AN ABSTRACT OF THE THESIS OF

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Title: Three Remote Sensing Studies in Shasta Valley, California

Abstract Approved:

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The three remote sensing studies presented in this thesis were undertaken to determine how Landsat imagery could be utilized in the study of land-use in the Shasta Valley. Landsat Multispectral Scanner (MSS), Thematic Mapper (TM), and Enhanced Thematic Mapper Plus (ETM+) imagery was used to observe the effects of the 1987-1992 drought on water coverage in the Shasta Valley, to create a land-cover map of the farming community of Gazelle, California, and to examine the impact of logging on Goosenest, California.

Boolean processing of three MSS datasets showed that the 1974 subscene, selected to illustrate long-term average climatic conditions, had the highest water coverage at 8.4%; the 1992 subscene, acquired at the height of the drought, had the lowest water coverage at 2.3%; and the 1985 subscene, acquired after the short-term 1976-1977 drought and before the start of the 1987-1992 drought, had a water

coverage of 5.6%. A thematic map of the farming region around Gazelle, California was created using unsupervised classification of ETM+ bands 3, 4, 5.

An attempt was made to predict which parcels of land had been logged by Weed Lumber Company/Long-Bell in Townships 44-45N, Range 3W on Goosenest. After determining that this was impossible due to the complex logging history of the region, change detection study of the state of vegetation on Goosenest was conducted using three years of MSS data. It was found that cleared lands (or lands with a low vegetation cover) recovered between the years 1974-1985 while more vegetated lands were cleared (or had a reduction in vegetation) during the years 1985-1992. Much of the change in vegetative cover was seen to be a product of the climate. However, logging patterns could clearly be detected. A more thorough investigation of past logging on Goosenest might improve interpretation of change detection using satellite imagery.

Three Remote Sensing Studies

in Shasta Valley, California

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CHAPTER I

INTRODUCTION

Overview

Remote sensing refers to obtaining information about an object without coming into physical contact with it. It is an interesting field of study because there are many ways to obtain the desired data. First, the data can be obtained from different platforms, such as airplanes, helicopters, satellites, and even kites or hot-air balloons (Figure 1). This is referred to as multistage. Second, data can be obtained from different altitudes. Satellites and spacecraft would necessarily be at a higher altitude above the Earth than a helicopter or kite. The ability to obtain data at different altitudes is called multilevel. Third, the data may be multispectral; that is, different portions of the electromagnetic spectrum can be utilized in obtaining the data. The several devices available can record ultraviolet radiation, visible light, infrared radiation, and microwaves.

Investigating the Earth remotely provides humans with a unique perspective of the planet. This perspective is visually interesting and, more importantly, it contributes to our understanding of how humans have helped to shape the patterns we encounter on the landscape. Examining a small portion of our Earth, the Shasta Valley, will enhance our knowledge of this valley as well as add to our greater awareness of how remotely sensed images can be utilized to detect change.

Figure 1. Jim and Susie Aber from Kansas join pilot Jane English on an exploration of the Shasta Valley from Dragon Egg, May 1999.

The Landsat system has now been gathering data for more than twenty-five years. For this project, five scenes from three different types of sensors are used to view the impact of the 1987-1992 drought in Shasta Valley; create a land-cover map of the region around Gazelle, California; and examine the effects of logging on Goosenest. The scenes were acquired between 1974 and 1999, providing twenty-five years of data with which to examine Shasta Valley. In addition, historical images, maps, interviews, and aerial photographs acquired from airplanes, helicopters, and hot-air balloons are utilized in this study.

Study Area

A double chain of mountain ranges lies along the Pacific coast of the contiguous United States. One chain hugs the coastline whereas the other is 50 to150 km inland. Between these parallel ranges lie a series of valleys including the Puget Lowland of Washington, the Willamette Valley of Oregon, and the Sacramento Valley of California. The Shasta Valley is located in central Siskiyou County in far northern California between the two ranges (Figure 2).

Shasta Valley is about 58 km (36 miles) long and around 48 km (30 miles) wide with the longer axis lying in a north-south direction. The Shasta Valley watershed covers an area of approximately 2072 square kilometers (512,000 acres) (Holbrook 1955; Gwyne 1993). The location of the study area as well as its geology, climate, drainage system, and soils are covered in more detail in Chapter II.

Scope of Study

Satellite imagery is used to examine three aspects of the Shasta Valley. The effects of the 1987-1992 drought on Shasta Valley are examined using Multispectral Scanner scenes acquired in June of 1974, 1985, and 1992. The patterns produced by logging around Goosenest are illustrated using Enhanced Thematic Mapper Plus satellite imagery and air photos. Finally, an Enhanced Thematic Mapper Plus scene is used to create a level-one land-cover map of the area around Gazelle, California using unsupervised classification in conjunction with National Aerial Photography Program (NAPP) photographs. The classification is based on ground observations combined with examination of the Siskiyou County Important Farmland 1996 map (California Department of Conservation 1998), the Geologic Map of the Weed

Quadrangle, California (Wagner and Saucedo 1987), the USGS topographics map of the Gazelle Quadrangle (United States Geological Survey 1984), and land-use records based on 1993 NAPP air photos from the Farm Services Agency located in Yreka, California.

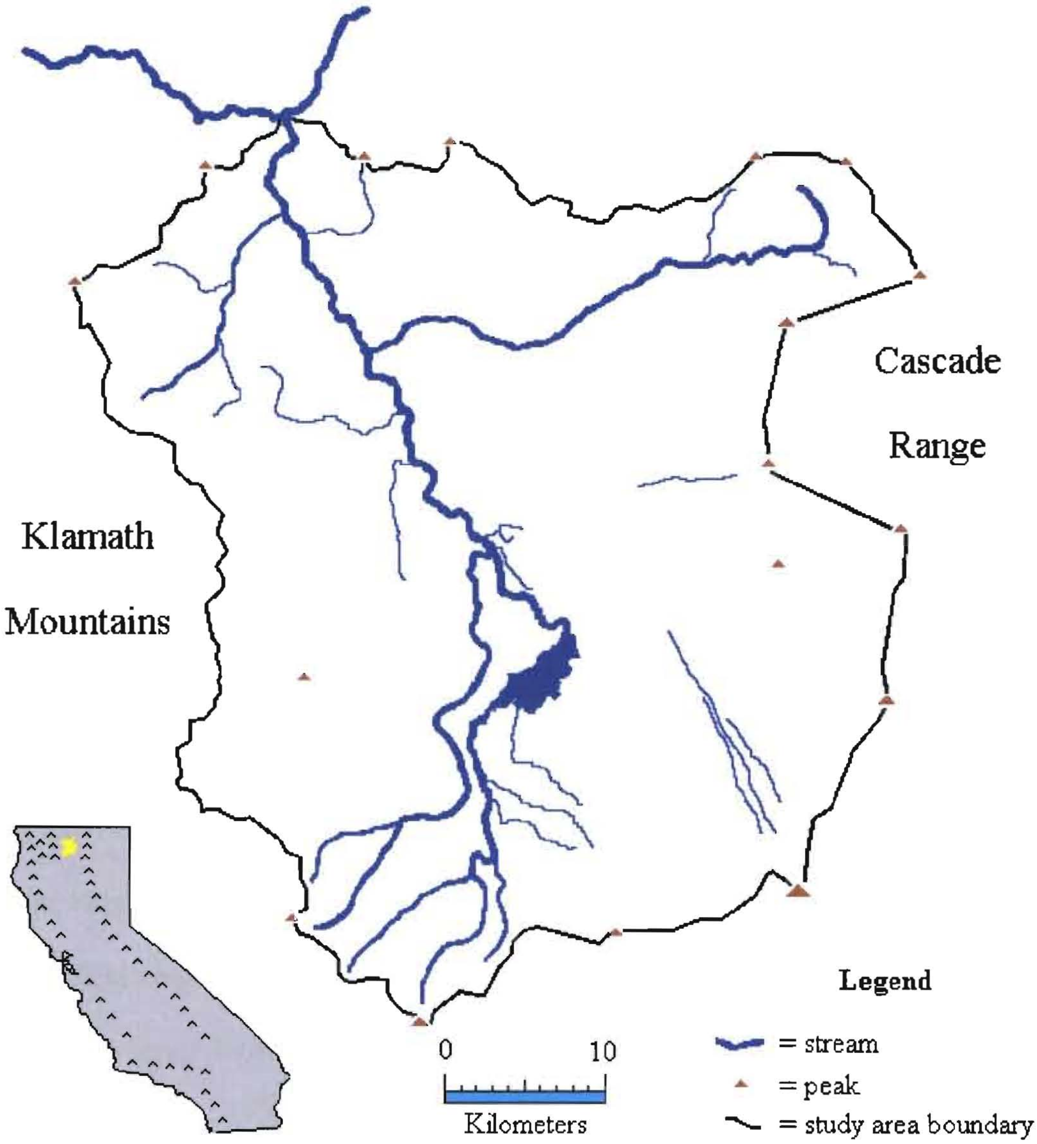


Figure 2. The Study Area, Shasta Valley, California (Information Center for the Environment 1997).

Land-Use Classification

Shasta Valley is a relatively small valley in a mountainous, rural environment. The valley's high elevation, short growing season, and low summer precipitation result in lower productivity than other agricultural regions of California. This comparatively low agricultural productivity, along with its location away from major universities, has inhibited study by instructors and students alike. The studies made regarding agriculture and land use in the Shasta Valley are shown in Table 1.

Land-use classification systems have been developed by several organizations, including the United States Geological Survey (USGS) and the International Geographical Union (Avery and Berlin 1992). Remote sensing textbooks frequently cover specific land-use systems (Jenson 1983; Avery and Berlin 1992; Arnold 1997). Numerous difficulties are encountered when using satellite imagery to classify land use and detect change. The type of sensors utilized within a given program, such as Landsat, often change over time resulting in increased variables. The accuracy of categorizing land cover using satellite imagery varies, ranging from 8-99%, and largely depends on the qualifications of the interpreter (Mas and Ramírez 1996). Ideally, a minimum of 85% accuracy should be achieved using satellite data (Avery and Berlin 1992; Crum 1997), but this is difficult to obtain without field verification. Several organizations, including the USGS, have developed a hierarchical land-use classification system that consist of three or more levels. The altitude of the platform and the range of mapping scales are shown in Table 2 using a four-level scheme.

Category	Author	Date	Title
Agriculture	Holbrook	1955	The Agricultural Geography of Shasta Valley, California
Soils	Watson et al.	1923	The Soil Survey of the Shasta Valley Area, California
	Newlun et al.	1983	Soil Survey of Siskiyou County, California, Central Part
Water	Smitherum and Zander	1925	Shasta River Adjudication Proceeding: Report on Water Supply and Use of Water from Shasta River and Tributaries
	York et al.	1965	Land and Water Use in Shasta-Scott Valleys Hydrographic Unit
	Horn	1964	Shasta Valley Investigation
	Gwynne	1993	Investigation of Water Quality Conditions in the Shasta River, Siskiyou County
Economics	Wilson	1935	A Study of the Economic Life of Siskiyou County
Climate	Elford and McDonough	1976	The Climate of Siskiyou County
Logging	Shoup Signor	1987 1982	Railroad Logging in N.E. Siskiyou County Rails in the Shadow of Mt. Shasta
History	Wells	1881	The History of Siskiyou County
Power	Rippon and Rippon	1985	Pioneering with Electricity in Siskiyou County
	Rippon and Rippon	1986	Early Twentieth Century Hydro-Power Plants and High Voltage Lines in Siskiyou County
Internet	Derkson	1996	Klamath Resource Information System (KRIS)
	Perry	1996	The Shasta River
	Perry	1996	The China Ditch
	Massey	1995	Siskiyou County Department of Agriculture
	ICE	1997	California Rivers Assessment Interactive Web Database

Table 1. Summary of literature relating to land use in Shasta Valley, California.

Classification Level	Platform Altitude	Map Scale Range
I	Above 22,000 meters	1:250,000 to 1:3,000,000
II	9,000 to 22,000 meters	1:60,000 to 1:125,000
III	3,000 to 9,000 meters	1:20,000 to 1:60,000
IV	1,200 to 3,000 meters	1:8,000 to 1:20,000

Table 2. Appropriate altitude and map scale for land-use classification (Source: Avery and Berlin 1992).

It is apparent from Table 2 that land-use classification using satellite imagery cannot be as detailed as mapping projects using air photos. The advantage of the four-level classification system is that the first general level can be based on satellite data and additional details can be added if air photos or ground reconnaissance is available. The first and second levels of a typical land use and land cover classification system are presented in Table 3.

Landsat History

President Eisenhower established the National Aeronautics and Space Administration (NASA) in July 1958 in response to the USSR's launching of Sputnik in October 1957. From the beginning, NASA was more focused towards research and development than applications. National prestige also played a major role in the development of NASA, especially after John F. Kennedy became President in 1961 (Mack 1990). In the spring of 1961 President Kennedy announced that the United States would send astronauts to the moon. This resulted in nationwide enthusiasm for the space program. The goal of the Apollo program was achieved on July 20, 1969 with the landing of Neil Armstrong and Buzz Aldren on the moon.

Level 1	Level 2
100 Urban and Built-up	110 Residential 120 Commercial 130 Industrial 140 Transportation 150 Communications/Utilities 160 Institutional 170 Recreational 180 Mixed-Urban 190 Open Land/Other
200 Agriculture	210 Cropland and Pasture 220 Orchards, Groves, Vineyards 230 Confined Feeding Operations 240 Other Agriculture
300 Rangeland	310 Grassland 320 Shrub/Brushland
400 Forest Land	410 Evergreen Forest 420 Deciduous Forest 430 Mixed Forest 440 Clearcut Areas 450 Burned Areas
500 Water	510 Streams and Canals 520 Lakes and Ponds 530 Reservoirs 540 Bays and Estuaries 550 Open Marine Waters
600 Wetland	610 Forested Wetland 620 Non-forested Wetland
700 Barren Land	710 Dry Lake Beds 720 Beaches 730 Non-beach Sand and Gravel 740 Exposed Rock
800 Tundra	810 Shrub and Brush 820 Herbaceous Tundra 830 Bare Ground 840 Wet Tundra
900 Perennial Snow or Ice	910 Perennial Snowfields 920 Glaciers

Table 3. Land-use and land-cover classification system (Source: Arnold 1997).

While the public's attention was focused outward into space during the 1960s, NASA was also investigating how spacecraft could provide data about Earth's resources. In 1967 NASA developed the Earth Resources Technology Satellite (ERTS) program, renamed the Landsat program in 1975. The first satellite in this program was launched via a Delta rocket from Vandenburg Air Force Base on July 23, 1972. It had onboard a Return Beam Vidicon (RBV), the main sensor, and an experimental sensor called a multispectral scanner (MSS). The MSS provided spectacular data and became an integral part of the program. ERTS-1, the first satellite launched, was renamed Landsat-1 in 1975 when the second satellite in the Landsat program was launched. Table 4 shows the launch and retirement history of the satellites in the Landsat program.

The MSS was carried by the first five Landsat satellites. It is a cross-track or whisk-broom scanner, that gathers reflected light from the electromagnetic spectrum in the bands shown in Table 5. The digital, multispectral, small-scale,

Satellite	Launch Date	Retirement Date	Sensors
ERTS-1 / Landsat 1	July 23, 1972	January 6, 1978	RBV, MSS
ERTS-2 / Landsat 2	January 22, 1975	February 25, 1982	RBV, MSS
Landsat 3	March 5, 1978	March 31, 1983	RBV, MSS
Landsat 4	July 16, 1982	August 1993	MSS, TM
Landsat 5	March 1, 1984	-	MSS, TM
Landsat 6	October 5, 1993	launch failure	ETM
Landsat 7	April 15, 1999	-	ETM+

Table 4. Landsat launch and retirement dates and sensors carried. RBV = Return Beam Vidicon, MSS = Multispectral Scanner, TM = Thematic Mapper, ETM = Enhanced Thematic Mapper, ETM+ = Enhanced Thematic Mapper Plus.

repetitive data with good resolution provided by the MSS became essential components of the Landsat program. Future sensors improved upon the MSS, but retained its key aspects.

The Thematic Mapper (TM) was first carried aboard Landsat 4, launched in 1982. This sensor has better spatial resolution, covers a wider range of the electromagnetic spectrum, and offers more bands of data than the MSS (Table 6). In addition to bands sensing the visible and near-infrared portions of the spectrum, the TM also senses middle- and thermal-infrared. The TM continues the coverage of the Earth begun with MSS but provides more data to the end user.

Landsat 7 was launched on April 15, 1999. The sensor aboard is an improved version of what was launched in the failed Landsat 6. The Enhanced Thematic Mapper Plus (ETM+) covers seven bands, which have been refined to better suit earth observation needs, and has a new panchromatic band with the highest resolution ever obtained from a Landsat satellite (Table 7). Data from this sensor became available to the public in September 1999.

Band #	**Spectral Range** (in micrometers)	**Ground Resolution** (in meters)
1	0.5-0.6 μm	79-82 m
2	0.6-0.7 μm	79-82 m
3	0.7-0.8 μm	79-82 m
4	0.8-1.1 μm	79-82 m

Table 5. Multispectral Scanner bands and their range and resolution.

Band #	Spectral Range (in micrometers)	Ground Resolution (in meters)
1	0.45-0.52μm	30 m
2	0.52-0.60μm	30 m
3	0.63-0.69μm	30 m
4	0.76-0.90 μm	30 m
5	1.55-1.75 μm	30 m
6	10.40-12.50 μm	120 m
7	2.08-2.35 μm	30 m

Table 6. Thematic Mapper bands and their range and resolution.

The Landsat program has provided scientists and other interested parties with more than 25 years of continuous coverage of the Earth's surface. Although the Landsat program operates under an "open skies" policy, meaning that the data are collected and available for use on a worldwide basis, end users have not always had the same access to the data (Mack 1990; Eisenbeis 1995). In 1985 Landsat was turned over to private industry which greatly inhibited personal use of recent data due to the high

Band #	Spectral Range (in micrometers)	Ground Resolution (in meters)
1	0.450-0.515 μm	30 m
2	0.525-0.605 μm	30 m
3	0.630-0.690 μm	30 m
4	0.750-0.90 μm	30 m
5	1.55-1.75 μm	30 m
6	10.40-12.50 μm	60 m
7	2.09-2.35 μm	30 m
pan	0.52-0.90 μm	15 m

Table 7. Enhanced Thematic Mapper Plus bands and their range and resolution.

cost of the data. For example, recent Thematic Mapper scenes from Landsat 4 or 5 cost $4,400 while TM scenes more than ten years old cost $425 per scene. With the return of the Landsat program to governmental agencies with the launch of Landsat 7 in 1999, new data has become more affordable, with prices for ETM+ datasets ranging from $475 to $600 per scene.

Methods and Materials

The primary data source for this study is Landsat satellite imagery. Several other types of data are utilized to help determine and illustrate land-use patterns in Shasta Valley. These data include maps, historical photographs, aerial photographs, documents, and informal interviews. The methods and materials for processing the satellite imagery are further discussed below.

Idrisi for Windows 2.0 is the software used to process the three multi-spectral scanner (MSS) scenes, the thematic mapper (TM) scene, and the enhanced thematic mapper plus (ETM+) scenes. This geographic information system (GIS) and image processing software was developed by the Graduate School of Geography at Clark University in 1987. The raster-based software is a valuable tool in processing satellite data and is available for a reasonable cost. The processing techniques described in Chapter III were specifically written for use with Idrisi software although the processes in general can be performed with other software programs.

Three MSS scenes of the study area are used in this project. The first scene was acquired by the first satellite, Landsat 1, on June 29, 1974. Two MSS scenes were acquired to study the effects of the 1987-1992 drought; a non-drought scene was taken on June 13, 1985 and a drought scene was taken on June 8, 1992. The last year MSS data were gathered was in 1992 making the June 1992 scene an historic part of the MSS era of the Landsat program.

The ETM+ scene selected for this project was acquired on July 14, 1999. In addition to using the seven bands of data for composite images and unsupervised classification, there is a new, high resolution panchromatic band which can be used in a manner similar to air photos, but with a smaller scale and lower resolution. The satellite data used in this study spans a 25-year period, permitting an examination of change in the Shasta Valley.

CHAPTER II

STUDY AREA

Location

Shasta Valley is located in the central part of Siskiyou County, one of the three California counties that border Oregon (Figure 3). Shasta Valley is located between the Klamath Mountains to the west and the Cascade Range to the east. Its

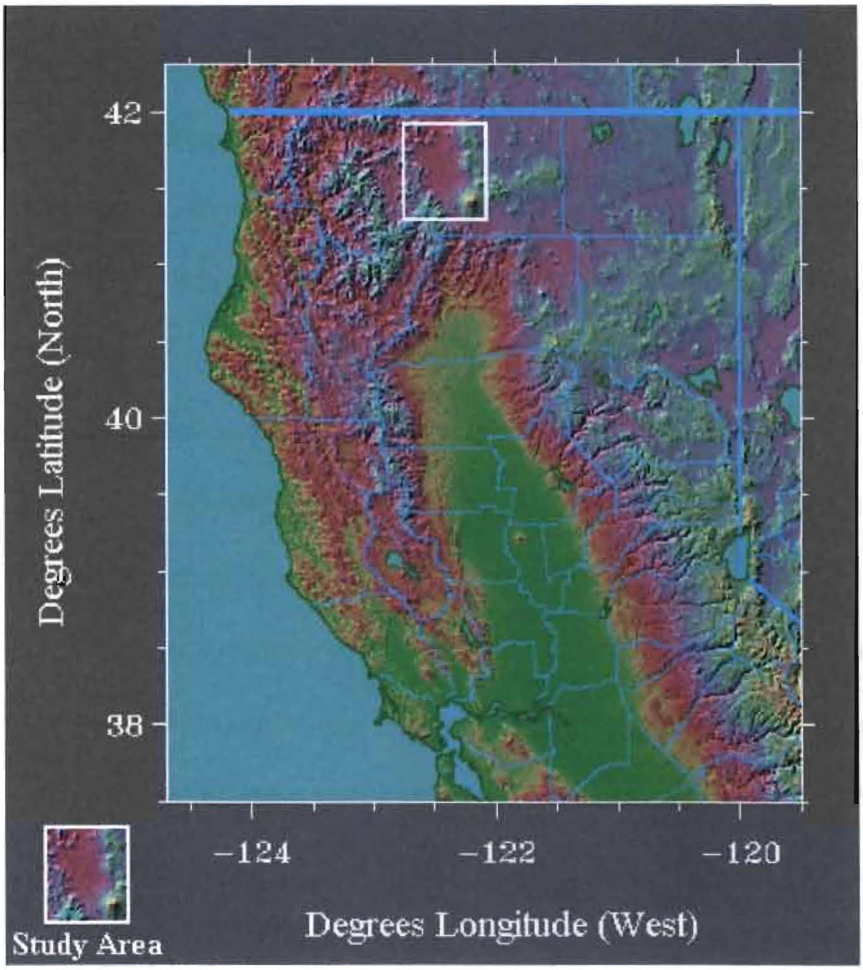


Figure 3. Location of study area in central Siskiyou County (Sterner 1995).

distinguishing features are the numerous hills scattered across the valley floor and Mount Shasta dominating the southeastern skyline. The outline of the valley floor is fairly well defined by the 1000-meter (3,200-foot) contour line. The Shasta River, with its source on Mount Eddy at the southwestern end of the valley, drains the Shasta Valley and flows north into the Klamath River, which in turn drains to the Pacific Ocean.

The study area generally corresponds with the drainage basin of the Shasta River and its tributaries (Figure 4). The Klamath Mountain peaks which flank the Shasta Valley on the west include, from north to south: Paradise Craggy, Badger Mountain, Antelope Mountain, Bonnet Rock, China Mountain, and Mount Eddy. The Cascade Range peaks on the eastern side of the Shasta Valley include, from north to south: Mary's Peak, Willow Creek Mountain, Ball Mountain, Goosenest, Herd Peak on Miller Mountain, Deer Mountain, Sheep Rock, the Whaleback, Mount Shasta, and Black Butte. Black Mountain and Bogus Mountain are sentinels at the northern end of the Shasta Valley, dividing the Willow Creek drainage basin, which flows directly into the Klamath River, from the Shasta River drainage basin.

The entire drainage basin of the Shasta River is included within the study area although, arguably, there are several locations that are not part of the Shasta Valley (Figure 5). Yreka is a reentrant valley separated from the Shasta Valley proper by the Kilgore Hills (formerly known as the Killdall Hills) on the northwestern side of Shasta Valley (Figure 5, #1). Yreka Creek drains this vale and is the northernmost major tributary of the Shasta River before it flows into the Klamath River. Weed is separated from the Shasta Valley proper by the hills between Weed and Edgewood

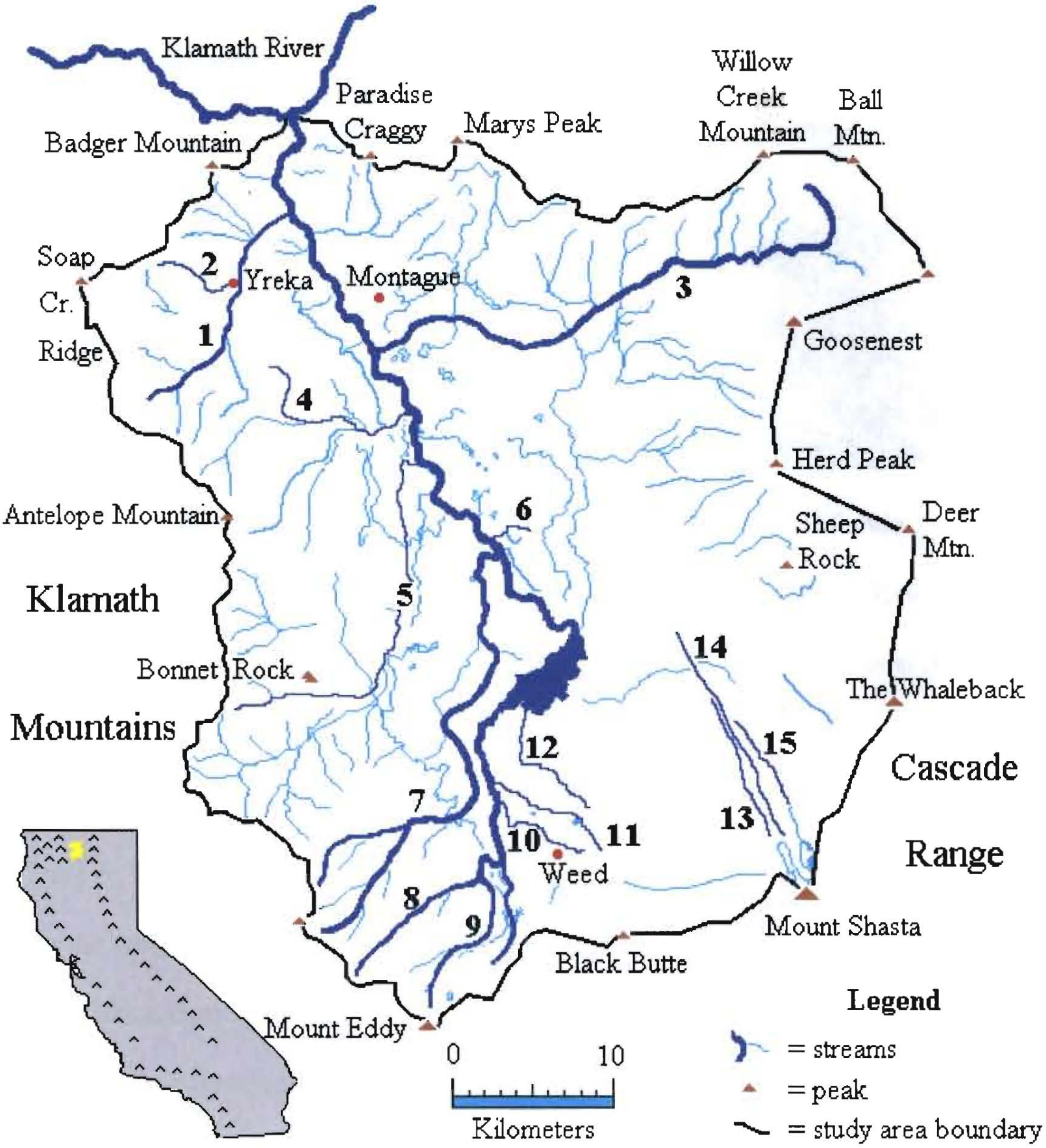


Figure 4. Shasta River and its major tributaries (dark blue). 1-Yreka Creek; 2-Greenhorn Creek; 3-Little Shasta River; 4-Julien Creek; 5-Willow Creek; 6-Big Springs Creek; 7-Parks Creek; 8-Eddy Creek; 9-Dale Creek; 10-Boles Creek; 11-Beaughan Creek; 12-Carrick Creek; 13-Graham Creek; 14-Whitney Creek; 15-Bolam Creek (Information Center for the Environment 1997).

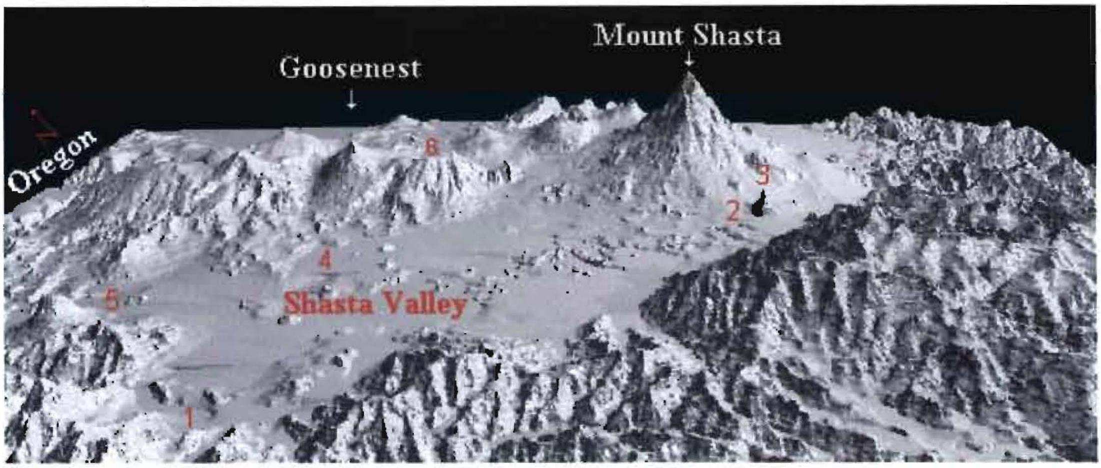


Figure 5. Digital Elevation Model (DEM) of Shasta Valley, California. View from northwest toward southeast. 1-Yreka Basin; 2-Weed; 3-Black Butte; 4-Little Shasta Valley; 5-Willow Creek drainage basin; 6-Grass Lake drainage basin (United States Geologic Survey 1997).

(Figure 5, #2). However, Boles Creek, Beaughan Creek, and Carrick Creek all flow from the western base of Mount Shasta through Weed city limits and into the Shasta River. Black Butte is located astride the divide between the Klamath drainage to the north and the Sacramento drainage to the south (Figure 5, #3). Black Butte is considered to be at the southernmost edge of the Shasta Valley for the purposes of this study. The Little Shasta Valley is on the eastern side of Shasta Valley and drains the region between Willow Creek Mountain and Goosenest (Figure 5, #4).

There are two areas that are excluded from this study of the Shasta Valley but which may be included as part of the Shasta Valley by others. The small valley north of Shasta Valley, where Willow Creek flows directly into the Klamath River (Figure

5, #5), is excluded from the Shasta Valley as it is in a different drainage basin. The Grass Lake region (Figure 5, #6), technically a part of the Shasta River watershed, is not included in this study as this sub-basin has internal drainage which does not flow into the Shasta River.

Geology

During the Jurassic Period (Table 8), about 200 million years ago, the supercontinent of Pangaea began to rift apart, partially along the suture zones of a former collision (Osborne and Tarling 1996; Courtillot and Vink 1983, Bonatti and Crane 1984). This continental rifting resulted in crustal extension and thinning which formed grabens and allowed mantle material to rise due to decreased pressure. Eventually, the continental rift zone subsided below sea level, the continental lithosphere parted, and a new ocean, the Atlantic, was born (White and McKenzie 1989). The birth of the Atlantic Ocean is part of the tectonic process which ultimately led to the geologic development of the Shasta Valley.

The seafloor spreading that occurred along the Mid-Atlantic Ridge resulted in the movement of the North American plate toward the west. This movement, in turn, resulted in subduction of the former Kula and Farallon oceanic plates beneath the western margin of the North American continent.

When the central portion of the Farallon plate subducted beneath the continental plate during the Oligocene 29 million years ago, the San Andreas fault came into existence (Figure 6). The northern remnant of the Farallon plate is called

Era	Period	Epoch	Age (mya)
CENOZOIC	Quaternary	Holocene	0.01 - present
		Pleistocene	1.6 - 0.01
	Tertiary	Pliocene	5.3 - 1.6
		Miocene	23.7 -5.3
		Oligocene	36.6 - 23.7
		Eocene	57.8 - 36.6
		Paleocene	66.4 - 57.8
MESOZOIC	Cretaceous		144 - 66.4
	Jurassic		208 - 144
	Triassic		245 - 208
PALEOZOIC	Permian		286 - 245
	Carboniferous		360 - 286
	Devonian		408 - 360
	Silurian		438 - 408
	Ordovician		505 - 438
	Cambrian		570 - 505
PROTEROZOIC			2500 - 570
ARCHEAN			3800? - 2500

Table 8. Geologic Time Scale (Geological Society of America 1983).

the Juan de Fuca plate and is composed of three major segments, the Explorer, Juan de Fuca, and Gorda platelets. The southern sections of the Farallon plate exist as the Rivera platelet south of Baja California, the Cocos plate to the west of Central America, and the Nazca plate west of South America.

Today the North American plate is moving southwestward at an approximate rate of 28 mm per year and the Juan de Fuca plate is moving northeastward at a rate varying between 20-60 mm per year (Hammond 1989; Trehu et al.1996). As the denser oceanic plates converge with the less dense continental plate they sink beneath the continent in a process known as subduction. Over time, as the Juan de Fuca plate

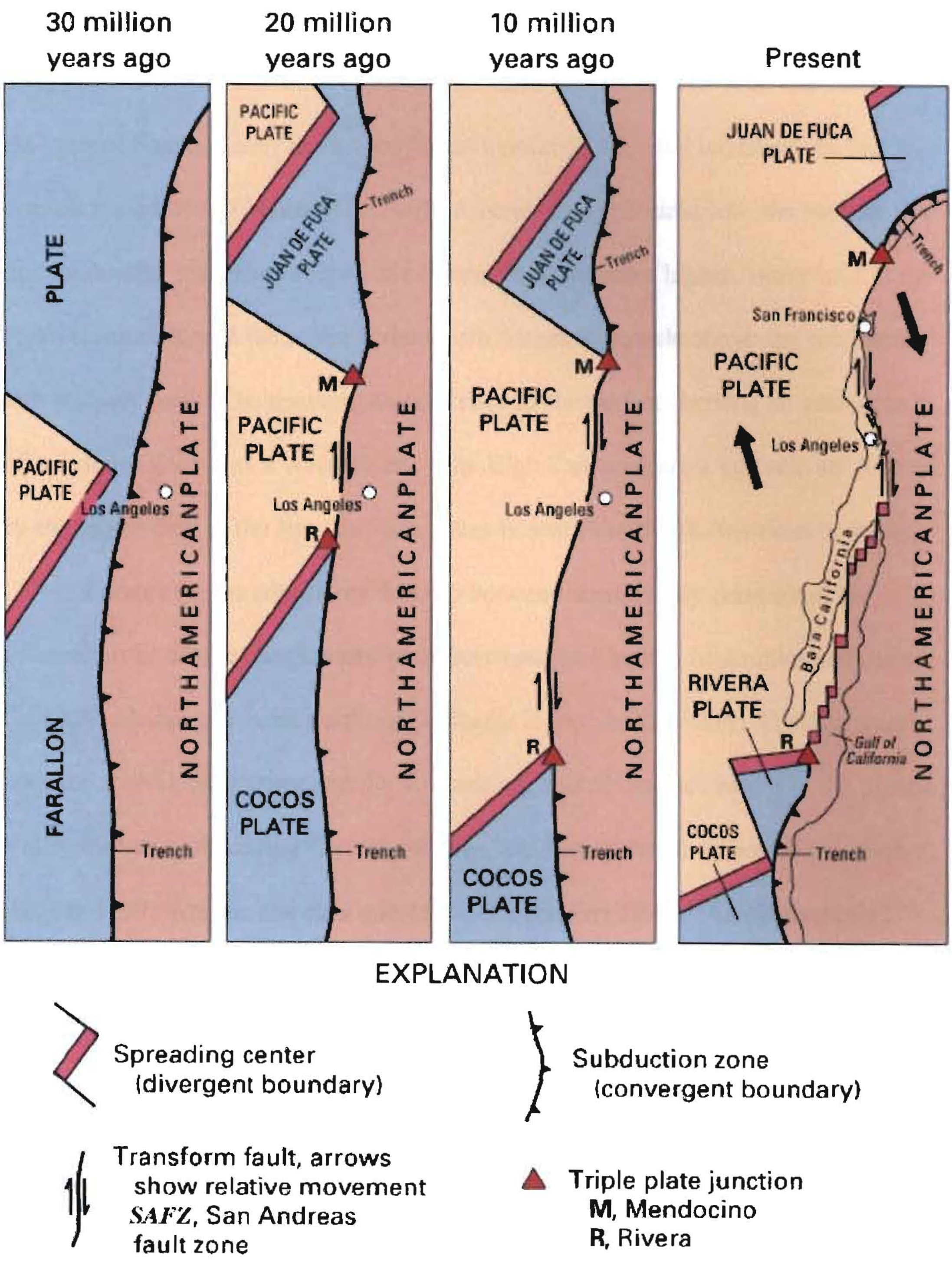


Figure 6. Subduction of the Farallon Plate beneath the western edge of the North American continent led to the development of the San Andreas Fault (Kious and Tilling 1996).

has subducted beneath the North American continent, parts of the seafloor have been scraped off onto the continent in a process called accretion. The Klamath Ranges to the west of Shasta Valley are a complex of numerous accreted terranes. As the oceanic plate suducts beneath the North American plate it sinks into the mantle. As this subducting slab dives deeper, the temperature becomes higher, water held in the rocks is released, and the rocks in the North American mantle above the subducting slab partially melt. The resulting magma rises to the surface forming an inland chain of volcanoes known as a volcanic arc. The High Cascades are a volcanic arc formed by the subduction of the Juan de Fuca plates beneath the North American continent.

Forearc basins commonly develop between accretionary prisms and the volcanic arcs. The former forearc basin between the Klamath Mountains and the pre-Cascade volcanic arc in far northern California is the Shasta Valley. Erosion from both the accretionary prism and the volcanic arc contributed sediments to the Shasta Valley forearc basin during Cretaceous time, producing the Hornbrook Formation (Blakey 1997; Wagner and Saucedo 1987; Orr and Orr 1999). All of the major valleys west of the Cascade Range were once forearc basins, including (from north to south) the Puget Lowland, the Chehalis basin, the Willamette Valley, Rogue Valley, Shasta Valley, and the Sacramento Valley (Hammond 1989).

Shasta Valley is considered part of the Cascade geologic province which formed during the Cenozoic Era. The oldest section of the Cascade Province is known as the Western Cascades. The major Western Cascade peaks in the study area are erosional remnants and intrusions and include Marys Peak, Terwilliger Peak, Gregory Mountain, Steamboat Mountain, Owls Head, Rabbit Hill, and Sheep Rock.

The Western Cascades are a sequence of arc volcanics dominated by andesitic lavas and breccias that were deposited between 39 and ten million years ago and overlie an assortment of pre-Tertiary terranes (Hammond 1989; McBirney and White 1982).

During the Pliocene Epoch andesitic and basaltic flows produced the lower peaks of the High Cascades. The Pliocene peaks in the study area are Willow Creek Mountain and Herd Peak on Miller Mountain (Wagner and Saucedo 1987). About 350,000 years ago, during the Quaternary Period, ancient Mount Shasta collapsed and formed one of the world's largest debris avalanches (Crandell et al. 1984). These deposits cover much of the valley floor and give the Shasta Valley its unusual topography. Overlying the ancient debris flow on the eastern side of the Shasta Valley is basalt, erupted about 300,000 years ago (Wood and Kienle 1990).

The current Mount Shasta was formed in four stages during the Quaternary. The Sargents Ridge cone was formed around 250,000 years ago; the Misery Hill cone formed about 130,000 years ago; the Shastina cone formed 9,600 years ago and the Hotlum cone 9,400 years ago (Christiansen 1990). Black Butte formed at about the same time as Shastina (Miller 1980). The Quaternary peaks of Mount Shasta, the Whaleback, Deer Mountain, and Goosenest are younger than the Pliocene Herd Peak, Willow Creek Mountain, and Eagle Rock, but all are considered part of the High Cascades (Wagner and Saucedo 1987). In addition to the Western Cascade and High Cascade formations, other geologic deposits crop out in the Shasta Valley. For example, Quaternary glacial deposits are found east of Lake Shastina and Holocene alluvium is found mainly in the northwestern portion of the valley.

Climate

Siskiyou County has the typical hot, dry summers and cool, wet winters characteristic of Mediterranean climates. Because of the higher latitude and elevation, some of the precipitation is received as snowfall. For the same reasons, the growing season in the study area is short, ranging from 126 to168 days in Yreka, and averaging 143 days in Montague (Newlun et al. 1983; Massey 1996). As in the rest of cismontane California, most precipitation in the Shasta Valley falls during the wet season, from October through March. Although the amount of yearly precipitation varies, all four stations in Shasta Valley receive over 70% of their total yearly rainfall during the wet season (Table 9).

The climographs of the three largest towns in Siskiyou County illustrate a Mediterranean climate with high summer temperatures and low summer rainfall (Figure 7). Weed is slightly colder and wetter than Yreka and Montague. Both factors are probably due to Weed's higher elevation.

Climate Station	Total Yearly Precipitation (in centimeters)	Precipitation During Wet Season (%)
Yreka	45.1	78
Montague	30.8	72
Edgewood	52.6	75
Weed	74.2	70

Table 9. Percent precipitation received at Shasta Valley climate stations from October through March (Elford and McDonough 1976).

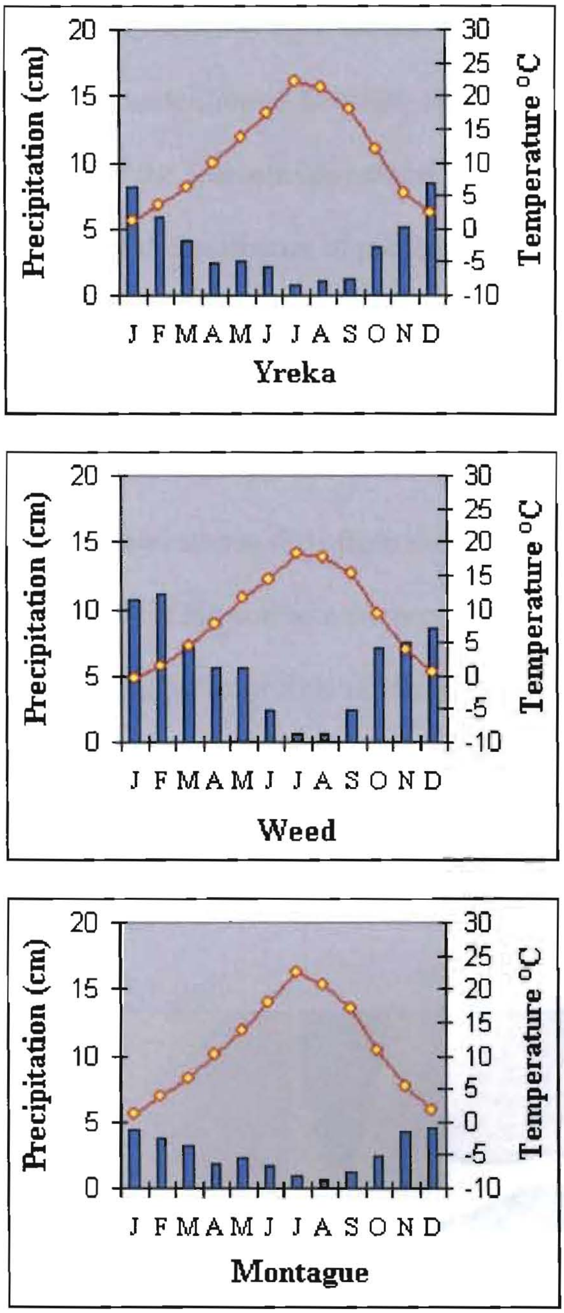


Figure 7. Climographs of Yreka, Weed, and Montague showing average monthly precipitation (blue) and temperature (yellow) (Elford and McDonough 1976).

The relatively high precipitation in the Cascades to the east of Shasta Valley contributes to stream flow and underground flow into the Shasta Valley. Shasta Valley lies in the rainshadow of the Klamath Mountains and is at a relatively low elevation. These two factors limit the amount of precipitation in Shasta Valley, with most of the valley receiving less than 50 cm (20 inches) of precipitation per year (Figure 8). Human activities in Shasta Valley, therefore, generally rely on irrigation or well water largely recharged by underground flow off of Mount Shasta, stream flow from the Cascade Range, and stream flow from the Klamath Mountains.

Winds are generally light in the northern portion of the study area. Montague has winds less than 26 kilometers per hour 89% of the time (Elford and McDonough 1976). In the mornings the winds in the Shasta Valley are lightest and ideal for ballooning (English 1999). In the southern section of the study area the winds tend

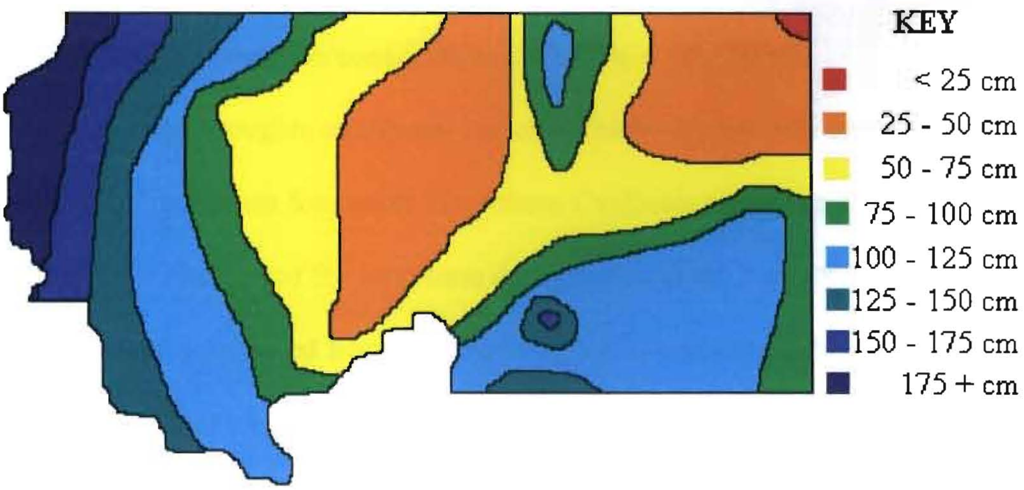


Figure 8. Isohyet map of Siskiyou County showing average annual precipitation (Elford and McDonough 1976).

to be stronger due to the effects of Black Butte funneling the winds. The lumber mill at Weed was located there due to the economic advantage of faster drying time of the lumber.

Elevational differences, along with the distance from the major source of precipitation, the Pacific Ocean, account for most of the variability in Siskiyou County's climate. During the winter the moisture is carried inland via extratropical cyclones. Northern California receives an average of five to seven storms during the wet season. If fewer than five storms occur it is likely to result in drought conditions (Bowling and Jercich 1996). The western half of the county is mountainous so the incoming moisture from the Pacific Ocean is readily uplifted and precipitated. The air descends after leaving the Klamath Ranges resulting in lower precipitation in the Shasta Valley. The air, still containing moisture, is again uplifted over the Cascade Range resulting in high precipitation in a north-south band along the range. Although most of the moisture is received from wintertime extratropical cyclones, summer afternoon thunderstorms also contribute to the yearly precipitation.

Short-term droughts commonly occur in California, but only two droughts have lasted for more than four years in northern California since record keeping began in 1850. The first of the long-term droughts occurred from 1929 to 1934. The second major drought lasted from 1987 to 1992 and is considered the most severe drought in California's history (Priest et al. 1993). Short-term droughts can also have severe impacts on the economy and environment. For example, the 1862-64 drought heavily impacted the developing cattle industry network in the American West

(Young and Young 1968) and the 1976-77 drought resulted in water-use regulations in California.

Tree-ring studies covering the years 1560 to 1992 in the Sacramento River Basin (the watershed immediately south of the study area) conducted by the Laboratory for Tree-Ring Research at the University of Arizona indicate that five long-term droughts of more than four years occurred during the 432-year period covered by the study (Priest et al. 1993). The tree-ring studies indicate that the 1987-92 drought was the second-worst historical drought, with the 1929-32 drought slightly more severe (Table 10). The 1593-95 drought was most extreme in terms of average annual runoff, but this drought lasted only three years, reducing its overall severity.

Period	**Length** (years)	**Average Runoff** (million acre-feet)
1579-82	4	12.4
1593-95	3	9.3
1618-20	3	13.2
1651-55	5	12.3
1719-24	6	12.6
1735-37	3	12.2
1755-61	6	13.3
1776-78	3	12.1
1793-95	3	10.7
1839-41	3	12.9
1843-46	4	12.3
1918-20	3	12.0
1929-34	6	9.9
1959-62	4	13.0
1987-92	6	10.0

Table 10. Multiyear droughts based on tree-ring studies in the Sacramento River Basin for 1860-1992 (Source: Priest et al. 1993).

Water Resources

Shasta River is a tributary of the Klamath River. The Klamath River is an outflow of Lake Ewauna, which is connected to Upper Klamath Lake in southwestern Oregon via Link River. The Klamath River traverses the Cascade Range near the California-Oregon border and flows through Klamath County in Oregon, and Siskiyou, Humboldt, and Del Norte counties in California. The Klamath River produces 16% of water flow in California and was declared a Wild and Scenic River in 1970 (Gentry 1986).

The tributaries of Shasta River (see Figure 4) include Yreka Creek, Greenhorn Creek, Little Shasta River, Willow Creek, Julien Creek, Parks Creek, Carrick Creek, Beaughan Creek, Boles Creek, Eddy Creek, Dale Creek, and Big Springs Creek and its tributary Little Springs Creek. Several streams flowing from Mount Shasta into the drainage basin but not directly into the Shasta River include Graham Creek, Whitney Creek, Bolam Creek, and Spring Creek. There are numerous seasonal and unnamed streams in addition to those listed above.

The natural drainage system affects human water usage. Yreka Basin has high groundwater storage in alluvial deposits. Water in the western Shasta Valley is somewhat high in magnesium and silica because of its source in a region of serpentine bedrock, the Klamath Mountains. Some areas on the southwest side are high in calcium due to the limestone formations. The soils in the western Shasta Valley are rich from an agricultural perspective, especially between the towns of Gazelle and Grenada, both located along the railroad. These soils are also conducive to good water storage and good wells. In the eastern portion of the valley, carbonated springs near Table Rock and the Bogus area are high in sodium and chloride. The groundwater in southeastern Shasta Valley is high in silica from the Plutos basalt. This basaltic lava flow supports the best aquifer in the valley (Newlun et al. 1983). Over the years several canals and ditches have been constructed and irrigation companies have been formed.

Soils

According to the general soil map (Figure 9), there are four major soil units in the study area: flood plain soils, foothill soils, Cascade Range soils, and Klamath Mountain soils. The flood plain soil units include 1) Settlemeyer-Diyou, 2) Gazelle, 3) Salisbury-Louie, 4) Stoner-Dotta, and 5) Delaney-Plutos. The foothill soil unit is 6) Lassen-Kuck-Mary. The mountain soil units include 7) Pinehurst-Bogus, a stony loam in the northeasternmost section of the study area, 8) Avis-Sheld-Iller, a stony sandy loam at the base of Goosenest, and 9) Ponto-Deetz-Neer, a sandy loam in the Weed area. Klamath Mountain soils in the study area include 10) Duzel-Jilson, a gravelly loam on the west side of the study area, 11) Marpa-Kinkel-Boomer, a gravelly loam in the southwestern section of the study area, and 13) lithic outcrops associated with either Klamath Mountain or Cascade Range peaks and scattered throughout the region (Newlun et al. 1983).

The Settlemeyer-Diyou soils occur along the flood plain of the Shasta River. These deep soils are alluvial and come from various sources. The main agricultural

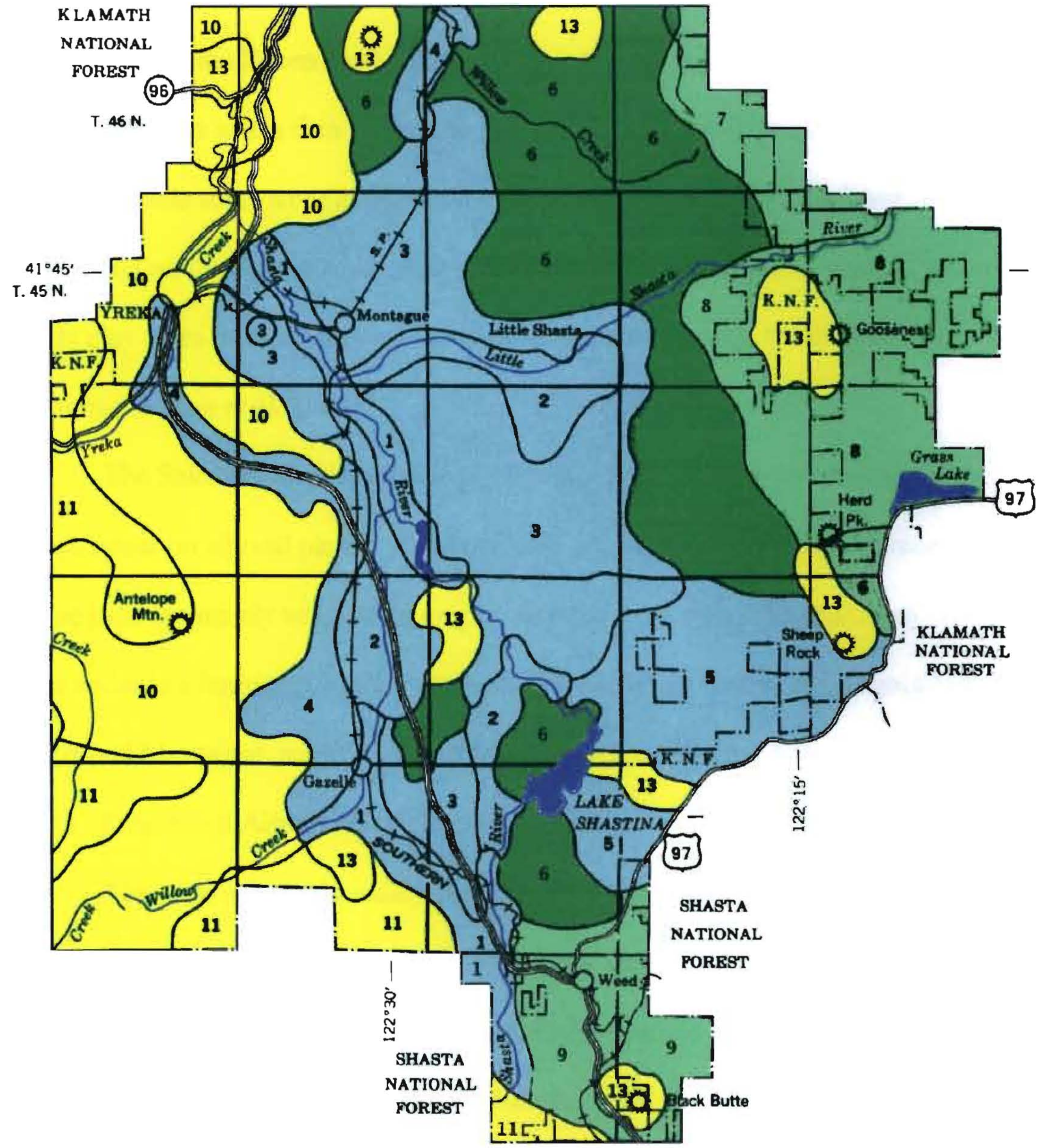


Figure 9. General Soil Map of central Siskiyou County. Blue- soils on flood plains, in basins, and on terraces, alluvial fans, and glacial outwash fans; dark green – foothill soils of the Cascade Range; light green – soils of the Cascade Range; and yellow – predominantly Klamath Mountain soils (Newlun et al. 1983).

use of this type of soil is livestock grazing. Because of the high water level, especially between December to June, it is recommended that cattle grazing be delayed until the soil is firm enough to withstand trampling (Newlun et al. 1983).

Gazelle soils occur along the flood plains of the Little Shasta River, Parks Creek, and on the Shasta River west of Lake Shastina. This poorly drained silt or sandy clay loam is underlain by a hardpan. Natural vegetation tends to be salt-tolerant (Newlun et al. 1983).

The Salisbury-Louie soils are thick, moderately-deep, well-drained soils which occur on alluvial plains. Salisbury soils are derived from mixed sources while Louie soils are mainly volcanic in origin. Both have an underlying hard pan. These soils underlie a large part of the Shasta Valley, occurring east of the Kilgore Hills, all around Montague, south of the Little Shasta River, and straddling Interstate 5 north of the Weed Airport (Newlun et al. 1983).

The west side of the valley from Yreka to Gazelle is predominantly composed of Stoner-Dotta soils (Figure 9, #4). These very deep, well-drained soils occur on alluvial fans. Suggested uses include cultivated crops, hay and pasture, rangeland, and housing. Most crops require irrigation (Newlun et al. 1983).

Delaney-Plutos soils (Figure 9, #5) are found on the northwestern slopes of Mount Shasta. They are found east of Lake Shastina and in Juniper Flats. The deep soils occur on glacial outwash fans. Some areas are overlain by basalt flows (Newlun et al. 1983).

Lassen-Kuck-Mary (Figure 9, #6) are foothill soils of the Cascades. These soils are found in the Western Cascade foothills on the east side of Shasta Valley and in the hills between Weed and Edgewood and those to the west of Lake Shastina. The Lassen-Kuck soils are a clay or clay loam and the Mary soils are loam (Newlun et al. 1983).

The Ponto-Deetz-Neer soils (Figure 9, #9) are located around Weed in the southernmost section of the study area. The Deetz soils formed on glacial outwash fans composed of volcanic material (Newlun et al. 1983). The Ponto-Neer soils are composed of volcanic ash and are associated with the Shastina and Black Butte pyroclastic flows.

Vegetation

The potential natural vegetation is closely allied with the climate and soil type (Figure 10). In the westernmost portion of the study area, oak woodland prevails. Grasslands and sagebrush steppes occur in the lower, central portion of the Shasta Valley. On the east side of the study area sagebrush with juniper predominates. In the higher elevations of the study area mixed pine forests are dominant. Chaparral is interspersed among the oak woodlands and mixed forests.

Historical Land Use

The original occupants of Shasta Valley were the Ahotireitsu (Shasta Valley Shasta), a subgroup of the largest tribe of the Shasta Nation (Plyley 1996; Renfro 1992; Kroeber 1953; Holt 1946). Few Shasta place names were adopted by the settlers. It appears that Peter Skene Ogden was the first outsider to use the name Shasta; he applied the name to a tribe, a river, and a mountain, but the mountain was

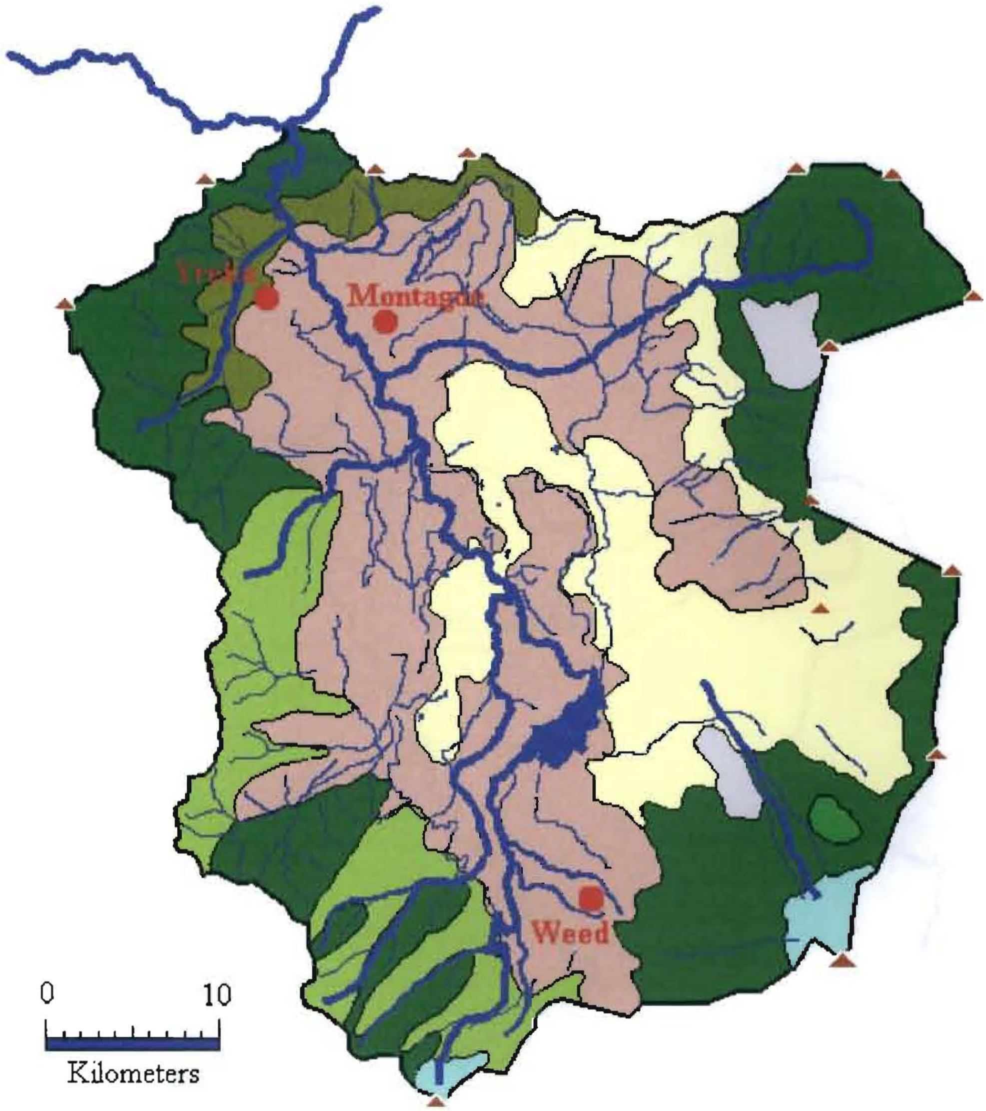


Figure 10. Potential natural vegetation map of Shasta Valley. Dark blue - water; light blue - snow or ice; light green - oak woodlands; green - mixed forest; dark green - conifer; olive green -chaparral; light yellow - shrub; beige - grassland; red - major towns (Information Center for the Environment 1997).

Mount McLoughlin, another Cascade peak, and the tribe, while still Shasta, was the Ikiruka'tsu (Rogue River Shasta) rather than the Ahotireitsu. The other toponym, Yreka, is most likely a corruption of *Wyeka*, meaning "pure white," the Shasta name for Mount Shasta (Renfro 1992; Zurflueh 1992; Gudde 1959; Wells 1881).

Most Shasta villages were located along the rivers and were especially abundant along the Shasta River, the Little Shasta River, Yreka Creek, and Willow

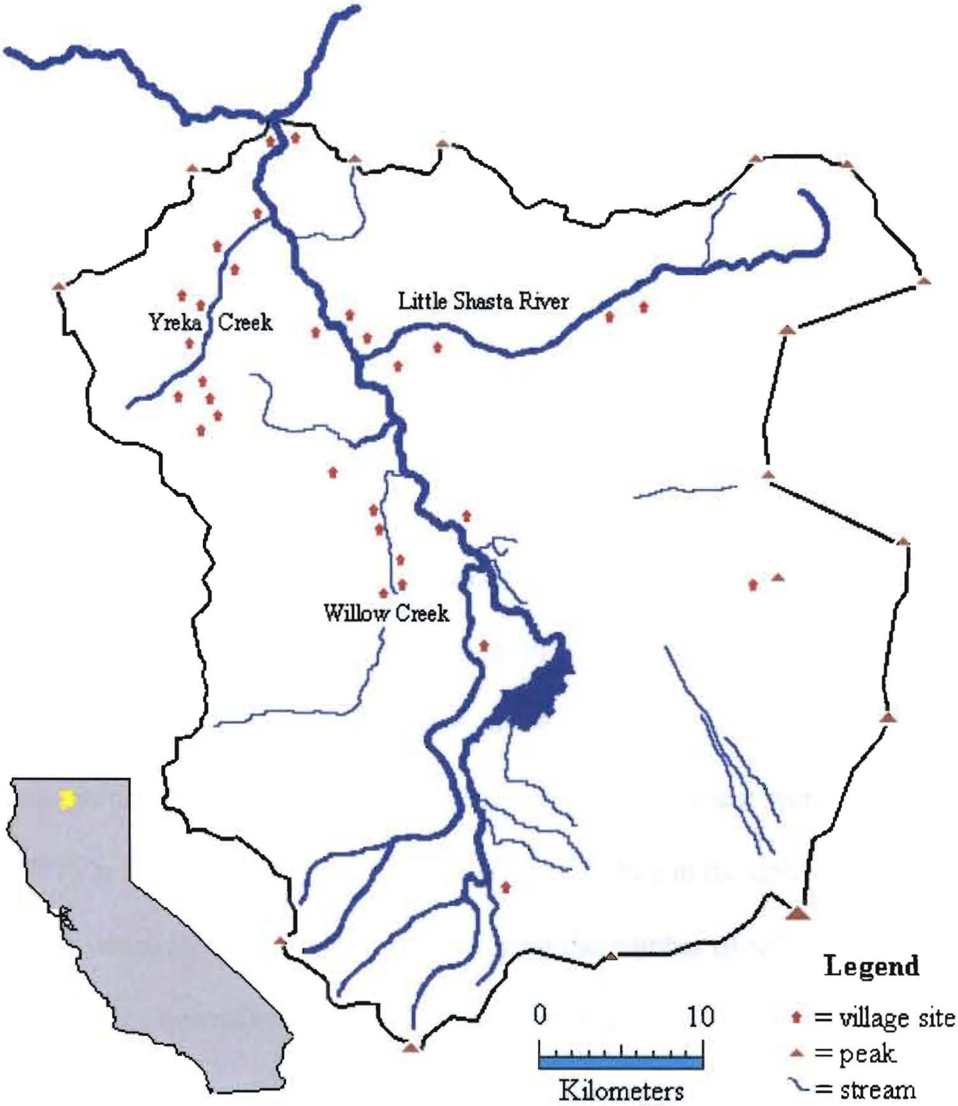


Figure 11. Location of Ahotireitsu villages in Shasta Valley (Heizer and Hester 1970; Information Center for the Environment 1997).

Creek (Figure 11). Village sites were also located at springs or near other water sources. Although the villages were permanent, the Shasta followed a cyclical food quest, constructing temporary housing at gathering, fishing, and hunting sites.

The trade network to which the Shasta belonged enabled them to exchange goods and ideas, and arrange marriages and alliances. Many of the Indian trails were later used by explorers and settlers.

Fur traders entered the Shasta Valley in 1826 with the coming of Peter Skene Ogden and, soon thereafter, Alexander Roderick McLeod, both of the Hudson's Bay Company. In addition to trapping beaver on their own, the newcomers obtained pelts from the Shasta in exchange for trinkets and tools. Exchange with the fur traders put an increased stress on fur-bearing mammals of the region (Plyley 1996).

The next wave of newcomers were the immigrants who crossed the Shasta Valley along the California-Oregon Trail between 1828-1849 (Miess 1993). When gold was discovered by Abraham Thompson in the Yreka region in 1851, this brought an immediate influx of miners from all parts of the world. Within six weeks, the population increased to 2,000 (Holbrook 1955) and by 1857 there were 5,000 people (Wells 1881) in the Yreka area. Mining processes resulted in the destruction of the streambed in which the salmon spawned, reducing the number of salmon.

As soon as miners entered the Shasta Valley region in great numbers, a market existed for farming and ranching. Within the year, farming in the Shasta Valley commenced with the cultivation of barley, wheat, corn, potatoes, cabbages, turnips, and beets (Wells 1881). Ranching also increased due to market demand. With the arrival of settlers, the need for housing increased and so did lumber production. At first, horses, oxen, and wagons were used to haul the timber but changing technology increased production until the timber industry became the mainstay of Siskiyou County.

The logging techniques used by the Weed Lumber Company varied over time. Prior to 1907 most of the logging was done by muscle power. Horse-drawn logging carts, called big wheels, pulled the logs to the railroad (Figure 12). There were two, four, and even six or eight horses per cart, depending on the steepness of the slope and size of the log. At the track the logs were team-loaded onto the cars. During this time period logging was limited to the flatlands and lower slopes. When logging first began on Goosenest around 1908, horses and big wheels were still being used (Zimmerman and Linville 1999).

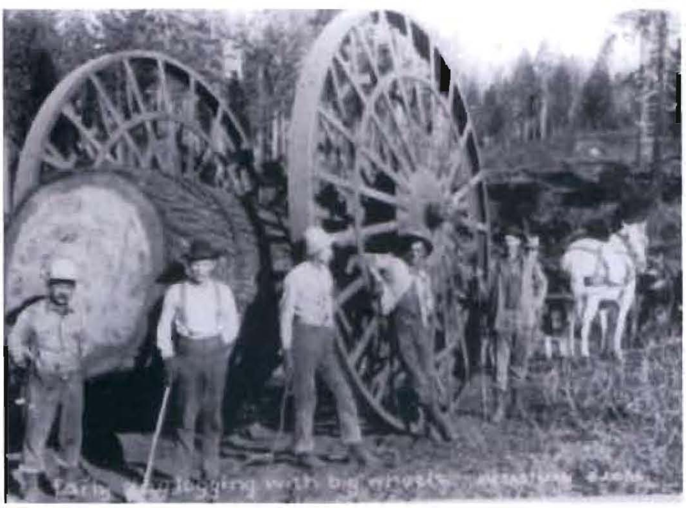


Figure 12. Early day logging with big wheels (Photo by J. H. Eastman circa 1900 courtesy Weed Historic Lumber Town Museum).

New technologies advanced as fast as the railroad, changing logging practices. By 1909 winches run by steam-powered donkey engines were used to haul logs to the tracks. By 1915 the Clyde Universal skidder and McGiffert loader were in use in the Goosenest area (Figure 13).

In the early 1920s Weed Lumber Company purchased a Titanic, a very powerful skidder that "really tore up the ground" (Linville 2000). The skidder, especially the Titanic (Figure 14), was largely responsible for damaging logging practices that killed virtually all the seedlings (Shoup 1987; Goosenest Ranger District 2000). Long-Bell sold the Titanic to the Longview facilities sometime after 1928 because the Forest Service was no longer allowing its use in the national forests (Shoup 1987; Linville 2000).

Figure 13. Loading logs with a McGiffert, 1916 (Photo by C. A. Miller courtesy of Weed Historic Lumber Town Museum).

Figure 14. The Titanic, 1916 (Photo by C. A. Miller, courtesy Weed Historic Lumber Town Museum).

In the mid-1920s Caterpillar tractors began to replace steam skidders (Shoup 1987; Linville 2000; Goosenest Ranger District 2000). "Cats" were mainly used on the upper slopes of Goosenest to skid the logs but loading was still done by a McGiffert. During World War II, cats were used on the higher slopes to harvest the fir used to make boxes to hold ammunition. Fir was not harvested much before that, except for butter boxes, as pine boxes would make the butter taste like turpentine (Linville 2000).

The outstanding logging patterns on Goosenest are closely related to the coming of the Central Pacific Railroad to Siskiyou County, changing technology, and the post-World War I boom which created a high demand for timber. Many factors influenced the final pattern which we can now see in satellite imagery. One of the major patterns is a result of the checkerboard layout of lands given to railroads as an incentive to build. The checkerboard pattern itself is a product of the United States Public Land Survey established in 1785. The Homestead Act of 1862, granting 160 acres (equal to a quarter section), also influenced the pattern we see. Time is another important factor as it determines the type of technology used, the amount of time the forest has had to recover, and the prevailing economy of the time during which logging occurred.

The size and outlook of the lumber companies often played a major role in the outcome of the forest after logging, with the smaller companies tending to have less impact on the land than the larger companies which generally operated at a faster pace. It is well known in the region that Weed Lumber Company and its successor Long-Bell Lumber Company, like many timber companies of the time, logged areas with little concern for the environment. This fact was recognized as early as 1908, when a Forest Service employee recorded in his field report, in reference to Weed Lumber Company, "*Under the present management and system of logging it seems certain that the logged area will become a non-producing brush covered tract of little value for grazing or any purpose though its value as a watershed will be only slightly reduced*" (Smith 1908). It became an even greater concern with the advent of skidders which accompanied the high demand for lumber after World War I. The Forest Service eventually banned the use of certain types of skidders, namely the Titanic, on their tracts of land. Weed used heavy-duty steam-powered skidders in the Goosenest area extensively from about 1917 to 1928 (Shoup 1987). The introduction of the gasoline tractor in the 1920s improved logging techniques but skidders continued to be used alongside Caterpillar tractors for several years (Goosenest Ranger District 2000). By the time International Paper bought out Long-Bell in 1956, the Caterpillar tractor was the exclusive skidder. The modern-day form of clear-cutting, which obliterated evidence of prior logging techniques, occurred after this time. The type of earlier over-logging done by Weed Lumber Company/Long-Bell is referred to as a Klamath Cut by the Klamath National Forest (Goosenest Ranger District 1999).

Land use in the Shasta Valley has changed over the years, but fishing and hunting, mining, agriculture, and logging have remained the foundation of the economy. Logging on the southeastern side of the study area, agriculture on the southwest side of the study area, and the impact of droughts in the central portion of the study area are examined in Chapters III and IV. The methods used in processing the satellite data are described in Chapter III while the results are presented in Chapter IV.

CHAPTER III

METHODS

Introduction

Several types of images are utilized in this project. The primary source of data was Landsat satellite imagery. Three multispectral scanner (MSS) scenes, one thematic mapper (TM) scene, and one enhanced thematic mapper plus (ETM+) scene were used (Table 11). Historical maps, images, and air photos were also utilized. The background content for this project was mainly gathered from the pamphlet files and Mount Shasta Collection at the College of the Siskiyous Library, the Siskiyou County Courthouse, and maps and pamphlets from the Yreka and Macdoel offices of the Klamath National Forest.

Idrisi for Windows Version 2.0 software was used to process each of the satellite datasets. *Idrisi* is a low-cost, raster based geographic information system (GIS) and image processing system developed by J. Ronald Eastman of Clark University. Directions for processing the data were obtained from *The Idrisi for Windows User's Guide* (Eastman 1997), Earth Science courses taken from Emporia

Sensor	Date	Scene ID
MSS	June 29, 1974	LM1048031007418090
MSS	June 13, 1985	LM5045031008516490
MSS	June 8, 1992	LM4045031009216090
ETM+	July 14, 1999	L71045031-03119990714

Table 11. Satellite datasets used in study.

State University (Aber 1997; Aber 1998), and *Processing Multispectral Scanner Data with Idrisi*, a portion of the *Scanning Shasta from Space* online presentation (Freeman 1998).

The satellite datasets were obtained through the United States Geological Survey Global Land Information System. The satellite datasets were provided on a CD-ROM. The steps that need to be taken to put MSS, TM, and ETM+ data into a format which can be read by Idrisi are described under Preprocessing the Data.

After the data are preprocessed, the different bands can be combined in various ways in order to create an image that can then be interpreted. The most common method is creating composite images using 3 bands of data. Different bands emphasize various aspects of the environment allowing the user to select the band combination most suited to what is being studied. For example, MSS band 1 (0.5-0.6 μm) is ideal for water studies because this bandwidth is best able to penetrate water. Ratio images remove the effect of shadows and allows the inclusion of more bands of data. The Normalized Difference Vegetation Index (NDVI) is a special kind of ratio image that detects the vigor of the vegetation. Composite ratio images allow the combination of single bands and ratio images. Unsupervised classification is a method of clustering natural groupings of the data in order to create thematic map-like images.

After describing the steps used to process the data, three hypotheses, utilizing these procedures to test them, are set forth. The impact of the 1987-1992 drought on Shasta Valley is examined by creating a Boolean image using a MSS band 4/2 ratio and comparing it with NDVI images. A land-use map of the Gazelle region is created using unsupervised classification of a composite ratio image ETM+ satellite data and NAPP air photos. Finally, the impacts of logging on Goosenest are inspected using unsupervised classification of a composite image created from ETM+ data.

Preprocessing the Data

There are five files which are essential to preprocess MSS scenes: the *.hd and the four *.i<bandnumber> files. The *.i<bandnumber> files need to be renamed. The number after the .i in the extension is the band number, which should be used in the file name. The extension needs to be changed to .img. So, for example, I changed Lm404503.i1 to sv1992-1.img, Lm404503.i2 to sv1992-2.img, Lm404503.i3 to sv1992-3.img, and Lm404503.i4 to sv1992-4.img (where sv stands for Shasta Valley, 1992 is the year the scene was obtained, and the number following the dash is the band number, followed by the .img extension).

The *.hd file contains the information needed to make a *.doc file which will accompany each band. The *.doc file should look like the information shown in the left side section of Table 12. Note that this is a text file saved with a .doc extension; the extension *Idrisi* uses for the documentation file which provides needed information about each image file. A *.doc file was made for each band, using the same naming scheme used for the image files but with a .doc extension. The section on the right (Table 12) shows either what to put in or where to get the information. The only things that will be different between the files for each band are the band number on the file title, value units, and the minimum value and maximum values, which are temporarily set at 0 and 255 respectively.

*.doc File Contents	Information to put in *.doc File
file title : MOUNT SHASTA (08 JUNE 92) BAND 1	give title a NAME, DATE, and BAND #
data type : byte	data type is from the line PIXEL_FORMAT=
file type : binary	leave file type as binary
columns : 3446	the columns # is from PIXELS_PER_LINE=
rows : 3519	the rows # is from LINES_PER_DATA_FILE=
ref. system : plane	leave ref. system : plane
ref. units : km	leave ref. units : km
unit dist. : 1	leave unit dist. : 1
min. X : 0	min. X = 0
max. X : 196.422	to get max. X multiply columns # by resolution
min. Y : 0	min. Y = 0
max. Y : 200.583	to get max. Y multiply rows # by resolution
pos'n error : unknown	leave pos'n error : unknown
resolution : 0.057	resolution is found at PIXEL_SPACING= (km)
min. value : 5	for now make min. value : 0
max. value : 127	for now make max. value : 255
value units : mss 1	make value units the band number after the mss
value error : unknown	leave value error : unknown
flag value : none	leave flag value : none
flag def'n : none	leave flag def'n : none
legend cats : 0	leave legend cats : 0

Table 12. How to create an *Idrisi* *.doc file for a band of Landsat MSS dataset.

The DESCRIBE feature of *Idrisi* provides information about each band. File - DESCRIBE was selected from the MenuBar (or the Describe button could be selected). This is the information needed to modify the files so they are usable in *Idrisi*. After examining the data, the Image Histogram button is selected to see a histogram of the data (Figure 15). This provides a graphical view of the data; it also provides a statistical summary to the right of the graph (not shown).

At this point the minimum and maximum values are adjusted in the *.doc file to reflect the values seen in the histogram. One of the last preprocessing steps is to determine the size of the file by multiplying rows by columns then dividing by 1024 (for byte size).

It may be that the scene is too large for the situation (limited computer memory or delimited study area). The *.img files and their accompanying *.doc files can be resized all at once through the WINDOWS command (Table 13). After viewing the entire scene to find where to place the corners, Reformat - Window was selected from the MenuBar. Batch-window was selected, then the image files (each band) to be resized were chosen from the Input image list. The initial characters were replaced with a prefix so the original data was not erased. The upper left column and row and lower right column and row numbers were selected and the image files were all resized after the OK button was selected.

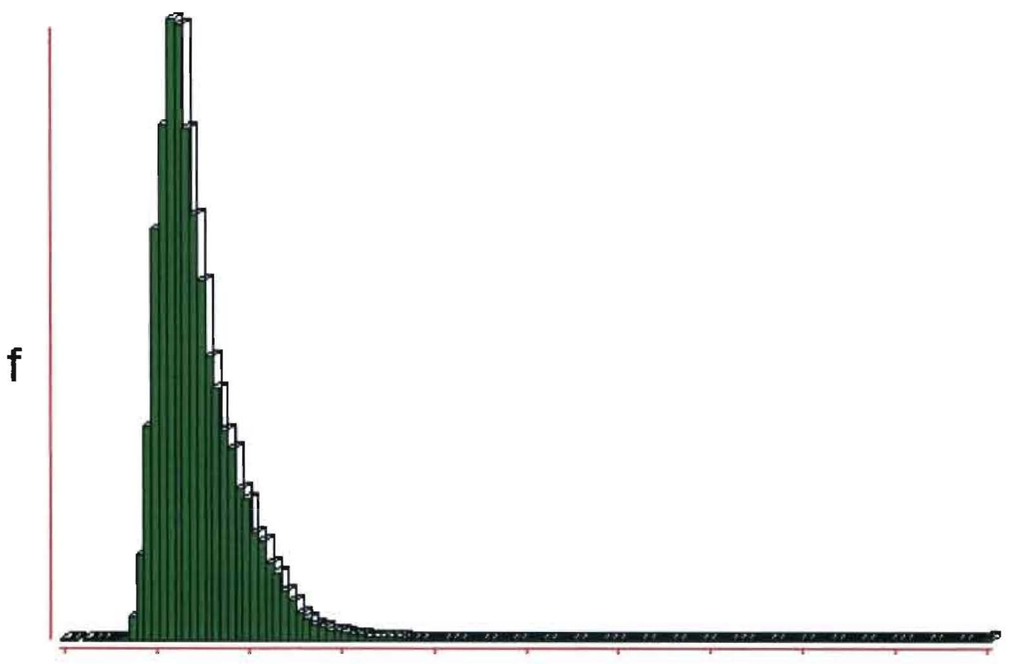


Figure 15. Histogram of MSS band 1 of the June 1992 scene (f = frequency, x-axis represents reflectance data values or derived data with a maximum range of 0-255).

Sensor	Scene Date	Windowed Area			
		Upper-Left Column	**Upper-Left Row**	**Lower-Right Column**	**Lower-Right Row**
MSS	June 29, 1974	475	1695	1720	2940
MSS	June 13, 1985	1040	1140	2599	2979
MSS	June 8, 1992	1040	1140	2599	2979
ETM+	July 14, 1999	2680	2350	4609	5348

Table 13. Windowed areas of satellite scenes used in study.

The windowed scenes are slightly larger than the actual study area. This was done for two reasons. First, landmarks outside the study area (such as Black Mountain) provide a visual reference to the viewer in determining the location of features in the scene and contain sites relevant to the study area (such as Copco Reservoir). Second, some images are georeferenced later to make the top of the image due north; extra room is needed to achieve this. In satellite studies of smaller parts of the study area, the column and row numbers of the windowed subscene are in reference to the windowed subscene of the Shasta Valley, not the original scene in its entirety.

Pre-processing TM data is similar to pre-processing MSS data, except that there are seven bands rather than four. Preparing ETM+ data, on the other hand, is significantly different; pre-processing ETM+ data is described below.

The data for ETM+ is stored in a GEOTIFF (*.tif) format. The main difference between ETM+ and MSS or TM datasets is that the header information needed to create the *.doc file is attached to the *.tif file, which will eventually become the *.img file. Another difference is that band 6 is separated into two files;

the first low-gain and the second high-gain. Band 6 was not used in this study. A new panchromatic band is included in Landsat 7 data and requires a different type of pre-processing than the rest of the bands.

Rename bands 1-5 and 7 as an *.img file, making sure to include the band number in the file name. Place these files in their own directory then set the Environment to that directory. Open each band one at a time using the Import/Export utility then choose Import – General Conversion Tools – PARE. Provide a new name for the output file (again including the band number), enter 8 bytes for the header size, select 8 bit for the data size then click on Continue. Enter the number of columns and rows based on the CD cover label. Keep the Reference System as plane but choose kilometers (km) for the Reference Units. Enter 0 for the minimum x- and y-units. For the maximum x- and y- units multiply the number of columns and rows by the resolution (0.03 km). The process takes several minutes for each band. After Paring, the minimum and maximum values can be set by viewing the histogram.

Composite Images

A composite image is made by combining three bands of data into one image. Each band has a color (red, green, blue) assigned to it before they are combined. Because MSS does not record the blue portion of the spectrum, an image which corresponds to what our eyes would see cannot be easily prepared and so the images are called false-color composites (Avery and Berlin 1992; Aber 1997; Aber 1998).

Using different band/color combinations allows certain features of the environment to be emphasized. The most common MSS composite image uses band

1 (blue), band 2 (green), and band 4 (red) and is called a standard false-color composite. Using this particular band/color combination, water shows up as blue to black, with clear, deep water darkest and shallow, silty water a lighter blue. Vigorous vegetation shows up as red and other vegetation as pink. Cities appear as bluish-gray and clouds and snow are white. This type of composite image is sometimes called a color-infrared composite because it resembles color-infrared photography (Avery and Berlin 1992; Aber 1997).

Constructing composite images is probably the most useful feature in *Idrisi* or other remote-sensing software packages. To make a composite image, Display - COMPOSIT was selected from the MenuBar. The filenames of the blue band, the green band, and the red band were entered and the new (Output) image was given a filename. Linear with Saturation Points was selected to chop off the tails of the histogram, with the Percent to be Saturated at 5.0. A title, which should include the name of the scene, the date, and the bands used, was entered. The image was created after the OK button was selected. The Color Composite 256 palette was used to view the image. The images selected to be used in the atlas were exported as *.bmp files then changed to *.jpg files in *Paint Shop Pro* 5.

Ratio Images

Band ratioing is accomplished by dividing each pixel in one band by the corresponding pixel in another band until all pixels have been processed. Ratioing removes shadows caused by the topography and sun position. Ratioing also emphasizes colors, enabling better interpretation of the image. Using MSS data, there are 12 different band ratio combinations (Avery and Berlin 1992; Eastman 1997; Aber 1997; Aber 1998).

Prior to ratioing bands, haze correction needs to be performed to reduce the effects of atmospheric scattering and to eliminate exaggeration of noise (Avery and Berlin 1992; Aber 1997; Aber 1998). It should be kept in mind that there cannot be a zero in either the numerator or denominator and that the minimum value of each band should be 1. Therefore, each band needs to be examined with the DESCRIBE feature in *Idrisi*. After noting the minimum value, the mathematical operation needed to normalize that number to one needs to be determined. This is done through SCALAR by selecting Analysis - Mathematical Operators - SCALAR from the MenuBar. After choosing the Input File and a providing a name for the new image (Output File), select the proper Operation needed, then enter the number to be added or subtracted in the Scalar Value box. For record-keeping purposes, the operation performed (such as +1 or -15) was recorded in the Value Units box. Finally, the image was given a title, such as "Band 1 Haze Corrected," and OK was selected. Each band needs to be processed in this fashion.

After each band is haze corrected, a ratio image can be made. Analysis - Mathematical Operators - OVERLAY was selected from the MenuBar (or one could click on the OVERLAY button on the ToolBar). The desired haze-corrected bands were selected for the First and Second image and a filename was chosen for the Output image. The Overlay Option was selected, which was First/Second for the basic ratio image. The image was provided with a title, such as "Band 1/Band 2," ratio for the value units is entered if desired, and the OK button was selected.

Different ratios have different uses. For example, MSS band 4/2 is good for estimating the health of vegetation because the near infrared values (band 4) increase and the red values (band 2) decrease in healthy vegetation, resulting in a high ratio value for healthy vegetation. MSS ratios using band 3/2 or band 2/3 are good for differentiating between soil or rocks and vegetation (Avery and Berlin 1992).

In order to use these ratio images later in making composite images, they need to be changed to byte-binary. This can be accomplished by using SCALAR to multiply by a number that will increase the maximum value to somewhere between 240-255. The file is then converted to byte-binary format by choosing Reformat - CONVERT from the MenuBar. The Input File is entered and a name provided for the Output file. Byte was selected for the Data Type and Binary for the File Type by Rounding then OK was selected to complete the operation. In addition to making this file more usable, it also makes it smaller.

Normalized Difference Vegetation Index

The Normalized Difference Vegetation Index (NDVI) is a special ratio used to detect vegetation. Because plants absorb red for photosynthetic processes and reflect infrared radiation, there will be a wide range between red and infrared in healthy vegetation (Avery and Berlin 1992; Eastman 1997; Aber 1997; Aber 1998). To offset the effects of shadows, the NDVI divides the difference between the infrared and red bands by the sum of the infrared and red bands, thus NDVI = (infrared - red)/(infrared + red).

The process used to prepare an NDVI ratio is the same as that for a normal ratio, except instead of choosing First/Second for the Overlay Option, select (First - Second) / (First + Second) and enter NDVI for Value Units. Using MSS data, the First image must be either band 3 or 4 (infrared) and the Second image is band 2 (red) whereas in a Thematic Mapper scene the First image is band 4 and the Second image is band 3.

NDVI images are useful to compare scenes between seasons in the same year or between like seasons in different years. This may enable the cycle of growth in a region to be determined or the effects of drought to be examined. NDVI images can also show deforestation or desertification if scenes from different years are available.

Composite Ratio Images

Composite Ratio Images are made in a manner similar to preparing regular composite images, but instead of combining three single bands, a combination of any three bands or band ratios can be utilized. If mixed band ratios and single bands are used, the image is referred to as a hybrid-ratio image. The files are changed to byte-binary format as described at the end of the Ratio Images section above.

Composite Ratio Images allow the display of more of the data. Using single bands, only three of the available bands can be utilized. With composite images that use at least one ratio image, it is possible that information from four bands is utilized. With the 12 ratio images, the NDVI image, various filtered images, plus the original 4 bands of data there are numerous possible combinations that could be prepared.

Unsupervised Classification

An unsupervised classification is a technique in which data values are clustered together by the computer and then the analyst tries to determine which natural or cultural feature each class refers to. Clustering data is a way to construct a thematic map of the image using natural groupings of the data.

To make a composite image, Analysis - Image Processing - Hard Classifiers - CLUSTER is selected from the MenuBar. The composite filename to be used is chosen, an output image name is made, the default settings are left as is, and the image is given a title. When displaying the image, a palette with 16 colors that are easily distinguished from each other is best.

ISOCLUST, a special type of clustered image, was also utilized. ISOCLUST is an iterative self-organizing cluster analysis module which clusters pixels of similar reflectance values. ETM+ bands 1-5 and 7 are used along with a composite "seed" image in the ISOCLUST module. A composite image of bands 3, 4, and 5 made with 1% linear saturation is suggested for use as the seed image as these bands collectively cover the greenness, brightness, and moisture content of the land being analyzed. The recommended three iterations and arbitrary ten clusters using the Qualitative16-color palette were used (Eastman 1997).

Boolean Processing

Boolean images are created by selecting Analysis – Database Query – RECLASS from the MenuBar. After selecting image as the file type and providing a new filename for the output image, new values are assigned to each pixel. In the case of creating Boolean images showing cleared versus vegetated regions on Goosenest, values representing cleared areas and vegetated areas were recorded. There was no overlap in these recorded values but for some scenes there was a gap in numbers which had not been assigned to either category. In this case, the number halfway between the highest value of cleared areas and the lowest value of vegetated areas was chosen as the cutoff point for assigning a pixel number to value 0 or value 1. After a Boolean image is created, the database can be queried for values such as area.

Three Hypotheses

The processing methods described above were used to compose images that help illuminate various patterns in the study area. The images are used to illustrate textual descriptions of specific features located in the Shasta Valley. Furthermore, three hypotheses are examined from a remote sensing perspective, namely:

1) The percent water coverage on Shasta Valley floor subscenes examined using ratio and Boolean processing of Multispectral Scanner data will correlate with relative drought conditions.
2) Land-cover in the region around Gazelle, California are discernible using unsupervised classification of Enhanced Thematic Mapper Plus satellite data.
3) Areas logged by Weed Lumber Company are distinguishable using unsupervised classification of Enhanced Thematic Mapper Plus data.

Examining the 1987-1992 Drought with Multispectral Scanner Data

Three MSS datasets were chosen to examine the effects of drought in the study area. All scenes selected had a cloud cover of less than 10% and were acquired in June for a better multi-temporal perspective. The earliest scene was gathered on June 29, 1974 prior to the short-term 1976-77 drought, yet forty years after the end of the last major drought in California. This scene provides a view of the long-term average non-drought conditions in the study area. The next scene was acquired on June 13, 1985. This scene was selected to be as far in time from the short-term 1976-77 drought as possible, yet before the severe 1987-92 drought. Finally, the last scene used in this study was gathered on June 8, 1992 to depict the most severe conditions of the 1987-92 drought.

Prior to processing the data, the subscenes of the study area were further windowed to exclude most of the mountainous perimeter and to include the bodies of water on the floor of the Shasta Valley (Table 14). Each windowed subscene covers nearly the same area and extends from near Badger Mountain in the northwest to near Black Butte in the southeast.

Sensor	**Scene Date**	Windowed Area			
		Upper-Left Column	**Upper-Left Row**	**Lower-Right Column**	**Lower-Right Row**
MSS	June 29, 1974	129	305	705	1027
MSS	June 13, 1985	225	638	794	1362
MSS	June 8, 1992	196	674	764	1400

Table 14. Windowed areas of Shasta Valley sub-scenes.

After windowing the subscenes, each band was haze corrected and a 4/2 ratio was made from the 1974, 1985, and 1992 subscenes. This ratio was selected because water absorbs infrared radiation (band 4) and reflects red light (band 2). Each 4/2 ratio was then made into a Boolean image showing land and water and the area of each determined. It is predicted that the 1974 and 1985 scenes will have a higher percentage of water than the 1992 drought scene. The results of this exercise are presented in Chapter IV.

Satellite Mapping of Cropland in Gazelle, California

Gazelle is a small town located along the Southern Pacific Railroad and Old Highway 99 on the western side of the Shasta Valley. The farmlands around Gazelle have some of the best soils in Shasta Valley, experience one of the mildest climates, and have a good supply of water. This combination has resulted in one of the most concentrated geometric field patterns in the valley. A land-cover map using level-one categories (see Table 3), including the location of built-up areas, agricultural area, rangeland, forests, water, and wetlands, was made using unsupervised classification.

June 13, 1993 NAPP air photos of the Gazelle area (NAPP 6249-030 and NAPP 6249-032) were used in this study to verify interpretation of satellite images. The maps contained in the "Soil Survey of Siskiyou County, California, Central Part," which use NAPP air photos from 1974, 1975, and 1977 as the base maps, were also consulted for verification purposes. Ideally, Thematic Mapper data from June of 1993 would have been used to compare directly with the June 13, 1993 NAPP air photos. However, satellite scenes obtained during the summer of 1993 were not of good quality due to the unusual cloud cover at the time the satellite passed overhead. Therefore, images created from the July 14,1999 Enhanced Thematic Mapper Plus scene were used to compare land-cover with the June 1993 NAPP air photos. A description of each of the satellite images made (Table 15) is provided in Chapter IV. The images from Table 15 are further discussed in Chapter V.

A Remote View of Logging on Goosenest, California

Due to the remarkable patterns observable on Goosenest from space (Figure 16), it was my hypothesis that the land logged on Goosenest by the Weed/Long-Bell Lumber Company would be evident and distinguishable in satellite imagery. After gathering information concerning land ownership and logging history of Townships 44 and 45 North, Range 3 West (Appendix A) and testing the hypothesis based on unsupervised classification of the composite image, it was ascertained that the ownership patterns were too complex for this type of study.

Land Use Category	Band combination
Urban	Bands 3, 5, 4
Agricultural	Bands 5 (haze corrected), NDVI, 4 (sobel-edge)
Vegetation Vigor	NDVI
Forest	Ratio 4/2
Water	Band 4/2 (Boolean)
All of the above	Bands 3, 4, 5 (unsupervised classification)
All of the above	Bands 3, 4, 5 (iterative clustering)

Table 15. Satellite band combinations used in comparing land-cover features.

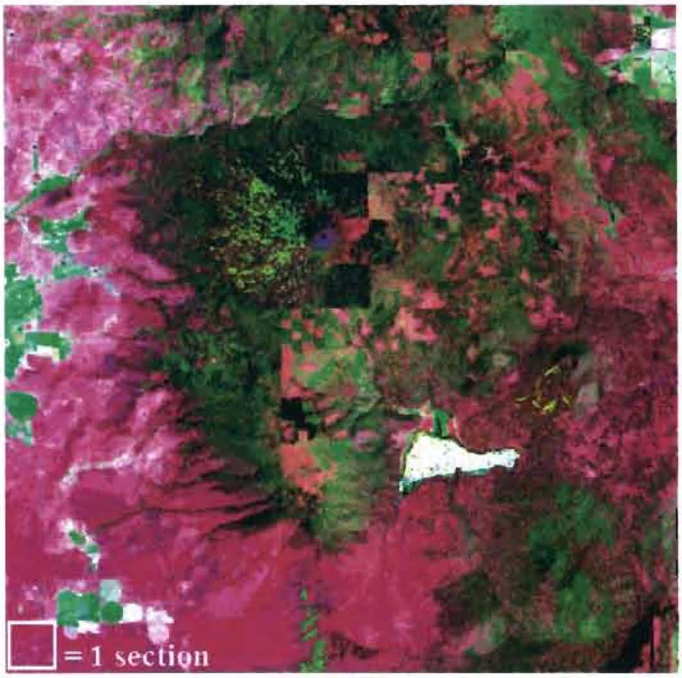


Figure 16. Composite image (bands 1, 4, 7) of region around Goosenest, Enhanced Thematic Mapper Plus July 14, 1999. Bright green = Quaternary lava flows from Goosenest and Little Deer Mountain, darkest greens = forested, medium green = shrubby, shades of pink = cleared lands, white = Grass Lake, and dark purple = cinder cone atop Goosenest.

Since the original prediction could not be tested, the three MSS satellite scenes were compared using Boolean classification of the NDVI ratio image. First, the scenes were WINDOWed to cover T44N and T45N, R3W. The upper left corner of the subscene is where Dewey Gulch enters the Little Shasta River. The lower right corner of the subscene is located at the southeast corner of the USFS parcel in Section One of T43N R3W on Deer Mountain. Boolean images, depicting cleared (or lightly vegetated) and vegetated areas, were then made of the subscenes, in which the value "0" indicates cleared areas and the value "1" represents vegetated areas. The database was then queried to determine the square kilometers of cleared and vegetated areas in each subscene. Next, the 1974 subscene was compared with the 1985 subscene using Analysis – Mathematical Operators – OVERLAY, using the "First minus Second" overlay option. This compares each pixel for change in the subscene. Analysis – Mathematical Operators – SCALAR was then used to add one to each pixel (to get rid of the negative value for future calculations). This resulted in an image where the value "0" indicates that a cell has gone from cleared to vegetated, "1" means that no change has occurred, and "2" means that a formerly vegetated cell became cleared. After the OVERLAY and SCALAR functions were performed for the years 1974-1985, and 1985-1992, the database was queried to determine the amount of change that had occurred. The new hypothesis for examining logging patterns on Goosenest is that there are more vegetated cells that become cleared than there are cleared areas that become vegetated. The results are presented in Chapter IV and discussed in Chapter V.

CHAPTER IV

RESULTS

This chapter specifically deals with the results of the three hypotheses presented in Chapter III. The hypotheses examined are listed below.

1) The percent water coverage on Shasta Valley floor subscenes examined using ratio and Boolean processing of Multispectral Scanner data indicate relative drought conditions.

2) Land-cover in the region around Gazelle, California is discernible using unsupervised classification of Enhanced Thematic Mapper Plus data.

3) Change detection of vegetation on Goosenest, based on three MSS scenes, shows that more territory becomes logged over time than regenerates.

A discussion of the information gleaned from these exercises, as well as any problems relating to the process or results, are presented in Chapter V.

Examining the 1987-1992 Drought with Multispectral Scanner Data

During the six-year drought that lasted from 1987 to 1992, yearly precipitation ranged from 61% to 86% of normal, with an average of 74% of normal (Priest et al. 1993; see also Roos 1992). Based on historical records, this was the worst drought since 1850 when weather records began in California. Based on tree-ring records, the 1929 to 1934 historical drought was slightly more severe, at least in the Sacramento River Basin (Priest et al. 1993).

It was hypothesized in Chapter III that MSS satellite data would indicate drought conditions by depicting the percent water coverage of the satellite scene using Boolean processing. MSS scenes were chosen specifically to examine the effects of drought in northern California, as described in Chapter III. The results showing the percent water coverage on the Shasta Valley floor for each of the datasets are shown in Table 16.

The results indicate that a drought year occurred in 1992, relative to the other two years. The 1974 scene was selected to represent the long-term average water conditions in the study area. Thus, this scene, as expected, was the wettest of the three years studied.

Satellite Mapping of Cropland in Gazelle, California

The goal of this section was to create a level-one land-cover map of the Gazelle region using ETM+. The planned land-cover map was produced using an ISOCLUST image of bands 3, 4, and 5 (Figure 17). This image does not include a legend and is not used as the final map.

Year	**Land Area** (square kilometers)	**Water Area** (square kilometers)	**Water Area** (%)
1974	1344.05	11.34	8.4
1985	1335.08	7.57	5.6
1992	1340.85	3.15	2.3

Table 16. Percent water coverage on Shasta Valley floor subscenes.

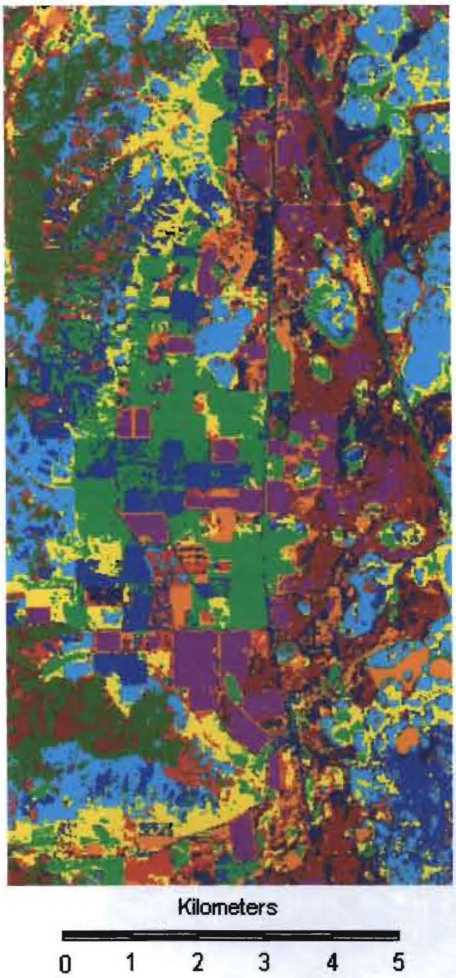
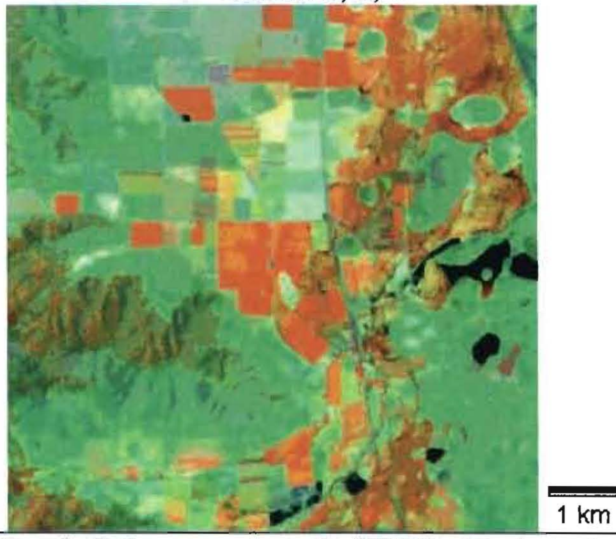
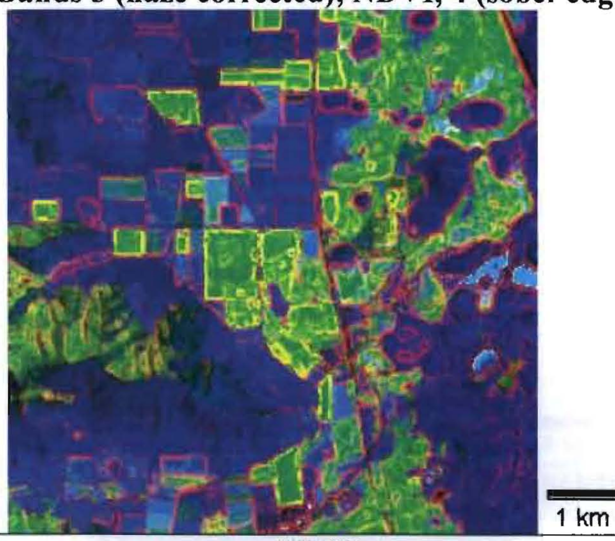


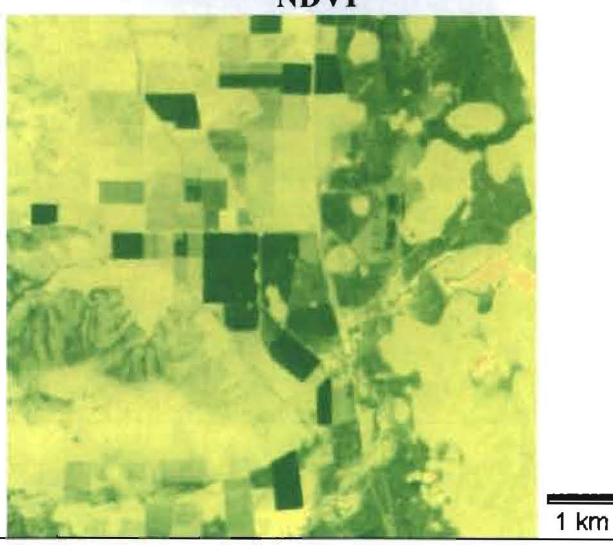
Figure 17. ISOCLUST image of bands 3, 4, 5 using three iterations and ten categories (ETM+ July 14, 1999).

Further satellite images of the Gazelle region, prepared following directions in Chapter III, are depicted in Table 17 on the following pages and discussed in Chapter V. The unsupervised classification of Bands 3, 4, and 5 using CLUSTER, rather than the more complicated ISOCLUST, was selected for the final product (Figure 18).

<table>
<tr><th>Land-Use Category</th><th>Band combination</th></tr>
<tr><td>#1 Urban

In this image water bodies are black, healthy vegetation ranges from light orange to orange-red, shades of green indicate poorly vegetated regions, and urban areas are a mottled olive and light blue. Light yellow may indicate fallow or plowed fields.</td><td>Bands 3, 5, 4

</td></tr>
<tr><td>#2 Agricultural

The pink lines are the result of a sobel-edge filter applied to band 4. The pink lines indicate boundaries. Shades of green indicate healthy vegetation. Light blue indicates water and the darker blues indicate areas with little vegetation.</td><td>Bands 5 (haze corrected), NDVI, 4 (sobel-edge)

</td></tr>
<tr><td>#3 Rangeland

The soils west of Old Highway 99 are Bonnet gravelly loam with fields located below the irrigation ditch. The yellow regions are used for grazing. The irregular green areas are loamy and used for hay, pasture, and grazing, although grazing is usually limited to the dry summer months. Dark green fields are most likely alfalfa.</td><td>NDVI

</td></tr>
</table>

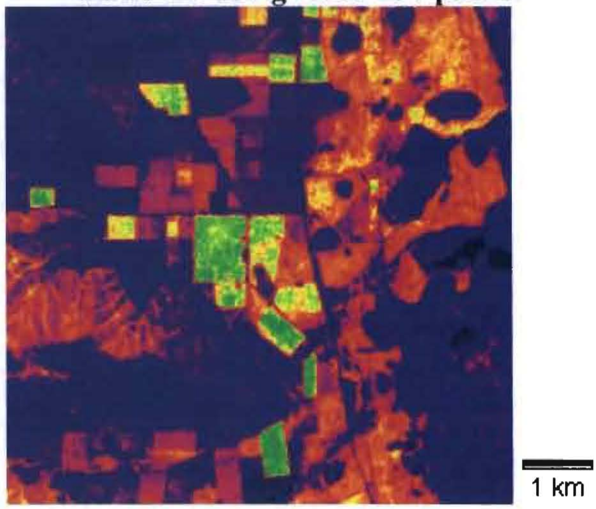
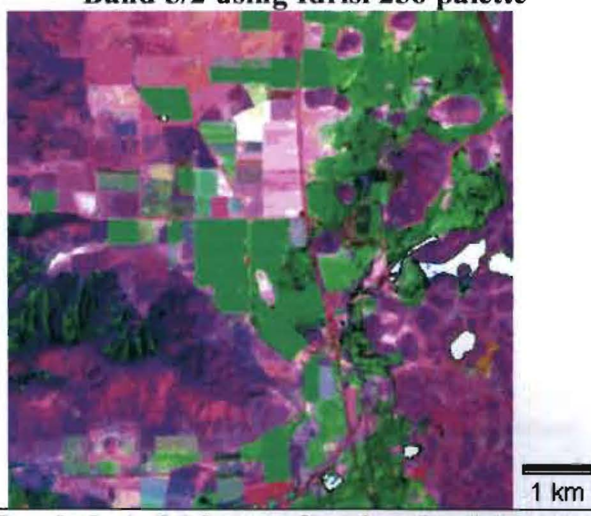
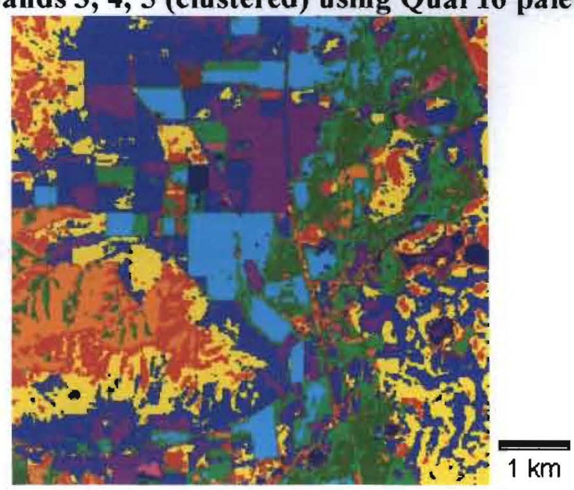
#4 Forest There is little forest cover (limited portions of bright red) in this subscene. Bonnet Rock ridge can be seen in the lower left quadrant of each image. The only tree-covered regions are on the north slope of this ridge and along Willow Creek, paralleling the ridge to the south then turning northward and paralleling Highway 99 to the east.	**Ratio 4/2 using Idrisi 256 palette** 
#5 Water Healthy vegetation is shown as green while sparsely vegetated land is in shades of purple. Bodies of water are white with a light turquoise in the shallower portions. Water bodies are distinguishable from barren fields because water is outlined in black. Most of the water bodies are located along Willow Creek.	**Band 5/2 using Idrisi 256 palette** 
#6 Wetlands The red, orange and yellow are hills. To the west are the foothills of the Klamaths. The hills to the east are part of the debris avalanche. The blues and purples are fields and pasture. Natural and artificial ponds are purple with a dark outline. The light and dark green interleaved region are the wetlands following Willow Creek.	**Bands 3, 4, 5 (clustered) using Qual 16 palette** 

Table 17. Satellite images used in determining land classification.

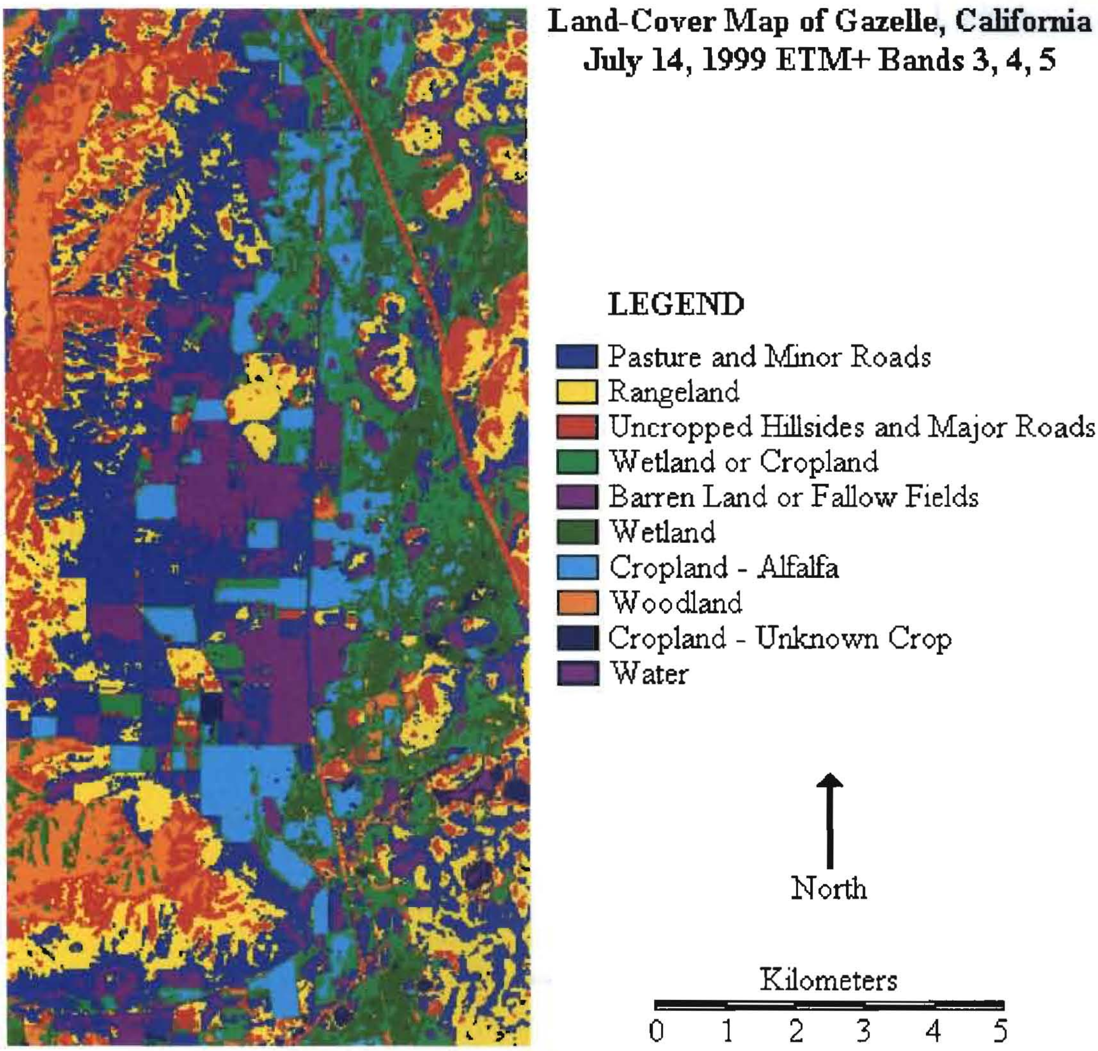


Figure 18. Land-cover map of Gazelle, California (July 14, 1999 ETM+ Bands 3, 4, 5).

A Remote View of Logging on Goosenest, California

A brief outline of ownership on the two townships on the east side of Goosenest are presented below. Records kept during the search for ownership information are provided in Appendix A.

The first period of land ownership can be called the pioneer period, which began in the 1850s with the Gold Rush and lasted until 1895 when the remaining government land was removed from the public domain. Patents for land were originally filed in Shasta County at the United States Land Office but references to original ownership of each parcel is generally available at the Siskiyou County Court House in Yreka. Land purchased by old-timers after 1895 is not included in this map. It should be noted that landowners could choose to do anything with their land, including logging it. Ownership for this period is shown in Figure 19.

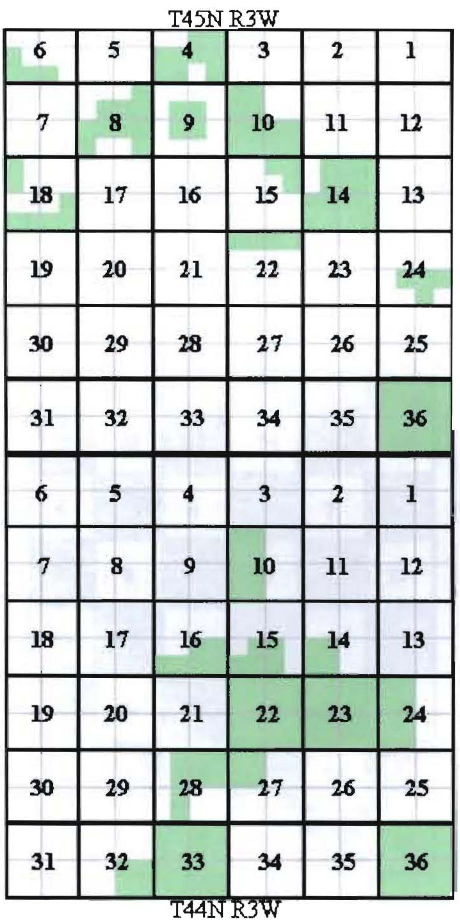


Figure 19. Land purchased or homesteaded between 1850-1895 in Townships 44-45 North, Range 3 West.

The United States decided to remove remaining public domain lands from the market beginning in 1891. Some of these lands eventually became part of the Shasta and Klamath National Forests in 1908, whereas alternate, odd sections were granted to the railroad in 1895. The land grants to the Central Pacific Railroad in this region are largely responsible for the resulting checkerboard pattern visible in aerial and satellite imagery. When part of a section had already been claimed, the railroad was granted the remaining portion. Railroad land ownership on Goosenest is shown in Figure 20.

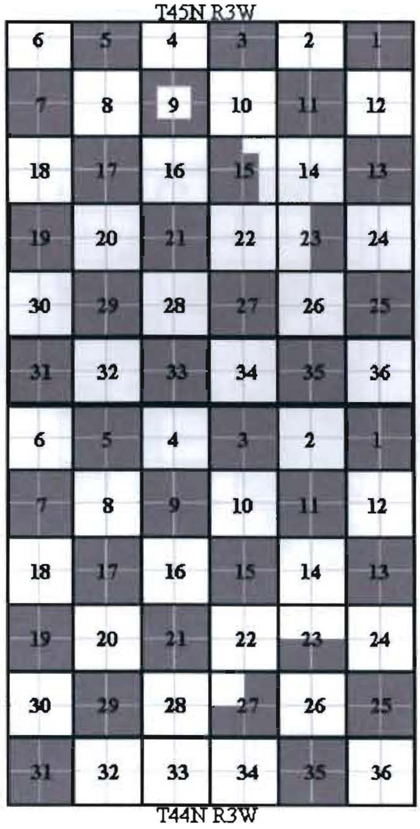


Figure 20. Lands granted to Central Pacific Railroad in Townships 44-45 North, Range 3 West in 1895.

The United States Forest Service is another major landowner on Goosenest. According to the Yreka Journal, A. F. Porter from the Bureau of Forestry came to Siskiyou County in September 1903 to "determine the suitability of creating a forest reserve" in Siskiyou County (Davies and Frank 1992). Both Shasta National Forest and Klamath National Forest were created in 1905 by proclamation from President Theodore Roosevelt. Shasta National Forest Service originally included the reserves on Goosenest. On July 1, 1908 the lands just north of Goosenest were transferred from Shasta National Forest to Klamath National Forest and on February 13, 1909 Goosenest Ranger District was formed. In the 1930s the Forest Service began a land exchange program in order to reduce the checkerboard pattern in the national forests. Figure 21 illustrates land ownership of the Forest Service on Goosenest.

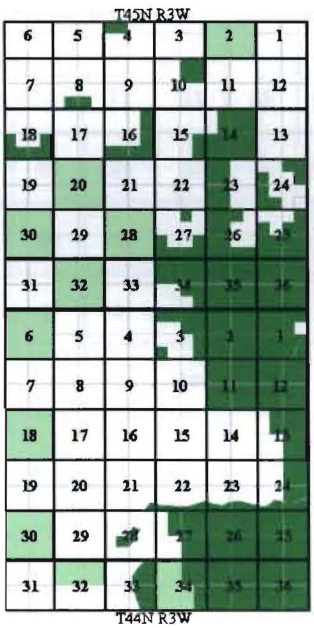


Figure 21. United States Forest Service lands in Townships 44-45 North, Range 3 West. Light green = USFS land with no prior recorded owners; dark green = land acquired through land exchange programs usually after previous logging.

The land owner of most concern to this study was Weed Lumber Company and its successors Long-Bell and International Paper. After the incorporation of the Weed Lumber Company, Abner and Rachel Weed transferred most of their prior holdings to the Weed Lumber Company. In 1905, Robert A. Long purchased most of Weed's share in the company but it was not until 1926 that Long-Bell became officially incorporated in Siskiyou County. Ownership by Abner Weed and other family members, Weed Lumber Company, and Long-Bell are presented in Figure 22, although the entire amount shown was never owned at any one time.

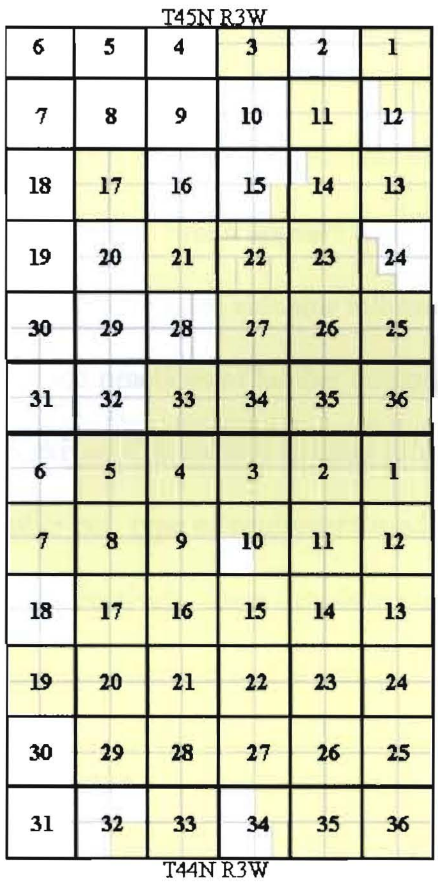


Figure 22. Weed Lumber Company/Long-Bell cumulative land ownership in Townships 44-45 North, Range 3 West.

Other, smaller logging operations also existed on and around Goosenest both before and during Weed operations there. The *Siskiyou Pioneer* was essential in tracking down which owners were involved in logging, especially the 1948 issue. Information prepared in 1908 by M. Smith, Jr. in the report on "Private Timber Holdings in California" provides information about the species of timber, estimates of board feet per acre, amount cut, and the condition the forest was left in after cutting. This series of reports resulted from the agitation of the 15th National Irrigation Congress in 1907 which led to the authorization of the California State Board of Forestry to examine private holdings in order to better manage watersheds and to prevent flooding. The publication stated that transportation, irrigation, and domestic use of water was being harmed by the removal of forests from the mountain slopes in California and that "the future of California depends most vitally upon the condition of the forest on her mountain slopes." Smith appears to have been objective in his final analysis; this small publication includes valuable information on the state of the forest as well as the attitudes and practices of lumber companies in California at the turn of the century. Early Siskiyou County newspapers provide important facts regarding the amount of timber cut, type of equipment used, and dates of operation (Rippon and Rippon 1985). Collectively, these details are important in understanding the current state of the natural environment on Goosenest. Land ownership by individuals or organizations known to have been involved in logging operations are presented in Figure 23.

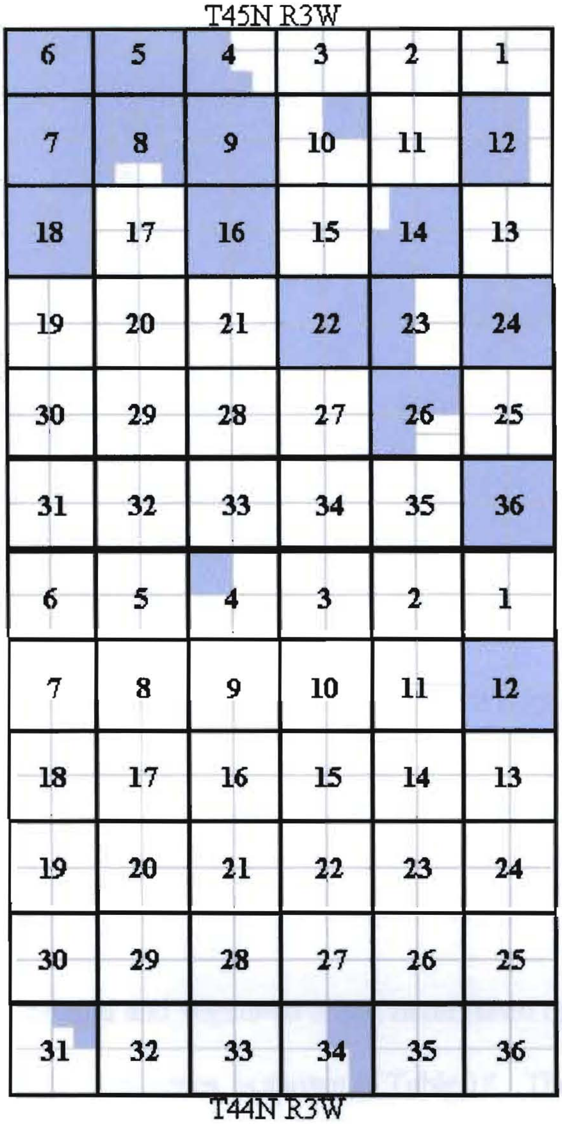


Figure 23. Private timberland in Townships 44-45 North, Range 3 West.

Logging patterns on Goosenest are visible in air photos (Figure 24) and satellite imagery. The original study area is outlined in Figure 25, with Township 45 North (T45N) on the top and T44N on the bottom. Due to several changes in land ownership as well as logging by different companies using different methods over time, the patterns visible from air and space are difficult to analyze. The original hypothesis regarding logging on Goosenest could not be tested for these two reasons.

Figure 24. The boundary between Townships 44 North (right) and 45 North (left), Range 3 West is clearly seen in this air photo taken April 25, 1999 (view to southeast).

The amount of cleared and vegetated areas, determined through Boolean processing of Shasta Valley subscenes, is shown in Table 18. The area covered by these subscenes overlaps the original study area. All of Township 44N, R3W is included, but only part of T45N, R3W is included. In addition, parts of T44-45N, R4W and T44-45N, R2W, are included in the subscenes. While the results indicate that about 43% of the land is cleared (or low in vegetation) at any given time, it does not show changes which have taken place over time.

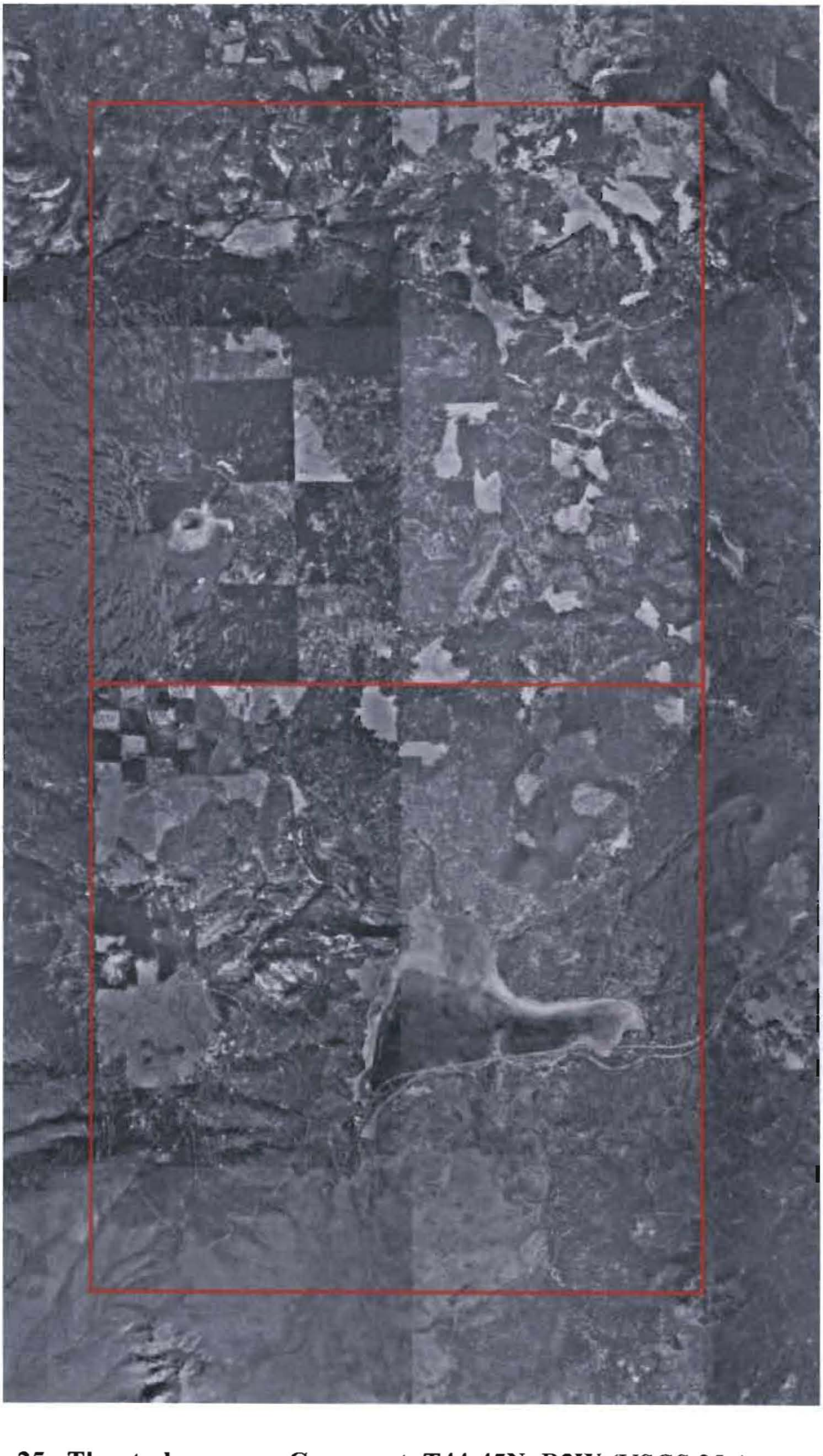


Figure 25. The study area on Goosenest, T44-45N, R3W (USGS 25 August 1993).

Subscene	Value Range	Cleared Range	Vegetated Range	Cleared Area (Sq Km)	Vegetated Area (Sq Km)	Total Area (Sq Km)
MSS 1974	62-204	62 <143	143 <205	112.7	154.8	267.5
MSS 1985	62-216	62 <160	160 <217	76.7	190.8	267.5
MSS 1992	105-208	105 <158	158 <209	123.2	144.2	267.4
TM 1988	86-214	86 <152	152 <215	136.6	130.8	267.4
ETM+ 1999	73-240	73 <192	192 <241	123.2	144.2	267.4

Table 18. Amount of cleared (low vegetation) and vegetated lands on Goosenest between 1974-1999 based on Boolean processing of NDVI ratio images.

The three MSS subscenes were compared to each other to determine changes that occurred on a cell-by-cell basis. It was predicted that there would be more changes from vegetated to cleared areas as opposed to cleared areas becoming vegetated; this prediction was supported overall. Visual and tabular information are presented in Table 19 and are discussed in Chapter V.

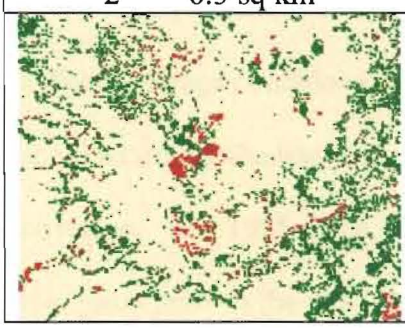
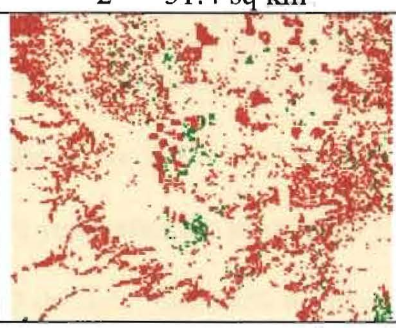
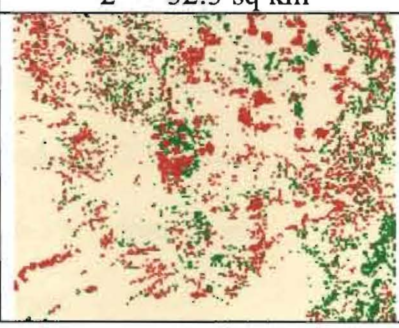
MSS 1974 to MSS 1985	MSS 1985 to MSS 1992	MSS 1974 to MSS 1992
0 = 42.3 sq km 1 = 218.8 sq km 2 = 6.3 sq km	0 = 4.8 sq km 1 = 211.1 sq km 2 = 51.4 sq km	0 = 21.7 sq km 1 = 213.5 sq km 2 = 32.3 sq km
		

Table 19. Change detection between MSS subscenes on Goosenest. 0 (green) = cleared to vegetated; 1 (beige) = no change; 2 (red) = vegetated to cleared.

CHAPTER V

DISCUSSION

Introduction

Three studies using Landsat imagery of the study area were conducted. Multispectral Scanner data were used to study the impact of droughts on the water coverage in Shasta Valley. Enhanced Thematic Mapper Plus data were used to create a land-cover map of the Gazelle farming community. Enhanced Thematic Mapper Plus data were also used to create a clustered image in order to predict where Weed Lumber Company/Long-Bell logged on Goosenest. As this image turned out impossible to classify, an alternate hypothesis stated that more vegetated land would be cleared over time than cleared lands would recover. This was tested using Boolean processing and change detection of three MSS datasets from 1974, 1985, and 1992.

Examining the 1987-1992 Drought with Multispectral Scanner Data

The results of the study turned out as expected. The 1974 scene, selected to indicate average conditions, had the highest water coverage at 8.4%. The 1992 scene, acquired during the last year of the severe 1987-1992 drought, had only 2.3% water coverage. The 1985 scene, eight years after the short-term 1976-1977 drought and two years prior to the 1987-1992 drought, had 5.6% water coverage.

A minor problem with this particular study is that Landsats 1-3 had a resolution of 79 meters per pixel while Landsats 4-5 had a resolution of 82 meters. This, along with possibly being off by one pixel when windowing the subscenes, may have resulted in the area covered being slightly different between scenes. I do not believe this significantly affected the results.

Although the results were as predicted, it should be kept in mind that only three years of data were examined and that other factors, such as irrigation projects, could impact the results. An example of problems in interpretation can be illustrated by examining the Normalized Difference Vegetation Index (NDVI) of the wettest and driest years (Figure 26). In an NDVI image the water shows up as a dark brown while the healthiest vegetation shows up as a dark green. The less healthy vegetation ranges from a light green to a yellow or beige for the very poor vegetation.

In the NDVI image of the1974 drought-free scene there is obviously more water, especially noticeable in Lake Shastina in the lower-right section of the image. However, the best fields do not appear as healthy as in the drought scene and there are more fields that are beige, indicating the least healthy vegetation. Three possible explanations for this are as follows. First, in drought years more irrigation takes place, lowering the water levels in the reservoirs but keeping the vegetation healthy. Second, irrigation may not have been equally distributed in the two years. Third, the 1974 scene was one of the earliest of the Landsat scenes gathered, and the data may be expressed differently than later versions. Regardless of the possible problems, the study indicates that Landsat imagery can be useful in drought investigation.

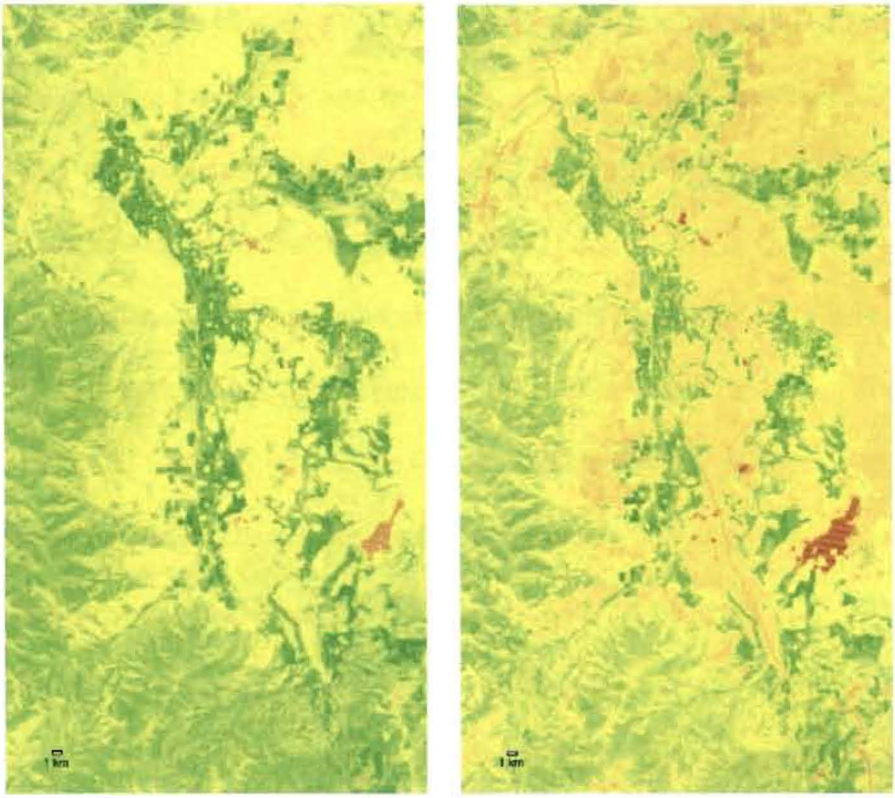


Figure 26. Normalized Difference Vegetation Index of 1992 drought year on left and 1974 drought-free year on right. Green – vegetation, with darker greens generally more vigorous; yellow – sparsely vegetated or less-healthy vegetation; tan – exposed soil or little/unhealthy vegetation; brown – water.

Satellite Mapping of Cropland in Gazelle, California

Enhanced Thematic Mapper Plus data were used to examine land-cover in Gazelle on the west side of Shasta Valley. The results indicate that agricultural studies using Landsat imagery can be useful; however, multi-year and multi-season data would be necessary, as would crop records for the various parcels over time.

Urban areas (see Chapter IV, Table 17 #1) can be clearly seen in composite satellite images using bands 3, 5, and 4. Yreka, Montague, and Grenada (with a population of approximately 7000, 1400, and 700 respectively) were readily apparent in the satellite view of northwestern Shasta Valley (Figure 27), but Gazelle (population 350) was barely distinguishable. The roads helped to locate built-up features. Based on this image, the urban area of Gazelle covers the region at the intersection of Old Highway 99 and the Gazelle Callahan Road. However, small communities such as Gazelle are not readily identifiable on satellite imagery and urban areas were not depicted on the final map (see Figure 18).

Agricultural regions (Table 17 #2) are distinguishable using a composite of band 5 (haze corrected), NDVI, and band 4 (sobel-edge). The geometric patterns indicate agricultural fields and the sobel-edge filter outlines field boundaries in pink. The bright green fields have the healthiest vegetation while the blue areas depict fallow or plowed fields. The NDVI (Table 17 #3) can also be used to indicate the health of the crops. In addition to outlying farmlands, this image delineates hills of the ancient Mount Shasta debris flow as well as bodies of water. This type of image is useful in signifying field boundaries, hills, water-bodies, and where irrigation is occurring, but it is of lesser use in creating a complete land-cover classification.

While the NDVI (Table 17 #3) does indicate the health of the vegetation, it does not indicate the soil types or how the land is being utilized. In general, however, if an area is rectangular in nature and is dark green, alfalfa is probably being grown. Also, virtually all pivot-irrigation systems in Shasta Valley are used for growing

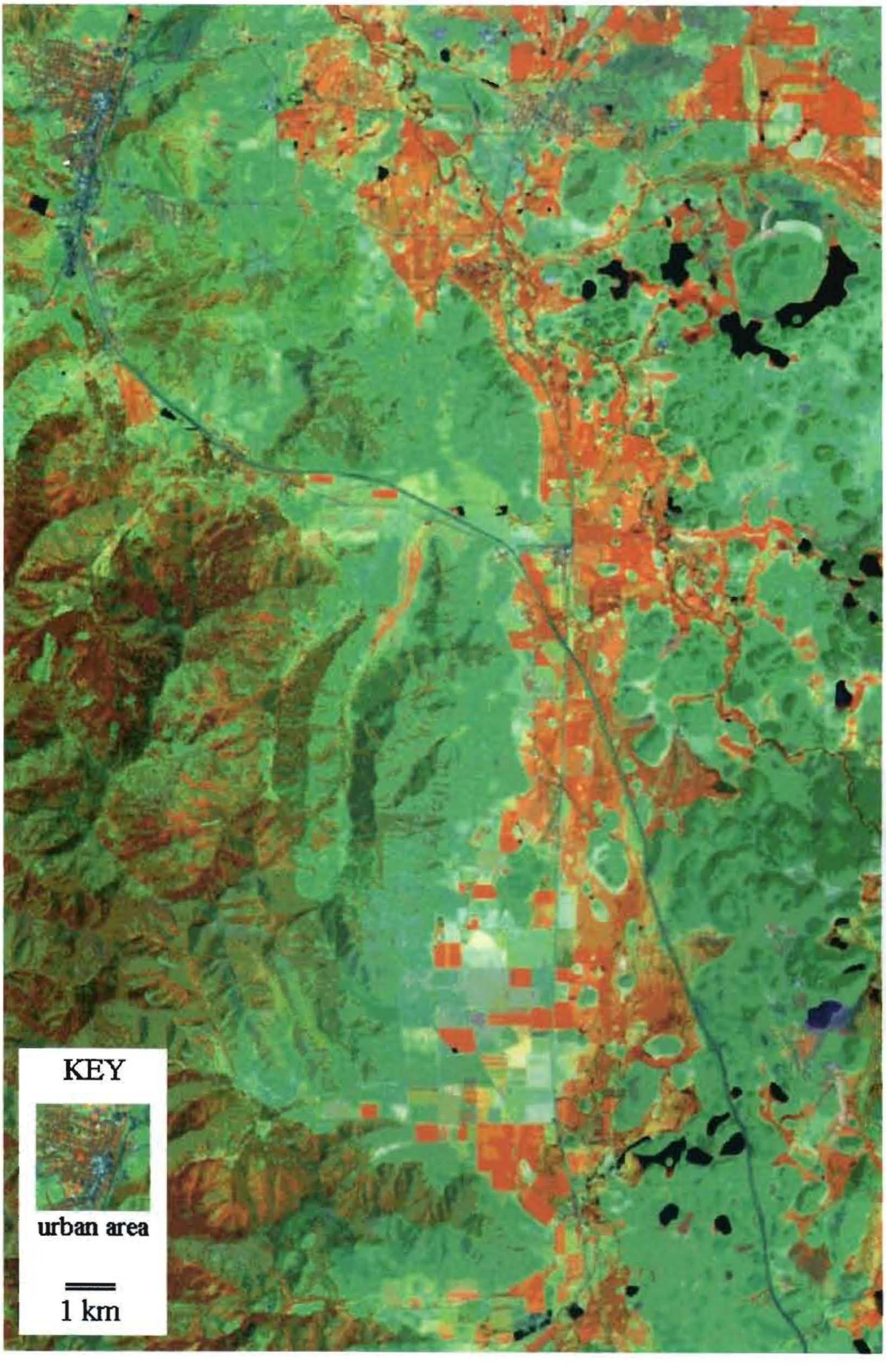


Figure 27. Northwestern Shasta Valley July 14, 1999 (TM bands 3, 5, 4)

alfalfa (Zwanziger and Zwanziger 2000). This satellite scene was obtained in July; note that some of the lighter, yellowish regions are fallow fields and may be used alternately for grazing and cropping. The regions in the NDVI image that are light yellow without field patterns tend to be grazed year round. The irregular, fairly dark green pasturelands to the east of Old Highway 99 tend to be poorly drained Gazelle silt loams or Settlemeyer loams. During the winter season while the soils are wet there are not many cattle grazing, but during the summer these areas are occupied by cattle. Overall, the lightest areas can be occupied by cattle year round, the medium to dark green irregular areas are used for rangeland in the summer, and the patterned areas are cropped but may be used for grazing as part of a crop rotation system.

A 4/2 ratio image using Idrisi 256 palette (Table 17 #4) was selected to illustrate the location of forest cover. However, both forested regions are shown as bright red, so are the grasslands and riparian regions along the river. To locate forested areas in any of the scenes one must know that forests are only found on the north slopes of the hillsides and to a limited extent in the riparian zone. Forested regions are limited in this subscene.

There are several types of satellite images which clearly depict water. The image in Table 17 #5 depicts water as white or turquoise if the water is shallow. Water strongly absorbs infrared radiation but weakly reflects red light so using ratios of MSS bands 3 or 4 and 2 or TM/ETM+ bands 4, 5, or 7 and 2 or 3 will be beneficial in detecting water. On the other hand, vegetation absorbs red and reflects infrared. The major problem with the image in Table 17 #5 is that the smaller bodies of water do not clearly stand out, although they can still be detected. Overall, this image does a good job of depicting land-cover even though it only uses two bands of data.

Wetlands (Table 17 #6) are shown in shades of green in the clustered image using bands 3, 4, and 5 with the Qualitative 16 palette using a broad generalization level and dropping the least significant clusters. This particular image was selected as the unsupervised classification used in creating a thematic map-like presentation of land-cover in the Gazelle region (see Figure 18).

A Remote View of Logging on Goosenest, California

The background study of land ownership and land use on Goosenest will provide future researchers with valuable information. The preliminary study illustrated how much information is available from county records, local publications and libraries, governmental organizations (such as the United States Forest Service), museums, and people who have lived in the county for several decades. Even though this information is available, much has been lost over time. Now is the time to undertake local studies, especially those that shed light on national and global events.

Several maps were created based on a wide variety of sources (see Appendix A). Maps showing pioneer, railroad, Forest Service, private timberland, and lands owned by Weed Lumber Company/Long-Bell were presented in Chapter IV and used in an attempt to determine logging patterns seen in Landsat imagery.

Based on the results of the preliminary study, pioneers were selective about the land they chose to purchase or homestead. For the most part, they chose land at the lower elevations along streams, lakes, or transportation routes. The families who did purchase timberland at the higher elevations tended to be entrepreneurial in nature; involved in the building industry, which necessitated a supply of lumber; or ranchers that practiced transhumance on a local scale.

The post-logging environment was determined, in part, by who logged the tract and when. The Forest Service eventually condemned the use of certain types of skidders and stated that lands logged by the Weed Lumber Company/Long-Bell "are in no small part practically desert and cannot produce timber short of a hundred years" (Shoup 1987). Although several other individuals and smaller lumber companies operated in this area, it was by far Weed Lumber Company which did the most logging here during the first half of the century. The Long-Bell Lumber Company and its predecessor, Weed Lumber Company, logged their holdings intensively. This fact is verified in historical documents and partially supported by satellite imagery, but later logging has prevented the determination, through satellite imagery, of the impact from logging by Weed Lumber Company/Long-Bell on Goosenest.

As the original hypothesis could not be tested, change in vegetation over time was examined using MSS imagery. From 1974 to 1985, the trend was that cleared or less vegetated land became vegetated, contrary to expection. From 1985 to 1992, however, more vegetated land was cleared. Overall, from 1974 to 1992, more vegetated land was cleared than cleared lands recovered.

The importance in examining a visual representation of the data is illustrated in Table 19 (Chapter IV). Much of the restored vegetation during the 1974-1985 period was along riparian channels along the base of Goosenest and Miller Mountain.

This is more indicative of climate change, with higher precipitation, than of recovery from logging. Likewise, the decrease in vegetation between 1985-1992 was along those same riparian channels, but to a greater extent. This declining vegetation correlates with the 1987-1992 drought, one of the most extreme droughts in California's history. However, T44N, R3W Section 6 was obviously logged during this period, as were several other parcels in the study area such as in T44N, R3W Sections 3, 4, 11, and 12 and T45N, R3W Sections 21, 22, 23, 26, 27, and 34.

CHAPTER VI

CONCLUSIONS

In the study of the 1987-1992 drought, using three MSS datasets, the 1974 subscene had the highest water coverage at 8.4%. This scene was acquired forty years after the last major drought in California but prior to the short-term 1976-1977 drought. The 1992 subscene, acquired at the end of the 1987-1992 drought, had the lowest water coverage at 2.3%. The 1985 subscene, acquired after the short-term 1976-1977 drought and before the start of the 1987-1992 drought, had a water coverage of 5.6%.

A thematic image depicting land-cover of the agricultural community of Gazelle, California was made using unsupervised classification (Figure 18). The initial study indicates that if satellite scenes are specifically selected to match available crop records, satellite mapping of certain crops in this region could indicate the vigor of selected crops on a seasonal and yearly basis and show farming changes over time.

An attempt was made to study the impact of logging on the vegetation of Goosenest. The complex land-ownership and logging history of the region prevented an adequate examination, but the study indicates that logging, as well as the recovery of vegetation after logging, can be readily detected using satellite imagery. It was seen that the impact of the climate also has to be considered when studying change detection of vegetation. A more thorough investigation of past logging on Goosenest would improve interpretation of change detection using satellite imagery.

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APPENDIX A

The records used to compile the township and section maps included in this appendix are from a wide variety of sources. By far the bulk of the sources came from the Siskiyou County Courthouse in Yreka. In the Recorder's Office there are indices to the Official Records (OR), which cover the years 1928 to 1979 and the Book of Deeds, which covers the period 1852 to 1927. The records themselves are stored on microfilm, of which there are duplicate copies. In addition, there are microfilm indices called Patent Cards, which include, for the most part, the first owner of a given parcel. Names, dates, volume and page numbers are provided, but these volumes are not located in Siskiyou County. It appears that these are originally from the United States Land Office in Redding, California. The maps I consulted at the courthouse are located in the Assessor's Office. I had the privilege of being able to see firsthand the Official Map of Siskiyou County, prepared by Nolan and Sarter on January 2, 1911. This map was stored in the back through a maze of rooms and it was carefully unrolled for me to examine. Also in the Assessor's Office are huge books which include four sections per page. On the right side is a map of the sections and on the left side are handwritten records, many of which have been crossed off and few of which are dated. Nevertheless, they were invaluable in my research. There are two versions. The older version has a Crocker binding and seems to cover the time when record keeping was taken over at the county level; that is, they are contemporary with the "Patent Records," or slightly newer. It appears the records go to 1910 at the latest. The newer binding is by Ray and Sons and is shown as RaySon on the outside binding and in my notes. It appears to postdate the 1911 Official Map of Siskiyou County, although there is some overlap depending on the length of ownership of a parcel. The people at the courthouse were friendly, courteous, and helpful.

My second most important source was the College of the Siskiyous Library, namely the Mount Shasta Collection. Many maps I used were obtained from the library. They also have the whole series of the *Siskiyou Pioneer*, which was very helpful, and numerous local books that have been of service in tracking down names and dates.

The people at the Klamath National Forest main office at Yreka, and the Ranger District in Macdoel, have also been exceedingly helpful, allowing me to pore over their maps and pamphlet files. Much information is available at these two locales, although one needs to look carefully. Of great importance is the expanded version of Shoup's "Railroad Logging in N.E. Siskiyou County," prepared for the Goosenest Ranger District in 1981. I can safely say that without this work, as presented in the 1987 issue of the *Siskiyou Pioneer*, I would not have accomplished, or even set out on, the task of trying to analyze logging patterns on Goosenest.

I tried to be as clear as possible when using abbreviations. However, when abbreviating people's names, I only used their initials after I had already written their full names. Different records record names in various fashions, such as initials instead of first names. Finally, after discovering the Bureau of Land Management's land record search engine at http://www.glorecords.blm.gov/search/search.asp, I verified the earliest land ownership dates in order to have a more accurate pioneer map. I used a little "c" for correct if the Patent Card was the same as this record or used BLM as the abbreviation for this website and added the correct information under that listing.

More than anything else, the study of logging on Goosenest made me understand how much data are available to the general public, and yet that data will become less meaningful with time if we do not organize it and ask questions of those who can help us interpret the data. Much information has been lost already but supporting information can often be found in such places as county records, local information held in public libraries and old newspapers, and photos and exhibits at local museums. Many projects exist at the local level to simply collate facts into cohesive units and publish the data for future generations. An example of this is found in "Pioneering with Electricity in Siskiyou County" (Rippon and Rippon 1985). When scanning old notes I had jotted down while reading this absorbing collection of old newspaper articles last summer, I found the following:

> December 21, 1887 – "Mssrs A. Wetzel, Jacob Martin, and Lucine Guilbert in Shasta County… proving up on timber land claims."
>
> May 1, 1889 – "Mary Wetzel obtains 100 inches Bull's Meadow Springs in Section 15 T45N R3W for irrigation."
>
> August 28, 1900 – "A. Wetzel acquires Bridges' Mill at Little Shasta, and will run it from now on in cutting lumber from his claims near Bull Meadows on the mountain area between Little Shasta and Butte Creek Valley."
>
> August 6, 1901 – "A. Wetzel builds telephone line from sawmill to Yreka."
>
> August 27, 1901 - "Bull Meadows Mill in Little Shasta turning out 25-30,000 feet per day."
>
> June 6, 1902 – "Goose Nest Lumber and Transportation Company gets new traction engine."

June 10, 1902 – "Wetzel sawmill at Little Shasta started up yesterday and cut 15,000 feet in 3 hours. Wetzel purchased mill from Abner Weed and moved it from Igerna to Bull Meadows."

July 4, 1902 – "Snow covered Wetzel Mill at Bull's Meadow, Little Shasta."

September 30, 1902 – "Wetzel's lumber being hauled… before winter snows."

February 24, 1903 – "Logger's at Wetzel's Sawmill, Bull Meadows, have about one-half million feet logs in the pond and expect to have a million more before mill is restarted in April. Logs are hauled via bobsleds…"

April 28, 1903 – "The Wetzel Sawmill at Bull Meadows was re-started yesterday, with expectations of making an extensive fun this summer, as there was a favorable winter for getting logs to pond."

October 27, 1903 – "Wetzel's sawmill cut 5,000,000 feet lumber this season and was shut down nearly a month ago on account of not being able to get it hauled out in time…"

January 12, 1904 – "J. L. Wetzel started loggers felling trees last week to secure a log supply for summer's run at Wetzel's Mill."

June 21, 1905 – "Wetzel supplies 20,000 out of 50,000 feet per day to Montague Box Factory."

August 29, 1906 – "At Wetzel's Sawmill between 60-70 men employed in woods and mill and nearly 50,000 feet lumber cut per day, 2,500,000 feet now in yards… logs are hauled to mill by 4-, 6-, and 12-horse teams…intention to extend dirt logging road to Grass Lake connecting with Weed's new logging or California Northeastern RR, Weed's new logging RR, a distance of seven miles."

July 31, 1907 – "Best steam traction engine hauled 7 wagon loads of lumber from Wetzel's Mill to Montague containing 55,000 feet on all steel car… Them steam machines make a great noise and racket…"

September 11, 1907 – "Sawmill plans winter shutdown. Louis Wetzel family back in Yreka for school. Mr. Wetzel will run mill about two more months."

February 2, 1910 – "Weed Lumber Company buys Wetzel's sawmill at Bull Meadows and 2,560 acres of timberland for $40,000. The timber tract was not intact, some of it having been logged over in years past."

June 23, 1910 – "Hudson and Dwinnell have leasted the former Wetzel Sawmill at Bull Meadows from the Weed Lumber Company for the purpose of sawing their 320 acres of timber located near there…"

In combination with data collected from the county courthouse, the College of the Siskiyous Library, and interviews with Elmer Zimmerman (1999) and Alford Linville (1999, 2000), I was better able to understand the logging history of Goosenest. Continued study of this region could lead to a better understanding of the regional climate, natural vegetation, and the impact of railroad logging on the forest as a whole.

6	5	4	3	2	1
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Land Ownership
of
T44N R3W Section 1
Mount Diablo Meridian

1) Central Pacific RR (all)
2) Weed Lumber Company (all)
3) Weed Lumber Co. + USA Exchange
4) Long-Bell sells to Pickering
5) Pickering exchanges for timber

8) CP
9) CP > Weed Lumber Co 1905

10) logged 1927-37
11) logged over as of 1/1/1925 except portion of →

1) CP
2) WLC
8) CP

3) USA
1) CP
2) WLC
6) USFS
7) USFS
8) CP

Owner ____________ Date ______
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Check and complete all sources used in creating this map.

☐ USGS 1:________ Quadrangle ____________________ Date ________
☐ USGS 1:________ Quadrangle ____________________ Date ________
9 Siskiyou County Book of Deeds 1852-1927 Volume 57 Page 472 Sept 30, 1905
4 Siskiyou County Official Records (1928+) Volume 100 Page 412 May 17, 1939
☐ USFS Pamphlet File ____________________
☐ College of the Siskiyous Library Pamphlet File ____________________
☐ Metsker's Map of Siskiyou County, California Date ________
1 Other Siskiyou County information R 3-4 W M.D.M Crocker binding
2 Other Off. Map of Sis. Co. 1911
3 Other R 3-4 W Rauben binding
5 Other OR Vol 99 p1-21 May 17 1939
6 Other USFS KNF (Yreka) 5400 Title Deed Long-Bell Lbr. Co. File #14
7 Other O.R. Vol 144 p147-149 Feb 20 1943 Long-Bell > USFS
8 Patent Card 44N R3W V8 p39 + V14 p252 US Land Office Records, Roo
Oct 9, 1895

6	5	4	3	2	1
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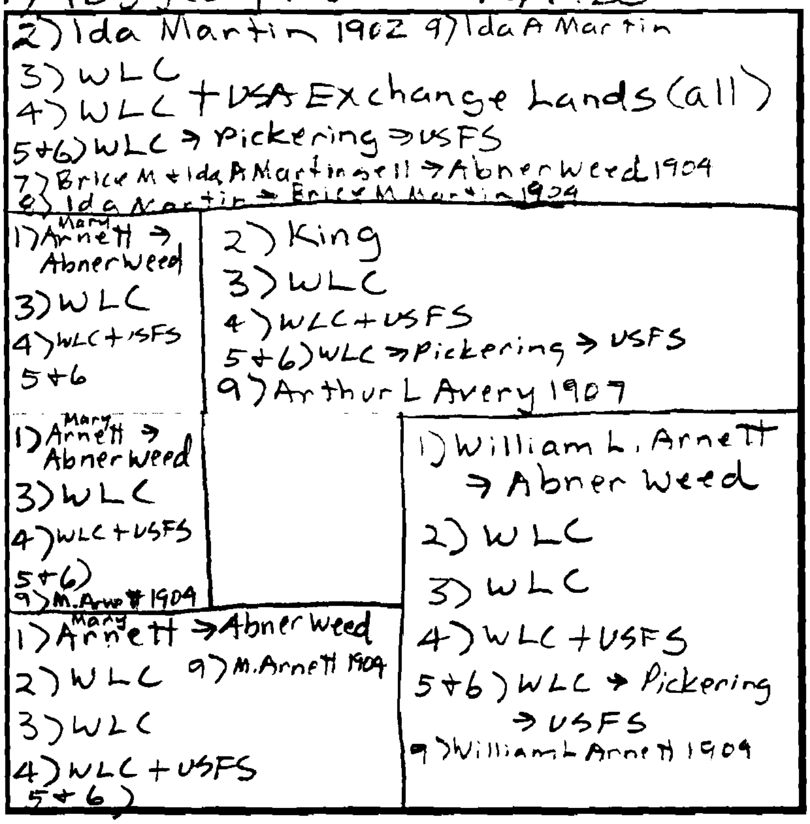
31	32	33	34	35	36

Land Ownership
of
T44N R3W Section 2
Mount Diablo Meridian

?) logged 1927- ?

11) logged prior to 1/1/1925



Owner Arnett Date 1903

Owner ______ Date ______

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Owner ______ Date ______

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Owner ______ Date ______

Check and complete all sources used in creating this map.

☐ USGS 1:______ Quadrangle ______ Date ______

☐ USGS 1:______ Quadrangle ______ Date ______

1 Siskiyou County Book of Deeds 1852-1927 Volume 60 Page 172,169 Feb 13, 1903

☐ Siskiyou County Official Records (1928+) Volume ______ Page ______

☐ USFS Pamphlet File ______

☐ College of the Siskiyous Library Pamphlet File ______

☐ Metsker's Map of Siskiyou County, California Date ______

2 Other Siskiyou County information R3-4W MDM Crocker binding

3 Other Off. Map of Sis Co 1911

4 Other R3-4W MDM RaySon binding

5 Other OR roll #41 vol 100 p 412 May 17, 1939 WLC sells to Picke[...]

6 Other OR vol 99 p1-21 May 17, 1939 Pickering exchanges for tim[...]

7 Other Book of Deeds V 64 p 459-460 June 18, 1904

8 " V 64 p 496-499 June 18, 1904

9) Patent Card T44N R3W

6	5	4	3	2	1
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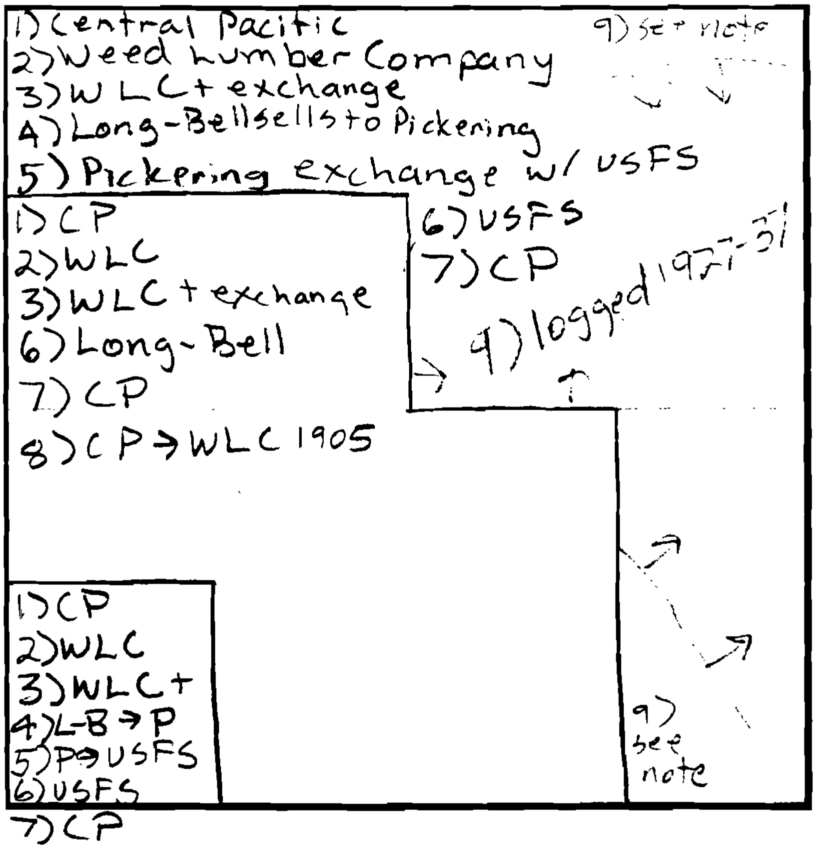
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership
of
T44N R3W Section 3
Mount Diablo Meridian



Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

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Check and complete all sources used in creating this map.

☐ USGS 1:__________ Quadrangle ______________________ Date __________

☐ USGS 1:__________ Quadrangle ______________________ Date __________

8 Siskiyou County Book of Deeds 1852-1927 Volume 57 Page 472 Sept 30 1905

4 Siskiyou County Official Records (1928+) Volume 100 Page 412

☐ USFS Pamphlet File ______________________

☐ College of the Siskiyous Library Pamphlet File ______________________

☐ Metsker's Map of Siskiyou County, California Date __________

1 Other Siskiyou County information R 3-4 W Crocker binding

2 Other Off Map Sis Co

3 Other R 3-4 W Ray Son binding

5 Other OR v 99 p 1-21

6 Other Metskers Atlas 1957

7 Other Patent Card 44 N R3W v 8 p 39 + v 14 p 252 US Land office Rec[illegible]
Oct 9, 1895

9) [illegible]

6	5	4	3	2	1
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18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership of T44N R3W Section 4 Mount Diablo Meridian

1) F.J. McNulty 2) F.J. Mc — 3) McCloud River Lumber Co. 4) Long-Bell 5) James Davis 1907	1) Isabella Martin 2) Weed Lumber Co. 3) WLC 4) Long-Bell 6) Isabelle + James B Martin sell to Brice M Martin 1904 7) Brice M + Ida A Martin sell to Abner Weed 1904 8) Isabelle Martin 1904
1) Ann Martin 2) WLC 3) WLC 4) Long-Bell 8) Ann Martin 1904	1) James B. Rohrer 2) WLC 3) WLC 4) Long-Bell 5) James B + Louisa Rohrer sell to Brice M. Martin 1904 7) Brice M + Ida A Martin sell to Abner Weed 1904 8) James B Rohrer 1904

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

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Owner ______________ Date ______

Check and complete all sources used in creating this map.

☐ USGS 1:__________ Quadrangle ______________________ Date __________

☐ USGS 1:__________ Quadrangle ______________________ Date __________

5 Siskiyou County Book of Deeds 1852-1927 Volume 64 Page 457 June 18, 1904

☐ Siskiyou County Official Records (1928+) Volume _______ Page _______

☐ USFS Pamphlet File ____________________

☐ College of the Siskiyous Library Pamphlet File ____________________

☐ Metsker's Map of Siskiyou County, California Date __________

1 Other Siskiyou County information R3-4W Crocker binding

2 Other Off Map Sis Co 1911

3 Other R3-4W RaySon

4 Other Metsker's Atlas 1957

5 Other Book of Deeds V 64 p 456-7 June 16, 1904

7 Other Book of Deeds V 66 p 489-490 June 18, 1904

8 Patent Card T44N R3W

Land Ownership
of
T44N R3W Section 5
Mount Diablo Meridian

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

1) Central Pacific
2) Weed Lumber Company
3) WLC 1909
4) Long-Bell
5) CP
6) CP → WLC 1905

Owner ________ Date ____
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Check and complete all sources used in creating this map.

☐ USGS 1:________ Quadrangle ________ Date ________
☐ USGS 1:________ Quadrangle ________ Date ________
6 Siskiyou County Book of Deeds 1852-1927 Volume 57 Page 472 Sept 30 1905
☐ Siskiyou County Official Records (1928+) Volume ________ Page ________
☐ USFS Pamphlet File ________
☐ College of the Siskiyous Library Pamphlet File ________
☐ Metsker's Map of Siskiyou County, California Date ________
1 Other Siskiyou County information R 3-4 W Crocker
2 Other off Map Sis Co 1911
3 Other R 3-4 W Rayson
4 Other Metsker's Atlas 1957
5 Other Patent Card 44 NR3W V8 p39 + V14 p252 US Land Office Reco
☐ Other ________

Land Ownership
of
T44N R3W Section 6
Mount Diablo Meridian

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

1) public domain (USA)
2) "
3) "
4) Shasta Nat'l Forest
5) USFS
6) USFS

8) logged 5/91 - 8/91 by Skip Brecount
7) logged 1960 - 1969

Owner ______ Date ______
Owner ______ Date ______
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Check and complete all sources used in creating this map.

☐ USGS 1:______ Quadrangle ______ Date ______
☐ USGS 1:______ Quadrangle ______ Date ______
☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______
☐ Siskiyou County Official Records (1928+) Volume ______ Page ______
☐ USFS Pamphlet File ______
☐ College of the Siskiyous Library Pamphlet File ______
☐ Metsker's Map of Siskiyou County, California Date ______
1 Other Siskiyou County information R 3-4W Crocker
2 Other Off Map Sis Co 1911
3 Other R 3-4W Kayson
4 Other Map of Eastern Part of Sis Co 1908
5 Other Metsker's Atlas 1957
6 Other KNF - Goosenest Ranger District 1968
7 [illegible]
8 Post 1967 Tracement Timber Sales Atlas

6	5	4	3	2	1
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18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership
of
T44N R3W Section 7
Mount Diablo Meridian

1) Shasta Nat'l Forest
2) Central Pacific
3) Weed Lumber Company
4) WLC 1909
5) Long-Bell
6) CP

Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
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Check and complete all sources used in creating this map.

☐ USGS 1:__________ Quadrangle ______________________ Date __________
☐ USGS 1:__________ Quadrangle ______________________ Date __________
☐ Siskiyou County Book of Deeds 1852-1927 Volume _______ Page _______
☐ Siskiyou County Official Records (1928+) Volume _______ Page _______
☐ USFS Pamphlet File ______________________
☐ College of the Siskiyous Library Pamphlet File ______________________
☐ Metsker's Map of Siskiyou County, California Date ___________
2 Other Siskiyou County information R 3-4 W Crocker binding
1 Other Map of Eastern Part of Sis Co 1908 - Note: most likeley boundary
3 Other Off Map Sis Co 1911
4 Other R 3-4 W Ray Son
5 Other Metsker's Atlas 1957
95 6 Other Patent Card 44N R3W V8p39 + V14p252 US Land Office Re

Land Ownership
of
T44N R3W Section 8
Mount Diablo Meridian

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
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31	32	33	34	35	36

3) Darwin M. Sheldon 4) WLC 5) WLC 1909 6) Long-Bell 7) heirs of Darwin M Sheldon 1905	3) J. M. Walbridge 4) WLC 5) WLC 1909 6) L-B 7) John M. Walbridge 1904
1) Orra E Arnett 3) Weed Lumber CO. 4) WLC 5) WLC 1909 6) L-B 7) Orra E Arnett 1904	2) Sarah J. Steinbrook 3) WLC 4) WLC 5) WLC 1909 6) Long-Bell 7) Sarah J Stainbrook 1904

Owner ______ Date ______
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Check and complete all sources used in creating this map.

☐ USGS 1:______ Quadrangle ______ Date ______
☐ USGS 1:______ Quadrangle ______ Date ______
1 Siskiyou County Book of Deeds 1852-1927 Volume 60 Page 170 Feb 12, 1903
☐ Siskiyou County Official Records (1928+) Volume ______ Page ______
☐ USFS Pamphlet File ______
☐ College of the Siskiyous Library Pamphlet File ______
☐ Metsker's Map of Siskiyou County, California Date ______
2 Other Siskiyou County information OR Vol 60 p 171
3 Other R3-4W Crocker
4 Other Off Map Sis Co 1911
5 Other R3-4W Rayson
6 Other Metsker's Atlas Sis Co 1957
7 Other Patent Card T44N R3W

Land Ownership
of
T44N R3W Section 9
Mount Diablo Meridian

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
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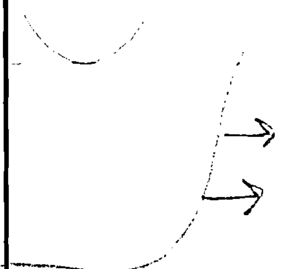
31	32	33	34	35	36

1) J. M. Walbridge
2) Abner Weed
3) Weed Lumber Co
4) Long-Bell
5) CP → J M Walbridge 1900
6) CP 1895



7) logged prior to 1/1/1925

Owner ______ Date ______
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Check and complete all sources used in creating this map.

☐ USGS 1:______ Quadrangle ______ Date ______
☐ USGS 1:______ Quadrangle ______ Date ______
5 Siskiyou County Book of Deeds 1852-1927 Volume 48 Page 253 June 7, 1900
☐ Siskiyou County Official Records (1928+) Volume ______ Page ______
☐ USFS Pamphlet File ______
☐ College of the Siskiyous Library Pamphlet File ______
☐ Metsker's Map of Siskiyou County, California Date ______
1 Other Siskiyou County information R 3-4 W Crocker
2 Other Off Map Sis Co 1911
3 Other R 3-4W Rayson
4 Other Metsker's Atlas Sis Co 1957
6 Other Patent (and T44N R3W)
7 Other Weed Lumber Company [illegible]

Land Ownership
of
T44N R3W Section 10
Mount Diablo Meridian

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

1) J. M. Walbridge 2) Abner Weed 3) Weed Lumber Co. 4) Long-Bell 5) Henry H. Poole 1890 5) Alonzo S. Walbridge 1890 Camp 3 6) [illegible] 1910	1) John H. Walbridge 2) Abner Weed 3) WLC 4) Long-Bell 5) John H Walbridge 1904
	1) Alice I. Walbridge 2) Abner Weed 3) WLC 4) L-B 5) Alice I Walbridge 1904

Owner ______ Date ______
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Check and complete all sources used in creating this map.

☐ USGS 1:______ Quadrangle ______ Date ______
☐ USGS 1:______ Quadrangle ______ Date ______
☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______
☐ Siskiyou County Official Records (1928+) Volume ______ Page ______
☐ USFS Pamphlet File ______
☐ College of the Siskiyous Library Pamphlet File ______
☐ Metsker's Map of Siskiyou County, California Date ______
1 Other Siskiyou County information R 3-4 W Crocker
2 Other Off Map Sis Co 1911
3 Other R 3-4W Rayson
4 Other Metsker's Atlas Sis Co 1957
5 Other Patent Card T44 N R3W
6 Other [illegible]
7 WLC, Ca + [illegible] 1925

Land Ownership
of
T44N R3W Section 11
Mount Diablo Meridian

6	5	4	3	2	1
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18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

1) Central Pacific
2) Weed Lumber Company
3) WLC + exchange
4) Long-Bell sells to Pickering
5) Pickering/USFS exchange
6) USFS
7) CP 1895
8) CP → WLC 1905
9) all logged < 1/1/1925

9) camp 4 1919

Owner ______ Date ______
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Check and complete all sources used in creating this map.

- [6] USGS 1: 62,500 Quadrangle The Whaleback Date 1954
- ☐ USGS 1:______ Quadrangle ______ Date ______
- [8] Siskiyou County Book of Deeds 1852-1927 Volume 57 Page 472 Sept 30 1905
- [4] Siskiyou County Official Records (1928+) Volume 100 Page 412 May 17, 1939
- ☐ USFS Pamphlet File ______
- ☐ College of the Siskiyous Library Pamphlet File ______
- ☐ Metsker's Map of Siskiyou County, California Date ______
- [1] Other Siskiyou County information R 3-4W Crocker binding
- [2] Other Off Map Sis Co 1911
- [3] Other R 3-4W Ray Son
- [5] Other OR vol 99 p1-21 May 17, 1939
- [7] Other Patent Card T44N R3W
- [9] Other Historic Resources ... logged 1905-1910 + 1927-37
- 10 WLC, Calif 1925

6	5	4	3	2	1
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18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership of T44N R3W Section 12 Mount Diablo Meridian

NW quarter:
1) Weed Lumber Co
2) McCloud River Lumber Co
3) Weed Lumber Co
4) L-B → Pickering
5) Pickering → USFS
7) USFS
8) ↓ Theodore Faulconer 1904

NE quarter:
1) SW Phillips
2) McCloud RLC
3) Long-Bell
6) Long-Bell → USFS
7) USFS
8) S W. Phillips 1917
9) CP → WLC 1905

SW quarter:
8) T Lonzo D King 1904
10) Logged < 1/4/25 ←
LDK

1) WLC (8)
2) MRLC
3) L-B
6) L-B → USFS
7) USFS

SE quarter:
1) Henry Swirt
2) McCloud RLC
3) Long-Bell
6) L-B → USFS
7) USFS
8) Henry A. Sweet 1907

Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
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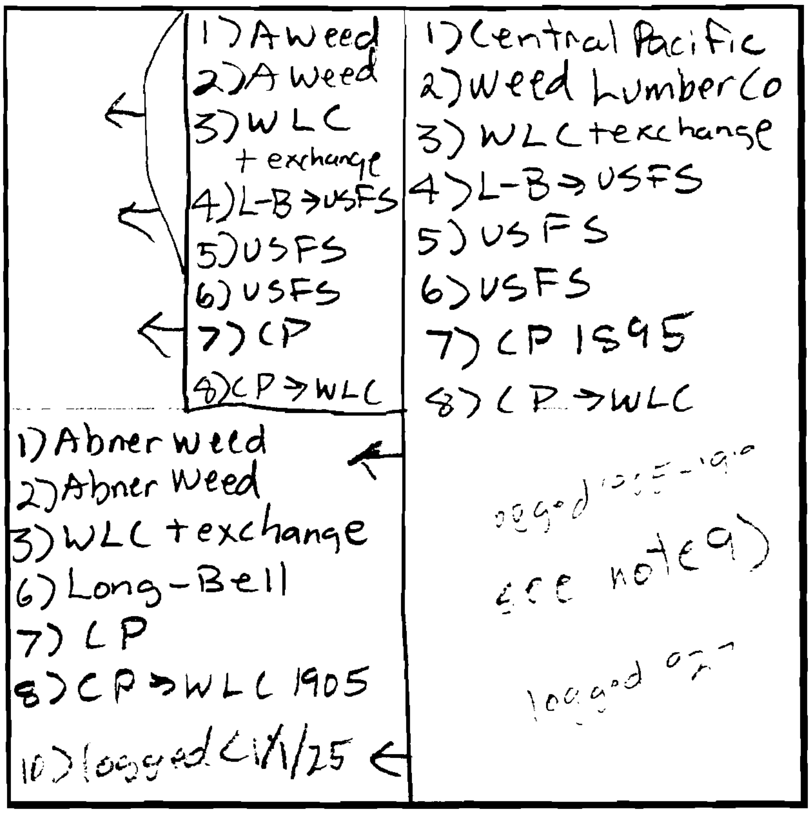
Check and complete all sources used in creating this map.

- [x] USGS 1:62,500 Quadrangle The Whaleback Date 1954
- [ ] USGS 1:______ Quadrangle ______ Date ______
- [1] Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______
- [4] Siskiyou County Official Records (1928+) Volume 100 Page 412 May 17, 1939
- [6] USFS Pamphlet File 5400 Title Deed Long-Bell Lbr Co. # 14 Feb 20, 1943
- [ ] College of the Siskiyous Library Pamphlet File ______
- [ ] Metsker's Map of Siskiyou County, California Date ______
- [1] Other Siskiyou County information R 3-4 W Crocker
- [2] Other OFF Map Sis Co 1911
- [3] Other R 3-4 W Rayson
- [5] Other OR vol 99 p1-21 May 17, 1939
- [6] Other ORvol144 p147-149 Feb 20, 1943
- [8] Other Patent Card T44N R3W

9) [illegible]
10) [illegible]

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership
of
T44N R3W Section 13
Mount Diablo Meridian



Owner ______________ Date ______

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Owner ______________ Date ______

Check and complete all sources used in creating this map.

5 USGS 1: 62,500 Quadrangle The Whaleback Date 1954

☐ USGS 1:__________ Quadrangle ______________ Date ________

8 Siskiyou County Book of Deeds 1852-1927 Volume 57 Page 472 Sept 30 1905

4 Siskiyou County Official Records (1928+) Volume 144 Page 147-149 Feb 20, 1943

4 USFS Pamphlet File 5400 title deed Long-Bell #14 Feb 20, 1943

☐ College of the Siskiyous Library Pamphlet File ______________

☐ Metsker's Map of Siskiyou County, California Date __________

1 Other Siskiyou County information R 3-4 W Crocker binding

2 Other Off Map Sis Co 1911

3 Other R 3-4W RaySon

6 Other Metsker's Atlas 1957

7 Other Patent Card T44N R3W

9 Other Historic [illegible]

10 WLC Cart 1925 [illegible]

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	~~14~~	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership of T44N R3W Section 14 Mount Diablo Meridian

1) Darwin A Sheldon 2) Abner Weed 3) Abner Weed 4) Weed Lumber Co 5) Long-Bell 6) Darwin A Sheldon 1904 logged < 1/1/25	1) Orra E. Sheldon 2) Abner Weed 3) Abner Weed 4) WLC 5) Long-Bell 6) Orra E Sheldon 1909 logged < 1/1/25
2) Grayson Owen 3) Abner Weed 4) WLC 5) Long-Bell 6) C.H. Burton 1872 logged < 1/1/25	2) Millie Miles 3) Abner Weed 4) WLC 5) Long-Bell 6) Millie Miles 1904 logged < 1/1/25

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Check and complete all sources used in creating this map.

☐ USGS 1:__________ Quadrangle ______________________ Date __________

☐ USGS 1:__________ Quadrangle ______________________ Date __________

1 Siskiyou County Book of Deeds 1852-1927 Volume 60 Page p167-168 1903

☐ Siskiyou County Official Records (1928+) Volume ______ Page ______

☐ USFS Pamphlet File ______________________

☐ College of the Siskiyous Library Pamphlet File ______________________

☐ Metsker's Map of Siskiyou County, California Date ____________

2 Other Siskiyou County information R3-4W Crocker

3 Other Off Map Sis Co 1911

4 Other R3-4W Rayson

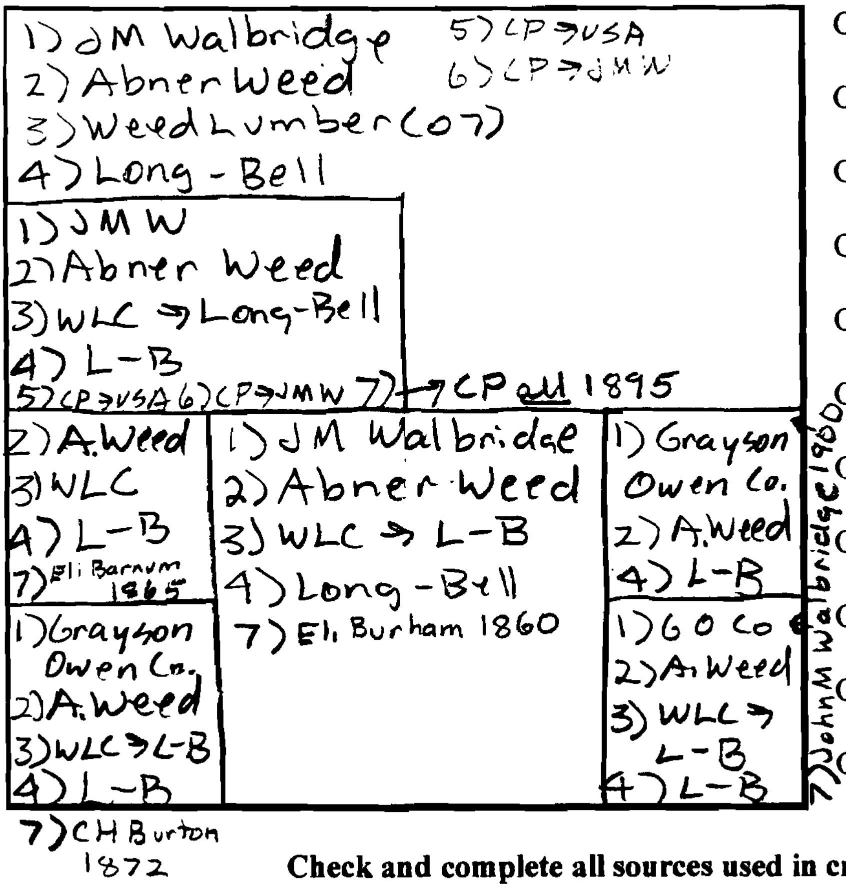
5 Other Metsker's Atlas 1957

6 Other Patent Card T44NR3W

7 Other WLC, Cal [illegible]

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership of T44N R3W Section 15 Mount Diablo Meridian



Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Check and complete all sources used in creating this map.

☐ USGS 1:______ Quadrangle ______ Date ______

☐ USGS 1:______ Quadrangle ______ Date ______

5 Siskiyou County Book of Deeds 1852-1927 Volume 48 Page 299 Nov 16, 1895 CP rec NY

☐ Siskiyou County Official Records (1928+) Volume ______ Page ______

☐ USFS Pamphlet File ______

☐ College of the Siskiyous Library Pamphlet File ______

☐ Metsker's Map of Siskiyou County, California Date ______

1 Other Siskiyou County information R 3-4W Crocker

2 Other Off Map Sis Co 1911

3 Other R 3-4W Ray Son

4 Other Metsker's Atlas 1957

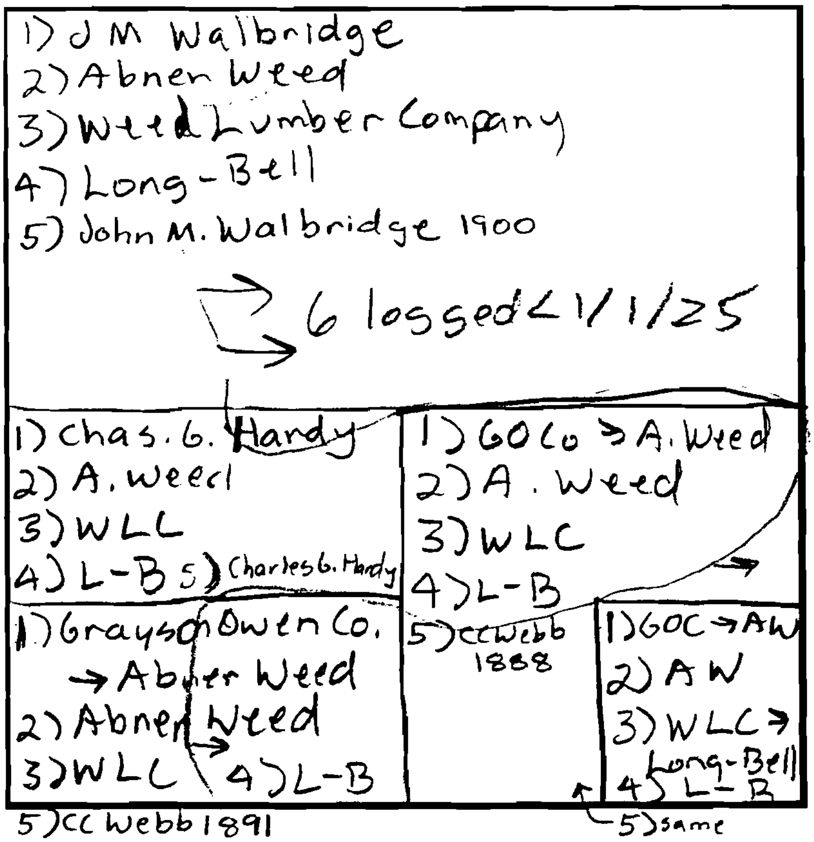
6 Other Book of Deeds V48 p253 June 7, 1900

7 Other Patent card T44N R3W

8 [illegible] WLC

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership of T44N R3W Section 16 Mount Diablo Meridian



Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Check and complete all sources used in creating this map.

- ☐ USGS 1:______ Quadrangle ______ Date ______
- ☐ USGS 1:______ Quadrangle ______ Date ______
- ☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______
- ☐ Siskiyou County Official Records (1928+) Volume ______ Page ______
- ☐ USFS Pamphlet File ______
- ☐ College of the Siskiyous Library Pamphlet File ______
- ☐ Metsker's Map of Siskiyou County, California Date ______
- 1 Other Siskiyou County information R 3-4 W Crocker
- 2 Other Off Map Sis Co 1911
- 3 Other R 3-4 W Rayson
- 4 Other Metsker's Atlas 1957
- 5 Other Patent Card T44N R3W
- 6 Other [illegible]

Land Ownership
of
T44N R3W Section 17
Mount Diablo Meridian

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

1) Central Pacific
2) Weed Lumber Company
3) WLC 1922
4) Long-Bell
5) CP 1895
6) CP → WLC 1905

Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______

Check and complete all sources used in creating this map.

☐ USGS 1:______ Quadrangle ______ Date ______
☐ USGS 1:______ Quadrangle ______ Date ______
☑ Siskiyou County Book of Deeds 1852-1927 Volume 57 Page 472 Sept 30, 1905
☐ Siskiyou County Official Records (1928+) Volume ______ Page ______
☐ USFS Pamphlet File ______
☐ College of the Siskiyous Library Pamphlet File ______
☐ Metsker's Map of Siskiyou County, California Date ______
1 Other Siskiyou County information R 3-4 W Crocker
2 Other Off Map Sis Co 1911
3 Other R 3-4 W Rayson
4 Other Metsker's Atlas of Sis. Co. 1957
5 Other Patent Card T44N R3W
☐ Other ______

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership
of
T44N R3W Section 18
Mount Diablo Meridian

1) USFS

2) [illegible]

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Check and complete all sources used in creating this map.

☐ USGS 1:__________ Quadrangle ______________________ Date __________

☐ USGS 1:__________ Quadrangle ______________________ Date __________

☐ Siskiyou County Book of Deeds 1852-1927 Volume _______ Page _______

☐ Siskiyou County Official Records (1928+) Volume _______ Page _______

☐ USFS Pamphlet File ______________________

☐ College of the Siskiyous Library Pamphlet File ______________________

☐ Metsker's Map of Siskiyou County, California Date __________

☐ Other Siskiyou County information ______________________

☑ Other Metsker's Atlas 1957

☑ Other [illegible]

☐ Other ______________________

☐ Other ______________________

☐ Other ______________________

Land Ownership
of
T44N R3W Section 19
Mount Diablo Meridian

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

1) Central Pacific 1895
2) CP
3) CP > WLC 1905
4) WLC
5) WLC 1922
6) Long-Bell

Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______

Check and complete all sources used in creating this map.

- ☐ USGS 1:______ Quadrangle ______ Date ______
- ☐ USGS 1:______ Quadrangle ______ Date ______
- 3 Siskiyou County Book of Deeds 1852-1927 Volume 57 Page 472 Sept 30 1905
- ☐ Siskiyou County Official Records (1928+) Volume ______ Page ______
- ☐ USFS Pamphlet File ______
- ☐ College of the Siskiyous Library Pamphlet File ______
- ☐ Metsker's Map of Siskiyou County, California Date ______
- 2 Other Siskiyou County information R3-4W Crocker
- 1 Other Patent Card T44N R3W
- 4 Other Off Map Sis Co 1911
- 5 Other R3-4W Rayson
- 6 Other Metskers Atlas 1957
- ☐ Other ______

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership of T44N R3W Section 20 Mount Diablo Meridian

1) Altimont Venham 1904 2) Weed Lumber Co 4) WLC 5) WLC 1922 6) Long-Bell	1) Jessie McD. Jamieson 1904 2) WLC 3) JMcDJ→WLC 1903 4) WLC 5) WLC 1922 6) L-B
1) Edward C. Weed 1907 2) Edward Weed 4) R. Weed 5) WLC 1922 6) L-B	1) Eva M Fabens 1904 2) WLC 3) EMF → WLC 1903 4) WLC 5) WLC 1922 6) L-B

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

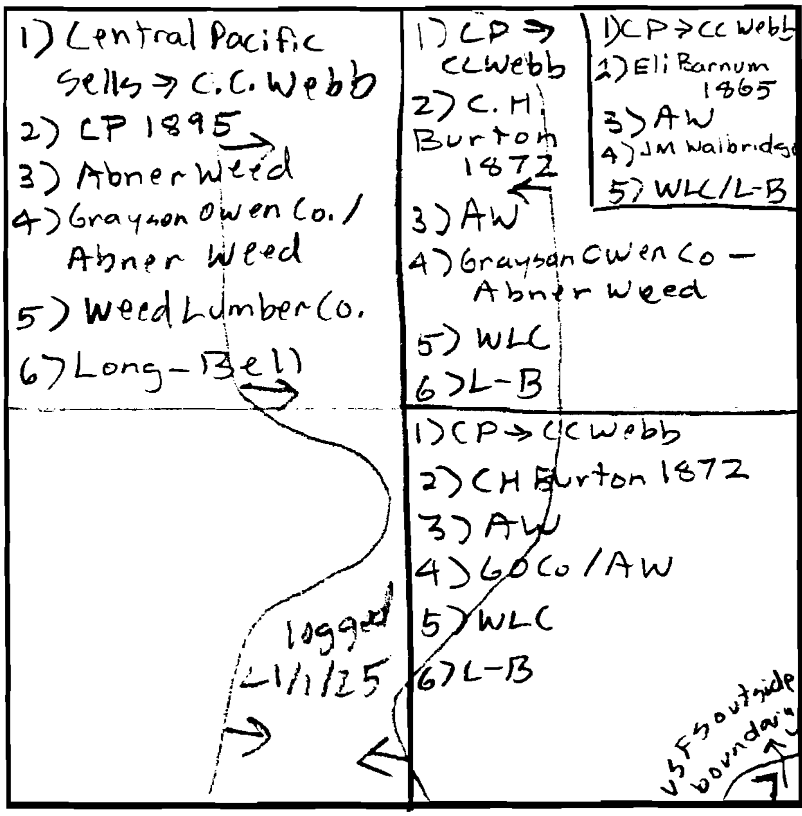
Owner ____________ Date ______

Check and complete all sources used in creating this map.

- ☐ USGS 1:________ Quadrangle ____________ Date ________
- ☐ USGS 1:________ Quadrangle ____________ Date ________
- 3 Siskiyou County Book of Deeds 1852-1927 Volume 59 Page 348 April 9, 1903
- ☐ Siskiyou County Official Records (1928+) Volume ______ Page ______
- ☐ USFS Pamphlet File ____________
- ☐ College of the Siskiyous Library Pamphlet File ____________
- ☐ Metsker's Map of Siskiyou County, California Date ________
- 2 Other Siskiyou County information R 3-4 W Crocker
- 1 Other Patent Card T44 N R3W
- 4 Other Off Map Sis Co 1911
- 5 Other R 3-4 W Rayson
- 6 Other Metskers Atlas 1957
- ☐ Other ____________

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership of T44N R3W Section 21 Mount Diablo Meridian



Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______

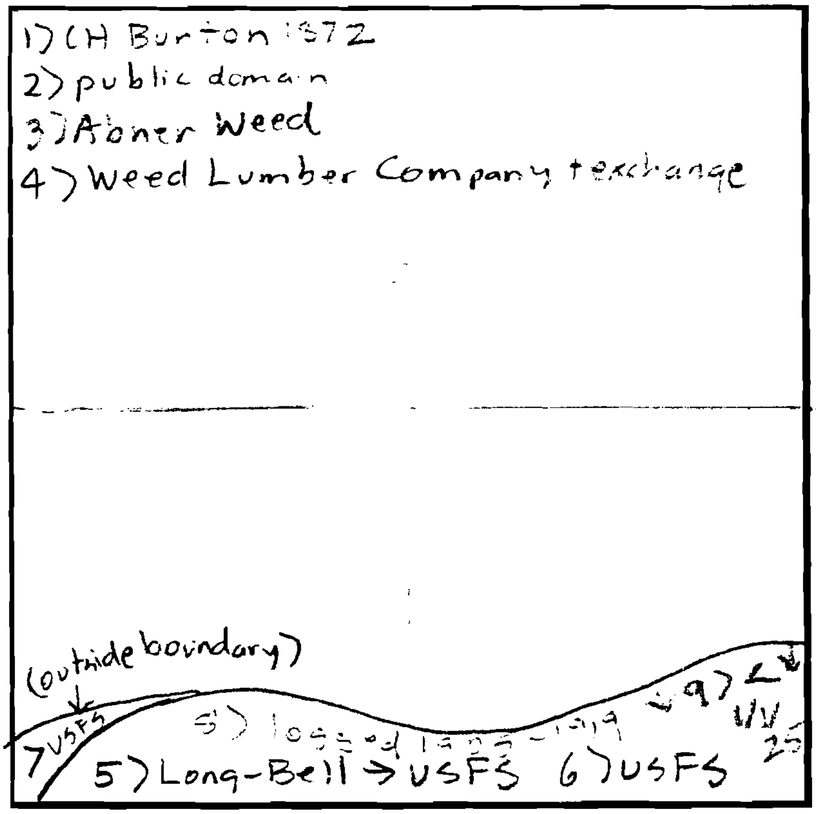
Check and complete all sources used in creating this map.

- ☐ USGS 1:__________ Quadrangle ____________________ Date __________
- ☐ USGS 1:__________ Quadrangle ____________________ Date __________
- ☐ Siskiyou County Book of Deeds 1852-1927 Volume 45 Page 14 July 21, 1891
- ☐ Siskiyou County Official Records (1928+) Volume ________ Page ________
- ☐ USFS Pamphlet File ____________________
- ☐ College of the Siskiyous Library Pamphlet File ____________________
- ☐ Metsker's Map of Siskiyou County, California Date __________
- 4 Other Siskiyou County information R 3-4 W Crocker
- 2 Other Patent Card T44N R3W
- 3 Other Off Map Sis Co 1911
- 5 Other R 3-4 W Rayson
- 6 Other Metsker's Atlas 1957
- 7 Other NE Sis Co Coordinated Road Mgmt Plan 1991

W...

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership
of
T44N R3W Section 22
Mount Diablo Meridian



Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Check and complete all sources used in creating this map.

☐ USGS 1:__________ Quadrangle ______________________ Date __________

☐ USGS 1:__________ Quadrangle ______________________ Date __________

☐ Siskiyou County Book of Deeds 1852-1927 Volume _______ Page _______

☐ Siskiyou County Official Records (1928+) Volume _______ Page _______

5 USFS Pamphlet File #110 V115 p113 May 20, 1940

☐ College of the Siskiyous Library Pamphlet File ______________________

☐ Metsker's Map of Siskiyou County, California Date __________

2 Other Siskiyou County information R3-4W Crocker

1 Other Patent Card T44N R3W

3 Other Off Maps ... 1911

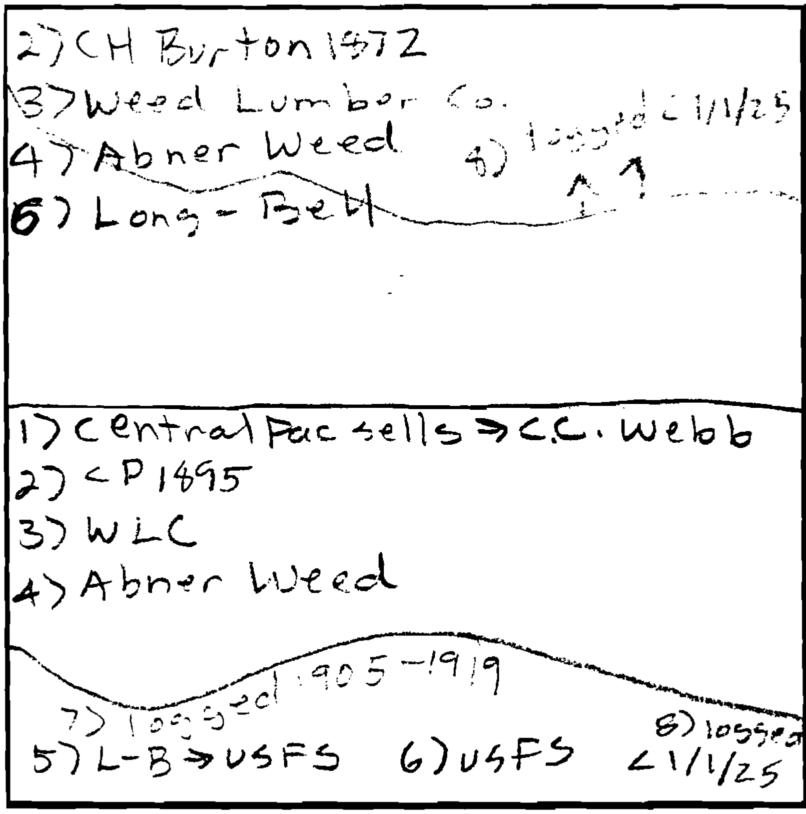
4 Other R3-4W ...

6 Other KNF ... Ranger District 1908

7 Other NE Sis Co Coordinated Road Mgmt Plan 1991

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership
of
T44N R3W Section 23
Mount Diablo Meridian



Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______

Check and complete all sources used in creating this map.

[ ] USGS 1:__________ Quadrangle ______________________ Date __________

[ ] USGS 1:__________ Quadrangle ______________________ Date __________

[1] Siskiyou County Book of Deeds 1852-1927 Volume 45 Page 14 July 21, 1891

[ ] Siskiyou County Official Records (1928+) Volume ________ Page ________

[5] USFS Pamphlet File #110 Title Deed Long-Bell Lbr Co. V 115 p113 May 20,

[ ] College of the Siskiyous Library Pamphlet File ______________________

[ ] Metsker's Map of Siskiyou County, California Date __________

[2] Other Siskiyou County information Patent Card T44N R3W

[3] Other R 3-4 W Rayson

[4] Other Off Map Sis Co [illegible]

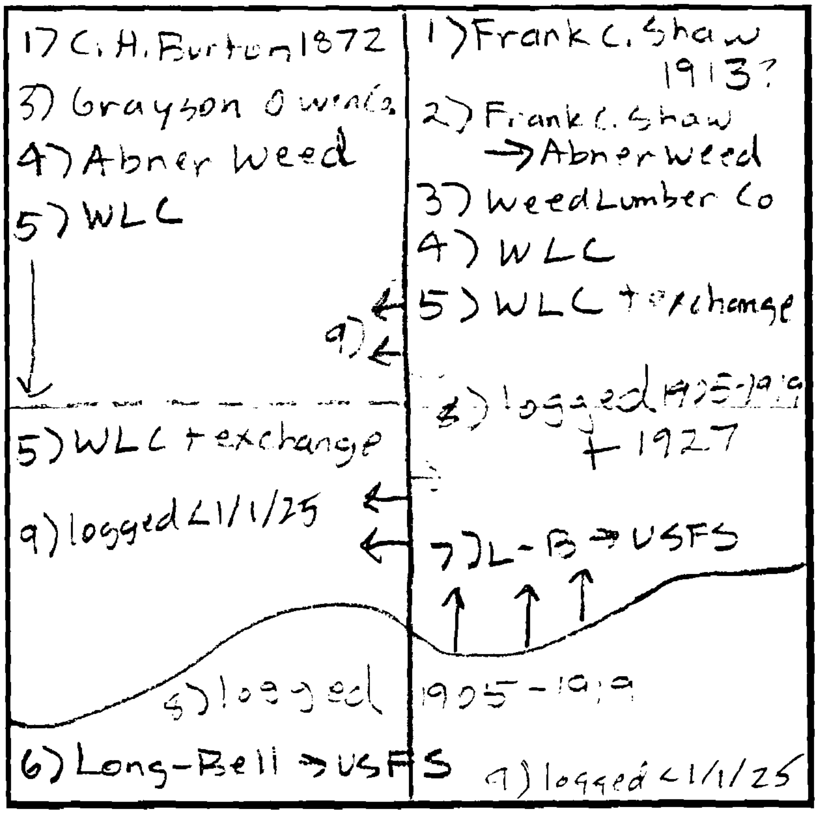
[6] Other Metsker's Atlas 1927

[7] Other [illegible]

[8] Other WLC [illegible] 1925

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership of T44N R3W Section 24 Mount Diablo Meridian



Owner ____________ Date ______
Owner ____________ Date ______
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Owner ____________ Date ______
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Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______

Check and complete all sources used in creating this map.

☐ USGS 1:__________ Quadrangle ______________________ Date __________
☐ USGS 1:__________ Quadrangle ______________________ Date __________
2 Siskiyou County Book of Deeds 1852-1927 Volume 61 Page 50 Dec 8 1902
7 Siskiyou County Official Records (1928+) Volume 144 Page 147-149 Feb 20, 1943
6 USFS Pamphlet File #110 V115 p113 May 20, 1940
☐ College of the Siskiyous Library Pamphlet File ______________________
☐ Metsker's Map of Siskiyou County, California Date __________
1 Other Siskiyou County information Patent Card T44N R3W
3 Other R3-4W [illegible]
4 Other Off Map [illegible] 1911
5 Other R3-4W [illegible]
8 Other Historic [illegible] Atlas
9 Other WLC Calif N 1925

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership of T44N R3W Section 25 Mount Diablo Meridian

1) CP 1895
2) CP
3) Weed Lumber Company
4) WLC + 1939 exchange
5) Long-Bell → Pickering
6) Pickering exchange w/ USFS
7) USFS
8) all logged 1925-[illegible]
9) logged < 1/1/1925

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Check and complete all sources used in creating this map.

- ☐ USGS 1:______ Quadrangle ______ Date ______
- ☐ USGS 1:______ Quadrangle ______ Date ______
- ☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______
- 5 Siskiyou County Official Records (1928+) Volume 100 Page 412 May 17, 1939
- ☐ USFS Pamphlet File ______
- ☐ College of the Siskiyous Library Pamphlet File ______
- ☐ Metsker's Map of Siskiyou County, California Date ______
- 1 Other Siskiyou County information [illegible]
- 2 Other R3-4W Crocker
- 3 Other Off Map Sis Co 1911
- 4 Other R3-4W RaySon
- 6 Other OR v99 p1-21 May 17, 1939
- 7 Other Metsker's Atlas 1957

[illegible]

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership of T44N R3W Section 26 Mount Diablo Meridian

1) John A McCoy 1904 2) WLC 3) WLC 4) WLC + 1939 ex 5) WLC → USFS 7) John A McCoy 1903 → Weed	1) Weed LC 1906 2) WLC 3) WLC 4) WLC + 1939 ex 5) WLC → USFS 6) J. C. Morris 1902
1) Addie McCoy 1904 2) WLC 3) WLC 4) WLC + 1939 ex 5) WLC → USFS 7) Addie McCoy → Weed	9) all logged 1995-[illegible] 10) all logged <1/1/1935

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

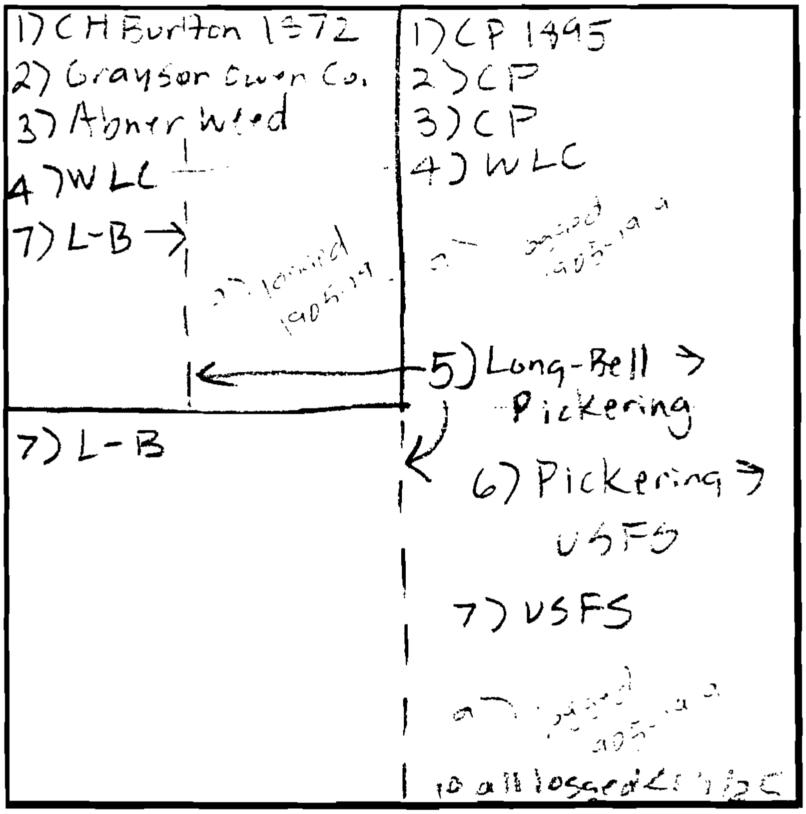
Check and complete all sources used in creating this map.

- ☐ USGS 1:__________ Quadrangle ____________________ Date __________
- ☐ USGS 1:__________ Quadrangle ____________________ Date __________
- 6 Siskiyou County Book of Deeds 1852-1927 Volume 61 Page 49
- 5 Siskiyou County Official Records (1928+) Volume 100 Page 412 May 17, 1939
- ☐ USFS Pamphlet File ____________________
- ☐ College of the Siskiyous Library Pamphlet File ____________________
- ☐ Metsker's Map of Siskiyou County, California Date __________
- 1 Other Siskiyou County information Patent Card T44N R3W
- 2 Other R 3-4 W [illegible]
- 3 Other [illegible]
- 4 Other R 3-4 W [illegible]
- 7 Other Book of Deeds V 60 p 175 Jan 3 1903
- 8 Other " V 60 p 92 Jan 22, 1903

9 [illegible]

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership of T44N R3W Section 27 Mount Diablo Meridian



Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

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Owner ______ Date ______

Owner ______ Date ______

Check and complete all sources used in creating this map.

☐ USGS 1:______ Quadrangle ______ Date ______

☐ USGS 1:______ Quadrangle ______ Date ______

☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______

5 Siskiyou County Official Records (1928+) Volume 100 Page 412 May 17, 1939

☐ USFS Pamphlet File ______

☐ College of the Siskiyous Library Pamphlet File ______

☐ Metsker's Map of Siskiyou County, California Date ______

1 Other Siskiyou County information Patent ... T44 R3W

2 Other R 3-4 W Grayson

3 Other CF Maps ... 19..

4 Other R 3-4 W Ruston

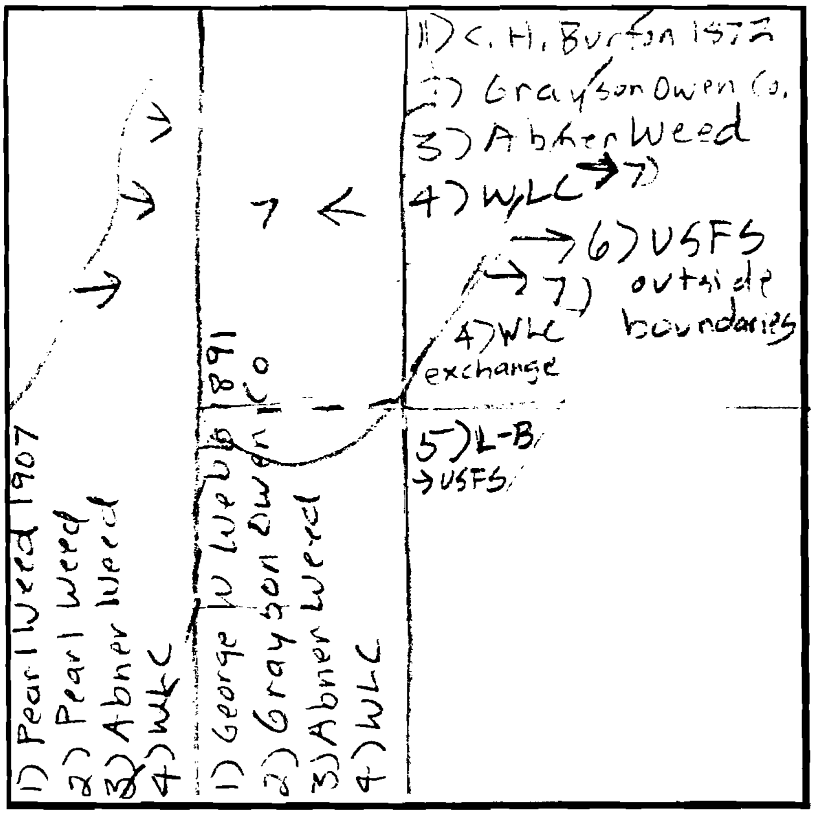
6 Other OR V 99 p 121 May 7 1939

7 Other Metsker's Atlas 1957

9 Southern Pacific Lands in Cal 1903 mineral rights

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership
of
T44N R3W Section 28
Mount Diablo Meridian



Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______

Check and complete all sources used in creating this map.

☐ USGS 1:__________ Quadrangle ______________________ Date __________

☐ USGS 1:__________ Quadrangle ______________________ Date __________

☐ Siskiyou County Book of Deeds 1852-1927 Volume _______ Page _______

5 Siskiyou County Official Records (1928+) Volume 115 Page 110 May 20, 1940

☐ USFS Pamphlet File ______________________

☐ College of the Siskiyous Library Pamphlet File ______________________

☐ Metsker's Map of Siskiyou County, California Date __________

1 Other Siskiyou County information Patent Card T44N R3W

2 Other R 3-4W Crocker

3 Other SF Map [illegible]

4 Other R 3-4W [illegible]

6 Other NE [illegible] Rd [illegible]

7 Other WLC [illegible] 1925 [illegible] 1925

Land Ownership
of
T44N R3W Section 29
Mount Diablo Meridian

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

1) CP 1895
2) CP
3) CP → WLC 1905
4) Weed Lumber Co
5) Long-Bell

Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______

Check and complete all sources used in creating this map.

☐ USGS 1:__________ Quadrangle ____________________ Date __________
☐ USGS 1:__________ Quadrangle ____________________ Date __________
☒ 3 Siskiyou County Book of Deeds 1852-1927 Volume 57 Page 472 Sept 30, 1905
☐ Siskiyou County Official Records (1928+) Volume ______ Page ______
☐ USFS Pamphlet File ____________________
☐ College of the Siskiyous Library Pamphlet File ____________________
☐ Metsker's Map of Siskiyou County, California Date __________
☒ 1 Other Siskiyou County information [illegible]
☒ 2 Other R 3-4 W Crocker
☒ 4 Other [illegible]
☒ 5 Other [illegible]
☐ Other ____________________
☐ Other ____________________

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership
of
T44N R3W Section 30
Mount Diablo Meridian

always public land

1) KNF

2) logged '50–69
truck logging

Owner __________ Date ______

Owner __________ Date ______

Owner __________ Date ______

Owner __________ Date ______

Owner __________ Date ______

Owner __________ Date ______

Owner __________ Date ______

Owner __________ Date ______

Owner __________ Date ______

Owner __________ Date ______

Owner __________ Date ______

Check and complete all sources used in creating this map.

- ☐ USGS 1:________ Quadrangle ______________ Date ________
- ☐ USGS 1:________ Quadrangle ______________ Date ________
- ☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______
- ☐ Siskiyou County Official Records (1928+) Volume ______ Page ______
- ☐ USFS Pamphlet File ______________
- ☐ College of the Siskiyous Library Pamphlet File ______________
- ☐ Metsker's Map of Siskiyou County, California Date ________
- ☐ Other Siskiyou County information ______________
- ☑ Other Shasta National Forest [illegible] 1916
- ☑ Other [illegible]
- ☐ Other ______________
- ☐ Other ______________
- ☐ Other ______________

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership
of
T44N R3W Section 31
Mount Diablo Meridian

1) Central Pac 1895 (all) 2) CP 3) CP 4) SP 5) SP	3) SP Land Co 4 Mt Shasta Pine Mfg.	3) SPL Co Co.
	3) CP 4) SP 5) SP	3) SPL Co 4) MSPM Co
1) CP 2) Churchill Co. 3) Churchill Co. 4) Coonrod + Coonrod	1, 2, 3) CP 4) SP 5) SP	

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Check and complete all sources used in creating this map.

- ☐ USGS 1:__________ Quadrangle ____________________ Date __________
- ☐ USGS 1:__________ Quadrangle ____________________ Date __________
- ☐ Siskiyou County Book of Deeds 1852-1927 Volume _______ Page _______
- ☐ Siskiyou County Official Records (1928+) Volume _______ Page _______
- ☐ USFS Pamphlet File ____________________
- ☐ College of the Siskiyous Library Pamphlet File ____________________
- ☐ Metsker's Map of Siskiyou County, California Date __________
- 1 Other Siskiyou County information Patent Card T44 ...
- 2 Other R 3-4 W Crocker
- 3 Other R 3-4 W Raysor
- 4 Other Metsker's Atlas 1957
- 5 Other Southern Pac Lands in Ca 1963
- ☐ Other ____________________

Land Ownership
of
T44N R3W Section 32
Mount Diablo Meridian

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

5) USFS
6) USFS

7) N ½ logged ? 2

1) Manuel F. Rose 1913
2) M Rose
3) M. Rose
4) Rose
6) Coonrod + Coonrod

1) C. H. Burton 1872
2) Grayson Owen Co
3) Abner Weed
4) WLC / L-B
6) Long-Bell
9) logged <1/1/1925

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Check and complete all sources used in creating this map.

9 WLC, Calif ~1925 SE¼

☐ USGS 1:______ Quadrangle ______ Date ______

☐ USGS 1:______ Quadrangle ______ Date ______

☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______

☐ Siskiyou County Official Records (1928+) Volume ______ Page ______

☐ USFS Pamphlet File ______

☐ College of the Siskiyous Library Pamphlet File ______

☐ Metsker's Map of Siskiyou County, California Date ______

1 Other Siskiyou County information Patent Card T44N R3W

2 Other R 3-4 W Crocker

3 Other Off Map Sis Co 1911

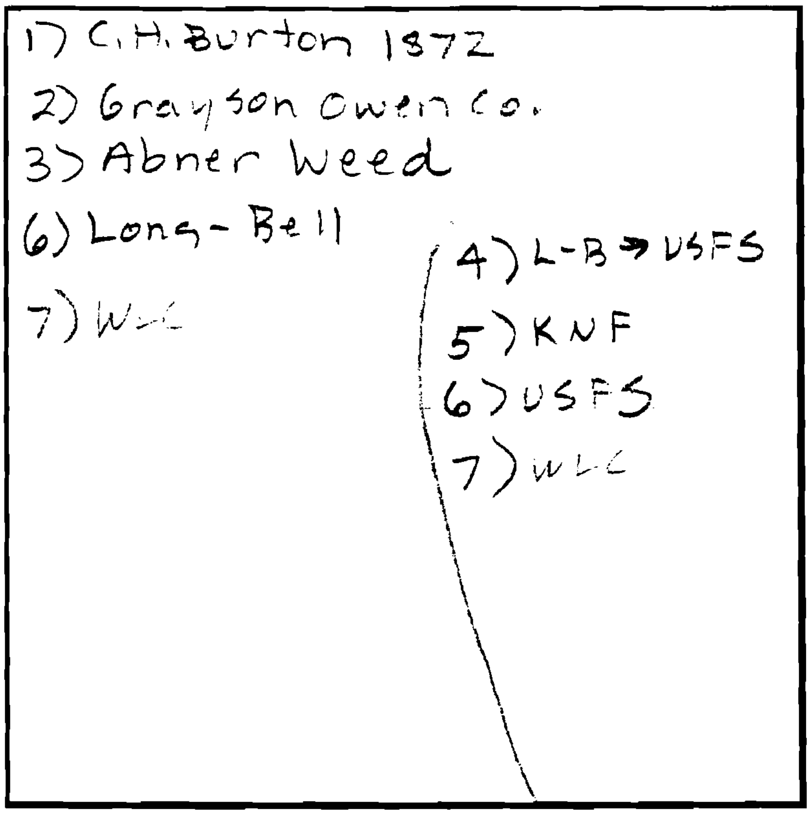
4 Other R 3-4 W Rawson

5 Other Shasta Nat'l Forest Westmal F 1936

6 Other Metsker's Atlas 1957

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership
of
T44N R3W Section 33
Mount Diablo Meridian



Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Check and complete all sources used in creating this map.

☐ USGS 1:__________ Quadrangle ______________________ Date __________

☐ USGS 1:__________ Quadrangle ______________________ Date __________

☐ Siskiyou County Book of Deeds 1852-1927 Volume _______ Page _______

☐ Siskiyou County Official Records (1928+) Volume _______ Page _______

4 USFS Pamphlet File #110 V115 p113 May 20, 1940

☐ College of the Siskiyous Library Pamphlet File ______________________

☐ Metsker's Map of Siskiyou County, California Date __________

1 Other Siskiyou County information Patent Card T44N R3W

2 Other R 3-4W Crocker

3 Other Off Map Sis Co 1911

5 Other KNF Goosenest Ranger District 405

6 Other Metskers Atlas 1957

7 Other all logged [illegible] 1925

Land Ownership
of
T44N R3W Section 34
Mount Diablo Meridian

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

7) USFS

1) Earl P. Neal 1904
2) Earl Neal
3) McCloud River Lumber Co
4) Weed Lumber Co
5) L-B → Pickering
6) Pickering → USFS
7) USFS 10)

logged 1919

logged 1918

1) SW Phillips 1917
2) SW Phillips
3) M R L Co
4) WLC 7) USFS
5) L-B → Pick, 6 Pick → USFS 10)

Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______

Check and complete all sources used in creating this map.

4b) [illegible] yellow pine [illegible] taken [illegible]

☐ USGS 1:__________ Quadrangle ____________________ Date __________

☐ USGS 1:__________ Quadrangle ____________________ Date __________

☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______

5 Siskiyou County Official Records (1928+) Volume 100 Page 412 May 17, 1939

☐ USFS Pamphlet File ____________________

☐ College of the Siskiyous Library Pamphlet File ____________________

☐ Metsker's Map of Siskiyou County, California Date __________

1 Other Siskiyou County information Patent Card T44N R34

2 Other R3-4W Cracker

3 Other Off Map Sis. Co 1911

4 Other R3-4W Pawson

6 Other OR Vol 99 p1-21 May 17, 1939

7 Other Metsker's Atlas 1957

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership of T44N R3W Section 35 Mount Diablo Meridian

1) CP 1895
2) CP
3) Weed Lumber Co
4) CP → WLC
5) L-B → Pickering
6) Pickering → USFS

(4) logged all, 25

7) Camp 2 '09 + logging RR

8

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Check and complete all sources used in creating this map.

☐ USGS 1:______ Quadrangle ______ Date ______

☐ USGS 1:______ Quadrangle ______ Date ______

4 Siskiyou County Book of Deeds 1852-1927 Volume 57 Page 472 Sept 30 1905

5 Siskiyou County Official Records (1928+) Volume 100 Page 412 May 17, 1939

☐ USFS Pamphlet File ______

☐ College of the Siskiyous Library Pamphlet File ______

☐ Metsker's Map of Siskiyou County, California Date ______

1 Other Siskiyou County information Patent Card T44N R3W

2 Other R3-4W Crocker

3 Other Off Map Sis Co '911

6 Other OR V 99 p1-21 May 17, 1939

7 Other [illegible]

4 Other WLC Cat 1925 all logged [illegible]

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership of T44N R3W Section 36 Mount Diablo Meridian

1) Harry H. Webb 1889
2) J C Mitchell
3) Weed Lumber Co
4) Long-Bell → Pickering
5) Pickering → USFS
6) logging RR shown
7) logged 4/1/1925

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Check and complete all sources used in creating this map.

- ☐ USGS 1:______ Quadrangle ______ Date ______
- ☐ USGS 1:______ Quadrangle ______ Date ______
- ☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______
- 4 Siskiyou County Official Records (1928+) Volume 100 Page 412 May 7, 1939
- ☐ USFS Pamphlet File ______
- ☐ College of the Siskiyous Library Pamphlet File ______
- ☐ Metsker's Map of Siskiyou County, California Date ______
- 1 Other Siskiyou County information Patent Card T44N R3W
- 2 Other R 3-4 W Crocker
- 3 Other Off Map Sis Co 1911
- 5 Other OR v 99 p 21 [illegible] 17, 1939
- 6 Other [illegible]
- 7 Other WLC Calif 1925 all logged 4/1/25

Land Ownership
of
T45N R3W Section 1
Mount Diablo Meridian

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

1) Central Pacific
2) CP
3) CP
4) Long-Bell
5) CP 1895
6) CP oct 9, 1895

Owner CP Date 1895
Owner Central Pac RR Date 1911
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner Long-Bell Date 1957
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______

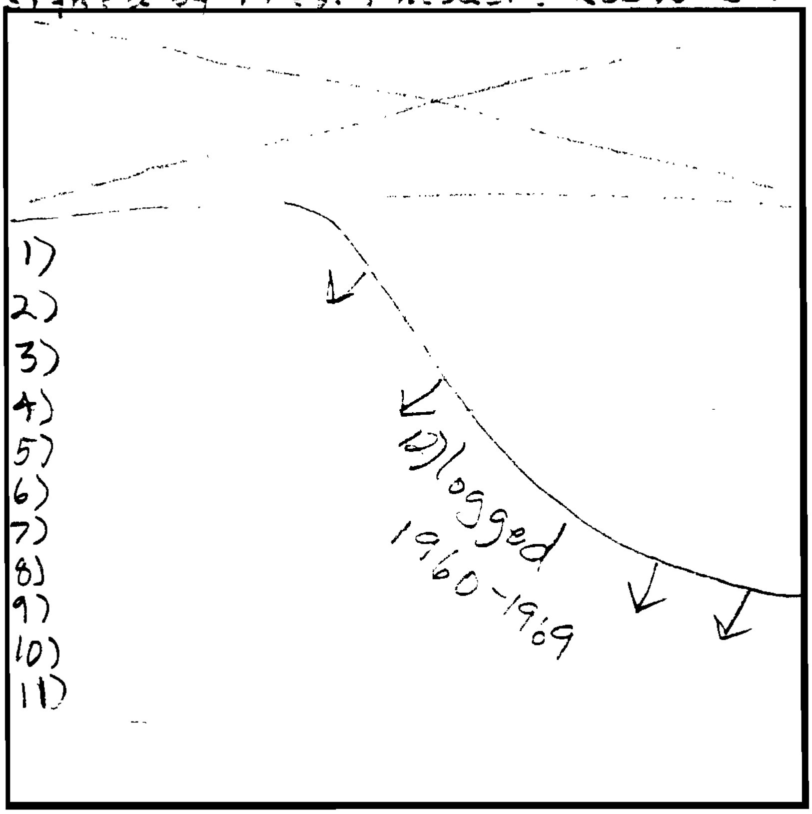
Check and complete all sources used in creating this map.

☐ USGS 1:______ Quadrangle ______ Date ______
☐ USGS 1:______ Quadrangle ______ Date ______
☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______
☐ Siskiyou County Official Records (1928+) Volume ______ Page ______
☐ USFS Pamphlet File ______
☐ College of the Siskiyous Library Pamphlet File ______
☐ Metsker's Map of Siskiyou County, California Date ______
1 ☒ Other Siskiyou County information R3-4W MDM Crocker Co. binding no dat
2 ☒ Other " " " R3-4W MDM RaySon binding undated O
3 ☒ Other Official Map of Siskiyou County 1911
4 ☒ Other Metsker's Atlas of Siskiyou County, California 1957
5 Other Patent Card T45N R3W Oct 9, 1895
6 Other BLM Land Patent Authority for this grant =
July 25, 1866: GRANT-RR O and C (14 Stat. 239)

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership
of
T45N R3W Section 2
Mount Diablo Meridian

Klamath Nat'l Forest District 3 – Goosenest – Formed Feb 13, 1909 signed by Pres. Theodore Roosevelt



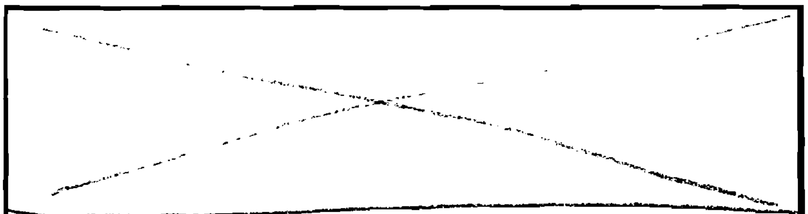
Owner USA Date 1900s
non-Shasta NF 1908
Owner USA Date 1911
USFS-KNF 1916
Owner USFS Date 1924
Owner USFS Date 1936
Owner USFS Date 1941
Owner USFS Date 1954
Owner ______ Date ______
Owner USFS Date 10/1970
Owner ______ Date ______
Owner USFS Date 1991
Owner ______ Date ______

Check and complete all sources used in creating this map.

2 Historic Resources Atlas
7 ☒ USGS 1:125,000 Quadrangle Macdoel Date 1941
8 ☒ USGS 1:62,500 Quadrangle Macdoel Date 1954
☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______
☐ Siskiyou County Official Records (1928+) Volume ______ Page ______
☐ USFS Pamphlet File ______
☐ College of the Siskiyous Library Pamphlet File ______
9 ☒ Metsker's Map of Siskiyou County, California Date 10/70
2 ☒ Other Siskiyou County information R3-4W MDM Crocker's binding undated
4 ☒ Other " " " R3-4W MDM Rayson binding undated
3 ☒ Other Official Map of Siskiyou County, Cal. Jan 3, 1911
6 ☒ Other Shasta Nat'l Forest East Half 1936
5 ☒ Other " " " 1924
10 ☒ Other NE Sis. Co. Coordinated Road Management Plan 1991
11 X " Shasta Nat'l Forest, Cal. North Half
1 X " Map of Eastern Part of Sis. Co. Cal. 1908 – shows Shasta [illegible]

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership
of
T45N R3W Section 3
Mount Diablo Meridian



1) Central Pacific
2) Central Pacific
3) CP
4) Long-Bell
5) CP

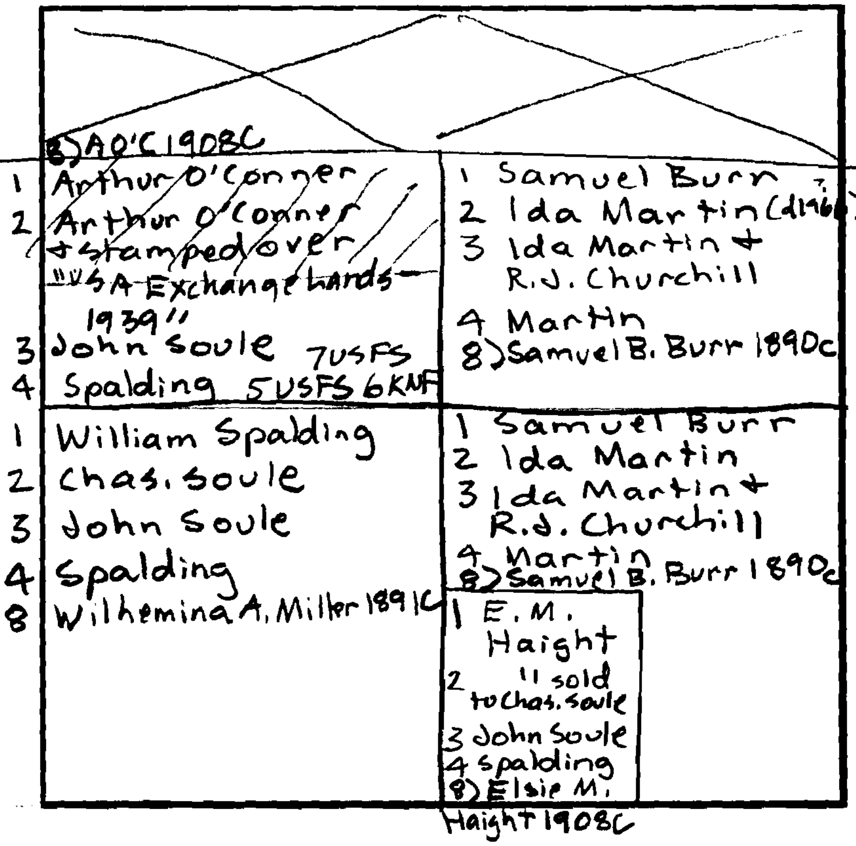
Owner CP Date 1895
Owner Cen. Pac. RR Date 1911
Owner ______ Date ______
Owner CP RR Date 1939
Owner ______ Date ______
Owner Long-Bell Date 1957
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______

Check and complete all sources used in creating this map.

- ☐ USGS 1:______ Quadrangle ______ Date ______
- ☐ USGS 1:______ Quadrangle ______ Date ______
- ☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______
- ☐ Siskiyou County Official Records (1928+) Volume ______ Page ______
- ☐ USFS Pamphlet File ______
- ☐ College of the Siskiyous Library Pamphlet File ______
- ☐ Metsker's Map of Siskiyou County, California Date ______
- 1 ☒ Other Siskiyou County information Official Map of Sis. Co. 1911
- 4 ☒ Other Metsker's Atlas of Sis. Co. 1957
- 2 ☒ Other R3-4W MDM Crocker binding } shows section owned by
- 3 ☒ Other R3-4W MDM Rayson binding } CP by 1939
- 5 ☒ Other Patent Card T45N R3W Oct 9, 1895
- ☐ Other ______

6	5	[redacted]	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership
of
T45N R3W Section 4
Mount Diablo Meridian



Owner ______ Date 19__

Owner ______ Date 1911

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date 1939

Owner ______ Date ______

Owner ______ Date 1954 1957

Owner KNF Date 1968

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Check and complete all sources used in creating this map.

5 USGS 1: 62,500 Quadrangle Macdoel Date 1954

☐ USGS 1:______ Quadrangle ______ Date ______

☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______

☐ Siskiyou County Official Records (1928+) Volume ______ Page ______

☐ USFS Pamphlet File ______

☐ College of the Siskiyous Library Pamphlet File ______

7 Metsker's Map of Siskiyou County, California Date 10/70

4 Other Siskiyou County information Official Map of Sis. Co. 1911

1 Other R 3-4 W MDM Crocker binding

2 Other R 3-4 W MDM RaySon binding

3 Other Metsker's Atlas of Sis Co 1957

6 Other Klamath Nat'l Forest Goosenest Ranger District 1968

8 Other Patent Card T45N R3W Oct 9 1895
c = verified through BLM online land patent search

9 Historic Resources Atlas

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership of T45N R3W Section 5 Mount Diablo Meridian

1) Central Pacific RR
2) Chas. Soule
3) John Soule
4) Mills + Briggs
5) CP 1895
6) logged 1920 w/ horses & hauled to Loosely Mill → lumber to Montague

Owner CP Date 1895

Owner Mills + Briggs Date 1911

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner John Soule Date 1957

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

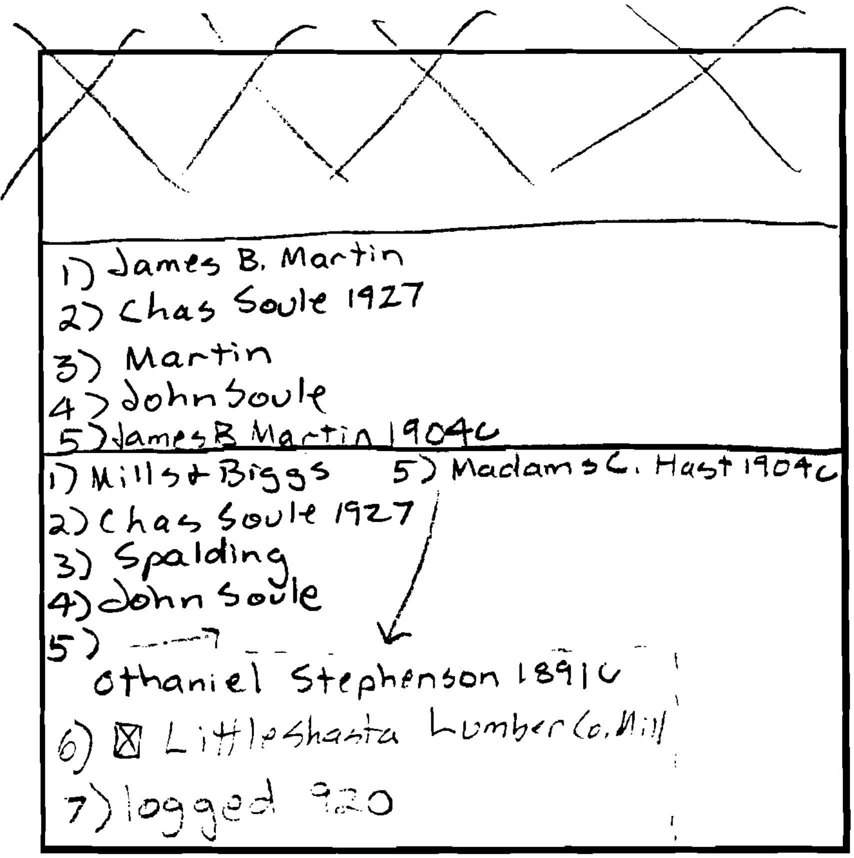
Owner ______ Date ______

Check and complete all sources used in creating this map.

- ☐ USGS 1:______ Quadrangle ______ Date ______
- ☐ USGS 1:______ Quadrangle ______ Date ______
- ☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______
- ☐ Siskiyou County Official Records (1928+) Volume ______ Page ______
- ☐ USFS Pamphlet File ______
- ☐ College of the Siskiyous Library Pamphlet File ______
- ☐ Metsker's Map of Siskiyou County, California Date ______
- 1 Other Siskiyou County information R 3-4 W MDM Crocker binding
- 2 Other " R 3-4 W " Rayson binding
- 3 Other Metsker's Atlas of Sis. Co. 1957
- 4 Other Official Map of Sis. Co. 1911
- 5 Other Patent Card T45N R3W Oct 9, 1895
- 6 Other Historic [illegible] Atlas also 8/28/1920 memorandum

[illegible]	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership
of
T45N R3W Section 6
Mount Diablo Meridian



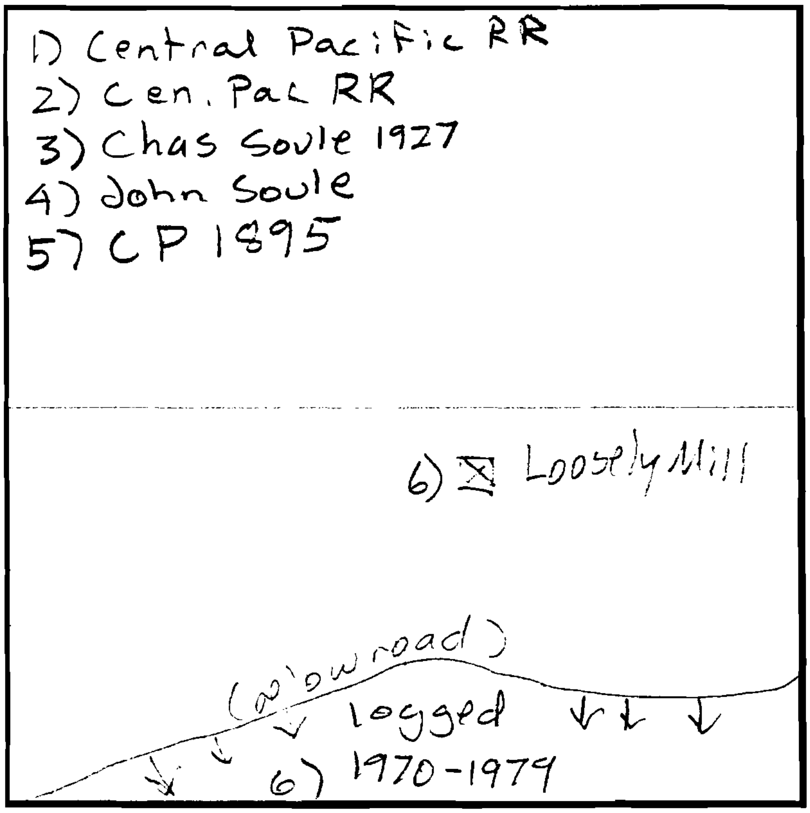
Owner ________ Date ______
Owner ________ Date ______
Owner Chas Soule Date 1927
Owner ________ Date ______
Owner ________ Date ______
Owner John Soule Date 1957
Owner ________ Date ______
Owner ________ Date ______
Owner ________ Date ______
Owner ________ Date ______
Owner ________ Date ______

Check and complete all sources used in creating this map.

☐ USGS 1:________ Quadrangle ____________ Date ________
☐ USGS 1:________ Quadrangle ____________ Date ________
☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______
☐ Siskiyou County Official Records (1928+) Volume ______ Page ______
☐ USFS Pamphlet File ____________
☐ College of the Siskiyous Library Pamphlet File ____________
☐ Metsker's Map of Siskiyou County, California Date ________
1 Other Siskiyou County information R3-4W Crocker binding
2 Other " R3-4W Rayson binding
3 Other Official Map of Sis Co. 1911
4 Other Metsker's Atlas of Sis. Co 1957
5 Other Patent Card T45N R3W
☐ Other [illegible]
7 [illegible] In [illegible] Logging RR [illegible]

Land Ownership
of
T45N R3W Section 7
Mount Diablo Meridian

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

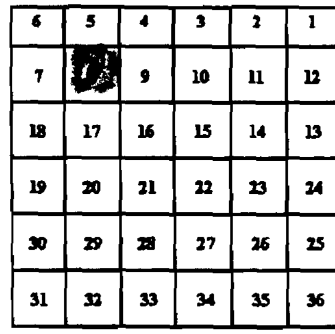


Owner ______ Date ______
Owner Central Pac Date 1911
Owner Chas Soule Date 1927
Owner ______ Date ______
Owner ______ Date ______
Owner John Soule Date 1957
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______

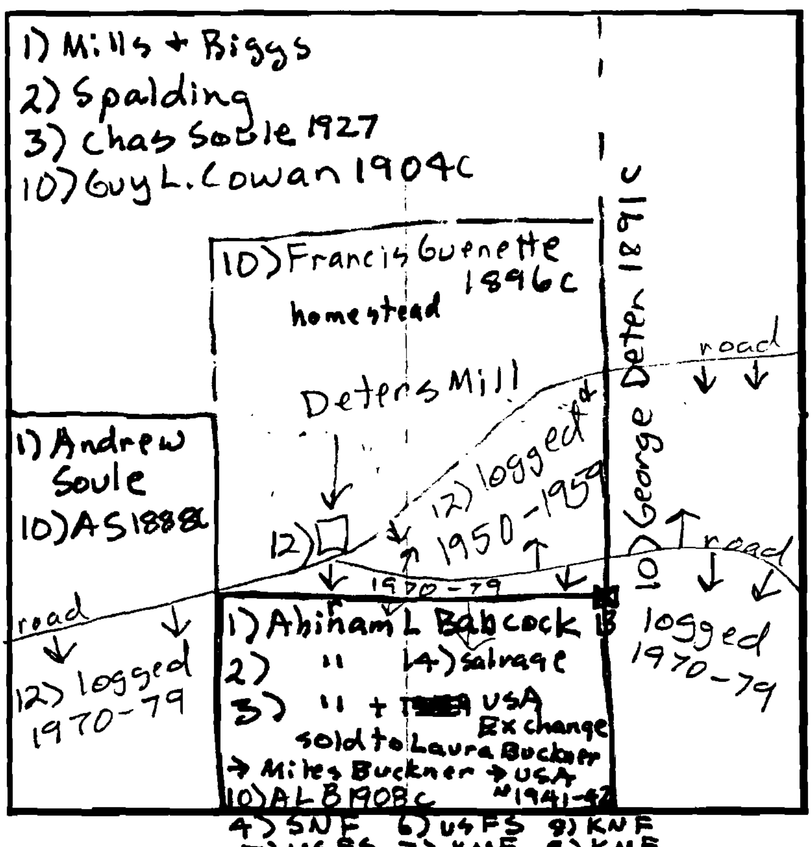
Check and complete all sources used in creating this map.

☐ USGS 1:______ Quadrangle ______ Date ______
☐ USGS 1:______ Quadrangle ______ Date ______
☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______
☐ Siskiyou County Official Records (1928+) Volume ______ Page ______
☐ USFS Pamphlet File ______
☐ College of the Siskiyous Library Pamphlet File ______
☐ Metsker's Map of Siskiyou County, California Date ______
1 Other Siskiyou County information R 3-4 W Crocker binding
2 Other Official Map of Sis Co 1911
3 Other R3-4W RaySon binding
4 Other Metsker's Atlas of Sis Co 1957
5 Other Patent Card T45N R3W Oct 9, 1895
6 Other Historic Resources Atlas

check ... did ... to Deter?
Loosley?



Land Ownership
of
T45N R3W Section 8
Mount Diablo Meridian



Owner	Date
Owner ______	Date ______
Owner ______	Date ______
Owner ______	Date ______
Owner ______	Date ______
Owner ______	Date ______
Owner ______	Date ______
Owner ______	Date ______
Owner ______	Date ______
Owner ______	Date ______
Owner ______	Date ______
Owner ______	Date ______

13) Loosely Mill 8/23/1920 map in Long-Bell Logging RR grades (green folder)

Check and complete all sources used in creating this map.

12) Historic Resources Atlas

4 USGS 1: 125,000 Quadrangle Macdoel Date 1941-1949 reprint

5 USGS 1: 62,500 Quadrangle Macdoel Date 1954

☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______

☐ Siskiyou County Official Records (1928+) Volume ______ Page ______

☐ USFS Pamphlet File ______

☐ College of the Siskiyous Library Pamphlet File ______

☐ Metsker's Map of Siskiyou County, California Date ______

1 Other Siskiyou County information R3-4W MDM Crocker binding

2 Other " Official Map of Sis. Co. 1911

3 Other R3-4W MDM Payson binding

6 Other Metsker's Atlas of Sis. Co. 1957

7 Other Klamath Nat'l Forest Goosenest Ranger District 1968

8 Other " " " " " " 1978

9 NE Sis. Co. Coordinated Road Mngmt Plan 1991 Aug 11 Panth...

10 Patent Card T45N R3W ...

6	5	4	3	2	1
7	8	9 √	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership of T45N R3W Section 9 Mount Diablo Meridian

1) Central Pacific RR
2) "
3) Chas Soule
4) John Soule

1) Mills + Biggs
2) ? check for Dwinnell
3) Chas Soule
4) John Soule
7) Mills Ranch
5) George Deter 1891c

7) logged 1950-59 + 1970-79

5) CP 1895c

Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______

Check and complete all sources used in creating this map.

☐ USGS 1:________ Quadrangle ______________ Date ________
☐ USGS 1:________ Quadrangle ______________ Date ________
☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______
☐ Siskiyou County Official Records (1928+) Volume ______ Page ______
☐ USFS Pamphlet File ______________
☐ College of the Siskiyous Library Pamphlet File ______________
☐ Metsker's Map of Siskiyou County, California Date ________
1 Other Siskiyou County information R3-4W Crocker binding
2 Other Official Map of Sis. Co. 1911
3 Other R3-4W Rayson binding
4 Other Metsker's Atlas of Sis Co 1957
5 Other Patent card T45N R3W
6 Other ~~BLM shows CP with title although it is divided as above~~

Note: Mills Ranch + Deters in Sec 9

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership
of
T45N R3W Section 10
Mount Diablo Meridian

1) Phoebe Terwilliger 2) ? 3) Sydney Terwilliger 6) Elsie Turner 11) no data 12) Willie Burr 3/11/1890	1) Edward Loosely 2) ? 3) Edward Loosely USA Land Exchange 1937 4) SNF 5) USFS 6) USFS 7) USFS 8) USFS 9) USFS 10) KNF 11) Edward K Loosely 1907 12) Edward K Loosley 1907
1) Ellen Smith 2) Smith 3) Clarence S. Smith 6) John Martin 11) James M. Smith 1890 c 13) logged 1970-79	1) Annie G. Smith 2) Smith 3) Annie G. Smith 6) John Martin 11) Clarence S. Smith 1890 c 13) logged 1950-59

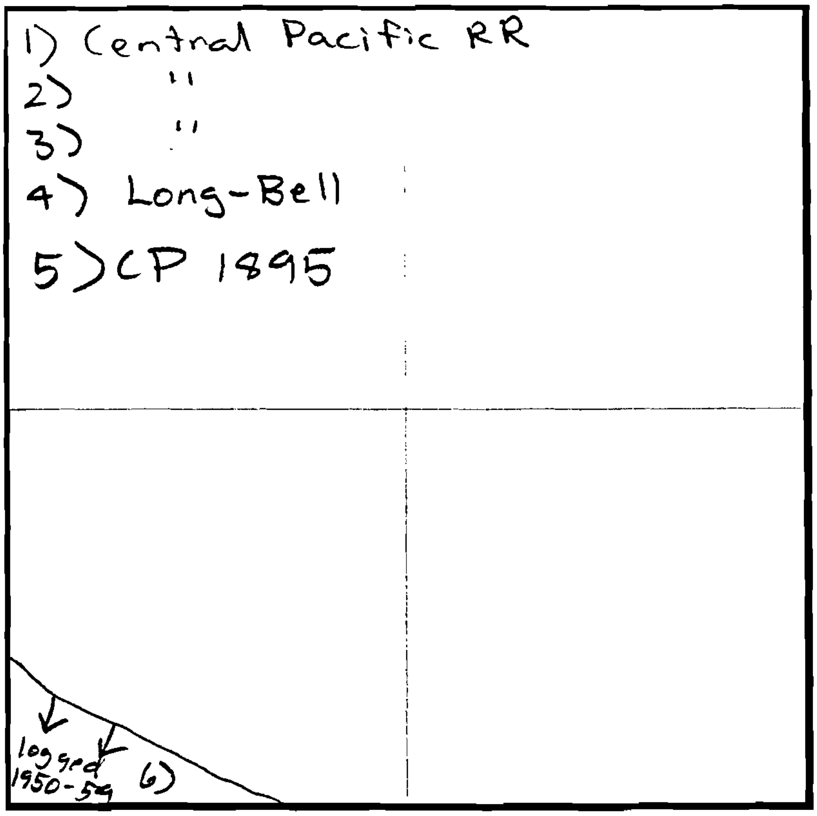
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______

Check and complete all sources used in creating this map.

13) Historic Resources Atlas
4 USGS 1:125,000 Quadrangle Macdoel Date 1949 reprint
5 USGS 1:62,500 Quadrangle " Date 1954
☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______
☐ Siskiyou County Official Records (1928+) Volume ______ Page ______
☐ USFS Pamphlet File ______
☐ College of the Siskiyous Library Pamphlet File ______
8 Metsker's Map of Siskiyou County, California Date 10/70
1 Other Siskiyou County information R 3-4 W MDM Crocker binding
2 Other Off. Map of Sis Co 1911
3 Other R 3-4 W MDM RaySon binding
6 Other Metsker's Atlas 1957
7 Other KNF Goosenest Ranger District 1968
9 Other " " " " 1978
10 NE Sis Co Coordinated Road Mngmt Plan 1991
11 Patent card T45N R3W

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

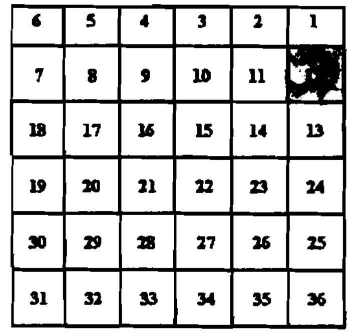
Land Ownership
of
T45N R3W Section 11
Mount Diablo Meridian



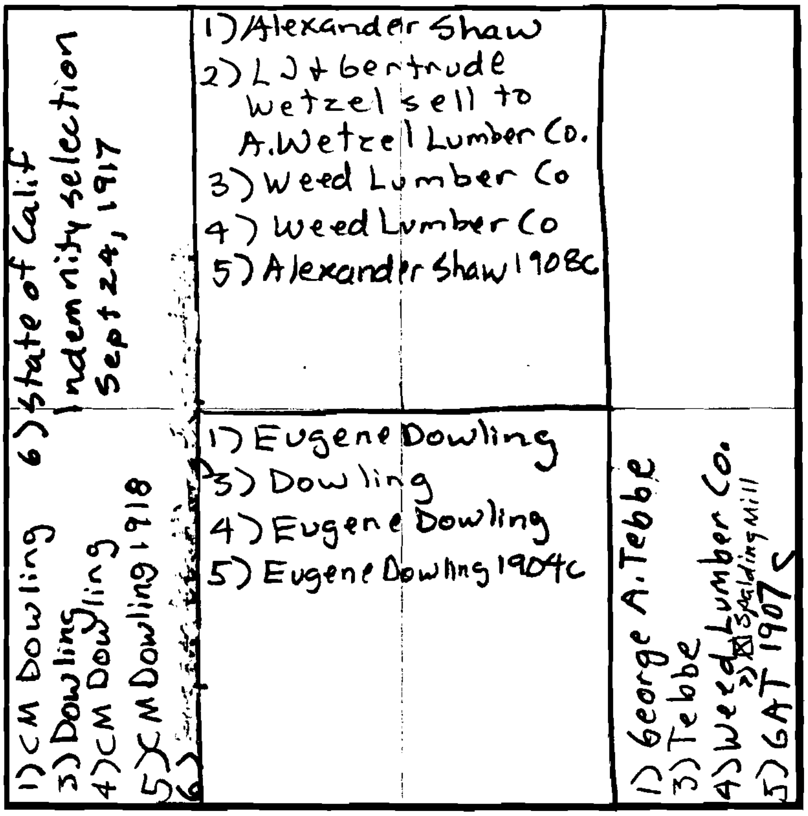
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______

Check and complete all sources used in creating this map.

☐ USGS 1:______ Quadrangle ______ Date ______
☐ USGS 1:______ Quadrangle ______ Date ______
☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______
☐ Siskiyou County Official Records (1928+) Volume ______ Page ______
☐ USFS Pamphlet File ______
☐ College of the Siskiyous Library Pamphlet File ______
☐ Metsker's Map of Siskiyou County, California Date ______
1 Other Siskiyou County information R3-4W Crocker binding
2 Other Off. Map of Sis Co 1911
3 Other R3-4W Rayson binding
4 Other Metsker's Atlas 1957
5 Other Patent Card T45N R3W Oct 9, 1895
6 Other Historic Resources Atlas



Land Ownership
of
T45N R3W Section 12
Mount Diablo Meridian



Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Check and complete all sources used in creating this map.

☐ USGS 1:__________ Quadrangle ______________________ Date __________

☐ USGS 1:__________ Quadrangle ______________________ Date __________

☐ Siskiyou County Book of Deeds 1852-1927 Volume _______ Page _______

☐ Siskiyou County Official Records (1928+) Volume _______ Page _______

☐ USFS Pamphlet File ______________________

☐ College of the Siskiyous Library Pamphlet File ______________________

☐ Metsker's Map of Siskiyou County, California Date __________

1 Other Siskiyou County information R 3-4 W Crocker binding

2 Other Book of Deeds Vol 79 p 567 Dec 27, 1909

3 Other off. Map of Sis Co 1911

4 Other R 3-4W RaySon binding

5 Other Patent Card T45N R3W

6 Other BLM c = correct

7 Historic Resources Atlas ~ location Spalding Mill

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership
of
T45N R3W Section 13
Mount Diablo Meridian

1) Central Pacific RR
2) "
3) "
4) Long-Bell
5) CP 1895

Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______

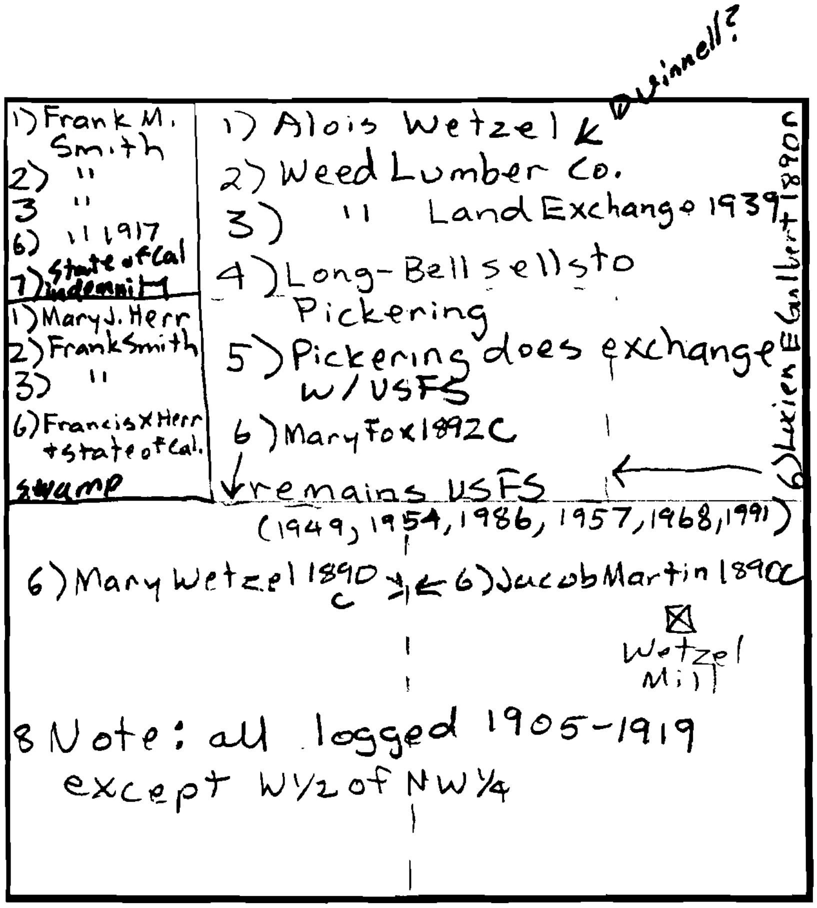
Check and complete all sources used in creating this map.

- ☐ USGS 1:______ Quadrangle ______ Date ______
- ☐ USGS 1:______ Quadrangle ______ Date ______
- ☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______
- ☐ Siskiyou County Official Records (1928+) Volume ______ Page ______
- ☐ USFS Pamphlet File ______
- ☐ College of the Siskiyous Library Pamphlet File ______
- ☐ Metsker's Map of Siskiyou County, California Date ______
- 1 Other Siskiyou County information R3-4W Crocker binding
- 2 Other Off. Map of Sis. Co. 1911
- 3 Other R3-4W RaySon binding
- 4 Other Metsker's Atlas 1957
- 5 Other Patent Card T45N R3W Oct 9, 1895
- ☐ Other ______

k for Bridges ≤ 1890s

Land Ownership
of
T45N R3W Section 14
Mount Diablo Meridian

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36



Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______

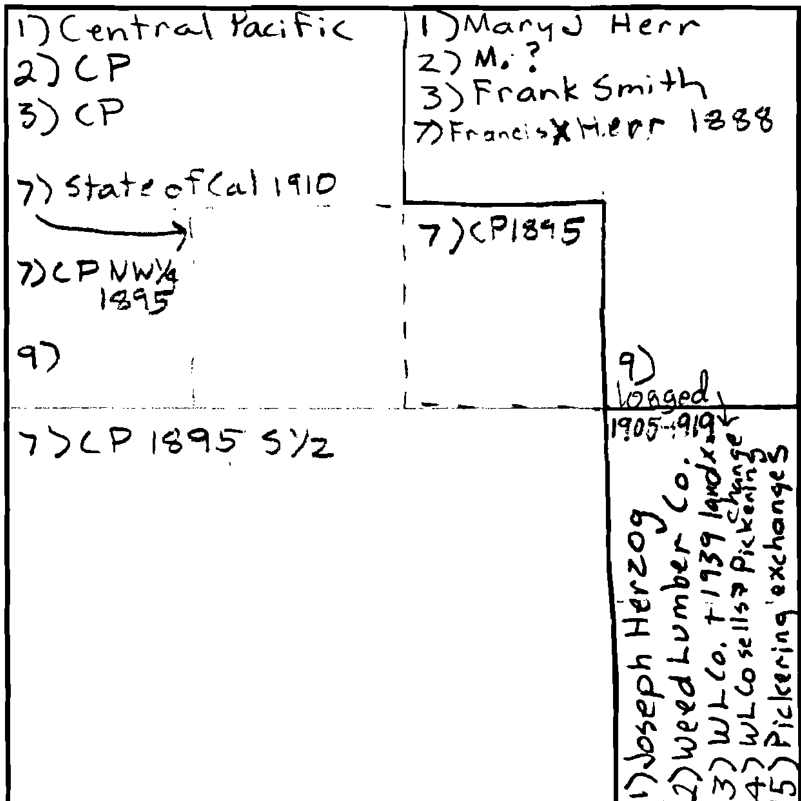
Check and complete all sources used in creating this map.

- ☐ USGS 1:__________ Quadrangle ______________________ Date __________
- ☐ USGS 1:__________ Quadrangle ______________________ Date __________
- ☐ Siskiyou County Book of Deeds 1852-1927 Volume _______ Page _______
- ☐ Siskiyou County Official Records (1928+) Volume _______ Page _______
- ☐ USFS Pamphlet File ______________________
- ☐ College of the Siskiyous Library Pamphlet File ______________________
- ☐ Metsker's Map of Siskiyou County, California Date __________
- 1 Other Siskiyou County information R 3-4 W Crocker Binding
- 2 Other Off Map of Sis Co. 1911
- 3 Other R 3-4 W Rayson Binding
- 4 Other OR roll #41 Vol 100 p412 May 17, 1939
- 5 Other OR vol 99 p 1-21 May 17, 1939
- 6 Other Patent Card T45N R3W

7) BLM see t45n r3w-swamp-....gif

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership
of
T45N R3W Section 15
Mount Diablo Meridian



8 CP sells to Alois Wetzel SE¼ of SE¼ 1900

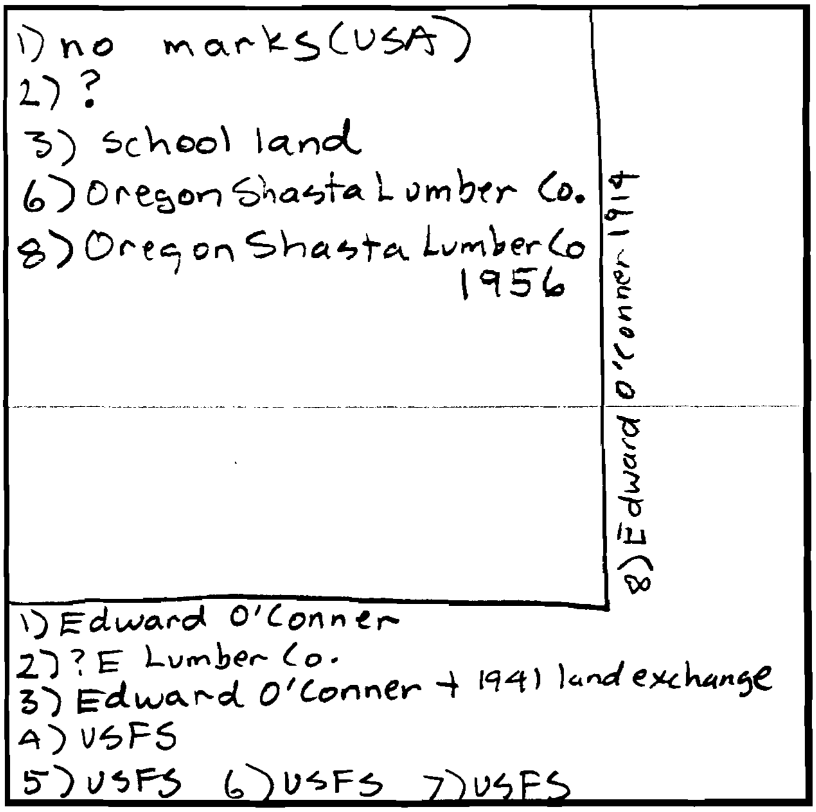
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner USFS Date 1939
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______

Check and complete all sources used in creating this map.

☑ 6 USGS 1:125,000 Quadrangle Macdoel Date 1941
☐ USGS 1:______ Quadrangle ______ Date ______
☑ 8 Siskiyou County Book of Deeds 1852-1927 Volume 48 Page 250 June 7, 1900
☑ 4 Siskiyou County Official Records (1928+) Volume 100 Page 412+ May 17, 1939
☐ USFS Pamphlet File ______
☐ College of the Siskiyous Library Pamphlet File ______
☐ Metsker's Map of Siskiyou County, California Date ______
☑ 1 Other Siskiyou County information R 3-4 W Crocker binding
☑ 2 Other Off. Map of Sis Co. 1911
☑ 3 Other R 3-4 W Rayson binding
☑ 5 Other Sis Co O.R. Vol 99 p1-21 May 17, 1939
☑ 7 Other Patent Card T45N R3W
☑ 8 Other BLM transferred fr/fed → state Jan 20, 1881
9 Historic Resources Atlas

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership of T45N R3W Section 16 Mount Diablo Meridian



Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner USFS Date 1941

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Check and complete all sources used in creating this map.

- ☒ 4 USGS 1:125,000 Quadrangle Macdoel Date 1941
- ☒ 5 USGS 1:62,500 Quadrangle Macdoel Date 1954
- ☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______
- ☐ Siskiyou County Official Records (1928+) Volume ______ Page ______
- ☐ USFS Pamphlet File ______
- ☐ College of the Siskiyous Library Pamphlet File ______
- ☐ Metsker's Map of Siskiyou County, California Date ______
- ☒ 1 Other Siskiyou County information R3-4W Crocker binding
- ☒ 2 Other Off. Map Sis Co 1911
- ☒ 3 Other R3-4W RaySon binding
- ☒ 6 Other Metsker's Atlas of Sis. Co 1957
- ☒ 7 Other KNF Goosenest Ranger District 1968
- ☒ 8 Other Patent Card T45N R3W

9 BLM transferred fed → state Jan 20, 1881

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership
of
T45N R3W Section 17
Mount Diablo Meridian

1) Shasta National Forest
2) Central Pacific
3) Central Pacific
4) Long-Bell
5) Long-Bell
6) CP 1895c

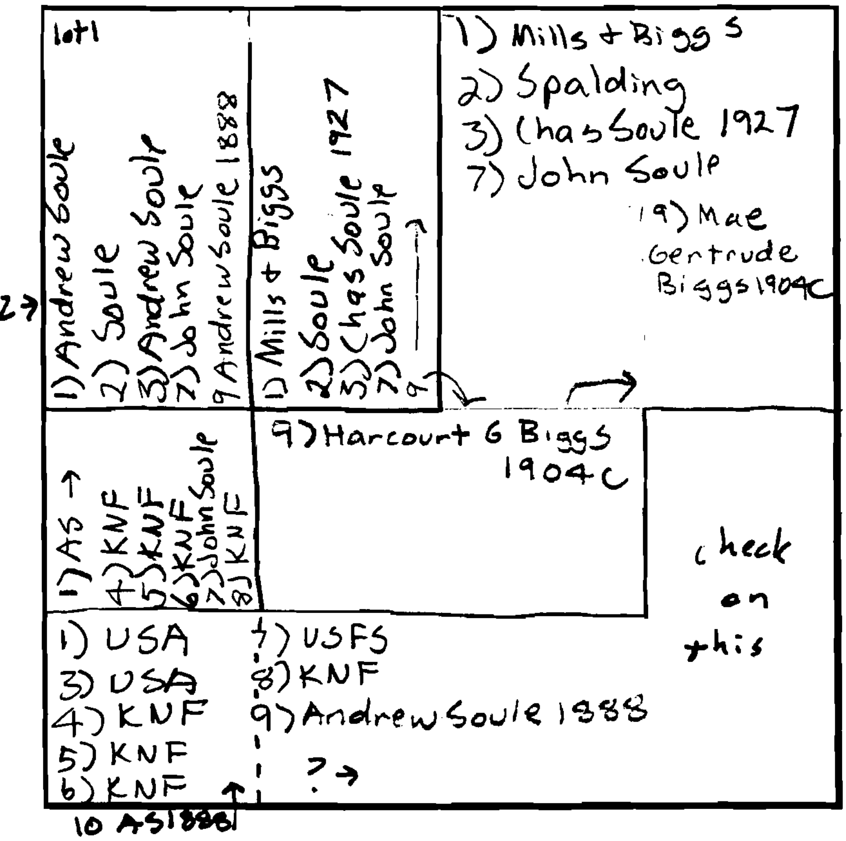
Owner Shasta Nat'l Forest Date 1908
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______

Check and complete all sources used in creating this map.

☐ USGS 1:______ Quadrangle ______ Date ______
☐ USGS 1:______ Quadrangle ______ Date ______
☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______
☐ Siskiyou County Official Records (1928+) Volume ______ Page ______
☐ USFS Pamphlet File ______
☐ College of the Siskiyous Library Pamphlet File ______
☐ Metsker's Map of Siskiyou County, California Date ______
2 Other Siskiyou County information R 3-4 W Crocker binding
1 Other Map of Eastern Part of Sis. Co. (Punnett & Bros.) 1908
3 Other Off. Map of Sis Co 1911
4 Other R 3-4 W Rayson binding
5 Other Metsker's Atlas of Sis. Co. 1957
6 Other Patent Card T45N R3W
7) BLM CP 1895

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership of T45N R3W Section 18 Mount Diablo Meridian



Owner	Date

Check and complete all sources used in creating this map.

- ☑ USGS 1:125,000 Quadrangle Macdoel Date 1941
- ☐ USGS 1:______ Quadrangle ______ Date ______
- ☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______
- ☐ Siskiyou County Official Records (1928+) Volume ______ Page ______
- ☐ USFS Pamphlet File ______
- ☐ College of the Siskiyous Library Pamphlet File ______
- ☐ Metsker's Map of Siskiyou County, California Date ______
- 1 Other Siskiyou County information R 3-4W Crockerbinding
- 2 Other Off Map of Sis. Co. 1911
- 3 Other R3-4W Rayson binding
- 4 Other Shasta Nat'l Forest North Half 1916
- 5 Other Shasta River + Tributaries 1924
- 7 Other Metsker's Atlas of Sis Co 1957
- 8 KNF Goosenent Ranger District 1968

Land Ownership
of
T45N R3W Section 19
Mount Diablo Meridian

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

1) Central Pacific
2) Shasta Nat'l Forest
3) Central Pacific
4) Central Pacific
5) Southern Pacific
6) Southern Pacific
7) CP 1895

Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______

Check and complete all sources used in creating this map.

☐ USGS 1:__________ Quadrangle ______________________ Date __________
☐ USGS 1:__________ Quadrangle ______________________ Date __________
☐ Siskiyou County Book of Deeds 1852-1927 Volume _______ Page _______
☐ Siskiyou County Official Records (1928+) Volume _______ Page _______
☐ USFS Pamphlet File ______________________
☐ College of the Siskiyous Library Pamphlet File ______________________
☐ Metsker's Map of Siskiyou County, California Date __________
1 Other Siskiyou County information T 3-4 W Crocker binding
2 Other Map of East Part of Sis. Co. (Punnett Bros) 1908
3 Other Off. Map Sis Co 1911
4 Other T 3-4 W RaySon binding
5 Other Metsker's Atlas of Sis Co 1957
6 Other Southern Pacific Lands in California Jan. 1963
7 Patent Card T45N R3W

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	[redacted]	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership
of
T45N R3W Section 20
Mount Diablo Meridian

1) public domain (USA)
2) "
3) "
4) Shasta Nat'l Forest

all other maps show as KNF or USFS

Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______

Check and complete all sources used in creating this map.

☐ USGS 1:__________ Quadrangle ______________________ Date __________
☐ USGS 1:__________ Quadrangle ______________________ Date __________
☐ Siskiyou County Book of Deeds 1852-1927 Volume _______ Page _______
☐ Siskiyou County Official Records (1928+) Volume _______ Page _______
☐ USFS Pamphlet File ______________________
☐ College of the Siskiyous Library Pamphlet File ______________________
☐ Metsker's Map of Siskiyou County, California Date __________
1 Other Siskiyou County information T 3-4W Crocker binding
2 Other Off Map Sis Co 1911
3 Other T 3-4W Rayson binding
4 Other Map of Eastern Part of Sis. Co 1908
☐ Other BLM no listing
☐ Other ______________________

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership of T45N R3W Section 21 Mount Diablo Meridian

1) Shasta Nat'l Forest
2) Central Pacific
3) CP
4) CP
5) KNF
6) Long-Bell
7) CP 1895

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Check and complete all sources used in creating this map.

☐ USGS 1:__________ Quadrangle ______________________ Date __________

☐ USGS 1:__________ Quadrangle ______________________ Date __________

☐ Siskiyou County Book of Deeds 1852-1927 Volume _______ Page _______

☐ Siskiyou County Official Records (1928+) Volume _______ Page _______

☐ USFS Pamphlet File ______________________

☐ College of the Siskiyous Library Pamphlet File ______________________

☐ Metsker's Map of Siskiyou County, California Date __________

2 Other Siskiyou County information R 3-4W Crocker binding

1 Other Map of Eastern Part of Sis Co 1908

3 Other Off Map Sis. Co. 1911

4 Other R 3-4 W Ray Son binding

5 Other Shasta Nat'l Forest compiled 1927 revised 1931 Note

6 Other Metsker's Atlas of Sis Co 1957

7 Patent Card T45N R3W

Land Ownership
of
T45N R3W Section 22
Mount Diablo Meridian

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

1) Alois Wetzel 1) A. Wetzel
4) WLC 4) Land exchange 1939
5) WLC 5) WLC
7) Alois Wetzel 1890c 6) USFS 7) Alois Wetzel 1890c
8) Logged 1905-1919

1) John Mackey
3) A. Wetzel Lumber Co.
4) WLC
5) WLC
7) John Mackey 1909c

1) Gertrude Wetzel
3) A. Wetzel Lum. Co.
4) Weed Lum. Co.
5) WLC
7) Gertrude N. Wetzel 1908c

1) Joseph Herzog
2) Louis J. Wetzel
3) A. Wetzel Lum. Co.
4) Weed Lumber Co.
5) WLC
7) Joseph Herzog 1909c

Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______

Check and complete all sources used in creating this map.

☐ USGS 1:______ Quadrangle ______ Date ______
☐ USGS 1:______ Quadrangle ______ Date ______
2 Siskiyou County Book of Deeds 1852-1927 Volume 78 Page 102 Feb 9 1907
6 Siskiyou County Official Records (1928+) Volume 100 Page 417 May 17, 1939
☐ USFS Pamphlet File ______
☐ College of the Siskiyous Library Pamphlet File ______
☐ Metsker's Map of Siskiyou County, California Date ______
1 Other Siskiyou County information R3-4W Crocker binding
3 Other Book of Deeds V79 p567 Dec 27, 1909
4 Other R3-4W Rayson binding
5 Other Off Map of Sis Co 1911
7 Other Patent Card T45N R3W
8 Other Historic Resources Atlas N½ of NE¼ + NE¼ of NW¼

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership
of
T45N R3W Section 23
Mount Diablo Meridian

logged 1905-1919
9)

1) Alois Wetzel
2) Weed Lumber Company
3) WLC + Exchange Lands 1939
4) Long-Bell → Pickering
5) Pickering / USFS land exchange + timber
6) USFS
7) CP 1895

1) Central Pacific
2) CP
3) CP
6) Long-Bell
7) CP 1895

Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______

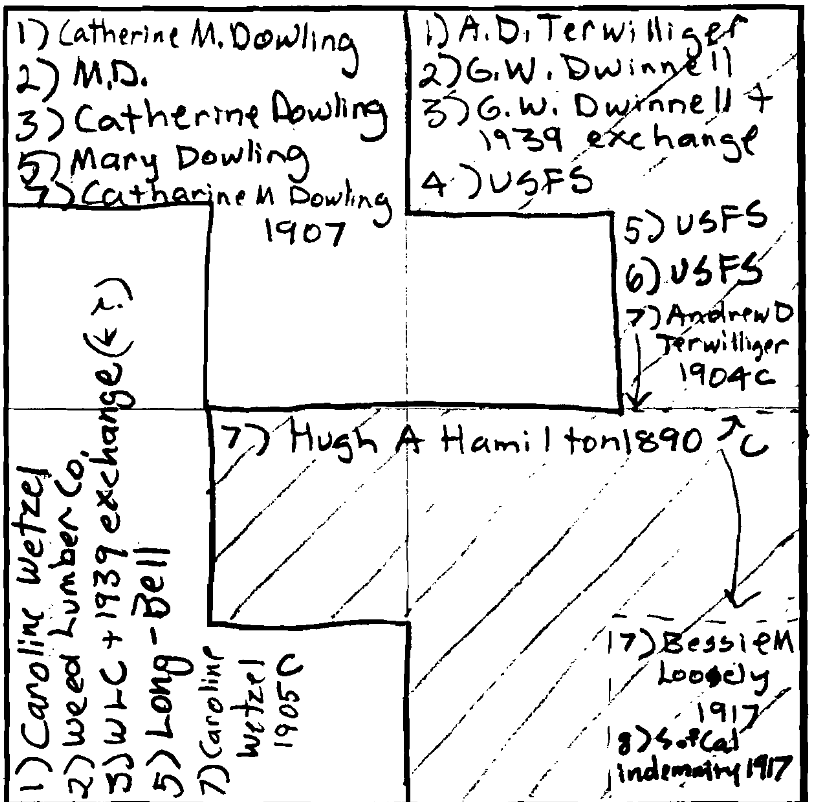
Check and complete all sources used in creating this map.

☐ USGS 1:__________ Quadrangle ______________________ Date __________
☐ USGS 1:__________ Quadrangle ______________________ Date __________
☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______
4 Siskiyou County Official Records (1928+) Volume 100 Page 412
☐ USFS Pamphlet File ______________________
☐ College of the Siskiyous Library Pamphlet File ______________________
☐ Metsker's Map of Siskiyou County, California Date __________
1 Other Siskiyou County information R3-4W Crocker binding
2 Other Off Map Sis Co 1911
3 Other R 3-4W Rayson "
5 Other OR vol 99 p1-21
6 Other Metsker's Atlas Sis Co 1957
7 Other Patent Card T45N R3W
8 BLM CP 1895
9 Historic Resources Atlas W½

k. Loosley

Land Ownership
of
T45N R3W Section 24
Mount Diablo Meridian

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36



hmmm...

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Owner ______ Date ______

Check and complete all sources used in creating this map.

10) Shasta Nat'l Forest Memorandum 1/16/1940 Chas Hamilton Mill operated ~189[illegible]

☑ 4 USGS 1: 125,000 Quadrangle Macdoel Date 1949 (not on 1941)

☐ USGS 1: ______ Quadrangle ______ Date ______

☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______

☐ Siskiyou County Official Records (1928+) Volume ______ Page ______

☐ USFS Pamphlet File ______

☐ College of the Siskiyous Library Pamphlet File ______

☐ Metsker's Map of Siskiyou County, California Date ______

☑ 1 Other Siskiyou County information R 3-4 W Crocker

☑ 2 Other Off Map Sis Co 1911

☑ 3 Other R 3-4 W Rayson

☑ 5 Other Metsker's Atlas of Sis Co 1957

☑ 6 Other KNF Goosenest Ranger District 1968

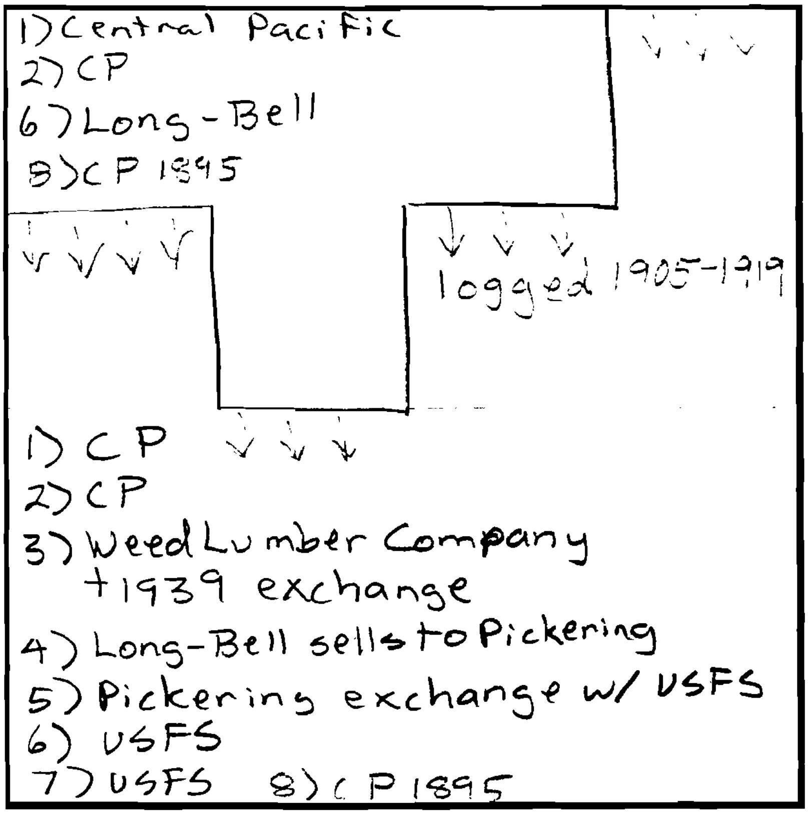
☑ 7 Other Patent Card T45NR3W

8 BLM Catherine M Dowling 4/29/1907   10) same area as 9 logged RR Logging T44N R1E - T45N R2W

9) ... logged 1905-1919 ...

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership of T45N R3W Section 25 Mount Diablo Meridian



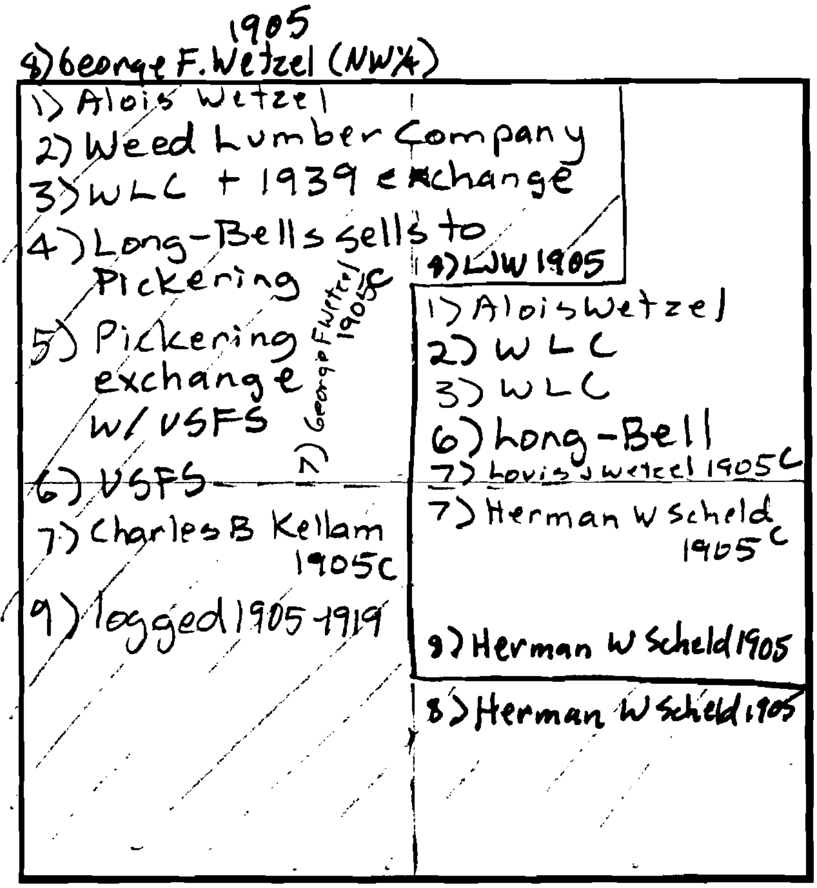
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______

Check and complete all sources used in creating this map.

- [7] USGS 1:62,500 Quadrangle Macdoel Date 1954
- ☐ USGS 1:________ Quadrangle ______________ Date ________
- ☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______
- [4] Siskiyou County Official Records (1928+) Volume 100 Page 412
- ☐ USFS Pamphlet File ______________
- ☐ College of the Siskiyous Library Pamphlet File ______________
- ☐ Metsker's Map of Siskiyou County, California Date ________
- [1] Other Siskiyou County information R 3-4 W Crocker
- [2] Other Off. Map Sis Co 1911
- [3] Other R 3-4 W Rayson
- [5] Other OR Vol 99 p1-21
- [6] Other Metsker's Atlas Sis Co 1957
- [8] Other Patent Card T45N R3W
- 9 Historic [illegible] Atlas

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	[redacted]	25
31	32	33	34	35	36

Land Ownership
of
T45N R3W Section 26
Mount Diablo Meridian



Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Check and complete all sources used in creating this map.

☐ USGS 1:__________ Quadrangle ______________________ Date __________

☐ USGS 1:__________ Quadrangle ______________________ Date __________

4 Siskiyou County Book of Deeds 1852-1927 Volume 100 Page 412

☐ Siskiyou County Official Records (1928+) Volume _______ Page _______

☐ USFS Pamphlet File ______________________

☐ College of the Siskiyous Library Pamphlet File ______________________

☐ Metsker's Map of Siskiyou County, California Date __________

1 Other Siskiyou County information R 3-4W Crocker

2 Other off Map Sis Co 1911

3 Other R 3-4W RaySon

5 Other OR vol 99 p1-21

6 Other Metsker's Atlas Sis Co 1957

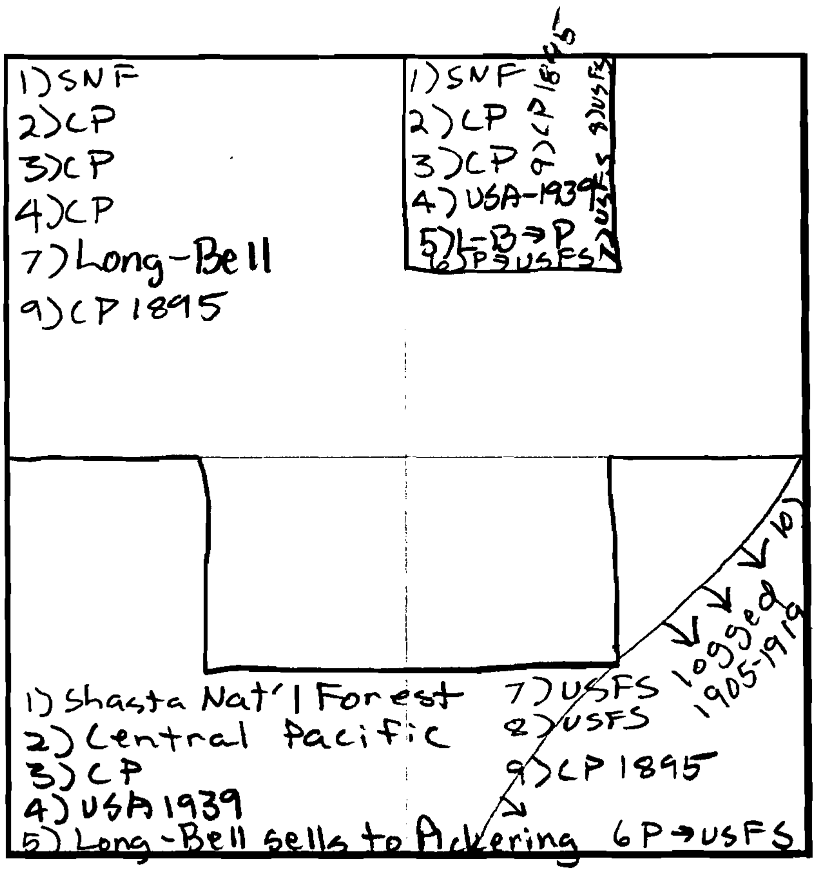
7 Other Patent Card T45N R3W (divided into quarters)

8 BLM

9 Historic Resources Atlas GRD

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership
of
T45N R3W Section 27
Mount Diablo Meridian



Owner ______________ Date ______

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Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Check and complete all sources used in creating this map.

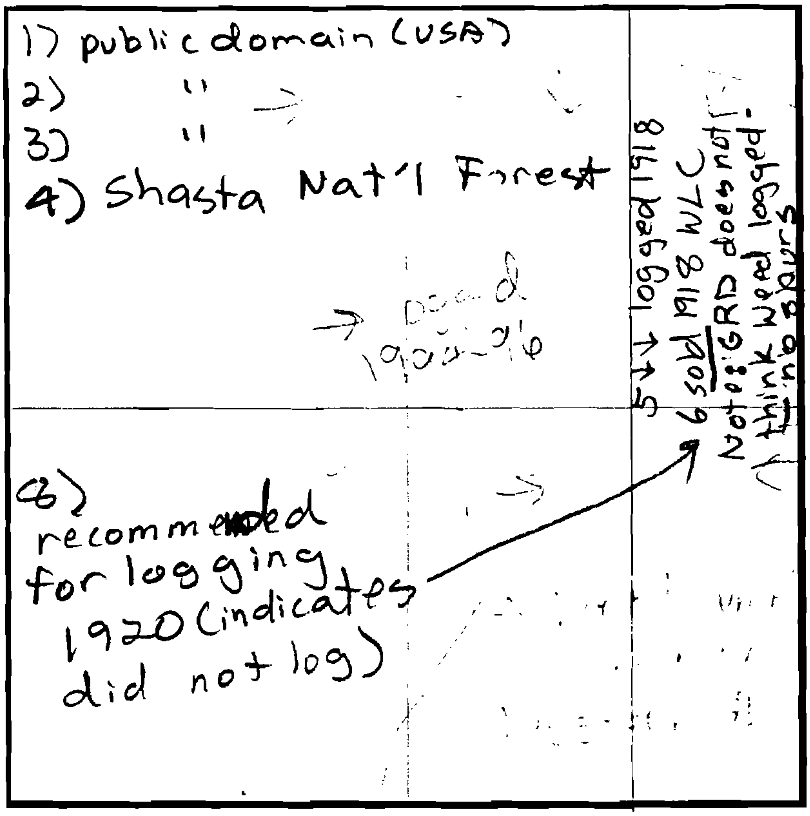
- [8] USGS 1: 62,500 Quadrangle Macdoel Date 1954
- ☐ USGS 1:__________ Quadrangle ______________ Date ________
- ☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______
- [5] Siskiyou County Official Records (1928+) Volume 100 Page 412 May 17, 1939
- ☐ USFS Pamphlet File ______________
- ☐ College of the Siskiyous Library Pamphlet File ______________
- ☐ Metsker's Map of Siskiyou County, California Date ________
- [2] Other Siskiyou County information R3-4W Crocker
- [1] Other Map of Eastern Part of Siskiyou Co, Cal. 1908
- [3] Other Off Map of Sis Co 1911
- [4] Other R3-4W Ray Son
- [6] Other OR vol 99 p1-21 May 17, 1939
- [7] Other Metsker's Atlas Sis Co 1957

9 Patent Card T45N R3W

10) [illegible]

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	[redacted]	27	26	25
31	32	33	34	35	36

Land Ownership of T45N R3W Section 28 Mount Diablo Meridian



Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Check and complete all sources used in creating this map.

5 Long Bell Logging RR grades 8/26/1920 memorandum

☐ USGS 1:__________ Quadrangle ______________________ Date __________

☐ USGS 1:__________ Quadrangle ______________________ Date __________

☐ Siskiyou County Book of Deeds 1852-1927 Volume _______ Page _______

☐ Siskiyou County Official Records (1928+) Volume _______ Page _______

☐ USFS Pamphlet File ______________________

☐ College of the Siskiyous Library Pamphlet File ______________________

☐ Metsker's Map of Siskiyou County, California Date __________

1 Other Siskiyou County information R3-4W Crocker

2 Other R3-4W Rayson

3 Other Off Map Sis Co 1911

4 Other Map of Eastern Part of Sis Co 1908

☐ Other BLM no data

5 Other Historic Resources Atlas 9/94

6 RR logging T44N R1E through T48N R2W Sierra Pacific 9/94 - 3/96

7) Post 1967 ... Timber Sales Atlas ...

Land Ownership
of
T45N R3W Section 29
Mount Diablo Meridian

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

1) Shasta Nat'l Forest
2) Central Pacific
3) CP
4) CP
5) Southern Pacific
6) SP
7) CP 1895

all
5 logged 1950-1959

Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______
Owner ____________ Date ______

Check and complete all sources used in creating this map.

☐ USGS 1:________ Quadrangle ______________ Date ________
☐ USGS 1:________ Quadrangle ______________ Date ________
☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______
☐ Siskiyou County Official Records (1928+) Volume ______ Page ______
☐ USFS Pamphlet File ______________
☐ College of the Siskiyous Library Pamphlet File ______________
☐ Metsker's Map of Siskiyou County, California Date ________
2 Other Siskiyou County information R3-4W Crocker
1 Other Map of Eastern Part SisCo 1908
3 Other Off Map Sis Co 1911
4 Other R3-4W RaySon
5 Other Metsker's Atlas 1957
6 Other Southern Pacific Lands in California 1-63
7 Patent Card T45N R3W

Land Ownership
of
T45N R3W Section 30
Mount Diablo Meridian

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

1) public domain (USA)
2) ''
3) ''
4) Shasta Nat'l Forest
5) Klamath Nat'l Forest
6) USFS

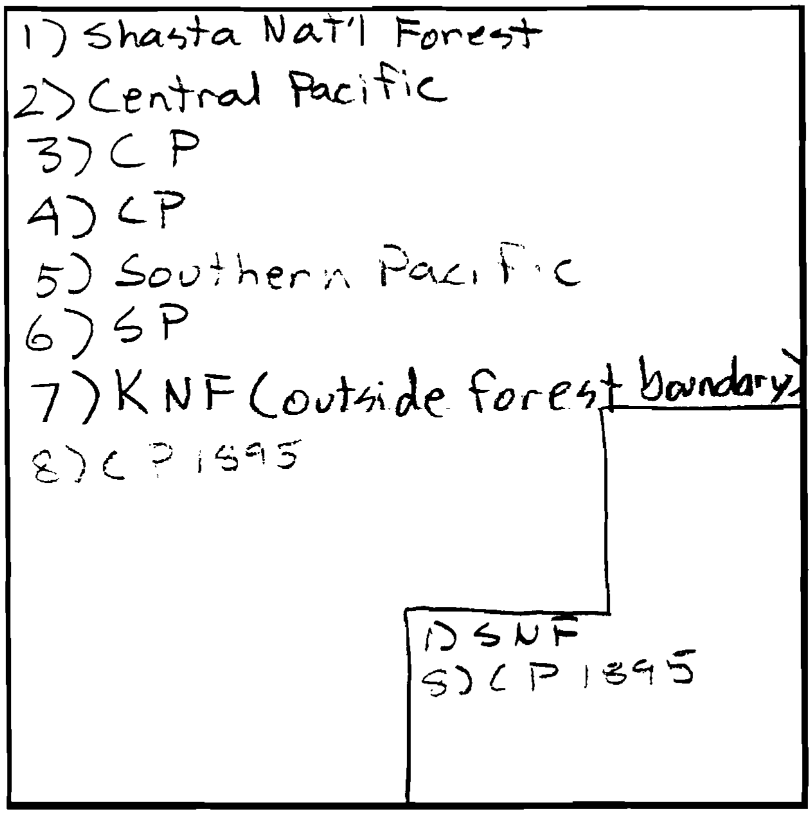
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______

Check and complete all sources used in creating this map.

- ☑ USGS 1:125000 Quadrangle Macdoel Date 1941
- ☐ USGS 1:______ Quadrangle ______ Date ______
- ☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______
- ☐ Siskiyou County Official Records (1928+) Volume ______ Page ______
- ☐ USFS Pamphlet File ______
- ☐ College of the Siskiyous Library Pamphlet File ______
- ☐ Metsker's Map of Siskiyou County, California Date ______
- 1 Other Siskiyou County information R 3-4 W Crocker
- 2 Other R 3-4 W Rayson
- 3 Other Off Map Sis Co 1911
- 4 Other Map of Eastern Part of Sis Co 1902
- 5 Other Shasta Nat'l Forest 1924
- ☐ Other BLM no data

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership
of
T45N R3W Section 31
Mount Diablo Meridian



Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Owner ______________ Date ______

Check and complete all sources used in creating this map.

☐ USGS 1:__________ Quadrangle ______________________ Date __________

☐ USGS 1:__________ Quadrangle ______________________ Date __________

☐ Siskiyou County Book of Deeds 1852-1927 Volume _______ Page _______

☐ Siskiyou County Official Records (1928+) Volume _______ Page _______

☐ USFS Pamphlet File ______________________

☐ College of the Siskiyous Library Pamphlet File ______________________

☐ Metsker's Map of Siskiyou County, California Date __________

2 Other Siskiyou County information R 3-4W Crocker

1 Other Map of Eastern Part of Siskiyou Co 1908

3 Other Off Map Sis Co

4 Other R 3-4W Rayson

5 Other Metsker's Atlas 1957

6 Other Southern Pacific Lands in California Jan 1963

7 NE Sis Co Coordinated Road Management Plan

Land Ownership
of
T45N R3W Section 32
Mount Diablo Meridian

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

1) public domain/US/?
2) "
3) "
4) Shasta Nat'l Forest
5) KNF
9) recommended for logging 1920 by LSLC
7) logged [illegible] ↓ ↓
8 logged 1918 WLC ↓↓↓
9) logging in progress 1920 LSLC

logged 1918 by WLC binder

Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______

Check and complete all sources used in creating this map.

9) Long Bell Logging R.R. grades (8/20 1920)

- 6 USGS 1:24,000 Quadrangle The Whaleback Date ________
- ☐ USGS 1:________ Quadrangle ________________ Date ________
- ☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______
- ☐ Siskiyou County Official Records (1928+) Volume ______ Page ______
- ☐ USFS Pamphlet File ________________
- ☐ College of the Siskiyous Library Pamphlet File ________________
- ☐ Metsker's Map of Siskiyou County, California Date ________
- 1 Other Siskiyou County information R 3-4W Crocker
- 2 Other R3-4W Rayson
- 3 Other OFF Map Sis Co 1911
- 4 Other Map of Eastern Part of Sis Co 1908
- 5 Other Shasta Nat'l Forest North Half 1916
- ☐ Other BLM no matching records (i.e. never sold)

7 Historic Resources Areas

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership
of
T45N R3W Section 33
Mount Diablo Meridian

1) Shasta Nat'l Forest
2) Central Pacific
3) CP
4) CP
5) Long-Bell
6) CP 1895

Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______

Check and complete all sources used in creating this map.

☐ USGS 1:__________ Quadrangle ______________________ Date __________
☐ USGS 1:__________ Quadrangle ______________________ Date __________
☐ Siskiyou County Book of Deeds 1852-1927 Volume _______ Page _______
☐ Siskiyou County Official Records (1928+) Volume _______ Page _______
☐ USFS Pamphlet File ______________________
☐ College of the Siskiyous Library Pamphlet File ______________________
☐ Metsker's Map of Siskiyou County, California Date ___________
2 Other Siskiyou County information R3-4W Crocker
1 Other Map of Eastern Part of Sis Co 1906
3 Other off Map of Sis Co 1911
4 Other R 3-4W Rayson
5 Other Metsker's Atlas 1957
6 Other Patent Card T45N R3W

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership
of
T45N R3W Section 34
Mount Diablo Meridian

NW ¼	NE ¼
1) John Dean 2) Weed Lumber Co. 3) WLC 1939 exchange 4) Long-Bell sells to Pickering 5) Pickering exchange with USFS 6) USFS 7) John Dean 1904 C	1) Wm B Shearer 2) WLC 3) WLC 1939 xchange 4) L-B → Pickering 5) Pickering ↔ USFS 6) USFS 7) William B Shearer 1904 C 9) logged 1905-1919
1) John Gilpin 2) John Gilpin 3) WLC 8) State of Calif. indemnity 1917	1) Robt H DeWitt 2) WLC 3) WLC 1939 exchange 4) L-B → Pickering 5) Pickering ↔ USFS 1) R H DeWitt 2) J. Gilpin 3) WLC 7) Herman W Scheld 1905 6) USFS 7) Herman W Scheld 1905 9) logged 1905-1919

Robert H. DeWitt 1904 SE ¼

Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______
Owner ______ Date ______

Check and complete all sources used in creating this map.

- 6 USGS 1: 62,500 Quadrangle The Whaleback Date 1954
- ☐ USGS 1: ______ Quadrangle ______ Date ______
- ☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______
- 4 Siskiyou County Official Records (1928+) Volume 100 Page 412 May 17, 1939
- ☐ USFS Pamphlet File ______
- ☐ College of the Siskiyous Library Pamphlet File ______
- ☐ Metsker's Map of Siskiyou County, California Date ______
- 1 Other Siskiyou County information R3-4W Crocker
- 2 Other Off Map Sis Co 1911
- 3 Other R3-4W Rayson
- 5 Other OR vol 99 p1-21 May 17, 1939
- 7 Other Patent Card T45N R3W
- 8 Other BLM

9 Historic Resources Atlas logged 1905-1919

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	[redacted]	36

Land Ownership of T45N R3W Section 35 Mount Diablo Meridian

1) Central Pacific
2) CP
3) Weed Lumber Company
   +exchange 1939
4) Long-Bell sells to Pickering
5) Pickering exchange w/USFS
6) USFS
7) USFS
8) CP 1895
9) all logged 1905-1919

Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______
Owner ______________ Date ______

Check and complete all sources used in creating this map.

☑ USGS 1:24,000 Quadrangle Grass Lake Date 1986
☐ USGS 1:__________ Quadrangle ______________ Date ________
☐ Siskiyou County Book of Deeds 1852-1927 Volume _______ Page _______
4 Siskiyou County Official Records (1928+) Volume 100 Page 412 May 17, 1939
☐ USFS Pamphlet File ______________
☐ College of the Siskiyous Library Pamphlet File ______________
☐ Metsker's Map of Siskiyou County, California Date __________
1 Other Siskiyou County information R3-4W Crocker
2 Other Off Map Sis Co 1911
3 Other R3-4W Rayson
5 Other OR Vol 99 p1-21 May 17, 1939
6 Other Metsker's Atlas 1957
8 Other Patent Card T45N R3W
9 Historic Resources Atlas

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

Land Ownership of T45N R3W Section 36 Mount Diablo Meridian

1) Weed Lumber Co. 2) McCloud River Lumber Co. 3) WLC +1939 exchange 4) Long-Bell sells to Pickering	1) Scott + Van Arsdale Lumber Co. 2) McCloud R L Co 3) WLC +1939 ex. 4) L-B → Pickering 5) Pickering ⇔ USFS 6) USFS 7) SBM
5) Pickering exchange w/USFS 6) USFS 7) Sigourney B. Morse 1892 8) all logged 1905-1919	

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Owner ____________ Date ______

Check and complete all sources used in creating this map.

- ☐ USGS 1:________ Quadrangle ____________ Date ________
- ☐ USGS 1:________ Quadrangle ____________ Date ________
- ☐ Siskiyou County Book of Deeds 1852-1927 Volume ______ Page ______
- 4 Siskiyou County Official Records (1928+) Volume 100 Page 412 May 17, 1939
- ☐ USFS Pamphlet File ____________
- ☐ College of the Siskiyous Library Pamphlet File ____________
- ☐ Metsker's Map of Siskiyou County, California Date ________
- 1 Other Siskiyou County information R 3-4W Crocker
- 2 Other Off Map of Sis Co 1911
- 3 Other R 3-4W Rayson
- 5 Other OR Vol 99 p1-21 May 17, 1939
- 6 Other Metsker's Atlas 1957
- 7 Other Patent Card T45N R3W

BLM fed → state of cal 1881

[illegible] all logged 1905-1919

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Linda E Freeman
Signature of Author

August 1, 2000
Date

Three Remote Sensing Studies in Shasta Valley, California
Title of Thesis/Research Project

Signature of Graduate Office Staff Member

August 14, 2000
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