Cultural Resource Overview
Klamath National Forest, California

James A. McDonald

USDA–Forest Service
Klamath National Forest
Management Summary

This report synthesizes information on the Klamath National Forest area environment and culture history, discusses the significance of the Forest's cultural resources, and makes recommendations for managing those resources. This report is one of a series of reports which will also provide descriptive summaries of Forest cultural resources, predict their distribution, and evaluate the effects of Forest activities on the resources.

The Klamath National Forest environment is varied and complex. It includes the Klamath Mountains and Cascades/Modoc Plateau geomorphic provinces. The ruggedness of the Klamath Mountains province and water supply problems in the Cascades/Modoc Plateau province create challenges for those who occupy and use them. Variations in elevation, soil, moisture, aspect and vegetation create numerous local environments within each province.

Little is known about the early prehistory of the Forest, although it is likely that the area was occupied by at least 4000 B.C. By the time European-Americans arrived in the area, it was occupied by people belonging to three cultures: the Karok, Shasta, and Modoc. Differences between these cultures may have originated partly from adaptation to differing local environments. The first European-Americans to enter the Forest area were members of Hudson's Bay Company trapping and exploring expeditions. They appeared in the late 1820's. The Forest area was not permanently settled by non-Indians until gold was discovered in 1850, however. Gold mining was the mainstay of the local economy and society for the next few years, but was eventually eclipsed by agriculture and timber harvesting. Indian cultures suffered heavily as a result of non-Indian settlement, but were not totally destroyed.

Most Forest cultural resources are significant in one of three ways. First, some resources are significant because an above average amount of research time has been spent in the investigation of the events, patterns and processes which they represent. These are gold mining and the Modoc War. Second, cultural resources may provide information that answers more general questions which researchers usually ask about any area, such as, "Who lived there?", "When did they live there?", "What did they do?" Finally, cultural resources may be important because they have a crucial role in on-going cultural systems. Native American sacred places are an example.

Among the recommendations which are made to locate, evaluate, protect and interpret Forest cultural resources, the most important are:

1) To proceed with planned conversion of Forest cultural resource files to an automated data base during Fiscal Year 1980, and to use this data base to prepare summaries of cultural resource
characteristics and descriptions of their distribution with respect to land management planning units.

2) To design and implement a Forest sample survey to provide more reliable predictions of cultural resource distribution and to estimate time and funding needs for meeting an objective of inventorying all cultural resources on Forest land by 1990.

3) To develop a Memorandum of Agreement with the State Historic Preservation Officer and the Keeper of the National Register of Historic Places to phrase significance criteria in terms specific to the local area.
**TABLE OF CONTENTS**

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>List of Tables</td>
<td>1</td>
</tr>
<tr>
<td>List of Figures</td>
<td>11</td>
</tr>
<tr>
<td>I. Introduction</td>
<td>1</td>
</tr>
<tr>
<td>II. Environmental Setting</td>
<td>5</td>
</tr>
<tr>
<td>III. History of Research</td>
<td>19</td>
</tr>
<tr>
<td>IV. Culture History</td>
<td>37</td>
</tr>
<tr>
<td>V. Recommendations</td>
<td>97</td>
</tr>
<tr>
<td>VI. Appendix A</td>
<td>123</td>
</tr>
</tbody>
</table>
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Climatic Change Along the Klamath River</td>
<td>115</td>
</tr>
</tbody>
</table>
### LIST OF FIGURES

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Location Map</td>
<td>116</td>
</tr>
<tr>
<td>2</td>
<td>Vicinity Map</td>
<td>116</td>
</tr>
<tr>
<td>3</td>
<td>Forest Administrative Units</td>
<td>117</td>
</tr>
<tr>
<td>4</td>
<td>Approximate Tribal Boundaries</td>
<td>118</td>
</tr>
<tr>
<td>5</td>
<td>1850 County Boundaries</td>
<td>119</td>
</tr>
<tr>
<td>6</td>
<td>1852 County Boundaries</td>
<td>120</td>
</tr>
<tr>
<td>7</td>
<td>1880 County Boundaries</td>
<td>121</td>
</tr>
<tr>
<td>8</td>
<td>1895 On County Boundaries</td>
<td>122</td>
</tr>
</tbody>
</table>
I. INTRODUCTION

The Cultural Resource Overview

A cultural resource overview is a study providing data for the development of a general resource management plan for a geographic region. This overview is one component of a series of cultural resource reports which will provide data for the Klamath National Forest Land Management Plan, which will establish the direction to be followed in the overall management of the Forest.

Professional guidelines for overviews are presented in McGimsey and Davis (1977:67, 69, 73-74). Forest Service objectives and standards are contained in Section 2361.22a of the Forest Service Manual. Both sets of guidelines agree that an overview should:

1. Synthesize existing knowledge about cultural resources.

2. Analyze that knowledge to evaluate the significance of cultural resources and to predict their distribution.

3. Describe current and anticipated land management activities and predict their effects on cultural resources.

4. Evaluate the adequacy of existing information about resources and activities, and evaluate the reliability of predictions based on that information.

5. Recommend any additional studies needed to develop reliable predictions.

6. Recommend measures to conserve significant cultural resources.

Research activities undertaken for an overview normally consist of the examination of published and unpublished documents, including Forest Service, State, university and museum records, and consultation with knowledgeable informants. If these activities do not provide data adequate to satisfy planning objectives, field studies may be made.

Klamath National Forest Overview Objectives

In setting specific objectives for this overview, a decision was made to emphasize evaluation of the significance of Forest cultural resources. Cultural resource significance is a topic of much discussion among and between archaeologists and land managers, and it was believed to be the topic most in need of clarification. Evaluation of cultural resource significance was accomplished through a review of previous historic, ethnographic and archaeological research in the Klamath National Forest.
area, which is summarized in Chapter III, and a synthesis of the results of that research, presented in Chapter IV. The review of research permitted the identification of cultural resource topics which have demonstrated their importance by the amount of research time which has been devoted to their study. The synthesis of research results permitted the identification of other topics, called "elements of a culture history" in this overview, which are usually considered important by historians, anthropologists, and archaeologists. Significant cultural resources are those which are associated with important topics (which may be "events," "patterns," or "processes") or which provide information about those topics.

In identifying important cultural resource topics, the principle of techno-environmental determinism was applied. Harris (1968:4) describes the principle:

"This principle holds that similar technologies applied to similar environments tend to produce similar arrangements of labor in production and distribution, and that these in turn call forth similar kinds of social groupings, which justify and coordinate their activities by means of similar systems of values and beliefs. Translated into research strategy, the principle . . . assigns priority to the study of the material conditions of sociocultural life, much as the principle of natural selection assigns priority to the study of differential reproductive success."

This focus results from the need to concentrate on the study of particular aspects of culture to make efficient use of the time available, the ability of this approach to be integrated with land management planning processes that involve the collection of a wide range of environmental data, and the effectiveness of the principle in explaining human behavior. The focus on technology and environment has led to the inclusion of a description of the Forest environment in Chapter II.

In addition to evaluating the significance of Forest cultural resources, this overview also evaluates the adequacy of existing knowledge about them, makes recommendations for additional studies, and recommends measures to conserve significant resources. Evaluations are made in Chapters II, III and IV, and recommendations are discussed in Chapter V. Evaluations and recommendations attempt to integrate the concerns of the archaeological profession and of land management planners.

Detailed descriptions of cultural resources, predictions of their distribution, description of current and anticipated land management activities and prediction of their effects on cultural resources are not emphasized in this overview, since the overview is part of a phased series of reports. Descriptive data on Forest cultural resources are contained in files which now include over 600 cultural resource site survey records and 300 reconnaissance reports. A large body of data
such as this is most efficiently summarized and analyzed by using automated data processing methods. The records are not currently part of an automated data base, but conversion to this format was planned for Fiscal Year 1980. Following conversion, a supplement to this overview will be produced and will describe cultural resources in terms of their artifacts and features, define types of cultural resources, and relate them to significant topics discussed in this overview.

Detailed predictions of cultural resource distribution have not been made in this overview in order to more efficiently integrate such predictions into the land management planning process. Land management planning units, to be called "capability areas" and defined on the basis of physical environmental variables such as soils, vegetation and hydrology, will not be fully defined and mapped until after this overview is completed. However, they will be defined and mapped prior to conversion of cultural resource files to an automated data processing format. Information on cultural resource location with respect to capability area will be entered during coding of the files, and summaries and predictive statements will be included in the overview supplement discussed above, allowing the predictions to be phrased in terms of the language of the land management plan.

Descriptions of land management activities and predictions of their effects on cultural resources are covered in general terms in this overview since specific activity descriptions would duplicate material that will be included in the land management plan, and since prediction of effects requires information on the nature and distribution of cultural resources and activities. This information will not be available in detail until Forest cultural resource files have been automated and the land management planning process is nearer completion.

The research, synthesis, evaluations and predictions contained in this overview have been based on published materials and on unpublished materials held by institutions in the immediate Forest area. Other institutions having collections were identified through telephone calls, letters and published references, and are listed in Appendix A. Certain of these institutions, notably the Smithsonian Institution, the University of California at Berkeley, and the Society for California Archaeology District 1 Clearinghouse at Chico, have large collections which also deserve firsthand inspection. For example, the S.C.A. Clearinghouse contains data on archaeological sites in the Forest area which would form a valuable complement to the data in Forest files.

One final decision concerning the objectives and content of this overview deserves note: a decision to concentrate on the discussion of archaeological resources. Cultural resources comprise scientific resources containing information about the past, architectural resources providing an aesthetic appreciation of our heritage, and ethnic resources playing a role in the beliefs and values of one of the many cultures that con-
stitute American society. Cultural resource overviews consider all three types of resource. While references will be made in this overview to the architectural or ethnic values of cultural resources, it may be necessary to consult individuals with expertise in those fields to obtain adequate information on the significance of some resources or the effects of specific activities. The Klamath National Forest does in fact obtain data on ethnic values when the information is required for planning of specific activities (see Chapter III).

Emphasis on archaeology is appropriate for study of the majority of Klamath National Forest cultural resources, and makes the most effective use of the time available for research. Archaeology is a discipline which studies artifacts in order to describe and explain human behavior. "Artifact" is broadly defined to include anything manufactured by humans or modified by human behavior (Rouse 1972:40-41; Clarke 1968:14-20). All Forest cultural resources, with the exception of a few ethnic resources, are artifacts and can be archaeologically studied. In contrast, only about 20% of Forest cultural resources have standing architecture.

In terms of the overview objectives described on page 1, this overview:

1. Synthesizes published knowledge of cultural resources. Unpublished data in Forest files will be synthesized during Fiscal Year 1980.

2. Analyzes available knowledge to develop research recommendations which can be used in assessing archaeological resource significance. Specific predictions of resource distribution have not been made, pending synthesis of data in Forest files and finalization of environmental capability areas by the Forest Land and Resource Management Planning Team.

3. Current and anticipated land management activities and effects are broadly described. More detailed descriptions of activities will be contained in the Forest Land Management Plan, to be completed in Fiscal Year 1981.

4. Evaluates the adequacy of existing information about resources and activities and evaluates the reliability of predictions based on that information.

5. Recommends additional studies needed to develop reliable predictions.

6. Recommends general program directions for the conservation and enhancement of significant archaeological resources.
II. ENVIRONMENTAL SETTING

In order to apply a techno-environmental approach to the study of an area's archaeological resources, it is necessary to know the environmental setting of the resources. This chapter presents a brief description of the Klamath National Forest environment, emphasizing those characteristics which are known or expected to have influenced human activity. A more detailed description of the Forest environment will be included in the Land Management Plan, in the form of capability area descriptions. Capability areas are ecological land units characterized in terms of several environmental variables, such as soils, parent material, vegetation, hydrology, and slope.

Klamath Mountains Geomorphic Province: Geology

The Klamath National Forest is located in Siskiyou County in Northern California, with the Supervisor's Office in Yreka (Figures 1-3). It encompasses over a million and a half acres in an area of great natural diversity that includes the Klamath Mountains, Cascade Range, and Modoc Plateau geomorphic provinces (Bailey 1966).

The dominant geological features of California are the two chains of mountains which parallel the coast and continue into Oregon. The lower coastward chain comprises the Coast Ranges and the higher inland chain includes the Sierra Nevada and Cascades. In Northern California the Coast Ranges are interrupted by the Klamath Mountains, which although they are geographically part of the Coast Ranges differ from them in age, history, geology, height and east-west extent.

Geologically, the Klamath Mountains are more closely related to the Sierra Nevada than to the Coast Ranges or Cascades (Whittaker 1960: 279-282; Bailey 1966). They consist of ancient, closely folded and faulted rocks, generally metamorphosed and with igneous intrusions, in an extremely complex mosaic of types. No well-defined trends in drainage or ridge direction are present, with the mountains giving the impression of "...a confusion of broken mountain ranges with steep and stony slopes (Peck 1941, quoted in Whittaker 1960:281)." The principal rivers cut transversely across the mountains, running generally westward from the interior valleys, through deep canyons to the ocean. Valley bottoms are narrow, and canyon walls are long, steep inclines from the bottoms to the uplands. Slopes with an average grade of 60% or more through a range of 3000 feet or more are common. An ancient peneplain is represented by rolling uplands in some areas, and in some places local alpine glaciers have shaped high-elevation topography.

The rugged topography of the Klamath Mountains tends to concentrate human activity in areas with no slope or with gentle slope, mainly the alluvial flats along major drainages. This shows up clearly in studies of prehistoric village location (Chartkoff and Chartkoff 1972). Villages...
generally do not occur on slopes over 10%. Historic towns and camps are also concentrated in valley bottoms. Archaeological sites found at higher elevations tend to be located on flats or ridgetops rather than on the slopes themselves. These sites are more functionally specialized than valley bottom sites, for example prayer localities, collecting camps or livestock camps as opposed to villages; and their locations tend to reflect the availability of specific natural resources, for example a high peak, a stand of oak or pastureage and water.

A second characteristic of Klamath Mountains geology of significance for cultural resources is the presence of several economically valuable minerals, including chromite, copper and gold (Albers 1966). Chromite is found exclusively in ultramafic igneous rocks and in serpentine derived from them. A large deposit occurs in the Seiad Valley-McGuffey Creek area. Chromite was produced in the Forest area chiefly during World Wars I and II, when access to foreign sources was difficult, and during the 1950's when the Federal government purchased it for a strategic stockpile. Base metals, particularly copper and to a lesser extent zinc and lead are important mineral products of the Klamath Mountains; but well over 90 percent have come from massive sulfide deposits outside the Forest. The Blue Ledge and Gray Eagle deposits within the Forest account for much of the remaining production.

The base metals are found chiefly in metamorphosed sedimentary and volcanic rocks. The most important mineral found in such rocks is gold, however. Approximately $140 million worth of gold was produced in the Klamath Mountains from 1880 to 1966 (Albers 1966:54). The gold came from three main sources: 1) as a byproduct of mining massive sulfide deposits for copper, 2) lode deposits, and 3) placer deposits. About $12 million of the $140 million came from massive sulfide deposits. About $38 million of the remainder came from lode deposits and the rest came from placers. The principal lode deposits lie in an arcuate belt in the central Klamaths and are predominantly in weakly metamorphosed Paleozoic sedimentary and volcanic rocks (Albers 1966:Figure 5). Placer deposits are located mainly along the Trinity and Klamath Rivers and their tributaries. Recent river gravels and Pleistocene and Tertiary gravels in terraces have yielded gold.

The mineral wealth of the Klamath Mountains played a central role in historic settlement and development of the Klamath National Forest area, which will be described in Chapter IV. Settlement by non-Indians followed the discovery of gold. Most early communities were located in areas having accessible and valuable placer deposits, and their growth and decline were linked to the productivity of the mines. Areas with gravel deposits of an appropriate age and areas with suitable bedrock geology as described above and in Albers (1966) have generally been at least prospected and often mined.
Climate

Climate in the Klamath Mountains province is controlled by zonal circulation and topography (Major 1978:21-68). A subtropical high over the Pacific Ocean produces a dry summer. Some precipitation does fall, primarily during thunderstorms. A winter low lies farther south and allows stormy westerlies to cross California, producing a wet winter.

The Klamath Mountains produce a marked change toward drier, warmer and more continental conditions in the interior. Table 1 shows climatic data for a series of localities along the Klamath River. The temperature changes reflect increased continentality up to Happy Camp and the normal decrease of temperature with elevation farther up the river. Inland precipitation drops sharply as a result of the mountains' rain shadow.

The principal direct influence of climate on human activity appears to be a result of the decrease of temperature with elevation. This reinforces terrain characteristics favoring use of the valley bottoms. Additional direct effects might be revealed by more intensive study.

Vegetation

Climate has had a considerable indirect effect on human activity through its influence on vegetation. Studies of Klamath Mountains province vegetation show the distribution of plant communities to be closely related to geology (presumably because of its influence on soils) and climatic conditions (Whittaker 1960; Barbour and Major 1978; Parker and Matyas 1978). Although the distribution is complex and detailed, only the larger patterns have been studied to date, primarily through aerial photography with some field verification. This is unfortunate, since many of the plants used by the inhabitants of the Forest area are not sufficiently common to be mentioned in existing community descriptions, and mapping of communities is not sufficiently detailed to show smaller communities which may have been of use to Forest inhabitants. The latter problem will be partially solved when the Klamath Land Management Plan is completed, since the data file for the plan will include environmental data for areas as small as four acres.

Low elevations and other xeric locations in the Klamath National Forest area support communities dominated by oak species. Oregon white oak (Quercus garryana), black oak (Quercus kelloggii), and canyon live oak (Quercus chrysolepis) are characteristic. The communities may be open or dense, with brush or grassland between the trees. This woodland is found on valley borders and foothills and may finger up to higher elevations on warm slopes. Oak-dominated communities are expected to contain a moderate to high number of prehistoric archaeological sites, as acorns were an important food for the Karok and Shasta (see Chapter IV). Each family had a special gathering place which was occupied during the fall.
Oak-dominated communities grade into forests of Douglas-fir (*Pseudotsuga menziesii*) and black oak with increasing available moisture. Ponderosa pine (*Pinus ponderosa*) California bay (*Umbellularia californica*) and manzanita (*Arctostaphylos spp.*) are associated with the Douglas-fir and oak. These forests are extensive and continuous. Prehistoric archaeological sites are expected within this vegetation zone, since most of the major species and many of the minor species are known to have been used by the Karok and Shasta. For example, Ponderosa pine root fibers were used in basketry, Douglas-fir was used as a sweathouse fuel, and manzanita berries were eaten. However, these plants were generally not the objects of extended gathering expeditions, and archaeological sites in the pine forests are likely to be less substantial and possibly less numerous. An exception may occur in the vicinity of stands of sugar pine (*Pinus lambertiana*), the nuts of which were used for food. Among the Karok, places where the trees grew were owned by individuals, and when it was time for cones to be gathered, each owner invited his family and friends to go with him on a collecting expedition which lasted about a week (Schenck and Gifford 1952:378). Repeated use of specific areas may have produced more substantial archaeological remains.

Forests dominated by white fir (*Abies concolor*) generally occur above the Douglas-fir forests. They give way to white fir-red fir (*Abies magnifica*) forests and finally to red fir-mountain hemlock (*Tsuga mertensiana*) forests with increasing elevation and moisture. Above 6800 feet, alpine communities of prostrate shrubs and herbs may be found. These include creambush (*Holodiscus microphyllus*), buttercup (*Ranunculus spp.*) and *Haplopappus greenei*. Plant species in these communities do not appear to have been as heavily utilized by the prehistoric and historic Indian inhabitants of the Forest as those of lower-elevation communities. However, since about 1915 the forest communities have been the objects of large-scale commercial timber harvesting.

Riparian and meadow communities can be found throughout all vegetation zones. While important because of their water and their linear nature, which maximizes edge effects that increase wildlife abundance, riparian communities in the Klamath Mountains have not been described. The dominant species appear to be various willows (*Salix spp.*), black cottonwood (*Populus trichocarpa*) and white alder (*Alnus rhombifolia*), which had various uses including basketry and medicine (Schenck and Gifford 1952:381-382). Meadow communities produce similar edge effects. These communities are particularly extensive in the zone of white fir-red fir forests between 4600 and 6400 feet (Sawyer and Thornburgh 1978:708-715). Because of effects on wildlife, openness, and gentle slope, meadows are likely foci of human activity and are likely to contain archaeological resources. Stockmen's camps are especially likely to occur in high meadows, which provide good summer grazing.
Vegetation patterns act in concert with topographic and climatic factors influencing human use of the Klamath Mountains. Riparian communities occur in locations where the terrain, which includes alluvial flats, favors settlement. The water and increased floral and faunal diversity and biomass would be attractive to human inhabitants. Oak, common at low elevations, is known to have been a major food source for prehistoric and historic Indian (see Chapter IV). In contrast, higher elevations tend to have less terrain suitable for extended occupation, with dense vegetation consisting primarily of species not widely used except for commercial timber harvests. Exceptions are meadows and ponds, with their less rugged terrain, diversity of vegetation, and edge effect. However, because of more extreme winter weather, it is probable that human use was seasonal.

Wildlife and Fisheries

A comprehensive inventory of Klamath Mountains province wildlife is contained in Marcot (n.d.) and will not be duplicated here. Mammalian species commonly observed within the Klamath National Forest include brush rabbit (Sylvilagus bachmani), coyote (Canis latrans), black bear (Ursus americanus), and blacktail deer (Odocoileus hemionis columbianus). Common birds include ravens and crows (Corvus species), California quail (Lophortyx californicus), mallard (Anas platyrhynchos), and pileated woodpecker (Dryocopus pileatus).

The most important of these animals for subsistence purposes was the deer, which was a staple of Shasta and Karok diets (Bright 1978:181-183; Holt 1946:308-312). Among the Shasta, deer were hunted by individuals while acorns were gathered in the fall. Late in the fall, a large drive using fire encirclement was held in the high Siskiyou portion of the Klamath Mountains. Deer wintering in live oaks were hunted after the first big snow, and in the spring deer using salt licks were driven into nooses set along trails. Karok hunting practices have been less thoroughly described, although they are believed to be generally similar to those of the Shasta.

Other significant animal species are the beaver (Castor canadensis) and the pileated woodpecker. The beaver was once common but is now relatively rare, probably due to deliberate efforts by the Hudson Bay Company in the 1820's and 1830's to destroy the population. Pileated woodpecker scalps are wealth items important to the Karok (see Chapter IV).

The Klamath River and its tributaries support a productive anadromous fishery. Compared to more southerly streams, it is located in an area of high precipitation and lower temperatures and evapotranspiration. The results are greater diversity and stability in the anadromous fish resource. Chinook and coho salmon (Onchorhynchus tshawytscha and O. kisutch, respectively) and steelhead (Salmo gairdneri) are found in the
Klamath. There are two major runs each year and historically it has been possible to catch fish at any time of the year. Pacific lamprey (Entosphenus tridentatus) and green sturgeon (Acipenser medirostris) also occur in the river.

California Department of Fish and Game estimates (news release, January 13, 1979) indicate that a total run of 110,000 fish escaped all Klamath River fisheries in the 1978 fall spawning run. Forest Service estimates (Kesner 1977:3) suggest a catch/escapement ratio of 5:1, indicating a total run of about 550,000 fish. That figure may be below the long term average due to effects of a recent drought.

Anadromous fish were another staple of the Karok and Shasta diet (Bright 1978:181; Silver 1978:216-217), and village locations were determined in part by fishery productivity (Chartkoff and Chartkoff 1975:176). Population density was higher on the downstream portions of the Klamath, and settlements clustered near the mouths of large tributaries, where the potential fish catch was larger and more reliable.

Cascade Range and Modoc Plateau Geomorphic Provinces: Geology

The Cascade Range lies to the east of the Klamath Mountains, and the Modoc Plateau lies to the east of the Cascades. The Cascades can be divided into the Western Cascade Range and the High Cascade Range (Macdonald 1965:66-89). In the Western Cascades, Upper Cretaceous sedimentary rocks are succeeded by volcanics which were faulted and tilted eastward and northeastward at the end of the Miocene. The rocks are predominantly pyroxene andesite, although ranging from olivine basalt to andesite. Erosion destroyed the volcanic landforms of the Western Cascades and reduced the region to one of rolling hills before renewed volcanism built the High Cascades, probably during the Pliocene and Pleistocene. The lower High Cascade rocks consist largely of pyroxene andesite with smaller amounts of basalt and hornblende andesite and dacite. The lavas appear to have built a broad ridge with few, if any, big cones. Continuing volcanism became more concentrated at distinct centers and more individual cones were built. Some were shield volcanos and some were composite cones. At Medicine Lake, flows and domes of rhyolite obsidian were erupted, with some activity as recent as 300 years ago. The Modoc Plateau, to the east of the Cascades, consists of a series of northwest to north-trending block-faulted ranges, with the intervening basins filled with broad basalt flows and lake deposits. Small shield volcanoes, steeper-sided lava or composite cones and cinder cones are also present in the basin. The oldest rocks are of Miocene or Oligocene age and the youngest are recent.

The geological history of the Modoc Plateau and Cascades has produced topography less rugged than that of the Klamath Mountains. While fault scarps in the Modoc Plateau can be high (up to 2000 feet) and steep (about 50%), they occupy a relatively small percentage of the land surface. The intervening basins have virtually flat topography produced
by lava flows and lake deposits. In the Cascades, slopes generally run 35% or less, although slopes up to 120% are found in some areas. This topography places fewer constraints on human activity than that of the Klamath Mountains. One would expect greater dispersal of activity in the Cascades and Modoc Plateau than in the Klamaths.

The geology of the Cascades and Modoc Plateau has definite effects on the hydrology of the provinces. The surface rocks, generally basaltic, are highly permeable and there is a nearly complete lack of surface drainage. However, underlying rocks are less permeable and the Cascade rocks prevent westward movement of the groundwater. The result is a water table at about 4000 feet in much of the Modoc Plateau area. Above that altitude streams lose water to the ground, while below that altitude they gain it (Macdonald 1966:95). The relative lack of surface water above 4000 feet is expected to counteract topographic characteristics favoring dispersal of human activity, at least in the case of those activities which require stable water supplies. In particular, given the low rainfall on much of the Modoc Plateau, agriculture would be difficult prior to the development of efficient well irrigation techniques.

The Cascades and Modoc Plateau lack the metallic resources of the Klamath Mountains. The principal mineral commodities are volcanic cinders, pumice, crushed stone and obsidian (Gay 1966). The obsidian flows are the most important mineral deposits of the Klamath National Forest vicinity, for they were a major source of raw material for tools used by the Indians of northern California. A survey of the Lava Beds area (Hardesty and Fox 1974) found quarry sites situated almost exclusively at the periphery of the Glass Mountain obsidian flow.

Climate

The zonal circulation patterns controlling the weather of the Klamath Mountains province also affect the Cascade and Modoc Plateau provinces, producing a similar pattern of dry summers and wet winters. Average annual precipitation at Mount Hebron is about 11 inches. Winter temperatures are severe and long periods of below-freezing weather are common. The combination of summer drought and cold winters limits the growing season to short spring and fall periods when moisture and heat are at levels permitting plant activity (Major 1978:40). Irrigation can alter this situation by alleviating drought, but is subject to the hydrologic restrictions outlined above. As in the Klamath Mountains, the primary direct effect of climate on human activity is expected to result from the increase of weather severity with elevation. Little winter activity at high elevations is expected.
Vegetation

Plant communities of the Cascades and Modoc Plateau are described in Barbour and Major (1978) and Parker and Matyas (1978). These descriptions suffer from limitations similar to those of Klamath Mountains community descriptions.

Lower elevations of the Modoc Plateau are characterized by sagebrush steppe vegetation communities. Sagebrush (*Artemisia tridentata*) is the dominant species. Bitterbrush (*Purshia tridentata*) and rabbit brush (*Chrysothamnus nauseosus*) are associated and may be codominant on dry slopes and flats. Festuca species and wheat grass (*Agropyron spp.*) also occur. Ray (1963:212-220) indicates that sagebrush and rabbitbrush were used by the Modoc as sources of fiber for artifacts and for medicines. Grass seeds may also have been collected for food.

Mountain brush communities are often found in the ecotone between the sagebrush steppe and coniferous forests. Characteristic species are mountain mahogany (*Cercocarpus ledifolius*), bitterbrush, serviceberry (*Amelanchier pallida*) and snowberry (*Symphoricarpos vaccinoides*). The Modoc ate serviceberries, and mountain mahogany was used in tools requiring a dense wood. Hardesty and Fox (1974) found that prehistoric camps were commonly associated with mahogany-bitterbrush communities, which are also mule deer wintering areas.

Sagebrush steppe gives way to juniper woodland with increasing elevation, although specific elevational limits are not given (Vasek and Thorne 1978). In open, rolling country the woodland is characterized by open stands of western juniper (*Juniperus occidentalis*) with an understory of shrubs or grass. Sagebrush, bitterbrush, serviceberry, and rabbitbrush are included in the shrubs. On ridges and mountain slopes, juniper may be associated with Jeffrey pine (*Pinus jeffreyi*) as well as with the shrubs. The Modoc used juniper as a source of fiber, wood for bows, and medicines. Friedman (1977) found that sites in the Mt. Dome region were concentrated in this vegetation zone.

In the Western Cascades, juniper woodland gives way to a narrow belt of Ponderosa pine forest. This is often little more than an ecotone between foothill woodland and mixed conifer forest. The mixed conifer forest includes Ponderosa and sugar pines, white fir, Douglas-fir, incense cedar and black oak. At higher elevations, forests are dominated by white fir. Important understory shrubs include tobacco bush (*Ceanothus velutinus*), bitter cherry (*Prunus emarginata*) and snowberry. On mesic sites, dogwood (*Cornus nuttallii*), yew (*Taxus brevifolia*) and vine maple (*Acer circinatum*) may be present. Semi-permanent camps, quarries and chipping stations have been found in Modoc Plateau fir-lodgepole pine communities, suggesting that a wide variety of activities occurred in the highlands (Hardesty and Fox 1974). On the eastern slopes, montane communities are dominated by ponderosa and Jeffrey pine,
which occur both in closed forests and open parklike communities with shrub understories. Of these species, sugar pine nuts and bitter cherry were eaten, yew wood was used for bows, and several of the pine and fir species had medicinal uses to the Modoc. In addition, the forests of the Cascades were logged on a large scale well before those of the Klamath Mountains, due to the less rugged topography.

Alpine vegetation in the Cascades is confined to the highest peaks, such as Mount Shasta, and does not occur in the Forest. Chaparral communities occur throughout the Cascades, and often indicate poor growing conditions. Dominant species include pinemat manzanita and kinnikinnick (Arctostaphylos spp.) the berries of which were eaten by the Modoc. Huckleberry oak (Quercus vaccinifolia), ceanothus (Ceanothus cuneatus), chinquapin (Chrysolepis chrysophylla), bitter cherry and various oaks may be associated. Chaparral may be so thick as to be impenetrable, and these species may occur as a dense understory in other communities. Riparian and meadow communities are found in the Cascades and Modoc Plateau but have not been carefully studied. Two important species found in wet places are camas (Camassia quamash) and epos (Carum oreganum), which are known to have been staples of the Modoc diet.

Comparison of the vegetation patterns of the Cascades and Modoc Plateau with those of the Klamath Mountains reveals two contrasts which should be reflected in human behavior. First, low-elevation communities of the Modoc Plateau tend to be less diverse in species composition than those of the Klamath Mountains. This should produce less reliance on single communities as sources of food and raw materials. With a less diverse composition, Modoc Plateau communities would be likely to experience more periods when adverse climatic conditions (e.g., drought) reduced the yield of important plants. An advantage would be gained by utilizing plants in another community with a greater tolerance for the given condition. Also, less diverse communities are more likely to experience seasonal variation in the availability of resources, and an advantage would be gained by utilizing additional communities with differing yield patterns. Second, there is no food resource in the Cascades or Modoc Plateau comparable to the oak stands of the Klamath Mountains. Acorns have been called "the most important and most characteristic [aboriginal] California staple (Baumhoff 1978:16)." Lacking this resource, aboriginal inhabitants of the Cascades and Modoc Plateau are expected to have used a greater range of foods in a given vegetation community, a greater range of communities, or both.

Wildlife and Fisheries

Marcot (n.d.) also contains an inventory of wildlife species of the Cascades and Modoc Plateau. Similar species are present in similar habitats in both the Klamath Mountains and the Cascades and Modoc Plateau. Many of the same fish species are also found: chinook, silver salmon and steelhead trout, for example. Also found are rainbow trout (Salmo gairdneri), Pacific lamprey, largescale and smallscale suckers
(Catostomus snyderi and Catostomus rimiculus), and green and white sturgeon (Acipenser medirostris and Acipenser transmontanus). The supply of anadromous fish available to inhabitants of the Cascades and Modoc Plateau is much less than that available in the Klamath Mountains. Again, aboriginal inhabitants lacked a potentially significant food source (Baumhoff 1978:16), and greater diversification is expected.

Past Environment

While information on modern environmental conditions, such as that presented above, is necessary if a research strategy employing the perspective of techno-environmental determinism is to be employed, this information cannot be used without introducing a word of caution. There is evidence suggesting that modern environmental conditions have not existed throughout the period of human occupation of the Forest area, which probably began prior to 4500 B.C. Many archaeologists working in the western United States have assumed a pattern of major climatic change affecting relationships between aboriginal cultures and their natural environment. The pattern was first hypothesized by Antevs (1948, 1955), and consists of shifts from a relatively cool and moist climate to a warm and dry climate and then to modern conditions. The cool, moist period is called the Anathermal and is said to have lasted from 7000 to 5000 B.C. It is characterized as having a climate at first similar to that of the present, which then began to grow warmer. Lakes in the Great Basin, south-central Oregon, and probably the Modoc Plateau were higher than those of today (Grayson 1976:76; Cressman 1977:25-56). Between 5000 B.C. and 2500 B.C. the climate was distinctly hotter and drier than the present, and many of the lakes of the Great Basin and other areas shrank or disappeared. This period is referred to as the Altithermal. The Medithermal, from 2500 B.C. to the present, is arid and semi-arid. Some of the lakes dessicated during the Altithermal have returned. Along with the changes in temperature, rainfall and lake level went changes in the distribution of vegetation communities and wildlife which had considerable impact on human populations. For example, Wallace (1978:28) suggests that the replacement of hunting cultures by plant-collecting cultures in Southern California may have been related to the onset of the Altithermal.

Archaeologists working in the Forest area have shown little inclination to investigate past environmental conditions and their effects on occupants of the area. One exception has been research by University of Oregon archaeologists at Nightfire Island (4SK4) on the dry margin of what was once the southwestern shore of Lower Klamath Lake. The site had been occupied from about 4000 B.C. to A.D. 1400. Analyses of bird remains (Grayson 1976) indicate that between 4000 and 2200 B.C. lake levels were higher than in subsequent years. This led Grayson to suggest that the traditional model of climatic history does not apply to the area, and that the Altithermal was wetter than the present. This shows that future studies of the relationships between climate, ecology and cultures must be based on local rather than large-scale models, and increases the need for such studies in Northern California.
Description of the relationships between human behavior and the natural environment is further complicated by the fact that the flow of cause and effect is not unidirectional. Past human populations have modified the Forest environment in many ways. For example, the Karok regularly burned vegetation to maintain the growth of desirable plants, such as huckleberry and hazel bushes, wild rice, tobacco and tan oaks (Harrington 1932:63-65). These practices declined with the disruption of Karok culture following contact with European-Americans. Thus the present distribution and abundance of these plants may not reflect past conditions. Likewise, hydraulic mining and poor timber harvest practices have increased sedimentation of streams, which may have reduced the productivity of the anadromous fishery, again indicating that research into local paleoenvironmental conditions will be required to adequately implement a technoenvironmental approach to the study of Forest archaeological resources.

Summary

A brief study of the Klamath National Forest natural environment indicates that several attributes are likely to be significant to occupants of the area. On the western side of the Forest, in the Klamath Mountains geomorphic province, rugged topography is likely to lead people to favor areas of flat land for most of their activities. These areas are primarily in valley bottoms, and the tendency to use valley bottoms is likely to be reinforced by their more moderate climate, water supply, fisheries, and productive plant communities. In spite of these factors, however, the preference for valley bottoms is not absolute; other Forest ecological zones are known to have contributed resources to the support of human populations. In the Cascades and Modoc Plateau geomorphic provinces on the east side of the Forest gentler terrain, greater homogeneity of vegetation communities and absence of highly productive fisheries or oak stands are expected to lead to a more balanced utilization of ecological zones. Within any zone, the location of stable water sources is expected to be critical to long-term use, particularly above 4000 feet. These differences between the Klamath Mountains and Cascades/Modoc Plateau may have implications for archaeological resource survey strategies. These implications are discussed in more detail in Chapter V.

At the present Forest ecological zones have been broadly characterized, and only general relationships to archaeological resources can be hypothesized. As the more detailed characterizations of zones contained in the Forest Land Management Plan are developed, more specific statements of relationships to archaeological resources will become possible. However, patterns should not be projected too far into the past until more is known about the history of the area's environment.
References Cited

Albers, John P.

Antevs, Ernst

Bailey, Edgar H.

Barbour, Michael G. and Jack Major, eds.

Baumhoff, Martin A.

Bright, William

Chartkoff, Joseph L., and Kerry K. Chartkoff

Cressman, Luther S.

Friedman, Janet

Gay, Thomas E., Jr.


Sawyer, John O. and Dale Thornburgh

Silver, Shirley

Vasek, Frank C. and Robert F. Thorne

Wallace, William J.

Whittaker, R. H.
III. HISTORY OF RESEARCH

Understanding the current state of information on Forest cultural resources requires knowledge of how that information was obtained, showing the information that has been sought and why it was sought. This facilitates evaluation of its usefulness in meeting current objectives. This chapter describes and evaluates previous research relevant to Forest archaeological resources. History, ethnography, and archaeology have contributed to the research. Since each discipline has shown a distinct research pattern, they will be described separately.

History

Research on the history of the Forest area began in 1859 when H. H. Bancroft began to gather data for his comprehensive history of western North America. Volumes 18 through 24 of his collected writings (Bancroft 1883-1890) present the history of California and contain many references to Siskiyou County. Research focusing specifically on the Forest area began in 1880 with the work of Harry L. Wells (1881; also see Frank 1976), which resulted in a history of Siskiyou County.

In both of these efforts, the emphasis was on the description and ordering of events. Interpretation tended to be based on common sense or intuition. While there are many details about specific people, locales, and actions, there is little information concerning the distribution of archaeological resources.

Since the time of Bancroft and Wells, there has been little interest in general historical synthesis and more interest in the historical investigation of specific topics. Among the subjects which have been singled out for special attention are medical care in Siskiyou County, the Modoc War, and gold mining. The history of medical care has been discussed by Jones (1953), an M.D. born at Henley in 1888. While practicing medicine in remote areas of the County, he was impressed by the amount of effort that earlier doctors had to apply to their jobs and resolved to write a history of medicine in the County. While emphasizing that topic, his Saddlebags in Siskiyou expanded in scope to discuss other subjects as well. Jones (1971) also wrote The Land of Remember about the history of the Cottonwood Basin area where he was born. Jones combined documentary research, personal experience, and contact with pioneer residents of the County in gathering data for these books.

The Modoc War has attracted considerable attention because a small but determined band of Modocs was able to resist a large force of heavily armed troops for an extended period. Numerous articles appeared in Yreka newspapers of the period, and books have been written by Riddle (1973), Murray (1958), and Dillon (1973). Riddle was a Modoc and presents a unique perspective on the war.
Gold mining has undoubtedly received historical attention because it led to the initial settlement of the Forest area and has been an important component of the economy. Wells (1881) has much information on the subject, as does the Siskiyou Pioneer, the yearbook of the Siskiyou County Historical Society. The 1957 issue of the Pioneer was devoted to mining in the County. Recently, Stumpf (1979) described the history of Siskiyou County gold mining from 1850 to 1900. Additional information on Siskiyou gold can also be found in more general publications, such as Gudde (1973) and Clark (1969).

The pattern of investigating specific topics can be seen most clearly in the work of the Siskiyou County Historical Society. The Society was formed in 1945 following the discovery of a gravestone dated 1839 that was believed to have marked the burial of a Hudson Bay Company trapper (Anonymous 1946). Until the 1970's the Society was the principal organization engaged in historical research. Issues of the Siskiyou Pioneer have frequently been devoted to a single topic, such as the gold mining issue and the issue on Scott Bar (1978). Selection of topics has depended on the interests of Society members, and much of the Pioneer consists of reminiscences by members who are long-time County residents. An Occasional Papers series has also been established recently (Brown and others 1976), and the Society has cooperated with County government in establishing a museum. The museum houses exhibits and artifactual, documentary, and photographic collections pertaining to County paleontology, prehistory, ethnography and history. Many of the collections have been donated by local residents, and a few have been gathered by professional archaeologists. The Klamath National Forest has an agreement with the museum to curate artifacts which are sometimes collected by Forest personnel performing archaeological reconnaissance surveys.

Since the early 1970's, the Forest has also become extensively involved in historical research on the County as part of its cultural resource management program. Emphasis has been on specific localities affected by Forest projects, and research has relied upon data in the Siskiyou County Museum and in Forest files. Some original information on Forest administrative history has been compiled through interviews with former Forest employees and residents of the area.

Ethnography

Ethnographic research may be said to have begun as soon as European-Americans entered the Forest area. Members of Hudson Bay Company trapping expeditions made observations about local Indians in their journals (Dillon 1975), and early American expeditions kept journals with information on local cultures (Wilkes 1845, 1849; Gibbs 1972, 1973). Volume 1 of Bancroft's (1883) Works contains a chapter incorporating nearly everything written on California Indians prior to 1874, including data on the Karok, Shasta, and Modoc. Bancroft relied heavily on the information provided by Wilkes and Gibbs and by Stephen Powers.
Powers, a newspaper publisher, sheepherder, and gold miner, produced the first comprehensive description of California Indian cultures, including those of the Forest area. He visited them during the summers of 1871 and 1872 and first published his descriptions as a series of articles in Overland Monthly, Atlantic, and other places (Powers 1872a & b, 1873, 1877, 1976). In 1875 and 1876 Powers visited some additional tribes and revisited others to collect artifacts for the Centennial Exhibition of 1876. In 1877 a more complete account of Powers' investigations was published (Powers 1877). Powers' publications described the customs of the people he observed, and some interpretation was attempted. Interpretation was not the strong point of his work, however, and his hypotheses have little credence today (such as one suggesting that California Indians are descendants of Chinese transpacific voyagers who settled at Healdsburg).

The era from 1860 to 1900 saw the decline of ethnographic research by talented non-anthropologists such as Powers and an increasing professionalization of anthropology (Eggan 1968:119-127). This trend was manifested in California with the establishment of the Department of Anthropology at the University of California at Berkeley. From the Department's founding in 1901, Berkeley dominated anthropological research in the Forest area until the 1970's.

Alfred L. Kroeber played a key role in setting the course of the Berkeley program (Heizer 1978:1-11). Realizing that the evidence for the nature of pre-contact Indian cultures was fast disappearing as older tribal members died and as younger individuals were discouraged from learning traditional ways, Kroeber attempted during his 45 years at the University to obtain and publish as complete a record of the ethnography of California as possible. Among his early projects was the Handbook of the Indians of California (Kroeber 1925), for which Kroeber did fieldwork on weekends, vacations, and sabbaticals from 1900 to 1917. The Handbook is a comprehensive reconstruction of "the scheme within which the people in ancient and more recent times lived their lives (Kroeber 1925:xv)." It exceeded Powers' work in detail and remained the most thorough description of Native Californians until the recent publication of the California volume of the Handbook of North American Indians (Heizer 1978). Even the latter volume depends heavily on Kroeber's research.

In northwestern California, Kroeber spent most of his time among the Yurok. He considered the Karok to be virtually identical in culture to their down-river neighbors. The information which he gathered on both cultures, in addition to appearing in the Handbook, served as the basis for discussions of particular aspects of northwestern California Indian cultures which were published at later dates (Kroeber 1904, 1905, 1911, 1934, 1936, 1946). Kroeber also encouraged students and other researchers at Berkeley to undertake work on cultures of the Forest area. Schenck and Gifford (1952) studied Karok ethnobotany, and Gifford collaborated with Kroeber (1949) in a description of northwest California ceremonial customs. Hewes (1947) studied fishing practices, as did Kroeber and Barrett (1962). Kelly (1930) wrote about carving and O'Neale (1932) studied basket making.
By the mid-1930's it had become apparent that 170 years of warfare, disease and acculturation had almost completely destroyed even the memory of pre-contact cultures. Kroeber was therefore instrumental in initiating an accelerated effort to gather the remaining information. The Culture Element Survey of Native Western North America set anthropologists to locating the most reliable informants possible and determining which elements of a pre-established list of traits were present in the cultures studied. Voegelin (1939) and Driver (1942) published results which included Forest area cultures. In 1946, Catherine Holt updated Dixon's data on the Shasta, and in the 1950's William Bright (1952, 1954a,b, 1957, 1958, 1967, 1978) began extended work on the Karok language under University auspices in an effort to record linguistic data before informants died. Shirley Silver, a student at Berkeley, undertook linguistic fieldwork and research on Shasta culture (Silver 1964, 1966, 1978) and is still engaged in research.

While pre-eminent, the Berkeley department was not the only institution carrying out research in the Forest area. Roland B. Dixon of the American Museum of Natural History and the Peabody Museum at Harvard conducted several seasons of field research in California during the first decade of the 20th century. Among the results was an ethnography of the Shasta (Dixon 1907). Jeremiah Curtin, J. P. Harrington and C. Hart Merriam, who did fieldwork among the Karok and Shasta, seem to have shared an extreme reluctance to publish. As a result, much valuable information lies in field notes and similar documents (Heizer 1969).

Jeremiah Curtin and John P. Harrington worked on the staff of the Bureau of American Ethnology. Curtin worked along the Klamath River in 1888. His memoirs have been published (Schafer 1940), and some notes are located in the Smithsonian Institution's National Anthropological Archives (Curtin 1889a-c). Harrington published articles on Karok stories and myths and on the use of tobacco among the Karok (Harrington 1931, 1932a & b). Field notes on the Karok are located at the National Anthropological Archives and notes on Shastan peoples are located at the Department of Linguistics, University of California, Berkeley. C. Hart Merriam was privately supported. Some of his notes have been edited and published by Heizer (1967) and Merriam (1926, 1930) published a limited amount of information himself. Other materials are located at the archives of the Archaeological Research Facility, Department of Anthropology, University of California, Berkeley.

Verne Ray, of the University of Oregon, performed fieldwork among the Modoc in the 1930's that resulted in a major monograph (Ray 1963).

In spite of the increasing professionalization of anthropological research from 1900 onward, non-anthropologists also continued their involvement. Edward S. Curtis (1911, 1924) compiled a considerable amount of ethnographic data relevant to the Karok, Shasta, and Modoc, and did some field work. Lucy Thompson (1916), a Yurok, provides much valuable information on Yurok and Karok cultures. Charles S. Graves, Probation Officer for Siskiyou County, published two books (Graves 1929,
1934) based on Yurok Indian stories that also contain data relevant to the Karok. Arnold and Reed (1957) wrote about their experiences living among the Karok in the early 1900's. Most of this work focuses on pre-contact culture.

With the exception of Bright and Silver, little fieldwork on Indian cultures of the Forest area has been done since the 1940's. The decline of fieldwork probably reflects the loss of informants capable of providing information on pre-contact cultures and a lack of interest in studying acculturated peoples. On the whole, research conformed to the pattern of the "American historical school" (Eggan 1968:127-134), which concentrated on describing the history of specific peoples and cultures in limited geographical regions. Fieldwork and data collection were emphasized as central to the construction of these histories. Ultimately, comparison of individual histories was expected to reveal the processes shaping cultural development. In fact, this did not often occur, for researchers became lost in a mass of descriptive detail. Heizer (1978: 14-15) has predicted that future research is likely to consist primarily of "mining and remilling the vast body of published direct-testimony ethnographies, ethnohistoric accounts, unpublished archival material, and museum collections." The lack of enthusiasm for studying contemporary Indian cultures is regrettable, but is perhaps due to the understandable unwillingness of contemporary Indian people to be subjected to such study. It may also be due to an outlook narrowed by too many years spent attempting to preserve a record of pre-contact cultures.

While much of this ethnographic work is of high quality, it is often of limited use for cultural resource management. Although the objective of the research was comprehensive cultural description, matters such as social structure, legal practices, and religion frequently received detailed treatment, while descriptions of the ecological setting of seasonal camps and of the activities which occurred at those camps are often very sketchy, for example: "...late in the fall the Shasta went high up in the Siskiyous for the last big fall deer hunt (Holt 1946:312)." When information of potential value is presented, for example descriptions of religious beliefs and practices that might provide assessments of ethnic significance, interpretation is often complicated by the ethnographers' objective of describing pre-contact cultures. It is difficult to determine the extent to which the data reflect the modern situation.

As a result, the Forest Service has begun to gather ethnographic data, generally for specific projects. Winter (1978) and Winter and Heffner (1978a & b) have compiled data on the Karok of the Orleans area of the Six Rivers National Forest, and an anthropological study of the Gasquet-Orleans Road on that Forest has gathered and synthesized much data on the Karok and other northwestern California cultures (Theodoratus, Chartkoff and Chartkoff 1979). The Klamath National Forest has begun a project to describe the present ethnic significance of Karok village and ceremonial sites (Palmer 1979), and regularly consults with local Native Americans to evaluate the effects of projects on specific areas.
Archaeology

Prior to the 1970's, archaeological research in the Forest area lagged behind ethnographic research in quantity, and often in quality. This may have resulted from the dominant position of the Department of Anthropology at Berkeley, and Kroeber's influence within the Department (Heizer 1978:12). Kroeber believed that artifacts would remain undisturbed in the ground almost indefinitely. Given that individuals knowledgeable about pre-contact Indian cultures were rapidly dying, Kroeber assigned higher priority to ethnography; archaeological projects tended to result from chance finds rather than from a planned, systematic research program. The scope of inquiry was often limited to an identification of the culture represented by the site.

In 1950 William Wallace, Edith Taylor, and Alex Krieger spent three days excavating a rock shelter in the Shasta Valley, at the request of local amateur archaeologists Walter Pollock, his son, and C. K. Kay, who had previously dug in the shelter. Their collections were made available to the University of California and reported on by Wallace and Taylor (1952). The report described the artifacts and attempted to determine the cultural affiliation of the site. In the early 1950's, small field parties under Gordon Grosscup and Robert Squier conducted reconnaissances and excavations in the Lower Klamath Lake and Tule Lake area (Friedman 1976:20-21, Squier 1956). The reconnaissance concentrated on lava tube caves and the former shoreline of Tule Lake. Four types of sites were distinguished, and through the excavations three prehistoric cultural phases were defined. In 1953, Robert Heizer described a Shasta rain rock uncovered near Gottville during construction of State Highway 96 and removed to the Fort Jones Museum. University archaeologists James Bennyhoff and Albert Elsasser examined materials associated with burials found during bulldozing of a channel for Bogus Creek (Pollock 1971). The burials were attributed to an 1860 attack by Modoc Indians on a party of Shasta engaged in trade with a white peddler. Heizer and Hester (1970) collaborated on a list of Shasta villages.

The first substantial research in the Forest area was conducted by a member of the University of Oregon faculty, L. S. Cressman (1940, 1942). Cressman conducted excavations in the Lower Klamath Lake Basin, concentrating on the association of artifacts with fossils of extinct animal species and on the number of cultural strata present. The objective was establishment of a chronological sequence of cultures in the area. On a broader scale, Cressman's excavations were part of a lifelong program of research devoted to a demonstration of the antiquity of Northern Great Basin cultures and description of the effects of post-glacial environmental change on the human occupants of the region.

At the same time that Cressman reported on his Lower Klamath Lake investigations, Robert F. Heizer (1942) analyzed materials recovered by amateur archaeologists from caves and shore sites at Massacre Lake and Tule Lake. Heizer described features and artifacts, and concluded that it was unlikely that the sites were ancient, as most of the artifacts recovered could be matched with ethnographically-known types.
Cressman and Heizer's reports are among the better archaeological reports for the Forest vicinity. They provide insight into the reasons why specific sites were selected for study and describe the methods of excavation employed and the artifacts and features found. The most serious defect of the work may be their reliance upon amateur collections and materials eroded from their stratigraphic position, which make dating and chronological ordering very tentative.

The University of Oregon again became involved in archaeological research in the Forest area through a survey of the area to be inundated by construction of the Iron Gate Dam on the Klamath River. Three sites were recorded, one of which was excavated and described by Frank Leonhardy (1961, 1967), a student at the University. The primary objective of the excavation was to determine the age and cultural affiliation of the site. Again, in the late 1960's, Oregon students became involved in the excavation of a site, Nightfire Island, located near the original shore of Lower Klamath Lake (Friedman 1976:22-23). Unfortunately, final publication of the results by the University archaeologists has not yet occurred, although a short article (Johnson 1969) on obsidian hydration dates and a Ph.D. dissertation (Grayson 1972; also see Grayson 1976) are available. Carroll Howe, a local amateur who was instrumental in initiating the excavations, has published his own book on the results (Howe 1979, also see Howe 1968). This work probably resulted from the continued influence of L. S. Cressman on the Oregon program, as manifested by the interdisciplinary nature of the research, which involved geology, palynology, linguistics, ethnography, physical anthropology, and archaeology, and by its concern with ecological questions.

Additional archaeological research prior to the 1970's was undertaken by Canfield and Crouch, who excavated a cave in the Lava Beds area (Friedman 1976:18), and by B. K. Swartz (1962; 1964), who undertook a survey and excavation on the south shore of Tule Lake prior to the construction of an access road for the Lava Beds National Monument. Both projects emphasized the identification and description of the occupations represented by the sites. Canfield and Crouch identified two component occupations, and Swartz identified four dating from prior to 1500 B.C. to the Modoc War.

A change in the direction of archaeological research in the Forest area occurred in the 1970's. Prior to that time the University of California and University of Oregon programs had dominated research, and program directions were heavily influenced by the interests of Kroeber and Cressman. The research was not sufficiently broad in scope to meet cultural resource management needs. It often focused on the construction of local cultural chronologies. As a result, cultural resource management policy created a need for a considerable amount of research. To date, projects have focused on the location and description of cultural resources for specific undertakings.
Surveys have been undertaken for sewage projects (Johnson 1975a & b; 1976), highways (Clewett 1973; Bass 1974; Wiant and Sheeders 1975; Buck 1976), bridges (Hopkins 1979a-c), subdivisions (Kowta 1978), and the Gasquet-Orleans Road (Theodoratus, Chartkoff, and Chartkoff 1979). The greatest number of projects has been sponsored by the Forest Service. The Klamath National Forest has completed over 200 Archaeological Reconnaissance Reports to date. All of these reports have inventoried the cultural resources of particular project areas. Most of the information on the non-Forest Service projects, including the site records, has been submitted to the Society for California Archaeology District II Clearinghouse at Chico. The Clearinghouse is a State-designated repository for archaeological survey data pertaining to Siskiyou County. It holds records for over 300 local archaeological sites. These records would be a valuable complement to Forest site survey data for efforts to define patterns in the significance and location of archaeological resources.

Research of a more general nature has been conducted by Hardesty and Fox (1974), Friedman (1976, 1977), Quillen (1978a & b), and Chartkoff and Chartkoff (1972a-d; 1973; 1975; also see Chartkoff 1975). Hardesty and Fox reconnoitered the Lava Beds and Medicine Lake Highlands and located 768 Native American sites. Five types of sites were distinguished and their associations with microenvironments defined by dominant floral species was defined. Friedman wrote an archaeological overview and an inventory of the Mount Dome and Timbered Crater regions for the Bureau of Land Management which was reviewed and updated by Quillen.

The Chartkoffs' work was the result of a Forest Service contract to train paraprofessionals to conduct archaeological reconnaissances. Their objectives were to (1) train Forest Service paraprofessionals, (2) train anthropology students in archaeological field methods, (3) inventory archaeological resources within Karok territory, and (4) research the evolution of subsistence and settlement patterns along the Middle Klamath River. More than 175 prehistoric and historic archaeological sites were recorded and six sites were test-excavated. Because the contract did not provide money for analysis, publications to date have not exploited the full range of information recovered, and the Klamath National Forest has not received a complete list and description of the resources inventoried.

The Chartkoffs' archaeological contribution to the Gasquet-Orleans Road report (Theodoratus, Chartkoff and Chartkoff 1979) also provides information of general relevance. Their survey examined known ritual locations, alternative road routes, and a sample of the adjacent area, and supplements the results of the river-valley survey.

These studies have serious deficiencies with respect to Klamath Forest planning. Hardesty and Fox, Friedman and Quillen concentrate on prehistoric and historic Native American archaeological sites. There is no discussion of non-Indian archaeological sites that provides adequate planning data. The utility of the Chartkoffs' research is limited because only a portion of the information is available to the Forest, and the results may lose accuracy as one moves away from the Klamath River valley and the immediate Gasquet-Orleans Road vicinity.
Conclusions

Description of previous historic, ethnographic, and archaeological research in the Forest area indicates that it suffers from a lack of balance. Historic research has concentrated on specific topics, and most attention has been paid to gold mining and the Modoc War. Broader cultural syntheses of particular geographic areas, time periods or social groups have not been attempted since Wells published his history of Siskiyou County. Archaeological research has focused on the construction of cultural chronologies, with occasional forays into the field of environmental reconstruction and ecological interpretation. Again, broader cultural syntheses have not been attempted. Fieldwork has been concentrated in areas selected for their ability to produce answers to specific research questions (such as the Klamath Lake basin) and in areas selected without concern for any research question (such as land management project areas). The extent to which the resulting data adequately represent conditions in the Forest as a whole is still a matter for debate. Ethnographic research has aimed at comprehensive cultural descriptions, but in this case a different question of balance arises: emphasis has been placed on describing the pre-1850 condition of Forest Indian cultures, and data may not adequately reflect later changes.

Given this situation, two conclusions appear to be evident. First, gold mining and the Modoc War are significant historical topics, in the sense that they have received more than an average amount of attention. Cultural resources which can provide information about these topics are potentially significant. These resources include mines, mills, miners' camps, ditches and facilities such as stores that served the mining population, as well as military encampments, supply centers, and residences of individuals important in the Modoc War.

Second, existing information is far from being a complete inventory of Forest area cultural resources, and years of additional field and archival work remain to be done. With respect to land management planning, the representativeness of the existing information is likely to be a critical issue. It will be difficult for planners to assume that a capability area with few known cultural resources is archaeologically insensitive, if few surveys have examined that capability area. Such a situation may be common until surveys are designed with the specific objective of providing data representative of all capability areas. More specific statements can be made once capability areas are mapped and can be related to areas already surveyed.
Anonymous

Arnold, Mary E. and Mabel Reed
1956  *In the land of the grasshopper song: a story of two girls in Indian country in 1908-09.* Schooner Features, Eureka.

Bancroft, Hubert Howe

Bass, Henry O.
1974  Archaeological reconnaissance of selected portions of State Highway 97, Weed to Dorris, Siskiyou County, Ca. Department of Anthropology, California State University, Chico.

Bright, William

Brown, Eleanor, Jim Röck, Don McKinney and Chris Sellman

Buck, Paul E.
1976  Archaeological reconnaissance of State Highway 3, near Yreka, Siskiyou County, California. Department of Anthropology, California State University, Chico.
Chartkoff, Joseph L.

Chartkoff, Joseph L., and Kerry K. Chartkoff

Clark, William B.

Clewett, S. E.
1973 Hornbrook-Ager Highway survey, Siskiyou County. Department of Anthropology, California State University, Chico.

Cressman, Luther S.

Curtin, Jeremiah
1889a Fifteen untitled stories. Ms. 269, National Anthropological Archives, Smithsonian Institution, Washington, D.C.
1889b Karok vocabulary, Bluff Creek to Happy Camp, Siskiyou County, California. Ms. 847, National Anthropological Archives, Smithsonian Institution, Washington, D.C.
1889c Pulikla vocabulary, Klamath River, California. Ms. 1459, National Anthropological Archives, Smithsonian Institution, Washington, D.C.
Curtis, Edward S.

Dillon, Richard

Dixon, Roland B.

Driver, Harold E.

Eggan, Fred

Frank, Emilie A.

Friedman, Janet

Gibbs, George

Graves, Charles S.
1929 Lore and legends of the Klamath River Indians. Press of the Times, Yreka.
1934 Before the white man came. Siskiyou News, Yreka.
Grayson, Donald K.  


Gudde, Erwin G.  

Hardesty, Donald L. and Steven Fox  

Harrington, John P.  


Heizer, Robert F.  


Heizer, Robert F., and Thomas R. Hester  

Hewes, Gordon W.  

Holt, Catharine  
Hopkins, Joseph D., III
1979a A cultural resources survey of the Willow Creek Bridge on Louie Road, near Gazelle, Siskiyou County, California. Siskiyou County, Department of Public Works, Yreka.

1979b A cultural resources survey of the Garrick Creek Bridge on the Edgewood-Big Springs Road, Siskiyou County, California. Siskiyou County, Department of Public Works, Yreka.

1979c A cultural resources survey of the Mill Creek Bridge on Quartz Valley Road near Mugginsville, Siskiyou County, California. Siskiyou County, Department of Public Works, Yreka.

Howe, Carrol
1968 Ancient tribes of the Klamath country. Binfords & Mort, Portland.


Johnson, Keith L.
1975a Archaeological reconnaissance at Happy Camp, Siskiyou County, California. Department of Anthropology, California State University, Chico.

1975b Archaeological reconnaissance of the Montague Sewage Treatment Project. Department of Anthropology, California State University, Chico.

1976 The search for Ishipisha-Tishiram village near Happy Camp, Siskiyou County, California. Department of Anthropology, California State University, Chico.

Johnson, LeRoy Jr.

Jones, J. Roy

1971 The land of remember. Privately printed, Yreka.

Kelly, Isabel T.

Kowta, Makoto
Kroeber, Alfred L.


Kroeber, Alfred L., and Samuel A. Barrett


Leonhardy, Frank C.


Merriam, C. Hart


Murray, Keith A.
O'Neale, Lila

Palmer, Gary
1979 Karok villages and ceremonial sites. Ms., on file, Klamath National Forest, Yreka.

Pollock, Hazel N.

Powers, Stephen

Quillen, Dennis K.

Ray, Verne F.

Riddle, Jeff C.

Schafer, Joseph, ed.

Schenck, Sara M., and E. W. Gifford
Silver, Shirley


Squier, Robert J.

Swartz, B. K. Jr.


Swartz, B.K., Jr. and Marion L. Parker

Theodoratus, Dorothea J., Joseph Chartkoff and Kerry Chartkoff
1979  Cultural resources of the Chimney Rock section, Gasquet-Orleans Road, Six Rivers National Forest. Theodoratus Cultural Research, Fair Oaks.

Thompson, Lucy
1916  To the American Indian. Cummins Print Shop, Eureka.

Voegelin, Erminie W.
Wallace, William J. and Edith S. Taylor  

Wells, Harry L.  

Winter, Joseph C.  

Winter, Joseph C. and Kathy Heffner  


Wiant, Wayne C. and Donna Sheeders  
1975 An archeological impact study of the proposed road widening project of Forest Highway 93, from Somes Bar to Forks of the Salmon. Archeology Study Center, California State University, Sacramento.  

Wilkes, Charles  
1845 Narrative of the United States Exploring Expedition during the years 1838, 1839, 1840, 1841, 1842. 5 vols. Lea and Blanchard, Philadelphia.  

1849 Western America, including California and Oregon with maps of those regions and of the Sacramento Valley. Lea and Blanchard, Philadelphia.
IV. CULTURE HISTORY

This chapter synthesizes the results of the research described in Chapter III to present a culture history of the Klamath National Forest vicinity. This "history" discusses prehistory and ethnography as well as history itself, and is a basis for the identification of important persons, events, and trends that may be represented by Forest cultural resources. Any culture history should consist of specific elements, and thus this synthesis also serves to identify information needed to complete the history.

Elements of A Culture History

The elements of a culture history are answers to a series of questions about an area: (1) What cultures occupied it? (2) What is the spatial and temporal distribution of each culture? (3) What were the cultures like in subsistence, technology, social structure, religion and other characteristics? (4) How and why did they develop? While the questions are general, the research strategy described in Chapter I leads to a focus on economic data in providing answers.

Prehistory

Very little is known about the early prehistory of the Forest area, and inferences must be based on information from other parts of Northern California and Southern Oregon. On this basis it appears that at least two cultural traditions may be represented within the Forest: those of the North Coast Ranges and the Great Basin. Their distribution may roughly correlate with the major physiographic units of the Forest area, the Klamath Mountains and Cascades/Modoc Plateau geomorphic provinces.

North Coast Ranges

A tentative prehistoric cultural sequence has been established for the Sonoma, Lake, and Mendocino County portion of the North Coast Ranges and may apply to the Klamath Mountains as well. The sequence is based primarily on materials recovered from the Borax Lake area (Harrington 1948; Treganza 1950; Meighan 1955; Meighan and Haynes 1970; Frederickson 1973, 1974).

The earliest inhabitants of the North Coast Ranges may be represented by large, fluted projectile points which resemble Folsom points (Harrington 1948:62, 64-66, 70). The Folsom point is a widely-distributed type, and has elsewhere been dated to about 8500-6000 B.C. The points are believed to have been mounted on spears and darts and to have been used against large game animals, such as extinct species of bison. Little else is known about the people who made these points:

"Apparently their dwellings were such as to leave few traces in the ground. Only open-air settlements have been recognized though they may occasionally have resorted to shelter beneath rock overhangs or
in caves. The absence of deep refuse deposits at the dwelling places points to temporary or brief recurrent occupancy. Socio-political inferences are hazardous, but the economics of a simple hunting life must have demanded groups of limited size. Perhaps a few families related by kinship hunted and traveled together. As yet, no skeletal remains of the hunters themselves have been certainly identified, therefore, nothing can be said regarding their physical type or mortuary practices (Wallace 1978:25).

A second phase of the occupation of the ranges is represented by an artifact assemblage that includes wide-stemmed points, called Borax Lake points (Harrington 1948:82), mullers and milling stones. The assemblage is referred to as the Borax Lake Pattern and dates from about 5000 to 2000 B.C. The mullers and milling stones are thought to indicate a new emphasis on seed foods and a decreased reliance on large game. Some patterns of association between Borax Lake sites and environmental features have been discerned (King 1974: Wylie 1976; Joseph C. Winter personal communication 1978). Sites have been found on or near ridgetops in open meadows or close to springs. Since the sites are at about 6000' elevation, they do not appear to be suitable for winter occupation and sites in other locations are also expected. Based on their survey of the Gasquet-Orleans Road area, Chartkoff, Davis and Donahue (1979:G-5) feel that in the Klamath Mountains a generalized hunting and gathering way of life may have brought individual families or hunters into high-elevation valleys and ridgetops, and that temporary summer occupations resulted.

The Borax Lake Pattern is followed by the Mendocino Complex, which is characterized by smaller projectile points, lacks the Borax Lake point type, and commonly includes mortars and pestles, thought to reflect the beginning of exploitation of acorns. The Mendocino Complex dates from about 1000 B.C. to A.D. 0. From this period on, cultures develop in an increasingly localized manner, and inferences based on adjacent areas probably do not apply to the Klamath National Forest (Elsasser 1978). Chartkoff, Davis, and Donahue (1979:G-5 to G-6) hypothesize that the period from 2000 B.C. to A.D. 500 was one of increasing adaptation to riverine resources. Local peoples became seasonally transhumant, occupying winter base camps along the river and a wide range of special-function sites in other seasons, including temporary highland hunting and collection sites in the winter. Large stemmed points are characteristic of the period. From A.D. 500-1500, use of riverine resources became increasingly effective, so food could be harvested and stored at riverine base camps through most of the year. Base camps became increasingly larger, sedentary, and more socially complex. In the highlands, seasonal summer occupations by bands or settlements as a whole gave way to more specialized uses. Hunting and quarrying were done by expedition from lowland base camps. From A.D. 1500-1850, exploitation of the anadromous fishery is believed to have been perfected. River villages became fully sedentary; the economic use of highland areas declined, to be replaced by ritual use.
The overall pattern of cultural development within the North Coast Ranges appears to reflect significant changes in subsistence practices: first from primary reliance on large game to a more balanced use of a variety of smaller game and plants, then to an increased reliance on acorns and anadromous fish. This pattern is often said to result from the climatic changes from the Anathermal to the Altithermal and then to the Medithermal: the drier climate of the Altithermal was unfavorable for supporting the large game pursued by Folsom hunters and led to the use of a greater range of foods as many large game species became extinct, while the cooler and moister Medithermal may have once again allowed greater specialization. As was stated in Chapter II, such an explanation requires evaluation on a local basis, and constitutes one topic about which important archaeological information could be obtained.

It is not the only topic about which important information could be obtained, however, since existing information is not adequate to complete other elements of the culture history. These include: (1) identification of the peoples inhabiting the Klamath Mountains from the earliest occupation to A.D. 1400, (2) delineation of cultural boundaries and settlement patterns throughout the prehistoric period on other than a hypothetical basis, (3) more detailed description of subsistence practices and of other aspects of culture.

**Great Basin**

The Great Basin prehistoric sequence, which includes the Modoc Plateau and possibly the Cascade Range provinces, shows a trend broadly similar to that of the North Coast Ranges. There is more detail available because of the University of Oregon excavations in the area.

The earliest known inhabitants are represented by materials excavated by L. S. Cressman along the margins of Lower Klamath Lake (Cressman 1940, 1942). Artifacts include leaf-shaped projectile points, fossilized bone foreshafts, beveled-edge knives, and heavily weathered grinding stones. They were associated with fossils of extinct animal species, which led Cressman to conclude that they dated prior to about 6500 B.C. The presence of grinding stones in an assemblage of this date suggests an earlier exploitation of seeds in this area than in the North Coast Ranges.

The remainder of the sequence is represented by the materials from Nightfire Island (Grayson 1972, 1976). A series of five phases dating from 4000 B.C. to A.D. 1400 have been tentatively defined. The Phase 1 assemblage includes leaf-shaped and large side-notched points. It is dated from 4000 to 3000 B.C. Phase 2 (3000 B.C. to 2200 B.C.) is characterized by the presence of corner and side-notched points and cylindrical mullers; Phase 3 (2200 B.C. to A.D. 0) by an increasing frequency of corner-notched points; Phase 4 (A.D. 0 to A.D. 1000) by the presence of small stemmed and corner-notched points; and Phase 5 (A.D. 1000 to A.D. 1400) by Gunther barbed points.
The overall trend of this sequence is believed to consist of increasing adaptation to marsh and lake environments from a generalized hunting and gathering base. The work of Cressman (1956) at Klamath Lake, Squier's (1956:37) survey of the Tule Lake area and Swartz' (1961, 1962, 1964) survey and excavation support the inference: evidence of occupation of appreciable duration is found in the immediate neighborhood of present and former lake shores. This trend would parallel the increasing local specialization that characterizes the later portions of the North Coast Ranges sequence, and seems to be a predictable result of the unique ecological characteristics of the lake basins.

However, the trend may be a premature inference based on unrepresentative data, since the researchers concentrated their research efforts on areas near water bodies. Quillen (1978) surveyed areas away from major water bodies and located a number of sites post-dating A.D. 600. These were identified as hunter's encampments/workshops, and might indicate decreased subsistence specialization late in the prehistoric period.

As in the Klamath Mountains, a tentative local prehistoric culture sequence has been developed for the Modoc Plateau. Unfortunately, cultural boundaries and the distribution of activities are poorly understood. Cultural descriptions have not progressed much beyond the identification of diagnostic artifacts, and we do not yet understand the dynamics of the developmental sequence.

Ethnography

Archaeological research (Chartkoff and Chartkoff 1972a-d, 1975; Chartkoff 1975; Leonhardy 1961, 1967; Grayson 1972, 1976) indicates that the historic Indian cultures of the Forest area had developed by about A.D. 1400. These are the Karok, Shasta, and Modoc.

KAROK

The Karok are identified primarily in terms of their language, which belongs to the Hokan family but has no close relatives (Dixon and Kroeber 1913). Their culture closely resembles that of the adjacent Yurok.

The Karok occupied the Klamath River from Bluff Creek to Seiad (Figure 4). The area between Happy Camp and Seiad was occupied by a group which was bilingual, speaking both Karok and Shasta, and which has sometimes been considered marginal to the Karok. There were also villages on Indian Creek and up the Salmon River (Bright 1978: Figure 1). Population was densest around Orleans, at the mouth of the Salmon River, and at Clear Creek. No political institution unified the tribe prior to the arrival of non-Indians.

The Karok were oriented to the resources of the rivers and streams. Major salmon runs occur in the spring and fall, and much of the year's food supply was secured at those times (Kroeber and Barrett 1960). Rapids were favored fishing locations, since their channels tended to restrict fish movement to predictable areas. Usually, a fishing platform was built at the edge of the river. The sites for these platforms
were privately owned but could be rented for a part of the catch. Fish were generally caught in a net lowered on an A-frame. Sometimes, a smaller "plunge net" on an oval frame was used to scoop fish out of the rapids (Bright 1978: Figure 2). Harpoons were also used, and eels were caught with dip nets or gaffs. While some fish could be caught year round, much of the spring and fall catch was dried and smoked for preservation and consumed during periods when the catch was at a minimum.

Acorns and deer were other major components of the Karok diet. Acorns of the tan oak (Lithocarpus densiflora) were preferred. Families camped out in the fall, living in temporary houses of fir bark and gathering the acorns from the ground. Tannic acid was removed by cracking and drying the acorns, rubbing them to remove their skins, grinding them to flour with a stone pestle on a flat slab, and leaching the flour in a sand pit. This produced a dough which was mixed with water and boiled in a large basket with heated rocks, producing a soup or mush. The dough could also be cooked on hot stones to make bread. On occasion, whole acorns were buried in wet ground to soak for a year or more, then boiled in the hull and cracked with the teeth for eating. Wild grass seeds and a wide variety of edible nuts, bulbs and greens were also eaten. Shenck and Gifford (1952) provide information on the Karok use of a number of plants for food and other purposes. Deer were hunted in the fir forests on the mountain slopes, often using deer-head masks as decoys. Dogs were used to run the animals into snares set on their trails. Elk, bear, rodents, and other small mammals and birds were also hunted.

The importance of river resources is reflected in the Karok village location pattern. Ninety percent of the recorded villages lie within a quarter mile of the rivers, and the Chartkoffs (1975:176) reported that villages tended to be located at the mouths of major tributaries, since the tributaries diverted a portion of the spawning run, decreasing the fishing potential upstream. The availability of flat land also influenced village location, as 95% of the villages were located on land with less than 10% slope (Chartkoff and Chartkoff 1972). Villages contained one to ten living houses and one or more sweat houses. There was one family per living house. The living houses were mainly the dwelling of women and children, with the men visiting at mealtime. The men slept, sweated and gambled in the sweat houses, which were not open to women except for the initiation of a female shaman. Both house types were rectangular, of rough planks, semi-subterranean, with a stone-paved porch outside. Gathering of firewood for the sweat house had religious implications. Limbs were supposed to be cut from the uphill and downhill sides of tall Douglas fir trees, accompanied by ritual weeping and prayers for success in hunting and gambling, which were the main means of acquiring wealth.

The Karok depended on a technology of wood, stone, plant fiber and bone for maintaining their way of life. Wooden planks for housing were split from logs with horn wedges and stone mauls, then worked with stone adzes. Fine carving of wood, again with stone tools, produced storage boxes, cooking paddles and spoons (Kelly 1930). Boats made from hollowed
redwood logs were purchased from the Yurok. Oval soapstone dishes were used to catch grease from cooking salmon. Small obsidian knives, flaked using an antler, were hafted to wooden handles and used for butchering game. Large obsidian blades (see Kroeber 1925: Plate 2 for similar Yurok types) were wealth items displayed at ceremonies. A bow made of yew wood backed with sinew and with a sinew string was the principal weapon. Arrows were of syringia wood, with obsidian heads used in war. Other tools included carved elk horn spoons for men, mussel-shell spoons for women, bone awls for hide sewing, wooden fire drills, and a tobacco pipe consisting of a straight wooden tube and soapstone bowl.

Ceremonies were as important as technology in maintaining the Karok way of life, and remain so today. The principal ceremonies are usually referred to in English as World Fixing or World Renewal rituals, and are held at the villages of Inam, Katimin, Amaikiaram, and Panamnik. They are linked in concept and timing into a sequence which must be completed in order to revitalize the world and prevent famine, disease, and disaster. While keyed directly to phases of the moon, the ceremonials are also roughly correlated to the spring and fall salmon runs. The cycle begins with the First Salmon Ceremony of Amaikiaram in the spring, corresponding to the spring run of chinook salmon, and closes with the waning of the moon in September, at the time of the fall run of chinooks, King salmon, and steelhead. Some economic activities are timed to correspond with the ceremonial schedule. For example, the fish weir of the village Afsuf could only be constructed after the occurrence of the Amaikiaram Jumping Dance (Palmer 1979).

The ceremonies include a sacred element consisting of a journey and recitation of a formula by a priest. The journey covers a ritually prescribed route. During the journey the priest recites the formula, which narrates how the ceremony was established by a race of supernatural beings who formerly inhabited the earth. Recounting their actions recreates the results, renewing and revitalizing the world (Kroeber and Gifford 1949; Palmer 1979). The ceremonies also include public dances, the Jumping Dance, Deerskin Dance, War Dance, and Boat Dance. The Jumping Dance is held at Amaikiaram. The Deerskin Dance and War Dance are held at Inam, Katimin, and Panamnik; and the Boat Dance is performed at Inam and Panamnik. The dances share some features, but each has its own constellation of steps, songs, equipment and costumes. The dances are competitive, in that they are an occasion for the display of wealth items and groups of dancers try to outdo each other in the amount of wealth displayed. While the public dances have been held irregularly during the twentieth century, the priest's ritual is still conducted on a yearly basis.

In addition to renewing the physical condition of the world, the ceremonies play an important role in regulating Karok social relationships. Rights to perform rituals and sponsor dances are distributed so as to link kin groups and villages into cooperating units. Also, to avoid spoiling the dances, all who attend must resolve their differences beforehand. In these ways, the ceremonies take the place of more explicitly political institutions (Palmer 1979).
An important characteristic of the ceremonies is their extreme localization. The dances occur in specific villages, and are associated with specific locations within the villages: "everything that is prescribed may be done only at a specified spot. This is true equally of indoor and outdoor, of esoteric and exoteric acts. Hence, the formulist's itineraries to named places, the dancers' filing in to stand facing in one direction only under a particular tree or roof (Kroeber and Gifford 1949:3)." This implies that ceremonial localities will be of great cultural sensitivity, as the ceremony is seen as essential to the maintenance of world order, and as substitutions cannot be made for localities used in a ceremony without causing it to lose effect or fail completely. These localities are identified in Palmer (1979).

In addition to the two major ceremonies, the Karok conduct several other dances and rituals. The Brush Dance is conducted for curing sick children, there is a dance for girls reaching puberty and a dance for initiating shamans. Shamans are curers, usually women, who treat patients by sucking on their bodies and removing disease objects ("pains") without breaking the skin. "Herb doctors" also exist and treat patients with internal and external herbal medicines and recitation of formulas. Individual rituals for obtaining priestly and shamanistic knowledge, and for obtaining wisdom and good fortune also exist. In the past if an individual died, the body was removed from the house through a partially dismantled wall and buried in a family-owned plot. Valuables were broken and buried with the corpse. A fence was built around the grave, and clothes and utensils were hung on it and left to rot. Mourners were believed to be contaminated for five days following burial, and had to take sweat baths, scarify themselves, and avoid certain activities such as hunting, travel and eating fresh meat. After the five days the ghost of the deceased was believed to go to the sky, where the Milky Way was called the road of the dead. Personal formulas and rituals also exist, and generally have the objective of obtaining knowledge, wisdom and good fortune for the self or community (Theodoratus, Chartkoff and Chartkoff 1979). These rituals are also highly localized and are usually associated with high places, but information on ritual localities within the Klamath National Forest has not been gathered.

Karok culture was characterized by considerable local autonomy. Individual villages were the principal political unit (Curtis 1924:60). Rich men were leaders within the villages because of the prestige of their wealth. Linkages were created by kinship, and if, for example, individuals from different villages had occasion to feud, relatives would become involved but usually not the entire village. Kinship units did not seem to have a well-defined structure. Kroeber (1925:21) noted that among the Yurok "a definite group of kinsmen acting as a group capable of constituted social action did not exist". The same is presumed to be true of the Karok.
The Karok did not recognize crimes against the tribe or community. Undesirable behavior either offended the supernatural, which would bring retribution in the form of bad luck, or offended private persons and property, which would require payments to the affected individuals or their families. Murder could be compensated in this way. Refusal to pay the indemnity could result in negotiation, but often resulted in a retaliatory killing and a feud if payment was not prompt and adequate.

Payment was in the form of dentalium shell money or other valuables, including woodpecker scalps, deerskins of unusual color (particularly albino) and large obsidian and flint blades. Payments were also made by a bridegroom to the bride's father in marriage, and one's social standing depended upon how much one's father had paid for one's mother. Personal wealth also entered into the reckoning of social standing. It is sometimes said that everything had a price to the Karok, but this is probably true only in a legal sense, in that damage to personal property and personal injury could be paid for. There seems to have been no market mechanism, and food was only sold in emergencies. Overall, wealth items among the Karok seem to have had the characteristics of "primitive valuables" as outlined by Dalton (1977:198-199).

It is evident that the Karok were heavily involved in exchange with their neighbors (Davis 1961:24-25). For example, they traded dentalia to the Yurok and received redwood canoes, Olivella shells, pipes and bows, among other items. Items traded to the Shasta included dentalia, salt, tan oak acorns and baskets. Goods received in return included white deer skins, obsidian, sugar pine nuts, and dentalia. The two-directional trade in dentalia and salt, and the trade of acorns and sugar pine nuts suggests that trade served to dampen fluctuations in the supply of vital subsistence items.

The Karok people and their culture suffered much from their contact with whites. The first Europeans seen by the Karok were probably Hudson Bay Company trappers (see below). In 1850-51, their territory was suddenly overrun by gold miners. In 1852, after clashes between whites and Karoks near Orleans, most of the Karok villages as far north as the Salmon River were burned, while the Karok took refuge in the mountains. The Army became involved in fighting the Karok and killed 15 in 1851. In 1855, 75 more were killed in clashes with the military. Eventually, some Karok returned and built houses in unoccupied places near white farms which had been built on their villages. In 1887, the General Allotment Act provided that certain Indians could settle on the public domain and obtain title. An amendment in 1910 extended the act to lands in the National Forests more valuable for agriculture or grazing than for timber. About 90 allotments have been made in the Klamath National Forest, primarily to Karok. The allotments consist of plots of agricultural land up to 160 acres, and usually include one or two homes, a barn, a field, and sometimes an orchard.

The pre-Gold Rush population of Karoks has been estimated at 2700 (Cook 1956:98). Military operations, murders and disease produced a rapid population decline. By 1930 a total of 755 people were identified as Karok, of which 16.4% were said to be full-blood. In 1972, the Bureau of Indian Affairs reported that 3,781 individuals were identified as having at least some Karok ancestry (Bright 1978:189), indicating a resurgence of the people and of pride in being identified as Indian.
SHASTA

The Shasta, like the Karok, spoke a language belonging to the Hokan family. There are four divisions of the Shastan language: Shasta, Konomihu, New River Shasta, and Okwanuchu. The Shasta inhabited the Klamath River and its tributaries from above Seiad Valley to roughly the point where the river crosses the California-Oregon border, as well as the headwaters of the Rogue River. The Konomihu inhabited the area from about four miles below the Forks of Salmon to about five miles up the north fork of the Salmon and seven miles up the south. The New River Shasta inhabited the Salmon River above the Konomihu and the head of the New River. The Okwanuchu occupied the area along the heads of the streams draining south from Mount Shasta (Figure 4). The relationships between these various groups of Hokan-speakers is not known (Kroeber 1925:280-282).

The Shasta settlements along the Klamath and Rogue Rivers were loosely organized into divisions. The Shasta inhabiting the Rogue River drainage formed one division. The California divisions were in the Shasta Valley, Scott Valley and the Klamath River east of the Scott River. A group called the Kammatwa lived on the edge of the Shasta territory adjoining the Karok on the Klamath River. The Kammatwa appear to have acted as go-betweens for the rest of the Shasta and the Karok. Although the Shasta and Karok could not communicate directly, the Shasta spoke to the Kammatwa, who spoke to the Karok living in the Seiad vicinity (the Watiru), who in turn spoke to other Karok. This communication link was probably an important element in Shasta-Karok trade, and the Kammatwa-Watiru area may be a fruitful locality to study prehistoric trade.

No archaeological study of Shasta settlement pattern has been attempted. Heizer and Hester (1970) summarized ethnographic knowledge about Shasta settlements. This information pertains primarily to the locations of winter villages. Along the Klamath River, the preferred location for a village was at the mouth of a creek feeding into the river. A few villages were located near oak stands in the hills, usually near large springs. In the Shasta and Scott valleys, villages were usually located at the edge of the valleys where a stream came out of the mountains.

The Shasta, like the Karok, relied upon salmon for part of their food supply. In the spring, the Shasta moved out of their winter houses and into brush huts along the river bank. The men fished using dip nets and long, flat seine nets, basket traps, weirs, hook and line and spears. Women and children dived for mussels. There were no ceremonies on the scale of the Karok first-salmon ceremony for assuring the salmon supply, although there were some smaller-scale observances (Holt 1946:310).

Deer were another staple. Hunting occurred in the spring, and focused on salt licks, where hunters shot the deer from ambush and drove them into nooses placed in trails leading to the licks. Dogs were used very little in hunting except for tracking wounded deer.
The Shasta remained in their brush huts during the summer. The men continued to fish while the women gathered fruits and berries as they ripened. Wild currants, blackberries, elderberries, wild grapes, service berries, and berries of madrone and manzanita were among the gathered foods. Epos (*Carum* sp.) were also gathered. Initial gathering occurred in the lower Klamath area, but moved to the upper Klamath (above Hornbrook) and the Shasta Valley later in the season (Holt 1946:308).

In late August, the second salmon run began and the intensity of fishing increased. At this time, salmon were dried for winter consumption. Following the run, acorns began to ripen and the majority of the Shasta abandoned their brush huts and scattered into the oak groves in the hills. Single families lived in small bark houses among the oaks. They maintained exclusive gathering rights to the oak tree immediately next to the hut. However, each family could collect acorns just about anywhere. Gathering was undertaken primarily by the women, who also collected nuts from digger, sugar and ponderosa pines.

While the women were collecting, the men hunted deer. Some groups on the south side of the Klamath organized communal deer drives. The dense vegetation on the north-facing slopes forced the animals to move along trails. Brush fences and snares were therefore placed along the trails, and several families then swept the hills to drive the deer into the snares. On the north side of the river fires were often set to drive the deer into ambushes.

The acorns and deer meat were then brought down to the winter villages. Women began collecting the winter wood supply, hulled and dried the acorns, and gathered mussels. The men engaged in some fishing and squirrel hunting. Following the first heavy snows, additional communal deer hunts were organized. Men and women went into the mountains on snow shoes. There they encircled the deer, forced them into deep snow and clubbed them. During the rest of the winter, the Shasta subsisted on stored acorns, pine nuts, deer meat and salmon. With the arrival of spring the Shasta again moved into brush huts.

Thus, Shasta subsistence practices were seasonally patterned and involved movement from winter villages located at creek mouths along the Klamath and along streams at the edge of the Scott and Shasta valleys to brush huts along river and stream banks, and then into bark houses in oak stands. In this respect similar environmental zones are archaeologically sensitive in both the Karok and Shasta territories.

The Shasta winter house was rectangular, about 16 by 29 feet and excavated to a three-foot depth, with steeply-sloping roofs, dirt side-walls and board end walls. More than one family might occupy a house. Multiple-family conical dwellings are also said to have been used by the Shasta Valley division (Voegelin 1942:66, 185). Large villages also had an assembly house located in the center. This was about 20 to 27 feet wide and 30 to 40 feet long and excavated about 6½ feet. It was similar in construction to the dwelling house. In addition to being the site of general gatherings, the assembly house could be used for dances by
novice doctors, to accommodate visitors that a villager could not house, and as a multi-family dwelling and sweathouse. Large villages along the Klamath River and the lower Scott and Shasta valleys had men's sweathouses. These were built like assembly houses but were somewhat smaller. They were built near a stream and could accommodate 15-20 men, who sweated there almost daily. Women were not allowed in. Men lounged or worked in the sweathouse during the day, and boys older than 10 or 12, unmarried men and visiting men slept there. Also there were smaller sweathouses (dome-shaped, made of willow poles, pine bark slabs and skins) which were family property and used by both men and women, and menstrual huts for women.

The Shasta relied heavily upon obsidian for knives, scrapers and arrow points. Foreshaft arrows with obsidian points were used for war and for large game. Wood or bone points were used for small game or birds. Sinew-backed wood bows were used. Other work in stone included cylindrical pestles, serpentine pipe tips, and soapstone bowls. Pipes, carved and plain mush paddles, digging sticks and spoons were made of wood; scrapers, awls, wedges, flaking tools and salmon gins were made of bone and horn. Spoons were also made from elk kneecaps, deer skulls, and mussel shell. Unlike the Karok the Shasta made and used few canoes. Those used along the Klamath were purchased from the Karok or Yurok. Dugouts made from sugar pine logs were used in the Shasta Valley and along the Klamath to Gottville. Above Gottville, tule rafts were used. The Shasta imported baskets, but also made a variety of their own (Silver 1978: Figure 4).

Ceremonies consisted of a puberty ritual for girls, a war dance, a ceremony for initiating shamans and a Circle Dance. These do not appear to have had the close association with specific localities which characterizes the Karok world-renewal ceremonies. There were also individual rituals for boys at puberty, involving a "trip for luck" into the mountains. This was a quest for a vision, and secured success in hunting, fishing, gambling and racing. It could be repeated throughout adulthood, and may have been associated with specific high, rocky places (Holt 1946:335).

Curing ceremonies also existed and in their general characteristics resembled those of the Karok. Shamans were usually women, and cured by sucking "pains" from the bodies of patients. As among the Karok, herb curers also existed. Burial was in family-owned plots, and the deceased's personal property was burned or buried with the corpse. Along the Klamath River the deceased's dwelling house was abandoned or torn down and rebuilt. In the Shasta Valley it might be deserted temporarily. Mourners were subject to taboos, including seclusion and restrictions on food consumption.

The Shasta appear to have had a more well-defined sociopolitical organization than the Karok. Kinship was bilateral with a bias toward the father's line (hunting and fishing places were inherited in the male line, although during a man's lifetime anyone belonging to the same local group could hunt in his territory). The Shasta family was the basic social unit. Many villages actually consisted of only one family.
Each large village and each of the Shasta divisions had a headman. The headmen of the four divisions were considered equal, although in the case of serious problems the Oregon Shasta headman mediated. The Oregon leadership position is believed to have been hereditary, passing to the oldest brother, or if there was none to the oldest son. There was probably a loose hereditary succession in the other groups as well. Wealth may also have entered into the determination of leadership.

The primary function of the headman related to property matters. He acted as a mediator in quarrels by influencing the amount of payment made for an injury. If the offender could not pay, the headman might advance the payment, thereby accruing obligations which enhanced his influence. The headman avoided participation in warfare as much as possible, but he did negotiate peace terms with the enemy headman.

Although possessing headmen, the Shasta resembled the Karok in that they do not appear to have recognized crimes against the community. Payments to offended individuals or relatives were made for property damage, personal injury or murder. Failure to make proper payment resulted in a feud. The payment for an individual was determined by the price paid for his or her mother in marriage.

Objects of wealth used in these payments included clamshell discs, dentalia, olivella and haliotis shells, deerskins and woodpecker scalps. For the most part, wealth items were obtained in trade. The Shasta received obsidian from the Achomawi and gave them dentalia. They imported pine nut necklaces from the Wintu and traded buckskin, obsidian and dentalia for acorns. They traded dried acorn paste with the Rogue River Athapaskans for dentalia. The Shasta Valley division imported buckskin clothing from the Warm Springs Indians using dentalia for exchange. The trade emphasis in California was with the Karok, Hupa and Yurok. The Shasta received acorns, baskets, dentalia and other shells in exchange for pine nuts, obsidian blades, juniper beads and Wintu beads. The trade between the Klamath River Shasta and the Karok usually had the Kammatawa acting as middlemen, but when White Deerskin Dances were held the Shasta appear to have traveled downriver and traded directly. The Karok, Hupa and Yurok often came into Shasta territory to trade.

The Shasta appear to have remained friendly with the Karok, but were somewhat afraid of the Hupa and Yurok. They were regarded as being devil-possessed, and Shasta had to be careful to avoid insulting them. Relations with other trading partners sometimes deteriorated into war, which involved raiding villages to avenge murder, rape, witchcraft or an insult to a headman. War leaders were selected by the fighters. Fighting consisted of surprise attacks on enemy villages and camps, with hand-to-hand combat. In intertribal wars women were captured for ransom and children might be taken as slaves. The Shasta fought the Achomawi, Wintu and Modoc. Retaliatory raids against the Modoc, who conducted annual summer raids into Shasta territory, were the closest thing to organized warfare among the Shasta. Usually the Shasta Valley and Klamath River divisions banded together for such raids.
Warfare among the Shasta consisted of private feuds. Raids were usually not made within one's own division, and did not involve entire divisions. The raiding party surrounded the victim's village at dawn, and the leader called for that individual to come out. Usually all of the villagers emerged from their houses. The ensuing fight lasted until the raiders were driven off or until the raiders killed the person they were after. Peace negotiations usually followed a raid, for there was strong pressure from others in the villages involved to make the feuding parties settle their differences.

The Shasta fared worse than the Karok in their contacts with non-Indians. In 1851 a treaty was made with the California Shasta headmen and provided for a reservation in Scott Valley (Heizer 1972:97-99), but it was never ratified. Shasta of the Scott and Shasta valleys went to the aid of the Oregon Shasta during the Rogue River wars and suffered heavily. In 1856 Oregon and California Shasta survivors were taken to reservations at Grande Ronde and Siletz, Oregon. The Shasta way of life was badly disrupted by 1870.

These events took their toll on the Shasta people as well as on their culture. At the time of the first contact there were about 2000 Shasta (Dixon 1907: 390). By about 1906 there were only about 121 Shasta living in Siskiyou County (Kelsey 1971). In 1962, it was estimated that there were 36 Shasta living on the Quartz Valley rancheria (U.S. Bureau of Indian Affairs 1963). There were also some Shasta living in the Siletz and Grande Ronde areas. The Konomihu population was probably small when non-Indians began to arrive, and by 1955 it was estimated that there were only about five persons alive with some Konomihu ancestry (Kroeber and Heizer 1970:6). It appears that the Konomihu and New River Shasta cultures were essentially similar to that of the other Shasta as described above (Silver 1978:221-222). Additional information will only be obtained through archaeological techniques.

**MODOC**

The Modoc language belongs to the Penutian family (Heizer and Whipple 1971: Map 1). It is related to that of the neighboring Klamath Indians and distinct from that of the Karok and Shasta. The closest cultural affiliation of the Modoc is also with the Klamath.

The Modoc inhabited territory bounded by Goose Lake on the east, the watershed between the Lost and Pit Rivers on the south, Butte Creek on the west, and a line about half way between the Lost and Klamath Rivers on the north. The principal area of settlement was that around Lower Klamath, Tule and Clear Lakes and along the Lost River (Figure 4; Ray 1963: Maps 1 and 2).

Modoc villages were located near permanent streams or lakes. They were winter settlements, and were not inhabited year-round. The Modoc were hunter-gatherers and followed a seasonal pattern of movement in response to the seasonal availability of their foods (Ray 1963:180-200).
As soon as the snow melted, usually in March, the winter houses were dismantled. Covering materials were removed to expose and air out the interior. Small mat-covered houses were built for those too old or sick to travel. Able-bodied villagers moved to a location where the men could fish for the spring run of suckers. While the men fished the women cleaned, dried, and cooked the fish and gathered edible plants, especially desert parsley. Large quantities of pine saplings were also gathered for use as fish-drying racks. Sometimes a whole village moved to one fishing camp, but more often two or more camps were established in close proximity. The camps were semipermanent, that is, the sites were reoccupied.

The camps were occupied as long as the run of suckers lasted, normally about three or four weeks. The Modoc then moved on to areas where epos roots could be gathered. The roots were a staple of the Modoc diet. At the same time, trout were beginning to appear in the streams, and the choicest sites for the new camps were on streams and rivers close to the epos. However, availability of epos was more important than fishing potential in determining camp locations. Waterfowl eggs were also gathered at this time. These camps were also semipermanent.

In late June or early July another move was made to areas where ripe camas were available. Camas was a highly-valued but scarce food, producing a wide dispersion of the population and frequent movement of camps during the period it was being gathered. Women gathered the camas while the men continued to fish for trout and hunt waterfowl and small game where possible. Late in July collecting efforts shifted to white camas (*Zygademas venosis*). Numerous other varieties of edible roots and water-lily seeds (*Nuphar polysepalum*) were gathered. This began a period of seed-collecting which continued through September, taking the Modoc to all parts of their territory. Some hunting of antelope on the plains and mountain sheep in the lava beds also occurred at this time.

In late August and early September, the men began fishing for the fall run of suckers and the women began harvesting and drying lowland berries. Toward the end of this period, hunting activities began in earnest and camps were moved to remote locations and higher elevations. While the men hunted deer and elk the women collected huckleberries and other high-elevation plant foods.

While intensive hunting continued until the snows came (usually in December), the Modoc returned to their winter villages in October. The houses were rebuilt or replaced if necessary. During December men fished for the winter run of trout in open streams and lakes. Individual hunting trips were made if a household's food supply began to run low. In March, the cycle began again.

Modoc winter villages contained several house types. The most common was a circular, semi-subterranean, earth-covered lodge that ranged from 16 to 40 feet in diameter and about four feet deep. Less common was an elongated, mat-covered house with steep, sloping walls and a flat roof. This house type was primarily used for small family groups, those of limited wealth, and when construction time was limited. It also served
as a summer residence when relative permanency and substantial accommodations were desired. These houses were about 13 by 25 feet. If used as a winter residence the floor was excavated 12 to 18 inches and the sides were banked with earth about a foot or two above ground. Dome-shaped, mat-covered structures about 10 feet in diameter were used as utility buildings but were also sometimes used as dwellings, particularly by elderly persons. These were the common form of summer house as well. Two types of sweat houses were also built—a dome-shaped type similar to the summer hut and an earth-covered wedge-shaped house (Ray 1963:161). Unlike the Karok and Shasta, the Modoc allowed women to use the sweat houses.

Modoc material culture was marked by a heavy reliance on tule and bulrush, which were abundant in their territory. Mats, house coverings, rafts, basketry and moccasins were among the articles made from these materials. Ray (1963:212-220) lists Modoc uses for a variety of plants. Of the artifacts most likely to occur in archaeological sites, the most distinctive is the two-horned muller (Kroeber 1925: Figure 27). It has a round base and two "horns" or a single peak bifurcated at the top. The "horns" served as hand grips. The metate was a flat slab, usually of lava, irregular to circular in shape. The two-handed muller, lacking "horns", was used for grinding other seeds.

Modoc fishing technology differed from that of the Karok, probably because streams were smaller, standing water was more important, and the principal species caught were different (Kroeber 1925:325-326). Fish hooks were used more often. The Modoc fish spear had an unbarbed point, because the spear could be thrust entirely through the smaller fish species present in their territory. The principal net was a large, triangular net on two poles held apart by a crossbar and operated from the bow of a canoe. The canoes were dug out of a fir log, 10 to 30 feet long and about two feet wide.

The Modoc bow was broad, flat, sinew-backed and had recurved ends. The arrow was often made from a reed, but light wood was also used. Arrows had foreshafts and obsidian points. A war spear, a short stick with an obsidian head, was also used. A stone maul was used for wood splitting, with an elk horn or mountain mahogany wedge.

The Modoc recognized one or more political leaders in each village. There could be several leaders because being the male head of a household was sufficient to qualify an individual as a leader. However, leaders were ranked on the basis of the size of the household they controlled, their oratorical ability, and their wealth. The role of the leader consisted of keeping the peace within the village, usually by mediating inter-family disputes. Oratory and advice were the principal mechanism of leadership. Settlement of property or personal injury offenses was a matter of payment to the offended party, as among other Indian groups living in the Forest area. When a decision involving an entire village had to be made, it was accomplished by an assembly involving all the adults. Assemblies could be called by any village
leader, but his rank and the urgency of the problem determined whether or not the assembly actually was held. If the issue was sufficiently important, a leader could call conferences with leaders of other villages.

Modoc leaders did not participate in wars. Their competence was limited to civil affairs. War chiefs were acknowledged by the villagers on the basis of their skill in battle. The Modoc also recognized religious leaders. Political leaders and war chiefs did not become shamans, but virtually any other male could be called to become a shaman from shortly after marriage to middle age. Women could be called to become shamans after menopause. Potential shamans received their "calls" from spirits in a series of dreams. To attain shaman status, the individual had to visit certain locations prescribed by tradition, often the pits remaining at the site of deceased shamans' houses, and had to go through an initiation ceremony. As was true elsewhere in northern California, the shaman's principal function was the treatment of illness through the removal of intrusive objects from the body.

Like the Karok and Shasta, the Modoc engaged in trade with their neighbors. Slaves, baskets, blankets, beads, clothing, axes, spears and fish hooks were traded to the Klamath Indians for female slaves and various hides. Furs, bows, detalia and horses were supplied to the Achomawi in return for shell beads, braided grass skirts, pine nut string skirts and baskets. Buckskin dresses and shirts were traded to the Shasta for bows and dentalia (Davis 1974:29).

Of particular interest to anthropologists was the trade in slaves (Kroeber 1925:319-320; Ray 1963:134-145). These were usually obtained in raids on the Achomawi and Shasta. In addition to trading with the Klamath, the Modoc also sometimes took their captives directly to an Indian trading center at the Dalles, on the Columbia River, and traded for horses. While the Modoc had a tradition that the taking of slaves had always been a tribal practice (Ray 1963: 145), Kroeber (1925:320) implies that it might have been stimulated by the appearance of non-Indians and their horses, which were the prime object of the historic trade. Kroeber does suggest that whatever the ultimate origin of raiding and slave-taking, the immediate causes may have been vengeance feuds, since the Modoc fought certain Achomawi groups or villages but remained friendly with others.

The slave raids were integrated into the Modoc political structure, for the slave trade could enhance the wealth and standing of political leaders. The political leaders purchased slaves from the war chiefs and traded them to the Klamath for wealth items. Proceeds of the exchange could then be used to purchase additional slaves (Ray 1963:144-145). Thus, the Modoc could provide a case study for the elucidation of relationships between trade, warfare and political organization.

Major Modoc ceremonies appear to have consisted of a five-night long dance for girls reaching puberty and a five-night dance to initiate shamans. These ceremonies generally took place in or near the villages, and ordinary dwelling houses could be used for indoor portions of the ceremonies.
The Modoc, like the Karok and Shasta, suffered in both numbers and
culture as a result of their contact with non-Indians, but not without
inflicting heavy losses on the new arrivals. The Applegate Trail,
pioneered in 1846, brought settlers headed for the Oregon Territory
directly through Modoc land. Wagons crossing summer range are said to
have frightened away game on which the Modoc depended, and the trains
were attacked in retaliation (Murray 1959:17). Alternatively, it may
also have been that the Modoc simply did not want strangers in their
territory. This is implied by Ray's (1963:135) comments on the causes
of war between the Modoc and other Indians. Attacks occurred sporad-
ically throughout the following years, and the pace accelerated with the
discovery of gold in Yreka in 1851, which increased traffic on the
Trail. Parties from Yreka were frequently involved in escorting wagon
trains and in retaliatory raids, but most of the fighting occurred in
the Lost River and Tule Lake area, and not on the Forest. The raids
virtually ceased following a surprise attack on a Modoc village by a
Yreka party led by Ben Wright. Around 45 Modoc were killed in the
attack (Dillon 1973:48-55).

However, considerable friction remained between the non-Indians and the
Modoc, and increased during the 1860's as Oregon and California settlers
began moving on to land belonging to the Modoc and the Klamath. In
addition, those two tribes were fighting their traditional Shasta and
Achomawi enemies. Fearful of being attacked by soldiers from newly
established Fort Klamath, a group of Klamath, Modoc and Shasta leaders,
including Captain Jack of the Modoc, met with Judge Elijah Steele of
Yreka, Indian Agent for northern California, in an effort to work out a
treaty. An agreement was in fact reached, but did not involve a reserva-
tion. This made it immediately suspect in the eyes of many whites,
and since Steele had exceeded his authority in making the treaty it was
ignored. Instead, a second treaty was drawn up under the auspices of
J.W.P. Huntington, Superintendent of Indian Affairs for Oregon, and
signed by leaders of the Klamath, Snake and Modoc tribes. The Klamath
apparently were the most willing signers, but the Snake and Modoc were
reluctant, and a band of Modoc led by Captain Jack refused to acknow-
ledge the treaty. The principal reason for their resistance was the
fact that the treaty included provisions for a reservation for all the
tribes on Klamath territory. The other two groups would be forced to
leave their traditional homes. Captain Jack and his followers continued
to live in the Lost River area.

This caused considerable apprehension among non-Indians and Indians
alike, aggravated by threats and thefts by both sides. Considerable
public pressure was exerted to arrest Captain Jack and to confine his
followers to the Klamath Reservation. Finally, in November, 1872, the
somewhat reluctant Army attempted to arrest Jack for the murder of a
Modoc shaman, triggering the Modoc War.

Jack was not arrested and he and his followers retreated to the Lava
Beds, where they succeeded in resisting a much larger Army force for six
months, inflicting heavy casualties. The Army and settlers suffered
between 130 and 160 dead and wounded, including General E.R.S. Canby,
while the Modoc lost only about 18, plus the four leaders executed at
the end of the war - Captain Jack, Schonchin John, Black Jim, and Boston
Charley. The history of the war has been discussed in many books, among the best of which are Riddle (1973), Murray (1959) and Dillon (1973). Most of the fighting in the war occurred north and east of the Forest, in the vicinity of Tule Lake. However, the Tickner Road and Emigrant Trail, both of which run through the Forest, were used as supply routes during the campaign, and raids on soldiers occurred on both routes (Wells 1881:149). Thus, there may be some Modoc war-related sites within the Forest, although they are likely to be rather small (Campbell 1968:76-77).

Following the war, 153 of the surviving Modoc were moved to the Shawnee Reservation in Oklahoma. Those Modoc under Old Schonchin who had remained peaceful were allowed to remain at Yainax in Oregon. In 1909, the Oklahoma Modoc were permitted to go to the Klamath Reservation and a few did so. As of 1970, there were about 30 Modoc in Oklahoma, about 300 in Oregon and an unknown, but small, number in California (Dillon 1973:336-339).

In summary, existing ethnographic data are adequate to identify the cultures of the Forest vicinity and to provide a fair amount of descriptive detail. However, additional information is needed to complete the culture history elements. The distribution of non-village sites has not been adequately described, and we have only a sketch of what occurred within them, as ethnographic descriptions have glossed over activities conducted in the back country. Ethnographic data were gathered from relatively few informants, and the extent to which data from one or two informants can be used to characterize an entire culture is debatable. Finally, ethnographers attempted to describe pre-contact cultures, and the data may not accurately represent Indian cultures after 1850. This would pose problems for attempting to use the data in statements of ethnic significance as well as for interpreting archaeological resources. With respect to the expectations described in Chapter II, the existing ethnographic data do support the suggested cultural differences between the Klamath Mountains and the Cascades-Modoc Plateau in a crude qualitative way. The Modoc appear to have a more elaborate seasonal cycle than the Karok with more balanced use of ecological zones, and the Shasta appear to be intermediate between the two. However, since existing ethnographies do not explicitly and systematically address the issue, the impression may be created by the reporting biases of individual ethnographers.

**History**

The first non-Indians to explore the Klamath National Forest area were trappers of the Hudson Bay Company who arrived in the winter of 1826-1827. The company, operating out of Fort Vancouver at the confluence of the Willamette and Columbia rivers, was attempting to trap out the beaver population of Oregon and northern California (Dillon 1975:23-24). They were hoping to make the area unattractive to American trappers and settlers, and thus hold it for Britain. In addition, they were searching for the Buenaventura River, which supposedly flowed from the Great Salt Lake to the Pacific (needless to say, they never found it).
In September, 1826, Peter Skene Ogden set out with a party of trappers for the Snake River country. Discouraged with the results, Ogden decided to head for the untrapped Klamath River, previous parties having proceeded as far as Klamath Lake. He arrived at Klamath Lake in December and explored and trapped the lake, Link River, Lower Klamath Lake, Tule Lake and the Lava Beds. Returning to the vicinity of Klamath Lake, he reached the Klamath River on January 12 and started down the river. Near Camp Creek he left the river and turned southwest to Cottonwood Creek. During all this, he had little success in his trapping. Ultimately, he found out from local Indians that they hunted the beaver by burning the stream banks in dry weather to kill them. Ogden's party continued downriver, perhaps to Beaver Creek, and then turned north, crossing the Siskiyous and dropping down into the Little Applegate River. He also sent a smaller party down the Klamath, and they reached a point only four days from its mouth before turning back and joining the main body of trappers in Oregon. Ogden trapped in Oregon during February and March, then started back across the Klamath on April 2, 1827. When he reached the Klamath he found a note left by Thomas McKay, leader of another party of trappers, suggesting that the two groups rendezvous on the Pit River. However, Ogden previously had said he would meet McKay at Klamath Lake, and stuck by that arrangement. The two parties met at the Lake on April 22, and explored the Pit River before returning to Fort Vancouver by way of the Snake River country (Dillon 1975:43-79).

A second party of Hudson Bay Company trappers passed through the Forest area in 1829. Alexander McLeod led a party from Fort Vancouver across the Siskiyous to Klamath Lake, then to Lower Klamath Lake, the Pit River and the Sacramento to the Central Valley. On his return he traveled along the western slope of Mount Shasta and was caught in a heavy snow on December 2. He was trapped until mid-January, when his party struggled out of the mountains and into the Shasta Valley, from which he crossed the Siskiyous again. He finally reached Fort Vancouver on February 13, 1830 (Dillon 1975:165-173).

While trapped near Mount Shasta, McLeod's party lost all their horses, forcing them to cache their pelts, which were then ruined by melting snow the following spring. The location of McLeod's camp is not known with certainty, but is thought to have been along the McCloud River - named for McLeod but later misspelled. In 1874 a wooden trough and some guns were found on the North Fork of the McCloud and may have marked the location of the camp (Dillon 1975:172; Wells 1881:44). McLeod's return route included a camp near Sheep Rock and a crossing on the Klamath River near Hornbrook. It was used several times by subsequent Hudson Bay Company trappers on the way to the Central Valley. Occasionally these parties worked in the Shasta, Scott and Butte Valleys, and beads used in trade by the company's employees are sometimes found in historic Indian sites. No Hudson Bay Company site, other than McLeod's possible camp, has been found in the Forest area. It is expected that any such site would be rather insubstantial, consisting of one or more hearths and a few artifacts, since existing accounts contain no references to semipermanent or permanent facilities. Although the company established no permanent facilities, their efforts did succeed in exterminating beaver in the Forest area.
This did not prevent American settlement of California and Oregon, however. Americans began moving in during the 1830's, and the pace quickened in the 1840's.

Mining

Settlers ignored the Forest area until the Gold Rush of 1849. Word of discovery of gold at Sutter's mill was first published in San Francisco in March, 1848. By November of that year the first shiploads of gold-seekers began to leave the Atlantic coast. Some took the long voyage around Cape Horn, and wherever they stopped for supplies word of the discovery spread, and the Americans were soon joined in the gold fields by Columbians, Chileans and Peruvians. Others traveled by way of the Isthmus of Panama or took the Overland Trail. Meanwhile, ships sailing from San Francisco informed Hawaii, the Philippines, Australia and China of the events in California. During 1849 the non-Indian population of California jumped from about 20,000 to 90,000, and roughly a quarter were non-Americans.

The miners were a restless group. It was widely believed that the gold found in the rivers and streams had been washed down from some place where it lay in solid beds, and each believer feared that another might discover the "mother lode" first (Bancroft 1888:87). Thus the gold-seekers fanned out over the state in a search for the big strike. By late 1849, prospecting had begun along the Klamath and Salmon Rivers.

News of the discovery of gold in California triggered a substantial immigration from Oregon. Many of these Oregonians traveled the route walked by McLeod's band of trappers. In June, 1849 Lindsay Applegate led a train of six wagons across the Siskiyous and down the Shasta Valley, hoping to settle there. The isolation of the valley discouraged the party, however, and they turned back, but not before Applegate and some others had prospected along the headwaters of the Scott River (Wells 1881:53).

In June, 1850, a number of prospectors crossed the mountains from the North Fork of the Trinity River. Upon reaching the South Fork of the Salmon River, they followed it downstream to the Forks, where they found rich deposits. Several hundred men gathered there, and spread up the North Fork as well. A prospecting expedition started up the Klamath from its mouth. They got as far as Happy Camp, where they were turned back by Indian resistance. Striking across the mountains, they returned to Forks of Salmon, where they spread word about good diggings on the Klamath. In July a party of about 40 men set out from the Forks to prospect the Klamath again. They worked from the mouth of the Salmon River to a point about a mile above the mouth of the Shasta River, where they were overtaken by a faction of the original Klamath River expedition. The combined parties traveled up the Shasta to Yreka Creek, up Yreka Creek to Greenhorn Creek, and then south to the Sacramento River. They did find gold at Greenhorn Creek, but underestimated the value of the deposits and moved on. When they reached the Sacramento, they overtook the party of Gov. Joseph Lane of Oregon, who had left the state...
to search for California gold. Lane was following the trail which crossed the Siskiyous and ran down the Shasta Valley to the Sacramento. He too had prospected along the Shasta River, but had not been satisfied with the results (Wells 1881:59-60).

In the meantime another party of gold-seekers led by John Scott had left Forks of Salmon. They went to work on a tributary of the Klamath, which became known as the Scott River, and named the place where they were working Scott Bar. However, resistance by Indians caused Scott's party to abandon the area. They went up the river to Scott Valley, over the divide to the North Fork of the Salmon and then across the mountains to Trinity, where they spread the word of their discovery. Almost immediately, a party of fifty was organized with a few of Scott's men as leaders and returned to Scott Bar. The locale has been continuously settled since then (Wells 1881:60-61).

In December, 1850, a party from Scott Bar set out up the Klamath. They prospected to the Shasta and up that river nearly to its source. On their return they camped at Yreka flats, where they found gold but did not realize the value of the deposits. The party divided, and five men went up Greenhorn Creek on the return to Scott Bar, while five went up Yreka Creek. Those who went up Greenhorn found a rich deposit of gold, but had to return to Scott Bar for supplies. On their return in January, 1851, they traveled all night and upon their arrival fell asleep. They had been followed by another group of miners who, finding the discoverers asleep, staked off all available ground. The original group, frustrated, left for Oregon.

By late in the winter of 1850-1851, the Yreka area had become a major thoroughfare and camping spot for miners in the region. There were thriving camps at Forks of Salmon, Bestville, and Scott Bar (Gudde 1975). Many of those passing through the Yreka area were on their way to Scott Bar. One such party joined a group of Oregonians at Yreka in March, 1851. While prospecting, Abraham Thompson, a member of the group, found coarse gold on the flats in the area. The discovery was profitable, and became known as Thompson's Dry Diggings. It brought 2000 miners to the spot in less than six weeks. Thus Yreka (at that time called Shasta Butte City) came into being. In October, 1851, it was described as a town of about 300 houses and 1000 inhabitants (Gibbs 1972:66). However, the town was probably much less substantial than the statistics suggest. As was true of most early mining towns in California, the camp almost literally sprang up overnight, and consisted of a motley collection of tents, brush shanties and shelters put together from shacks, poles, logs and canvas. Many of the miners had no intention of remaining any length of time. They intended to move on after making a quick, rich strike, and especially if they found nothing (Stumpf 1979).

However, some individuals did remain a while, and those mining communities which served mines with sustained production began to take on an air of permanence, with log and board cabins. Fires and the consequent need to rebuild hastened the process of reconstruction and spurred the construction of brick buildings. By the 1860's, Yreka's
main street had two- and three-story brick buildings on either side (Miller 1972:54-55). By that time many other mining towns had sprung up, and could boast of hotels, stores, butcher shops, blacksmith shops and, of course, saloons, one of the few sources of entertainment. Among these were Humbug, Hamburg, Cottonwood, Seiad, Happy Camp, Callahan, Mugginsville, Sawyers Bar, Yocumville, Cecilville, Petersburg and Deadwood (Stumpf 1979). The latter town, at the junction of Deadwood and Cherry Creeks, was second only to Yreka in importance during the 1850's; and in an 1856 convention to determine a seat for Siskiyou County Deadwood lost to Yreka by only a few votes. However, the population began to decline rapidly after 1858 as the surface gold was worked out, and in a few years the town was almost completely destroyed by a series of fires (Stumpf 1979; Wells 1881: 216). At present, a few terraced foundations, fruit trees, and dumps attest to the town's former existence (U.S.F.S. Archaeological Site Survey Record 05-05-55-3).

The rapid growth of the mines and towns necessitated the imposition of some type of legal order. The miners solved their own problems with respect to the regulation of mining activity through the creation of mining districts (Paul 1947:210-239). The usual procedure was for each camp or local unit to hold an open meeting for all the miners. Regulations governing all claims within the area were drawn up. These governed such matters as the size of claims, the number which could be held and the way in which they had to be marked. Broadly similar regulations were developed throughout California, perhaps because there was so much moving from district to district, and became the basis for the Federal mining laws of 1866, 1870 and 1872.

Although miners' juries were sometimes convened to handle criminal matters, the need for some form of political authority was also felt. At the time the Salmon, Scott and Klamath rivers were first prospected and settled they were under the jurisdiction of Shasta County. However, the county seat was at Shasta City, a rather inconvenient location for the northern mines. Thus in 1852, the legislature created Siskiyou County. The county has not always had its present boundaries, however. Because of the rapid shifts in population in areas removed from county seats, land has since shifted between Modoc, Humboldt, Del Norte and Siskiyou Counties (Figures 5-11). With regard to Forest history, those shifts indicate that counties other than Siskiyou may have records pertinent to the local area for some periods.

Mining in Siskiyou County followed a developmental pattern seen throughout much of the state (Paul 1947; Stumpf 1979). The pattern was related to the nature of the gold deposits. There are two major types of deposits, known as "lodes" and "placers". Lode deposits are mineralized rock embedded in surrounding rock. As the rock is eroded, the gold is washed into streams and rivers; the eroded particles gradually settle to the bottom and collect in placer deposits: accumulations of sand, gravel, stone and gold.

Placer gold was discovered and worked first during the years of the Gold Rush. It was easier to work than lode gold, as it did not require crushing the surrounding rock. To extract placer gold, miners used the
same force that had created the placer deposits: gravity. The pan, rocker, long tom and sluice were the principal devices used in the process, and relied on settling to remove the heavy gold particles from the dirt.

The pan, the rocker, the long tom and the sluice (see Paul 1947: 48-66 for descriptions) tended to replace each other in the order named in the process of working placer deposits. Each handled a greater volume of dirt per day and per person than its predecessor. Thus as the rich deposits were worked out they enabled miners to work areas with decreasing concentrations of gold.

Exposed gravel bars along rivers and streams were mined first, using these tools. As the bars were exhausted, less accessible deposits were exploited. Ground sluicing was one method of working them. Water was channeled to the area to be sluiced. A ditch was then cut and the water run into it as men with picks and shovels loosened the banks and bottom. The earth was washed away while the gold settled in crevices in the bottom of the ditch. Every few weeks or months, material from the bottom of the ditch was run through rockers, long toms or sluices to collect the gold. In some areas the water was dammed up and released all at once, washing the gravel and earth below it through sluices. This was known as "booming".

River channels were also worked as exposed bars were exhausted. A portion of the river was detoured from its bed, and the bottom gravels mined. This form of mining began rather early in Siskiyou County. Early in 1851 a dam was built on the Scott River opposite the present town of Scott Bar (Wells 1881:61), and by October the river from Scott Bar to the mouth was "turned from it's bed" by mining operations (Gibbs 1972:159).

Both ground sluicing and river mining required more organization and investment than the long tom, rocker or sluice. Dams, flumes and other structures had to be built, and rebuilt yearly after spring floods. In the case of river mining, work could only proceed during the summer while the water was lowest. Thus these mining operations had to be organized to get as much work as possible done in a limited amount of time. Thus, while three or four men might successfully operate a rocker, the river mining companies on the Scott River consisted of 10 to 20 men.

River mining operations continued throughout the 1800's, but were limited to working deposits near the surface. As the surfaces of the river banks and channels were worked out, even less accessible deposits were mined, involving greater cooperative effort and more capital investment (Stumpf 1979; Paul 1947:124-151). One of the techniques used was drift mining, which worked buried placers laid down in earlier geological periods. Adits and shafts were dug into areas likely to contain gold, and if a profitable deposit was found, drifts were driven to extract the gravel, which was then washed to separate the gold.
The technique was quite similar to lode or quartz mining, in which adits and drifts were driven to gold-bearing quartz veins. However, quartz mining also involved the use of a milling device to crush the ore prior to extracting the gold. Arrastras and stamp mills (described in Paul 1947:133-135) were the most common crushing devices. Drift mining and quartz mining were quite expensive, costing five or six dollars per linear foot of adit under good conditions and up to sixteen dollars per foot in bad, not including the cost of working the deposit itself or of crushing the ore. Thus, while gold-bearing veins were found in Humbbug and in Scott Valley in 1851, the high cost of labor and of transporting equipment in the mountains prevented profitable operation of a quartz mine until 1859. By that time, roads had improved and labor was in greater supply. The quartz mining industry developed rapidly in the early 1860's, and by 1900 there were 116 lode mines in operation in Siskiyou County (Stumpf 1979).

The development of a stock market may also have promoted the employment of more expensive mining techniques, as investment by outsiders was often the only way sufficient funds could be raised to establish a drift or quartz mine. Trading in mining stocks began in the early years of the gold rush, but confidence was soon lost because of unscrupulous promotion and the uncertainties of profit from even the best-run ventures. It was not until the Comstock Lode had been successfully developed in the 1860's, primarily by incorporated companies selling stock publicly, that investment capital became available in adequate amounts (Paul 1947:130-131, 181-186). It appears that substantial amounts of outside capital were invested in Siskiyou mining operations in the 1870's, some of it from sources as far aways as England (Stumpf 1979).

In spite of such economic developments, the expense of mining low-grade deposits might have led to an early decline of the mining industry in the County had it not been for two technological developments. The first of these was hydraulic mining, which involved using a stream of water under high pressure to erode the base of a placer gravel bank. The water collapsed the bank and washed the material into sluices. Some hydraulic systems in Siskiyou County had water falling up to 500 feet through pipes up to 22 inches in diameter. It has been estimated (Paul 1947:154) that in 1867, with wages costing $4.00 per day, the cost of washing a cubic yard of gold-bearing gravel with a pan was $20.00, with a rocker $5.00, with a long tom $1.00, and with a hydraulic operation, the cost was $.20. The hydraulic method thus made it possible to work many deposits which could not otherwise be mined profitably. By the turn of the century hydraulic mines outnumbered all other types of placer mining in Siskiyou County. In 1895 there were 229 hydraulic mines that had operated or were operating in the County, compared to 41 drift mines and 126 other placer mines (Stumpf 1979). Abandoned hydraulic mine pits and their ancillary ditches and flumes are a common sight in the County today (e.g., U.S.F.S. Archaeological Site Survey Record 05-05-52-8).
The second development in mining technology was the dredge, which allowed efficient mining of river bottoms and gravel bars too low to be hydraulically mined. The dredge was a floating platform, with a single scoop or a line of buckets on a conveyor belt at the front (see *The Siskiyou Pioneer* 1957: 42, 43, 45, 61 and 81). These excavated the gravel, which was dumped on the dredge and washed to separate the gold. The waste was usually placed on another conveyor and dumped at the rear of the dredge, creating the characteristic rippled tailings piles. Dredges have operated on the Scott and Klamath Rivers, Deadwood, McAdams and Greenhorn Creeks and at other locations. The first dredge worked the Scott River near Callahan beginning in 1903, and dredges continued in use in the County until 1957 (Denny 1957). Little information is available, however, perhaps because the dredges reflect a period of decreased importance of gold to the State and local economies as other industries developed. Nevertheless, dredges were important in maintaining the viability of gold mining, allowing some areas which had already been worked to be profitably mined again (Clark 1969: Table 2, Figure 1; Reichman 1957:81).

Social factors, particularly the presence of foreign miners, also contributed to continued production in some mining areas. Miners from many nations, including Britain, Germany, Australia, Hawaii, Chile, Peru, Mexico and China joined Americans in the gold fields. The non-European miners, particularly the Latin Americans and Chinese, met with considerable hostility and were expelled from some mining districts (Bancroft 1888:403-404). This was in part due to racism and in part due to the fact that many of the non-Europeans worked for lower wages than the European and American miners, which put them in an advantageous position in the labor market. A special tax was imposed on Chinese miners to discourage them. In 1850, the legislature prohibited foreigners from mining without a license, which cost $20 per month. This was repealed in 1851, reinstated in 1852 at the rate of $3 per month, raised to $4 in 1853 and $6 in 1855, dropped to $4 in 1856 and declared unconstitutional in 1870 (Chinn and others 1969:24). While in theory it applied to all foreign miners, the tax was almost exclusively collected from Chinese.

Chinese were often employed to work mines that would not have been profitable if standard wages had been paid. In many cases, they bought mines that had been abandoned by other miners. In Siskiyou County, Chinese had come to own a large number of placer mines by 1870, a situation which alarmed some but pleased others since they were customers of local merchants, stockmen and farmers who otherwise would have had less business (Stumpf 1979; *Yreka Journal* September 13, 1867 and July 24, 1872). The Chinese were the most numerous foreign group in Siskiyou County, and from 1860 to 1890 formed a considerable portion of its population (Chinn and others 1969: Table VI). There are frequent references to the Chinese in accounts of mining activities (e.g. Ball 1957; Barton 1957, Grider 1957). Substantial "Chinatowns" existed at Yreka, Hamburg, Happy Camp, Petersburg Bar and Callahan, but have now been levelled.
In spite of the large numbers of Chinese in the County, there is little information about them other than a few anecdotes and what can be extrapolated from more general histories (such as that of Chinn and others 1969). This is in large part due to racist attitudes which denied the Chinese access to the American legal and social systems. For example, Chinese could not testify against whites in court, and white courts generally refused to handle matters involving only Chinese. Thus, one source of historical records is virtually absent. The Chinese were often ignored in newspaper accounts as well. This racism culminated in the Chinese Exclusion Act of 1882, amended in 1884 and 1888. This Act prevented the entry of additional Chinese laborers into the United States. It contributed to the decline in the Chinese population of Siskiyou County noted in the 1890 census figures, and to a decline in the total number of Chinese in California (Chinn and others 1969: Table VI).

Lack of information about the Chinese in the County is probably also due in part to the desires and behavior of the Chinese themselves. Chinese immigration to California was fostered by events in China as well as by the discovery of gold in California (Chinn and others 1969:11-12). The defeat of China by the British in the Opium War of 1840 opened the country to trade. Consequences of trade included increased exportation of silver from China to pay for trade goods. This in turn led to a rise in the price of silver, which created economic hardships for the peasants, since silver was the standard for payment of taxes. Importation of western goods also ruined Chinese handicraft industries. At the same time, the ruling Manchu dynasty was entering a period of decline in which corruption, injustice and poor government were common. Finally, from 1846 to 1850, a series of floods and droughts occurred throughout China. The results of these pressures were poverty and rebellion.

The discovery of gold in California provided an opportunity to escape the poverty and strife. Many Chinese came to the gold fields in order to earn money in the mines and return home in a better economic position. They did not intend to remain and be assimilated into American culture, even if assimilation had not been resisted. These objectives reinforced racist attitudes, producing the social and political isolation of the Chinese in separate camps and "Chinatowns", structured by associations based on family ties and geographical origin in China (see Chinn and others 1969:64-70 for descriptions of these institutions).

Overall, major trends in gold mining in Siskiyou County reflect trends in California as a whole (Clark 1969:6-8), and show the influence of technological, economic, and social developments. Early gold mining was an industry involving individual initiative and low capital investment, with miners relying on the rocker, long tom and sluice. However, these methods were relatively inefficient, and limited to rich surface placer deposits which were rapidly exhausted. Miners turned to the less accessible placers and to lode deposits. This was a rapid process, and by 1851 river mining, drift mining and quartz mining were all in use in Siskiyou County. Since these methods involved longer periods of development and more elaborate technology such as dams and flumes, miners more
frequently pooled their resources. Some joint-stock associations were formed, but the amount of capital available from this source was limited by investor wariness following an initial period of inflated expectations. The efficiency of these new techniques, while greater than that of the old, was nevertheless limited, and because of this and the increased difficulties of working the buried placers and lode deposits, gold production fell off rapidly (Clark 1969:Figure 1).

The development of hydraulic mining techniques made it possible to mine buried placers. These came into widespread use in the 1870's. However, they required large investments in equipment, such as flumes, pipes, giants and sluices, and it is fortunate that at this time the success of joint-stock companies in developing the Comstock Lode created renewed confidence among potential investors. This success also aided the development of lode mines in California. Gold production increased overall in the 1870's and 1880's. A setback was suffered in 1884, when court action resulted in restrictions on the amount of debris that hydraulic miners could release into rivers. The development of dredges in the 1890's resulted in another increase in mining production. Like the hydraulic operations and lode mines, dredges required large amounts of capital. Overall, it was becoming difficult for an individual to develop a successful mine, since the remaining deposits required processes such as hydraulicking or dredging to be worked profitably. The miner was becoming a "company man" (Stumpf 1979).

Mining production began to drop in the 1920's, as other investments became more attractive and as the general prosperity raised costs. During the Depression, however, costs dropped and the price of gold rose, creating a mining boom that resulted in the highest dollar output from the mines since the 1850's. With the beginning of World War II, output dropped sharply, and War Reduction Board Limitation Order L-208 caused the mines to be shut down. The order was lifted in 1945, but mining did not regain its former prominence (Clark 1969:1-9).

Timber

The development of the mining industry was linked to the development of other segments of the economy in California and in the Forest area. In particular, lumber was needed for the construction of sluices, flumes, mills, houses and for mine timber. Initially, individual miners felled their own timber and cut boards in sawpits or shaped the logs with adzes and broadaxes (Schrader 1948:ii; Bryant 1938:3).

Sawmills could produce larger quantities of lumber than hand methods, however, and it was not long before they were built to meet the needs of mining camps. The first mill in Siskiyou County was built by the China Ditch Company at the head of the Shasta River in 1853. It was sold to J.A. Maxwell in 1854. In 1878 Maxwell was apparently still operating the mill with his sons, one of whom, Milton, left to buy a mill about three miles south of what is now Weed. In 1883 another brother, J.H., bought into Milton's mill. Abner Weed bought the mill from the Maxwell brothers in 1894 and built a new mill at Weed in 1901. In 1903 the Weed
Lumber Company was incorporated. R.A. Long of the Long-Bell Lumber Company bought a controlling interest in the company in 1916 and took complete ownership in 1922. In turn, Long-Bell was purchased by International Paper in 1956. Their mill at Weed is now one of the largest lumber operations in Siskiyou County (Weed 1974).

Not all lumber operations developed such a long tradition, however. Early methods of transporting logs and lumber were poorly developed in the Forest area and transportation costs were high. In many areas pack trails were the only developed transportation routes. Thus, it was usually more economical to move a mill than to attempt to utilize distant sources of logs. It was unusual for logs to be cut more than two miles from a mill or from a waterway which could be used to float the logs to the mill (Cox 1974:228-229).

In addition, mills were placed as close to areas of demand as possible. In Siskiyou County, it appears that many early mills were set up to provide lumber for a specific flume or mine (Schmidt 1948). As a result, many mills had very short lives, as brief as a few months (Meamber and Deter 1948), and today a clearing, a few tin cans and other artifacts, and perhaps a sawdust pile may be the only remains.

In the 1880's changes occurred in logging practices and transportation which led to the alteration of this pattern. Until that time, trees were felled with single-bit axes and bucked with crosscut saws. In the 1880's double-bit axes began to replace single-bit axes in making undercuts, and backcuts were made with crosscut saws, reducing the amount of time required to fall a tree by 80% (Cox 1974:227). In addition, the steam donkey was developed by John Dolbeer and first used in 1881 near Eureka. This engine replaced horses and oxen in the yarding process, and greatly simplified yarding on steep slopes. By 1891 the "bull donkey," which could skid logs, had been developed. By the late 1890's even small logging operations had power equipment, which reduced the cost of yarding and skidding by as much as half when compared to the use of teams (Cox 1974:232). Also during the 1880's, band saws were developed and made possible the efficient use of large logs, such as are common in the old-growth timber of the Forest. Previously, circular saws had commonly been used for cutting logs, but the larger the saw became, the thicker the blade had to be in order to withstand centrifugal force, and consequently more wood was wasted in the kerf (Cox 1974:234).

While these technological changes increased the productivity of logging and lumber operations, they would not in themselves have created the boom which occurred in the California and Pacific Northwest timber industries in the 1880's and 1890's. Limitations of demand remained, because of the comparatively small local population and the difficulty of transporting lumber to distant markets. In the Forest area, this too changed in the late 1880's, with the completion of the north-south Southern Pacific Railroad line in Ashland, Oregon, on December 17, 1887. The line ran through the Shasta Valley, and within four years of its completion the population of Siskiyou County had doubled (Van Orsdel 1960).
The increase in the county population increased local demand for lumber. In addition, construction of the railroad required considerable quantities of timber for ties and trestles, and wood was needed to fuel the trains. Finally, the railroad made it possible to ship lumber to distant markets at a cost which would make the product competitive. It became profitable to ship lumber to San Francisco, southern California, and eventually to the east coast.

The effects of this increased demand can be seen in the number of major mills which were established in the late 1880's and 1890's in the Forest area. Abner Weed's mill was one such mill. The sawmill operated on a small scale at first, but soon received a contract from the Southern Pacific Railroad to furnish it with ties. Weed added landing docks to handle the ties and built a second sawmill. In 1902 he constructed a box factory, which was expanded in 1907 to manufacture sash and door materials (Weed 1974: 24). This growth required capital, and thus Weed formed the corporation with R.A. Long.

The McCloud River Lumber Company, now owned by U.S. Plywood, similarly benefited from the railroad. The company originally supplied wood fuel for the trains, but also owned a few mills which had supplied timber for railroad construction. The owners, George W. Scott and William W. Van Arsdale, hoped to be able to expand beyond local markets. They constructed a railroad grade from their mill at Upton, on the Southern Pacific line, to the McCloud River Valley, where they built a new mill, as the Upton location did not have an adequate water supply for an expanded operation (Hanft 1971:11-25).

Other major mills were located at Klamathon and Hilt, also on the Southern Pacific line. Construction of the Klamathon mill began in 1888. Placer mines down the Klamath River were one major customer. Lumber rafts were built and floated down river because of poor roads. A box factory was built in 1894, and probably supplied customers outside of Siskiyou County. A notable feature of the operation was the Pokegama Chute. Located on the north side of the Klamath about a mile below Shovel Creek, it was 2650 feet long and had an 834 foot drop. It delivered logs from the timbered land north of the river to the Klamath, where they were floated to the mill. The Klamathon mill burned in 1901. Eight million board feet of lumber, two box factories, a saw mill, 20 to 30 business buildings and many residences were destroyed. The mill was not rebuilt, and today there is virtually no trace remaining of the mill or town (Dowling 1948). The Hilt mill was originally built in the 1860's and was located on the West Fork of Cottonwood Creek. It was owned by Bill Smith. In 1877 John Hilt bought it and moved it up the creek two miles. A circular saw and steam power were installed, to replace the old water-powered, single sash saw with walking-beam. There is no record of Hilt shipping lumber, and his market must have been primarily local. In 1901 or 1902 the mill was sold to a group of Oregonians who brought in a second mill and established the Hilt Sugar Pine Company. At that time a lumber yard and town were established near the Southern Pacific depot. This became the nucleus of the town of
In 1906 the operation was sold to the Northern California Lumber Company, which changed the mill to a band-saw mill and built drying kilns for a box factory. The company had financial problems, however, and borrowed $100,000 from Fruit Growers' Supply Company, which produced fruit shipping boxes. Northern California Lumber went bankrupt shortly thereafter, and Fruit Growers' took over the operation to recover their loan. Fruit Growers' continues to harvest timber in the area today, although the mill was closed in 1973 (Graves 1975:1-63).

The railroad affected logging as well as milling: railroads could be used to haul logs to mills as well as lumber to markets, and loggers soon took advantage of the fact. From 1903 to 1905 the Weed Lumber Company built a railroad from its mill to Grass Lake. The railroad was sold to the Southern Pacific, which completed the line to Klamath Falls in 1909, eventually making it the main north-south line, replacing the Shasta Valley route. Logging camps were established within a few miles of the line by the Weed Lumber Company, and logs were loaded at a siding for transport to Weed. Prior to 1921, logs were drawn to the sidings by horses and oxen with high wheels. After 1921, crawler tractors were used (Weed 1974:30). Also in 1921, the lumber company built a spur line from the Southern Pacific siding at Leaf to Tennant. The line was extended to Glass Mountain in 1933. The town of Tennant was built as a company town to house loggers in 1921 and 1922. Tennant had a complete railroad facility that included a roundhouse, machine shop, warehouses, switch yards and powerhouse. There was also a general store, post office, elementary school, and a hospital with a full-time nurse. Spurs were constructed off the Leaf-Tennant-Glass Mountain line to reach stands of timber which were to be logged. Logs were brought to the spur by tractor, loaded on a company train and taken to Weed by Southern Pacific. Railroad logging by Long-Bell continued until 1956, when International Paper took over the firm. The Tennant operation was terminated, and logs are now hauled by truck. The old Leaf-Glass Mountain line is now Forest Road 44N01 (Weed 1974:30-31; Egolf n.d.).

The Hilt mill was also dependent upon a railroad logging operation. When the Northern California Lumber Company took over the mill in 1906, their expansion efforts included construction of a railroad line from the Hilt lumber yard to the sawmill on Cottonwood Creek and then into the woods. The line had branches which ran between North Hungry and Grouse creeks, and to the head of Cottonwood Creek. The main line extended into and across Grouse Creek, then northwest to Long John Creek, Red Mountain Creek and the headwaters of Beaver Creek. The line remained in use until 1933, when Fruit Growers ran out of timber which could be efficiently railroad logged. At that time, the company began using trucks to take logs to the mill from other areas in Siskiyou County, including Beaver Creek, Cow Creek, Castella, Moffett Creek and Indian Creek (Graves 1975:17, 28-35).

Railroad logging such as practiced by Long-Bell and Fruit Growers Supply was an important development, for logs could be hauled 10-15 miles on rails for no more than it cost to haul one or two miles with oxen, an
important factor as stands close to the mills were depleted. This allowed considerably greater stability in mill location, which in turn facilitated entry into the markets opened up by the longhaul railroads. These markets were "maturing", that is, utilizing a smaller proportion of rough lumber and a larger amount of heavily manufactured products, such as the sash and door materials produced by the Weed mill. These products required a greater investment in mill facilities, an investment which would probably not have paid well if the mills had to be moved frequently (Cox 1974:237-239). In addition, larger investments were required in the woods, as the railroad operations had to handle larger timber volumes to be efficient. As a result, logging camps increased in size from about 10-20 men to 30-60 men. The camps themselves did not change much, however. They consisted of tents or flimsy wooden barracks, and could be easily picked up and moved in their entirety (except for their trash) as timber in a given area was harvested (Graves 1975:29).

In spite of the fact that new markets had been opened up and larger, more permanent mills were being built, the timber industry in the Forest area was not really healthy. For example, the Klamathon mill experienced financial trouble which may have contributed to the failure to rebuild the mill following the 1902 fire. The problems of the Northern California Lumber Company have already been cited. The reasons for these financial problems are not given, but it is possible that they were suffering from difficulties which plagued the industry as a whole (Cleppen 1971:136-137). Due to the relative abundance of forest land, prices were low. At the same time, property taxes on the land were based on the value of the timber if sold, and if standing timber was sold in a lump-sum sale the profits were taxed as capital gains (a low rate) while if the owners harvested it themselves or sold timber gradually over a period of years the proceeds were taxed as ordinary or excess profits (a high rate). Finally, the danger of forest fires pressured timber owners to sell the timber as quickly as possible. The results of these factors were overcutting of timber, which threatened to deplete the supply, and an oversupply of lumber, which resulted in low prices and forced mill operations to sell large quantities in order to earn a profit, which in turn kept prices low.

These problems were gradually overcome in the late 1800's and early 1900's, but the timber industry did not really begin to attain a sound economic position until after World War II (Cleppen 1971). The process began with the establishment of National Forest Reserves and ultimately of the National Forest System. One of the objectives of the forest system was prevention of depletion of timber supplies through sustained-yield management. This was an immediate and obvious response to the problem of overcutting. Other responses took longer. In 1911, the Weeks Law was enacted, authorizing cooperative arrangements that provided federal money to states establishing fire prevention and control programs which met federal standards. The number of states participating rose from 11 in 1911 to 29 in 1924, when the Clark-McNary Law superseded the Weeks Law, and fostered additional cooperative efforts. By 1949, 44 states were engaged in cooperative fire prevention and
control programs. The activities of the Civilian Conservation Corps during the Depression gave a further boost to fire control, as numerous lookouts, fuelbreaks, roads and trails were constructed. Thus one major incentive to overcutting was gradually removed. The tax problem took somewhat more time to solve. Individual states modified property tax laws at different times, and it was not until 1944 that the Internal Revenue Code was changed to allow taxing the increased value of timber as a capital gain for the year it was cut or sold, rather than as ordinary income. With the reduction of the timber glut, the financial positions of both mill and harvest operators improved.

The overall trend of the timber industry in the Forest area was thus one of development from small operations serving local needs to large, heavily capitalized companies serving national and even international markets. The earlier style of operation did not disappear when the larger operations developed (Schrader 1948; Meamber and Deter 1958; Schmidt 1948) but accounted for less of the total cut. In spite of developments in woods and mill technology, and in marketing ability, the industry was probably not very healthy until after World War II, if the national pattern is applicable in this area. Investigation of this question might be one topic of historical research on the timber industry.

Within the Klamath National Forest itself, logging of significant volumes did not begin until World War II (U.S.D.A. Forest Service 1974:A76-A78). The Forest was created by Presidential proclamation on May 6, 1905. In 1947, the Orleans District was detached and became part of Six Rivers National Forest. The Klamath took over administration of the Shasta National Forest's Callahan and Goosenest Districts in 1953.

Until 1918 very little timber harvesting occurred on the Forest except for local use in mining and agriculture, and some railroad logging on land owned by the Long-Bell Lumber Company which was later transferred to the Forest Service (U.S.D.A Forest Service 1974:A76; Egolf n.d.). In 1918 the Fruit Growers Supply Co. started operations on Forest land in the Oak Knoll Ranger District. Logging of significant volumes in other areas did not begin until 1941.

Agriculture

Early mining camps in Siskiyou County were dependent upon food packed in from other areas. However, land was taken up as early as 1851 in the Scott and Shasta Valleys in order to raise cattle and hay (Wells 1881:192). In 1852 vegetables, wheat, barley, and oats were being grown in Yreka, and in 1853 grain was being grown in the Scott and Shasta Valleys. Mills were built to grind the grain, beginning with the Lafayette Mill in Quartz Valley in 1853 (Reichman 1956). Eventually, agriculture became another mainstay of the local economy.

The earliest farms and ranches were established in areas readily accessible to the mines. Butte Valley, on the eastern side of the Forest, was not settled until the 1860's (Edwards 1957:21; Helfrich 1957). Initially, much of the land for farms and settlements was pre-empted: land was cleared, houses were built, and crops grown without title.
Legislation allowed settlers to buy up to 160 acres of their pre-empted land for $1.25 per acre after it was surveyed, without competition from other buyers. The Homestead Act of 1862 allowed a person to obtain 160 acres of land virtually without cost if he lived on it and made improvements. The Timber and Stone Act of 1878 provided for securing title to land valuable for timber and stone in a manner similar to that allowed in the Homestead Act. No studies of the pattern of land disposal resulting from these laws have been made in the Forest area. It is expected that transportation and accessibility to markets played a major role in determining the pattern (Clawson 1971:11-15).

Livestock raising dominated the agricultural activities carried on within the Forest. When the National Forest system was established, attempts were made to exclude lands more valuable for agriculture than for timber (Steen 1976:34, 40, 50, 58, 79, 106). Thus the land included within Forests often tends to have characteristics which make it undesirable for farming, such as extreme ruggedness, but it can often be grazed. The Klamath National Forest appears to have been no exception. Little farming has occurred, and generally it has been part of homesteading activities through which the land has passed into private ownership. The homesteads generally resemble Indian allotments in their archaeological features.

Grazing, on the other hand, has long been a part of Forest use activities. As was suggested above, the first livestock brought into the area, primarily cattle, provided meat for the miners. As long as the miners prospered there was a good market for beef (Foulke 1963:1). When the mines played out in the 1860's stock had to be driven as far as Sacramento to find a market. When the Southern Pacific railroad line reached the Shasta Valley in 1887 it gave a new boost to the cattle industry, as it became cheaper to ship the animals long distances to market. In addition, shipment by rail reduced the weight loss that occurred while driving cattle. Gazelle and Montague became major shipment points with some cattle driven from as far away as eastern Oregon.

Completion of the Klamath Falls to Weed line by the Southern Pacific Railroad in 1909 led to a similar boom in Butte Valley (Edwards 1957:21). Cattle ranching began in that area in 1861, when J.A. Fairchild, C.W. Hard and I.S. Matthews brought in 1200 head of cattle and 300 horses. Fairchild established a camp that year and then began to build a sizable ranch in the Oklahoma Flats area south of Lower Klamath Lake. By 1866 he had entered into agreements with the Modoc which gave him the privilege of using land from Butte Creek to Lost River. Both Fairchild and the Modoc respected the agreements, and got along well even during the Modoc War (Helfrich 1957:4; Edwards 1957:21). Other notable early Butte Valley settlers were the Ball brothers, whose ranch became the Prather ranch, Presley A. Dorris and the Van Bremmer brothers. From the 1860's to 1905 growth was slow but steady. From 1905 to about 1910 Butte Valley began to prosper as the railroad was built through it. For instance, the town of Macdoel was founded in 1907 when members of the Church of the Brethren, hoping to establish a farming community, settled at what was then the end of the line. Homesteading began at Long
Prairie and Red Rock Valley at about this time (Egolf n.d.), but settlers were forced to leave by a severe drought from 1915 to 1919. Settlers in Butte Valley also experienced problems with water supplies, and in the 1920's canals were dug to bring water from Antelope, Butte and Shovel Creeks and Meiss Lake. However, efficient irrigation systems were not developed until the 1950's (Egolf n.d.).

Use of areas in the Goosenest Ranger District for grazing probably began around the turn of the century, with ranchers just turning their stock loose for the summer. There was a concentration of sheep herds east of the mountain range formed by Sharp, Wild Horse and Garner Mountains and north of the main Long-Bell railroad grade (now road 44N01). Cattle tended to be restricted to the west of this area. The Forest Service acquired much of this land from the Long-Bell Lumber Company in 1937 and shortly thereafter established regulations for grazing. Use fees were set, allotments were designated for each rancher, and the number of animals was limited on the basis of available forage (Egolf n.d.).

While some of this activity in Butte Valley area occurred at the expense of established areas such as Gazelle and Montague, agriculture remained important in the Scott and Shasta valleys, and grazing continued to be an important activity on Forest land. Correspondence in the Klamath National Forest files indicates that Forest officers spent a considerable amount of time from 1905 to 1912 in efforts to enforce grazing regulations (Bower 1978). Nationwide, the Forest Service met considerable resistance to efforts to control grazing, which continued into the 1950's (Steen 1971:58–60, 205-209, 272-277, 162-167).

Transportation

The discussions of timber and agriculture indicated that transportation, particularly the arrival of the Southern Pacific Railroad, played an important role in the development of the Forest area. While this is true, transportation is one of the least-studied aspects of local history.

Prior to the arrival of whites, travel in the Forest area was by foot and canoe or raft. Unfortunately, there is no information available on the trails used by local Indians. It is probable that many of the trails used by early white settlers had also been used by Indians. Routes were likely to have been constrained by the location of easy grades, passes and major drainages and ridge systems. For example, the first miners to prospect the Klamath probably traveled Indian paths paralleling the river. However, the supply and communication needs of miners, and later of loggers, farmers and ranchers, were different from those of the Karok, Shasta and Modoc. Thus all Indian trails were not taken over by the whites, and many white trails had no Indian counterparts.

Initially, miners in the Klamath area were dependent upon coastal towns for supplies. This was in part the result of a cartographic mistake (McGowan 1949:227). When gold was discovered on the Trinity River in
late 1849, it was thought that the river flowed into what had been called Trinidad Bay by Spanish map-makers. Thus the easiest route to the mines appeared to be a voyage up the coast from San Francisco to Trinidad, then up the Trinity River. It was expected that the Trinidad area would be heavily settled, and town sites were laid out at Trinidad in March, 1850, at Humboldt, Eureka and Union in April, and at the mouth of the Klamath a little later in the year. These became the important early supply centers for the Klamath mines.

When mining began along the Salmon and Scott rivers in 1850, the first important trail was established from Trinidad to the diggings (McGowan 1949: 231-233). This was a pack trail, which led up the coast to Big Lagoon, avoiding the densest part of the redwood belt lying east of Trinidad. It then turned eastward and crossed Redwood Creek to the Bald Hills. Elk Camp was the first stopping place east of the redwoods. From there the trail led to Big Bar on the Klamath, along the river's left bank to the Trinity, over a toll bridge on Bluff Creek and on to Orleans. At Orleans the animals were ferried across the river. They traveled two miles southward, then turned east and ascended Orleans Mountain. The trail then descended to the Salmon River and continued up the river, one branch going up each fork.

Trinidad soon lost much of its pack trade, however. Business was not well organized, and many pack trains went to Union on Humboldt Bay because supplies at Trinity were exhausted (McGowan 1949:234). In addition, Union had a better harbor, and Trinidad gradually lost its pack trade to Union. The trade began to decline in 1851, and by 1853 had been taken over by Union and Crescent City. Union's trail crossed the Mad River and Redwood Creek, climbed the Bald Hills and followed them north until it joined the Trinidad trail near Coyote Peak. On the average, 100 pack mules left each week for the Klamath mines, carrying $4,000 to $5,000 worth of supplies. However, as many as 500 mules sometimes left for the Klamath and Salmon River mines in one day (McGowan 1949:235, 238, 239).

Meanwhile, Crescent City had come into prominence as a packing center when gold was found in Oregon's Rogue River Valley. When miners began to move up to the Scott and Shasta valleys, Crescent City built a trail to Happy Camp, and Union lost the Klamath trade (McGowan 1949:238, 245-247). This trail was the Kelsey Trail, which followed the Crescent City-Jacksonville, Oregon trail for a few miles before ascending the ridge north of Mill Creek to the Bald Hills. It followed the ridge top for a few miles, then dropped down to the South Fork of the Smith River and proceeded to Harrington Creek, where it ascended the ridge north of the creek to the Siskiyou divide. From there it followed Clear Creek to Ferry Point. Branches led both up and down the Klamath, while the main branch of the trail crossed the river and continued across the Marble Mountains, down Kelsey Creek, or possibly Shackleford Creek, (Meamber 1950:15-17) to the Scott River and up the river to Fort Jones.
Ultimately, the trails from the coast were surpassed by overland routes from the Central Valley. There was strong competition between the coastal towns and Shasta City for Yreka business. Shasta began to dominate trade with the Trinity River mines since the overland route to sources of supplies in the Central Valley was shorter than the routes to the coast and San Francisco (McGowan 1949:228). At Shasta, goods were transferred from wagons to pack mules. From there a pack trail led to the Trinity River mines, and branches led to the Salmon and Scott Rivers (McGowan 1949:255; "G.I. Joe" 1950:1). One left the Trinity at Coffee Creek, following the creek to its headwaters and across the divide to the headwaters of the Salmon River, then down the river. The second branch followed the Trinity River, then over Scott Mountain to the Scott River. At that point it branched again, with one branch leading to Callahan, Etna and Fort Jones and another going up the Scott to its source, across the divide, then down into the Shasta Valley and on to Yreka. Yreka, the Shasta Valley, and the Scott Valley were all reached more easily by this route then by the trail from Union, and as early as 1851 Shasta dominated the trade to Scott Bar.

Pack trains remained an important means of transportation to the Scott River and Yreka mines until 1855. In 1852, shallow-draft steamers began bringing supplies to Red Bluff via the Sacramento River, turning it into an important transshipment point for the mines. In 1855 wagon teams began leaving Red Bluff for Yreka (McGowan 1949:264-265). They traveled up the Pit River to Fall River, crossed the Pit River and headed west by way of the Military Pass Trail and Sheep Rock (Helfrich 1957:4). During the late 1850's and the 1860's wagon roads began to replace the pack trails. Pack trains were an immediate answer to supplying the demand created by the rush of gold-seekers, as they did not require a great deal of road construction in the rugged northern mountains. However, the cost of shipping goods by pack trains was higher then by wagon, inducing merchants and individuals to form joint-stock companies in order to construct wagon roads and obtain lower freight charges. In 1855, wagons freighted supplies from Red Bluff to Yreka for one cent per pound less than reliable packers would charge (McGowan 1949:264).

Wagon roads were developed more rapidly on the eastern side of the Forest than on the west, perhaps because of the easier terrain. Among the earliest roads was the Yreka Trail, which branched from the Applegate Trail into Oregon west of divide between Willow Creek and Laird's Landing on Lower Klamath Lake. It followed Willow Creek about four miles to Willow Springs, where travelers often camped. The trail then ran southwest across Red Rock Valley to cross Butte Creek near Kegg. It then continued southward through the Orr Lake Gap, along the south side of Grass Lake to the south base of Sheep Rock. It then ran northwest past what is now the Coonrod ranch, where it forked, with one fork leading to Little Shasta and the other to Yreka. The trail was heavily traveled by emigrants heading for Yreka in the early 1850's. Other important roads were the wagon road from the Pit River, which joined the Yreka Trail at Sheep Rock, the Ball Mountain Road built some time before 1864 between the Shasta and Butte Valleys, the Tickner Road built in 1871 from the Ball Mountain Road to Alturas and Surprise Valley, and
roads from the Butte Valley to Klamath Falls constructed in the 1860's and 1870's (Helfrich 1957). On the western side of the Forest, roads were not completed down the Scott and Klamath rivers until about 1891 (Meamber 1950:18). As wagon roads were constructed, pack trains were relegated to supplying those areas where population was too low to realize a profit from road construction (McGowan 1949:266).

These early trails and roads generally followed development and population growth, in contrast to construction of the Southern Pacific Railroad line, which when viewed from a local frame of reference was a stimulus to economic development and population growth. The stimuli for transportation development, and the effects of such development, for the period from the 1890's to World War II have not been studied. However, it is apparent that the development of trails and roads in all periods of the Forest's history is closely tied to other activities, and that the nature of transportation routes can provide information on economic development and population growth in areas served by those routes.

In summary, existing knowledge allows the identification of the ethnic groups which occupied the Forest vicinity during the historic period. Considerable descriptive detail on the activities of Anglo-Americans is available, but other ethnic groups have been ignored. Patterns of development during the historic period can be discerned, and some tentative technoeconomic explanations can be sketched. Because of the non-quantitative nature of the available data, potential differences in the nature and distribution of activities and in the balance of use of ecological zones described in Chapter II cannot be evaluated.

Summary

Initial occupation of the Forest vicinity may have occurred prior to 5000 B.C. Different lines of cultural development may have been followed in the Klamath Mountains and Cascades-Modoc Plateau provinces, and may reflect adaptation to the different natural environments. Such adaptive differences were noted among the three cultures present in the Forest area at the time of initial contact with non-Indians: the Karok, the Shasta, and the Modoc. Mining, agriculture, and timber harvesting became mainstays of the local economy following settlement of the area by non-Indians in the 1850's. A significant factor controlling development was transportation, due to the rugged topography of much of the area.

Throughout the history of the area, settlement has shown a preference for areas with stable water supplies, although water itself was not the only resource, or even the principal resource, influencing settlement location. Archaeological and ethnographic work in the Cascades-Modoc Plateau province suggests that the Modoc and their predecessors settled along lakes, rivers and marshes to take advantage of abundant fish, waterfowl, and vegetation. In the Klamath Mountains province, little is known about prehistoric settlement; but villages are believed to occur
in river valleys. The Shasta and Karok favored the rivers for village sites, probably due to the presence of flat ground, the anadromous fishery, and oak stands in nearby hills. Historic settlers favored the river valleys because of rich placer gold deposits, although as agriculture became more important settlement dispersed into areas such as the Scott, Shasta, and Butte Valleys, away from the major rivers and placers.

Nevertheless, these were not the only areas utilized, as the resources of the river, lake, and marsh environments were not sufficient to support existing populations. Thus the Modoc followed a seasonal pattern of movement that took them away from their villages along the lakes and marshes. Likewise, the Karok and Shasta hunted and collected in the back country, and lode mining, logging, and grazing took historic inhabitants into the Klamaths and Cascades.

The major defects of existing knowledge can be characterized as a lack of balance, due to the uneven amount of detail on the various aspects of Forest area cultures gathered during previous research, and a lack of information on archaeological resource distribution, due to the fact that previous research did not have the gathering of such information as an objective (Chapter III).
REFERENCES

These references are intended to provide a comprehensive list of publications relevant to the topics discussed in this chapter of the overview, in order to aid individuals doing detailed research on those topics. Not all the references listed have been cited in this chapter.

PREHISTORY

Adams, Cynthia J.
1979 Archaeological survey report of three alternative proposed maintenance station locations in Seiad Valley, Siskiyou County. California Department of Transportation, Redding.

Antevs, Ernst

Bass, Henry O.
1974a Environmental impact report for archaeological resources located in eleven selected segments of State Route 96. Society for California Archaeology District 2 Clearinghouse, Chico.
1974b Archaeological reconnaissance of selected portions of State Route 97, Weed to Dorris, Siskiyou County, California. Society for California Archaeology District 2 Clearinghouse, Chico.

Beardsley, Richard K.

Boynton, Michael J.
1973 Interim progress report for the archaeological salvage of the Hedge Creek Site, 4-SIS-55, Siskiyou County, California. Society for California Archaeology District 2 Clearinghouse, Chico.

Buck, Paul E.
1976 Archaeological reconnaissance of State Highway 3, near Yreka, Siskiyou County, California. Society for California Archaeology District 2 Clearinghouse, Chico.

Chartkoff, Joseph L.
Chartkoff, Joseph L., and Kerry K. Chartkoff

Chartkoff, Joseph L., and Kerry K. Chartkoff


Chartkoff, Joseph L., John R. Davis and Randolph E. Donahue

Clewett, Stanley E.

1974 Archaeological reconnaissance of the proposed Weed Airport expansion. Society for California Archaeology District 2 Clearinghouse, Chico.

Clewlow, C. W., Jr.

Cressman, Luther S.


76.
Davis, Alan
1978 Happy Camp Sanitary District archaeological observation project, Siskiyou County, California. Happy Camp Sanitary District and California State Water Resources Control Board.

Elsasser, Albert B.
1965 The archaeology of the north coast of California. Ph.D. dissertation, Department of Anthropology, University of California, Berkeley.

Elsasser, Albert B., and Robert F. Heizer

Elston, Robert, ed.

Fox, Steven J., and Donald L. Hardesty

Frederickson, David A.
1973 Early cultures of the North Coast Ranges, California. Ph.D. dissertation, Department of Anthropology, University of California, Davis.

Friedman, Janet
1976 Archaeological overview for the Mt. Dome and Timbered Crater regions, north central California. Department of Anthropology, California State University, Chico.

Gould, Richard A.

Grayson, Donald K.
Hardesty, Donald L. and Steven Fox

Harrington, Mark R.

Heizer, Robert F.

Heizer, Robert F., and John Mills

Heizer, Robert F., and Thomas R. Hester

Hopkins, Joseph W., III
1979a A cultural resources survey of the Willow Creek Bridge on Louie Road, near Gazelle, Siskiyou County, California. Siskiyou County, Department of Public Works, Yreka.

1979b A cultural resources survey of the Garrick Creek Bridge on the Edgewood-Big Springs Road, Siskiyou County, California. Siskiyou County, Department of Public Works, Yreka.

1979c A cultural resources survey of the Mill Creek Bridge on Quartz Valley Road near Mugginsville, Siskiyou County, California. Siskiyou County, Department of Public Works, Yreka.


Howe, Carrol
1968 Ancient tribes of the Klamath country. Binfords & Mort, Portland.

Hughes, Richard E.

Jensen, Peter M.

1978b Archaeological reconnaissance of the Indian Creek Road Project. Terrascan, Inc., Redding.

Jensen, Peter M. and Paul R. Reed

Johnson, Jerald J.
1966 Archaeological investigation of 4-SIS-258. Department of Anthropology, University of California, Davis.

Johnson, Keith L.
1973 Proposed archaeological salvage of the Hedge Creek Site, Siskiyou County, California. Society for California Archaeology District 2 Clearinghouse, Chico.

1975a Archaeological reconnaissance at Happy Camp, Siskiyou County, California. Department of Anthropology, California State University, Chico.

1975b Archaeological reconnaissance of Hayden Ridge Timber Sale, Siskiyou County, California. Society for California Archaeology District 2 Clearinghouse, Chico.

1975c Archaeological reconnaissance of the Montague sewage treatment project, Siskiyou County, California. Society for California Archaeology District 2 Clearinghouse, Chico.

1975d Archaeological reconnaissance of the Weed-Shastina Water Quality Control Project, Siskiyou County, California. Society for California Archaeology District 2 Clearinghouse, Chico.

1976 The search for Ishipishi-Tishiram village near Happy Camp, Siskiyou County, California. Department of Anthropology, University of California, Chico.

Johnson, LeRoy, Jr.


King, Thomas F.

Kowta, Makota
1975 Research design: northeast California. Society for California Archaeology District 2 Clearinghouse, Chico.


Leatherman, Kenneth E.
1940 Report on archaeological excavations at Petroglyph Point, June-July 1940. Lava Beds National Monument, Tulelake.

Leonhardy, Frank C.


Meighan, Clement W.

Meighan, Clement W., and C. Vance Haynes

Parker, John W.
1978a Archaeological evaluation of eight areas for proposed bridge replacement on State Route 139, Modoc and Siskiyou Counties, California. California Department of Transportation, Redding.

1978b Site delineation at CA-SIS-342, Siskiyou County, California, State Route 97. California Department of Transportation, Redding.

Quillen, Dennis K.


Rhode, David
1979a Archaeological survey report of five alternative maintenance station locations in Seiad Valley, Siskiyou County. California Department of Transportation, Redding.

Soule, William E.


1978c *Cultural resource field report for a tributary to the Klamath River. Prepared for Steven J. Beall and Mary Delco, Somes Bar.*


Squier, Robert J.


Squier, R. J., and G. L. Grosscup


Swartz, Benjamin K., Jr.

1961 *A preliminary archaeological survey along the proposed highway, Lava Beds National Monument, California. Lava Beds National Monument, Tulelake.*

1963b  Basic data report of materials obtained from survey under permit between the National Park Service and the Klamath County Museum, June 1961, and excavation under contract 4-10-0434-877 between the National Park Service and Arizona State Museum, July-August 1962. Lava Beds National Monument, Tulelake.


KAROK


Arnold, M. E., and M. Reed 1957  In the land of the grasshopper song. Schooner Features, Eureka.


Bean, Lowell J.

Bright, William L.

Chartkoff, Joseph L.

Chartkoff, Joseph L. and Kerry K. Chartkoff

Cook, Sherburne F.

Curtin, Jeremiah
1889a Fifteen untitled stories. Ms. 269, National Anthropological Archives, Smithsonian Institution, Washington, D.C.
1889b Karok vocabulary, Bluff Creek to Happy Camp, Siskiyou County, California. Ms. 847, National Anthropological Archives, Smithsonian Institution, Washington, D.C.

1889c Pulikla vocabulary, Klamath River, California. Ms. 1459, National Anthropological Archives, Smithsonian Institution, Washington, D.C.

Curtis, Edward S.

Dalton, George

Davis, James T.

Dixon, Roland B., and Alfred L. Kroeber

Driver, Harold E.

Drucker, Philip

Gibbs, George

Gifford, E. W.

1939a Karok narratives. Ethnological Documents of the Department and Museum of Anthropology, University of California, Berkeley 146.

1939b Karok field notes, part I. Ethnological Documents of the Department and Museum of Anthropology, University of California, Berkeley 174.
1940  Karok field notes, part II. Ethnological Documents of the Department and Museum of Anthropology, University of California, Berkeley 179.


Graves, Charles S.
1929  Lore and legends of the Klamath River Indians. Press of the Times, Yreka.

1934  Before the white man came. Siskiyou News, Yreka.

Gunther, Erna


Haas, Mary R.

Hamp, Eric P.

Harrington, John P.
1926  Karuk ethnographic and linguistic notes. Ms. in National Anthropological Archives, Smithsonian Institution, Washington.


Jacobsen, William H., Jr.
Kelly, Isabel T.
1930 The carver's art of the Indians of northwestern California. 

Kennedy, Mary J.

Kroeber, Alfred L.

1905 Basket designs of the Indians of northwestern California. 
*University of California Publications in American Archaeology and Ethnology* 2:105-164.

1911 The languages of the coast of California north of San Francisco. 


Kroeber, Alfred L., and Samuel A. Barrett

Kroeber, Alfred L., and Edward W. Gifford
1949 World renewal: a cult system of Native northwest California. 

Marrant, Doris E.

Nichols, Johanna
1971 Diminutive consonant symbolism in western North America. 
*Language* 47:826-848.

Olden, S. E.
1923 Karoc Indian stories. San Francisco

O'Neale, L. M.
Palmer, Gary
1979 Karok villages and ceremonial sites. Ms., on file, Klamath National Forest, Yreka.

Powers, Stephen

Roberts, H. H.

Saindon, Carolyn

Schafer, Joseph, ed.

Schenck, Sara M., and Edward W. Gifford

Silver, Shirley

Theodoratus, Dorothea J., Joseph Chartkoff and Kerry Chartkoff
1979 Cultural resources of the Chimney Rock section, Gasquet-Orleans Road, Six Rivers National Forest. Theodoratus Cultural Research, Fair Oaks.

Wallace, William J.

Woodward, A.

SHASTA

Angulo, J. de, and B. d'Harcourt

Boas, Franz

Curtis, Edward S.
Dixon, Roland B.


Dixon, Roland B., and Alfred L. Kroeber

Farrand, L., and L. J. Frachtenberg

Gibbs, George

Gifford, E. W.

Haas, Mary R.

Harrington, John P.
1928-1933 Konomihu and Shasta fieldnotes. Ms. in Survey of California Indian Languages, Department of Linguistics, University of California, Berkeley.

Heizer, Robert F.

Heizer, Robert F., and Thomas R. Hester

Holt, Catharine
Hopkins, Joseph W. III

Jacobs, Melville

Kelsey, C. E.

Kroeber, Alfred L.

Kroeber, Alfred L., and Samuel A. Barrett

Kroeber, Alfred L., and Robert F. Heizer

Langdon, Margaret and Shirley K. Silver, eds.

Maloney, Alice B.
1945 Shasta was Shatasla in 1814. *California Historical Society Quarterly* 24:229-234.

Marrant, Doris E.

Merriam, C. H.


Olmstead, D. L.

Powers, Stephen

Silver, Shirley

Voegelin, Erminie W.

Wallace, William J., and Edith S. Taylor

MODOC

Allen, James M.
1956 Wi-ne-ma. Vantage Press, New York

Angulo, J. de., and B. d'Harcourt

Angulo, J. de, and L. S. Freeland

Barrett, Samuel A.
Bennett, Kenneth A.

Boas, Franz
1891 Physical characteristics of the tribes of the north Pacific Coast. *British Association for the Advancement of Science, Annual Meeting Report* 61:424-449.

Boyle, William H.
1959 *Personal observations on the conduct of the Modoc War.* Dawson's Book Shop, Los Angeles.

Brady, Cyrus T.

Curtin, Jeremiah

Curtis, Edward S.

Campbell, Loreita

Colville, Frederick V.


Davis, James T.

Dillon, Richard

Franks, A.W.
1873 A bow and two arrows of the Modoc. *Journal of the Royal Anthropological Institute of Great Britain and Ireland* 3:204-205.

Gatschet, Albert S.
1890 The Klamath Indians of southwestern Oregon. *Contributions to North American Ethnology II.*


Gifford, E. W.
1922 California kinship terminologies. University of California

Graves, Charles S.
1929 Lore and legends of the Klamath River Indians. Press of the Times,
Yreka.

Hall, J. C., and B. Nettl
1955 Musical style of the Modoc. Southwestern Journal of Anthropology

Heizer, Robert F., and M. A. Whipple
California Press, Berkeley.

Hopkins, Joseph W. III
1979 A cultural resources overview of the western half of the Goosenest
Ranger District, Klamath National Forest. Klamath National Forest,
Yreka.

Howard, O. O.
1907 My life and experiences among our hostile Indians. Hartford.

Jacobs, Melville
1968 An historical event text from a Galice Athabaskan in south-
western Oregon. International Journal of American Linguistics
34:183-191.

Kroeber, Alfred L.

Kroeber, Alfred L., and Samuel A. Barrett
1960 Fishing among the Indians of northwestern California.

Kroeber, Theodora K.
1957 A note on a California theme. Journal of American Folklore
70:72-74.

Martin, Lucille J.
1969 A history of the Modoc Indians: an acculturation study. The
Chronicles of Oklahoma 47:398-446.

McLeod, Ken

Meacham, A.B.
1876 Wi-Ne-Ma and her people, the story of the Modoc Indian War.
American Publishing Co., Hartford.
Miller, Joaquin

Murray, Keith A.

Nash, Philleo

Powers, Stephen

Ray, Verne F.

Riddle, Jeff C.

Spier, Leslie


Thompson, Erwin N.

Turner, W. M.

Van Alstyne, Peter Ware

Voegelin, Carl F.

Voegelin, Ermine W.

Wells, Harry L.
HISTORY

Ball, Lottie A.
1957 Four men from Petersburg

Bancroft, Hubert Howe
1888 The works of Hubert Howe Bancroft, XXIII. The History Co., San Francisco.

Barton, Chester

Beck, Warren A. and Ynez D. Hasse

Bower, R. W.
1978 Chronological history of the Klamath National Forest,

Bryant, Ralph C.
1938 Lumber, its manufacture and distribution. John Wiley & Sons, N.Y.

Chinn, Thomas W., H. Mark Lai and Philip P. Choy, eds

Clawson, Marion

Cleppen, Henry

Cox, Thomas R.

Clark, William B.

Denny, Karl V.
1957 Callahan mines. The Siskiyou Pioneer 2(10):41-44.
Dillon, Richard  
1975 Siskiyou Trail: the Hudson's Bay Company route to California  

Dowling, Eugene S.  
1948 Klamathon. Siskiyou County Historical Society Yearbook 1(3):  
1-11. Yreka.

Edwards, Barbara H.  
1957 The settlement of Butte Valley. The Siskiyou Pioneer, 2(9):  
21-22.

Egolf, Gail  
n.d. Historical overview of Tennant Geothermal area: Goosenest  
Ranger District, Klamath National Forest. On file, Klamath  
National Forest, Yreka.

Foulke  

"G.I. Joe"  
1950 Yes, I remember. Siskiyou County Historical Society Yearbook  

Gibbs, George  
1972 Journal of Redick McKee's expedition through northwestern  
California in 1851. Edited by Robert F. Heizer. University  

Graves, W. Frank  

Grider, J. B.  
1957 Gold mining from Scott Bar to Happy Camp. The Siskiyou Pioneer  
2(10):27-35.

Gudde, Erwin G.  

Hanft, Robert M.  
1971 Pine across the mountain. ... California's McCloud River Railroad  
Golden West Books, San Marino.

Helfrich, Devere  
1957 Trail, road and transportation history of Butte Valley. The  

Hopkins, Joseph W. III  
1979 A cultural resources overview of the western half of the Goosenest  
Ranger District, Klamath National Forest. Klamath National Forest,  
Yreka.
McGowan, Joseph A.

Meamber, Fred J., Jr.

Meamber, R. Bernice and T. M. Deter

Miller, Joaquin

Paul, Rodman W.
1947 California gold: the beginning of mining in the far west. University of Nebraska Press, Lincoln.

Reichman, Gus

1957 The Deadwood mining district. The Siskiyou Pioneer 2(10):81-82.

Schmidt, Andrew R.

Schrader, George R.

Steen, Harold K.

Stumpf, Gary
1979 Gold mining in Siskiyou County, 1850-1900. Siskiyou County Historical Society, Yreka.

United States, Department of Agriculture, Forest Service

Van Orsdel, Dorothy
1960 A brief history of Siskiyou County. Siskiyou County Superintendent of Schools, Yreka.

Weed, Abner E.

Wells, Harry L.
V. RECOMMENDATIONS

The objective of the Klamath National Forest's cultural resource management program is compliance with environmental and historic preservation legislation. This chapter describes the responsibilities created by existing laws and regulations, and shows how they can be met.

The Legal Basis for Cultural Resource Management

The legal basis for Federal cultural resource management is provided by the Antiquities Act of 1906, the National Historic Preservation Act of 1966, the National Environmental Policy Act of 1969, the Archaeological and Historic Preservation Act of 1974, and the American Indian Religious Freedom Act of 1978. Procedures for compliance with this legislation are spelled out in 36 CFR 60, 61, 63, 67 and 800. Under these laws and regulations, Federal agencies have responsibilities to:

1. Locate cultural resources which may be eligible for inclusion in the National Register of Historic Places.

2. Evaluate those resources to determine whether or not they qualify for the Register, and to nominate them to the Register if they qualify.

3. Protect those characteristics which make the resources eligible for the Register, by avoidance or mitigation of adverse effects due to agency activities and by enforcement of the Antiquities Act.

4. Promote public understanding of the heritage represented by the resources.

In addition, the American Indian Religious Freedom Act directs agencies to avoid or minimize adverse effects of their actions on American Indian religious practices.

Location of Cultural Resources

The National Historic Preservation Act of 1966 established the Advisory Council on Historic Preservation to encourage the attainment of cultural resource management objectives. Among the most significant of its functions is that defined in Section 106 of the Act:

The head of any Federal Agency having direct or indirect jurisdiction over a proposed Federal or federally assisted undertaking in any State and the head of any Federal department or independent agency having authority to license any undertaking shall prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license, as the case may be, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible
for inclusion in the National Register. The head of any such Federal agency shall afford the Advisory Council on Historic Preservation established under Title II of this Act a reasonable opportunity to comment with regard to such undertaking.

However, no national inventory of resources eligible for inclusion in the National Register exists, and if only those resources actually listed in the Register received Section 106 consideration, many Register-quality resources would be damaged or destroyed.

Recognizing this, President Nixon issued Executive Order 11593 in 1971, requiring Federal agencies to inventory and nominate qualified cultural properties to the National Register and to exercise caution in the interim to assure that their actions did not damage National Register-quality resources.

Forest Service direction (Forest Service Manual 2361.02) calls for an inventory on National Forest System lands by 1985 sufficient to provide a data base for land management planning, and an inventory of all cultural resources by 1990. The deadline for the Klamath National Forest's land management plan has been moved up to 1981.

Section 2(b) of Executive Order 11593 directs Federal agencies to exercise caution to assure that their actions do not damage or destroy National Register-quality resources pending completion of the inventory and is reflected in section 2361.02 of the Forest Service Manual. Standards for compliance with this portion of the Executive Order are contained in FSM 2361.22b. These standards reflect current standards being used by the Advisory Council on Historic Preservation and by State Historic Preservation Officers, who require agencies to inventory cultural resources within the areas affected by direct and indirect impacts of an undertaking. The inventory must consist of a thorough search of existing information, including professional publications, the files of institutions and agencies holding cultural resource data, State Historic Preservation Officer files, knowledgeable individuals, and the National Register. Since few areas of the Nation have been adequately surveyed for cultural resources, even the most thorough examination of existing information is not likely to provide inventory data, and must be supplemented by a field inspection. Two types of field inspection are recognized: sample survey and complete survey (FSM 2361.22b).

Sample surveys are appropriate for general land management plans and for obtaining information for the early planning stages of specific projects. In some cases sample surveys may be appropriate for actions with diffuse or indirect effects. Sample surveys provide a basis for making predictive statements concerning the nature and distribution of cultural resources, the procedures and costs for complete surveys, the effects of proposed projects and the costs for mitigation of adverse effects. A sample survey of the Forest would satisfy 1981 land management planning objectives.
Complete surveys are intended to locate all cultural resources in a project area or administrative area. They are appropriate for inventorying specific project areas in accordance with section 2(b) of Executive Order 11593 and FSM 2361.02, and for inventorying all cultural resources in accordance with Forest Service objectives for 1990.

At the present time the Klamath National Forest intends to use existing archaeological information to meet 1981 land management planning objectives, and has no specific plan for meeting the 1990 inventory objective. Previous overview chapters have shown that existing cultural resource information lacks representativeness and it is recommended that a plan for a probabilistic sample survey be developed and implemented as soon as possible.

The lack of representativeness is serious because it complicates land management planning and development of a work plan to meet the 1990 inventory objective. Land management planners will have to tolerate a larger degree of uncertainty in statements about archaeological resources than would be the case if probabilistic sample information were available. In addition, estimates of the resources needed to inventory Forest lands by 1990 will be imprecise.

Many sample survey strategies could be employed to evaluate inventory needs, but probabilistic sample surveys are most effective since they allow objective evaluation of the accuracy and precision of the results. A stratified sample using the capability areas defined for land management planning as strata appears to be the most efficient means of obtaining useful results (Judge, Ebert & Hitchcock 1975:121).

While recommendations for techniques should be made in the context of planning for a specific sample survey, one general recommendation should be made. Archaeological discussions of sampling have often made statements about the percentage of a region which should be sampled to obtain reliable results (e.g. Mueller 1974). However, the reliability of the results actually depends on the size of the population sampled and its variance with respect to the characteristics measured, and not on the sample fraction (Thomas 1978:237). The variance of the studied characteristics can be estimated from existing data, in this case the Forest Archaeological Reconnaissance Report files. When Forest capability areas have been mapped and existing cultural resource records entered into the planned computerized storage and retrieval system, crosstabulations should be made to estimate the variance of capability areas with respect to cultural resource type, number, size and other characteristics. This information could then be used to determine the size of the sample needed to reliably assess 1990 inventory needs.

Lack of representative Forest sample survey data also decreases the efficiency of locating cultural resources in specific project areas. As was stated above, the Forest Service Manual states that complete surveys are to be used in such areas, in order to inventory all cultural resources. Since the objective is to inventory cultural resources rather than the land per se, less-than-complete surveys could be employed if it can be
shown that unstudied land does not contain cultural resources. Intuition is not adequate to demonstrate such a situation, however. Only complete or probabilistic sample surveys in environmentally similar areas are sufficiently objective to support such a judgment. Until a complete Forest inventory or probabilistic sample survey is available to demonstrate that certain environmental zones do not contain cultural resources, complete surveys of each project area will generally be necessary to meet inventory objectives. Departures from this strategy will require justification on a case-by-case basis.

One comment can be made concerning the possible conclusions to be drawn from a probabilistic Forest sample survey about specific project inventory needs. The sample survey will likely reveal that more extensive resource location surveys will be needed on the Goosenest Ranger District than on the other Forest districts. The Goosenest District lies within the Cascades and Modoc Plateau geomorphic provinces. The environmental discussion in Chapter II indicates that natural resource distribution patterns are likely to have led to a more balanced and dispersed human use of ecological zones in those provinces. More and larger capability areas are likely to require inventory on the Goosenest District.

Evaluation of Cultural Resources

Once a cultural resource has been located through a general inventory or a project-specific survey, its significance must be evaluated. The American Indian Religious Freedom Act and the National Historic Preservation Act of 1966 provide the basis for evaluating cultural resources. The Religious Freedom Act provides direction to protect and preserve Native American religious cultural rights and practices. Such rights include access to sites, use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites. Identification of sacred practices should be based on ethnographic overviews or specific consultations and will not be discussed further in this report. Evaluation of religious significance is presently based on case-by-case consultation with Native Americans.

National Historic Preservation Act significance criteria are presented in 36 CFR 60.6, and define significance in American history, architecture and archaeology. The criteria pose some problems of interpretation. For example, criteria for resource integrity are oriented toward the evaluation of architectural resources and are difficult to apply to archaeological resources. This overview will discuss archaeological significance criteria. Opinions of qualified historical architects and historians will be required to clarify the significance criteria in those fields.

For archaeological purposes, the most important criteria are those which state "The quality of significance in American...archaeology... is present in districts, sites, buildings, structures, and objects of State
and local importance that possess integrity... and... that are associated with events that have made a significant contribution to the broad patterns of our history; or... that have yielded, or may be likely to yield, information important in prehistory or history (36 CFR 60.6)."

Any archaeological resource that can be analyzed to obtain information has sufficient integrity to be potentially significant, even if some disturbance has occurred. The ability to yield information is the key component of archaeological integrity (King, Hickman, and Berg 1977:14). The actual significance of an archaeological resource will depend on the information it can produce. Significant resources are those which represent major events noted in the culture history, which contribute to elements of the history that are lacking or incomplete or which correct existing information. The culture history in the preceding chapter indicates that a broad range of information is relevant to archaeological research, producing a situation in which it can be argued that virtually any cultural resource is archaeologically significant (Schiffer and House 1977:256–257).

However, this is only the first stage in making decisions on managing the cultural resources. The National Register is a planning tool, and while Advisory Council comments concerning effects on National Register sites must be taken into account when decisions are made on agency programs and projects, the actual decision rests with the Federal agency implementing the undertaking (36 CFR 60.2.C). An additional category of information is needed in order to make these decisions. Any given resource is not equally suited to all archaeological purposes. Resources differ in their information content and this places qualifications on their significance that may guide management. Both an assessment of the range of questions that an archaeological resource can answer and a consideration of where else the same questions might be answered is required in order to assign research and preservation priorities (Schiffer and House 1977:256; King, Hickman, and Berg 1977: 99–100). The Forest culture history can structure assessment of the range of questions which can be answered by a given cultural resource, and a Forest inventory as discussed above can provide the basis for determining where else the same questions could be answered. The inventory data is the additional category of information which is required for sound program and project decision making.

The culture history described a number of significant patterns in local prehistory and history and the events which contributed to those patterns. During the prehistoric period, major climatic variations are believed to have required behavioral adjustments on the part of Forest area inhabitants. Archaeological resources which can contribute to the description of these variations and adjustments are significant. Examples of such resources are sites containing pollen or large quantities of preserved organic material, or a group of contemporaneous villages and camps in differing ecological zones that represent a pattern of subsistence behavior under a particular environmental regime.
The arrival of non-Indians in the Forest area had a major impact on local Indian cultures, and resources representing the events which produced this impact are significant. Examples are villages burned during the 1850’s, military encampments, and Indian allotments.

The first major event of the historic period was the exploration of the local area by Hudson Bay Company trappers. Hudson Bay trapper camps will be significant if found. The discovery of gold led to the initial non-Indian settlement of the area, and mines and camps of the period 1850-1852 will be significant representatives of this event. The development of new technologies, such as hydraulic and dredge mining, sustained the gold industry in later years; examples of these technologies will be significant representatives of these events. Development of new technologies also aided the growth of the local lumber industry, and examples of these technologies will also be significant. Other important events in the development of the timber industry included the construction of the Southern Pacific Railroad and the establishment of the National Forest System. Mills which provided timber for the railroad, or to the markets served by the railroad, are significant. Railroad engineering features are significant. Early Forest Service facilities, such as Ranger Stations and Guard Stations, are significant. Finally, the Great Depression had an important effect on local history, and Depression-related resources are likely to be significant. Examples include mines reoccupied during those years, and Civilian Conservation Corps constructions.

In addition, the elements of the culture history, as described at the beginning of Chapter IV, can also aid in the assessment of significance, since they comprise the range of information that is usually sought in doing prehistoric and historic research. Information pertinent to these elements is thus important.

Specifically, any archaeological resource dating prior to A.D. 1400 will be significant, because of the limited amount of information pertaining to this period. All elements of the culture history remain to be completed. The cultures inhabiting the Forest area must be identified, the nature and distribution of their activities determined, their spatial and temporal boundaries plotted, and the course of their development described and explained. Somewhat more culture-historical information is available for Indian cultures following A.D. 1400. The cultures inhabiting the Forest area have been identified, and characteristic traits defined. The locations of major villages have been mapped and approximate cultural boundaries are known. Archaeological resources are not expected to be significant as a result of their potential to provide such information on post-A.D. 1400 Indian cultures, unless there are reasons to believe that the information contradicts existing knowledge. However, the elements of the culture history are by no means complete. It has been shown that ethnographic reports focus on activities conducted within major villages, and often on the more spectacular or esoteric activities, such as ceremonials. Thus, the full range of
cultural activities and their distribution have yet to be described. In
addition, ethnographers concentrated on describing the state of Indian
cultures prior to the 1850's, and available cultural descriptions are
static and do not adequately delineate or explain later cultural develop-
ment. Archaeological resources can therefore be significant because of
their potential to contribute to these less-well-studied elements of the
Forest culture history. Examples of such resources are hunting and
collecting camps, archaeological sites post-dating the burning of
many of the villages in the 1850's and Modoc War-related sites.

The ultimate objective of the collection of such information about local
culture history is the understanding and explanation of human behavior
in general. Attainment of this objective is more efficient if research is
directed to the testing of specific hypotheses. Three research topics
appear to be productive of hypotheses which could be tested with data
obtained from certain Klamath National Forest archaeological resouces,
and will allow greater specificity in the assessment of the significance
of resources related to prehistoric and historic Indian cultures.

The first topic is an examination of the relationships among population
density, subsistence practices, sedentism, social stratification and
political organization. It is suggested by a series of hypotheses
proposed by Schalk (1977), based on the structure of an anadromous fish
resource and its implications for social organization. Schalk notes
that specialized adaptations to anadromous fish resources, similar to
that of the Karok, often occur in environments that favor more gener-
alized hunting and gathering subsistence practices, and suggests how
this anomaly might arise. Briefly, hypotheses advanced by Schalk and
hypotheses based on geographic theory suggest that:

(1) Initial occupation of the Klamath Mountains will consist of
clustered settlements favoring specific capability areas (such
as alluvial flats). Population density will be low, sub-
sistence will be generalized and the pattern of food resource
exploitation will show marked seasonality. Society will be
egalitarian. Exploitation of anadromous fish will begin early
in the occupation because runs occur during periods of rela-
tively low terrestrial productivity, and an elaborate storage
technology would not be required as the fish would be available
for extended periods.

(2) With increasing population, greater subsistence specialization
to increase the efficiency of food production is expected.
This may increase sedentism as people focus on a resource or
resources occurring in a specific environmental zone. As the
population begins to compete for resources, a less clustered
and more regular settlement pattern will develop. Social
derifferentiation will appear and will consist of an organi-
zational structure capable of coordinating episodes of intense
exploitation of specific resources. These changes will be
gradual and culminate in ethnographically-recorded conditions.
As can be seen, investigation of this topic would require data relevant to the completion of many elements of local culture history. Information on the identity of prehistoric cultures inhabiting the area, their technology, the nature, number and distribution of sites, the nature and distribution of artifacts within sites and cultural chronology will be required in order to make statements concerning population density, subsistence practices, social organization, and patterns of development. Comparison of data from the Karok and Shasta areas may reveal the effects of differing quantities of anadromous fish and reliability of runs. However, it does not appear that research on this topic could effectively utilize data from the Indian cultures of the Cascades and Modoc Plateau. Although the Modoc did fish, and the prehistoric inhabitants of the area probably also fished, they did not rely upon anadromous species and thus the structure of the fish resource differed considerably. This would reinforce other differences in the overall structure of the Cascades/Modoc Plateau environment (see Chapter II) that would call for a markedly different cultural adaption.

A second topic might be more successful in incorporating data from the eastern portion of the Forest: investigation of the development of trade in the local area. Ethnographers have commented on the volume and variety of goods traded by California Indian cultures (Davis 1961), and the Karok, Shasta, and Modoc were part of this trade system. Among the Modoc, individuals used wealth gained in trade to establish social and political leadership (Ray 1963:134-135). Since much of Modoc trade involved trading slaves for horses, Kroeber (1925:319-320) suggested that it resulted from European or American influences, with the Modoc increasing the frequency of raids on other groups in order to obtain slaves who could be traded for the recently introduced horses. However, the Modoc gave and received a number of other goods in trade (Davis 1961:29), and it seems equally plausible that trade for horses was a relatively late addition to an indigenous system whose origin did not lie in the conditions of Indian-white contact.

The conditions under which trade originates and the forms of trade have received considerable anthropological and archaeological attention (for example, see Earle and Ericson 1977). Many explanations for the origin of trade see it as an attempt to procure vital commodities not available in a particular area. For example, the Modoc traded with the Klamath for hides, and this might be interpreted as a reflection of a shortage of deer within Modoc territory. However, valuables such as dentalia were traded as well, and such trade is more difficult to explain, as there is often no immediate practical use for the traded item. Thus some recent hypothesis have focused on the role of trade in maintaining social differentiation within cultures or in regulating the exchange of vital commodities (for example, Wright and Zeder 1977). These discussions suggest the following hypothesis:

(1) Early prehistoric cultures within the Forest area will be marked by low overall levels of trade and limited or non-existent trade of valuables. Low population levels and higher group mobility are likely to limit the need for trade in vital commodities, and lack of social differentiation will limit the need for trade in valuables.
Deteriorating climatic conditions, such as those hypothesized for the Altithermal, or population growth, or a combination of these factors, will increase pressure on vital resources. Trade in these commodities will increase as a means of alleviating this pressure, particularly if subsistence specialization is another response to pressure. In that case, trade will serve as a protection against the failure of a critical resource. Trade in valuables will also appear or increase, since it can regulate the flow of vital commodities to prevent the breakdown of exchange due to fluctuations in resource availability and population. In particular, accumulation of valuables will serve as a substitute for storage of perishable commodities.

Again, investigation of this topic can utilize a broad range of data, including those on chronology, technology, subsistence, population size and social organization. Since the Modoc, Shasta, and Karok were all involved in trade, it is a topic which could be studied for any of them, and in fact contrasts between groups such as the Karok and Modoc could potentially reveal much about the interaction between subsistence specialization, trade, and social organization.

A third topic of investigation, and one which would also be appropriate for all areas of the Forest, although not necessarily for all time periods, is acculturation: the study of the changes in a culture brought about as a result of its contacts with other cultures. Archaeological resources produced by historic Indian cultures would be particularly significant because of their potential contribution to this topic, which could be studied through an ethnographic overview as well as through archaeological methods. As was pointed out in Chapter III, considerable work remains to be done to describe and explain development of Indian cultures following 1850. Since there are numerous competing anthropological analyses of acculturation, there is an opportunity to compare and evaluate hypotheses using data from the Forest area. For example, Keesing and Keesing (1972:352-356) present hypotheses concerning differential rates of change in different aspects of a culture undergoing acculturation (such as the material conditions of life, social organization and ideology), which might be tested with Forest data.

With regard to the non-Indian cultures of the Forest area, it has been stated that some elements of the culture history are relatively complete: existing data identify the cultural groups present in the Forest, describe their distribution and depict a wide range of activities. Thus archaeological resources would not normally be significant because of their contribution to these elements of the culture history. Nevertheless, some deficiencies do exist. For example, the level of documentary information relevant to minority cultures is limited, and archaeological resources related to such cultures may be significant because of the descriptive information they contain. Examples of such resources would be Chinese mining camps or ethnic enclaves within towns. Again, research on acculturation could provide a focus for specific investigations.
A second deficiency lies in the area of our understanding of the reasons for the patterns of development of non-Indian cultures. We know how those cultures developed, but our understanding of why they developed that way is intuitive and untested. Chapter IV sketched some potential explanatory factors, such as the role of transportation economics. The literature of economics and geography contain a multitude of hypotheses which could be tested and possibly refined using Forest data.

Finally, the level of documentation of many archaeological resources related to non-Indian cultures provides opportunities for testing archaeological methods and techniques. Hypotheses about the artifactual correlates of human behavior may be tested on historic sites using documentary data as a control. Significance of this kind will depend on the quantity and quality of documentation of the behavior under study, and will have to be assessed on a case-by-case basis.

These recommendations for evaluating the significance of archaeological resources have been offered to clarify the meaning of "significance." The recommendations are obviously not a comprehensive statement of the potential of Forest archaeological resources. They are based on areas of current archaeological research interest of which the author is aware and on the ability of Forest cultural resources to contribute to the study of such topics. They do illustrate the point that not all resources are important in the same ways, and can serve as the starting point for the assessment of resource significance in specific cases.

This process should be carried further. Cultural resource regulations require that evaluations of significance involve consultation between the Federal agency, the State Historic Preservation Officer, the Keeper of the National Register and the public. The recommendations made above can be submitted to these organizations and circulated to the public for review. During this process, additional topics for research and aspects of significance may be defined and some of the above recommendations may be modified or eliminated. The result of the process would be the development of a Memorandum of Agreement between the Forest, the State Historic Preservation Officer and the Keeper of the National Register. The memorandum would contain significance criteria phrased in terms of specific information potentially contained in Forest archaeological resources. Evaluations of the significance of individual resources could then be phrased in terms of the memorandum, and measures to mitigate adverse effects of Forest activities could be designed to address specific topics. This would decrease the amount of time spent in evaluating significance, assessing effects and proposing mitigation, as these activities are presently undertaken on a case-by-case basis, starting from scratch each time.

For example, it is time consuming to demonstrate the significance of a lithic scatter to a question such as the adjustment of settlement patterns to climatic variation, since this should minimally include a description of the known or hypothesized climatic conditions (including citation of evidence), a description of the known or hypothesized
settlement patterns, and an argument showing how the scatter represents the patterns or poses new questions. In addition, the resulting evaluation may appear to overestimate the amount of information that can be gained from the individual site, unless it is made clear that the appropriate analytical techniques will be consistently applied to a large number of similar sites. The Memorandum of Agreement would be a more efficient device for presenting the reasoning behind such an evaluation, and for assuring that appropriate measures would be taken to realize the scientific opportunity presented by the resource.

Development of such a memorandum will require classification of the archaeological resources as well as definition of significant information, since in order to be useful the memorandum must show which cultural resources can provide any given category of significant information. Thus, it is recommended that a Memorandum of Agreement be developed and submitted to the S.H.P.O. and Advisory Council following creation of the automated cultural resource data base in fiscal year 1980. Summaries of resource characteristics extracted from this data base should allow identification of consistent associations of characteristics that can be classified into resource types, and the nature of the characteristics should allow definition of the significance of any specific type.

It was previously suggested that decisions concerning the management of archaeological resources located within projects should be based on both the significance of the resources and on consideration of where else the significant information can be obtained. Knowledge of the number and locations of Forest archaeological resources is needed for the latter consideration, and possession of this knowledge is one of the goals of the 1990 inventory objective. Until that time, existing knowledge may be used to make estimates. Such estimates are likely to be imprecise, since previous data-gathering efforts were not oriented toward assessing resource number and location Forestwide. Again, a study in the form of a Forest probabilistic sample survey, already recommended to assess the needs for meeting the 1990 inventory objective and to aid in planning specific projects, would be useful and is recommended.

Cultural Resource Protection

After resources have been identified and evaluated as significant, compliance with law and regulations requires that agencies attempt to avoid or mitigate adverse effects on the resources. During planning of their activities, agencies are required to identify and evaluate the effects. Criteria to be applied in this process are found in 36 CFR 800.3. Results of the evaluation are submitted to the State Historic Preservation Officer and the Advisory Council on Historic Preservation for review. If the agency, the State Historic Preservation Officer, or the Advisory Council determine that adverse effects will occur, consultation among the three parties is begun to find means of avoiding or
mitigating the adverse effects, subject to the final decision-making authority of the agency implementing the undertaking. Procedures for consultation are outlined in 36 CFR 800.4-6. Since cultural resources are non-renewable, first priority is given to attempting to find ways of preserving them.

Because Forest Service programs are directed toward multiple use of forest resources, they are quite diverse, and so are their impacts.

Timber management is the dominant activity on the Klamath National Forest, and the diversity of effects of Forest land management activities can be illustrated by examining the impacts of timber harvesting (Wildesen 1978:10-20). An analysis of effects must be based on an assessment of the combined impacts of the proposed use, which in turn must be based on an evaluation of the type, degree, extent and duration of the impacts of each component activity, whether direct or indirect. For an archaeological resource, direct impacts fall into three main types: (1) compaction of soils and sediments; (2) physical disturbance of the surface; and (3) alteration of chemical or physical properties of the soil. Other impacts might consist of erosion, sedimentation, hydrological changes and changes in the local micro-climate. Impact degree can depend on the type of yarding system used (e.g. ground machinery or animals, cables, or aerial support), road design, landform, soil, season (felling and yarding on snow can have less impact than on bare ground), and type of equipment used. Extent of impact can depend on the choice of the number, size and distribution of trees to be cut, and on the yarding system used.

Following the harvest, slash disposal, reforestation and thinning of the regenerated timber stand will have additional impacts that vary with the specific techniques employed (e.g. burning versus hand piling of slash, hand planting versus natural regeneration, etc.).

Other Forest programs include range management (with activities such as issuing grazing permits and construction of range improvements), recreation management (development and maintenance of campgrounds and trails) and Forest administration (issuing special use permits, construction of administrative facilities, land exchanges, etc.). These have impacts similar to those of timber harvest.

Finally, effects will depend on the significant characteristics of cultural resources within project impact areas. An impact has an effect only if it alters a characteristic that makes a specific resource significant. Thus, while 36 CFR 800.3 indicates that audible impacts of a project may cause an adverse effect, this would normally not occur in the case of an archaeological resource that is significant because of its information content. On the other hand, such impacts might produce adverse effects on Native American religious places. Because of the extreme variability, analyses of effect must be made for each project and often for each site. The Memorandum of Agreement recommended above could alleviate the situation somewhat by providing advance agreement about potentially significant resource characteristics.
Nevertheless, broad characterization of potential adverse effects of Forest programs must be attempted in order to suggest archaeological resource management directions. The most frequent and severe adverse effects to archaeological resources (although not necessarily to ethnic or architectural resources) are produced by ground disturbing activities that disrupt the spatial relationships of artifacts and decrease the information potential of the resources. A second potential source of adverse effect is neglect of a resource that leads to the deterioration and destruction of its significant characteristics (36 CFR 800.3.b.4). Failure to take action to prevent destruction of a resource by vandalism (including "pothunting") or by weathering could constitute an adverse effect.

To date, archaeological resource protection measures by the Klamath National Forest have focused on prevention of adverse effects due to ground disturbing activities. The Forest has adopted a "site conservation approach (Wildesen 1978:3-4)" in response to the non-renewable nature of cultural resources. Resources are protected by not permitting activities which entail adverse effects, or are permitted only after the creation of a barrier preventing contact with the resource (for example, logging on snow over a lithic scatter). This approach has drawbacks, since it limits the means by which conflicts between alternative land uses may be resolved. All land-based resource uses are restricted to a finite number of acres, a large percentage of which has evidence of human use. Restriction of all potential conflicting uses to land lacking archaeological or other cultural resources is impossible, and it appears that increasing emphasis on a "value conservation approach (Wildesen 1978:4-5)" rather than a site conservation approach is necessary on practical grounds.

The goals of the value conservation approach are: (1) to minimize damage to all cultural resources; (2) to "bank" specific resources for future use; and (3) to maximize use of significant resource characteristics when neither of the first two objectives are feasible. The hypothetical case of tractor logging on a deep prehistoric site with a surface heavily disturbed by prior logging illustrates the contrast between these goals and those of the site conservation approach. Strict application of the site conservation approach would exclude personnel and equipment from the site. Application of the value conservation approach might involve a sample excavation of the site to determine that no significant new disturbance of the site would result from additional logging, which could then proceed if adequate inspection and enforcement of the Antiquities Act were also provided.

The value conservation approach would demand a more precise approach to the assessment of resource significance than the site conservation approach. The "values" to be conserved are the specific characteristics which make an archaeological resource significant. Again, a Memorandum of Agreement containing explicit significance criteria specific to the Forest area would aid the process.
Both of the two approaches outlined above are normally discussed in terms of their application to specific undertakings. Neither deals directly with the effects of vandalism not produced by specific projects or with natural deterioration. The Forest has a limited program for dealing with potential adverse effects from these sources. Forest employees who note instances of vandalism are expected to report it to the Forest Archaeologist and Forest law enforcement officers (usually Fire Prevention Technicians) for investigation. However, the Forest is large and many resources are located in remote areas, inspection is infrequent and vandalism not discovered until delay has made investigation impossible. In addition, there are no financial resources available for dealing with weathering and erosion. At present, no information exists describing the occurrence of vandalism and weathering. This information is needed in order to determine whether the Forest's program is adequate to avoid adverse effects due to neglect. It is recommended that computerization of cultural resource files should allow for the coding of information on the present condition of cultural resources. Analysis of these data should focus on the number of disturbed sites and severity of disturbance, in order to evaluate the need for a stronger program of law enforcement and maintenance.

Public Understanding

The ultimate goal of the Federal cultural resource management program, as defined in legislation, is to foster an increased awareness and understanding of our cultural heritage. This is reflected in the Forest Service Manual, which states that the goals of cultural resource program as a part of multiple-use management include "Interpretation so that the public may gain a better understanding and perspective of our heritage (FSM 2361)." This cannot be accomplished unless the information obtained through cultural resource management activities is communicated to the public.

The current Forest cultural resource program contains few formal provisions for meeting this goal. Current program objectives do not include any related to "public understanding."

Since the Siskiyou County Museum and Historical Society are logical organizations for persons with interests in local history to contact, it is recommended that the Forest develop a formal program of cooperation with those organizations. Elements of the program might include presentation of lectures to Historical Society meetings on a specified regular basis, submission of articles for publication in the Siskiyou Pioneer and contribution of artifacts and information to the development of Museum exhibits. It is also recommended that the Forest cooperate with the Historical Society in the publication of a synthesis of local history for the general public. No such synthesis has been published since Wells' (1881) history of Siskiyou County. The Forest has the necessary information available in this archaeological overview and in its cultural resource files, and the Historical Society may be able to rework the synthesis into a format suitable for general publication. In fact, it is desirable to arrange for general as well as technical
publication of results whenever Forest cultural resource activities produce significant amounts of new information. For example, the possibility of requiring preparation of both general and technical summaries of results in contracts for cultural resource work should be considered.

The recommendations above have been made to meet the needs of members of the public who have previously developed an interest in cultural resources. Additional Forest activities fostering public awareness and understanding of our heritage should focus on calling the attention of others to the presence and significance of cultural resources. These could be coordinated with the Forest Visitor Information Service Program. The Forest is beginning to do this through the inclusion of cultural resource summaries on the Forest recreation map and other guides to recreational use. Current Forest objectives call for the construction of a self-operated (nonstaffed) information station on the Scott River District in 1980, and there is discussion of constructing one such station on each Forest District. The station will include interpretive signs, and is an opportunity for developing public understanding of cultural resources. An interpretive sign for inclusion in the station should be developed, and additional signs developed if other stations are constructed.

Summary

Several deficiencies have been identified in existing knowledge concerning the cultural resources of the Forest area. To eliminate these deficiencies, it is recommended that:

1. The collections of institutions holding large quantities of archaeological data be inspected firsthand. Chapter III suggests that, at a minimum, copies of site records and survey reports on file at the Society for California Archaeology District 2 Clearinghouse in Chico be obtained, the holdings of the University of California, Berkeley, be surveyed, and a list of collections and archival materials be obtained from the Smithsonian Institution.

2. A statistical summary of Forest cultural resource files should be prepared, following computerization of those files in Fiscal Year 1980, and used as the basis for a supplement to this overview. Summaries of resource characteristics should be used to define resource types and the distribution of these types with respect to land management planning capability areas should be described.

3. A Forest sample survey be implemented to provide an assessment of needs for meeting the existing 1990 cultural resource inventory objective and to aid in making decisions on the management of resources within specific project areas.

4. Case-by-case consultation to identify and evaluate architectural and ethnic values of Forest cultural resources be continued, and preparation of architectural and ethnic overviews by individuals with expertise in those fields be prepared.
It was also noted that the National Register significance criteria are difficult to interpret due to lack of specificity. It was recommended that:

(5) A Memorandum of Agreement phrasing National Register significance criteria in terms specific to Siskiyou County be developed between the Forest, the State Historic Preservation Officer, and the Keeper of the National Register.

The memorandum would identify information needed to complete elements of local culture history and to address current archaeological research needs. Archaeological resource significance could be assessed in terms of the ability of specific resources to provide this information. Efforts to conserve cultural resource values and to mitigate adverse effects of Forest activities would then focus on conserving these specific classes of significant information.

Avoidance and mitigation of the adverse effects of Forest projects would be insufficient to conserve cultural resource values if vandalism and natural deterioration of the resources are leading to a loss of significant information. Therefore:

(6) Computerization of cultural resource files should allow for coding of data on vandalism and weathering. Statistical summaries of their frequency and an analysis of their effects should be prepared, as a basis for assessing the need for a stronger Antiquities Act enforcement program and a maintenance program.

Finally, there are no specific cultural resource program objectives for dissemination of information to the public. It is recommended that:

(7) The Forest develop a formal program of cooperation with the Siskiyou County Museum and County Historical Society to disseminate information to the public.

(8) The Forest develop an interpretive sign for inclusion in an information station to be built on the Scott River District, and additional signs be developed if similar stations are built on other Forest Districts.
References

Advisory Council on Historic Preservation

Davis, James T.

Earle, Timothy H. and Jonathon E. Ericson, eds.

Judge, W. James, James I. Ebert and Robert K. Hitchcock

Keesing, R.F. and F. Keesing

King, Thomas F., Patricia Parker Hickman and Gary Berg

Kroeber, Alfred L.

Mueller, James W.

Ray, Verne F.

Schalk, Randall F.

Schiffer, Michael B., and John H. House
Thomas, David Hurst

Wells, Harry L.

Wildesen, Leslie E.

Wright, Henry and Melinda Zeder
Table 1

Climatic Change Along the Klamath River
(From Major 1977: Table 2-10)

<table>
<thead>
<tr>
<th>Station</th>
<th>Distance Inland (mi.)</th>
<th>Altitude (ft.)</th>
<th>Mean Temp. (°F.)</th>
<th>Precipitation (in.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crescent City</td>
<td>0</td>
<td>46</td>
<td>53 46 57</td>
<td>70</td>
</tr>
<tr>
<td>Happy Camp</td>
<td>43</td>
<td>1089</td>
<td>56 39 73</td>
<td>50</td>
</tr>
<tr>
<td>Yreka</td>
<td>78</td>
<td>2631</td>
<td>52 34 72</td>
<td>17</td>
</tr>
<tr>
<td>Tulelake</td>
<td>139</td>
<td>4039</td>
<td>46 30 65</td>
<td>10</td>
</tr>
</tbody>
</table>
Figure 3
KLAMATH NATIONAL FOREST
ADMINISTRATIVE UNITS

LEGEND
- District Boundary
- Forest Boundary
- Supervisor's Office
- Ranger Station
FIGURE 4
KLAMATH NATIONAL FOREST
APPROXIMATE TRIBAL BOUNDARIES

[Map of the Klamath National Forest showing tribal boundaries and a scale for miles.]
Figure 5
FAR NORTHERN CALIFORNIA
COUNTY BOUNDARIES
1850 TO PRESENT
1850
Figure 6
FAR NORTHERN CALIFORNIA COUNTY BOUNDARIES
1850 TO PRESENT
1852
Based on Coy, Owen C., 1923, CALIFORNIA COUNTY BOUNDARIES
California Historical Survey Commission, Berkeley.

Figure 10
FAR NORTHERN CALIFORNIA COUNTY BOUNDARIES
1850 TO PRESENT
1880
Figure 11
FAR NORTHERN CALIFORNIA COUNTY BOUNDARIES
1850 TO PRESENT
1895 ON
APPENDIX A

Sources of Data Pertaining to Local Cultural Resources

This Appendix lists institutions holding data pertinent to the study of local cultural resources, whether the data consist of a few artifacts or an extensive collection of field notes, artifacts, publications, and photographs. It has been partially compiled from personal knowledge and references cited in preceding chapters. However, the principal source of information is:

Bean, Lowell John and Sylvia Brakke Vane

Institutions:

American Indian Historical Society
1451 Masonic Avenue
San Francisco, CA 94117

Has private correspondence, government archival material, unpublished manuscripts and photographs generally collected from California Indians themselves. It may have some northern California materials.

American Museum of Natural History
Central Park West at 79th Street
New York, N.Y. 10024

Has 39 Modoc artifacts.

Library
American Philosophical Society
Philadelphia, PA

Has a collection of papers from anthropologists who have worked in California. The Karok and Shasta are covered in manuscripts in the collection. Anthropologists represented include Jaime de Angulo, Roland Dixon, J. P. Harrington, and A. L. Kroeber.

Amerind Foundation
Dragoon, AZ 85609

Has 51 Karok items, including White Deerskin dance materials.

Arizona State Museum
University of Arizona
Tucson, AZ 85721

Has Klamath River tribes artifacts, including some of Karok manufacture. Also has Modoc artifacts.
Buffalo Museum of Science
Humboldt Park
Buffalo, N.Y. 14211

Has a Karok deerskin and feather headdress.

California Academy of Sciences
San Francisco, CA

Has a research collection with ethnographic materials gathered by A. L. Kroeber. These may contain some northwest California materials.

Library
California Historical Society
2099 Pacific Avenue
San Francisco, CA 94109

The Society has a collection of county histories, U. S. censuses for California, and a collection of photographs and drawings from early magazines. The latter includes photographs pertaining to the Karok.

California State Archives and Central Records Depository
1020 O Street
Sacramento, CA 95814

Has various State records, including papers related to Indian wars and papers of State officials.

California State Library
Library - Courts Building
P. O. Box 2037
Sacramento, CA 95809

Has extensive holdings of published works on California history.

Anthropology Library
University of California
Berkeley, CA 94720

Contains most of the University Library's anthropology collection of published materials. Of special interest is the collection of Ph. D. dissertations, some of which pertain to the Forest area.

Archaeological Research Facility
University of California
Berkeley, CA 94720

Has an extensive library of published resources and miscellaneous manuscript materials, including C. Hart Merriam materials.

Bancroft Library
University of California
Berkeley, CA 94720
Has an extensive collection of published and unpublished materials pertaining to California Indians and history. Included are oral histories, manuscripts, and historical map collections. Of special interest are the University Archives, which contain Lowie Museum and Department of Anthropology records which include unpublished ethnographic data collected by students and faculty. The library has the papers of A. L. Kroeber, letters from Stephen Powers to John Wesley Powell and Joseph R. Rosborough's letter on northern California Indians. Material by H. H. Bancroft and other historians is also held by the library.

Robert H. Lowie Museum of Anthropology
University of California
Berkeley, CA 94720

The Museum has one of the most significant collections of artifacts pertaining to California Indians, including those of northern California.

University Library
University of California
Davis, CA 95616

Has a California history collection including manuscripts and pictures, and the C. Hart Merriam collection of California Indian baskets with accompanying ethnographic notes. These may include some materials relevant to the Forest area.

University Library
University of California
Los Angeles, CA 90024

Has papers of Jaime de Angulo, which may contain material on the Karok, Shasta, and Konomihu.

Department of Anthropology
University of California, Santa Barbara
Goleta, CA 93106

Has a few northwestern California baskets, which may include Karok baskets.

Department of Anthropology
California State University
Chico, CA 95929

Has archaeological artifacts and data from Siskiyou County, including Karok, Shasta, and Modoc areas.

Museum of Anthropology
California State University
Hayward, CA 94542

Some ethnographic notes on the Karok are in the Museum's anthropology archives.
Carnegie Museum
Carnegie Institute
4400 Forbes Avenue
Pittsburgh, PA 15213

Has three Modoc baskets and a few other Modoc artifacts.

Clarke Memorial Museum
Third & E Streets
Eureka, CA 95501

Contains a collection of prehistoric and historic Indian artifacts from northwest California.

University Museum
University of Colorado
Boulder, CO 80309

Has some northern California hats and baskets, which may include materials from the Forest area.

Eureka-Humboldt County Library
421 I Street
Eureka, CA 95501

Published materials on local history and Indian cultures are included in its holdings.

Fort Jones Museum
Fort Jones, CA 96032

Has historical items of local interest, and Indian artifacts including Karok and Shasta baskets.

Heard Museum of Anthropology and Primitive Art
22 E. Monte Vista Road
Phoenix, AZ 85004

Has a collection of California Indian artifacts, including some from the Shasta and Karok.

Hoopa Valley Tribal Museum
Hoopa, CA 95546

Has archaeological artifacts collected by Six Rivers National Forest personnel and contractors, some of which pertain to the Karok.

Library
Humboldt State University
Arcata, CA 95521

Collections include published materials on northwest California ethnography and history and unpublished papers, correspondence, and photographs.
Henry E. Huntington Library and Art Gallery  
1151 Oxford Road  
San Marino, CA 91108

Has a major collection of archival material, with much information about California Indians. Also has a large photographic collection and an extensive library of published works.

Illinois State Museum  
Springfield, IL 62706

Has four Modoc baskets.

University Museum  
Indiana University  
Bloomington, IN 47401

Has ethnographic music archives which include Modoc music collected by Leslie Spier.

J. J. Jackson Memorial Museum  
Box 333  
Weaverville, CA 96093

Local Indian and pioneer artifacts, possibly including Karok and Konomihu, are included in its collections.

Jacksonville Museum  
Box 480  
Jacksonville, OR 97530

Has northern California Indian artifacts.

Klamath County Museum  
1451 Main Street  
Klamath Falls, OR 97601

Has archaeological artifacts and data for the Modoc and Shasta, Modoc War Records, pioneer artifacts, published and unpublished historic documents.

Lava Beds National Monument  
Tulelake, CA 96134

Has published and unpublished materials pertaining to the Modoc and the Modoc War, also northeast California Indian and U. S. military artifacts.

Lompoc Museum  
200 H Street  
Lompoc, CA 93436

Has Karok basketry and non-basketry artifacts.
Los Angeles County Museum of Natural History
900 Exposition Boulevard
Los Angeles, CA 90007

Has over 300 ethnographic artifacts from northwest California Indians, as well as a large reference library with 8000 volumes on California history.

Department of Anthropology
Michigan State University
East Lansing, MI 48824

Has archaeological artifacts and data pertaining to the Karok occupation of the Klamath River and the prehistory of the Gasquet-Orleans Road area.

Museum of Anthropology
University of Michigan
Ann Arbor, MI 48104

Has a collection of California Indian artifacts, including a few from the Modoc and Shasta, and possibly some Karok as well.

The Museum of the American Indian,
Heye Foundation
Broadway at 155th Street
New York, N.Y.

Has a comprehensive collection of California Indian materials, including almost all tribes. Includes field notes and other archival materials as well as artifacts.

Department of Anthropology
University of Nevada
Reno, NV 89507

Has the surface collections resulting from Hardesty and Fox' surveys in the Lava Beds and Glass Mountain areas.

Newark Museum
43-49 Washington Street
Newark, NJ 07101

Has eight Shasta baskets.

New York State Museum and Science Service
State University of New York
Albany, N.Y. 12224

Has one Karok basket.

University of Oregon
Eugene, OR 97403
Has archaeological artifacts and data in the anthropology department and Natural History Museum. Includes materials collected by L. S. Cressman and the Nightfire Island excavation project.

Pioneer Museum and Haggin Galleries
1201 N. Pershing Avenue
Stockton, CA 95203

Has a collection of California Indian artifacts which includes approximately 950 baskets. Some of these are probably from northern California.

San Francisco Public Library
Larkin and McAllister Streets
San Francisco, CA

Has a 13,000 volume collection of publications on California, including historical and ethnographic material.

Robert E. Schenk Memorial Archives
Society for California Archaeology
Adan E. Treganza Anthropology Museum
San Francisco State University
San Francisco, CA 94132

Has a collection of manuscripts from California archaeologists, some of which are pertinent to northwestern California.

Siskiyou County Courthouse
301 Fourth Street
Yreka, CA 96097

Has County administrative records, including birth and death records, mining records and land ownership records.

Siskiyou County Library
719 Fourth Street
Yreka, CA 96097

Has published and unpublished materials on County history.

Siskiyou County Museum
910 South Main Street
Yreka, CA 96097

Has Karok, Shasta and Modoc artifacts, including a large collection of baskets. Also has Euro-American artifacts, some pioneer manuscripts and published materials on local history. Klamath National Forest archaeological collections are curated by the Museum.

Southwest Museum
234 Museum Drive
Los Angeles, CA 90065
Has a large collection of art and artifacts from all parts of California. Also has some of J. P. Harrington's manuscripts and 100,000 volumes of published works on Western Americana and the American Indian.

Department of Anthropology
Stanford University
Stanford, CA 94305

Has a collection of ethnographic artifacts that includes a Yurok-Karok canoe and about 500 baskets, some of which may be from northern California.

Trees of Mystery Indian Museum
Klamath, CA 95548

Has northwestern California Indian materials, including Karok items. Ceremonial costumes are included in the collection.

Klamath National Forest
1215 S. Main Street
Yreka, CA 96097

Has archaeological site records and reconnaissance reports for work on Forest lands and a small library with published materials pertaining to local prehistory, ethnography and history. Also has oral history data obtained from local residents, and Forest Service records.

Modoc National Forest
441 N. Main Street
Alturas, CA 96101

Has archaeological site records and reconnaissance reports resulting from work on Forest lands and a small publications collection. Also has Forest administrative records and some oral history data.

Six Rivers National Forest
407 F Street
Eureka, CA

Has archaeological site records and reconnaissance reports resulting from work on Forest lands and a small library with published materials pertaining to local prehistory, ethnography and history. Also has Forest administrative records and some oral history data.

Library of Congress
Washington, D.C. 20540

Recordings of Karok and Konomihu songs, J. P. Harrington's Karok Texts manuscript and typed notes and notebooks, as well as published materials on Forest area Indians.

National Archives and Records Service
Washington, D.C. 20408
Has the records of the Washington Office of the Bureau of Indian Affairs. The California Archives Branch in San Bruno, CA, has records pertaining to northern California agencies.

Federal Archives and Records Center
1000 Commodore Drive
San Bruno, CA 94066

Has non-current records of Federal agencies in northern California and other areas, including the Forest Service.

Department of Anthropology and
National Anthropological Archives
Smithsonian Institution
Washington, D.C. 20560

Has an extensive collection of artifacts by California Indians, including northwest California baskets and ceremonial costumes. Also has an extensive collection of unpublished ethnographic materials, including field notes, correspondence and photographs. Included are manuscripts and notes by George Gibbs, C. Hart Merriam, and J. P. Harrington.

Thomas Burke Memorial Washington State Museum
University of Washington
Seattle, WA 98195

Has California ethnographic material, including collections made from the Modoc by Leslie Spier.