater consideration and protection of wild and scenic river resource values.

The Legislature should fund added costs incurred by Siskiyou County in administering this plan.

The Legislature should authorize funding for the studies specifically called for in this plan.

The Legislature should authorize funding for additional manpower for State agencies mandated by this plan to undertake new programs or expand existing programs.

The Legislature, through Resolution, should support addition of the Scott River to the Federal Wild and Scenic Rivers System under Section 2(a)(ii) of PL 90-542.

State Agencies

Resources Agency. The State Resources Agency has been charged with the responsibility of preparing a management plan for the Scott River and its adjacent land areas. This waterway management plan is the means in which to protect and enhance the values for which the Scott River was included in the State's Wild and Scenic Rivers System.

This plan should be reviewed and recommendations for amendment made to the Legislature as necessary.

The Resources Agency shall ensure that all State agencies and departments, and its political subdivisions, are carrying out the recommendations of this plan and are conducting their responsibilities consistent with the Wild and Scenic Rivers Act.

The Resources Agency shall work to ensure the cooperative working relationships between federal and State agencies and departments as called for in this plan are realized.

The Resources Agency shall ensure that the cooperative efforts of State agencies and departments as called for in this plan are fully carried out.

The Resources Agency shall recommend that the Governor request inclusion of the Scott River in the Federal Wild and Scenic Rivers System under Section 2(a)(ii) of PL 90-542.

Department of Fish and Game. The Department of Fish and Game has been designated by the Resources Agency to conduct the State Wild and Scenic Rivers planning program and has the responsibility for the protection of fish and wildlife resources of the State.

When requested by Siskiyou County, the Department of Fish and Game shall provide technical assistance in the development of a County ordinance for riparian vegetation protection, and the revision of the County's surface mining and reclamation ordinance within the planning area, and on-site inspections during ordinance enforcement.

The Department of Fish and Game shall provide a representative for all Timber Harvest Plan Review Team preharvest and postharvest inspections for THPs within the Scott River planning area and shall provide the following:

- *technical assistance in the identification of rare and endangered plants, flag areas to be protected, and help CDF prescribe protective measures;*

- *technical assistance in the identification of riparian forms of vegetation, not limited to streamside areas, flag areas to be protected, and to help CDF prescribe protective measures;*

- *technical assistance in the identification and flagging of trees and snags of value to the osprey population to be protected from timber harvesting;*

The Department of Fish and Game shall make recommendations to the Department of Forestry to ensure that THPs conform to the recommendations of this plan and are consistent with the Wild and Scenic Rivers Act. The Fish and Game representative shall certify that the concerns of this plan have been incorporated, and that after a postharvest inspection, shall certify that the special stipulations of the THPs have been fully carried out by the operator.

The Department of Fish and Game shall inspect spawning gravels in the Scott River planning area seasonally to determine if flushing flows are adequate to maintain the quality of the spawning areas.

The Department of Fish and Game shall, in cooperation with Klamath National Forest on National Forest system lands, work jointly with the Department of Water Resources to reevaluate fishery flow needs of the Scott River.

If flows are found to be inadequate:

The Department of Fish and Game shall, in cooperation with Klamath National Forest on National Forest system lands, work jointly with the Department of Water Resources to conduct studies to determine methods and feasibility of augmenting fishery flows of the Scott River.

If this investigation indicates that such actions are advisable:

The Department of Fish and Game shall, in cooperation with Klamath National Forest on National Forest system lands, develop an action program to enhance anadromous fish habitat in the Scott River and its major tributaries.

Also:

The Department of Fish and Game shall coordinate efforts with the State Water Resources Control Board and the Department of Water Resources to develop a program that would place selected Wild and Scenic Rivers into the statewide water quality surveillance and monitoring program.

The Department shall ensure that all agreements entered into pursuant to Sections 1601-1606 of the Fish and Game Code are consistent with the recommendations in this plan, and will closely monitor the agreements they have entered into to ensure that the provisions are being complied with.

The Department shall review Forest Service-proposed plans within the Scott River planning area and in "areas of special concern". If found to be in conflict with this plan or the provisions of the Wild and Scenic Rivers Act, the Department shall enter into negotiations with the U.S. Forest Service to resolve points of conflict.

The California Department of Forestry. The Department of Forestry has regulation and permit authority in the Scott River area through its authority under the Z'berg-Nejedly Forest Practice Act of 1973. In view of its responsibilities:

The Department of Forestry shall carry out the Northern Forest District Rules in the planning area and in "areas of special concern" to fully protect the resources of the Scott River.

With the following modifications:

The Timber Harvest Plan Review Team shall include an engineering geologist licensed by the State in the preharvest inspection of all THPs in the planning area and in "areas of special concern" where slope instability conditions are involved.

The Department of Forestry shall provide for the protection of riparian forms of vegetation, rare and endangered plants, and osprey habitat as provided in the recommendations of this plan, with technical assistance from the Department of Fish and Game, by specifying special stipulations on the THPs and ground flagging in all parts of the harvest area if necessary to ensure such protection on the ground.

In all portions of the planning area and in "areas of special concern" specified in this plan as areas of slope instability, the scenic segments of the planning area, the 200-foot Special Treatment Area along the main stem Scott River, and "shade tree buffer zone tributaries", the Department of Forestry shall provide for the protection of resources by using the recommendations in this plan and by providing stipulations on the THPs.

Board of Forestry

The Board of Forestry shall amend the Northern District Rules according to the recommendations contained within this plan as soon as possible. Where necessary, the Board shall make recommendations to the Legislature for amending the Forest Practice Act according to the recommendations contained within this plan.

Mining and Geology Board

The Board shall work with the Resources Agency in establishing policies and standards for reclamation of mining operations.

The Board shall develop special provisions in the State policies for the reclamation of mined land which would apply to planning areas of all designated Wild and Scenic Rivers, consistent with the findings set forth in the Surface Mining and Reclamation Act of 1975.

North Coast Regional Water Quality Control Board/State Water Resources Control Board

The Regional Board shall work with the Corps of Engineers, Forest Service, and the Department of Fish and Game through the Resources Agency in setting up a joint review process for "Section 404" and "Section 10" permits.

The State Water Resources Control Board shall work with the Department of Fish and Game and the Department of Water Resources to establish a selected water quality monitoring program to become part of the statewide water quality surveillance and monitoring program.

Department of Water Resources

The Department shall participate with the Department of Fish and Game and the Department of Boating and Waterways in a study to determine the feasibility of augmenting summer flows in the Scott River.

Department of Boating and Waterways

The Department of Boating and Waterways shall participate with the Departments of Fish and Game and Water Resources in determining desired recreation boating flows for the Scott River.

The Department of Boating and Waterways shall conduct its evaluation of the Scott River as a possible designated State Boating Trail within the recommendations of this plan and the intent of the Wild and Scenic Rivers Act. A representative of the Department of Fish and Game shall provide advisory assistance to the evaluation study.

State Lands Division

The State Lands Division shall determine the extent of State rights and ownership in the bed of the Scott River as soon as possible.

Local Agencies

Siskiyou County

The County should achieve consistency with this plan and the objectives of the State's Wild and Scenic Rivers Act by amending the appropriate zoning ordinances.

The County should amend its ordinance for the review and approval of reclamation plans and the issuance of permits to conduct surface mining operations pursuant to Section 2774 of the Public Resources Code to provide for the protection of the Scott River's Wild and Scenic River resource values.

The County should formulate and adopt an ordinance for the protection of riparian forms of vegetation within the planning area in conformance with the recommendations in this plan, using technical assistance supplied by the Department of Fish and Game.

The County Planning Department should review determinations submitted by all local agencies and evaluate their compliance with this plan and the Wild and Scenic Rivers Act. The Planning Director should report annually through the Board of Supervisors to the Secretary for Resources on plan implementation and compliance by the local agencies.

The County Planning Department should annually review actions carried out by local agencies in the planning area and evaluate compliance with this plan. The Planning Director should report annually through the Board of Supervisors to the Secretary for Resources on plan implementation and compliance.

Federal Agencies

U.S. Forest Service (USFS). The Forest Service was created by the Organic Administration Act of 1897 (16 U.S.C. 473) to manage the National Forests. Present authorities include land use planning and management, along with permit and regulatory powers covering many of the uses and activities that occur in the National Forest. The forests are to be administered for outdoor recreation, watershed, timber, wildlife, range, wilderness, and other purposes. Because pressures for use of National Forest lands have increased and conflicts among users have developed, USFS has gone through an evolution of management authority as a result of congressional actions and Presidential directives. These legislative mandates and Presidential directives have given the framework to the USFS to adequately protect the resource values of the Scott River.

Klamath National Forest should continue to fully implement all of their laws, policies, and regulations to ensure adequate protection of the Wild and Scenic River values of the Scott River.

Klamath National Forest should follow the strategies and implementation direction outlined in their Region's Section 208 Water Quality Management for National Forest system lands within the Scott River planning area.

The Land and Resource Management Plans of Klamath National Forest should evaluate and consider the State's interest in the Scott River as expressed within the California Wild and Scenic Rivers Act and in the recommendations portion of this plan.

The Forest Service should participate with the Resources Agency in a subwatershed monitoring program to evaluate and predict the impacts of selected projects on the Scott River.

U.S. Army Corps of Engineers

The Corps of Engineers should establish a joint review process regarding "Section 404" and "Section 10" permits, with the appropriate State and local agencies, through the Resources Agency, to avoid duplication of effort.

The District Engineer should enter into an agreement with the Regional Water Quality Control Board through the Resources Agency to enable joint processing of Corps and State permit applications for activities in the river channel.

CHAPTER VI. SUMMARY OF POTENTIAL ECONOMIC IMPACTS

This section summarizes the results of an economic analysis of the Scott River Waterway Management Plan. The complete analysis is contained in Appendix X. The contents of the management plan and the manner in which it will be implemented limit the ability to forecast and identify economic impacts in the quantitative cost/benefit format usually employed by economists. The plan contains sets of recommendations that deal with various aspects of the environment within planning areas around the waterways. These recommendations call for new activities or programs, changes in the standards or regulations historically controlling activities within the area, and the prohibition of certain activities.

If the plans are adopted by the California Legislature, it is assumed the recommendations will be mandatory upon State agencies. The plan recommendations will not necessarily be mandatory on other activity controlling public agencies in the areas, such as Siskiyou County and the U.S. Forest Service. Also, even though many of the recommendations are quite general, they do not recognize the need for trade-offs when site-specific decisions are made concerning the prohibition of degradation versus the utilization of resources. Furthermore, many of the plan's recommendations call for public agencies to make administrative decisions that, while they may differ from what has historically been observed, do not differ from environmentally sensitive interpretations of existing guidelines and statutes. For all these reasons it is difficult to make precise quantitative predictions of the costs and benefits that will result from the adoption of the plan. In this analysis, it was assumed that the plan's recommendations would be implemented unless research with relevant agencies indicated they would not follow the letter of the recommendations. The implications of this assumption was then traced out quantitatively or qualitatively to provide a perspective on the economic impacts of the plans. The conclusions of the study are summarized below.

The implementation of the Scott Plan would preserve and enhance the scenic environment and increase the currently available fish resource by about 10 to 25%. Over time this will encourage the use of the area by a few thousand more recreationists, bringing total visitations in the area up to between 12,000 and 17,000 users per year. These users will enjoy the area more than they would in the absence of the plan. The increased value to them is hard to quantify, but they might be willing to pay several hundred thousand dollars a year for the enjoyment of the area rather than forego such recreational use. In addition, future generations will have the option of using resources preserved by the plan's implementation.

Currently, annual anadromous fish escapement estimates for the Scott River system are 8,000 Chinook salmon, 800 coho salmon, and 5,000 steelhead. The 10 to 25% increase for steelhead escapement will endure the added recreational use of the area summarized above. Salmon increases will encourage some increase in local recreation since 4% of the additional salmon caught will be caught in the river. But 78% of the plan-induced additional salmon catch will benefit ocean commercial fishermen while 18% are likely to be caught by ocean sport fishermen. Taking a midpoint of the 10 to 25% increase in

escapement as an estimate of increased fishing induced, the value of the addition to the commercial catch would be about 26,000 pounds of salmon, with a dockside value of about $78,500 per year. An additional 715 angler days of ocean sport fishing would be induced, resulting in about $24,300 worth of sport fishing expenditures per year.

The single resource most likely to be utilized less as a result of the plan's implementation is timber. The production of wood is the major economic activity in the County. The plan's implementation would reduce the profitability of logging and, to some extent, decrease the timber cut. Forest management of small holdings for timber production may, in some cases, be made unfeasible. Development opportunities, while already small, will be lessened. The forecast expansion of agricultural activity in the Scott Valley may be inhibited by groundwater use limitations. Private property values will be slightly decreased. There will be a small net decrease in private sector employment opportunities in Siskiyou County - perhaps 19 or 20 jobs in all.

The governmental costs of administering the plan and carrying out its suggested programs will not be negligible. One-time costs to State agencies are likely to be about $200,000, while annual costs are likely to be approximately $145,000. Significant but hard to estimate administrative and operational costs will be imposed upon the County and the County tax base decreased somewhat due to land value diminutions and timber cut decreases.

REFERENCES

Kroeber, Theodora. 1976. Ishi in two worlds. Univ. Calif. Press.

Lanse, Roger I. 1972a. An estimate of the 1970-71 angler pressure and sport fish harvest - Scott River, Siskiyou County, California. Calif. Dep. Fish and Game, Anad. Fish. Admin. Rep. No. 72-7.

_____. 1972b. Klamath National Forest fish habitat management plan. U.S. Forest Service, California Region.

McKee, J. E., and H. W. Wolf. 1963. Water Quality Criteria, 2nd ed. Calif. State Water Res. Control Bd., Publication 3-A.

APPENDIX I. BEDROCK GEOLOGY

The Scott River planning area lies in a part of California known as the Klamath Mountains geologic province. The geologic history of this province is long and complex and sometimes obscure.

About 450 million years ago, a large ocean covered that part of the earth where the Scott River is now located. Clay, silt, sand, and gravel, eroded from nearby land areas, together with material erupted from volcanoes and the organic remains of very small animals, were continuously being deposited on the bottom of this ocean. This deposition continued until approximately 130 million years ago.

About that time, enormous forces generated deep in the earth began to compress this ocean floor and push it upwards. During this period of mountain building, pieces of the underlying oceanic crust were forced into the overlying materials, now along breaks or faults metamorphosed sedimentary and volcanic rocks. Molten materials, formed by the great heat and pressure of this mountain building, were also forced into these metamorphosed rocks and formed granite rock.

This great period of mountain building, and possibly a second period beginning some 70 million years ago, formed the rock types and geologic structures which are characteristic of the Klamath Mountains geologic province. The Scott River planning area lies almost entirely within a portion of this province known as the Western Paleozoic and Triassic Belt.

The recent geologic history of the planning area is somewhat obscure. The most recent major change in the area was some 10 million years ago, when further vertical uplift of the mountains occurred. Some of the older rocks in the planning area were eroded because of the increased river flows due to the increased steepness of the topography. This accelerated flow is responsible for the existing deep canyons in the watershed.

About 1 million years ago, lower temperatures and increased precipitation resulted in the formation of glaciers at higher elevations in the mountains. Since the last glaciers retreated about 10,000 years ago, climatic conditions along the Scott River have been similar to those found these today. The processes of weathering, erosion, and deposition continue slowly to modify the geology of the watershed.

APPENDIX II. LANDSLIDES AND SURFICIAL DEPOSITS

Surficial deposits are altered bedrock material which has formed in place by weathering or been transported to another location either by force of gravity, water, or snows and ice. As such, these deposits account for a substantial amount of surface and near surface (below soil) area in the Scott River planning area. Landslides, one of the most predominant sources of surficial deposits, are found throughout the planning area, as are surface erosion, and stream and gully erosion. These natural processes are often accelerated, and even initiated, by such activities of man as logging, road building, and mining.

A. Types

Because landslides and surficial deposits are responsible for shaping much of the landscape in the Scott River planning area, it is important to understand the types of features which they produce. Reference to the Landslides and Surficial Deposits Map shows 12 basic feature types:

1. Landslides. These deposits range in age from active to tens of thousands of years old, and in size from a few tens of feet to a few thousand feet in longest dimension. They include several types such as slump or rockfall, but most commonly are debris landslides.

2. Alluvial deposits. These deposits include irregular strata of clay, silt, sand, and gravel that have been deposited by running water in the beds of streams and creeks and in landslide depressions. In the planning area, they vary in thickness from a few feet to several hundred feet, and some have been altered by past hydraulic mining activities.

3. Alluvial fan deposits. These strata of clay, silt, sand, and gravel are generally formed where Scott River tributaries emerge onto more gently sloping valley floors, such as at Quartz Valley.

4. Older alluvial fan deposits. These strata lie above the level of present alluvial fan deposition.

5. River terrace deposits. These strata occur adjacent to but above the present bed of the river and its major tributaries. Several terrace levels representing different ages are present along the Scott up to several tens of feet above the present channel.

6. Colluvial deposits. These deposits lie chiefly at the base of slopes and cliffs, and are composed of fresh and weathered rock fragments.

7. Channel and floodplain deposits. The Landslides and Surficial Deposits Map shows these areas for both the Scott River and its major tributaries. These include alluvial deposits except where the river channel is on bedrock. They are subject to rather regular rearrangement and transport during seasonal high water, and to sometimes catastrophic changes during major floods such as occurred in 1964.

8. Active gullies and channels. These drainages range in size from small gullies to the channels of major tributaries of the Scott River. Alluvial deposits can occur in some, particularly in their lower reaches and during periods of low flow, but the majority of these drainages are actively eroding into bedrock or surficial materials.

9. Questionable bedrock. These areas are often adjacent to landslides, or exhibit unusual characteristics, but are probably underlain by stable bedrock.

10. Mined area. On the map, these features include several of the larger borrow mined areas near Scott Bar and east of Quartz Valley.

11. High erosion areas. In these locations, natural vegetation has been removed and natural drainage patterns have been altered, resulting in extensive rilling and erosion of soil and surficial material.

12. Glaciated areas. These areas include several bowl- or U-shaped valleys and sharp divides in the southwestern part of the planning area, which are probably the result of late Pleistocene glaciation.

B. Planning Area Existing Conditions

A brief inspection of the Landslides and Surficial Deposits Map reveals that landslides occur throughout the planning area and account for a significant part of the existing topography. The majority of the larger landslides probably experienced their initial and greatest movements under different, perhaps wetter, climatic conditions, although regional uplift may have been a contributing cause. These landslides may be a few thousand to a few tens of thousands of years old and are generally moderately stable under existing natural conditions. The smaller landslides are predominantly debris landslides or rock falls and are associated with the older, larger landslides. Many of these landslides are presently active or have undergone movement within the past few tens of years. The majority of these landslides are clearly related, directly or indirectly, to man's activities in the area.

A comparison of the Landslides and Surficial Deposits Map and the Bedrock Geology Map suggests that landslides are fairly evenly distributed with respect to the different geologic units. However, there tends to be an increase in the number and size of landslides from the north to the south throughout the planning area. The south-facing slopes (north canyon wall) along the Scott River between Quartz Valley and Kelsey Creek Guard Station, and along Canyon Creek from well within the Wilderness Area to the Scott River, are almost entirely landslides. The north- and east-facing slopes south of Scott River and west of Quartz Valley are also predominantly landslides. The smaller landslides are concentrated on the lower canyon slopes along Scott River and its tributaries and in upland areas that have been modified by logging activities. Rock falls and talus creep areas are common on oversteepened slopes along the Scott River and in upland areas, particularly where highly factured and/or weathered bedrock is exposed at the surface such as in cirque headwalls.

Active gullies and channels occur throughout the planning area and are often associated with landslides. They commonly occur in the head scarp areas and toe or downslope areas of landslides. They are also extensively developed in and downslope from some high erosion areas that have been modified by logging activities, particularly in the area west of Quartz Valley. Some of the active gullies and channels in the southwestern part of the planning area may be related to snow avalanches.

Areas with high surface erosion are widespread in some parts of the planning area, particularly in the southern part, west of Quartz Valley. They generally coincide with timber harvest areas, but also result from natural causes such as fire.

Alluvial deposits occur along the Scott River and its tributaries and in the central and eastern parts of Quartz Valley. Smaller alluvial deposits occur in closed depressions associated with landslides in upland areas. Alluvial deposits in smaller drainages are subject to rather frequent erosion and redeposition.

Alluvial fan deposits and older alluvial fan deposits occur at the mouth of some smaller drainages and most of the larger tributaries to the Scott River, and form a coalescing alluvial apron along the west side of Quartz Valley. The larger fans are generally not sites of current deposition, but the smaller ones may be sites of rapid deposition during periods of high water. Many of the alluvial fan deposits almost certainly include some debris-type landslide deposits.

River terrace deposits occur along the Scott River and in the lower reaches of some of its major tributaries. There are several terrace levels, representing different ages of deposition and subsequent downcutting, present along the Scott River, the lowest being only a

few tens of feet above the existing channel. The lowest terrace level adjacent to Scott River may be a site of deposition during major floods such as occurred in 1964. Terrace deposits are well exposed in some road cuts along Scott River between Scott Bar and Kelsey Creek Guard Station.

Colluvial deposits are probably present on most slopes in the planning area, but only the larger areas along Scott River and Mill Creek were mapped separately on the map. These areas are sites of relatively slow accumulation of material and are generally stable under existing conditions.

Channel and floodplain deposits occur in the channel and adjacent floodplains of the Scott River and its major tributaries. These areas are relatively small along most of the Scott River but are more extensive in Quartz Valley. They include only the areas that are sites of erosion or deposition during normal high flow periods, as interpreted from the aerial photographs.

Except for the glaciation in the southwestern part of the planning area and the large scale landsliding, which was active during earlier periods and under different conditions, the natural processes of erosion and deposition continue slowly to alter the landscape, producing characteristic deposits and features. Man's activities appear to be the major factor that significantly modifies these processes.

APPENDIX III. SOILS

Soils in the Scott River planning area have formed primarily from the underlying bedrock. It is important to study these soils because they form the fabric from which most vegetation grows, and thus they are essential to the generation and continuance of all life. Soils, however, can be fragile, and can be lost, particularly on hillsides. A certain amount of soil loss in an area like the Scott River watershed is normal. However, extended soil loss can hamper growth or regrowth of vegetation. When lost, soils can wash into streams and rivers, affecting the flow of water and interfering with the spawning and feeding of fish.

Thus, like all things which make up the environment, soils can be affected by, and have an effect on, mankind. The Scott River planning area soils have been studied particularly to understand these effects, principally because of the way that the erosion, or washing away, of unprotected soils can affect the river and the organisms living in it.

In general, soils are formed by a variety of physical and chemical processes on the parent rocks. These processes are affected by climate, topography, living organisms, rock types, and time, and they most commonly lead to an evolution of three soil layers:

1. Horizon A: closest to the surface; contains mostly decomposing plant materials. Dark in color.

2. Horizon B: contains oxides and silicates precipitated from Horizon A, and clay. Redder in color.

3. Horizon C: contains primarily weathered parent material, and frequently, calcium carbonate (caliche).

The parent material of most soils is usually surficial deposits; that is, rocks of all sizes broken off from the underlying bedrock and either remaining in place or having moved over time. In the Scott River planning area, some surficial deposits have been transported to other places and are now forming soils. For example, Shackleford Creek has carried an immense amount of sand and gravel out of the Marble Mountains, creating alluvial fan deposits in Quartz Valley, over which soils have formed in places. Similar deposits lie along the Scott River and its major tributaries, and glacial deposits are present higher up, in the Marble Mountains Wilderness Area.

Soils in the Scott River planning area exhibit low to moderate infiltration rates (rate at which rainfall can soak into the soil). However, the area has a high annual precipitation, meaning that all water falling cannot be infiltrated.

Soil types in the Scott River planning area vary considerably. Variations in texture and composition are due primarily to differences in elevation and underlying parent material, although locally, human activity has also resulted in changes to natural soil characteristics. Soils on the higher slopes in the southwestern portion of the Scott River watershed are thinner and less mature than soils in other areas, and locally soils and surficial deposits are entirely absent, and hard, unweathered rock crops out at the surface. Pleistocene glaciers occupied this area down to elevations as low as about 5,500 feet until approximately 10,000 years ago, removing any soil which had formed prior to glaciation. Consequently, soils present in this area have formed since glacial retreat, primarily on valley bottom glacially transported debris (moraines). The soils in other mountainous portions of the planning area are somewhat deeper, older (since they were not removed by glaciers) and more mature (finer grained, higher clay content, etc.). The deepest soils occur in Quartz Valley.

A direct relationship exists between the soil type and underlying parent material. Soils forming over granite rocks are coarse grained and tend to be shallow. Soils forming over rocks known as meta-sediments and meta-volcanics are finer grained and shallow to deep. Soils forming over transported surficial deposits are gravelly and relatively deep.

In some portions of the planning area, natural soil characteristics have been altered by agricultural, mining, and logging practices. Virtually all agriculture in the planning area is in Quartz Valley; this agriculture has resulted in changes in the soil characteristics by the addition of fertilizers, irrigation, the alteration of biological processes, and so forth. Mining practices, particularly hydraulic mining of the alluvial deposits and alluvial terrace deposits, mainly along the Scott River from south of Scott Bar north to the Klamath River, have resulted in the local destruction of soils associated with these deposits. Logging practices, particularly clear cutting and access road construction, have locally resulted in the alteration or destruction of soils by erosion and land-sliding due to the removal of natural vegetation and modification of slope and drainage patterns.

The Scott River Soils Map shows six different soil associations, divided into two groups. These associations have varying degrees of susceptibility to erosion. These susceptibilities provide one of the bases for the Geologic Impacts and Hazards Map, and they underlie many of the recommendations for soil stability and water quality proposed in Chapter IV.

APPENDIX IV. SLOPE

This factor is of critical importance in the lower Scott River watershed, because of the region's mountainous nature, the relative instability of some of the soils, visibility criteria, the extent of erosion, and the extent of human activity, primarily logging and road building, in the area. Traditionally, slopes are described in graduated levels, such as 0 to 15%, 15 to 30%, 30 to 40%, and so on. This traditional approach has been upgraded on this Scott River study to reflect the relative stability of the soils as well. As an example, certain soils in the planning area become unstable on slopes between 16 and 50%, other soils do not become unstable unless the slope exceeds 50%. Consequently, the slopes in the planning area have been mapped in the following categories: 0 to 15%, 15 to 50%, 50 to 75%, and above 75%. The greatest proportion of the planning area lies in the 16 to 50% category.

The relationship of slope to soil stability, surficial deposits, erosion, landsliding, and other factors is cover in Chapter IV, Section B, Road Construction and Maintenance.

APPENDIX V. VEGETATION

Vegetation in the Scott River planning area can be grouped in eight basic plant communities, which are shown on the Vegetation Map (Plates A-5A and A-5B).

Each plant community, except for those areas altered by man's activities, represents slight variations in soil type and microclimate. Except for rare instances, the boundaries between plant communities are somewhat deceptive in that the boundaries are actually transition zones varying in width from a few tens of feet to a hundred feet or more. Therefore, any boundary drawn is a best estimate of where one plant community tends to dominate an adjacent plant community. Moreover, plants typical of one community may occur as subordinates or isolated individuals in another community.

Generally known as a mixed conifer forest, the Scott River planning area vegetation is composed of Douglas fir, ponderosa pine, incense cedar, sugar pine, and white fir, as well as broadleaved species, which are present mostly as an understory but occasionally as dominants.

On the Vegetation Map, the mixed conifer forest has been subdivided into its component plant types. The largest type thus identified is the coniferous forest, which occupies all aspects and slopes. Douglas fir and ponderosa pine are found on the mid to lower slopes, while white fir is fairly well confined to the higher elevations. Incense cedar occupies the drier sites, and sugar pine occurs as scattered individuals mixed with Douglas fir and ponderosa pine.

Within the coniferous forest are residual stands of white fir and ponderosa pine. Generally, the larger, mature trees have been logged. In some instances, mostly in the residual pine stands, an understory of conifer reproduction has developed. The residual white fir stands do not appear to have a reproductive understory, but this lack could be a reflection of more recent logging.

Also within the coniferous forest type are a few plantations of ponderosa pine and Douglas fir planted in the mid-1960s. These plantations are stocked with trees less than 5 inches DBH (Diameter at Breast Height).

Numerous hardwood species are also found within the coniferous forest, including canyon live oak, California black oak, Oregon white oak, madrone, chinquapin, manzanita, ceanothus, and poison oak. The forest floor generally contains a cover of litter, grass, and forbs.

White fir is the climax species for the entire conifer plant community, although either Douglas fir or incense cedar may replace it on drier sites where the white fir cannot withstand moisture stresses. Continued logging and occasional fires will maintain the dominance of species other than white fir over most of the watershed.

A mixed conifer/hardwood forest occurs in isolated but fairly large tracts thoughout the planning area. These trees are typically inconsistent stands of older Douglas fir or pine with an understory of oak, chinquapin, madrone, and various shrub species. It is difficult to say why this particular community occurs where it does, as its topographic position does not indicate extreme adverse environmental conditions. However, it may be the product of past logging or wildfire.

The plant community occupying nearly as great an area as the coniferous forest is the conifer-scrub community, which is defined on Forest Service maps as noncommercial. These sites are characterized by rocky, shallow soils, which are incapable of supporting stands of large trees. Widely scattered incense cedar and ponderosa pine occur in this type along with various oaks, poison oak, shrubs, and grasses. This community is most common and extensive on dry sites with a south or west exposure, although small areas occur almost everywhere.

The barren type shown on the Vegetation Map is primarily rock, which may support some shrub species and lichens and mosses. These areas are generally located near the mountain tops, but some occur along the Scott River and represent sand bars, rock bars, and possibly landslide areas. The plant species found in the high elevation rock areas are low growing shrubs adapted to the harsh growing conditions. Near the river, annual grasses occur on the sand bars along with willow, which is supple enough to withstand water velocities when it is flooded. Landslide areas vary from being totally barren to nearly stabilized depending on the age of the landslide. A few of the mapped barren areas are actually extensive brush fields resulting from past wildfires. While the dense brush may impede the establishment of conifers, the latter will undoubtedly become established and crowd out the brush, provided, of course, the area does not burn again.

The hardwood community may be best described as primarily a riparian community. It occupies moist sites in and near the valley bottoms and supports a rather lush growth of trees, shrubs, grass, and forbs. This community exists discontinuously along the Scott River on sand bars and floodplains. Willow occurs in those areas subject to annual flooding, while bigleaf maple, alder, and black cottonwood make up the overstory adjacent to the river. These species also occur in the major tributary canyons and near springs. Because of their location, the hardwood communities play a key role in maintaining channel stability, and thus in protecting water quality. They are also valuable wildlife habitat for both terrestrial and aquatic species.

A number of areas of recently clear-cut land exist in the planning area. These areas once supported Douglas fir forest, but now contain mostly shrubs and Douglas fir reproduction.

Of the two remaining plant communities, only one is a naturally occurring part of the ecosystem. The grass community exists as small, widely distributed openings within the forest. In general, the boundaries of the grass community are sharply defined, reflecting an abrupt change in soil type. There may be a very slow invasion taking place there by the pine and white fir.

The agricultural areas delineated on the map are restricted to the valley bottoms and represent irrigated forage crops such as alfalfa. The area devoted to agricultural land and the crops grown thereon may vary yearly depending on economic conditions and the availability of water.

An important environmental factor in maintaining the vegetation characteristics of the planning area is fire. Periodic fires have swept through the mixed conifer forests, eliminating some of the thinner barked species and perpetuating the Douglas fir and pine. Fires also created ideal seedbed conditions for regeneration, leaving bare mineral soil and few competitors. The advent of effective fire prevention and fire suppression techniques has resulted in a buildup of fuels in the forest, and an increased volume of brush and hardwoods, resulting in greater fire danger. The more tolerant species, such as white fir, tend to increase in numbers at the expense of the Douglas fir and pine, which are the more valuable commercial species. Logging has replaced fire as a disruptive force in the forest, removing trees and exposing mineral soil. When followed by prescribed burning, logging tends to promote lower successional stages in the development of the forest characterized by the pine and Douglas fir, and less brush and hardwoods.

Moreover, should there be a wildfire in these managed forests, there is less danger of an extremely hot fire destroying all of the trees and the soil microorganisms and the actual organic content of the soil.

APPENDIX VI. OWNERSHIP

Reference to the Ownership Map shows that the major landholder in the Scott River planning area is the U.S. Forest Service, which was given the responsibility of managing certain lands owned by the citizens of the United States under the Organic Administration Act of 1897, and by the Multiple Use Sustained Yield Act of 1960. The latter states that such management shall be carried out for outdoor recreation, range, timber, watershed, and wildlife and fish purposes.

A very small proportion of the planning area is administered by the Bureau of Land Management, under the Department of the Interior.

Substantial portions of the private lands within the planning area are owned by three companies - Southern Pacific, United Fruit Growers, and International Paper. These lands are used primarily for timber production.

Private mining claims filed with Siskiyou County are shown by small circles. The locations of some of these claims are approximate. Private lands, other than major commercial ones, are denoted by the letter P.

APPENDIX VII. TRANSPORTATION

Although there is only one major road in the Scott River planning area, the entire watershed is covered with minor roads and trails. Thus although most travel is along the Scott River Road, vehicular and pedestrian travel opportunities are widespread throughout the planning area.

The Scott River road is a Federal Aid Secondary Route under the jurisdiction of the Siskiyou County Department of Public Works. It runs through the center of the planning area, paralleling the river for its length between Shackleford Creek and the Klamath. During most of this distance, it lies within 100 feet of the river. However, just north of Sunny Slope Ranch, the road leaves the river and climbs the west slope of the canyon to heights of up to 500 feet above it, descending to meet the river again at Scott Bar. Frequently during this section, the road is invisible and inaudible from the river's banks. However, at times, fine views of the river can be obtained from the road's shoulder.

Because of its relationship to the river, the road offers a variety of beautiful scenery to the traveler. Where the river is close by, the traveler can enjoy the sight of its pools, white water, bedrock outcrops, rocky walls, and green vegetation. Above and beyond, the steep slopes of the canyon, with their rows of conifers, carry the eye to higher and farther vistas. Many of the visitors to the planning area will see it primarily by driving along the Scott River road. For planning area residents, the road remains the only really feasible year-round means of travel to and from Hamburg, Yreka, Fort Jones, and other locations. Thus the width, safety, comfort, and visual quality of this road, as well as the isolation which it affords, are all very important to visitor and resident alike.

Most maintenance on the Scott River road is carried out by Caltrans under contract to Siskiyou County Department of Public Works, and recently has primarily involved flood restoration. Public Works anticipates that at some point during the next 10 years it may wish to upgrade the road considerably, although it states that it now has no plans for extensive work unless there is a marked increase in traffic or accidents.

The Department states that this upgrading would develop the road to a design speed of 35 to 40 miles per hour, and would expand it to a two-lane width by medium current design standards. The requirements would be necessary because the road is a Federal Aid Route and thus must conform to the design standards of the State of California or to those of the American Association of State Transportation Officials.

According to Public Works, such an upgrading of the road will entail, in most cases, the reworking of the existing bed from the beginning of the Scott River canyon, below Shackleford Creek, to Gold Flat. From Gold Flat to Scott Bar or below, the upgrade will involve cutting out or bridging the curves.

In the questionnaire which has been submitted to lower Scott River residents as a part of this study, a substantial majority indicated that they would prefer the road to stay the same, rather than be widened. Concerns expressed by residents related to property condemnation and to the loss of isolation resulting from an upgraded road, as well as to what was stated as a generalized environmental concern over more construction and traffic.

As far as maintenance is concerned, the Department of Public Works states that at present there are no materials disposal sites established along the Scott River Road. Apparently there has been some discussion between the Forest Service and Public Works about disposal sites on public land. In the absence of such sites, road construction and maintenance debris and slide materials are "generally deposited on a wide bench somewhere above the high water mark," according to Public Works officials. However, no differentiation was expressed, by these officials, between a normal year's high water mark and a flood year mark.

Reference to the Transportation Map shows seven categories of roads and trails:

1. County: Primarily the river road with a few adjacent spurs. Generally paved.

2. Light duty: Well-maintained public and private logging roads, and other private roads.

3. Unimproved dirt: Logging roads or trail access.

4. Proposed reconstruction: Unimproved or revegetating roads proposed for upgrading to carry logging trucks on proposed new Forest Service harvests.

5. Revegetating: Roads not receiving much or any traffic, and over which vegetation is returning.

6. Trails: These routes are for either jeep, pack horse, or foot, and are so indicated by the appropriate letter.

7. Proposed roads: New roads which will be built to service proposed Forest Service logging areas.

APPENDIX VIII. WILDLIFE

One of the Scott River planning area's greatest attributes, and one most praised by its citizens, is its diversity of wildlife. This diversity is due in part to the wide variation in elevations, from 1,500 to 6,300 feet. It is also due to a range in habitat types throughout the planning area.

A. Wildlife Habitats

The Scott River planning area can be classified into seven such distinct habitat types. A particular animal species' habitat consists of the combination of physical and biological elements within its environment that is favorable for its continued survival. Such elements can be categorized into groups based on certain common characteristics which distinguish them; these are termed habitat types. A given species may be adapted to a wide range of habitat types, as is the deer, or it may be almost totally dependent on one type, as is the spotted owl, a bird of coniferous forests.

In addition to habitat types, there is a habitat concept known as the "edge effect", which is very important in determining the capacity of an area to support wildlife. Simply stated, the edge effect occurs wherever two habitat types come together, such as the zone where forest and grassland meet. The edge area is generally more favorable as wildlife habitat than either type considered along because it offers the advantages of both. Species abundance and diversity are usually greater in edge areas, and it is often the amount of edge habitat in a given environment that has the greatest influence on its wildlife carrying capacity. The Scott River watershed contains a high proportional area of edge habitat.

The seven wildlife habitat types found in the Scott River planning area can be summarized as follows:

1. Coniferous forest. The value of this habitat varies with the forest density; generally, forests of low to moderate density with a good understory (shorter vegetation) provide the best habitat. High density, old growth forests are dominated by tree-dwelling mammals, insect-eating birds, and amphibians. Low to moderate density forests contain deer, raccoons, skunks, bats, and a wide variety of birds, reptiles, and amphibians.

2. Hardwood forest. This forest type often intermingles extensively with coniferous species, and contains excellent cover and food value for animals. In particular, the acorns of oaks provide a highly nutritious source of food for birds, small, and medium-sized mammals, and deer.

3. Riparian areas. This type is one of the most valuable wildlife habitats, consisting of the lush vegetation (trees, shrubs, and herbaceous plants) that commonly grows along the Scott River and its tributaries and at springs and seeps. This habitat is particularly valuable during the dry summer months when surrounding areas are less habitable due to higher temperatures, lack of moisture, and reduced availability of green vegetation. Birds, fur-bearing mammals, reptiles, insects, and amphibians thrive in this habitat type.

4. Brush. This habitat type is dominated by woody shrubs in varying densities. It provides excellent cover and food for a wide variety of animals. It is most valuable when only moderately dense so as to allow unrestricted animal movement.

5. Grassland. Burrowing mammals, reptiles, and amphibians are common in this habitat. It provides important hunting grounds for predatory birds, mammals, and reptiles. During spring, fall, and winter, this habitat provides food for deer, particularly in edge areas near brush or tree cover.

6. Agriculture. This habitat type includes orchards, pasture lands, and row crops. The latter two are generally of limited or low habitat value.

7. Barren/Rocky. Rocky areas provide denning and/or observation sites for bobcat, cougar, fox, and predatory birds. Some birds use ledges for nesting sites, and some rodents, such as the woodrat, inhabit crevices in the rocks.

B. Wildlife Species

Of the great variety of wildlife in the Scott River planning area, certain groups and species deserve special attention because of their rareness or endangered status, their sensitivity to environmental change, or their economic or recreation value to mankind:

1. Black-tailed deer. Deer utilize a variety of habitats, particularly brush, riparian, hardwood forest, and low to medium density coniferous forest. Deer summer range covers most of the Scott River planning area; winter range is restricted to the lower elevations. Deer have both a positive economic and recreational value and an aesthetic value to the citizens of the Scott River planning area. Although the deer population in the area is not high, both local residents and visitors hunt them during the archery and regular season.

Many deer populations in California have declined since the 1960s. This decline in numbers is due to a decrease in quantity and quality of key deer habitat caused by such things as residential and recreational subdivisions, water impoundments, range overutilization, and road construction.

2. Mammalian carnivores. This group includes animals such as the mountain lion, coyote, bobcat, black bear, fox, raccoon, skunk, opossum, weasel, ringtail, fisher, marten, mink, and badger, all whose ranges include the Scott River planning area. As predators, this group plays an important role in maintaining the balance among the populations of their prey species. Several prey on small and medium-sized mammals, while others, such as the raccoon, feed on a wide range of smaller animals, including reptiles, amphibians, invertebrates, and bird eggs. The mountain lion is an important predator of deer.

   Habitat requirements for this group vary between species. Those with the most strict requirements are the marten and fisher. Both the marten and fisher are largely restricted to coniferous forests and are sensitive to human disturbance.

3. Raptors. Raptors, or birds of prey, include hawks, eagles, falcons, owls, and vultures. Populations of several of these species have been slowly declining over the past several years as a result of human encroachment into their ranges, illegal shooting, and the effects of persistent pesticides.

   The osprey is a large raptor which nests along rivers, lakes and coastal waters largely in the northwestern half of California. It is a migrant to the Scott River, usually arriving between mid-March and early April. It most commonly builds its nests in the tops of snags (dead trees) or other trees (most frequently Douglas fir), usually directly adjacent to the river and rarely greater than 1/2 mile from it. The nest consists of a mass of sticks about 3 feet wide and 3 to 4 feet thick. One to four eggs are laid between mid-April and early May. The incubation period is about 35 days, with the young hatching in early June. Incubation is entirely performed by the female. The young are usually fully feathered and leave the nest by early September. By the end of September, most of the birds leave the area for their southward migration.

   The osprey feeds almost entirely on fish, which explains its close association with bodies of water. Its skillful and dramatic dives during fishing activity are truly among the exciting

sights in nature, and for this reason it possesses high aesthetic appeal. Because of its almost exclusive fish diet, the maintenance of a suitable fishery is important to its continued reproduction along the Scott River. Also important is the presence of suitable nest sites and the prevention of adverse disturbance during the nesting and rearing period.

4. Rare, endangered, or threatened species. There are two planning area vertebrate species that fall under one or more of these classifications:

   a. Southern bald eagle. This endangered bird is a winter visitor to the Scott River, but has not in recent years, as far as is known, used the area for nesting.

   b. American peregrine falcon. Designated endangered by the California Department of Fish and Game, this species is not known to nest within the planning area, although the area is suitable habitat within their known range. This species is classified as endangered by the California Department of Fish and Game and the U.S. Fish and Wildlife Service.

APPENDIX IX. ARCHAEOLOGY

Prior to the influx of miners, ranchers, and farmers to northern California in the 1800s, most of Siskiyou County was populated by the Shasta people. Their territory was bounded on the east by the Modoc tribes, and on the west by the Karok (see Figure IX-1). Shasta territory comprised four major drainages, those of the Rogue, the Klamath, the Shasta, and the Scott rivers. The people of each drainage were characterized by certain differences of dialect and custom. The Scott River people were named Iruaitsu.

The Iruaitsu occupied, as far is known, the lower-lying areas along the river, placing their villages on terraces or knolls not far from the water, often near tributaries or springs. Villages were probably located to take advantage of maximum available sun exposure and of access to essential food resources.

Suitable village sites along the lower river were few, and the Iruaitsu were thus not widespread. A U.S. Government field census in 1851 described seven towns on the river, and estimated an average population each of 60 persons, for a total of 420. Subsequent research indicates that this total population estimate may have been too high, although other villages seem to have existed. One of the most recent studies on the archaeological resources of the planning area, prepared primarily through interviews with descendents of the Shasta, records nine villages:

1. Ko-watch'-ah-hah

   A village at the mouth of the Scott River on the South side of Klamath River.... The village was supposedly the home of a chief and a great place for fish.

2. Ussopag

   This village was on the Scott River at the mouth of Mill Creek.

3. As'-soo-pahk

   A village at Scott Bar, upstream from Ussopag.

4. At-tik'-kah-ap'-se-rook

   This village was on the Scott River, a few miles above Scott Bar.

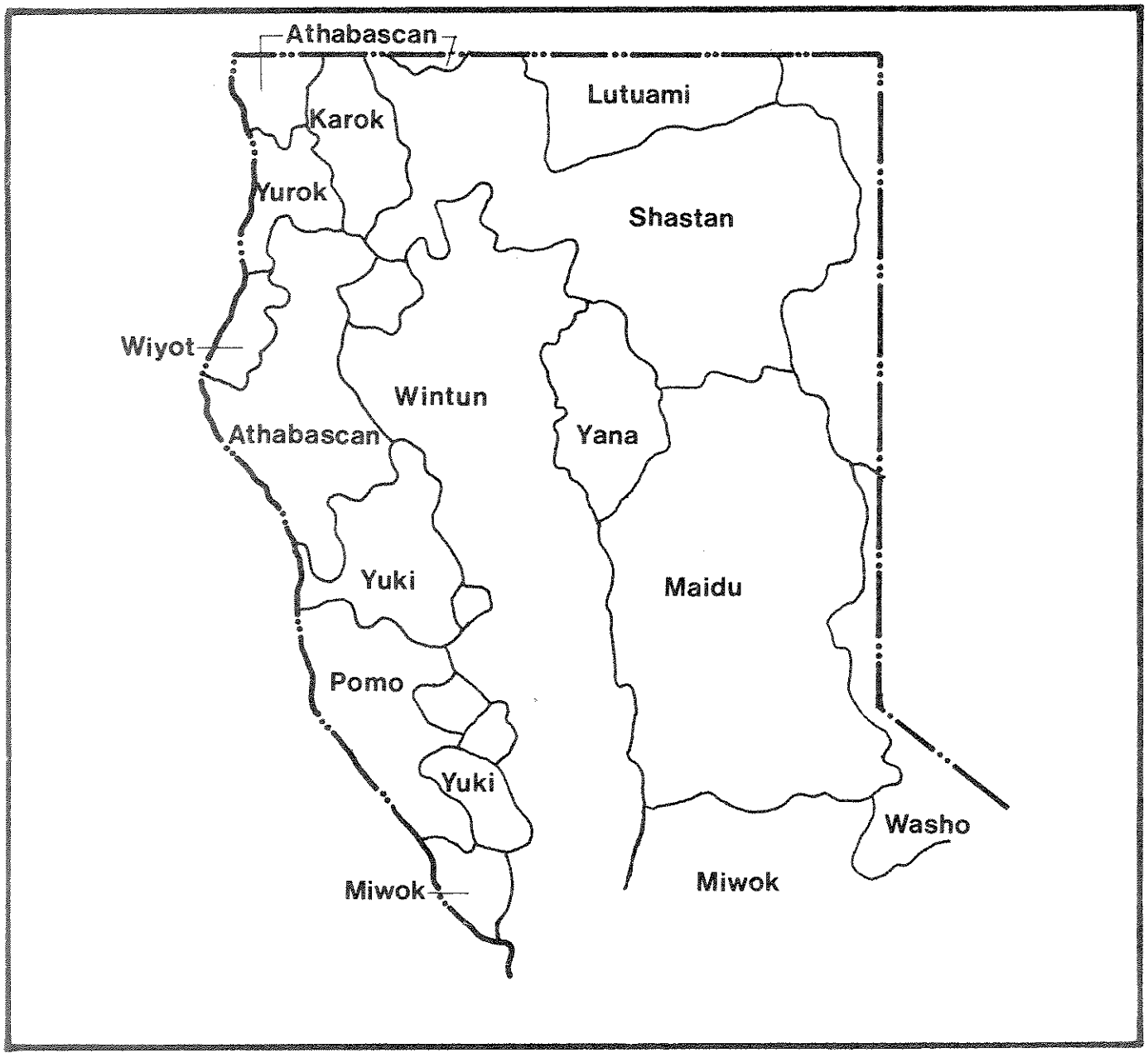
5. Tah'^{ch}-wah-tok

   This village was on the Scott River near a deer lick 15 miles below Meamber School.

FIGURE IX-1

Tribal Territories of Northern California.

Source: Kroeber, 1976.



6. Ab'-se-kow

   A village on the Scott River about 12 miles below Meamber School.

7. Ha^{ch}

   Village on southwest side of Scott River a little below Wats-ah-he-mah.

8. Wah-room'-pah

   Located on southwest side of Scott River about 4 miles below Meamber School and opposite Wicks Ranch.

9. Wats-ah-he'-wah

   A village situated in a canyon about 11 or 12 miles below Wicks place but above Ha^{ch}.

In the typical Iruaitsu village, all buildings were semisubterranean. The dwelling house (ŭmma) was rectangular, perhaps 16 by 20 feet, and was dug to a depth of 3 or 4 feet. A very important village, one with a chief (such as Ko-watch'-ah-hah) probably also had an assembly building known as an okwa'-ŭmma, which was sometimes as large as 25 by 40 feet, and excavated to a depth of up to 6 1/2 feet. Sweat houses, called wu'kwa, were more common, and in shape were similar to, though smaller than, the Okwa'-ŭmma.

In addition to permanent villages, Shasta tribes usually had summer camps nearby, where brush shelters were used. As well, they usually established seasonal camps at higher elevations, to be near certain plants as they came to maturity.

A variety of such food resources were available to the Iruaitsu. Oaks, whose acorns were the main diet of many California tribes, grew in abundance. The acorns were ground into a mash, after which inedible elements were leached with water. Other nuts were available also as food, including those of the digger, sugar, and yellow pine, and hazelnut. Berries were plentiful, as were bulbs such as the camas and sego lily. Elk and deer were plentiful, as well as antelope in Scott Valley. Fish, particularly salmon, were often available in the river which flowed by the village.

Little is known about the people who may have populated the Scott River planning area before the Iruaitsu. Until recently, it was throught that the Indian had not migrated into most of mountainous northern California until shortly before the arrival of the white race. However, recent surveys have revealed an older culture at higher elevations that that of the Shasta or Wintu.

These "Early" cultures show a quite different adaptation to the environment than that of later people like the Iruaitsu. Ridge sites up to 6,000 feet in elevation have been recorded in the Six Rivers National Forest, on South Fork Ridge, Shasta-Trinity National Forest, and in the Mendocino National Forest. These high elevation sites date to between 2,000 and 6,000 years old, and seem to have had a primary dependency on large animals and on the utilization of small grass seeds, rather than exhibiting the fish/small-game/acorn economy of the more recent cultures.

The first contact between the Iruaitsu and the white race probably occurred in the 1820s and 1830s, when fur trappers began to descend the Klamath River from the east. Scott River was known to them as Beaver River, and they often wintered along it.

After the discovery of gold at Scott Bar, an invasion of miners along the river caused a major disruption of the Iruaitsu culture. Their population was decimated, forests were felled, roads and houses were built, and some village sites hydrualic mined. In such a confrontation between a larger, stronger race and a smaller, less technological culture, the outcome was inevitable, and the Iruaitsu faded from life, the survivors blending their blood with survivors of neighboring tribes and with the dominant whites.

As a consequence of hydraulic mining and of major floods since the middle of the last century, no archaeological remains of any of the villages along the Scott River have been found.

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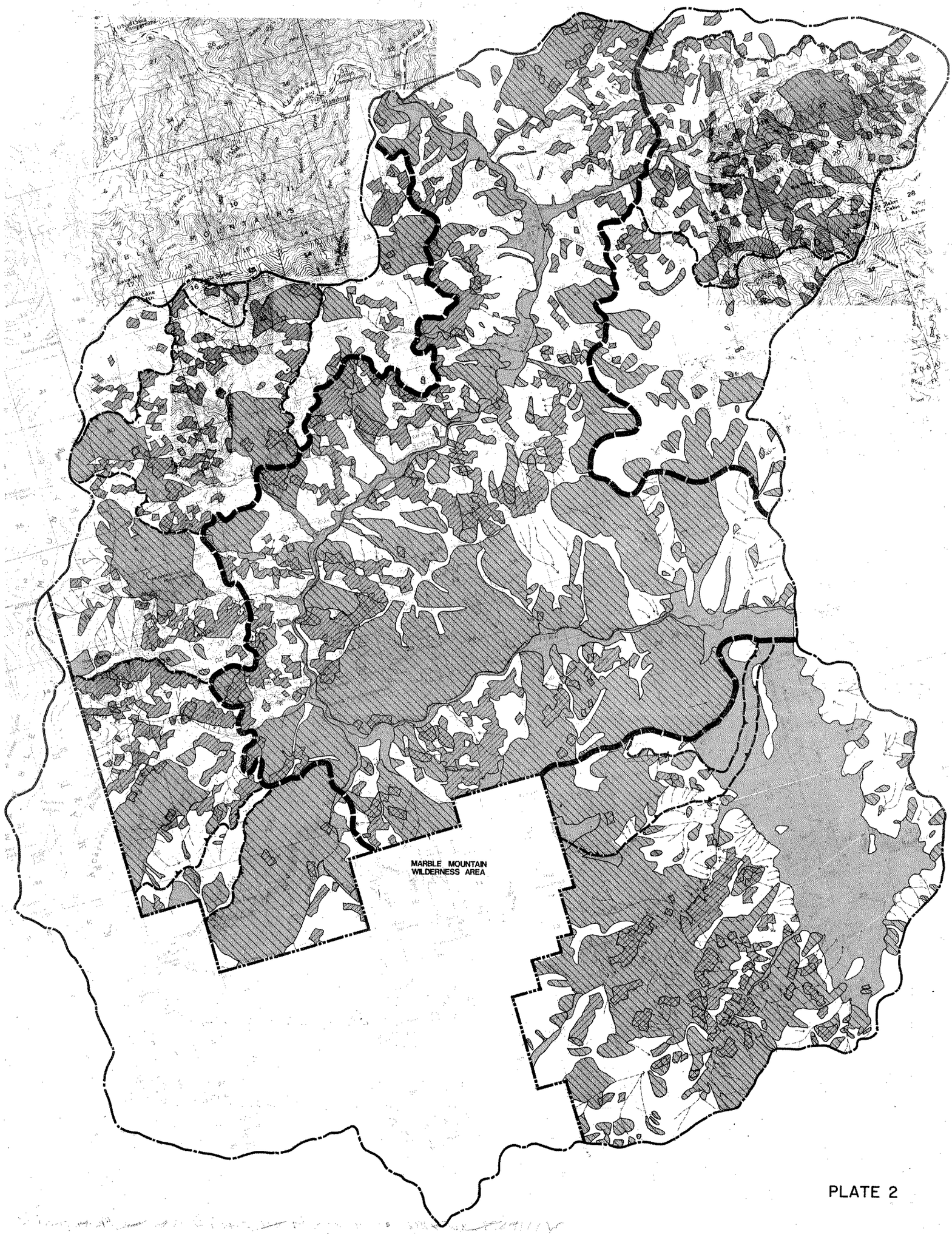


PLATE 2

Scott River
Waterway Management Plan

State of California Resource Agency • Department of Fish and Game
July 1979

Geologic Impacts and Hazards

- IDENTIFIED LANDSLIDES AND POTENTIAL LANDSLIDES
- SLOPES GREATER THAN 50%
- AREAS OF HIGH SURFACE EROSION, SURFICIAL DEPOSITS AND FLOODPLAIN
- DIRECTION OF ACTIVE EROSING GULLIES

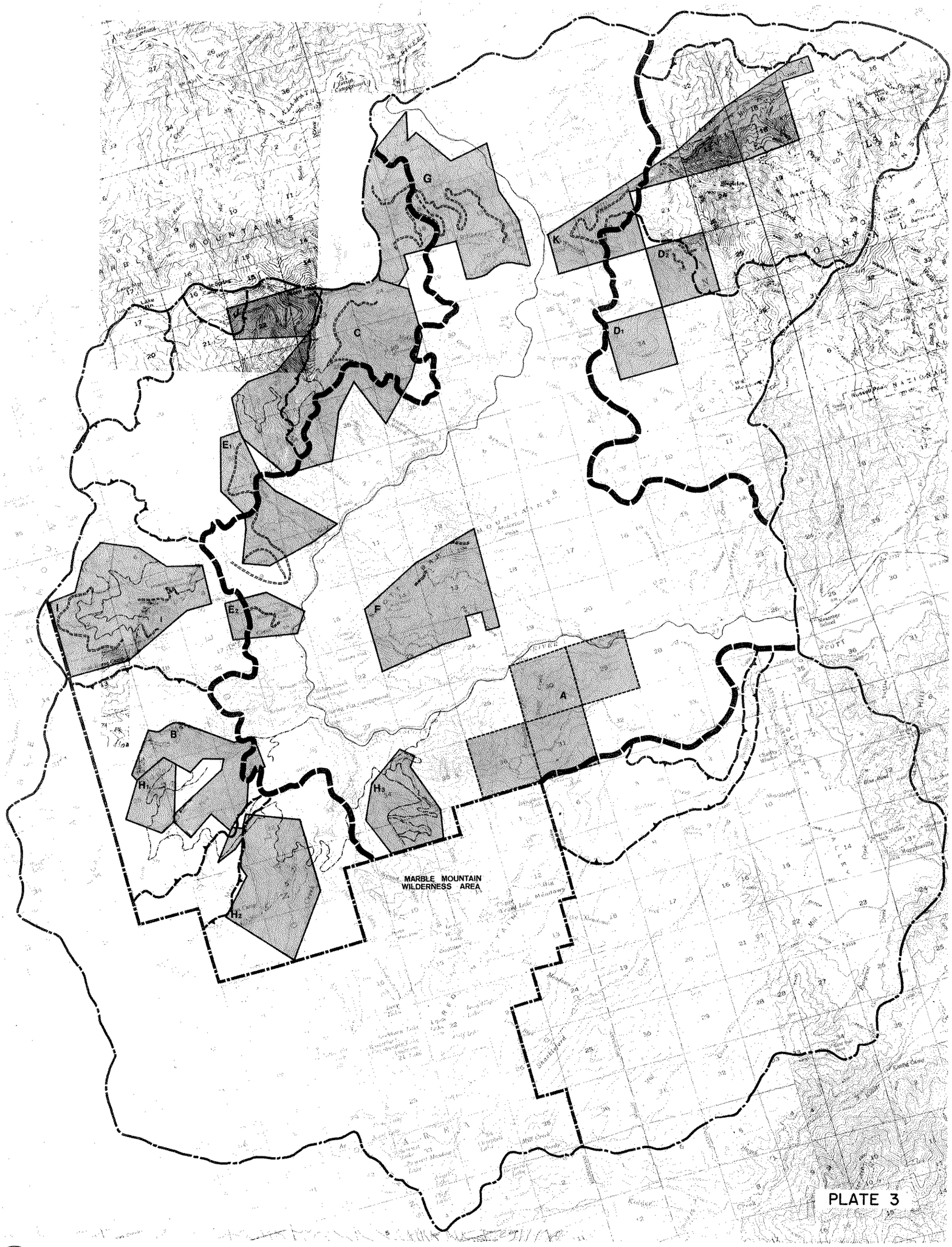
NOTE : UNSHADED AREAS ARE NOT NECESSARILY FREE OF IMPACTS AND HAZARDS

EDAW inc.

10 | 40 | 160
80
320
640 Acres or 1 Sq. Mile

North 0 2000' 1Mile 2 Miles

WATERSHED BOUNDARY
AREAS OF SPECIAL CONCERN
PLANNING AREA BOUNDARY



Scott River
Waterway Management Plan

State of California Resource Agency • Department of Fish and Game
July 1979

Proposed Logging Areas

AREAS TO BE CUT	ADVERTISE DATE	TIMBER VOLUME
A	NA	NA
B	JAN. 78	6.0 MMBF*
C	APRIL 78	6.0 MMBF
D_1, D_2	JUNE 79	6.5 MMBF
E_1, E_2	AUG. 79	4.0 MMBF
F	NOV. 79	4.0 MMBF
G	APRIL 80	10.0 MMBF
H_1, H_2, H_3	SEPT. 80	11.0 MMBF
I	FEB. 81	8.5 MMBF
J	MARCH 81	2.5 MMBF
K	JULY, 81	30. MMBF
TOTAL	1981	85.5 MMBF

RECONSTRUCTION OF EXISTING ROAD

PROPOSED NEW ROADS

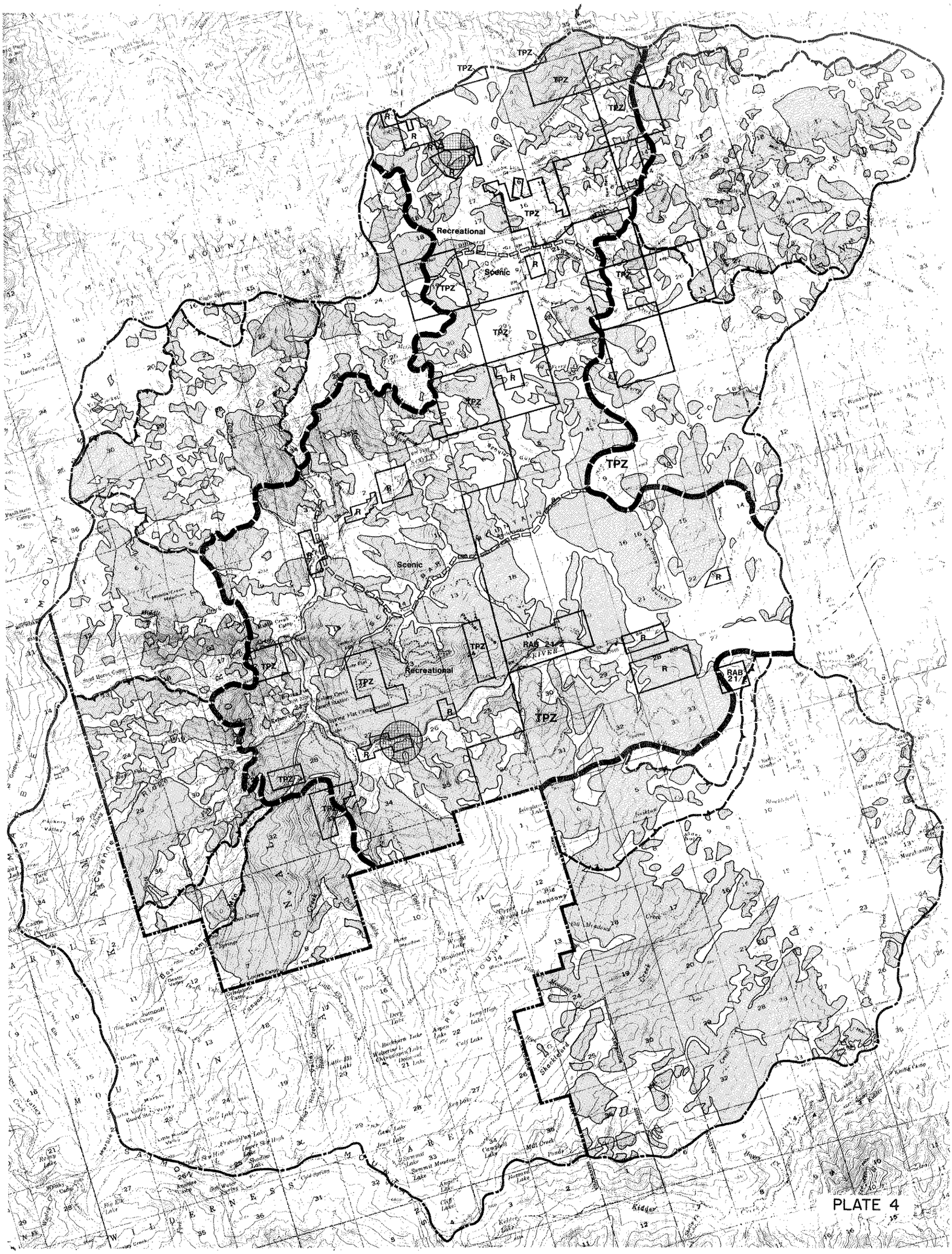
*MMBF - MILLION BOARD FEET.

EDAW inc.

640 Acres or 1 Sq. Mile

North 0 2000' 1 Mile 2 Miles

WATERSHED BOUNDARY
AREAS OF SPECIAL CONCERN
PLANNING AREA BOUNDARY



Scott River
Waterway Management Plan

State of California Resource Agency • Department of Fish and Game
July 1979

Management Recommendations

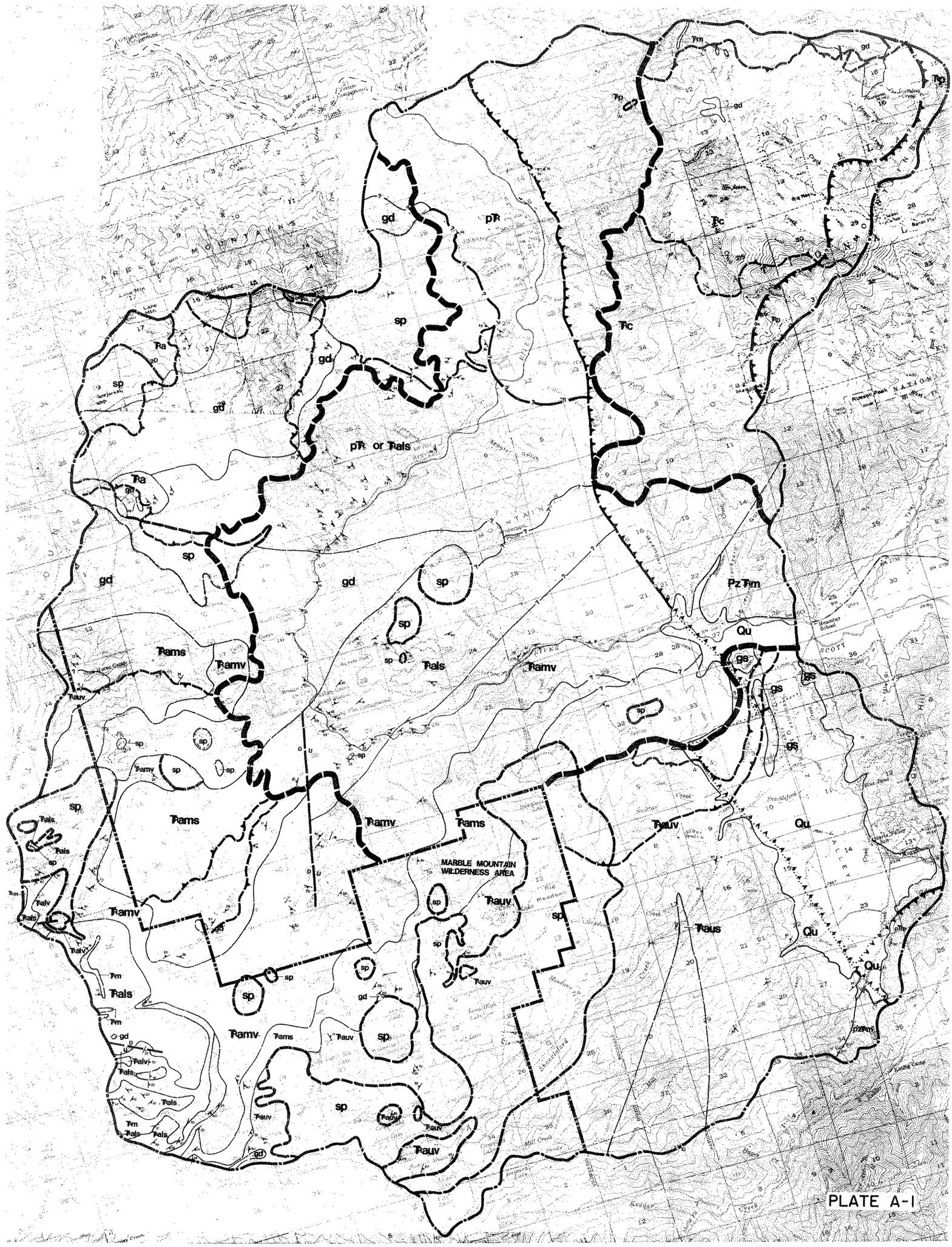
- GEOLOGIC HAZARDS (LANDSLIDES AND SLOPES > 50%)
- RARE FLORA — REFER TO VEGETATION SECTION OF TEXT
- TPZ — TIMBER PRESERVE ZONE (AS RECOMMENDED)
- R — RAB 20, 20 ACRES MINIMUM LOT SIZE, RESIDENTIAL — REFER TO LANDUSE AND MANAGEMENT SECTION OF TEXT
- RAB 2½ — 2½ ACRES MINIMUM LOT SIZE, RESIDENTIAL — REFER TO LANDUSE AND MANAGEMENT SECTION OF TEXT
- Rec — RECREATIONAL, SCENIC - RIVER CLASSIFICATION

EDAW inc.

640 Acres or 1 Sq. Mile

North 0 2000' 1Mile 2Miles

WATERSHED BOUNDARY
AREAS OF SPECIAL CONCERN
PLANNING AREA BOUNDARY



Scott River
Waterway Management Plan

State of California Resource Agency • Department of Fish and Game
July 1979

EDAW inc.

640 Acres or 1 Sq. Mile

North 0 2000' 1Mile 2 Miles

WATERSHED BOUNDARY
AREAS OF SPECIAL CONCERN
FLAGGING AREA BOUNDARY

Bedrock Geology

TERTIARY DEPOSITS

Qu — SURFACE DEPOSITS, UNDIFFERENTIATED

JURASSIC ROCKS

gd, sp — GABBRO AND DIORITE, SERPENTINE

TRIASSIC ROCKS

Ta, Taus — APPLEGATE GROUP, UNDIFFERENTIATED; UPPER METASEDIMENTARY; UPPER METAVOLCANIC;

Tauv, Tams — MIDDLE METASEDIMENTARY; MIDDLE METAVOLCANIC;

Trams, Trals — LOWER METASEDIMENTARY; LOWER METAVOLCANIC;

Talv, Tm — ARGILLITE; PHYLLITE; METAVOLCANIC ROCKS OF DEDMOND RIDGE; CHERT, ARGILLITE, AND METAVOLCANIC ROCKS OF ALL CREEK.

Tp, Tmv — METAVOLCANIC ROCKS OF ALL CREEK.

Tc

PALEOZOIC OR TRIASSIC

pzTm, gs — REMBER FORMATION PHYLLITE, CHERT, BASALT AND GREENSTONE

PALEOZOIC ROCKS

pR, pRs — TOWNSEND GULCH, SALMON HORNBLENDE, ABRAMS AND UNDIFFERENTIATED SCHIST

CONTACT; DASHED WHERE APPROXIMATELY LOCATED; QUERIED WHERE UNCERTAIN.

HIGH ANGLE FAULT. DASHED WHERE APPROXIMATED LOCATED; DOTTED WHERE CONCEALED; D-DOWNTHROWN SIDE, U-UPTHROWN SIDE.

LOW ANGLE FAULT. DASHED WHERE APPROXIMATELY LOCATED. QUERIED WHERE UNCERTAIN, DOTTED WHERE CONCEALED, BARBED ON UPPER PLATE

STRIKE AND DIP OF BEDDING

STRIKE AND DIP OF FOLIATION

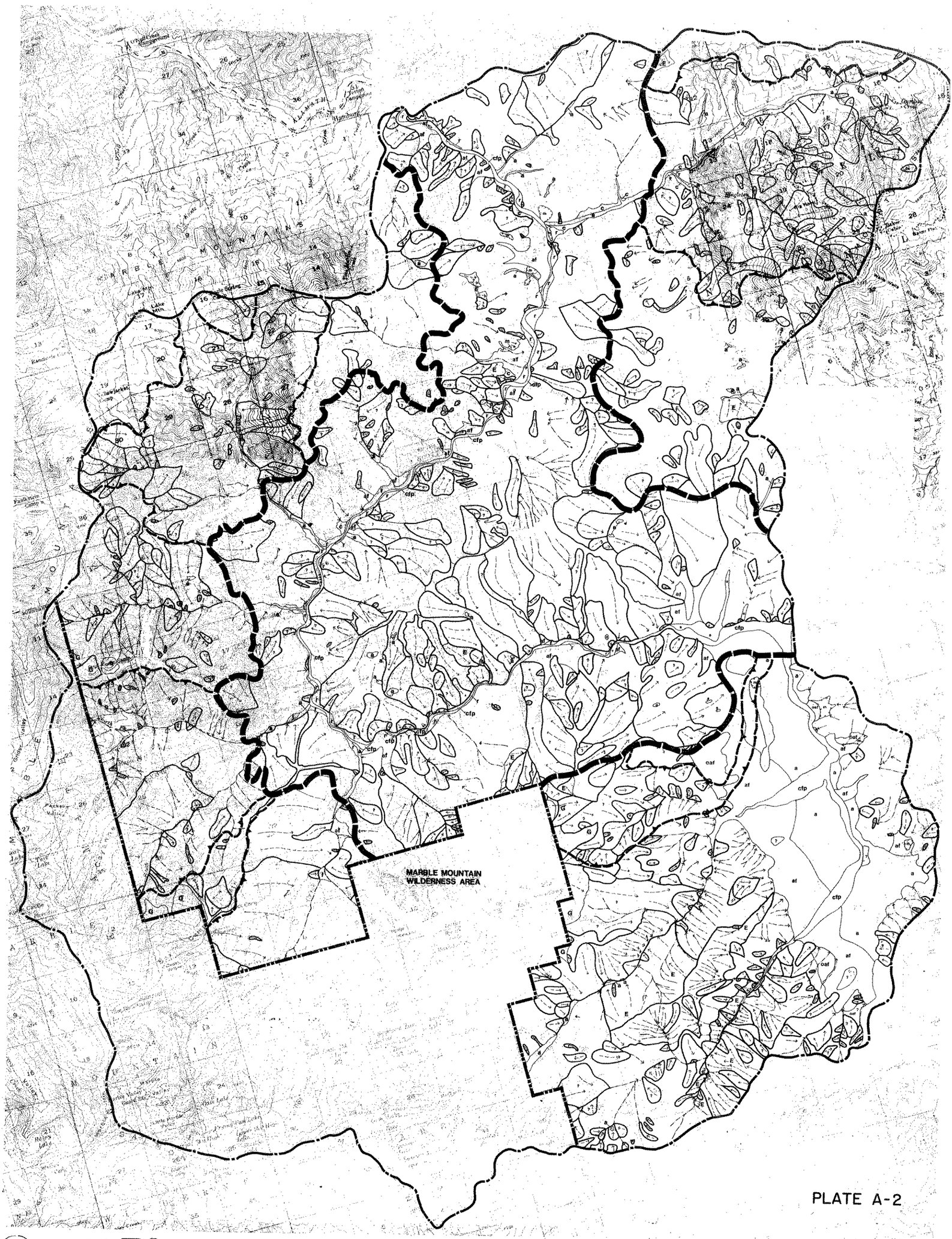


PLATE A-2

Scott River
Waterway Management Plan

State of California Resource Agency • Department of Fish and Game
July 1979

EDAW inc.

10 40 80 160 320
640 Acres or 1 Sq. Mile

North 0 2000' 1Mile 2Miles

WATERSHED BOUNDARY
AREAS OF SPECIAL CONCERN
PLANNING AREA BOUNDARY

Landslides and Surficial Deposits

- m — MINED AREA
- b — BEDROCK QUERIED WHERE UNCERTAIN.
- s — LANDSLIDES SMALL LANDSLIDES MINIMUM AREA MAPPED IS 5 ACRES.
- ls — LANDSLIDES MINIMUM AREA MAPPED IS 10 ACRES.
- ls? — QUERIED LANDSLIDES MINIMUM AREA MAPPED IS 10 ACRES.
- G — GLACIATED AREA; QUERIED WHERE UNCERTAIN
- c — COLLUVIAL DEPOSITS
- a — ALLUVIAL DEPOSITS
- af — ALLUVIAL FAN DEPOSITS
- oaf — OLDER ALLUVIAL FAN DEPOSITS
- t — RIVER TERRACE DEPOSITS
- cfp — CHANNEL AND FLOODPLAIN DEPOSITS
- E — HIGH EROSION AREA (ACTUAL)

NOTE: ARROWS SHOW DIRECTION OF DOWN HILL MOVEMENT.

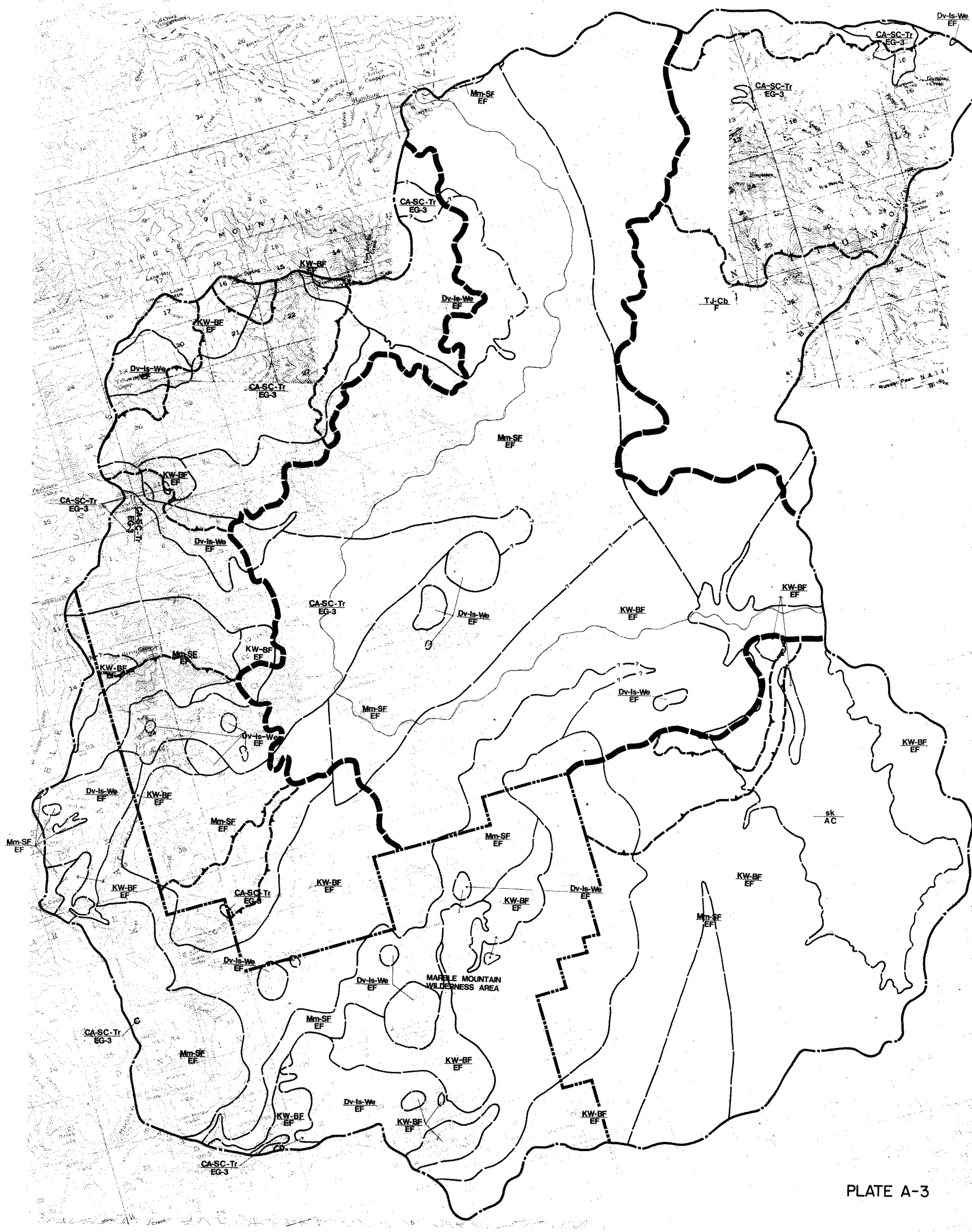


PLATE A-3

Scott River
Waterway Management Plan

State of California Resource Agency • Department of Fish and Game
July 1979

EDAW inc.

640 Acres or 1 Sq. Mile (10, 40, 160, 80, 320)

North 0 2000' 1 Mile 2 Miles

WATERSHED BOUNDARY
AREAS OF SPECIAL CONCERN
PLANNING AREA BOUNDARY

Soils

GROUP 1

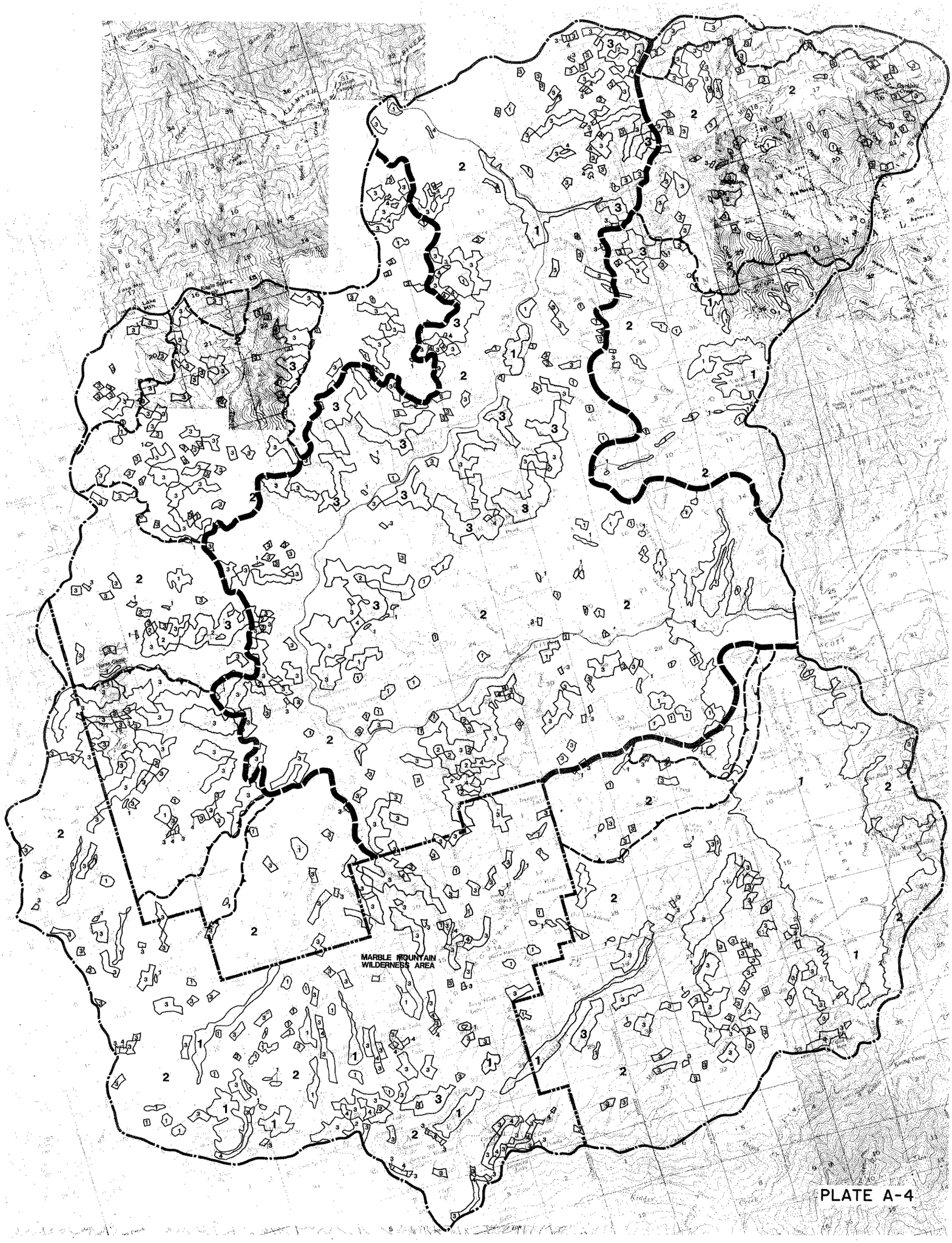
AREAS DOMINATED BY MODERATELY DEEP TO VERY DEEP, NEARLY LEVEL TO STEEP, SOMEWHAT POORLY TO SOMEWHAT EXCESSIVELY DRAINED SOILS.

sk / AC	STONER ASSOCIATION, 0 to 9 % SLOPE, OVER STRATIFIED SILTY, SANDY OR CLAYEY SEDIMENTS.
Kw-BF / EF	WINKEL-BOOMER ASSOCIATION 15 TO 50 % SLOPES, OVER METAMORPHOSED SEDIMENTARY AND IGNEOUS BEDROCK.
Mm-SF / EF	MASTERSON-SHEETIRON ASSOCIATION, 15 TO 50 % SLOPES SEDIMENTARY BEDROCK.
TJ-Cb / F	TYSON-CAHTO ASSOCIATION, 30 TO 60 % SLOPES, OVER SHALY BEDROCK.

GROUP 2

AREAS DOMINATED BY SHALLOW TO DEEP, WELL TO SOMEWHAT EXCESSIVELY DRAINED, NEARLY LEVEL TO VERY STEEP SOILS.

CA-SC-Tr / EG-3	CHAWANAKEE-SHAVER-TOLLHOUSE ASSOCIATION, 15 to 75 % SLOPES, SEVERELY ERODED, OVER WEATHERED GRANITIC ROCK.
Dv-Is-We / EF	DUBAKELLA-ISHI PISHI-WEITCHPEC ASSOCIATION, 15 TO 50 % SLOPES, OVER METAMORPHOSED BEDROCK HIGH IN SERPENTINE MINERALS.



Scott River
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State of California Resource Agency • Department of Fish and Game
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Slope

1	0-15%
2	15-50%
3	50-75%
4	ABOVE 75%

NOTE:
MINIMUM SIZE AND WIDTH MAPPED IS 10 ACRES

EDAW inc.

WATERSHED BOUNDARY
AREAS OF SPECIAL CONCERN
PLANNING AREA BOUNDARY

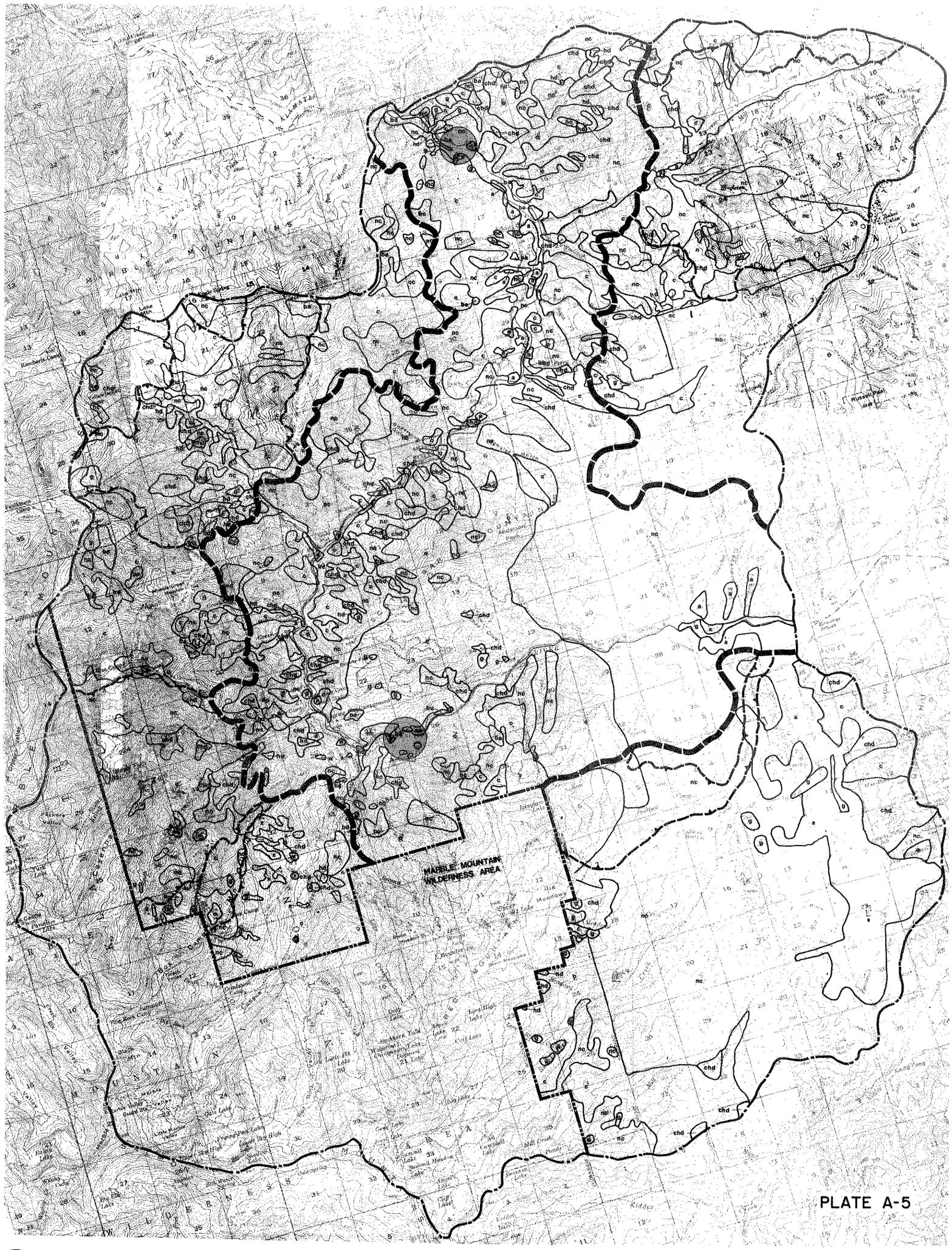

PLATE A-5

Scott River
Waterway Management Plan

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July 1979

EDAW inc.

10 | 40 | 160
80 | 320
640 Acres or 1 Sq. Mile

North 0 2000' 1Mile 2Miles

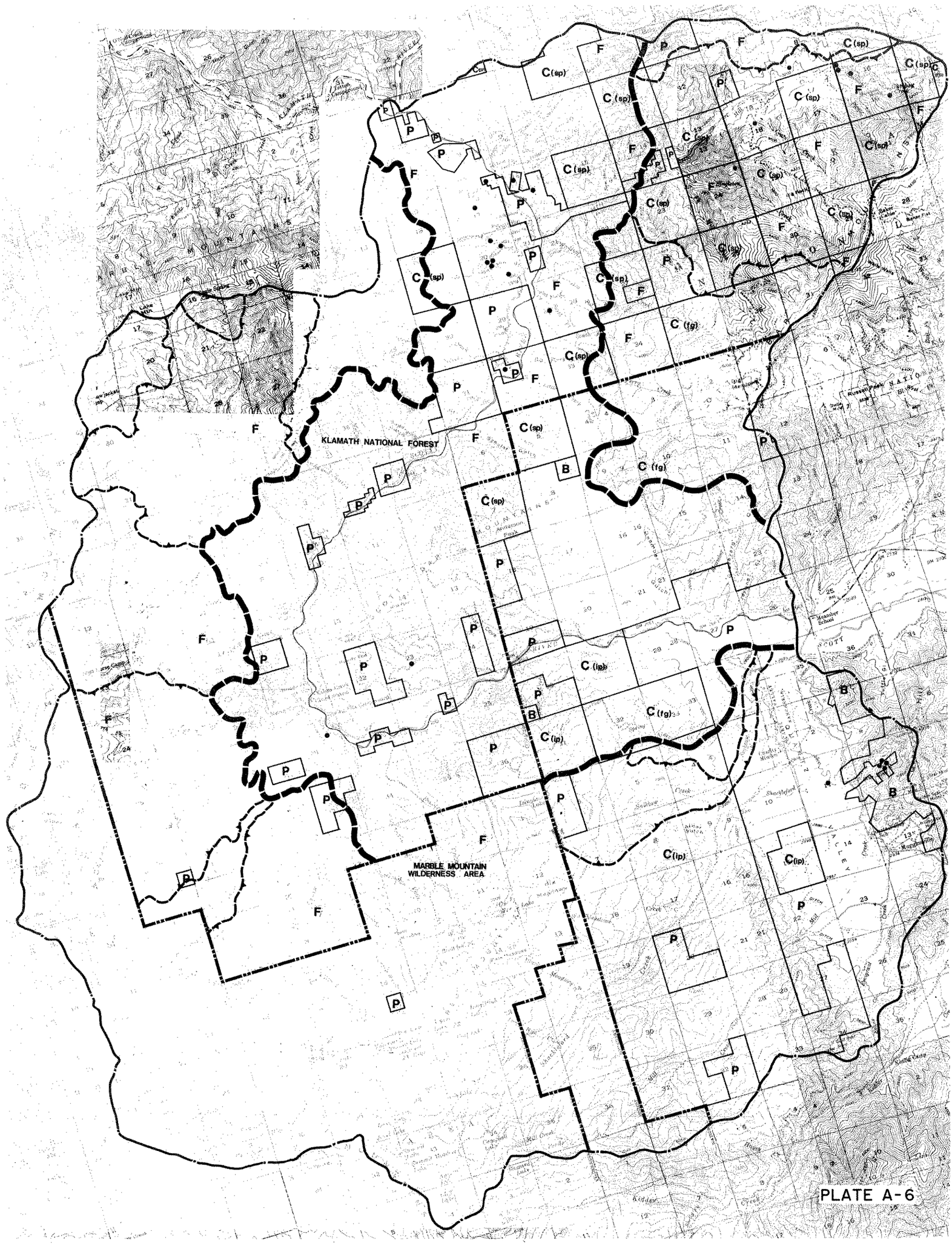
WATERSHED BOUNDARY
AREAS OF SPECIAL CONCERN
PLANNING AREA BOUNDARY

Vegetation

- c CONIFER
- chd CONIFER HARDWOOD MIX
- hd HARDWOODS
- nc CONIFER SCRUB MIX
- g GRASS AND BRUSH LANDS
- ba BARRENS AND ROCKY
- a AGRICULTURAL
- x CLEAR CUT
- PARK FLORA

INFORMATION SOURCE
A TIMBER TYPE MAP, USFS.
B EDAW AIR PHOTO INTERPRETATION AUG. 1978
C USDA SOIL CONSERVATION SERVICE, SCOTT RIVER WATERSHED MAY 1972

NOTE
MINIMUM SIZE AND WIDTH MAPPED IS 10 ACRES



Scott River
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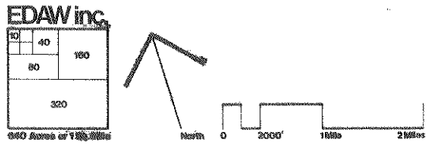
EDAW inc.



Ownership

U.S. GOVERNMENT

- F — NATIONAL FOREST LANDS
- B — BUREAU OF LAND MANAGEMENT

CORPORATIONS

- C(sp) — SOUTHERN PACIFIC LAND CO.
- C(fg) — FRUIT GROWERS
- C(ip) — INTERNATIONAL PAPER CO.

OTHER PRIVATE LANDS

- ● — PRIVATE MINING CLAIMS
- P — PRIVATE LANDS
- NATIONAL FOREST BOUNDARY

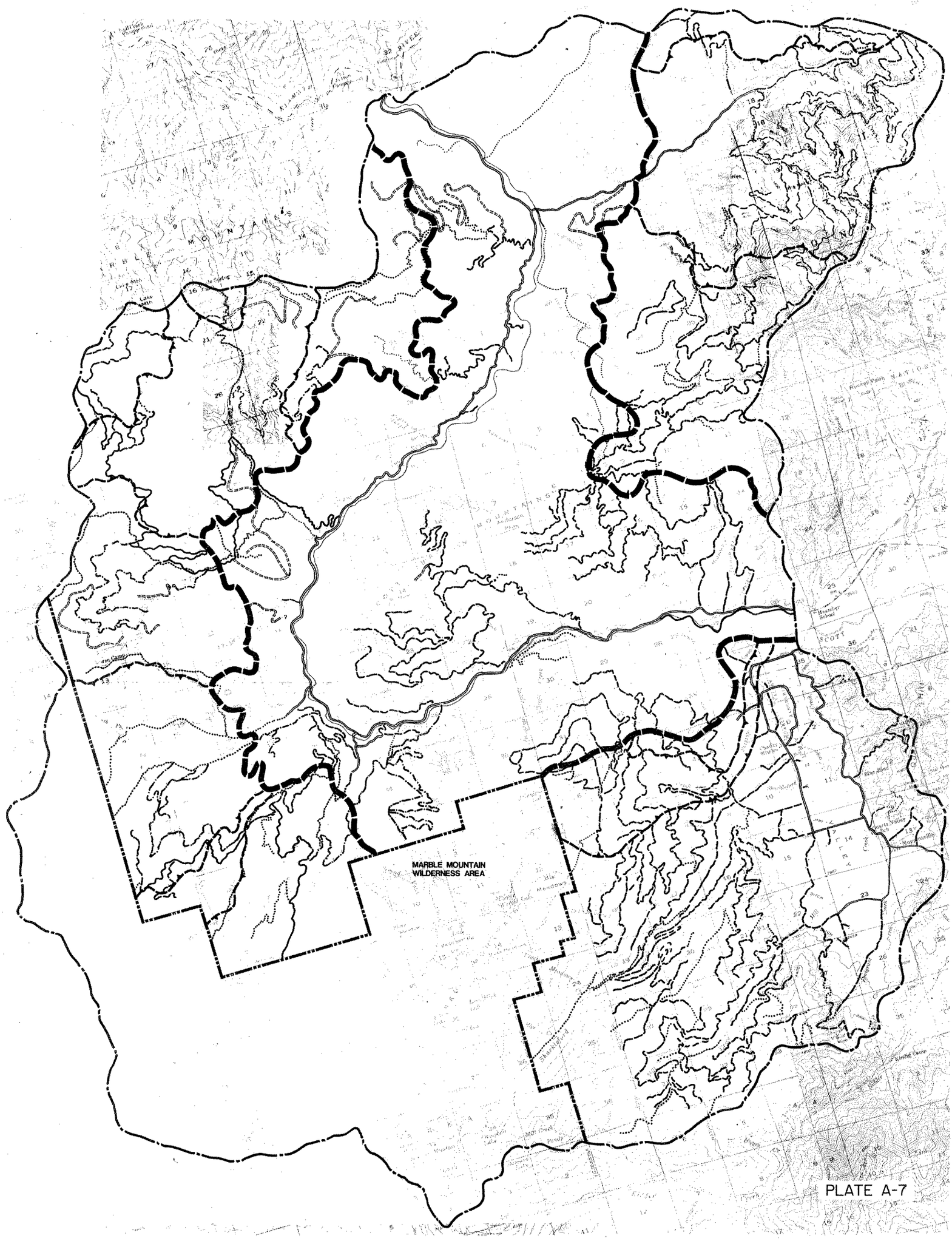


PLATE A-7

Scott River
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Transportation

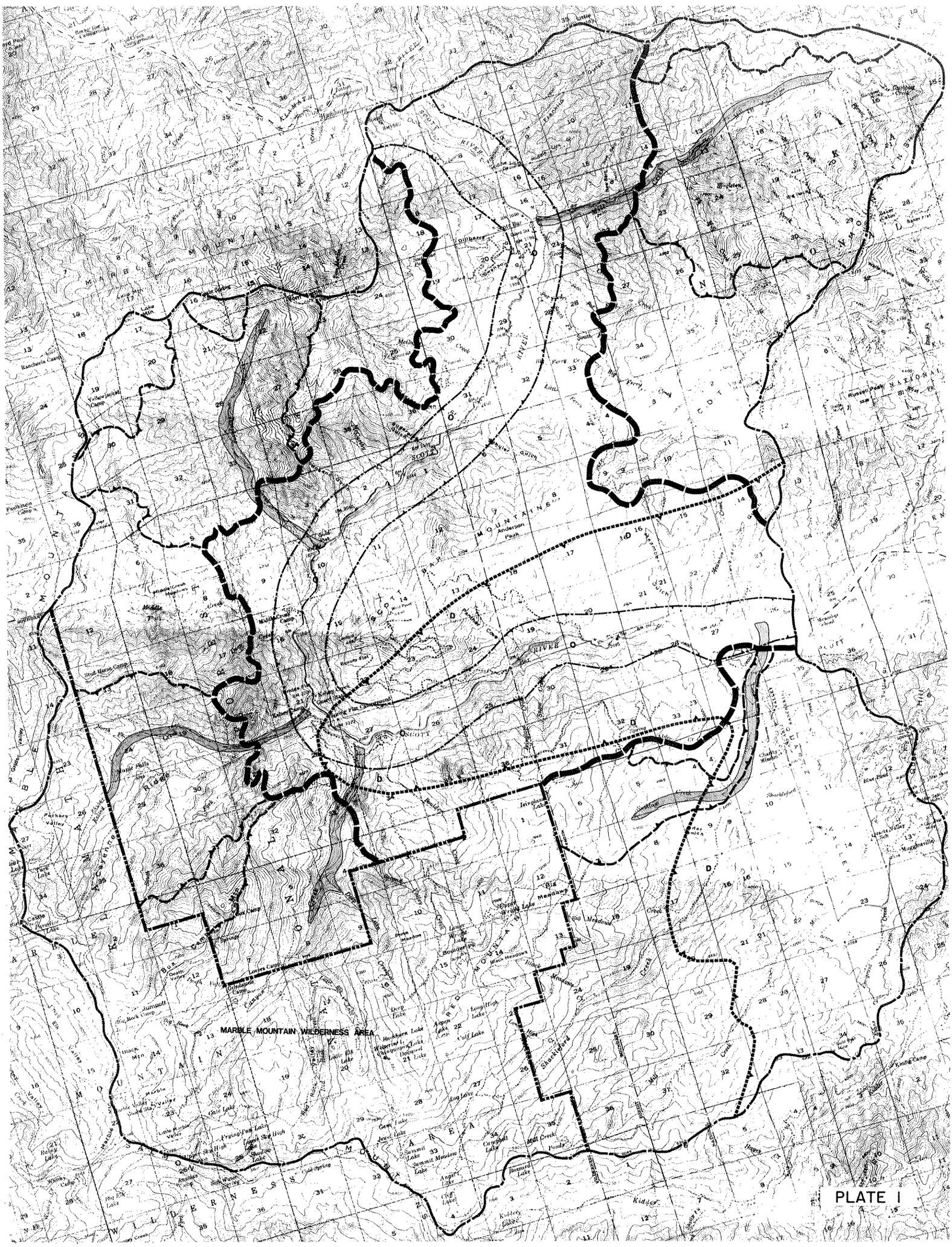
- COUNTY ROADS
- LIGHT DUTY
- UNIMPROVED DIRT
- PROPOSED RECONSTRUCTION OF EXISTING ROAD
- PROPOSED NEW ROADS
- UNMAINTAINED ROADS
- TRAILS
- ? QUERIED WHERE UNKNOWN

EDAW inc.

10 | 40 | 160
80
320
640 Acres of 1 Sq. Mile

North 0 2000' 1 Mile 2 Miles

WATERSHED BOUNDARY
AREAS OF SPECIAL CONCERN
PLANNING AREA BOUNDARY



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EDAW inc.

10 40 160 80 320
640 Acres or 1 Sq. Mile

North 0 2000' 1Mile 2Miles

WATERSHED BOUNDARY
AREAS OF SPECIAL CONCERN
PLANNING AREA BOUNDARY

Sensitive Habitat Areas

TRIBUTARIES NEEDING A SHADED TREE BUFFER ZONE LOCATED ON EACH SIDE, TO MAINTAIN OPTIMUM WATER TEMPERATURES FOR SALMONID SPAWNING.

D DEER WINTER RANGE.

O OSPREY MANAGEMENT ZONE.