

## 2.0 AFFECTED ENVIRONMENT

### 2.1 INTRODUCTION

This chapter describes the existing physical, biological, cultural, social, and economic characteristics of the King Range National Conservation Area and its associated planning area. The affected environment defines the baseline of existing conditions from which possible impacts of the plan alternatives may be analyzed. The majority of the data was provided by the BLM Arcata Field office; federal, state, county, and local agencies; various organizations; and other public and private sources. Data includes published and unpublished reports, maps, and digital format (GIS).

### 2.2 PHYSICAL ENVIRONMENT AND SETTING

#### 2.2.1 Geology and Soils

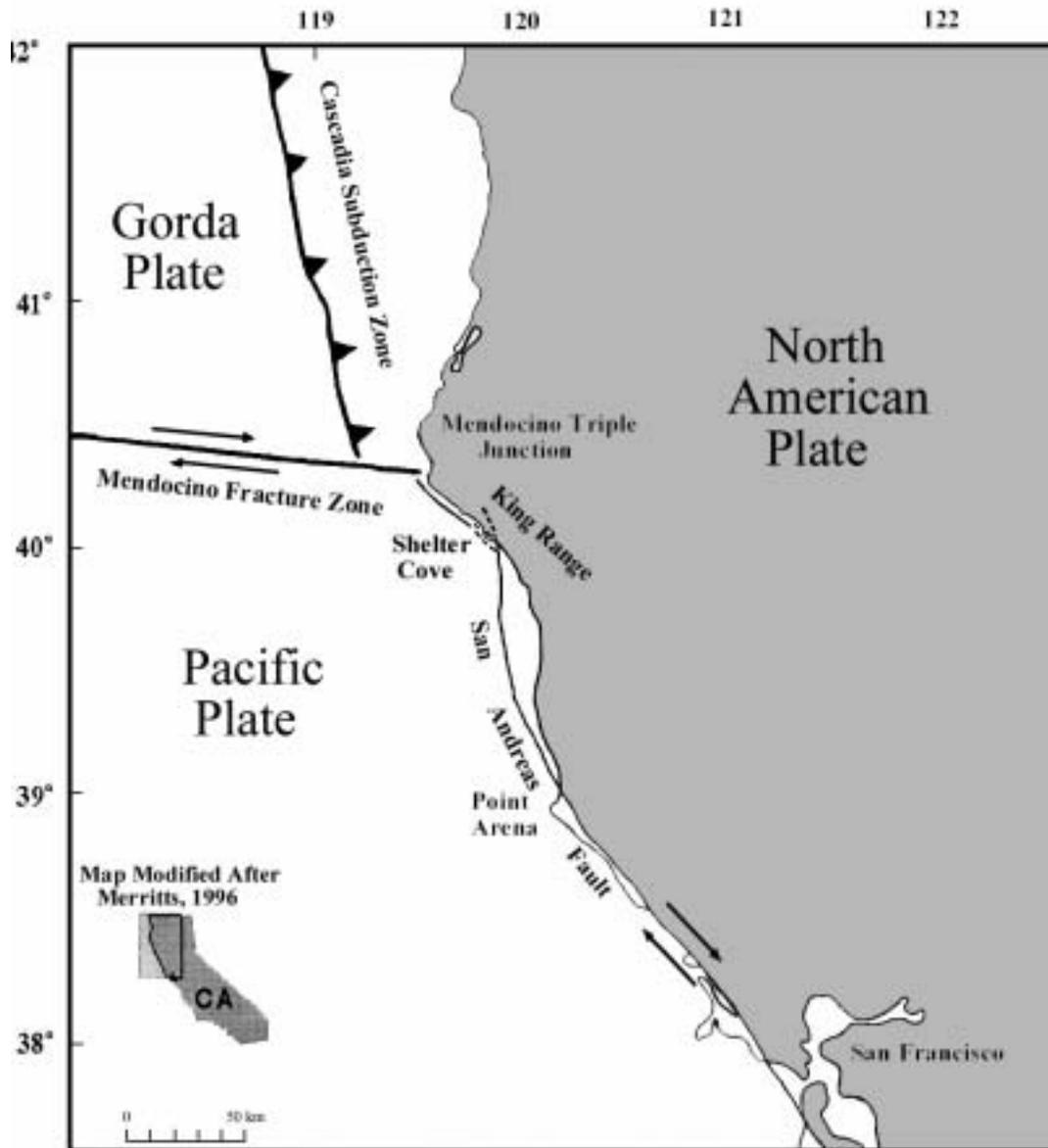
The combined geologic forces of the entire King Range area are continually reshaping the landforms of the Lost Coast, creating new habitat for stream, land, and marine life forms, and altering or completely eliminating habitat for others. Entire mountain sides are sometimes altered by storm and earthquake events in a matter of days, where in other parts of the world it would take hundreds or even thousands of years to achieve the same natural result. The King Range appears to be an area of geologic and climatic extremes, but it is also a place of uniqueness. Not only does it contain dynamic and fast changing mountain and coastal environments, dramatic beauty, and scenic coastlines, it is also a place where one can directly observe and walk upon the results of some very recent and great geologic forces.

##### *2.2.1.1 Tectonics*

The King Range lies just south of one of the most geologically active areas in North America. Three large tectonic plates converge just north of the King Range at a geologic feature known as the Mendocino Triple Junction, causing large and frequent earthquakes. The tremendous tectonic forces at the Mendocino Triple Junction and along the western front of the King Range have created high coastal mountain peaks, steep incised stream courses, and young coastal rock platforms. Geologists using radiometric dating and conducting coastal surveys have also determined that these compressional forces produce one of the highest geologic uplift rates in the world, which accounts for the high elevation and steep topography of the King Range (LaJoie et al. 1982, McLaughlin et al. 1983, Merritts 1989).

The geologic history and formation the Mendocino Triple Junction is very complex, but in general terms, three pieces of the earth's crust, called tectonic plates, are moving past and beneath each other in different directions (see Figure 2-1). This is unusual, as most earthquake-prone zones only involve two plates grinding against each other; the Mendocino Triple Junction represents one of the few places in the world where three plates meet close to land. North of the Junction, the Gorda Plate is being driven eastward beneath the North American Plate in what geologists refer to as the Cascadia Subduction Zone. This deep subduction zone is where most earthquake activity occurs in northwest California, and farther east and north creates the volcanic Cascade Range of mountains.

FIGURE 2-1: MENDOCINO TRIPLE JUNCTION



South of the Junction and along the western edge of the King Range, the San Andreas Fault forms the boundary between the Pacific and North American Plates; though much of its trace north of Point Arena lies beneath the ocean, geologic evidence suggests it bends shoreward briefly at Shelter Cove. The fault motion between these two plates is a sliding "strike-slip motion," with the Pacific Plate moving northwest and the North American Plate sliding southwest. The King Range rests on the North American Plate and moves with the plate on its southwest course.

West of the Junction, out at sea, the Pacific and Gorda Plates slide past each other in an east-west motion, forming a transform fault known as the Mendocino Fracture Zone. The east-west sliding motion also generates large sub-sea earthquakes felt throughout the entire region. This fracture zone

represents further bending of the San Andreas Fault, where it turns west from its trace along the coastal edge of the King Range.

In March 1992, three large earthquakes, measuring magnitudes 7.1, 6.6, and 6.7, struck an area immediately north of the King Range (the first quake was centered close to Petrolia, the two aftershocks offshore) at the Mendocino Triple Junction, and submerged land was dramatically uplifted from the ocean near the sites of these earthquakes. Intertidal rock platforms and beaches were raised as much as four feet above sea level, creating new tidal areas seaward while stranding marine organisms and eliminating some tidepool habitat closer to shore.

Before the 1992 earthquakes, Dr. Kenneth R. LaJoie, a research geologist at the U.S. Geological Survey, had mapped the low elevation marine terraces at Cape Mendocino just north of the King Range. He suspected that the unique bedrock features and beach ridges found along the entire Lost Coast might have formed during very large and recent earthquake events. Using radiometric carbon14 methods to date fossils and driftwood deposited in the terraces at Cape Mendocino, he determined that the lowest marine terrace was only 3,100 years old. LaJoie had suspected that this young marine terrace and other platforms further south along the western front of the King Range might have been uplifted suddenly during an earthquake event. The new coastal land surfaces that were uplifted during the 1992 earthquakes confirmed his theory. Further mapping and geologic dating by Merritts and Bull (1989) showed that multiple uplifted surfaces of various ages extend south along the entire Lost Coast. It is now generally accepted that these young marine platforms were created suddenly during earthquake events during the last 5,000 years.

Evidence of past earthquake events can be viewed along most the shoreline of the King Range in the form of older "fossil" marine platforms cut into the bedrock at higher elevations above the present day tidepools. These marine terraces represent not only geographic stair steps, but also steps back into recent geologic time with the youngest platforms at the lowest elevation, near the present shore line, and the oldest terraces at higher elevations further from shore.

Older marine terrace deposits are found near the southern end of the King Range, exposed in the sea cliffs at Shelter Cove. The relatively flat westward portion of Shelter Cove is made up of marine beach gravels and sands overlying on an uplifted marine bedrock terrace. This terrace was previously dated at approximately 40,000 years, much older than the low coastal terraces to the north. Dating of the Shelter Cove terrace was determined using carbon14 dates from fossil spruce cones in the young deposits overlying the terrace (McLaughlin et al. 1983), but recent geologic work on these same deposits indicate they may be slightly older, with dates in the 60,000 to 100,000 year range (Merritts et al. 2000). Immediately to the east, the marine terrace deposits are overlain by older landslide deposits which form the grassy and forested slopes above the Shelter Cove.

Much of the Lost Coast Trail, which extends along the beach from the Mattole River south to Shelter Cove, travels over uplifted rock platforms formed during very large earthquakes. If it were not for the tremendous geologic forces that uplifted this coastal area during the last few thousand years, much of the flat platform that the Lost Coast Trail rests upon would not be available for hiking and camping today. The marine tidepools found along the shoreline of the King Range have also evolved from this series of recent uplift events and earthquakes. The excellent surfing at Big Flat north of Shelter Cove owes its existence to the same forces, with the waves breaking on an uplifted but still submerged bedrock reef

close to shore. Rocks and small islands located just off the coast are made up of erosion-resistant remnants of marine platforms.

The famous San Andreas Fault has been mapped at Shelter Cove, its trace passing northwest through the upper slopes immediately east of the cove and entering the seafloor near the mouth of Telegraph Creek. This map trace was established shortly after the 1906 San Francisco earthquake, based on the mapping of ground breakage and fractures immediately after the earthquake. Since that time other geologists have proposed that the actual trace of the San Andreas lies offshore, and that the ground fractures mapped in 1906 were caused instead by landsliding (McLaughlin et al. 1983). However, the issue of where the San Andreas Fault trace actually lies in the vicinity of Shelter Cove is still not settled. A new team of geologists from the U.S. Geological Survey, who have re-mapped and trenched the geologic features at Point Delgada, proposed that the fault may indeed lie on land just east of Shelter Cove, in the vicinity or just east of the old 1906 fault trace near Black Sands Beach and Telegraph Creek (Prentice et al. 1999).

#### *2.2.1.2 Rock Types and Age*

Though the topographic features such as the high mountains and the uplifted bedrock platforms along the King Range are geologically young, they are composed of very old bedrock. Most of these rocks formed from deep ocean sediments and volcanic eruptions beneath the sea starting in the Cretaceous period, 60 million years ago, and continuing until the Eocene epoch, 40 million years ago. Some small outcrops of younger sandstone and shale, dating to the middle Miocene epoch, 15 to 24 million years ago, have also been discovered along the Lost Coast (McLaughlin et al. 1982).

In a simplified model, the rocks were transported in a conveyor belt-like fashion eastward on oceanic plates to the adjacent continental plate, where they were folded against and subducted beneath the older continental plate. Repetition of this subduction and deformation process over time formed fault-bounded belts of highly folded and fractured rocks, with the youngest rocks located on the western boundary of the adjoining continental plate. Some of the rocks that were subducted beneath the continental plate were altered by heat and pressure, then raised to their present position by faulting and folding, and later exposed by erosion. This subduction and accretion process formed most of the California Coast Ranges, including the King Range.

The rock types of the King Range are mostly marine sandstones and shale, but there are also minor occurrences of chert, conglomerate, and volcanic basalt (see Figure 2-2). The entire suite of rocks are grouped together in Franciscan Complex, a geologic formation which is divided into many fault bounded blocks of varying ages called "geologic terranes." Locally this group of Franciscan rocks is aptly called the King Range Terrane. Geologists have further divided the King Range Terrane into the King Peak and Point Delgada units, based on slightly different rock types and age differences. All of the rocks have undergone both shearing and folding, but folded rocks were found to be the most common (McLaughlin et al. 2000).

The younger King Peak unit of the terrane consists of mostly sandstone and shale, with some outcrops of conglomerate and rare occurrences of igneous rock in the form of basalt. Small outcrops of limestone and ribbon chert are sometimes associated with the basalt.

FIGURE 2-2: GEOLOGY AND SOILS

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The age of the rocks in the King Peak unit was thought to be the Eocene epoch, but some of these rocks have recently been dated to be from the middle Miocene epoch based on fossil evidence (McLaughlin et al. 1982).<sup>1</sup> There are no important mineral deposits in this group of rocks, with the exception of a small deposit of manganese that was mined by hand briefly during the mid-1950s from chert deposits at the Queen Peak Mine on the south fork of Bear Creek, then trucked to Arizona for processing.

The older Point Delgada unit of the King Range Terrane has a more complex range of rock types, well exposed at Shelter Cove in the tidal zone. These rocks include altered or metamorphosed sandstones and shale, and small outcrops of limestone, along with pillow basalts and other volcanic rocks such as volcanic tuffs, basaltic sandstones, and flow breccias. (McLaughlin et al. 2000). These volcanic rocks are the result of deep undersea volcanic eruptions approximately 60 million years ago. In addition there is a zone of tectonically sheared shale or “mélange,” which contains blocks of glaucophane blue-schist, chert, quartzite, and other volcanic rocks. Microfossils from this rock complex date from the Late Cretaceous period, much older than the above-mentioned King Peak unit. In some isolated areas hydrothermal waters have locally altered some of the rocks to form small veins of minerals such as pyrite, chalcopyrite, sphalerite, and galena (McLaughlin et al. 2000).

### *2.2.1.3 Soils and Geomorphology*

The geologic forces at the Mendocino Triple Junction and frequent earthquakes, along with extreme climatic conditions, are responsible for shaping rugged topography and high mountain relief of the King Range. These same forces have also sheared and fractured large zones of rock, making them weak in some areas and susceptible to erosion and large landslides. High rainfall in the King Range, often reaching over 150 inches per year, accelerates the erosion process, especially in the rocks weakened by shearing and faulting, and landslides occur frequently.

On the western slope of the King Range, landslides discharge large amounts of rock and soil into coastal streams. As the materials are transported downstream to the flat marine platforms, they may form large alluvial fan deposits such as those found on Spanish Flat and Big Flat. These alluvial fans are often used by hikers along the Lost Coast Trail as resting or camping spots, as they are flatter and more open than much of the coastline.

Large blocks of the more resistant sandstone form the steeper, sharp-crested slopes of the King Range such as King Peak, the highest point in these coastal mountains. These high ridges parallel the coastline and reach elevations near 4,000 feet within three miles of the shore, with western slopes dropping precipitously to the ocean. These steep slopes shed large amounts of surface rock and soil debris in the form of debris slides which sometimes reach all the way to the ocean shoreline. A recent example of this type of slide intersected the Lost Coast Trail during the winter in 2003 near Buck Creek.

Three dominant rock types control most of the topography and soil formation throughout most of the King Range: 1) isolated blocks of resistant massive sandstone, 2) zones of sheared shales, and 3) combinations of shale and sandstone found as thin interbeds or small sandstone units interrupted by shale beds. The massive or thick bedded sandstones form steep rocky faces with crested ridges,

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<sup>1</sup> Fossils are extremely rare in this portion of the King Range, but age dating of the rocks has been determined using microscopic fossils such as foraminifera and diatoms found in the cherts, limestones, and some shales.

weathering to form sandy and silt rich soils found on the more stable slopes. Small side hill drainages in this rock type tend to be straight, well incised, and evenly spaced (McLaughlin et al. 2000). Examples of this type of topography are found along the Rattlesnake Ridge area near King Peak.



*More resistant sandstone forms the sharp crested mountains in the King Range peak area.*

The sheared shales weather to clayey soils and are structurally weak. Hill slopes with these rock and soil types tend to have rounded topography on the upper slopes and ridge crests with poorly incised side hill drainages. Excellent examples of this type of topography, soil, and bedrock can be found on the slopes and ridges immediately north and south of Cooskie Creek, along the western edge of the King Range.

Where the rock types are mixed shale and sandstone and are more heterogeneous, the hillslopes form more irregular slopes with intermediate steepness. According to observations by McLaughlin (2000), side hill drainages in these areas run directly downhill, have irregular spacing, and slopes have an irregular form or lumpy form. This type of landform can be found in the Horse Mountain Creek watershed.

Overall the landforms and soils types of the King Range blend together in soft mosaic when viewed from a distance or from the air. But each rock type, its structure, and weathering factor determines what landform and soil type will ultimately form. These geologic factors, when combined the sun angle, elevation, and ocean proximity, also determine the vegetation pattern of the King Range. The predominantly unstable soils, high rainfall (see below), and seismic activity require careful siting of roads, trails and facilities, as well as continuous maintenance to prevent their erosion and failure.



*Less resistant shale bedrock and clay soils form the rounded topography in the northern part of the King Range.*

### 2.2.2 Minerals and Energy Resources

Despite nearby Petrolia's name, the KRNCA contains few energy or mineral resources. The first commercial oil in California was produced from a well drilled near Petrolia in 1865, and there was sporadic exploration along the Mattole River between Honeydew and Cape Mendocino through the 1950s, but no significant production ever took place.

In 1929 the area was withdrawn from disposition by Executive Order 5237, which included a withdrawal of the public lands from non-metallic mining claims. An unpublished BLM Minerals Inventory was conducted in the King Range in 1962, and the resulting report described the area's geology as having little or no potential for most metallic minerals, and the extreme inaccessibility made most possible mining ventures impractical (Collins 1962a). At that time, 31 mining claims existed in the King Range, grouped around Queen's Peak, Saddle Mountain, and Big Flat, but only one had yielded any actual production. Known as the Bear Creek mine, it was an open pit operation that produced manganese in 1958 and '59, sold to a federal buying program. When the program shut down in 1959, the mine closed as well. A second unpublished minerals report from 1962 investigated an alleged quartz mining claim being excavated at the north end of Big Flat, but found it to be a search for buried treasure, and suggested that the attempt to take possession of the parcel as a quartz mine was invalid (Collins 1962b).

Section 6(a) of the 1970 King Range Act made all U.S. mining laws applicable on KRNCA lands, "except that all prospecting commenced or conducted, and all mining claims located after the effective date of this Act shall be subject to such reasonable regulations as the Secretary may prescribe to effectuate the purposes of this Act. Any patent issued on any mining claim located after the effective date of this act shall recite this limitation and continue to be subject to such regulations. All such regulations shall provide, among other things, for such measures as may be reasonable to protect the scenic and esthetic values of the Area against undue impairment and to assure against pollution of the streams and waters within the Area." Section 6(b) added: "Nothing in this section shall be construed to limit or restrict rights of the owner or owners of any existing valid mining claim." These restrictions were intended to

provide protection against unnecessary damage from prospecting or mining activities without eliminating this use outright (U.S. Congress 1970). No mining claims currently exist in the KRNCA.

Based on the low mineral potential, in-place protective policies, and lack of valid mining claims in the KRNCA, mineral issues are considered to be insignificant with minimal potential impact and will not be discussed or assessed any further in this RMP/EIS.

### 2.2.3 Paleontological Resources

Paleontological resources are the physical remains or other physical evidence of plants and animals preserved in soils and sedimentary rock formations. They are important for correlating and dating rock strata, and for understanding past environments, environmental change, and the evolution of life. There are no known paleontological resources of any significance or threatened by any public use or management activity in the KRNCA. The resource is not being affected by the plan and therefore will not be discussed or analyzed in this RMP/EIS.

### 2.2.4 Climate

The climate in Northwest California can be broadly described as Mediterranean; winters are wet and cool, and summers have virtually no precipitation. Nearly all rainfall occurs between October and May. Summer temperatures are warm in inland locations, and can exceed 100°F on the hottest days. Average air temperatures range from a high of 95°F to a low of 30°F. The coastline is moderated by the cold Pacific Ocean waters, with summer high temperatures in the mid-60s with many days of fog. Due to its extreme topographic relief, the KRNCA exhibits both coastal and inland weather characteristics in a relatively small geographic area. The rugged topography also causes some local weather anomalies in wind, rainfall, and temperature.

The 4,000 foot vertical rise of the King Range results in a high degree of orographic (terrain induced) lifting of storms approaching the coast, causing intense rainfall. Rainfall exceeds 100 inches annually and occasionally tops 200 inches on the ridges. In contrast, the immediate coast receives about half as much rain, with about 65 inches falling at Shelter Cove (see Table 2-1). The total amounts of precipitation combined with the often intense and prolonged rainfall events bring flood or near-flood events to the watersheds regularly. Twenty-four hour rainfall totals exceed 16 inches in the most intense storms.

Table 2-1: Comparison of Coastal (Shelter Cove) and Mountain (Wilder Ridge) Rainfall Totals

AREA	AVERAGE MONTHLY PRECIPITATION												
	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH	APR.	MAY	JUNE	ANN.
Shelter Cove	0.23	0.77	1.60	4.32	8.21	11.77	10.76	9.82	8.96	4.50	3.20	1.22	<b>65.40</b>
Wilder Ridge <sup>1</sup>	0.11	0.60	1.20	6.06	16.84	23.46	22.81	19.81	17.49	7.02	3.93	1.39	<b>120.71</b>

<sup>1</sup> Trower rain gauge, Wilder Ridge Road 4 miles south of Honeydew, average for years 1980-2002.

Source: National Weather Service, Western Regional Climate Center Web Site, 2003.

Snow falls periodically at the higher elevations, but rarely at sea level. Although significant snow accumulations may occur on the King Range Crest, it usually melts within a few days, except in shaded

areas at the highest elevations. Here, snow may persist for several weeks or more and restrict road and trail access.

A coastal climatic anomaly associated with the King Range is the low incidence of summer fog. Although the coastal beaches receive some fog, it is much less prevalent than the rest of northwest California. Coastal summer temperatures are in the 60s (Fahrenheit) on days when marine air influences the area, but often climb into the 80s with strong offshore winds. The cool marine air layer is rarely deep enough to reach the King Range Crest, resulting in summer temperature inversions where the higher ridges are 20-30 degrees warmer than the coast, and often exceed 90°F. Table 2-2 compares average coast and inland temperatures throughout the year.

Table 2-2: Comparison of Coastal and Inland Temperatures

SHELTER COVE TEMPERATURES—COASTAL (°F)													
	JAN	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT	OCT.	NOV.	DEC.	ANN.
Avg. Max.	57.7	57.9	59.2	61.3	65.5	68.7	69.9	69.6	70.2	67.1	61.5	57.7	<b>63.9</b>
Avg. Min.	45.4	45.5	45.4	46.0	48.5	51.4	52.7	53.0	52.9	51.6	48.1	45.9	<b>48.9</b>
RICHARDSON GROVE STATE PARK—INLAND (°F)													
Avg. Max.	50.0	55.0	59.4	64.8	71.6	79.2	86.7	87.3	82.9	70.5	55.8	49.5	<b>67.6</b>
Avg. Min.	36.5	38.1	39.2	40.8	45.1	50.0	52.7	52.9	49.3	44.8	40.6	37.0	<b>43.9</b>

Source: National Weather Service Data, Western Regional Climate Center Web Site, 2003

The steepness of the King Range, combined with the topography of the river basins in the area, also produces an unusual local weather phenomenon of offshore winds emanating from a northeast to easterly orientation. This condition is an exception to the prevailing winds along the entire California coastline where the direction is usually onshore from west to southwest. “Flagging,” or the wind-caused pattern of leeward-only limb growth and development of ridgetop Douglas fir, points westward toward the ocean, indicating this typically easterly flow.

### 2.2.5 Air and Air Quality

Air quality for the planning area is managed and monitored by the North Coast Unified Air Quality Management District (NCUAQMD). The BLM does not have any ongoing operations in the King Range that fall under air quality permits issued by the state or federal government. The two primary unregulated sources of air pollution that can originate on public lands in the King Range are smoke from fires and dust generated from road use, maintenance, and rehabilitation.

In the event of a uncontrolled wildfire in the KRNCA, the NCUAQMD Regulation 2 (revised 1987 and adopted by the Basin Control Council of the California North Coast Air Basin and Mendocino County Air Pollution Control Board, 1988), contains provisions for the setting of backfires necessary to save life or valuable property (California Public Resources Code, Section 4426). The regulation also allows prescribed burning activities for the abatement of fire hazards (California Health and Safety Code,

Section 13055) and for forest management, range improvement, disease or pest prevention, or the improvement of land for wildlife and game habitat (California Health and Safety Code Section, 39011[a]).

The BLM can burn only when sanctioned by the California Air Resources Board or the NCUAQMD (California Health and Safety Code, Section 41855). The BLM must comply with the guidelines set forth in the North Coast Unified Air Quality Management District Particulate Matter (PM10) Attainment Plan (1995) in order to achieve the California Ambient Air Quality Standards for PM10. Smoke management concerns must be addressed in all prescribed fire plans. For all prescribed burns over ten acres in size, a Smoke Management Plan must be submitted to the NCUAQMD for approval prior to ignitions. Smoke emissions from prescribed burning activities may have minimal intermittent effects on the visual resources of the King Range NCA and surrounding communities, but are not expected to significantly impact the Humboldt Bay Air Basin or the Ukiah—Little Lake Air Basin.

Dusty roads are not considered to have a significant affect on air quality due to the absence of ultramafic or serpentine bearing rock formations within the KRNCA (L. Green, pers. comm. 2003).

Currently, road maintenance activities are performed during moderately wet periods during the fall and spring to ensure adequate soil moisture content. This seasonal operation reduces dust generation during grading and enhances road surface compaction, which results in road surfaces that are less prone to dust generation from routine traffic and less likely to erode under precipitation. Occasionally, application of dust suppressants like lignosulfate, magnesium chloride, and calcium chloride is required to mitigate dust generation from certain roads in the front-country when climatic conditions are very dry. Dust suppression is not performed immediately adjacent to sensitive surface water bodies. King Range operations are either not subject to or are currently fully compliant with all air pollution control requirements. There are no planned operational changes that will result in generation of regulated air pollutants; therefore, no specific alternatives have been identified to address air quality.

### **2.2.6 Visual Resources**

The KRNCA encompasses one of the most dramatic coastal landscapes in the contiguous 48 states, and conservation of the area's scenic attributes was an important factor in its designation as a National Conservation Area. The scenic qualities of most landscape settings in the KRNCA are mostly defined by dramatic natural features. The characteristic landscape in the southern two-thirds of the area consists of steep walled, heavily forested mountains rising abruptly from black sand beaches. On the lower slopes, solid forests are only broken by occasional landslides carving long open swathes down to the waterline. Upper slopes are a mosaic of dark green conifers and pale snags interspersed with patches of grey-green chaparral. North of Kinsey Ridge, the vegetation changes to a mixture of forest and golden coastal prairies.

In the northern part of the King Range, cultural resources also contribute to scenic values. Wooden structures from historic and present-day ranching operations are integral parts of a highly scenic pastoral landscape. The historic Chambers Cabin, with associated barn and corrals set against a majestic backdrop of coastal prairies, regularly appears in scenic calendars and books. The Punta Gorda Lighthouse, perched on a rocky outcrop above an isolated stretch of beach, is another example of a popular scenic attraction.



*The southern part of the King Range is characterized by heavily forested mountains plunging into the Pacific.*



*Historic ranching structures contribute to the pastoral scenic qualities in the northern part of the King Range.*

When developments complement and borrow form, line, color and texture from existing landscape features, they minimize impacts to the characteristic landscape to retain the visual integrity of the area. The BLM uses the Visual Resource Management (VRM) system as a framework to assess scenic values on public lands and manage visual impacts from activities and projects. Public lands are inventoried based on three factors:

- € Relative levels of scenic quality: In the King Range, the coastal slope contains outstanding scenery and is known nationally for its dramatic meeting of mountains and sea. The inland ridges, although still very scenic, are more typical of other landscapes in northwestern California.

- € Level of viewer sensitivity to landscape changes: The highest viewer sensitivity occurs at popular public use areas such as scenic overlooks, recreation sites, and trail and road corridors. Areas visible from private residences also receive high sensitivity ratings.
- € Distance of an area from points or corridors of high viewer sensitivity: Even minor landscape changes are very evident when viewed in the foreground zone, but these changes become less evident with distance.

Based on these inventory factors, VRM classes are assigned to different areas of public land and used as a basis to consider visual values in the planning process. The VRM classes are then adjusted if necessary to reflect the resource allocation decisions and management actions proposed in various plan alternatives.

Each VRM class allows for projects with differing degrees of contrast with the characteristic natural landscape elements of form, line, color, and texture. As described below, the higher numbered classes allow for projects with greater contrast to the landscape.

#### *2.2.6.1 VRM Inventory/Management Classes*

**Class I:** The objective of this class is to preserve the landscape's existing character. This class allows for natural ecological changes and only very limited types of management activities and uses. Any contrasts with the natural landscape must be minimal and not attract attention.

**Class II:** The objective of this class is to retain the landscape's existing character. The level of change to the characteristic landscape should be low. Management activities and uses can be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture in the predominant natural features of the characteristic landscape.

**Class III:** The objective of this class is to partially retain the landscape's existing character. The level of change to the characteristic landscape can be moderate. Management activities and uses may attract attention, but should not dominate the view of the casual observer. Changes should repeat the basic elements of the predominant natural features of the landscape.

**Class IV:** The objective of this class is to allow for management activities and uses requiring major modifications to the natural landscape. The level of change to the characteristic landscape can be high. Management activities and uses may dominate the view and be a major focus of viewer attention. However, every attempt should be made to mitigate the impacts of activities through careful location and repeating the visual elements of the landscape.

When projects or actions are proposed in the planning area, a visual contrast rating is conducted to ensure that they are designed and located to meet the VRM Management Class objectives. For example, a project to restore coastal prairie in the northern part of the KRNCA should borrow from the existing size, shape, and texture of nearby natural openings.

## 2.3 CULTURAL AND SOCIOECONOMIC ENVIRONMENT

### 2.3.1 Introduction

The socioeconomic context refers to the social, economic, and cultural connections of nearby communities with the KRNCA. It incorporates the region's social history, and informs community assessment and response to resource management issues. The social mix of individuals and groups affects community cohesiveness, capacity for cooperation and problem solving, and other social variables that influence the identification and response to resource management issues. Cultural orientations, especially sense of place, values about natural resources, and world views about nature influence how groups identify management issues and construct acceptable solutions.

Because BLM interacts frequently with nearby residents and groups to address local concerns and issues regarding KRNCA management efforts, the area's history and sociocultural composition are important elements to incorporate into any planning effort.

Roughly 500 acres of the KRNCA fall within northern Mendocino County, but the social and cultural dynamics in the area connect most strongly to southwestern Humboldt County. The small communities of Petrolia, Honeydew, Ettersburg, and Whitethorn/Thorn Junction lie just outside the KRNCA boundary, while Shelter Cove, currently a mostly-residential subdivision, is completely surrounded by BLM lands. Gateway communities close to Highway 101, the major north-south route, include Garberville, Redway, and Ferndale. The largest cities in the region are Eureka and Arcata, both 1-2 hours north of the KRNCA by car (see Figure 2-3).

Because Humboldt County is where most local communities and other potentially affected socioeconomic resources are located, it is the primary focus of this section. As a result, many data on existing economic conditions is provided at the county level for Humboldt County only; comparative information for Mendocino County is provided where appropriate. In addition, some statewide economic indicators are provided to help put local conditions in perspective; however, other state and national economic conditions are not addressed because the RMP update only has the potential to cause very minor or negligible economic impacts beyond the local study area. However, given the importance of the KRNCA to a variety of social groups, the social portion of this section addresses issues in a broader context beyond the local study area. Thus, the affected social environment also includes urban northern California and many other areas where many King Range visitors reside, or where people are found who care about and identify with the King Range but do not actually visit the Lost Coast.

FIGURE 2-3: REGIONAL TOWNS AND CITIES

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### 2.3.2 Applicable Regulatory Framework

Section 202 of FLPMA requires BLM to integrate physical, biological, economic, and other sciences in developing land-use plans (43 USC § 1712).

Section 102 of NEPA requires federal agencies to “insure the integrated use of the natural and social sciences ... in planning and decision making” (42 USC § 4332). FLPMA regulations 43 CFR § 1610 and the BLM Manual 1601 Land Use Planning and H-1601-1 Land Use Planning Handbook further elaborate on this legislative mandate.

Federal agencies are also required to “identify and address ... disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States” in accordance with Executive Order 12898 on Environmental Justice.

The Council on Environmental Quality's Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500-1508) provide guidance related to social and economic impact assessment by noting that the "human environment" assessed under NEPA is to be "interpreted comprehensively" to include "the natural and physical environment and the relationship of people with that environment" (40 CFR 1508.14). Furthermore, these regulations require agencies to assess not only "direct" effects, but also "aesthetic, historic, cultural, economic, social, or health" effects, "whether direct, indirect, or cumulative" (40 CFR 1508.8).

### 2.3.3 Historical Context

Today's KRNCA is a landscape of intricately connected patterns of human and natural history. Past settlement and uses of the area by a variety of peoples has been as important as ecological processes in shaping and creating the place that the BLM manages today. In order to better understand how the King Range came to look the way it does, as well as the context in which BLM management is taking place, it is important to briefly review the area's cultural history and present-day social context.

#### 2.3.3.1 *Native Americans*

##### Prehistory

Prehistory in the West is often divided into four time periods: Early, Paleoindian, Archaic, and Late Prehistoric, although some scholars use different terms.<sup>2</sup> No Early or Paleoindian Period sites have been located in the King Range planning area and hence these periods will not be discussed further.

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<sup>2</sup> For example, for the north coast of California, Fredrickson (e.g., 1974) refers to the Late Prehistoric as the Emergent Period. The cultural contents of these temporal periods are called a variety of terms in different geographical areas by different scholars and are typically named for an archaeological type site where a pattern, complex, or horizon was first described, but sometimes for the person who discovered it. The patterns, complexes, or horizons may be subdivided into phases or aspects, often named for an archaeological type site. Prehistoric periods have been presented in these arbitrary terms by archaeologists working with the archaeological record as a means to define and separate the past so it can be discussed in segments rather than as a continuum.

The Archaic Period is generally divided into (1) Early (ca. 8,000 to 5,000 years ago) represented by millingstone assemblages characterized by unshaped manos and metates made of a variety of rock types suggesting a generalized hunting and hard seed collecting economy; and (2) Middle (ca. 5,000 to 3,000 years ago) characterized by the bowl mortar and pestle indicating a shift to an emphasis on an acorn processing economy; and Late (3,000 to 1,500 years ago). These various time periods can usually be distinguished by specific projectile point typologies. There is also an increase over time in the numbers of projectile points found at sites, which can be interpreted as intensification of hunting. Early and Middle Archaic Period sites have not yet been identified along the coastal strand but have been recorded inland approximately six miles from the coast. Scientific archaeological excavations and analysis of several prehistoric sites on the King Range coast date the remains to the Late Archaic Period. The coastal area appears to contain cultural deposits no older than 2,800 years, possibly due to the continued geologic uplifting and erosion factors.

For the Late or Emergent Prehistoric Period, a regional migration model was proposed by Whistler (1979) based on linguistics. Whistler suggests that the Yurok moved into the area around A.D. 1100, displacing the Wiyot, who may have settled the area 200 years earlier, to the south. Both of these groups have languages based in Algonquian linguistic family. The Yurok brought a well-developed fishing and woodworking technology that they easily adapted to their new marine and riparian homeland; these technologies soon spread to groups in adjacent areas. From their smaller river canoes, they developed the large dugout canoe for exploiting offshore sea mammal rookeries in their new environment (Hildebrandt 1981). Whistler also suggests that the Sinkyone, Mattole, and Bear River groups, all speaking variations of an Athabaskan linguistic pattern, arrived in the King Range region approximately 600 to 700 years ago (ca. A.D. 1400).<sup>3</sup> Evidently, they too adopted many of the Yurok fishing, woodworking, and hunting techniques and technologies.

Archaeologically, the migration of the Wiyot and Yurok is associated with the Gunther Pattern. This artifact assemblage consists of harpoon points, nets, and fish hooks, groundstone net sinkers, Dentalium shell beads, the distinctive Gunther Barbed projectile points, bird bone flutes, abalone (*Haliotis*) ornaments, steatite bowls, antler woodworking wedges, stone mauls, antler spoons, large and miniature ceremonial bifaces, and groundstone zoomorphs. Most of this assemblage is the same as that found throughout the archaeological sites along the King Range coast (excepting steatite bowls, carved elk antler spoons, and groundstone zoomorphs). The assemblage suggests an economy adapted to coastal and riparian resource exploitation, hunting, fishing, and hard seed and acorn processing.

### Ethnographic Information

The KRNCA is within the traditional territory of the two Athabaskan speaking groups known today as the Mattole and Sinkyone. These groups, along with the Bear River people, were located between Coast Yuki and Pomo to the south and Wiyot and Yurok to the north and the Wailaki to the east (see Figure 2-4).

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<sup>3</sup> Note that the Bear River people are sometimes discussed as a separate group (Baumhoff 1958; Nomland 1935, 1938), but more often are lumped with the Mattole (Elsasser 1978; Kroeber 1925).

FIGURE 2-4: APPROXIMATE TRIBAL BOUNDARIES IN THE EARLY 19<sup>TH</sup> CENTURY

8.5 x 11 insert

The Mattole and Sinkyone acquired some technology as well as cultural and religious traits from neighbors on all sides, adapting what they could to suit their localized needs and were, therefore, considered transitional between Central California and Pacific Northwest Culture Areas (Elsasser 1978 at 191; Fredrickson 1984; Kroeber 1925 at 146). Any knowledge of their lifeways is based on sketchy accounts by early explorers and settlers; interviews with elderly Sinkyone, Mattole, and Bear River people; commonalities with other groups; and archaeological evidence. Not many local Native Americans survived the widespread aggression of early Euroamerican settlers, ranchers, and soldiers—those not killed off were removed to reservations out of the area. A few eventually found their way back home.

Political subdivisions among the northwest Athabaskans consist primarily of what Kroeber called *tribelet*s (Kroeber 1925; Moratto 1984 at 5-6). These were small groups with territory typically limited to a single river drainage or valley. *Tribelet*s often had a single principal village or settlement with strategically placed seasonal camps for resource procurement throughout their territory. The traditional territory of the Mattole was along the coast from the vicinity of Davis Creek south to Spanish Flat. It extended inland perhaps fifteen miles to include the lower and middle portions of the Mattole River drainage, after which one entered Wailaki territory to the east. The Mattole are said to have had two *tribelet*s with some sixty village sites (Baumhoff 1958).

The Bear River people lived between Davis Creek and Fleener Creek, with the Bear River dividing their territory (Nomland 1938). They evidently controlled both banks of the drainage inland some ten miles. No information is recorded about the number of *tribelet*s, but Baumhoff (1958) identified seven village sites (Elsasser 1978 at 191). At least one Bear River descendant and her children presently live at Rohnerville Rancheria in Loleta.

The Sinkyone are typically discussed in terms of a northern and southern group. The Northern group called *Lolangkok* controlled the upper reaches of the Mattole River and parts of the main fork and south fork of the Eel River but had no territory on the coast. The southern Sinkyone group is called the *Shelter Cove* people. Their territory included a portion of the coast from Spanish Flat in the north to Usal Creek and Rockport in the south. They had four *tribelet*s and approximately eighteen villages (Nomland 1935).

The natural environment of the Mattole, Sinkyone, and Bear River people centered on the coastal strand, utilizing resources from the ocean with its intertidal rock outcrops and beaches, to grassy or forested hillsides rising steeply from the flats to as much as 4,000 feet, to creeks and rivers emptying into the ocean. Subsistence was based on seasonal rounds of gathering and hunting. *Tanoak* was the most important source of edible acorns, with major stands growing throughout the upper reaches of the King Range. Hazel nuts, manzanita berries, native blackberry, raspberry, and elderberry were important vegetal resources. Other edible seeds and nuts were harvested along with various grass seeds and berries (pine nuts, buckeye, huckleberry, Oregon grape, salal, wild strawberries, crow berries, and thimbleberries, to name a few). Greens were harvested during spring and summer; acorns, berries, and grasses became available in late summer and fall.

The Mattole and Sinkyone were in a very favorable environment for hunting and fishing. Along the coast, they caught birds, marine mammals, mollusks, seaweed, eels, fish, and the occasional beached whale. Huge runs of salmon, steelhead, and surf fish such as smelt were important marine resources in northern California and the Pacific Northwest. Salmon and steelhead were taken with spears, fish hooks, and nets. During winter, the Mattole built a fishing weir at the mouth of the Mattole River, an

undertaking that required a huge cooperative effort, where men fished while women and children transported, cleaned, smoked, and stored the fish (Fredrickson 1984:480). In late summer and fall, smelt (a small fish similar to sardines) came onto sandy beaches to spawn; these were taken with nets in the shallow water. The entire village camped on the beach along with friends and relatives from inland groups. Fish, shell fish, and whale meat were dried for use during the lean winter months (Fredrickson 1984:480; Kroeber 1925). Large and small game was plentiful in the region. The principal large game species included Columbian black-tailed deer and Roosevelt elk, taken by chasing the animals to the point of exhaustion when they were easier to kill.

The Mattole, Sinkyone, and their neighbors practiced a seasonal migration based on the changing availability of various food resources over the year. In winter, people moved inland along rivers to semi-permanent village sites, often located close to favored fishing spots to take advantage of winter salmon runs. In spring and summer, people would move to the coast or upland to the hills and cooler forests and build small temporary camps where various plant and animal resources would be available. Based on estimates of available food resources, Baumhoff (1958) was able to estimate population and territory size for the Mattole and Sinkyone; see Table 2-3 for a summary that includes Kroeber's (1925) 1910 population estimate while the table itself is adapted from Elsasser (1978).

Table 2-3: Mattole and Sinkyone Population and Territory

GROUP	SQUARE MILES	FISHING MILES	PRE-CONTACT POPULATION <sup>1</sup>	POPULATION DENSITY <sup>1</sup>	1910 POPULATION
Bear River	121	21	1,276	10.5	—
Mattole	219	42	1,200	28.6	—
Lolangkok Sinkyone	254	43	2,076	8.2	100
Shelter Cove Sinkyone	350	67	2,145	6.1	100

<sup>1</sup> Per square mile

Source: Elsasser (1978).

Like virtually all California tribes, the Mattole and Sinkyone were skilled in basketry. Their plain twined technique used hazel, willow, or *Ceanothus* sticks as framework with conifer roots and bear grass to weave as an overlay then wove in patterns of bear grass, maidenhair fern, giant fern, or decorative items such as porcupine quills. Fern dye was made from red alder bark (Elsasser 1978 at 200) while porcupine quills were dyed with Oregon grape roots. A variety of shapes were known, including twined, truncated conical hopper baskets for processing acorns on shallow, slab mortars, conical burden baskets and hats, eeling traps, seed beaters, and small bowls for serving mush.

Re-curved bows and self bows with simple wood arrows were made and used by the Sinkyone and Mattole, as well as with a two-piece arrowshaft smoother. Some arrows may have been used untipped, but were usually tipped with a variety of projectile points including Gunther Barbed, McKee Unifaces, corner-notched, side-notched, or denticulated barbed bifacial points. Wood planks for structures were made from driftwood logs by splitting them with elk horn wedges driven by shaped stone mauls. Shaped conical and flanged groundstone pestles were used. Mush was cooked in baskets using hot stones handled with two stick tongs. Bone awls were used for sewing and the Sinkyone are reported to have had

bone needles with eyes (Elsasser 1978 at 202). Fire was started by means of hand drills of buckeye or willow on willow or alder fire hearths. Dry moss was used as tinder (Elsasser 1978 at 199).

Sinkyone and Mattole people actively managed local resources for a variety of uses. In particular, fire, whether caused by lightning strikes or man-made, had profound effects on the landscape.<sup>4</sup> Applied to oak woodland habitats in late summer and early fall, fire killed acorn worms that could have infested the next year's crop (Raphael 1974) and cleared the understory of brush, making it easier to gather healthy acorns ready for harvest later in the season. Burning grassy areas and prairies also helped ensure abundant growth the following season, both for food seed and as open grassland for deer and elk habitat, and helped maintain bulbs, corms, and tubers used as food.

Most storage, cooking, and food processing implements, as well as nets, snares, and weirs used for fishing and hunting, were woven of plant material. The variety of plants used to construct baskets is extensive: willow, hazel, huckleberry, beargrass, wild iris, sugar pine roots, ferns, vines, grass stalks, and rhizomes from many different forbs, grasses, sedges, and rushes (BLM 1995). Collecting these items required active manipulation of each plant source to produce quality construction materials, usually young growth or shoots that were strong yet still pliable enough to weave. Techniques used to produce the desired materials included burning, pruning, and coppicing shrubs to encourage sprouting of straight shoots, as well as burning and pruning grasses to produce long straight stalks and to remove old plant material. These uses shaped the resources of the King Range to reflect the residents' cultural preferences and values, and many of these impacts on the landscape are still visible in the present-day, usually localized in areas of consistent, long-term (although often seasonal) use and habitation.

### *2.3.3.2 Euro-American Settlement and Development*

Spanish ships may have stopped briefly along the North Coast as far back as the 1570s; Vizcaino, a Spanish explorer of the 1600s is credited with naming the point at Shelter Cove "Punta Del Gada." The first documented explorations from sea, however, took place in the early 1800s with Russian, American, and British fur trappers and traders searching particularly for sea otter. The first overland explorer was Jedediah Smith who visited the area in 1828, but Humboldt Bay was not truly "discovered" until the Josiah Gregg party made their way from the gold fields of Shasta and Redding onto the North Spit in 1849, looking for the Trinity River's outlet to the Pacific Ocean. The North Coast's timber industry sprang up almost immediately in 1851, initially supplying lumber to the gold mines. By 1880, the area's valuable redwood lumber was being shipped to all parts of the world and timber dominated the regional economy.

The immediate vicinity of the King Range, however, was not settled as densely as other parts of the North Coast region, and was never dominated by a single industry. The organized timber industry largely passed it by, due to the lack of redwood forests and the relative inaccessibility. Settlers first entered the Shelter Cove area to the south (Machi 1984) and the vicinity of present day Petrolia along the Mattole River to the north (Clark 1982; Eastman 1995) in the early 1850s. Many early ranchers raised cattle as well as sheep for mutton and wool to supply the Gold Rush market. These settlers often burned their

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<sup>4</sup> Recent research suggests that the majority of California's coastal prairie habitat was primarily anthropogenic in origin, from local tribes burning areas regularly; after European settlement, many of these areas quickly reverted to woody vegetation (Bicknell 1992).

lands repeatedly to enhance livestock forage and maintain existing openings, which echoed the earlier Indian practices of burning. Early settlers cut timber from their lands for their own use, grew their own produce, and often approached something like self-sufficiency, with a strong emphasis on their own independence (Machi 1984; Raphael 1974).

Other uses of the landscape quickly developed as well; the local dairy industry began with a creamery in Petrolia, mostly producing butter; later the dairy industry became more concentrated around Ferndale to the north. An orchard industry was started by an entrepreneur named Albert Etter in 1861, creating the small town of Ettersburg. Remnants of old orchards can still be found on homestead ruins throughout the King Range. Oil was also discovered in the Mattole region, giving Petrolia its distinctive name, and at one time supported as many as fifty companies prospecting in the area, but the oil boom was short-lived as deposits proved unprofitable to exploit. Up around Eureka and locally around Shelter Cove, fishing became a major economic enterprise by the 1880s, particularly for salmon.



*Bark was stripped from area tanoaks and used to produce tannins for the leather industry.*

Around the turn of the century a tanbark industry emerged with one center at Briceland, another at Bear Harbor in the Sinkyone Wilderness, and a third at the mouth of the Mattole River. Bark was stripped from tanoak trees and used to produce tannins for processing leather. Wharfs and rail systems for shipping tanbark to the San Francisco market were built by Calvin Stewart's companies at Bear Harbor and at the Mattole River (Mattole Lumber Company) with offices in Petrolia. Shipping facilities at Shelter Cove focused on fishing and exporting wool but shipped tanbark from Briceland as well. However, the tanbark industry dwindled by 1940 after a cheaper and faster method of tanning leather was invented. This had a distinct effect on local populations; in 1900 there were 675 people living in the Mattole, but by 1940 their numbers had dwindled by half (Roscoe 1977).

### *2.3.3.3 Recent Regional History*

The region's timber industry shifted dramatically around World War II, when mechanized logging, using bulldozers or "Cats," became common practice, and Douglas fir lumber jumped in demand to meet the post-war national housing boom (Clawson 1979). Huge areas of Douglas fir were cut in the 1940s and

'50s to meet the market demand, even in areas like the King Range that were formerly considered inaccessible but could now be harvested using mechanized equipment. Unlike the earlier industrialized redwood boom, at the outset most old-growth Douglas fir was owned by small landholders, cut using independent logging crews, and contracted to independently-owned mills. The influx of loggers created another economic boom for the area; Humboldt County was the largest timber producer in the state in 1940, and from 1940-60 the county's population more than doubled (Criley 2003). Even the tiny town of Whitethorn had five mills operating at one time and a population close to a thousand people (Raphael 1974, at 119).<sup>5</sup>

This had a noticeable effect on local land markets, as formerly worthless forested lands were suddenly considered valuable, and hence triggered higher property taxes on both the land and the standing timber itself (Vaux 1955).<sup>6</sup> To meet the additional tax burden, ranchers often had to sell their timber rights, or their extra acres, some of which were then subdivided for home sites. A 1956 survey of fir sellers found that two-thirds of non-industrial owners sold timber to get cash or to convert to grazing use (Vaux and Hofsted 1956). This process resulted in large swathes of clear-cut or "high-graded" (taking the largest trees and leaving smaller ones behind) land in a multitude of ownerships, with little attention given to reseedling or long-term sustainability (Pine 1956). The availability of timber also drew larger firms into the area, and lumber production reached an all-time peak in Humboldt County in 1959 (Criley 2003). Once the timber was gone, some ranchers maintained the grass that grew in place of the trees by burning. The pastures generally did not last long, though; many cut-over Douglas fir forests grew back mostly in tanoak, which is now considered a weed tree.

This intensive and accelerated harvesting of Douglas fir left an extensive legacy on the landscape. A study in 1968 showed that coverage by hardwoods, mainly tanoak, had increased significantly as a result of timber harvest practices (Oswald 1968).<sup>7</sup> In addition, erosion from poorly-constructed logging roads and the lack of reforestation contributed to greatly increased sediment loads in the region's rivers, leaving streams shallower, warmer, and more prone to flooding (Bodin, Brock et al. 1982; Raphael 1974). This condition proved disastrous in the winters of 1955 and 1964, when heavy rains caused immense flooding along the entire North Coast. Combined with river diversion projects and an increasingly active fishing industry, the eroded character of cut-over lands also had devastating effects on local anadromous fish populations, with salmon and steelhead runs shrinking to roughly one-third their historic sizes by the 1960s.

The timber boom of the 1940s and '50s had other effects as well. Between 1965 and 1982 the amount of agricultural and forest land in Humboldt County dropped by 87,000 acres as lands were subdivided into 20- or 80-acre parcels (Hight 2000).<sup>8</sup> The buyers were mostly "back-to-the-landers," people from the counter-culture or "hippie" movements of urban California, often buying lands in poor condition for

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<sup>5</sup> Raphael notes that many of the newcomers were "Okies—dispossessed farmers from the Dust Bowl who looked for jobs wherever they could find them." This caused some tension with the older, more established settlers, who saw the newcomers as economic competitors.

<sup>6</sup> Tax laws changed in 1946 to apply to total acreage, regardless of whether land was in timber or grassland, and so the value of the standing timber was then calculated as part of the overall value of the property (BLM 1996).

<sup>7</sup> Of cutover areas in Humboldt County, hardwood species covered 53 percent of the area, compared to only 28 percent of areas where no cutting had occurred. Areas that had been "high-graded" had hardwood cover as high as 60 percent.

<sup>8</sup> Note this includes both parcels sold to "back-to-landers" plus the subdivision of Shelter Cove.

cheap prices (Anders 1990; Raphael 1974).<sup>9</sup> This back-to-the-land movement was centered in the southern part of Humboldt County; from 1970-80, the population of the Garberville census tract nearly doubled (Criley 2003). Researcher Jentri Anders describes the motivation of these self-titled “new settlers” as a “desire to relearn how to live on the land in a way that would meet minimal human needs without causing permanent damage to the natural environment” (BLM 1996). Many built their own homes, chopped their own wood, and grew their own food in an attempt to be as self-sufficient as possible. Not everyone who tried it, stayed—the winters in particular can be harsh, with near-constant rain and cold—but those who stuck it out were dedicated to their particular lifestyle and the philosophies that informed it.<sup>10</sup> In particular, many of them espoused an early ecological consciousness, forming local grassroots organizations like the Mattole Restoration Council which focuses on fisheries health and watershed restoration (House 1999).

### 2.3.4 Current-day Social and Cultural Context

In the King Range and adjacent areas, there are various communities of place and interest that interact in a variety of complex ways, both among one another and with the BLM. Such sociocultural entities can be tightly circumscribed geographically, in the case of small villages, or widely distributed over the landscape as in the logging or ranching community. Some of these groups obtain a sense of community from their physical proximity and frequent interactions; others get it from their shared world view, common interests, or experiences. This section describes both communities of place, the local towns surrounding the King Range, as well as communities of interest: the Native American community, the ranching community, and so on. In an attempt to present reasonably systematic information, each group will be briefly described in terms of similar attributes: demographic composition, geography, sense of identity, sense of place, key values, lifestyle, community cohesive factors, orientation toward the natural environment and the ways the community views and interacts with the KRNCA. Time and space constraints will limit the discussion to major groups.

#### 2.3.4.1 *Communities of Place*

As described earlier, a number of small communities are located just outside the KRNCA boundary, starting with Petrolia to the north, and Honeydew, Ettersburg, Whale Gulch, and Whitethorn/Thorn Junction dotted along the eastern edge. In contrast, the residential development at Shelter Cove is located on the coast, surrounded by the ocean on one side and the King Range on the other. The communities of Garberville and Redway lie further inland along the Highway 101 corridor to the east of Thorn Junction, while Ferndale is farther north of Petrolia (see Figure 2-3). These communities share a powerful identification with the area as a distinct geographic and cultural region, almost as a separate part of California—referred to alternately as the North Coast, the Lost Coast, or “behind the redwood curtain.”

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<sup>9</sup> Anders (1990) asserts that the reason most of the “back-to-the-landers” could afford to buy the subdivided tracts is precisely because the land was in too poor of condition to use for anything else.

<sup>10</sup> Raphael notes that “Most of the old-time residents feel threatened by the most recent invasion of newcomers, just as they did by the arrival of the Okies in the late ‘30s.” However, he makes the distinction that hippies were not a threat economically; in contrast, they brought more money into the local economy. The old-time residents often disliked them more for social reasons, not being comfortable with the counter-culture aspects of their lifestyles (Raphael 1974, at 169).



*The Cape Mendocino Lighthouse, located on BLM lands in Mal Coombs Park, has become a community symbol for Shelter Cove.*

There is a split between the communities closest to the King Range in terms of their connection to the KRNCA and sense of community character. On the coast, Shelter Cove has more of a tourism focus and hence a more direct economic relationship to the KRNCA. In contrast, the Mattole Valley communities of Whitethorn, Petrolia, and Honeydew seem to base much of their community identity to their isolation, and are not always receptive to outsiders. A number of people from these communities expressed concerns during Scoping about the possible effects of this plan update on local community character, not wanting to become “gateways” to the KRNCA.

Unlike the towns that are closest to the King Range, Garberville and Redway are more closely linked to the Highway 101 corridor, with its north-south flow of traffic. Most of the tourists who pass through are focused on Redwoods State Park; the King Range is a substantial detour off the 101 corridor, and so gets fewer visitors who are just exploring off the main highway. Ferndale is similarly more tourism oriented, as well as a center of the remaining dairy industry in Humboldt County; its scenic main street, with a number of well-maintained Victorian houses and storefronts, has been used as the backdrop for several movies.

The KRNCA has a high degree of engagement with adjacent communities, particularly in the context of ongoing cooperative relationships/involvements with local non-profit groups, who are actively engaged in environmental restoration and resource management issues. The relationship between the BLM and the communities for the most part is a positive one. In particular, the Mattole watershed and its associated communities seem to be of a manageable scale and size for community organizing and involvement, which over the years has gradually come to foster a willingness to accommodate different perspectives among neighbors (House 1999).

#### *2.3.4.2 Communities of Interest*

##### Native Americans

As mentioned previously, most of the indigenous peoples from what is now the KRNCA and the immediate surroundings succumbed to disease or died at the hands of Euro-American settlers in the 1850s. Most of the few who survived this time were placed on reservations. Small remnant populations reside in urban areas such as Eureka and on rancherias and reservations scattered throughout the region (Figure 2-5).

FIGURE 2-5: RESERVATIONS AND RANCHERIA LOCATIONS

8.5 x 11 insert

Regional reservations and rancherias in the vicinity of the King Range area are Big Lagoon Rancheria some 70 miles north of the KRNCA; Trinidad Rancheria and Hoopa Valley Reservation, both approximately 60 miles north; Blue Lake Rancheria approximately 50 miles north; Table Bluff Reservation approximately 30 miles north; Bear River Band of Rohnerville Rancheria approximately 25 miles north; Round Valley Indian Reservation some 25 miles southeast; Laytonville Rancheria approximately 30 miles southeast; and Sherwood Rancheria some 40 miles southeast. The Hoopa Valley and Round Valley Reservations are among the largest reservations in California, while the others are quite small.

The Bear River Band is enrolled on the Rohnerville Rancheria. The total enrollment was estimated at 12,862 in 1999 by the U.S. Department of Health and Human Services, but most do not live on the Rancheria. This group has a special relationship to the KRNCA as the closest federally recognized tribe, and consults with the BLM on a regular basis on a variety of management issues, including NAGPRA issues.<sup>11</sup> Several persons on the Rohnerville Rancheria can trace their families to the Mattole area, and there are still a few Indian allotments belonging to Mattole descendants near Prosper Ridge near the north end of the KRNCA.

There is a distinct connection with the land among Native people that forms part of their sense of identity. Among the Sinkyone and Mattole, village and place names were often synonymous; a special bond to the land was evident. Although they no longer live in the King Range as a functioning, independent society, local natives retain traditional ties to the area. Key values among the Native Americans of the region include a sense of loss over the massive transformations that have engulfed the natural world, along with a desire to maintain connections with the local landscape, particular resources within that landscape, and a continuity of use in the context of specific traditional or group practices. A number of writers have noted that the prevailing feeling of local Native Americans toward destruction of natural resources by non-Natives is more often sadness than anger, as exemplified in the following quote:

One of the three local Indians to survive into the days of the tanbark boom told of a visit from Nagaicho, the Sinkyone Creator. Nagaicho had looked at the area around Briceland and remarked sadly, 'It looks just like my people lying around, lying around with all their skin cut off' (Raphael 1974:92).

While there is little substantial data, it would appear likely that the lifestyle of surviving Sinkyone and Mattole is similar to other people of moderate means in the area (Smith 2003). Trips to the beach are popular for picnics, beachcombing, and general recreation. Fishing and hunting are also popular. The Bear River people view the KRNCA as a valuable natural area (Smith 2003). Some Native people use the area for traditional collecting of acorns and other food plants, medicinal herbs, and basketry and other craft materials.

Contemporary Native American use of natural resources in the King Range also continues through cooperative programs with the BLM in addition to individual or informal small group use. In particular,

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<sup>11</sup> Native American Graves Protection and Repatriation Act (NAGPRA) affirms the rights of Indian tribes and Native Hawaiian entities to custody of Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony with which they are culturally affiliated. It directs federal agencies and museums (that is, museums receiving federal funding) to inventory their collections for these items and to attempt to identify their cultural affiliation. It also directs the agencies and museums to return these items to the affiliated Indian tribes or Native Hawaiians that request them.

the KRNCA represents a valuable set of resources that can be accessed by even urban Native Americans in a way that is different from other parts of the region that are either in private hands or within the sphere of influence of geographically established tribal entities. It provides land and resources for those who have none of their own, which may allow some to continue cultural practices and uses that otherwise would be lost.

### Ranchers and Similar Working Landowners

As discussed in Section 2.3.3.2, ranching began in the Humboldt Bay area during the Gold Rush era. By the early twentieth century there were considerable numbers of small, relatively self-sufficient homesteads in the KRNCA vicinity; virtually all of these ran some cattle and/or sheep; some ran a few hundred head (Raphael 1974:102).<sup>12</sup> These homesteads did not have electricity, and lacked the practical means for preserving hundreds of pounds of beef, so typically they did not butcher, but rather drove cattle to markets. Many of the earliest homesteads are no longer functioning farms; some have been abandoned, or have been subdivided into smaller parcels with second homes, or homes for people who commute to wage labor elsewhere. Most ranchers currently make a living harvesting a variety of resources from their lands, not just cattle. The experience of the French family of Ettersburg may be typical (French 2002:3):

Until the mid-1980s we raised mostly sheep, but with the ideas prevalent today, pressure to leave the wild animals alone and have little or no predator controls, raising sheep is no longer feasible. Uncontrolled dogs are almost a bigger problem. We now raise more cattle, which only bring in enough money to pay property taxes. The rest of the ranch income is from timber operations. In order to keep this property, ranch income has always had to be supplemented by other work... The pressures on ranchers today make it ever harder to earn a living off the land. We would like to see this property that took so much effort to put together, be able to remain a large land holding for future generations. Open land tracts are becoming more scarce and we feel that this would be a great loss to the environment as well as to our family.

The sense of place and identity with the land are very strong among the remaining working landowners. Many feel under pressure by the increased environmental regulation on the one hand and the increasing tax burdens and other financial pressures to sell off and subdivide their land—a prospect virtually all ranchers are very reluctant to do, as their land usually has, like the French's, been in their family for many generations. At a regional scale, many worry about too much productive agricultural land being converted to either subdivisions of public ownership.

### "Back to Landers" or "New Settlers"

As described earlier, in the late 1960s a substantial number of "back to the landers" moved into the King Range area, buying cut-over lands that had recently been subdivided. This group came to call themselves "new settlers," in contrast to older, more established families. They were often young and interested in

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<sup>12</sup> Even where there has been a relative continuity of use, area ranching has seen a number of trends of change over time. Prior to the tanbark boom and bust in the early twentieth century, almost all homesteaders and ranchers kept hogs. Many produced hams and bacon for income. The hogs thrived on acorns, but raising hogs became less viable after many tanoak trees were harvested for their tannin. Sheep ranching then became the economic mainstay of the area. Later, cattle would become relatively more important than sheep, due in part to changes in regulations regarding predator control that made raising sheep problematic.

the counter-culture movement. Importantly, ideas about their relationship to the surrounding landscape and environment was often the primary purpose for moving to the area, as part of a powerful motivation to get away from urban life, simplifying their existence, and having a much more direct relationship with the natural world. Many of the initial group of “new settlers” have stayed and established roots of their own, and today are generally involved with local veterans associations and other civic activities, including local environmental organizations (House 1999).

Initially, the old and new settlers clashed over ideas and lifestyles. However, both groups highly value independence and personal freedom; neither wants anyone looking over their shoulder or telling them how to live their lives. After living in close proximity for 30-40 years, the boundaries between these communities are increasingly blurred; their kids attend school together, get married, and have kids of their own, intermingling their backgrounds and values. Some “new settlers” have taken up ranching, while some “old settlers” have adopted ideas or practices of the back-to-the-landers. In part due to their 20-plus year history of working together on salmon restoration efforts, residents of the Mattole Valley have made great strides in terms of coexisting and working together to solve issues of mutual interest.

Once thought of solely as an activity of the “new settlers,” the marijuana culture and underground economy of northwest California has crossed social and political boundaries as the economics of ranching and logging have changed, much as old settler and new settler cultures have intermixed. The marijuana economy is the current “boom” phase of a historic boom and bust cycle characteristic of the rural North Coast, and is as much an element of local cultural identity as the logging, ranching, and fishing industries. Whatever its actual contribution to the economy of the region, the marijuana culture and economy plays a significant role in relationships among the “communities of interest” that interact around the KRNCA. Although not the overriding factor in all relationships within these communities of interest, the marijuana culture and economy does exist as a major socio-economic factor in the region.

### Tourism Business Community

The major tourist communities in the vicinity of the King Range are Ferndale (30 miles north), Garberville/Redway 20 miles east along the U.S. 101 Corridor, and Shelter Cove, a subdivision along the southern coast of the KRNCA. These communities actively promote themselves as tourist destinations and host numerous festivals, concerts, and other events to attract visitors. Shelter Cove offers bed-and-breakfast lodging, restaurants, sport fishing operations, beaches, and campgrounds, and is the main commercial tourism services provider immediately adjacent to the KRNCA. Other communities around the perimeter of the KRNCA (e.g., Whitethorn, Briceland, Ettersburg, Honeydew, and Petrolia) lack large-scale tourism oriented services, although general stores and small lodging operations are partially dependent on area visitors.

The main route into Shelter Cove is on Highway 101 through Garberville, then west on Briceland-Thorn Road through Redway, Briceland, and Thorn Junction. While there is little formal data on the views of residents of these small communities toward tourists, it is clear that tensions exist among residents of the smaller communities, based on comments from public scoping and in writings on the area. The very qualities that make the Lost Coast attractive to residents also bring visitors to the area. The towering redwoods, pristine beaches, majestic mountain scenery, and slow-paced rural character are all very attractive attributes. On the positive side, local residents are able to enjoy world-class natural features and back-yard public land amenities such as hiking trails, campgrounds, and scenic drives that are

supported by state and federal funds and that many visitors must travel for hundreds or thousands of miles to experience. On the negative side, residents must endure traffic, loss of privacy, trespass, and other problems associated with visitor destination areas. There is a great deal of local concern and consensus about protecting the area's qualities from overdevelopment and overuse, and retaining the region's character and sense of place as "the Lost Coast." The specifics on what constitutes overdevelopment or overuse are harder to find agreement upon.



*Southern Humboldt County depends on tourism as a major component of the area economy.*

### Non-Tourist Business Community

There are also some widely scattered small retail businesses in the small communities surrounding the KRNCA, in and around such places as Whitethorn, Honeydew, and Petrolia. Each of these small settlements has a small general store which provides groceries and other supplies to local residents and visitors. The King Range area also hosts many small cottage industries and art studios, ranging from wineries to organic farms to candle makers to silk screening to potters. Some of these businesses are partly dependent on area tourists, but in general they market products outside of the immediate area.

## **2.3.5 Minority and Low-Income Populations**

### *2.3.5.1 Background and Applicable Regulatory Guidance*

"Environmental justice" refers to the fair and equitable treatment of individuals regardless of race ethnicity, or income level, in the development and implementation of environmental management policies and actions. In February 1994, President Clinton issued Executive Order (EO) 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations." The objective of this EO is to require each federal agency to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health

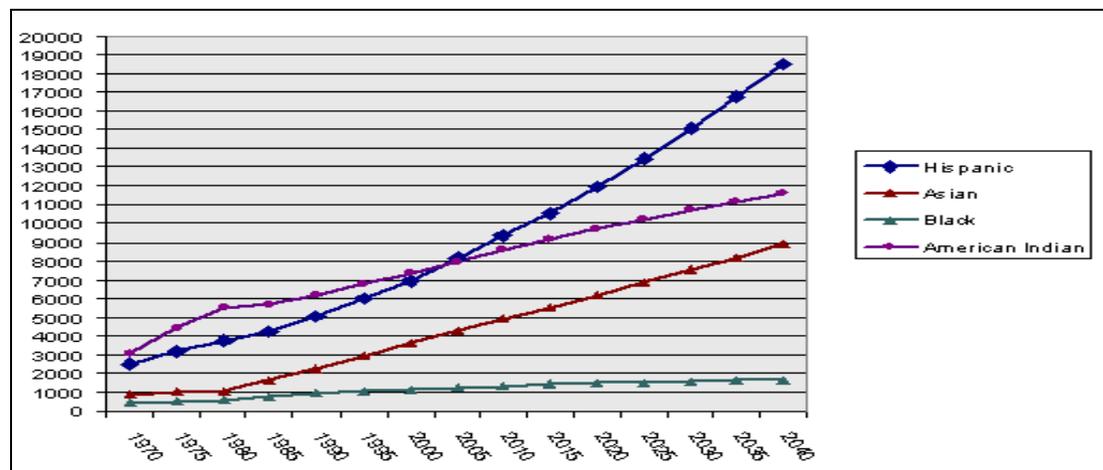
or environmental effects of its programs, policies, and activities on minority populations and low income populations (Council on Environmental Quality 1997).

The EO was accompanied by a memorandum which emphasized the importance of the National Environmental Policy Act (NEPA) as a means for implementing environmental justice principles. The memorandum directs federal agencies to analyze the environmental effects, including human health, social, and economic concerns, of their actions where such analysis is required by NEPA.

### 2.3.5.2 Regional Context

Data and projections from the CA Department of Finance show that minority populations in Humboldt County have been increasing since the KRNCA was established in 1970, and will continue to grow over the life of the plan (Figure 2-6). However, minority populations still make up only 15 percent of the county population compared to over 50 percent for the state as a whole. Humboldt County has been impacted greatly by the loss of jobs in the timber industry, and Census 2000 data for poverty levels show that low-income populations make up a larger proportion of the county population than the state as a whole (19.5 percent for Humboldt County vs. 14.2 percent for California).

FIGURE 2-6: HUMBOLDT COUNTY MINORITY POPULATION FROM 1970 PROJECTED TO 2040



Source: CA Department of Finance Table, Humboldt County Planning Division Web Site ([www.co.humboldt.ca.us/planning](http://www.co.humboldt.ca.us/planning))

### 2.3.5.3 Use of the KRNCA by Low Income and Minority Populations

Very limited data is available on the ethnicity of users of KRNCA resources and programs. A visitor use study completed in the summer of 1990 indicated that very few minority groups accessed the KRNCA for outdoor recreation use. At that time 96 percent of KRNCA recreation visitors were white, followed by 2.3 percent Asian and 0.5 percent Hispanic and 0.5 percent Native American. No detailed income data was collected as part of the study. A more recent survey (2003), focused on the Lost Coast Trail, showed a slight increase in minority population use of the area. This survey breakdown was as follows: 87.8 percent white, 4.3 percent Asian, 4.0 percent Native American, 3.2 percent Hispanic, 1.8 percent Hawaiian, and 1.1 percent black.

Among local minority populations, Southeast Asian immigrants are known to use KRNCA regularly for hunting and special forest products gathering (the 1990 and 2003 visitor surveys did not reflect these users since they tend to access the KRNCA primarily in the late fall months). These users come primarily from Eureka, but also from Central Valley communities such as Sacramento and Modesto. Over 90 percent of the commercial mushroom permittees in the KRNCA have Southeast Asian surnames.

Political autonomy and social self-reliance are central to the Hmong sense of ethnic identity, stemming in part from their recent history of persecution and forced migration. Based on this context, efforts made by BLM to incorporate Hmong input into land use planning may be met with reluctance or hesitation, in part due to residual mistrust of government. Nevertheless, this does not mean that Hmong residents do not want to be recognized as a unique social group.

On the contrary, Hmong refugees have a strong will to survive as a distinct people (Chai 1999:33). Collectivism is one of the most important values in traditional Hmong and Laotian communities (Chai 1999:40). Unfortunately, programs designed to help integrate Hmong refugees into mainstream American culture and provide access to social services were poorly developed. As a result, opportunities for education and employment for refugee families are limited and many of these families rely on public assistance. Furthermore, there is very little existing community framework in northwestern California for Hmong residents to become active in local decision-making, which has marginalized their needs.

In summary, the experience of the Laotian and Hmong cultures as refugees has resulted in their mistrust of government, which has led to limited communication of their needs and preferences for public land management. In the past, the BLM has had very little direct contact with the Hmong/Laotian communities other than the issuance of permits and intermittent field contact for permit compliance. An effort has been initiated through local community organizations to obtain input from these groups for the current planning process.

#### *2.3.5.4 Existing BLM Participation in Economic Assistance Programs*

The Northwest Economic Adjustment Initiative was designed in response to the Northwest Forest Plan to assist workers, businesses, tribes, and communities in Washington, Oregon, and northern California affected by reductions in timber harvests. The Jobs-in-the-Woods component of this initiative improves ecosystem health while at the same time providing economic assistance to local communities.

Since 1995, the Arcata Field Office has developed cooperative agreements with local non-profit organizations as part of the Jobs-in-the-Woods program. These include stewardship projects for watershed restoration activities, trail maintenance, and restoration planning. The Jobs-in-the-Woods program has been successful in providing employment in economically depressed regions and employment sectors of the county.

From 1994-2003 the BLM has provided 1.6 million dollars in funding, primarily through the Jobs-in-the-Woods program, to accomplish restoration, interpretive and other resource management projects in the KRNCA. Much of the watershed restoration work in the King Range has been completed through this program. However, no data is available to determine specific impacts to low income or minority populations.

### 2.3.6 Economic Context

This section describes existing economic conditions surrounding the KRNCA to provide a baseline for assessing the potential impacts of the RMP alternatives. For example, the BLM can affect local employment and income conditions not only by changing the way it manages natural resources or grazing allotments, but also by helping fund or create new vegetation management or restoration-related programs or projects. The construction of new recreation trails or facilities, road maintenance and other activities also can affect some of the socioeconomic conditions described in this section. The BLM can also influence local economic conditions indirectly by pursuing new management strategies that alter future visitation levels, thus affecting total future spending by recreationists and other visitors. Demographics and selected economic indicators of social well-being are also presented to help provide context and put local conditions in perspective relative to statewide conditions.

#### *2.3.6.1 Demographic and Economic Indicators of Social Well-Being*

##### Population

While Shelter Cove has had some notable population growth in recent years, population growth in other local communities has been low to moderate. However, regional and statewide populations are expected to continue to grow at a substantial rate, resulting in increasing demand for the diverse and unique attributes of the Lost Coast and King Range. The visitor base for KRNCA is primarily non-locals, with many visitors from the Sacramento Valley and San Francisco Bay Area; approximately 75 percent of Lost Coast Trail visitors travel more than 100 miles to visit the KRNCA (Martin and Widner 1998; BLM Trailhead Register Data). As a result, population estimates presented in this section include the local study area (Humboldt County), counties in the greater Sacramento region (Sacramento and San Joaquin Counties), and counties in the Bay-Delta region (Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties). Given the important influence future population growth has on KRNCA visitation and resources, BLM must carefully plan for the population projections summarized below.

Table 2-4 shows historic population growth in the region and the State (there are no incorporated cities in the local study area, and all local communities are included in data provided at the county level). The counties in the greater Sacramento and Bay-Delta regions are collectively referred to as urban northern California. Table 2-5 presents population projections through the year 2040.

In total, the current (2002) population in Humboldt County is approximately 127,700 people. Humboldt County has a high percentage of its population living in unincorporated areas, roughly 53 percent in 2000 (CDOF 2002a). An additional 8.8 million people live in urban northern California and 35 million people in the State as a whole.

Historically, population shifts in the North Coast have been closely tied to changes in the timber industry, but since 1970 or so this relationship has become more complex due to the diversifying economy of the region. From 1970 to 2002, population growth in Humboldt County (28 percent) lagged behind urban northern California (59 percent) and the State (75.4 percent). This pattern also holds in recent years; between 2000 and 2002, population growth in Humboldt County (0.9 percent) was approximately less than one-third of urban northern California (3.0 percent) and the State (3.4 percent). Although

population growth in Humboldt County has been relatively low, it is apparent the population base served by the KRNCA has grown considerably over the past three decades.

Table 2-4: Historic and Current Population Levels <sup>1</sup>

AREA	1970	1980	1990	2000	2002
Humboldt County	99,692 (—)	108,525 (8.9%)	119,118 (9.8%)	126,518 (6.2%)	127,676 (0.9%)
Urban Northern CA <sup>2</sup>	5,556,022 (—)	6,310,482 (13.6%)	7,541,994 (19.5%)	8,570,857 (13.6%)	8,829,076 (3.0%)
State of CA	19,971,069 (—)	23,668,562 (18.5%)	29,758,213 (25.7%)	33,871,648 (13.8%)	35,037,196 (3.4%)

<sup>1</sup> Percentage increases are in parentheses and represent total percentage change from previous period.

<sup>2</sup> Represents Alameda, Contra Costa, Marin, Napa, Sacramento, San Francisco, San Joaquin, San Mateo, Santa Clara, Solano, and Sonoma counties

Source: California Department of Finance 2002a, 2002b, 2003a, 2003b

Table 2-5: Population Projections <sup>1</sup>

AREA	2010	2020	2030	2040
Humboldt County	135,602 (6.2%)	141,092 (4.1%)	145,099 (2.8%)	146,933 (1.3%)
Urban Nor. CA <sup>2</sup>	9,887,674 (12.0%)	10,829,950 (9.5%)	11,872,584 (9.6%)	12,879,012 (8.5%)
State of CA	39,957,616 (14.0%)	45,448,627 (13.7%)	51,868,655 (14.1%)	58,731,006 (13.2%)

<sup>1</sup> Percentage increases are in parentheses and represent total percentage change from previous period. For the year 2010, it represents change from 2002.

<sup>2</sup> Represents Alameda, Contra Costa, Marin, Napa, Sacramento, San Francisco, San Joaquin, San Mateo, Santa Clara, Solano, and Sonoma counties.

Source: California Department of Finance 1998

Future population growth in Humboldt County is expected to remain moderate, with just over 20,000 new residents expected through 2040 relative to year 2000 conditions; this represents a population increase of 16 percent over the next forty years. During this same period, population growth in urban northern California and the State is projected to be 50 percent and 73 percent, respectively. These data suggests that the immediate region is not likely to experience significant population growth, but that the KRNCA will receive increased use pressure from population growth elsewhere in northern California.

In addition, the demographics of new migrants to the North Coast area have been changing over the past two decades. Historically the area had drawn mostly labor migrants in search of work, particularly in the booming timber industry, but since 1980 in-migration has included more retirees and “equity migrants,” people who sold homes in the skyrocketing real estate markets of the Bay Area, Los Angeles and San Diego during the 1980s and ‘90s and bought ocean-view homes along the North Coast at prices substantially lower than their previous homes’ values but still higher than most locals can afford. The local housing prices are still relatively low (the median home price in Humboldt County in 2001 was \$142,000, compared to a statewide median of \$240,000). However, area home prices have increased

dramatically in recent years, climbing 73% between 1999 and 2003; by July 2003 the median home price had risen to \$215,000, (CICG data, HSU Web Site).

### Unemployment

Unemployment levels within a particular area are commonly used as an indicator of the strength of a local economy and social well-being of its population. Table 2-6 presents the size of the labor force and average annual unemployment rates in the local study area, with the State of California included for comparative purposes.

Table 2-6: Unemployment Rates <sup>1</sup>

AREA	1990		2000		2001	
	LABOR FORCE <sup>2</sup>	UNEMPLOYMENT RATE	LABOR FORCE <sup>2</sup>	UNEMPLOYMENT RATE	LABOR FORCE <sup>2</sup>	UNEMPLOYMENT RATE
Humboldt County	56,500	7.9	60,100	6.3	59,100	6.1
State of CA	--	5.8	--	4.9	--	5.3

<sup>1</sup> March 2001 Benchmark

<sup>2</sup> Represents civilian labor force

Source: California Employment Development Department 2003

In 2001, Humboldt County had an average unemployment rate of 6.1 percent; which is higher than the statewide average (5.3 percent). Unemployment in the region has been steady in recent years, holding at just over 6 percent since 2000, which is considerably lower than historical (1980-1990) conditions, when unemployment sometimes reached as high as 13 percent (CIGC data).

### Per-Capita Personal Income

Another indicator of social well-being is per-capita personal income.<sup>13</sup> Table 2-7 shows per-capita personal income (i.e., total personal income divided by population) in the local study area and the State since 1970.

Table 2-7: Per-Capita Personal Income <sup>1</sup>

AREA	1970	1980	1990	2000
Humboldt County	\$17,930	\$20,720	\$21,632	\$23,237
State of CA	\$21,370	\$25,138	\$28,830	\$32,149

<sup>1</sup> Constant dollars (2000); adjusted using CPI inflation factor

Source: Bureau of Economic Analysis 2003

<sup>13</sup> Personal income is defined as the income that is received by persons from participating in production, from both government and business transfer payments, and from government interest (which is treated like a transfer payment); it is calculated as the sum of wage and salary disbursements, other labor income, proprietors' income with inventory valuation and capital consumption adjustments, rental income of persons with capital consumption adjustment, personal dividend and interest income, and transfer payments to persons, less personal contributions for social insurance (BEA 2003).

Per-capita personal income in Humboldt County has ranged from approximately \$18,000 in 1970 to just over \$23,000 in 2000. However, local income levels have historically been consistently lower than statewide levels. In 2000, per-capita personal income in Humboldt County was 38 percent lower than in the State. Growth in per-capita personal income between 1970 and 2000 in Humboldt County has been roughly 30 percent; this is less than the growth rate in the State (50 percent) over this same 30-year period.

### Poverty Rates

An area's poverty rate is an estimate of the percentage of the area's total population living at or below the poverty threshold established by the U.S. Census Bureau. Table 2-8 presents poverty rates in the local study area, with statewide figures included for comparative purposes.

Table 2-8: Poverty Rates <sup>1</sup>

AREA	1989	1999
Humboldt County	17.6%	19.5%
State of CA	12.5%	14.2%

<sup>1</sup> Represents percentage of all people in poverty relative to entire population.

Source: U.S. Department of Agriculture 2003

Poverty rates increased in the local study area and the State between 1989 and 1999. The poverty rate in Humboldt County in 1999 was 19.5 percent, up from 17.6 percent in 1989, and has been consistently higher than statewide rates over time.

### *2.3.6.2 Regional Economic Base*

There are two primary components of the local and regional economic base that are expected to be affected by the management alternatives under consideration—earnings/income and employment. This section presents an overview of the regional economy, including data on earnings/income and employment for Humboldt County.

### Total Personal Income and Earnings

As described above, per-capita personal income serves as an indicator of social well-being. Total personal income measures the total income generated throughout an entire area, and could be directly or indirectly affected by changes in the management of KRNCA. Table 2-9 shows absolute levels of total personal income in the local study area between 1980 and 2000. Table 2-10 presents earnings by place of work, which is a component of total personal income. The measure of earnings by place of work is more relevant than total personal income with respect to projecting impacts to an economy's input because it focuses on money earned by businesses (i.e., proprietor's income), wages/salaries of employees, and excludes exogenous inputs such as transfer payments.

Total personal income in Humboldt County in 2000 was nearly \$3 billion dollars, almost three times income levels in 1980. The rate of change in total personal income has been lower in Humboldt County (49 percent) compared to the State (67 percent) since 1990.

In Humboldt County, earnings by place of work totaled nearly \$1.9 billion dollars in 2000, which is approximately 64 percent of total personal income. Of this total, roughly 70 percent is attributed to wage and salary income and 21 percent to business earnings (proprietor's income). Earnings by place of work in Humboldt County have grown by 45 percent since 1990 and have more than doubled since 1980. Since 1990, proprietor's income has outpaced wage and salary income in Humboldt County, rising nearly 98 percent compared to 40 percent.

Table 2-9: Total Personal Income (in thousands of dollars)

AREA	1980	1990	2000
Humboldt County	\$1,080,093	\$1,966,112	\$2,936,028
State of CA	\$286,288,598	\$655,567,167	\$1,093,065,244

Source: Bureau of Economic Analysis, 2003

Table 2-10: Earnings by Place of Work (in thousands of dollars)

EMPLOYMENT TYPE	1980	1990	2000
Wage and Salary	\$546,083	\$950,161	\$1,325,550
Proprietor's Income	\$125,340	\$202,874	\$401,423
Other Labor	\$77,381	\$145,440	\$159,863
<b>Humboldt County (total)</b>	<b>\$748,804</b>	<b>\$1,298,475</b>	<b>\$1,886,836</b>
Wage and Salary	\$164,243,847	\$368,413,384	\$638,795,808
Proprietor's Income	\$26,921,343	\$62,148,804	\$120,226,020
Other Labor	\$22,711,417	\$52,363,733	\$66,202,354
<b>State of CA (total)</b>	<b>\$213,876,607</b>	<b>\$482,925,921</b>	<b>\$825,224,182</b>

Source: Bureau of Economic Analysis, 2003

## Employment

Local and regional employment levels could also be directly or indirectly affected by implementation of the updated RMP. Table 2-11 presents absolute levels of employment by industry between 1980 and 2000 for Humboldt County.

The Humboldt County economy supported approximately 69,500 part-time and full-time jobs in 2000. Total employment has increased steadily since 1980, with a 19 percent job growth rate between 1980 and 1990, and 13 percent between 1990 and 2000. In terms of employment by industry in Humboldt County, the leading sectors consist of Services (31 percent), Retail Trade (19 percent), and Government (17 percent). As seen in Table 2-11, this pattern has been fairly consistent since 1980. The prominence of the Services sector, as a percentage of total employment in the County, has grown over time, from 25 percent in 1980 to 31 percent in 2000.

Table 2-11: Employment by Industry in Humboldt County

INDUSTRY	1980	1990	2000
Humboldt County (total)	51,607	61,377	69,448
Farm (Agriculture)	1,262 (2.5%)	1,424 (2.3%)	1,636 (2.4%)
Ag. Services, Forestry and Fishing	1,746 (3.4%)	1,689 (2.8%)	2,178 (3.1%)
Mining	93 (0.2%)	89 (.15%)	N/A <sup>1</sup>
Construction	1,951 (3.8%)	3,544 (5.8%)	3,739 (5.4%)
Manufacturing	7,194 (13.9%)	7,086 (11.5%)	6,980 (10.1%)
Transportation and Public Utilities	2,793 (5.4%)	2,888 (4.7%)	2,495 (3.6%)
Wholesale Trade	1,966 (3.8%)	2,070 (3.4%)	N/A <sup>1</sup>
Retail Trade	9,099 (17.6%)	12,002 (19.6%)	12,997 (18.7%)
Finance, Insurance and Real Estate	3,056 (5.9%)	3,298 (5.4%)	4,571 (6.6%)
Services	12,814 (24.8%)	16,681 (27.2%)	21,173 (30.5%)
Government	9,633 (18.7%)	10,606 (17.3%)	11,817 (17.0%)

<sup>1</sup> Data unavailable to avoid disclosure of confidential information, but the estimates for this item are included in the totals.

Source: Bureau of Economic Analysis, 2003

### Shifts in Regional Economic Activity

For over 30 years, Humboldt County has been facing a decline in its resource-based economy, as non-traditional economic sectors become more dominant. Regionally, the economic base continues to shift from resource extraction industries, particularly timber harvesting and processing, to a mixed economy with tourism services representing a major component of the region's existing economy. This trend can be seen in Table 2-12, which presents earnings by industry for selected key industries in Humboldt County since 1980.

Table 2-12 illustrates the increasing importance of tourism and agriculture and the decreasing role of timber in the regional economy. Between 1980 and 2000, earnings in the lumber manufacturing sector have declined approximately 36 percent (in real terms) in Humboldt County; although the forestry sector expanded between 1980 and 1990 (data are not available for 2000). Despite its notable overall decline, logging still plays an important role in the Humboldt County economy outside the KRNCA. For example, lumber-based manufacturing generates roughly 75 percent of the County's total manufacturing income, and 27 percent of the timber produced in the State comes from Humboldt County (Humboldt County 2000). However, due to technological innovations and a reduction in the amount of local timber to be harvested (local mills now import some of the logs they process), timber production is now being done by fewer employees. As noted by one study, lumber-related jobs only accounted for 7.8 percent of employment in Humboldt County in 1997, in contrast to an estimated 50 percent in 1950 (Criley 2003).

During this same period (1980-2000), industry sectors supporting the agricultural and tourism economies have increased in Humboldt County. The agricultural sector declined between 1980 and 1990, but then experienced a significant increase, more than doubling from 1990 to 2000. This is most likely attributable to the close relationship between the agricultural industry and regional and state economies, which were

depressed in 1990, as well as to a relatively higher proportion of farm production expenses relative to gross farm income in 1990. Overall, the agricultural sector has increased by 50 percent in Humboldt County since 1980.

Table 2-12: Regional Trends in Earnings by Industry in Humboldt County  
(thousands of dollars) <sup>1,2</sup>

INDUSTRY	1980	1990	2000
<b>Agriculture</b>			
Farm Industries	\$33,706	\$12,047	\$33,200
Agricultural Services	\$6,646	\$13,535	\$27,461
Sub-total	\$40,352	\$25,582	\$60,661
<b>Forest Products</b>			
Forestry	\$3,916	\$5,126	NA <sup>3</sup>
Lumber and Wood Product Manufacturing	\$263,309	\$198,258	\$169,278
Sub-total	\$267,226	\$203,384	-- <sup>3</sup>
<b>Tourism Industry</b>			
Retail Trade	\$199,522	\$228,510	\$241,045
Hotels and other Lodging Places	\$13,268	\$13,231	\$15,533
Amusement and Recreation Services	\$6,775	\$7,614	\$12,601
Sub-total	\$219,565	\$249,354	\$269,179

<sup>1</sup> Constant dollars (2000); adjusted using CPI inflation factor

<sup>2</sup> Components of earnings include wage and salary disbursements, other labor income, and proprietor's income

<sup>3</sup> Data not available in BEA database to avoid disclosure of confidential information; unable to calculate sub-total

Source: Bureau of Economic Analysis, 2003

As part of the agricultural sector, ranching also has historically been an important component of the local area's economy and sense of identity, and this continues today, although agriculture has gone through transformations somewhat similar to the timber industry. Livestock ranching and related products represent 59 percent of the total cash receipts from agricultural sales (including livestock and crops), down from 86 percent in 1980. The dairy industry still represents a substantial portion of Humboldt County agriculture; while it only produces 1 percent of the state's milk, regional demand actually is larger than the four local processors can supply (Hight 2000). Wool production in the region dropped significantly in the 1960s and '70s and remains low, but beef production has actually increased by nearly half since 1980. Both beef and dairy have benefited from a strong "buy local produce" mentality in the North Coast (Criley 2003).

The importance of the tourism industry in Humboldt County has been increasing as the region's economic base has shifted away from resource extraction. The tourism industry consists of a range of retail and service firms, including lodging establishments, restaurants, retail stores, gasoline service stations, and other businesses that sell products and services to travelers, all of which could be affected by RMP alternatives. The tourism industry has experienced a steady increase in the local study area over the last two decades, characterized by an overall increase of 23 percent in Humboldt County between 1980 and 2000. Of the sectors included in the tourism industry, the amusement and recreation sector has

experienced the greatest relative growth over time. Tourism expenditures translate into jobs (and wages/salaries), state and local government sales tax revenues, and state income taxes. According to the California Division of Tourism, there were 1.5 million recreational trips to Humboldt County in 1997. The average expenditure per day (statewide) was \$63.60. Table 2-13 shows the contribution of tourism to the local and State economies.

Table 2-13: Statewide and Regional Trends in Tourism

AREA/CATEGORY	1992	1995	2000
<b>Humboldt County</b>			
Destination Spending (\$million)	214.1	230.0	284.7
Earnings (\$million)	63.2	68.1	82.8
Employment (jobs)	5,780	6,030	6,110
Local Tax Receipts (\$million)	3.4	3.9	4.7
State Tax Receipts (\$million)	9.7	10.5	13.1
<b>State of CA</b>			
Destination Spending (\$billion)	40.1	44.2	66.0
Earnings (\$billion)	16.0	17.5	24.9
Employment (thousands of jobs)	878	935	1,100
Local Tax Receipts (\$billion)	0.9	1.1	1.7
State Tax Receipts (\$billion)	2.0	2.2	3.1

Source: Dean Runyon Associates 2002

In 2000, travelers to the region contributed approximately \$284.7 million to the Humboldt County economy. These spending levels supported 6,110 jobs with total earnings of \$82.8 million in the County. Since 1992, travel spending in Humboldt County has grown at an average of 3.6 percent annually; this is lower than the statewide annual average of 6.4 percent between 1992 and 2000.

### 2.3.6.3 Components of Local Economic Base

Like the regional economy described in the sections above, the local economy in the immediate vicinity of the King Range has also undergone a major transition, from being heavily dependent on timber extraction to a more diverse economy with a greater dependence on tourism and the development of first and second (vacation) homes. The primary economic activities in the area currently are visitor-related services, ranching, new housing construction (especially in Shelter Cove and the gateway communities of Ferndale and Garberville), commercial and sport fishing out of Shelter Cove, and logging.

There is also an important but hard to measure “underground economy” of marijuana cultivation, particularly in southern Humboldt County, which brings money into the region not only through the sale of marijuana but also through purchase of local goods and services in support of the industry. In the early 1980s, the Redway/Garberville Chamber of Commerce estimated that the marijuana industry represented at least 25 percent of the area’s economy; some more recent estimates put this percentage as high as 75 percent (this estimate is based on anecdotal evidence, as more accurate or scientific estimates are not available; see also Raphael 1985).

In addition to tourism and real estate services and construction, ranching and logging still play important roles in the local economy; within the KRNCA, there are four grazing allotments leased to local ranchers. Logging has not occurred inside the KRNCA boundary since the 1980s but does occur on private property near the KRNCA. A magnesium mine in the local area closed in the early 1960s (see Section 2.2.2, Minerals).

#### 2.3.6.4 Local Economic Activity Affected by KRNCA Management

##### Recreation Management and Expenditures by Visitors

KRNCA visitation and related recreation activities generates positive income and employment effects in the local economy as visitors spend money on gasoline, lodging, and various supplies, including food and equipment. These expenditures support local employment and generate earnings for local proprietors and employees. Ultimately, these expenditures filter through the local and regional economies, generating indirect jobs and earning growth through what is often referred to as the “multiplier” effect.

Data on direct recreation expenditures is from the U.S. Fish and Wildlife Service’s 2001 *National Survey of Fishing, Hunting, and Wildlife-Associated Recreation*, which was used to estimate expenditures for consumptive recreation activities (i.e., fishing and hunting), and on the U.S. Forest Service’s 1998 *Draft General Technical Report, Developing Expenditure Profiles for Forest Service Recreation Visitors*, which was used for all other recreation activities.

Because the expenditures by non-locals are necessarily higher on a daily basis than expenditures made by locals, and because non-local expenditures bring new dollars into the local economy, and thereby serve to expand the local economy, separate estimates were prepared for both local and non-local visitors. Generally, locals are defined as residents who live within 50 miles of the KRNCA; all other recreationists are considered non-locals.<sup>14</sup> This treatment is consistent with methodology used by the U.S. Forest Service in developing its expenditure profiles, which serves as the basis for the recreation expenditure profiles used in this analysis and by the BLM in assessment of *Employment and Income in the Western U.S. Attributable to BLM Recreation* (2001). The breakdown of local versus non-local visitors at KRNCA is based on the *Final Management Report for 1997 Lost Coast Trail Backcountry Visitor Study*, a report to the BLM prepared by Humboldt State University (Martin and Widner 1998). Origin data from this report serve as a proxy for all recreation visitors, and indicates that 11 percent of visitors traveled less than 50 miles to reach the KRNCA. Therefore, 11 percent of total visitors are considered locals, while the remaining 89 percent are considered non-locals. The number of hours spent pursuing different recreation activities on these visits is translated into Visitor Days, which represent twelve hours of a given activity. This information serves as an effective proxy for estimating resident Visitor Days of 15,930 per year and non-resident Visitor Days of 128,886 per year.

Data on recreation visitation is derived from the BLM’s Recreation Management Information System (RMIS) and professional estimates for dispersed use (see Section 2.13 for more information). Total

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<sup>14</sup> This holds true for all recreation activities except for hunting and fishing. Expenditure data for hunting and fishing are based on a State resident versus non-resident basis as presented in the *U.S. Fish and Wildlife Service’s 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation*. It is not possible to determine the number of resident hunters and anglers that live within 50 miles from their destination.

recreation visits to KRNCA, including Special Recreation Permits, are estimated at 129,610 for fiscal year 2002. These total visits yield an estimated total of 144,816 Visitor Days per year.

It is also important to distinguish the types of recreation activities that visitors are participating in to evaluate the economic effects of recreation spending because different activities generate significantly different expenditures. Table 2-14 summarizes recreation use and average expenditure information by activity. Recreation expenditure profiles for locals and non-locals were developed based on existing data sources as described above.<sup>15</sup> All estimates are in 2000 dollars and do not include the non-market values addressed in Section 2.3.6.6 below.

Table 2-14: Economic Impact of Recreation Expenditures at KRNCA

RECREATION ACTIVITY	ANNUAL VISITOR DAYS (LOCAL / NON-LOCAL)	AVERAGE DIRECT EXPENDITURES PER DAY (LOCAL / NON-LOCAL) <sup>1</sup>	TOTAL DIRECT EXPENDITURES <sup>2</sup>
Backpacking	8,198 / 66,327	\$10.69 / \$54.45	\$3,699,125
Camping	4,433 / 35,864	\$22.87 / \$37.81	\$1,457,389
Driving for Pleasure	602 / 4,868	\$26.05 / \$71.37	\$363,117
Fishing (freshwater)	16 / 133	\$38.83 / \$67.16	\$9,549
Gathering Non-Commercial Forest Products	98 / 792	\$22.87 / \$50.65	\$42,348
Horseback Riding	771 / 6,237	\$10.69 / \$54.45	\$347,869
Hunting (Big game)	650 / 5,255	\$43.93 / \$131.31	\$718,607
Hiking/Walking	443 / 3,585	\$10.69 / \$54.45	\$199,925
Nature Study	55 / 444	\$22.87 / \$50.65	\$23,769
Picnicking	260 / 2,106	\$22.87 / \$37.81	\$85,596
Photography	53 / 428	\$22.87 / \$50.65	\$22,882
Swimming	122 / 990	\$22.87 / \$37.81	\$40,233
Viewing Interpretive Exhibits	48 / 387	\$22.87 / \$50.65	\$20,686
Viewing – Other	11 / 85	\$22.87 / \$50.65	\$4,562
Wildlife Viewing	171 / 1,384	\$22.87 / \$50.65	\$73,999
<b>TOTAL</b>	<b>15,930 / 128,886</b>	--	<b>\$7,109,656</b>

<sup>1</sup> Recreation expenditure profiles do not necessarily correspond directly to the specific types of recreation activities occurring at KRNCA. Average expenditures for each activity are based on the most applicable expenditure category.

<sup>2</sup> Total direct expenditures by recreationists result in direct and indirect income effects to local proprietors and residents.

Applying recreation expenditure estimates to the estimated number of days for each activity yields a total estimate of \$7,109,656 (2000 dollars) for expenditures associated with recreational activities in the

<sup>15</sup> The estimates of direct visitor expenditures are intentionally conservative. BLM visitor days are expressed as 12 hours of a given activity. However, the expenditure data from both the U.S. Forest Service and the U.S. Fish and Wildlife Service are expressed as activity days. Any part of a day spent in a given activity is counted as one activity day. For example, if someone hunted for 6 hours one day and 6 hours another day, it would represent 2 activity days for hunting. However, such use would only represent one 12-hour BLM visitor day. We are not aware of a reliable database to convert visitor days to activity days. As a result, the direct visitor expenditure amounts in this study should be regarded as conservative estimates and therefore actual expenditures may be higher.

planning area; \$265,534 for local visitors, and \$6,844,122 for non-local visitors. This averages about \$49.09 per person, per day.

As indicated above, the visitation data summarized in this section includes activities associated with special use permits. In fiscal year 2001, BLM issued Special Recreation Permits for 36 events serving a total of 1,086 participants. Of these, 14 were commercial permits, which included one local event for Mal Coombs Park, one for ongoing shuttle service, and 12 for Lost Coast backpack trips, totaling 620 participants. The remaining 22 were non-commercial permits, which included three permits for special events (i.e., memorial services and a wedding) and 19 for Lost Coast backpack trips for organized groups. Fees received by BLM for the Special Recreation Permits (commercial permits only) totaled approximately \$7,655. Individual permits for campground use cost \$5 or \$8 depending on the site. Fee receipts from campgrounds totaled \$12,062 in 2002.

Estimated recreation-associated expenditures by individual participants generated by the KRNCA in 2001 totaled \$7,109,656 or \$7.1 million. Direct and indirect economic effects of these expenditures are based on an analysis of recreation-based multipliers prepared by the U.S. Army Corps of Engineers for Lake Mendocino (1999), another North Coast recreation destination.<sup>16</sup> These multipliers estimate effects to the "region," which is defined as all counties within a 30 mile radius of the project. The recreation expenditure-related effects described in this section would primarily be based in Humboldt County, and to a lesser extent in Mendocino County. Other areas would benefit as well; for example, visitors might purchase gasoline or lunch in Marin or Sonoma County as they travel from the San Francisco Bay Area. In total, recreation expenditures are estimated to generate \$2.46 million in direct labor and proprietor income and created or sustained 143.7 jobs (2,000 hour full-time equivalent) as a direct effect. Non-local expenditures totaling \$6,844,122, which bring in new money and contribute to the expansion of the regional economy, generated \$2,371,488 of that total, in new income, and directly created 138.3 new jobs of the 143.7 jobs total. The total direct, indirect, and induced effect of these expenditures on the regional economy amounts to \$4.30 million in income and 197.8 jobs.

### Grazing Management

The KRNCA provides livestock grazing opportunities to local ranchers through the administration of cattle grazing leases on public land allotments. These leases generate local income and employment benefits to ranchers and their employees utilizing the KRNCA, and other economic benefits for local County governments, including sales and income tax revenue. In addition, cattle ranching leads to indirect economic effects related to ancillary expenditures made by local ranchers for services and products in the agricultural services industry that help support their ranching businesses. Changes in KRNCA grazing practices could therefore affect the local and regional economy.

Currently, the BLM administers grazing leases to a total of five operators for a total of 2,050 Animal Unit Months (AUMs)<sup>17</sup> annually (see Section 2.10 for additional information regarding KRNCA grazing). The

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<sup>16</sup> Direct and indirect income and employment effects are derived from the total recreation expenditures at the KRNCA. Direct income effects are lower than total recreation expenditures because they account for costs associated with providing recreation goods and services. Indirect and induced effects result from the multiplier effect of direct expenditures circulating through the economy.

<sup>17</sup> An AUM is the amount of forage needed by an "animal unit" (AU) grazing for one month, with the animal unit defined as one mature 1,000 pound cow and her calf.

economic value of grazing to potentially affected ranchers, their employees, and the local and regional economies is primarily related to the quantity of cattle supported through the cattle leases and the associated revenues earned and expenditures made to support that level of cattle production. Information on representative revenues and costs associated with cattle production in Humboldt County was collected to help define related and existing economic conditions related to potentially affected KRNCA cattle grazing. A Beef Production Cost Study for Humboldt County published by the local U.C. Cooperative Extension office (1981) was used for this RMP and EIS and the revenue and cost information from this Humboldt County study was adjusted to current (2000) dollars and compared to other, more recent, typical enterprise budgets for cattle ranching in other parts of California to confirm that the adjusted data was applicable to current conditions.

Using the source cited above, it is estimated that in Humboldt County, gross revenues and expenses (cash costs) associated with a typical 200-cow cattle ranching operation are approximately \$486.71 and \$406.67 per cow (2000 dollars), respectively; therefore, net revenues (or income earned by the rancher) are estimated to be roughly \$80.04 per cow. (Note: these figures exclude family labor and non-cash costs from expenses). The net revenues represent income earned by the rancher and costs represent money input to the local economy, mainly in the agricultural services sector (e.g., feed; veterinary costs and medication; gasoline, oil, and equipment repairs; maintenance; insurance, part-time, non-family labor; dog expense, horse expense, replacement bulls; and other miscellaneous overhead and operating expenses).

Currently, grazing allotments at the KRNCA can support up to a total of approximately a 256-340 cow-calf herd (based on 2,050 AUMs for all potentially affected ranches combined for a season of use between six and eight months). However, on average, grazing levels at KRNCA are lower than capacity, averaging about 220 cows (1,540 AUMs), and in 2002, roughly 1,500 AUMs were grazed supporting roughly 214 cows. Based on this range (214-340 cows) and typical revenues and costs, it is estimated that grazing at KRNCA generates a total of approximately \$104,004 - \$165,240 in annual gross revenues. Expenditures for ancillary services that serve as inputs into the local economy range from \$86,884 - \$138,040; these expenditures also result in sales tax revenues that are realized by state and local county governments. Net income earned by local ranchers ranges between \$17,120 and \$27,200 annually. It is not known how many jobs are supported by grazing at KRNCA. However, grazing would generate some level of direct employment effects (i.e., jobs to ranchers) and secondary job effects as money is circulated through the local and regional economies. The direct and indirect income that is earned also results in income tax revenues for federal, state, and local governments.

### Funding Local Conservation Programs

BLM has been actively supporting local conservation programs through direct funding of projects and programs. This funding is a direct input to the local economy. As these funds are spent to implement specific projects, direct and indirect income, employment, and fiscal (tax revenue) benefits are generated.

Historically, the BLM has provided funding to a wide range of non-profit organizations to perform work in the KRNCA, mostly for watershed restoration projects (e.g., road removal/revegetation and other sediment reduction efforts). However, other projects included historic structure restoration, trail and fuel break construction, and other types of vegetation management. Organizations that received funding included several local watershed/fishery restoration groups, volunteer fire departments, county government, a historic preservation society, and an interpretive association. In total, the BLM provided

roughly \$1,620,000 for completion of public land projects to organizations in the communities immediately surrounding the King Range from 1994-2003. This translates into an annual average of about \$162,000.

### Specialty Forest Product Management

Some of the resources found within the KRNCA represent specialty forest products that are mostly harvested by local residents. These resources include mushrooms, beargrass, and firewood. The harvesting and subsequent re-sale of these products generates income and could be affected by changes in KRNCA management.

The economic impact of mushroom, beargrass, and firewood harvesting is relatively minor and estimates of the income generated by such harvesting are not available. Much of the harvesting is used for personal use, and while some commercial harvesting takes place, it is highly variable and hard to measure because most of the transactions are cash deals from family-owned operations. However, some permit data is available. In terms of commercial mushroom harvesting, the BLM issues a maximum of thirty permits at one time with no harvest limits. The harvesting season lasts four to six weeks. Beargrass is harvested in the KRNCA for the floral industry. The BLM typically issues ten to twelve permits per year for beargrass harvesting. Lastly, downed timber is sometimes harvested for firewood by local residents and the BLM periodically issues permits for collecting firewood after storm events.

### Road and Facility Maintenance and BLM Employment

BLM contracts with local construction companies for road grading activities and janitorial service providers for facility maintenance and clean-up. Such contracting supports jobs and generates income for local service providers. Currently, the BLM is involved in maintenance contracts with local contractors totaling about \$40,000 to \$45,000 per year for janitorial services at the BLM office, campgrounds, and recreation sites as well as for road grading activities.

The BLM employs nine people (not including seasonal employees) at the KRNCA in the Whitethorn office, which includes two permanent fire staff. The local payroll totals approximately \$427,000 per year; including benefits, payroll expenditures total \$521,000 per year.

#### *2.3.6.5 Fiscal Resources and Public Services*

Fiscal resources (tax revenue received by government agencies) and related public services could be affected by the RMP. The sections below focus on the major types of fiscal resources and public services that could be affected by the RMP: sales and lodging tax revenues generated by KRNCA visitors, emergency services, and law enforcement. Property values and potential property tax considerations are addressed below. Existing road maintenance activities by local counties and the related MOUs between the counties and BLM are not expected to change as a result of the RMP.

### Sales and Lodging Taxes

The major fiscal resources most affected by KRNCA management are visitor sales and lodging tax revenues received by Humboldt County. The RMP will not include major changes in land tenure;

therefore, changes in local government property tax revenues are expected to be minor, and changes in payments-in-lieu of taxes (PILT) (which are currently estimated to be roughly \$500,000 per year) will also be modest.

Existing sales and lodging taxes (i.e., transient occupancy taxes or TOT revenues) could be affected by the RMP, thereby impacting Humboldt County revenues, if the RMP leads to changes in KRNCA visitation levels. In total, over \$13 million in sales revenues were distributed to cities and/or county governments in Humboldt County during the fiscal year 2000-01. Sales tax revenues at the county level grew by 65 percent in Humboldt County between 1990-91 and 2000-01 (State Board of Equalization 1992, 2002).

TOT revenues from sales and lodging taxes have grown considerably in the study area since 1992. In total, nearly \$3 million in TOT revenues were generated in Humboldt County in 2000 (Dean Runyon Associates 2002). TOT revenues have increased in Humboldt County at an average annual rate of 4.6 percent between 1992 and 2000. Local trends in TOT revenues are lower than statewide trends where growth averaged 8.8 percent annually since 1992.

#### Emergency Services and Law Enforcement

Emergency services and crime control/law enforcement could be affected by the RMP. Emergency services, including search and rescue of hikers and others who need assistance, is provided by the Humboldt and Mendocino County Sheriff Departments, BLM, and for offshore assistance, the U.S. Coast Guard. The Honeydew, Shelter Cove, and Petrolia Volunteer Fire Departments also assist and are often the first people on the scene during search and rescue operations. Existing search and rescue operations typically average five to ten incidents per year under existing conditions and baseline recreation/visitation use. The year 2000 was a notable and tragic year, with four KRNCA visitors dying during two incidents. BLM law enforcement staff, the two county sheriff departments, and Coast Guard also routinely enforce a variety of laws and regulations that are often violated by visitors, including boating safety rules, traffic laws, camping regulations, thefts and vandalism, etc.

The local volunteer fire departments listed above, BLM staff, and the California Division of Forestry and Fire Protection are the primary agencies involved with fire-fighting. The relatively abundant vegetation found in the study area combined with extreme weather conditions, including notable wind and heat during the summer and fall, lead to hazardous fire conditions. (See Section 2.11, Fire Management, for detail on frequency of fire in the King Range.) BLM coordinates its fuel/vegetation management and fire-fighting activities with the local volunteer fire departments, and its cooperative agreements with the local departments total approximately \$4,000 to \$5,000 per year.

#### *2.3.6.6 Other Economic Values (including Non-Market Values)*

In addition to the existing economic conditions described in previous sections, it is important to also consider the non-market values of the study area's attributes that may be affected by the RMP's alternatives, including its natural and cultural resources. Unlike gasoline or employee wages, these values either do not have a market or, in the case of property values, do have a market but are difficult to quantify. Nevertheless, such values are important to consider because they help tell the entire economic "story." Despite the difficulties associated with measurement of these values, it is well-accepted that the

natural and cultural resources of an area, and the open space the area may provide, can have a dollar value. For example, it is common for real estate investors to pay more for view lots or property adjacent to open space, or for people to make financial donations to help protect old-growth forests, endangered species, or other sensitive resources.

Non-market values consist of “use values” and “non-use values.” Use values are the dollar values of those benefits derived from the direct utilization of the resource area (e.g., hiking, hunting, general nature appreciation, etc.). Economists measure the non-market component of use values by estimating the consumer surplus associated with these activities, which is defined as the maximum dollar amount above the actual market price that a consumer would be willing to pay to enjoy a good or service. The market component of use values is relatively easy to measure, via expenditures by recreationists; however, not all goods and services provided by KRNCA have market values. Non-use values refer to the benefits derived from the mere presence of the KRNCA as open space, or from the protection of related resources. Such values typically have two components: option values and existence values. Option value represents the benefits from having these properties available for future use, while existence value reflects the willingness-to-pay to know these resources simply exist. One methodology used to place a dollar value on non-use values is contingent valuation, a technique that involves the use of surveys to help determine people’s willingness to pay for something.

Open spaces also generate other types of value, including market values (the sales value of open space that is available for sale); enhancement values (positive influence on property values); production values (value of commodities produced by open space); the value of open space as a natural system (benefits of a natural ecosystem realized directly and indirectly by society); and more intangible values (e.g., scientific, aesthetic, genetic diversity, historical, cultural, and religious values).

The enhancement value of open space on property values has been well researched and documented. Numerous studies have demonstrated that homes and properties located close to open space are more valuable relative to properties located further away, holding all else constant. This relationship varies based on the various characteristics (type, size, location, etc.) of open space resources, including the quality of views provided by the open space near a property. Open space can indirectly affect property tax revenues realized by local jurisdictions through the effect open spaces have on property value assessments.

To help the reader understand the potential value of some of the KRNCA’s natural and cultural resources, and example of a range of typical non-market values for recreation activities is summarized in Table 2-15 from a recently published U.S. Forest Service report titled *Benefit Transfer of Outdoor Recreation Use Values* (Rosenberger and Loomis 2001). The Forest Service study used a “benefits transfer” methodology, which is defined as the application of existing information and knowledge on benefit values to new contexts. Table 2-15 provides summary statistics related to consumer surplus for 21 recreation activities derived from various economic studies and as compiled in the Forest Service report.

By applying the range of values in Table 2-15, an estimate of the recreation-related consumer surplus (using fiscal year 2002 recreation data) can be derived for the KRNCA; this is estimated to be \$3,723,785 per year (2000 dollars). While this may seem high, it represents a weighted average value of only \$25.71 per Visitor Day for all types of recreation, including hunting and fishing. This represents the total amount recreationists would likely be willing to pay for the related recreation activities if a fee for

participation were required. Those who are accustomed to free access and use of the public land tend to forget that it represents a recreation opportunity and experience that many would be willing to pay for. Participants in KRNCA-related organized recreation events that obtain commercial Special Recreation Permits have paid a fee for that activity, so the fees obtained from these permits (\$7,655) are excluded from this estimate.

Table 2-15: Summary Statistics on Average Consumer Surplus Values  
(per activity day per person from recreation demand studies – 1967 to 1998)<sup>1</sup>

ACTIVITY	NUMBER OF STUDIES	NUMBER OF ESTIMATES	MEAN OF ESTIMATES	MEDIAN OF ESTIMATES	STD. ERROR OF MEAN	RANGE OF ESTIMATES
Camping	22	40	\$30.36	\$24.09	5.50	\$1.69-187.11
Picnicking	7	12	\$35.26	\$24.21	9.66	\$7.45-118.95
Swimming	9	12	\$21.08	\$18.19	4.46	\$1.83-49.08
Sightseeing	9	20	\$35.88	\$21.13	9.41	\$0.54-174.81
Off-road driving	3	4	\$17.43	\$15.85	6.27	\$4.37-33.64
Motorized boating	9	14	\$34.75	\$18.15	11.65	\$4.40-169.68
Non-motorized boating	13	19	\$61.57	\$36.42	13.76	\$15.04-263.68
Hiking	17	29	\$36.63	\$23.21	7.87	\$1.56-218.37
Biking	3	5	\$45.15	\$54.90	8.40	\$17.61-62.88
Big game hunting	35	177	\$43.17	\$37.30	2.21	\$4.74-209.08
Small game hunting	11	19	\$35.70	\$27.71	9.56	\$3.47-190.17
Fishing <sup>2</sup>	39	122	\$35.89	\$20.19	3.42	\$1.73-210.94
Wildlife viewing	16	157	\$30.67	\$28.26	1.38	\$2.36-161.59
Horseback riding	1	1	\$15.10	\$15.10	0	\$15.10-15.10
Rock climbing	2	4	\$52.96	\$48.14	11.80	\$29.82-85.74
General recreation	12	31	\$24.26	\$10.03	7.48	\$1.18-214.59
Other recreation	11	16	\$40.58	\$33.78	9.64	\$4.76-172.34

<sup>1</sup> Constant dollars (fourth quarter, 1996)

<sup>2</sup> Fishing includes all types of fishing such as cold water, warm water, and salt-water fishing. The number of estimates for fishing is under-representative of the entire body of knowledge since fishing studies were not a primary focus of the literature review.

Source: Rosenberger and Loomis 2001.

## 2.4 CULTURAL AND HISTORIC RESOURCES

### 2.4.1 Introduction

The KRNCA is rich in the remains of prehistoric occupation and numerous historic activities. The topography, coastal setting, presence of numerous perennial and seasonal water sources, wide range of floral and faunal species and other natural resources made this region a prime location for human habitation and economic pursuits over thousands of years. Cultural resources in the KRNCA range from early Native American village sites and activity areas to the remains of historic structures associated with tanbark, shipping, ranching, and recreational industries. Many sites have been documented within the

KRNCA in varying states of preservation and are subject to a number of natural and human-induced impacts. Efforts to eliminate or at least minimize some of these impacts have been implemented in recent years. While some of these efforts have been highly successful, some have not and numerous resources remain subject to the cumulative effects of weather, erosion, and vandalism.

Archaeological investigations have occurred in the KRNCA over the course of the last 70 years, though not in any systematic manner until relatively recently. Archaeological surveys of the King Range have been conducted primarily by Sonoma State University, U.C. Davis, and the BLM since the 1970s. These documented a number of cultural resources on the beach, at the mouths of major tributaries, and on some interior ridges and drainages (Levulett 1979, 1981, 1985; Levulett and Hildebrandt 1987; McGeachy and Bell 1979; Praetzellis 1995; Roscoe 1983; Rumph 1982; Tuttle 1982). As a result of these research efforts, over 100 prehistoric and historic sites have been documented. Of these, 17 (all located along the coastal strand) have been subjected to subsurface testing or excavation. The accumulated data were used to develop the King Range Cultural Resource Management Plan in 1988, which included site-specific recommendations for protection, stabilization, data recovery, and monitoring.



*The Punta Gorda Lighthouse is on the National Register of Historic Places.*

Active management of cultural resources began in 1974 when the King Range Management Program was approved by the Secretary of the Interior, the United States Congress, and the Governor of California and was endorsed by Humboldt and Mendocino Counties. At that time, the BLM contracted with Dr. David Fredrickson and Sonoma State University to conduct a comprehensive archaeological survey of the King Range coastal strand. Prior to 1974, very few sites had been recorded. In the early 1950s, Robert Greengo surveyed the coastal strand from Cape Mendocino in the north to about a mile south of the mouth of the Mattole River. Greengo recorded four sites in that locale and conducted test excavations at one of the sites (Greengo 1950: Letter report and site records on file: BLM Arcata Field Office). In 1954, Bennyhoff, Elsasser, and Davis recorded sites and did test excavations at Shelter Cove for a local landowner who had contacted U.C. Berkeley because of burials eroding out of the beach terrace (Macchi and Kroeber 1954: Correspondence plus letter report and site records from Elsasser, Davis, and Bennyhoff on file: BLM Arcata Field Office). This site, CA-Hum-182, became the focal point for future excavations by field schools in the 1980s due

to ongoing erosion and development projects. Valerie Levulett conducted surveys of the higher terraces and upper reaches of the King Range including ridges and inland areas, as well as revisiting all the coastal sites recorded by Fredrickson et al. (Levulett 1979, 1981, 1985).

Historic resources within the KRNCA have more recently begun receiving attention. Rodney Mayer of the Ukiah BLM nominated the Punta Gorda lighthouse to the National Register of Historic Places (NRHP) in 1975; it was subsequently listed in 1976. In the early 1990s, the BLM implemented a cooperative project with Sonoma State University under the direction of Dr. Adrian Praetzellis, historic archaeologist, to record and evaluate all historic structures and ruins in the KRNCA. Architectural drawings and comprehensive records were produced for all structures, along with pertinent archival research. In addition, local ranchers were interviewed and oral histories were recorded as part of this project.

#### 2.4.2 Applicable Regulatory Framework

As a property owned and managed by the BLM, the KRNCA is subject to the provisions of Section 106 of the National Historic Preservation Act (NHPA) of 1966. Section 106 work is streamlined and modified under The California Protocol of 1998 between the BLM and the State Historic Preservation Officer (SHPO). This Programmatic Agreement (PA) has been reviewed annually and is used in conjunction with the BLM Manual Sections 8100-8160 after replacing the PA from 1991. Section 106 requires federal agencies to take into consideration the potential effects of proposed undertakings on cultural resources listed on or determined potentially eligible for inclusion on the NRHP, and to allow the Advisory Council on Historic Preservation the opportunity to comment on the proposed undertaking. The regulations implementing Section 106 are promulgated by the Secretary of the Interior, as codified in Title 36 Code of Federal Regulations (CFR) Part 800. Formal consultation is normally conducted between the SHPO and the BLM State Director or Deputy Preservation Officer.

Identification, evaluation, and management of cultural resources are ongoing processes. The evaluation of resources against the criteria for inclusion on the NRHP, including an assessment of site integrity or condition, the consideration of potential project-related impacts, and the development of management plans and actions relative to those impacts are additional elements of the Section 106 process.

Determining the NRHP eligibility of a site or district is guided by the specific legal context of the site's significance as set out in 36 CFR Part 60.4, and by the BLM Manual 8100 Series. The NHPA authorizes the Secretary of the Interior to maintain and expand a National Register of districts, sites, buildings, structures and objects of significance in American history, architecture, archaeology, engineering, and culture. A property may be listed on the NRHP if it meets criteria for evaluation as defined in 36 CFR 60.4:

“The quality of significance in American history, architecture, archaeology, engineering and culture is present in districts, sites, buildings, structures and objects that possess integrity of location, design, setting, materials, workmanship, feeling and association and:

- € That are associated with events that have made a significant contribution to the broad patterns of our history; or
- € That are associated with the lives of persons significant in our past; or
- € That embody the distinctive characteristics of a type, period or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

€ That have yielded, or may be likely to yield, information important in prehistory or history.”

Most prehistoric archaeological sites are evaluated with regard to Criterion D of the NRHP, which refers to site data potential. Such sites typically lack historical documentation that might otherwise adequately describe their important characteristics. Archaeological methods and techniques are applied to gain an understanding of the types of information that may be recovered from these deposits. Data sought are those recognized to be applicable to scientific research questions or to other cultural values. For example, shellfish remains from an archaeological deposit can provide information about the nature of prehistoric peoples’ diets, foraging range, exploited environments, environmental conditions and seasons during which various shellfish species were taken. These are data of importance to scientific research that can lead to the reconstruction of prehistoric life-ways. Conversely, some archaeological sites are of traditional or spiritual significance to contemporary Native Americans or other groups, particularly those sites which are known to contain human burials.

Site integrity is also a consideration for the NRHP eligibility of an archaeological locale. The aspects of resources for which integrity is generally assessed include location, setting, design, workmanship, feeling, and association. These may be compromised to some extent by cultural and post-depositional factors (e.g., construction, maintenance, erosion, bioturbation, grazing, recreational use, etc.), yet the resource may still retain its integrity if the important information residing in the site survives. Conversely, archaeological materials such as shell or faunal remains may not be present in sufficient quantity or may not have adequate preservation for accurate identification. Thus, their potential as data to address important research questions is significantly reduced. Assessment of these qualities is particularly important for archaeological properties where the spatial relationships of artifacts and features are necessary to determine the patterns of past human behavior.

### 2.4.3 Existing Conditions

#### 2.4.3.1 Documented Prehistoric Sites

At least 90 prehistoric sites have been identified within the KRNCA, the majority of which having been documented on or within a short distance from the coast. The favorable topography, numerous perennial stream courses, and diversity of floral and faunal resources, made these coastal areas highly attractive for prehistoric occupation. Consequently, numerous sites have been found in these areas. However, it is important to note that the concentration of sites along the coast may not necessarily reflect the entire range of prehistoric patterns of land use within the King Range and surrounding region. While beaches and near-beach areas were clearly important locations for early Native American populations, the density of recorded sites along the coast may also reflect the relative ease with which such sites can be discovered and recorded by researchers.

The 1988 King Range Cultural Resource Management Plan included a comprehensive list of sites (prehistoric and historic) located within the KRNCA. It also included a rating system intended to prioritize coastal sites in terms of their data potential, integrity and the level of risk to site integrity. The classification system identifies the following five priority levels:

1. Sites which are subject to severe or ongoing impacts, which have not been tested in the past, and which appear to contain numerous or unique data (or whose data potential is unknown); all require annual monitoring.
2. Sites subject to impact, but at a slower rate than those described above, which have not been tested, and which appear to contain numerous or unique data (or whose data potential is unknown); all require monitoring every 3 years.
3. Sites which have been tested and shown to contain diagnostic, unique, or otherwise valuable data, or where the sampling was incomplete; all require monitoring every 3 years.
4. Sites which have been tested and found to contain data redundant with those of other sites in the research area, but where enough deposit remains to allow additional data collection (e.g., for testing of specific research questions or methods); all require monitoring every 5 years.
5. Sites located on private land; such lands should be acquired as part of the King Range Acquisition program; failing this, BLM should seek preservation easements for these sites; in the meantime, sites should be monitored regularly, with owners' permission.

The individual site priority level also bears on potential eligibility for the NRHP. Levels of Site Prioritization and Categorization are also set forth in the BLM Manual (8110.4) and the Use Categories are as follows:

- € Scientific Use
- € Conservation for Future Use
- € Traditional Use
- € Public Use
- € Experimental Use
- € Discharged from Management

#### *2.4.3.2 Historic Sites*

In general, prehistoric cultural resources in the KRNCA have received a fair amount of attention from researchers over the past 50 years. Equally important, but less investigated, are the numerous historic remains within the KRNCA that are associated with various occupations and industries. Mining, ranching, tanbark, farming, logging, transportation, recreation, and shipping have all played important roles in the historical development of the King Range area.

Shelter Cove, in particular, was an important Humboldt County shipping port and statistics from 1881 reflect not only the prominence of this port but also the importance of sheep ranching in the King Range area. In that year it was reported that 220,000 pounds of wool were exported from Shelter Cove (probably from the Shelter Cove Wharf and Warehouse Company). Tanbark, cut from tanoaks found throughout the NCA and utilized in leather tanning was also shipped from Shelter Cove (2,000 cords in 1905). The tanbark industry died out in the early years of the 20th century as the cheaper and quicker chrome tanning method (first patented in 1884 by an American, Augustus Schultz) was fully adopted by the leather industry (see: [www.all-about-leather.co.uk](http://www.all-about-leather.co.uk)). Other major shipping points for tanbark were

also located in Bear Harbor and near Mattole Beach where a wharf extended into the ocean at Sea Lion Rock. Due to rough seasonal weather, this facility could not be employed during the winter months.



*Few traces remain of the railroad tracks and wharf at the Mattole River mouth.*

Few traces of the King Range's tanbark industry remain today except for some of the transportation routes, local place names and minor elements of the shipping facilities and wharves at Shelter Cove and near Mattole Beach. However, another of the major local industries, ranching, has left very tangible evidence on the landscape. The Chambers Ranch, situated near Mattole Beach, consists of a cabin and associated stock pens, barns, and other structures and is likely eligible for listing on the NRHP. Other ranching and farming-related structures and buildings occur in many areas within the King Range and many have been formally documented by the BLM.

Early recreational use of the King Range resulted in the construction of several hunting cabins and at least one complex of cabins and more substantial structures located on King Peak Road (which used to be called Horse Mountain Road), on Horse Mountain Ridge. Based on construction techniques and materials still visible in the building remains and associated artifacts, these facilities appear to have been constructed sometime before the 1920s or 1930s although they were still in use at least until the 1960s and 1970s.

Another group of structural remains, including a substantial cut stone foundation, are located along King Peak Road. Artifacts found in the area indicate an occupation as early as the late 19th century for this site with continued use of the property well into the 1950s or later. While General Land Office (GLO) plats do list the local homesteaders and their occupations, little information regarding this particular site has been found. However, it may have also served other purposes related to any of the industries and economic pursuits common to the King Range area during the latter half of the 19th and early 20th centuries.

#### **2.4.4 Management Issues and Considerations**

There are four predominant forces affecting prehistoric and historic cultural resources situated within the KRNCA: natural erosion, recreational use, livestock trampling/wallowing, and rodent burrowing. The natural forces of weathering and erosion are impacting many of the coastal Native American sites in

particular, as well as a number of historic sites such as the Punta Gorda lighthouse. Prehistoric occupation and burial sites are constantly being impacted by wave action and stream erosion, particularly during the winter months when heavy seas batter the coastline. The historic Chambers Ranch, including the cabin and associated ranch buildings, is also subject to climatic stresses although it remains in generally good condition.

Illegal activities have also caused damage to area cultural resources. Notable impacts include vehicles driving through sites (including those clearly marked), vandalism of the Chambers Ranch, destruction of an early recreational cabin on Horse Mountain Ridge, and the intentional destruction of fences protecting prehistoric sites near Mattole Beach. However, in general, vandalism appears to be the lesser of the management issues within the KRNCA and the impacts of natural erosion and weathering are more pressing concerns.

Sheep and cattle have been pastured on the coast area since the mid-19th century. Approximately 290 head of cattle are pastured in the KRNCA in any given year. These cattle tend to create extensive wallows, which can impact documented and unrecorded prehistoric sites in particular. Fences were constructed around some sites by the BLM to keep the cattle out of sensitive areas. However, cattle also congregate in and adjacent to the creeks in the KRNCA, which is where the many village sites were located. Wallowing and trampling can break surface artifacts, disturb the sandy soil, and shift the horizontal and vertical distribution of archaeological materials, severely impacting the integrity of cultural resources.

The BLM has implemented a number of measures in recent years to mitigate the effects of visitation, erosion, grazing, and bioturbation. Closure of the beach to OHV use has resulted in greater protection for prehistoric sites located in the sand dunes immediately adjacent to the beaches. The placement of interpretive signs and fencing has raised public awareness of the importance of such sites.

While fencing and site excavation may be the most expedient methods by which to preserve cultural resources and retrieve important scientific data, certain restrictions on these methods exist. Since the King Range CRMP was written, using fencing as a means to protect sites or restrict visitor access to certain areas has been discouraged by the BLM as it can degrade the visual and wilderness aspects of the KRNCA. Options such as plantings of various types of vegetation may have to be examined.

Concerning data collection on threatened sites, with the introduction of fairly recent regulations (NAGPRA, AIRFA, EO13007, etc.), any disturbance of sites in the KRNCA which may contain burials is avoided as preferred by the federally recognized Tribal entity; the Bear River Band of Rohnerville Rancheria. In the past, the Bear River Band has participated in all test excavations conducted to date. The BLM has a Tribal Resolution and a Plan of Action in place with the Tribal government. Consequently, data collection may only be conducted on sites in imminent danger of outright destruction.

#### *2.4.4.1 Traditional Native American Uses*

Apart from the prehistoric and historic archaeological resources located within the KRNCA, a natural resource, bear grass, is an important plant species to many of the Native American groups currently inhabiting the region. Bear grass is a choice material for basket weaving, a traditional art form among Indian groups who have long-standing ethnographic ties to the region. It has been suggested that access

to certain areas of the KRNCA containing dense patches of bear grass be restricted only to qualified Native American groups. Such privileged restrictions, however, are not permitted by law for any group, including traditional Native American basket weavers.

Alternative means by which to preserve bear grass for Native American weavers will be considered in the plan. In addition, various bear grass habitat enhancement procedures may be effective, including controlled burns and the clearing of brush that opens an understory in which bear grass thrives. By expanding bear grass habitat in the KRNCA, the opportunities for gathering by the Native American community and other groups for traditional or economic pursuits would increase, reducing harvesting pressures on the limited existing distribution of the plant.

## 2.5 LANDS AND REALTY

### 2.5.1 Legislative History and the Land Acquisition Program

In 1929, the unreserved public domain lands in the King Range area were withdrawn from settlement or disposition by Executive Order 5237, pending classification. This was done at the request of the California State Division of Beaches and Parks due to the area's recreation potential (Congressional Record 1961, at 10182). However, no action was taken to classify the lands; they were closed to settlement or transfer, but not actively managed by the BLM for several decades. However, in the 1950s the area came to the attention of Congressman Clem Miller, who first introduced a bill to establish the KRNCA in 1961. His vision for the area was tied to comments made to Congress by President John F. Kennedy that same year, directing that public lands should be devoted to productive uses and maintained for future generations. Miller believed that outdoor recreation, at the time rising rapidly in popularity, could be balanced on equal footing with traditional extractive uses of public lands, and that efficient management of the King Range would require consolidation of the area's "crazy quilt" land ownership pattern (Congressional Record 1961, at 10181).<sup>18</sup> His bill enjoyed a surprising consensus of support, including such diverse interests as the Humboldt County Board of Supervisors, the Humboldt County Cattlemen's Association and Farm Bureau, the Sierra Club, and a local group called the Mattole Action Committee (Hastey 1995).<sup>19</sup>

Miller died unexpectedly in a plane crash in 1962, but his successor Congressman Don Clausen continued to support the bill through the 1960s, and it was passed and signed into law in 1970 (Public Law 91-476). It authorized land acquisition by either purchase or exchange, and has been described as a "mini-organic act for the BLM," including a number of innovative management ideas and authorities for the agency (Hastey 1995). The Act is also considered an important precursor to FLPMA, which passed in the 1976 and serves as the basic guiding legislation for the BLM today.

At the time the KRNCA Act was signed in 1970, the BLM owned and managed roughly 30,000 acres within the boundaries delineated in the Act. The designated area also included approximately 24,000

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<sup>18</sup> Miller had also been active in passing the Multiple Use-Sustained Yield Act of 1960, defining "multiple use" as a balance of uses within an entire system, rather than the presence of every use on every tract of land. The KRNCA was originally conceived of as a "pilot BLM multiple use area" (Peterson 1996, at 11).

<sup>19</sup> Undated "KRNCA Legislative History" states that Miller introduced his first bill "after extensive consultation with residents of neighboring communities."

acres of privately owned land. These private holdings were scattered throughout the KRNCA (see Figure 2-7), many of which were held by timber companies, plus the densely-platted (although with only 40 homes built at the time) subdivision of Shelter Cove and a scattered community of rural residences in Whale Gulch. The 1974 Management Program characterized the area as having active subdivision interest, yet actual residential construction had been very limited and the growth trend slow (BLM 1974).

The 1970 Act gave the BLM authority to acquire private lands via purchase or exchange, but only from willing sellers as long as the land use was compatible with the purposes of the Act (PL 91-476, Section 5(2)). Land exchange was the favored method, as a way of both consolidating BLM ownership in the King Range and relieving it of management responsibility for widely-scattered parcels, which were difficult and more expensive to manage, located in other parts of Humboldt County. In this way, both the BLM and private owners were seen to win, as management of both private and public lands could be more efficient and comprehensive. The Act also included limited condemnation authority, while stressing that acquisition by this method would only occur if all other methods had proved unsuccessful for parcels where the uses of the property were clearly incompatible with the overall purposes and objectives of the KRNCA. The Act specifically did not intend to eliminate private holdings or private enterprise from the conservation area, as they were “expected and encouraged to continue and to contribute to the overall economy and attractiveness of the area” (U.S. Congress 1970, at 3). Instead, the Act aimed to acquire most of the private land within the area through working with willing sellers: “The Department will attempt to acquire most of the private lands within the area except those in the Shelter Cove Development” (U.S. Congress 1970, at 10).

## 2.5.2 Existing Conditions

### 2.5.2.1 Land Acquisition

To date, BLM has acquired roughly 25,700 acres within the planning area. The vast majority of this acquisition, roughly 23,000 acres or 90 percent of the total, took place between 1973-1984 (see Appendix B for detail). The bulk of this acreage has been acquired by exchange, representing 46 parcels and over 22,200 acres, while 69 parcels have been purchased totaling only 3,076 acres.<sup>20</sup> In addition, four parcels adding up to not quite an acre were donated, and two parcels were condemned (due to development incompatible with the Act) for a total of 440 acres. In recent years acquisitions have been from willing sellers and all have been relatively small parcels. Since 1984, there have been 64 individual parcels acquired (out of a total of 120), but totaling only a little over 2,200 acres.

5,735 acres are still in private ownership within the KRNCA boundary, 2,966 acres of which are located outside of the Shelter Cove subdivision (see Figure 2-8). The BLM continues to acquire private lands within the area, with priority placed on coastal acquisitions from willing sellers. There were three life estate/reservations of right, all dating from the mid-1980s, for the access and use of private dwellings on acquired land, but only one currently remains active. The King Range Act does not allow for disposal of public lands within the KRNCA boundary.

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<sup>20</sup> Approximately 12,800 acres of BLM lands outside the KRNCA area went to private owners in these exchanges, many of which were timber lands. (Total is 186,618 thousand board feet of timber exchanged out, while the BLM gained 6,386 tbf.)

FIGURE 2-7: LAND OWNERSHIP AS OF 1974

8.5 x 11 insert

FIGURE 2-8: CURRENT LAND OWNERSHIP

11 x 17 insert

back of Figure 2-8

Several community groups have championed land acquisition efforts in the region surrounding the KRNCA to conserve old-growth forests and watershed values. Three acquisition areas (Mill Creek, Indian Creek, and Squaw Creek) directly adjoin the KRNCA. These lands are now under BLM management and are included in this RMP. Two additional community-driven conservation efforts within the vicinity of the KRNCA are the Redwoods to Sea Corridor and Sanctuary Forest projects. The vision of the Redwoods to Sea project is to develop a wildlife/ecological corridor linking the King Range to Humboldt Redwoods State Park using a combination of land acquisitions and conservation easements. This project includes approximately 5,000 acres of land now under BLM stewardship. The Sanctuary Forest project focuses on the headwaters of the Mattole River, in an area of old-growth redwood forest and critical salmon spawning habitat cooperatively managed as the Upper Mattole River and Forest Cooperative. BLM lands make up a much smaller component of this project.

### *2.5.2.2 Rights of Way*

The KRNCA has fifteen road rights-of-way, required to provide ingress/egress to private lands over federal lands. All of these follow existing roadways. Individual right-of-way agreements and requirements regarding access to private lands are beyond the scope of this plan and will not be discussed. Several BLM roads also provide access to private lands outside of the KRNCA boundary. These include the Noonung Creek Road, Finley Ridge Road, Paradise Ridge Road, and Prosper Ridge Road. In addition, the KRNCA includes the following utility and other rights-of-way:

- € Power transmission lines: 2
- € Telephone/Telegraph: 1 (Shelter Cove Road)
- € Water Facilities: 1 (near Kaluna Cliff, for transport water over public land onto private land; State of California determines water permit)
- € Other: 1 (Research facility on Lighthouse Road, housing the Mattole Salmon Group's fish hatchery)
- € Communication Site: 1 (Verizon, one tower on Paradise Ridge)

### *2.5.2.3 Rights-of-Way Involving Water Diversions*

Occasionally, neighboring property owners seek a right-of-way from the BLM to appropriate either groundwater or surface water from public lands. To date, requests for this purpose have been limited in the KRNCA, but are expected to increase as the population of the area grows. Surface water is defined as all perennial and seasonal seeps, springs, creeks, streams, and rivers. Although the impact of any one individual surface water diversion is typically small or immeasurable, cumulative diversions in a watershed can consume a significant portion of the in-stream flow. Due to geologic constraints and cost, groundwater use occurs infrequently in the area. Appropriation of groundwater can also result in reduced base flows in surface water bodies, although to a lesser extent than a direct diversion of surface water. As such, appropriation of groundwater is often ecologically preferable to diversion of surface water, and requires a case-by-case evaluation to properly determine the potential environmental consequences, if any.

#### 2.5.2.4 BLM Water Rights

In California, water rights are administered by the State Water Resources Control Board (SWRCB). To protect water rights in the King Range, the BLM is required to establish and maintain these rights under the same set of priorities afforded private landowners. There are two types of water rights, riparian and appropriative. In order to assure that new upstream water diversions do not result in adverse consequences to public resources in the King Range, the BLM would be required to assert its water rights to protect minimum in-stream flows required for fisheries and riparian habitat, as allowed by California law.

Currently, none of the surface water bodies within the King Range has been identified as fully appropriated, implying that there is sufficient flow to support new diversions of water for agricultural, domestic, or industrial use. However, if upstream water demand grows in the future, it might not be possible for the BLM to ensure the minimum in-stream flows required for protection of public lands and resources unless water rights are established and maintained. Water rights priorities are established “first in time, first in right.”

The BLM either has, or is in the process of obtaining water rights in at least 10 locations in the KRNCA, primarily to benefit wildlife values and grazing leases. The BLM has no instream flow rights and there was no Federal Reserved Water Right obtained with the establishment of the area as an NCA.

## 2.6 INVENTORY UNITS AND STUDY AREAS

### 2.6.1 Lands Possessing Wilderness Characteristics

#### 2.6.1.1 Applicable Regulatory Framework

Section 603 of the 1976 Federal Land Policy and Management Act (FLPMA) directed the Secretary of the Interior and the Bureau of Land Management (BLM) to review roadless areas of 5,000 acres or more having wilderness characteristics and to recommend to the President the suitability of such areas for preservation as wilderness. In determining these wilderness values, the law directs the BLM to use the criteria given by Congress in the Wilderness Act of 1964. In Section 2(c) of that Act, Congress states that wilderness is essentially an area of undeveloped federal land in a natural condition, without permanent improvements or human habitation, which has outstanding opportunities for solitude or a primitive and unconfined type of recreation. The area may contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

The original inventory phase of this process, initiated in 1978, involved examining the public lands to determine and locate the existence of areas containing wilderness characteristics that met the criteria established in the Wilderness Act. This inventory process, with a general description of all of California’s Wilderness Study Areas (WSAs), was published in *Wilderness: Final Intensive Inventory, Public Lands Administered by BLM California Outside the California Desert Conservation Area* (BLM 1979a). Subsequently in 1988, BLM issued the *Final Environmental Impact Statement for the Arcata Resource Area King Range WSA and Chemise Mountain WSA*, incorporating the wilderness recommendations into the planning process through an amendment to the Arcata Management Framework Plan.

Two Wilderness Study Areas, (the King Range and Chemise Mountain WSAs) totaling approximately 38,000 acres, were evaluated in the 1988 EIS. The BLM recommended to Congress that 24,960 acres be designated wilderness. Congress has the sole authority to designate an area as wilderness. Wilderness continues to be a major issue and various legislative proposals are being developed and debated, no definitive wilderness determination has yet been made for the King Range or Chemise Mountain WSAs. Until Congress decides whether to designate the areas as wilderness, the entire WSA acreage will be managed in accordance with the Bureau's *Interim Management Policy and Guidelines for Lands Under Wilderness Review* (1995). This policy lays out protective measures to prevent impairment of an area's suitability for preservation as wilderness. Consequently, both the King Range and Chemise Mountain WSAs are presently being managed under these guidelines, and will continue to be until either designated by Congress as Wilderness or released from protective management under Interim Management guidelines (see Figure 2-9).

#### *2.6.1.2 Wilderness Characteristic Assessment*

Since the original wilderness inventory was conducted in 1978-79, there have been numerous land acquisitions both adjacent to and within the WSAs. In addition, some intrusions, such as old logging roads, have rehabilitated naturally and in some locations have been physically decommissioned, recontoured, and replanted, and are successfully reverting back to a more natural condition. In 2003, as part of the development of this RMP and EIS, these specific type areas within or adjacent to the King Range and Chemise Mountain WSAs were examined to determine if they have wilderness characteristics.



*The Squaw Creek headwaters area is an example of lands that have returned to a more natural character.*

Twelve parcels of public land containing 10,327 acres adjacent to the King Range WSA were evaluated, and three parcels containing 215 acres adjacent to the Chemise Mountain WSA. Out of that total, 10,259 acres were found to meet the minimum criteria for wilderness characteristics (see Figure 2-10). This acreage was carried forward into the plan alternatives for analysis (see Section 3.8). Also, the entire 200

acres of purchased inholdings were found to possess wilderness characteristics. This assessment is on file with the BLM King Range office and is available for public review.

Because all parcels evaluated are adjacent to an existing WSA, the size requirement for lands possessing wilderness characteristics was met. In addition, those units found to possess wilderness characteristics all appear to have been affected primarily by the forces of nature, and exhibit outstanding opportunities for solitude and/or unconfined recreation. Most parcels also contain one or more outstanding supplemental values.

## 2.6.2 Wild and Scenic Rivers

### *2.6.2.1 Applicable Regulatory Framework*

The Wild and Scenic Rivers Act of 1968 (Public Law 90-542) was passed by Congress to preserve riverine systems that contain outstanding features. The law was enacted during an era when many rivers were being dammed or diverted, and is intended to balance this development by ensuring that certain rivers and streams remain in their free-flowing condition. The BLM is mandated to evaluate stream segments on public lands as potential additions to the National Wild and Scenic Rivers System (NWSRS) during the Resource Management Plan (RMP) Process under Section 5(d) of the Act. The NWSRS study guidelines are found in BLM Manual 8351, U.S. Departments of Agriculture and Interior Guidelines published in Federal Register Vol. 7, No.173, September 7, 1982 and in various BLM memoranda and policy statements. Formal designation as a Wild and Scenic River requires Congressional Legislation, or designation can be approved by the Secretary of Interior if nominated by the Governor of the state containing the river segment. There are no existing Wild and Scenic Rivers designations within the King Range.

### *2.6.2.2 Wild and Scenic Rivers in the Vicinity of the King Range*

The closest rivers to the King Range with existing Wild and Scenic designation are the Trinity, Van Duzen, and Eel Rivers. The South Fork Trinity and Van Duzen Rivers are approximately 20-40 miles inland and north of the planning area. The South Fork of the Eel River flows northward just inland from the planning area.

Several streams that adjoin the planning area were studied in the 1995 Arcata Resource Management Plan Amendment. These included short segments of the Mattole River and Bridge Creek (both near the King Range Administrative Site), and Jewett Creek. All three of these segments were found to be eligible for inclusion in the Wild and Scenic system. No suitability determination was made at that time. Segments of Squaw Creek and Shoals Creek were found ineligible.

As part of this planning effort, all rivers and streams in the planning area were evaluated for their eligibility and suitability for designation under the Wild and Scenic Rivers Act. A total of 34 stream segments were evaluated. The results of this evaluation are contained in Appendix C.

FIGURE 2-9: EXISTING SPECIAL DESIGNATIONS

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back of Figure 2-9

FIGURE 2-10: WILDERNESS CHARACTERISTICS ASSESSMENT

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back of Figure 2-10



*Big Flat Creek was one of 28 streams found eligible for Wild and Scenic River designations.*

### 2.6.3 Areas of Critical Environmental Concern

#### 2.6.3.1 Applicable Regulatory Framework

Areas of Critical Environmental Concern (ACECs) are areas of public land where special management attention is required to protect important natural and/or cultural resource values. The ACEC designation indicates to the public that the BLM recognizes these significant values, and has established special management measures to protect them. The BLM is required to consider designation of ACECs under Section 202(c)3 of the Federal Land Policy and Management Act (CFR 1610.7-2). Areas may be nominated for consideration as ACECs by the BLM, other agencies, or members of the public.

In order for an area to be designated as an ACEC, both of the following criteria must be met:

- € **Relevance:** The area must have a significant cultural, historic, scenic, wildlife, fish, or other natural system or process.
- € **Importance:** The above value, resource, process or system must be distinctive and be of greater than local significance.

Areas with significant natural hazards may also be designated as ACECs, although no areas meeting these criteria are known to exist within the KRNCA.

The KRNCA currently has one designated ACEC: The Mattole ACEC, which was designated in the King Range Extension Plan (1981) to protect significant archaeological sites, the fragile sand dune ecosystem, and riparian areas/ wildlife values in the Mattole Estuary. The original ACEC encompassed 350 acres. (Federal Register Vol. 54 no. 249, 12/29/89). The ACEC was expanded in a 1996 Plan Amendment to include 305 acres of newly acquired lands on the north side of the Mattole Estuary. The ACEC extends from the public land boundary north of the Mattole Estuary south for 7.5 miles to Sea Lion Gulch (see Figure 2-9).

## 2.7 WATER QUALITY

### 2.7.1 Applicable Regulatory Framework

Numerous factors can affect water quality within the KRNCA, including road construction and maintenance, land management practices, water consumption, pollution spills, and waste disposal practices. Water quality impacts from each of these activities are regulated under both federal and state laws.

The primary federal laws that are pertinent to water quality in the King Range include:

- € The Clean Water Act and amendments (CWA)
- € The Safe Drinking Water Act and amendments (SDWA)
- € The Resource Conservation and Recovery Act (RCRA)

The U.S. Environmental Protection Agency has granted primacy to the State of California to implement portions of both the Clean Water Act and the Safe Drinking Water Act. The California state laws and regulations that are pertinent to water quality in the King Range include:

- € The Porter-Cologne Water Quality Control Act
- € The California Water Code
- € The California Fish and Game Code
- € The California Health and Safety Code

The BLM is required to comply with the above laws and regulations. The regulatory agencies that are primarily responsible for oversight of BLM's activities as related to water quality are the State Water Resources Control Board (SWRCB), the California Regional Water Quality Control Board—North Coast Region (RWQCB), the California Department of Health Services—Office of Drinking Water (CDHS), and the U.S. Environmental Protection Agency.

### 2.7.2 Existing Conditions and Management Practices

#### 2.7.2.1 *Surface Water*

In general, watersheds within the King Range have experienced relatively little development compared to surrounding watersheds. For this reason, creeks, streams, and rivers in the King Range offer quality habitat for numerous aquatic species. Section 303(d) of the Clean Water Act requires each state to identify streams, rivers and lakes that do not meet water quality standards even after the implementation of technology based controls. The Mattole River is the only major water body in or adjacent to the King Range that has been listed as impaired on the State of California's Clean Water Act 303(d) list. The SWRCB and RWQCB identified excessive sedimentation and elevated temperature as causes for the impairment. As such, the BLM is required to minimize any action in the Mattole watershed that would threaten to further exacerbate temperature or sediment problems in the Mattole River or its tributaries.

As a major landowner in the Mattole River watershed, some of the BLM's activities will likely be regulated under the prescribed Total Maximum Daily Load for the watershed.

One of the primary factors affecting increased water temperature is reduced flow, especially during the warmer summer months when base flows in the Mattole River's tributary streams and the river are relatively small. Decreased base flow results from upstream diversion of springs and streams. Removal of riparian vegetation can result in increased solar radiation falling on the channel. Discharge of sediment from failing or improperly designed roads, forest fires, and poor land management practices can result in excessive sedimentation of the channel, reduction of available spawning habitat, and reduced effective channel depth. Relatively small changes in these individual factors can combine to result in large reductions in available cold water fish habitat.

### *2.7.2.2 Groundwater*

Due to the abundance of surface water, groundwater sources have not traditionally been relied upon in the King Range area. However, due to increasing sensitivity regarding drinking water quality and the potential environmental effects of excessive surface water diversions, the BLM has begun to increase its reliance on groundwater in the King Range. Specifically, the Mattole Campground potable water supply relies upon a groundwater well, and another well is planned for the King Range Administrative site. In those areas where groundwater wells are or will be installed to provide water to the public, the BLM is required to implement a wellhead protection plan to ensure that operations do not impair groundwater quality. The benefits of groundwater over surface water include increased in-stream flow for aquatic habitat, reduced treatment requirements for public water supplies, and reduced wear and maintenance of water supply system equipment. Compliance with drinking water law and regulations is described further under Facilities

### *2.7.2.3 Water Pollution*

The BLM does not have and does not envision any operations in the King Range that would involve permitted point-source discharges under the Clean Water Act and the National Pollutant Discharge Elimination System (NPDES). The only potentially regulated non-point source discharge in the King Range results from operations at the King Range office in Whitethorn, CA. Although existing laws and regulations do not require this facility to operate under the State of California's general NPDES permit for stormwater discharges, the facility has a stormwater pollution prevention plan that specifies management practices intended to minimize water quality impacts resulting from operations at the facility. In the unlikely event that new construction will result in more than one acre of ground disturbance, the BLM will file a Notice of Intent to the RWQCB indicating that discharges resulting from the construction project will be managed in accordance with the requirements in the applicable general NPDES permit.

Waste generation and disposal practices can also result in water pollution. The BLM currently disposes of all waste in a proper manner, as required by state and federal laws. All wastewater generated in the King Range is considered domestic sewage and, except for the King Range Administrative Facility, is either discharged to the Shelter Cove wastewater collection system or is pumped from pit toilets and properly disposed by a licensed hauler. The King Range Administrative Facility discharges its waste to a septic system.

#### 2.7.2.4 Watershed Restoration

In general, watershed restoration involves upgrading, reshaping and/or abandonment of outdated roads. Many of these older roads were constructed in a manner that now create significant potential for the road to wash out or fail and deliver large volumes of sediment into streams that support anadromous fisheries. Although restoration efforts are undertaken for the purpose of reducing sediment discharges to these streams, road maintenance, reshaping, and abandonment activities can also cause incidental sediment discharges. The BLM employs erosion control measures, frequently termed “best management practices” (BMPs), as needed during watershed restoration activities to reduce or eliminate incidental sediment discharge. Some of the BMPs include mulching, installation of sediment curtains, placement of hay bales, and other drainage control features, construction of rolling dips, and seasonal limits on operations.

## 2.8 AQUATIC ECOSYSTEMS AND FISHERIES

### 2.8.1 Introduction

The KRNCA provides habitat for salmon and steelhead listed as “threatened” under the federal Endangered Species Act (ESA). The fish were listed by Evolutionarily Significant Units (ESUs). The four ESUs are: Southern Oregon/Northern California Coasts (SONCC) coho salmon (*Oncorhynchus kisutch*), California Coastal (CC) Chinook salmon (*O. tshawytscha*), Central California (CC) coho salmon (*Oncorhynchus kisutch*), and Northern California (NC) steelhead (*O. mykiss*), hereinafter referred to as Pacific salmonids. Available information indicates that KRNCA salmonid habitat is recovering from the combined impacts of relatively recent flood events and past land uses, and riparian vegetation has re-established in the impacted area. However, in logged areas, climax communities along streams will not return to pre-harvest levels for centuries affecting recruitment of large wood to streams. Instream habitat quality and quantity has been reduced due to past land use practices, severely impacting salmonid populations. Restoration efforts, changes in land use patterns and riparian protection standards, and public ownership of lands has allowed instream habitat to begin recovering. Sedimentation from roads continues to be a primary impact to salmonid habitat, although impacts have been reduced through cooperative road maintenance efforts between public and private landowners, road restoration efforts, and broad scale transportation management and maintenance programs.

### 2.8.2 Applicable Regulatory Framework

The KRNCA provides habitat for the following federally listed Pacific salmonids:

- € Southern Oregon/Northern California Coasts (SONCC) coho salmon (*Oncorhynchus kisutch*); listed under the Endangered Species Act (ESA) as threatened (62 FR 24588; May 6, 1997). Designated critical habitat (64 FR 24049; May 5, 1999) encompasses accessible reaches of all rivers between the Mattole River in California and the Elk River in Oregon, inclusive.
- € Central California (CC) coho salmon (*O. kisutch*); listed under the ESA as threatened (61 FR 56138; October 31, 1996). Designated critical habitat includes accessible reaches from Punta Gorda, within the KRNCA, south to the San Lorenzo River in central California. However, this species has not been documented within streams draining the KRNCA.

- € California Coastal (CC) Chinook salmon (*O. tshawytscha*); listed under the ESA as threatened (64 FR 50394; September 16, 1999). Designated critical habitat (65 FR 7764; February 16, 2000) was withdrawn in 2002.
- € Northern California (NC) steelhead (*O. mykiss*); listed under the ESA as threatened (65 FR 36094; June 7, 2000), no critical habitat designated.

Section 7 of the federal Endangered Species Act requires BLM to enter into consultation with NOAA Fisheries for any discretionary federal action which may affect the above federally listed Pacific salmonids or designated critical habitat. Furthermore, Section 7 directs the BLM to carry out conservation programs to aid in the protection and recovery of these species.

In addition to critical habitat designations for listed Pacific salmonids, Essential Fish Habitat (EFH) provisions of the Magnuson-Stevens Act (MSA, as amended 1996) require heightened consideration of habitat for commercial species in resource management decisions, including EFH for SONCC coho salmon and CC Chinook salmon. EFH is defined in Section 3 of the MSA as “those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity.” The National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries) interprets EFH to include aquatic areas and their associated physical, chemical, and biological properties used by fish that are necessary to support a sustainable fishery and the contribution of the managed species to a healthy ecosystem. Freshwater EFH for Pacific salmonids includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically, accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers, and long-standing impassable natural barriers. The MSA and its implementing regulations at 50 CFR 600.92(j) require that before a federal agency may authorize, fund or carry out any action that may adversely effect EFH, it must consult with NOAA Fisheries. The KRNCA contains EFH for coho and Chinook salmon.

Finally, the Mattole watershed is one of eight Key Watersheds identified in the Northwest Forest Plan Record of Decision (1994) within the Coastal Province.

### 2.8.3 Existing Conditions

Habitat for Pacific salmonids within the KRNCA can be divided into two main regions: the east side of the KRNCA contains approximately twelve percent of the Mattole River watershed, and the western portion contains seventeen coastal streams that drain directly into the Pacific Ocean. The mainstem of the Mattole is approximately 62 miles in length, and has over 74 tributaries. The KRNCA contains approximately 56 miles of the 193 miles of anadromous habitat within the Mattole River watershed, and includes streams that contribute significantly to salmonid production in the Mattole River basin (see Figure 2-11).

Runs of Pacific salmonids in the Mattole River basin have declined drastically in recent decades. Anecdotal evidence as recent as the 1970s indicates that salmonids were so numerous that they could be speared, snagged, or netted at numerous locations along the lower river. CDFG (1965) estimated spawning escapement numbers at 5,000 Chinook salmon, 2,000 coho salmon, and 12,000 steelhead. Redd surveys and carcass counts conducted by watershed restoration groups since 1981 indicate that a few hundred pairs of spawners utilize the Mattole River and that steelhead is the primary species in the

Mattole River basin. It is estimated that steelhead numbers in the Mattole have declined less drastically than coho and/or Chinook salmon. Peak numbers of steelhead were observed in the estuary/lagoon in September 1994: 3,000 young-of-the-year, and 7,000 yearlings. Results of these surveys as well as previous studies of the Mattole estuary by Busby et al. (1988), indicate that rearing habitat in the Mattole estuary/lagoon is of poor quality due to lack of deep water habitat, high water temperatures, and poor food resources. Spawning surveys have been conducted in Bear, Honeydew, and Mill Creeks by watershed groups and have documented adult steelhead spawning. Bear Creek was stocked with steelhead and rainbow trout in the 1930s and in 1972, and the Mattole Watershed Salmon Group has implemented hatchbox programs for Chinook and coho salmon in Bear Creek since 1982.



*The salmon fishery is an important part of the identity and culture of the region.*  
Source: Anne Machi Collection.

### *2.8.3.1 Species Accounts*

#### Coho Salmon (*Oncorhynchus kisutch*)

General life history information and biological requirements of SONCC coho salmon have been described in various documents (Shapovalov 1954; Hassler 1987; Sandercock 1991; Weitkamp et al. 1995) as well as NOAA Fisheries' final rule listing SONCC coho salmon (May 6, 1997; 62 FR 24588). Adult coho salmon typically enter rivers between September and February. Spawning occurs from November to January (Hassler 1987), but occasionally as late as February or March (Weitkamp et al. 1995). Coho salmon eggs incubate for 35-50 days between November and March. Successful incubation depends on several factors including dissolved oxygen levels, temperature, substrate size, amount of fine sediment, and water velocity. Fry start emerging from the gravel two to three weeks after hatching and move into shallow areas with vegetative or other cover. As fry grow larger, they disperse up or downstream. In summer, coho salmon fry prefer pools or other slower velocity areas such as alcoves, with woody debris or overhanging vegetation. Juvenile coho salmon over-winter in slow water habitat with cover as well. Juveniles may rear in fresh water for up to 15 months then migrate to the ocean as "smolts" from March to June (Weitkamp et al. 1995).

FIGURE 2-11: EXTENT OF ANADROMY

11 x 17 insert

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In preparation for their entry into a saline environment, juvenile salmon undergo physiological transformations known as smoltification to adapt them for their transition to salt water. Coho salmon adults typically spend two years in the ocean before returning to their natal streams to spawn as three-year olds.

Available historical data and most recent published coho salmon abundance for California are summarized by NOAA Fisheries status review update (NOAA Fisheries Southwest Fisheries Science Center 2001). The number of streams with coho salmon present within the SONCC ESU was found to have declined from 1989-2000. In the CC ESU the number of streams identified as having historical coho salmon presence generally ranged between 44 to 48 percent from 1989-2000. The decline of SONCC coho salmon is not the result of one single factor, but rather a number of natural and anthropogenic factors that include dam construction, instream flow alterations, and land use activities coupled with large flood events, fish harvest, and hatchery effects.

All coho salmon stocks between Punta Gorda and Cape Blanco are depressed relative to past abundance, but there are limited data to assess population numbers and trends. The Mattole Salmon Group implemented coho salmon enhancement projects in Mill Creek from 1981 to 1987, and this tributary has provided the only known spawning and rearing habitat for coho salmon in the lower 27 miles of the Mattole. There were an estimated 500 spawners in 1981-1982, a peak of greater than 1,000 spawners in 1987-1988, and less than 200 spawners in 1994-1995. In 1987, a hatchbox program for coho salmon was implemented by watershed groups in an attempt to avoid the extinction of native Bear Creek coho salmon. Although the range of CC coho salmon overlaps the KRNCA from Punta Gorda south, coho salmon have not been documented in available habitat (coastal streams that drain directly into the Pacific Ocean) except for occasional observations of a few individuals. These streams may not be suitable (too steep, etc.) for utilization by CC coho salmon.

#### Chinook Salmon (*O. tshawytscha*)

NOAA Fisheries' (Meyers et al. 1998) status review of Chinook salmon contains information on the biological requirements of Chinook salmon. In summary, Chinook salmon mature between 2 and 6+ years of age (Myers et al. 1998). Fall-run Chinook salmon enter freshwater at an advanced stage of maturity, move rapidly to their spawning areas on the mainstem or lower tributaries of the rivers, and spawn within a few days or weeks of freshwater entry (Healey 1991). Post-emergent fry seek out shallow, near-shore areas with slow current and good cover, and begin feeding on small terrestrial and aquatic insects and aquatic crustaceans. The optimum temperature range for rearing Chinook salmon fry is 50°F to 55°F (Rich 1997, Seymour 1956) and for fingerlings is 55°F to 60°F (Rich 1997). In preparation for their entry into a saline environment, juvenile salmon undergo physiological transformations known as smoltification that adapt them for their transition to salt water. The optimal thermal range for Chinook during smoltification and seaward migration is 50°F to 55°F (Rich 1997). Chinook salmon addressed in this document exhibit an ocean-type life history, and smolts out-migrate predominantly as subyearlings, generally during April through July. Chinook salmon spend between 2 and 5 years in the ocean (Bell 1991; Healey 1991), before returning to freshwater to spawn. Some Chinook salmon return from the ocean to spawn one or more years before full-sized adults return, and are referred to as jacks (males) and jills (females).

A summary of Chinook salmon abundance (Myers et al. 1998) concluded that habitat loss and/or degradation is widespread throughout the range of listed Chinook salmon and that Chinook salmon in the Mattole River are at “high risk of extinction” (in Meyers et al. based on Higgins et al. 1992) and at “high extinction risk” (in Meyers et al. based on Nehlson et al. 1991). Restoration workers have implemented hatchbox programs since 1980 and have increased survival of early life stages through rearing salmon eggs to juvenile life stages and then releasing juvenile Chinook salmon back into the Mattole River system.

### Steelhead (*O. mykiss*)

Winter-run steelhead enter fresh water between November and April in the Pacific Northwest (Busby et al. 1996; Nickelson et al. 1992), migrate to spawning areas, and then spawn, generally in April and May (Barnhart 1986). Some adults, however, do not enter some coastal streams until spring, just before spawning (Meehan 1991). Summer steelhead enter freshwater in the spring and summer months, hold in the mainstem river and large tributaries, and then spawn in fall. Both winter-run and summer-run are found in the Mattole River, although summer-run steelhead are considered rare. Only winter-run steelhead are known to exist in the west side streams. Steelhead require a minimum depth of 0.18 m and a maximum velocity of 2.44 m/s for active upstream migration (Smith 1973). Spawning and initial rearing of juvenile steelhead generally take place in small, moderate-gradient (generally 3-5 percent) tributary streams (Nickelson et al. 1992). A minimum depth of 0.18 m, water velocity of 0.30-0.91 m/s (Smith 1973), and clean substrate 0.6-10.2 cm (Nickelson et al. 1992) are required for spawning. Steelhead spawn in 3.9-9.4°C water (Bell 1991). Depending on water temperature, steelhead eggs may incubate for 1.5 to 4 months (August 9, 1996, 61 FR 41542) before hatching, generally between February and June (Bell 1991). After two to three weeks, in late spring, and following yolk sac absorption, alevins emerge from the gravel and begin actively feeding. After emerging from the gravel, fry usually inhabit shallow water along banks of perennial streams. Fry occupy stream margins (Nickelson et al. 1992). Summer rearing takes place primarily in the faster parts of pools, although young-of-the-year are abundant in glides and riffles. Winter rearing occurs more uniformly at lower densities across a wide range of fast and slow habitat types. Productive steelhead habitat is characterized by complexity, primarily in the form of large and small wood. Some older juveniles move downstream to rear in larger tributaries and mainstem rivers (Nickelson et al. 1992). Steelhead prefer water temperatures ranging from 12-15°C (Reeves et al. 1987). Juveniles live in freshwater from one to four years (usually two years in the California ESU), then smolt and migrate to the ocean in March and April (Barnhart 1986). Winter steelhead populations generally smolt after two years in fresh water (Busby et al. 1996).

Population estimates of juvenile steelhead in the small coastal drainages within the western portion of the KRNCA were made for the 1999 and 2000 field seasons (Engle et al. 2002). At least two age classes were documented in all streams sampled during the two years of study, abundance varied between streams and the highest abundance/stream was 12,856 juvenile steelhead.

### Other Fish Species

The tidewater goby (*Eucyclogobius newberryi*), listed as endangered under the ESA, is endemic to California and is distributed in brackish-water habitats along the California coast. However, three sections of coastline in California, characterized by precipitous topography, lack lagoons at stream mouths and therefore form gaps in the distribution of the tidewater goby including from Humboldt Bay to Ten Mile

River (FR Vol. 57, No. 239, Dec. 11, 1992) including the King Range coastline. No sightings of tidewater goby have been documented in the lower Mattole River or other streams draining the KRNCA.

The bocaccio (*Sebastes paucispinis*) rock fish, an ESA Candidate species, lives among rocky reefs and soft ocean bottoms from Kodiak Island, Alaska, to Punta Blanca, Baja California. Populations of bocaccio are separated into northern and southern population segments, and the distribution of the northern population segment includes ocean habitat adjacent to the KRNCA. NOAA Fisheries recently determined that listing bocaccio is not warranted, but will retain bocaccio on the ESA Candidate Species list and continue to monitor its status. The decline of this species is due to a combination of over-harvesting and poor recruitment of young into the population. Although the southern population has substantially declined, measures have been taken, including the elimination of all directed fishing for this species.

Other non-listed fishes have been collected (Busby et al. 1988) from the lower Mattole River including Pacific lamprey (*Lampetra tridentata*), coastrange sculpin (*Cottis aleuticus*), prickly sculpin (*Cottus asper*), threespine stickleback (*Gasterosteus aculeatus*), surf smelt (*Hypomesus pretiosus*), redbtail surfperch (*Amphistichus rhodoterus*), shiner surfperch (*Cymatogaster aggregata*), walleye surfperch (*Hyperprosopon argenteum*), staghorn sculpin (*Leptocottus armatus*), speckled sandab (*Citharichthys stigmaeus*) and starry flounder (*Platichthys stellatus*). Pacific lamprey was petitioned for listing under the federal Endangered Species Act in January, 2003, and a status review is currently in preparation.

### 2.8.3.2 Habitat Status

The Mattole River historically produced large runs of salmon and steelhead; however, habitat quality and quantity has been reduced. Large-scale changes to the Mattole River occurred in response to the 1955 and 1964 floods, which coincided with peak years of logging and road building in the basin. The Mattole watershed has the second highest erosion rate in northern California, second only to the Eel River watershed (Griggs and Hein 1980) and is underlain primarily by young sedimentary rocks which are highly erosive and often incompetent, easily fragmented and cracked. The dominant rock formation is the Franciscan Coastal Belt assemblage and disturbance events in the Mattole watershed profoundly affect hillslope processes and instream habitat. Earthquakes, storm events, and lightning fires are the major natural disturbances, and in combination with human induced disturbance have triggered accelerated erosion. The King Range lies within a very active tectonic setting and has undergone extensive deformation, resulting in extreme geologic and geomorphic instabilities. Topography is steep and rainfall intensities are some of the highest in California. The mainstem Mattole stores massive amounts of sediments contributed from higher gradient tributaries, a condition that is not uncommon in northern California rivers within large, low gradient alluvial valley reaches.

Logging practices in the Mattole River watershed were identified as the “specific critical habitat problem” in a status review by Myers et al. (1998). There were an estimated 3,310 miles of active and abandoned roads in the Mattole River watershed (Perala et al. 1993) and the combined effects of these roads may be the single largest source of fine sediment delivered to the Mattole River. Stored sediments from past logging and road building have severely impacted fish habitat quality and quantity in the mainstem Mattole River. Pools have aggraded, and restoration groups have placed scour structures in some areas in an attempt to restore pool quality. Estuary habitat, a crucial link in the lifecycle of Pacific salmonids, has been reduced by excessive sedimentation, which has also resulted in higher water temperatures and

adverse impacts to food resources. Elevated summer water temperatures are one of the primary limiting factors for salmonids rearing in the Mattole River and impair salmon production at the reach and stream scales. However, smaller tributaries have lower temperatures and provide summer rearing habitat as well as summer low flow inputs to the Mattole River that are critical to the survival of salmonids. Loss of stream shading due to past logging and agriculture, aggradation due to increased sedimentation, and ongoing water withdrawals all continue to reduce instream habitat quantity and quality. Abatement of road-related drainage and erosion hazards is a top priority in terms of reducing upslope sources of erosion and further minimizing impacts to Pacific salmonid habitat. In March of 1994, the Environmental Protection Agency added the Mattole to its list of impaired watersheds (303d list) and a Draft Total Maximum Daily Load (TMDL) document has been prepared (North Coast Regional Water Quality Control Board, 2002).. The Mattole is impaired with regard to temperature, turbidity, and sedimentation. The California Department of Fish and Game recognized problems in the Mattole and recommended a policy of “zero net discharge” of sediment be implemented for all future timber harvest operations.

Within the KRNCA boundary, the west side of the King Range contains 39 perennial streams which range from small, narrow channels containing neither fish nor amphibians to large, broad channels containing both anadromous and resident fishes as well as an assortment of amphibians and riparian-dependent reptiles. Thirteen streams contain anadromous fish populations: Fourmile Creek, Cooskie Creek, Randall Creek, Spanish Creek, Oat Creek, Kinsey Creek, Big Creek, Big Flat Creek, Shipman Creek, Buck Creek, Gitchell Creek, Horse Mountain Creek, and Telegraph Creek. Recent studies (Engle 2001, Baldwin in progress) have found each stream to have relatively small populations of winter-run steelhead. Coho salmon have been observed in Fourmile Creek and Telegraph Creek although these streams do not appear to regularly support populations of coho salmon. A few juvenile coho salmon were captured in Big Creek during the summer of 1999 but extensive efforts to observe and capture coho salmon in 2000 and 2001 found none present. Coastrange sculpin are found in all streams containing steelhead and have also been observed in Willow Creek. Prickly sculpin have been captured in Cooskie Creek. Threespine stickleback have been captured in Cooskie Creek and Big Flat Creek.

In general, the west side streams are short and steep. The Fourmile Creek, Cooskie Creek, and Randall Creek watersheds contain more coast prairies than forests. These watersheds have experienced extensive grazing since the late-1800s. Sheep were the primary livestock in this area until the 1970s when ranchers switched to cattle. The watersheds south of Randall Creek are predominately forested. Some logging has occurred in the some of the watersheds which had private ownership but logging in these watersheds was not conducted at nearly the levels experienced in the Mattole watershed.

The largest streams, Big Creek and Big Flat Creek, appear to transport a relatively high volume of bedload originating from a number of large landslides found in their headwaters and major tributaries. In general these streams tend to have cool summer water temperatures, the notable exception to this is Cooskie Creek which regularly exceeds 80° F during summer months. Fish habitat quality in these streams is generally good but quite variable depending on channel morphology and gradient. None of these streams forms an estuary, even during periods of high streamflow.

#### 2.8.4 Management Issues/Practices

Currently, public lands in the Mattole watershed are managed consistent with the 1994 Northwest Forest Plan (NWFP). A primary component of the NWFP, the Aquatic Conservation Strategy (ACS), was designed to protect salmon and steelhead habitat by maintaining and restoring ecosystem health at watershed and landscape scales. Restoration has been championed by local watershed and salmon restoration groups in cooperation with the BLM since the 1970s and projects have been focused in the estuary, the lower river, and tributaries of the Mattole River. Livestock grazing continues in the lower Mattole watershed up to the lower North Fork and also on lands to the south of the Mattole within the KRNCA, including 11,100 acres within the following allotments: Spanish Flat, Strawberry Rock, Windy Point, and HJ Ridge. Timber harvest continues on private and industrial timberlands in forested uplands and throughout the upper watershed. BLM also maintains a campground and trailhead on the south side of the mouth of the Mattole and recreation (hiking and camping) is a primary use.

Although some of the above land uses continue to impact the watershed, on-going restoration efforts have made substantial progress improving habitat conditions. In general, approximately half of the watershed areas in the KRNCA are in relatively stable condition and half of the area has been impacted by past logging and road building. Within the Mattole Basin, parts of Bear and Honeydew Creeks are the least impacted by historic and ongoing land uses and these tributaries have the highest potential for providing refugia habitat for Pacific salmonids due to current conditions, land ownership patterns and potential for restoration.

Bear Creek lies within the KRNCA and is the third largest tributary of the Mattole River. Bear Creek provides approximately 19 miles of spawning and rearing habitat for Pacific salmonids and the watershed is comprised of predominantly public lands. Most of the land acquired by BLM was previously owned and logged by large timber companies. Many miles of abandoned roads were present on the acquired lands in the watershed and BLM has instituted an ongoing program of road rehabilitation to reduce the potential for road failures and chronic inputs of sediment. Currently there are arterial gravel roads that transect the Bear Creek watershed and segments have been identified as minor sediment sources. Proper maintenance, upgrades, and rehabilitation of erosion features have been identified and implemented to protect salmonid habitat from further sedimentation. Many homesteads and some agricultural operations obtain water from Bear Creek, which reduces habitat quantity and quality particularly during summer low flows. One grazing allotment currently exists in this watershed. Available information on physical habitat parameters indicates that instream habitat is recovering from floods, fire, and past land uses and riparian vegetation is well established. However, later seral coniferous riparian forests that provided large wood to streams will not likely return to pre-1950s levels for centuries.

Honeydew Creek is the fourth largest tributary of the Mattole River and approximately 69 percent of the watershed is in public ownership. The portion of this watershed within the KRNCA contains headwater tributaries that drain the north and east slopes of the King Range. The watershed contains seven sub-watersheds and of these watersheds, the upper mainstem and the West Fork have had minimal human impacts and could be characterized as refugia relative to aquatic habitat conditions. In contrast, the East Fork of Honeydew Creek, Bear Trap Creek, and High Prairie Creek have been intensively logged and grazed. Large scale erosion in this watershed along with removal of large streamside conifers contributed to simplification of the stream channel and reduced habitat quality and quantity for native fishes. The lower four miles of Honeydew Creek are in a broad alluvial valley where instream habitat has been

impacted by grazing, logging, residential development, water withdrawals, and sediment from logging and roads. Higher gradient channels at upper elevations transport sediment loads downstream and instream habitat exhibits less sedimentation effects than lower gradient channels. Although summer water temperatures are below lethal levels for salmonids, temperatures have been at stressful levels for long periods during the summer. However, Honeydew Creek is still three to five degrees below the temperatures in the Mattole River and comprises a significant portion of summer low flow inputs to the Mattole River.

The upper watershed, including the upper mainstem Honeydew Creek, West Fork and Upper East Fork, has not been as subjected (relative to other areas in the watershed) to impacts of high road density, timber harvest or vegetation type conversion. Portions of the Upper East Fork of Honeydew Creek downslope of the King Range Road experienced intensive tractor-based logging in the 1960s, while the watershed area upslope of the road has not been logged. Spawning habitat for coho and Chinook salmon is limited to areas of gentle gradient (2 percent or less), and significant low gradient sections are found in the lower mainstem and East Fork. Steelhead are able to access and spawn in steeper reaches. These steeper reaches have also been subject to chronic sediment inputs. Occasional sediment pulses, however have tended to maintain habitat quality and transport sediment downstream. Thus, Honeydew Creek provides more habitat for steelhead than coho or Chinook salmon. BLM (1996) reported that fish habitat in the steeper tributaries of Honeydew Creek is in good condition with the exception of Bear Trap Creek. The road network on public lands has been assessed by BLM and King Range Road had been identified as a concern because of the potential for culvert failures and sediment inputs to streams. In 1996, the northern-most 3.5 miles of the King Range Road, within the Upper East Fork of Honeydew Creek, was removed, which has reduced chronic sedimentation and potential catastrophic failures from plugged culverts and channel diversions. Continued road maintenance on all roads has been identified as a critical component of aquatic habitat protection and recovery.

Mill Creek is a tributary of primary importance to the lower Mattole River as it is the most significant source of cold water (Mattole Restoration Council 1995), has excellent water quality, and supports a population of SONCC coho salmon, as well as steelhead. Mill Creek is unique among Mattole River tributaries as instream habitat shows little evidence of sedimentation from past floods and logging. The lower mile of Mill Creek has been the most utilized by salmonids. The Lighthouse Road culvert, within the lower reaches of Mill Creek, had been a barrier to migration until modified in 1977 and 1980. In 2002, this culvert was replaced with a bridge to allow fish passage at all life stages. This stream has high potential as refugia for recovery of populations in the Mattole basin.

In addition, seventeen coastal streams drain the western portion of the KRNCA, flowing directly into the Pacific Ocean; most of them are too small to support fish populations. Seven of these streams were studied by Humboldt State University students in 1999-2000 including Cooskie, Randall, Spanish, Oat, Kinsey, Big, and Big Flat Creeks. Researchers (Engle et al. 2002) concluded that all of the coastal streams in the KRNCA are unique with respect to morphology, instream habitat and species composition. In addition, studies indicated that steelhead and resident trout utilize these small, steep coastal streams and they may be uniquely adapted to extreme habitat conditions including high stream energy, low summer base flows, high sediment supply and transport, and a lack of estuary habitat. Disturbances in these small watersheds have included cattle grazing, logging (limited areas), recreation/hiker use, slides, fires, and floods. Other studies of west side King Range streams are currently in progress.

## 2.9 WILDLIFE

### 2.9.1 Existing Conditions/Species

Twenty-one special status wildlife species, including six threatened or endangered species and fifteen otherwise determined to be sensitive, are found within the King Range, and are listed in Table 2-16. Critical habitat for four of the six threatened or endangered species also occurs within the KRNCA. The table also includes several species not known to occur in the King Range but that must be addressed by the plan due to their federal status, proximity to neighboring populations, historic occurrence, and/or presence of suitable habitat. Species names in the table in **bold type** indicate known presence in the project area.

Table 2-16: Federally and State Listed/Proposed Endangered or Threatened, and BLM Sensitive Wildlife Species

SPECIES	STATUS	PREFERRED HABITAT	OCCURRENCE AND COMMENTS
<b>AMPHIBIANS</b>			
<b><i>Rhyacotriton variegatus</i></b> <b>Southern Torrent Salamander</b>	Federal: Species of Concern  State: Species of Special Concern	Southern torrent salamanders can be found in and near cold mountain streams, springs, and seepages that are well shaded (Stebbins 1966). They require water for all stages of their life cycle and are seldom more than one meter from free-running water (Nussbaum and Tait 1977).	Surveys conducted in 1997 (Welsh and Hodgson) throughout the KRNCA commonly detected southern torrent salamanders in late seral forest streams. Within second growth forested habitats this species was detected only in the headwaters of the Mattole and Bridge Creek (Welsh and Hodgson 1997).
<b><i>Rana boylei</i></b> <b>Foothill Yellow-legged Frog</b>	Federal: Species of Concern  State: Species of Special Concern  BLM: Sensitive	Breeding occurs in the spring, where adults congregate in habitats consisting of shallow, slow flowing water with pebble and cobble substrate, preferably with shaded riffles and pools (Fuller and Lind 1992). This species is also known to utilize moderately-vegetated backwaters, isolated pools, and slow moving rivers with mud substrates (Corkran and Thoms 1996).	The foothill yellow legged frog occurs in streams throughout KRNCA in late seral forests, second growth forests and mixed second growth forest/grassland habitats (Welsh and Hodgson 1997).
<b><i>Rana aurora aurora</i></b> <b>Northern Red-legged Frog</b>	Federal: Species of Concern  State: Species of Special Concern	Breeding habitat consists of permanent or temporary water surrounded by dense grassy or shrubby vegetation (Jennings and Hayes 1994). Adult frogs prefer habitat with patches of dense grassy or shrubby vegetation (Jennings and Hayes 1994). Northern red-legged frogs tolerate higher salinity levels than most frog species and commonly occur in coastal habitats (D. Ashton, pers. comm., 2003).	Though uncommon, northern red-legged frogs may occur in marshy areas, ponds, stream, and estuary edges throughout the KRNCA (G. Hodgson, pers. comm. 2003).

Table 2-16: Federally and State Listed/Proposed Endangered or Threatened, and BLM Sensitive Wildlife Species

SPECIES	STATUS	PREFERRED HABITAT	OCCURRENCE AND COMMENTS
<b>BIRDS</b>			
<i>Pelecanus occidentalis californicus</i> <b>Brown Pelican</b>	Federal: Endangered  State: Endangered	Feeding occurs primarily in shallow estuarine waters with the birds seldom venturing more than 20 miles out to sea (FWS 1995). Sand spits and offshore sand bars are used extensively as daily loafing and nocturnal roost areas (FWS 1995, Fix and Bezener 2000).	Brown pelicans use the near-shore Pacific Ocean west of the project area and may occasionally use the beach and coastal promontories for day-roost sites. The birds occur in the area in the summer and fall of the year with a few rare occurrences being noted in the winter and spring (Harris 1991). Offshore rocks and sea stacks are used as roosting and loafing sites.
<i>Nycticorax nycticorax</i> <b>Black-crowned Night Heron</b>	Federal: None  State: None  BLM: Sensitive	Nests are placed individually or, most commonly, in colonies numbering up to several hundred pairs in trees, shrubs, or marsh vegetation; they are occasionally concealed in dense undergrowth. Black-crowned night-herons are sometimes abroad during the day, but specialize in hunting at night. At that time they occupy many foraging venues in wetlands, along shores, or otherwise in proximity to water.	These herons are resident over much of lowland California in appropriate habitat, both coastally and inland. Black-crowned night herons are year round residents within the KRNCA.
<i>Elanus leucurus</i> <b>White-tailed kite</b>	Federal: None  State: None  FWS: MNBMC	White-tailed kites are a locally common resident and breeder in northern California, especially in agricultural and riparian areas of the coastal plain (Harris 1996). White-tailed kites nest and roost in trees or small bushes in semi-open areas; mostly on the coastal plain (Harris 1996). Ungrazed habitats are strongly preferred over grazed habitats (D. Fix, pers. obs.).	Kites roost communally during the non-breeding season, roosting as many as 120 birds per site in the Eel River delta. Most of the northwestern California population occurs in bottomlands near the coast and in the near-coastal lowlands. White-tailed kites regularly occur in the KRNCA (BLM 2002).
<i>Haliaeetus leucocephalus</i> <b>Bald Eagle</b>	Federal: Threatened  State: Endangered	Adult and immature eagles from Alaska and the Pacific Northwest migrate along the coast following the salmon runs (Buehler 2000). They are typically situated within two miles of water bodies that support adequate food supply (Lehman 1979, USDI 1986). Bald eagle nests are usually located in uneven-aged, multi-storied stands with old-growth components (Anthony et al., 1982).	Bald eagle nesting activity has not been detected on the project area, but has been documented on the Mad River (PALCO 1998). A few bald eagles regularly winter in the vicinity of the project area on Yager Creek, the Eel, Elk, and Van Duzen Rivers, but none have been documented on the subject property. Bald eagles have been observed at the mouth of the Mattole River during spring 2002 and about one mile south of Saddle Mountain trail head in late October 2001.
<i>Falco peregrinus</i> <b>Peregrine Falcon</b>	Federal: Delisted	Although not strictly tied to aquatic habitats, peregrine falcons rely	Peregrine falcons are present in Northern California throughout

Table 2-16: Federally and State Listed/Proposed Endangered or Threatened, and BLM Sensitive Wildlife Species

SPECIES	STATUS	PREFERRED HABITAT	OCCURRENCE AND COMMENTS
	State: Endangered  FWS: MNBMC	upon populations of flocking birds such as shorebirds and ducks during the colder months, therefore favoring shorelines and shallows (Harris 1996, Fix and Bezener 2000). Preferred nesting sites include inaccessible cliffs on rocky outcrops and in river gorges (Fix and Bezener 2000).	the year. The CDFG peregrine falcon database documents eyries near the KRNCA at Shelter Cove and Cape Mendocino (CDFG 2002). Nesting habitat and prey are available within the KRNCA. Lack of documented occurrence information is mainly due to a lack of survey effort.
<b><i>Charadrius alexandrinus nivosus</i></b> <b>Western Snowy Plover</b>	Federal: Threatened  State: Species of Special Concern  FWS: MNBMC	In northern California, snowy plovers breed and winter along ocean beaches and gravel bars of the Eel River (Colwell et al. 2002). Nesting occurs above the high tide line in sandy substrate, and occasionally on driftwood (LeValley 1999).	Breeding season snowy plover surveys have taken place monthly at the mouth of the Mattole River and along gravel bars in the lower reaches of the river for the past 4 years. No snowy plovers have been detected, although there are historical records during the winter season.
<i>Brachyramphus marmoratus</i> Marbled Murrelet	Federal: Threatened  State: Endangered	Murrelets are coastal birds that nest in mature mixed conifer habitat up to 50 miles inland from the coast (FWS 1997). Marbled murrelets feed on small fish and invertebrates in near-shore marine waters, and nest inland primarily in older, large-limbed trees (Paton et al. 1987). Suitable nesting habitat has been described as mature to overmature coniferous stands, or those younger stands with interspersed large trees which may provide nesting opportunities (FWS 1997).	Between 1994 and 1999 approximately 3,231 acres of the best potential suitable marbled murrelet habitat in the KRNCA was surveyed to current protocol. One visual fly-over detection in the Squaw Creek watershed (just north of North Slide Peak) was documented in 1995.
<i>Gymnogyps californianus</i> California Condor	Federal: Endangered	Condors nest on cliffs and in burned out snags. Feed on carrion.	There are two historical records of condor in northwestern California (Harris 1996).
<i>Coccyzus americanus occidentalis</i> Yellow-billed Cuckoo	Federal: Candidate  State: Endangered  BLM: None	Patch size is an essential landscape feature for yellow-billed cuckoos (Laymon and Halterman 1985). While nests are almost always placed in willows, cottonwoods are extremely important for foraging (Laymon and Halterman 1985). The best habitats for nesting are at large sites with high canopy cover and foliage volume, and moderately large and tall trees.	Although there are no records of yellow-billed cuckoos within the KRNCA, they may be expanding their range and suitable habitat can be found in riparian areas. There have been sightings of cuckoos along the lower Eel River (Fernbridge to Cock Robin Island) in each of the last 3 years (G. Falxa, pers. comm. 2003).
<b><i>Strix occidentalis caurina</i></b> <b>Northern Spotted Owl</b>	Federal: Threatened  State: Species of Special Concern  FWS: MNBMC	The northern spotted owl is strongly associated with late-successional/old-growth forests. In northern California the spotted owl also occurs in some types of relatively young forests, especially where those forests are structurally	There are 12-14 known spotted owl activity centers in the King Range. BLM has surveyed much of the suitable habitat in conjunction with project related reviews, however there remains unsurveyed habitat.

Table 2-16: Federally and State Listed/Proposed Endangered or Threatened, and BLM Sensitive Wildlife Species

SPECIES	STATUS	PREFERRED HABITAT	OCCURRENCE AND COMMENTS
		similar to late-successional / old-growth forest stands (Solis and Gutierrez 1990).	
<b><i>Chaetura vauxi</i></b> <b>Vaux's Swift</b>	Federal: Species of Concern  State: Species of Special Concern  FWS: MNBMC	Vaux's swifts breed in coastal coniferous forests, with a significant minority now using chimneys in towns and cities. They forage in forest openings, burned-over forest, meadows, rivers, lakes, and suburbia. Nearly all roosts in migration are detected in chimneys (Fix and Bezner 2000).	Vaux's swifts occur in forested habitats of the KRNCA (BLM 2002).
<b><i>Empidonax traillii brewsteri</i></b> <b>Little Willow Flycatcher</b>	Federal: Species of Concern  State: Endangered (includes all subspecies)	Willow flycatchers have been found in riparian habitats of various types and sizes, ranging from small willow-surrounded lakes or ponds with a fringe of meadow, to grasslands, willow lined streams or sapling-dotted boggy areas. They have also been found several times in young regenerating Douglas fir stands in northern Humboldt County, with breeding confirmed in 1998 (D. Fix, pers. comm. 2003).	Willow flycatchers irregularly occur in the KRNCA where they have been detected in riparian and scrubland habitats (BLM 2002).
<b><i>Contopus cooperi</i></b> <b>Olive-sided Flycatcher</b>	Federal: Species of Concern  State: none  FWS: MNBMC	Olive-sided flycatchers breed in extensive conifer forests and stands from near sea level to 9000 feet in elevation. During migration this species occurs in a wide variety of habitats requiring only full-crowned trees (Fix and Bezner 2000). Olive-sided flycatchers are commonly detected near forest openings, burns, ponds, and bogs.	In the KRNCA olive-sided flycatchers uncommonly occur during spring and summer in forest and scrubland habitats (BLM 2002).
<b><i>Empidonax difficilis</i></b> <b>Pacific Slope Flycatcher</b>	Federal: Species of Concern  State: none  FWS: MNBMC	Pacific-slope flycatchers inhabit moist woodlands, mixed forests, low- to middle-elevation coniferous forests, shady, steep-walled canyons and ravines in locations with full shade (Fix and Bezner 2000).	In northern California this species is a common to abundant migrant, summer resident and breeder (Harris 1996). Pacific-slope flycatchers occur in appropriate habitats in the KRNCA.
<b><i>Toxostroma redivivum</i></b> <b>California Thrasher</b>	Federal: Species of Concern  State: none  FWS: MNBMC	California thrashers inhabit chaparral, foothills, and dense shrubs (Udvardy 1998).	California thrashers are uncommon year round residents in the southern portion of the KRNCA (BLM 2002). It is the only location where California thrashers occur in Humboldt County.
<b><i>Dendroica occidentalis</i></b> <b>Hermit Warbler</b>	Federal: Species of Concern  State: none	Within the King Range this species occurs in forestland and scrubland habitats (BLM 2002).	Hermit warblers are common in the KRNCA during the summer breeding season, uncommon during spring and fall and absent in winter (BLM 2002, Harris 1996).

Table 2-16: Federally and State Listed/Proposed Endangered or Threatened, and BLM Sensitive Wildlife Species

SPECIES	STATUS	PREFERRED HABITAT	OCCURRENCE AND COMMENTS
<b>MAMMALS</b>			
<b><i>Corynorhinus townsendii</i></b> <b>Townsend's Big-eared Bat</b>	Federal: None  State: Species of Special Concern	Townsend's big-eared bats are year-round California residents. Individuals are loyal to their natal sites (Pierson et al. 1991, Pierson 1996). Roosts are found within caves, abandoned mines, and buildings. Rock crevices and large snags may also provide habitat for roosting (Howell et al. 1996). Night roosts may occur in more open settings, including under bridges (Philpott 1997).	One active roost site is located in south-eastern Mendocino County (Pierson and Rainy 1994). Three roosts are known in Humboldt County (M.J. Mazurek and D. Purdy, pers. comm. 2003). The largest roost, located on Pacific Lumber Company land in a shack on the Eel River, hosts approximately 400 bats and is unusual in that it is used in consecutive years. A smaller roost of about 40 adult bats occurs in Grizzly Creek Redwoods State Park. At this location, bats roost in basal tree hollows. Deficient information within the King Range is due to lack of survey effort.
<i>Martes pennanti pacificus</i> Pacific Fisher	Federal: None  State: Species of Special Concern  BLM: Sensitive	Pacific fishers prefer late successional forests, especially for resting and denning, and occur most frequently where these forests have the fewest non-forested openings (Arthur et al. 1989, Thomasma et al. 1991, Powell 1993, Powell and Zielinski, 1994). The presence of a dense, continuous shrub layer is an important habitat element for fishers in the Pacific northwest (K. Zielinski, pers. comm. 2003)	No fishers were detected during surveys conducted using Trailmaster infra-red trip cameras at fourteen baited stations in the BLM Arcata Management Area, including the King Range Management Area, in 1999 and 2000 (Hawks 2000).
<b><i>Eumetopias jubatus</i></b> <b>Steller's Sea Lion</b>	Federal: Threatened  State: None  NMFS: Protected by Marine Mammal Protection Act	Steller's sea lions inhabit rocky shores and nearshore coastal waters (Whitaker 1998). They usually feed at night in water less than 180m deep within 15-25 km of shore (Whitaker 1998).	There are two major haul-out areas used by Steller's sea lions in the King Range vicinity; Seal Rock, just north of the Mattole River Mouth at Cape Mendocino, and Sea Lion Rock, located approximately 5 miles south of the Mattole River Mouth; breeding is suspected.

Species in **bold type** indicate known presence in the project area.

## 2.9.2 Wildlife Management Issues/Practices

### 2.9.2.1 Threatened and Endangered Species Monitoring and Management

Since the listing of various species, BLM has conducted protocol level surveys for three of the listed species: snowy plover, marbled murrelet, and spotted owl.

### Snowy Plover

Breeding season snowy plover surveys have taken place monthly at the mouth of the Mattole River and along gravel bars in the lower reaches of the river for the past four years. No snowy plovers have been detected, although there are historical records of detections during the winter season.

### Marbled Murrelet

Given the extreme difficulty of finding nests, the Pacific Seabird Group developed a protocol for surveying for marbled murrelets at inland sites (Ralph et al. 1994, Evans et al. 2002) that included classification of forest stands based on the behavior of birds. Certain behaviors, including murrelets flying below the canopy, indicate an “occupied” stand. These occupied stands are treated as if they were nesting stands or activity sites. Protection guidelines and additional life history information presented in the Pacific Seabird Group protocol provide the basis for management of occupied stands. Forests supporting marbled murrelets are generally protected.

Between 1994 and 1999, BLM and Humboldt State University qualified personnel conducted 281 station-visits to attempt to detect marbled murrelets in the King Range. Approximately 3,231 acres of the best potential suitable marbled murrelet habitat out of a total of 7,356 of potential suitable habitat in the KRNCA was surveyed to current protocol. One visual fly-over detection in the Squaw Creek watershed (just north of North Slide Peak) was documented in 1995.

### Spotted Owl

BLM is conducting protocol surveys of suitable habitat for baseline population information and to determine occupancy and status of owls in relation to proposed projects. Areas of unsurveyed suitable habitat remain and will be addressed by continued surveys (see Figure 2-12). Approximately twelve to fourteen spotted owl activity centers are known in the KRNCA. No timber harvests take place in these activity centers. The FWS is consulted on other project related activities in or near these activity centers.

#### *2.9.2.2 Management Issues Involving Non-Sensitive Species*

### Black Bear

In recent years black bear (*Ursus americanus*) encounters have increased and become a visitor safety issue, especially along the Lost Coast Trail. This is partially due to the amount of refuse at the high use sites such as Big Flat. The BLM has implemented a program to reverse this trend. It includes requiring visitors to use a hard-side, bear-proof food storage container for storing food, trash, toiletries (e.g., soap, sunscreen, toothpaste), and other scented items. BLM has arranged rental canisters at the King Range Visitor Center, the Arcata Field Office, Shelter Cove Campground and Deli, and the Petrolia Store. To facilitate this policy BLM has posted information about bears and the canisters on the King Range website, field offices, and at trailhead kiosks.

FIGURE 2-12: SUITABLE SPOTTED OWL HABITAT

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### Roosevelt Elk

Historically, Roosevelt elk (*Cervus canadensis roosevelti*) naturally occurred in the King Range. Typically they prefer meadows for foraging but will forage in forested areas. A herd of Roosevelt elk was successfully introduced in 1983, and has become well established. This herd occupies the Sinkyone State Park and southern portion of the King Range. Although Roosevelt elk have made a remarkable recovery, this species remains extirpated throughout the majority of its historical range.



*Roosevelt elk are often seen at Hidden Valley in the southern part of the KRNCA.*

The public has great appreciation for this species and values its role in the ecosystem as a native large herbivore. Problems occur when elk interact with people or destroy personal property. Introducing elk to an isolated location in the middle of the King Range, near Big Flat, has been suggested as a way to reduce the interaction of the local residents with the elk. An introduction was planned but not implemented in this area in the 1980s. Currently, the California Department of Fish and Game (CDFG) is not considering additional introductions of out-of-state elk into California because of concerns regarding diseases, such as chronic wasting disease and brucellosis. Current state policy for northwestern California is to allow existing elk populations (Prairie Creek, Sinkyone) to expand naturally and repopulate their historic range. Although the Sinkyone herd has not expanded north into the KRNCA, the Prairie Creek herd has expanded significantly southward and eastward with elk now being reported as far south as Carlotta, approximately twenty miles northeast of the KRNCA. State biologists anticipate that this expansion will continue into additional suitable habitat (J. Dayton, pers. comm. 2003).

### Columbia Blacktail Deer

Columbia blacktail deer (*Odocoileus hemionus columbianus*) are found throughout the King Range. They feed on leaves, buds, twigs, and grass and are found in all vegetation types in the planning area. The rut, or breeding season, begins in October in coastal Humboldt County. Although no specific data exists for the KRNCA, deer populations in Humboldt County are healthy and stable (J. Dayton, pers. comm. 2003).

### Other Species

Surveys for martens (*Martes americana*) and fishers (*Martes pennanti*) were conducted in 1999 and 2000 using Trailmaster infra-red trip cameras at fourteen baited stations in King Range. The baited camera stations did not detect fisher or marten in the King Range area (Hawks 2000). As discussed earlier, the forested habitats of the King Range are dominated by Douglas fir and tanoak, a relatively dry habitat structurally similar to inland habitats which are not typically used by fishers or martens. The amount of suitable habitat for fishers and martens within the King Range is limited; furthermore each individual requires large areas of late successional/old growth habitat for their home range. There is not enough suitable habitat within the King Range to support a population of either fishers or martens, although they may occur in old growth habitats within the neighboring Humboldt Redwoods State Park.

Two non-native species occurring within/surrounding the King Range are of interest to game hunters. Texas turkey (*Meliagris gallopavo intermedia*) was introduced to the King Range as a game species in the early 1980s (BLM 1996). Although turkeys inhabit the eastern edge of the KRNCA, suitable habitat is limited. Similarly, wild pigs (*Sus scrofa*) occupy the oak woodlands on private lands surrounding the KRNCA, but almost no habitat is found within the King Range itself.

#### *2.9.2.3 Hunting/Fishing/Collecting*

The BLM manages fish and wildlife habitat in a manner consistent with CDFG regulations for all applicable fish and game species found in the King Range. The King Range Act states that “The Secretary shall permit hunting and fishing on land and waters under the jurisdiction within the boundaries of the recreation area in accordance with the applicable laws of the United States and the State of California, except that the Secretary may designate zones where, and establish periods when, no hunting or fishing shall be permitted for reasons of public safety, administration, fish and wildlife management, or public use and enjoyment. Except in emergencies, any regulations of the Secretary pursuant to this section shall be put into effect only after consultation with the appropriate State fish and game department.”

Seasonal and geographical regulations for fish and game species in the King Range are set by the state. Deer season is the most popular hunt. The King Range falls within the B-4 zone under CDFG Hunting Regulations. The hunting season in B zones runs from late September until late October. However, the season in the B-4 Zone was changed to run from late August until late September so that the hunting would end prior to the rut which occurs earlier along the coast than in the inland parts of the B Zone.

Additional wildlife game species hunted in the King Range are wild turkey (*Meleagris gallopavo*), blue grouse (*Dendragapus obscurus*), California quail (*Callipepla californica*), mountain quail (*Oreortyx pictus*), western gray squirrel (*Sciurus griseus*), and black bear (*Ursus americanus*). Furbearing species hunted are gray fox (*Urocyon cinereoargenteus*) and raccoon (*Procyon lotor*); a special trapping license is required if dogs are used to hunt these animals. Turkey and deer hunting occurs mostly in the northern portion of the King Range. Few bear are hunted annually.

A limited amount of surf fishing occurs along the coast during the permitted seasons. All of the coastal streams and much of the Mattole River are closed to fishing to protect salmon and steelhead populations.

Portions of the lower Mattole are open to catch and release steelhead trout fishing. Shelter Cove is a very popular port for ocean sportfishing for both bottomfish and salmon.

Abalone diving/collection occurs mostly south of the Mattole River to Punta Gorda Lighthouse, from various coastal access points in Shelter Cove, and principally in Mal Coombs Park. Some abalone diving also occurs along reefs offshore from the King Range, accessed from boats.

#### 2.9.2.4 Migratory Birds

Of the approximately 900 migratory birds occurring in the United States, 122 were selected species of management concern at the national level; known as the U.S. Fish and Wildlife Service Migratory Nongame Birds of Management Concern (MNBMC), migratory bird species on this list occur within the KRNCA and contiguous lands. Birds on the MNBMC list known to occupy the King Range (either presently or historically) include white-tailed kite (*Elanus leucurus*), peregrine falcon (*Falco peregrinus anatumi*), western snowy plover (*Charadrius alexandrinus nivosus*), northern spotted owl (*Strix occidentalis caurina*), Vaux's swift (*Chaetura vauxi*), olive-sided flycatcher (*Contopus cooperi*), Pacific slope flycatcher (*Empidonax difficilis*), and California thrasher (*Toxostoma redivivum*).

## 2.10 TERRESTRIAL ECOSYSTEMS AND VEGETATION

### 2.10.1 Introduction

The KRNCA consists of habitats that are both structurally and compositionally diverse. Steep coastal ridges that bar most coastal fog incursion, plus the prevailing easterly winds, help to create and maintain an unusual mosaic of plant communities and species assemblages. As a result, the area hosts a number of rare species, some of whom are almost entirely restricted to the King Range. Such a large block of coastal habitat is rare in California and the Pacific coast of North America at large. The rugged nature of the King Range and its remote location have discouraged high levels of development or timber extraction from the area, and have also protected it from much exotic vegetation establishment, and thus maintained a high level of integrity for these ecosystems.

### 2.10.2 Applicable Regulatory Framework

The 1994 Northwest Forest Plan amended all Federal land use plans, including the King Range plan, and established land allocations and standards/guidelines for management of habitat for late-successional and old-growth related species within the range of the northern spotted owl, including the KRNCA. All BLM actions are also subject to the requirements of the National Environmental Policy Act, Clean Water Act, Migratory Bird Treaty Act, and must be in accordance with the legal requirements set forth under Section 7 of the Endangered Species Act (16 U.S.C. 1536 (c)).

### 2.10.3 Habitat Types

Dominant habitat types found throughout the King Range consist of mixed evergreen and coniferous forests, chaparral, coastal scrub, coastal dunes, and coastal prairies (see Figure 2-13). Each of these is described in greater detail below. The discussion of these habitat types is consistent with Holland's *List of*

*California Terrestrial Natural Communities Recognized by the California Natural Diversity Database (1999) and Sawyer and Keeler-Wolf's Manual of California Vegetation (1995).*

### 2.10.3.1 Forested Habitats

The forested habitats in the King Range transition into grassland habitats in the north and chaparral habitats in the south to form a complex vegetation mosaic. Upland forested habitats within the King Range can be categorized as Douglas fir, Douglas fir-Tanoak, Tanoak, and Canyon Live Oak vegetation (Sawyer and Keeler-Wolf 1995). Plant species composition consists primarily of Douglas fir (*Pseudotsuga menziesii*), tanoak (*Lithocarpus densiflorus*), canyon live oak (*Quercus chrysolepis*), and madrone (*Arbutus menziesii*) in the overstory, with scattered sugar pine (*Pinus lambertiana*) at higher elevations. Knobcone Pine (*Pinus attenuate*) stands are found on drier sites in the southern part of the King Range, while Grand Fir (*Abies grandis*) occupies wetter sites on Prosper Ridge and in the Mill Creek drainage. Stand structural diversity varies throughout the King Range, as does species dominance in each vegetative stratum, and stands are often composed of two or more distinct canopy strata. Canopy height varies substantially from less than 30 meters in some locations to over 70 meters. Douglas fir is the predominant overstory and emergent tree species on the western slope with sugar pine as a co-dominant at higher elevations, whereas tanoak is the dominant forest species on the eastern slope. Tanoak, canyon live oak, madrone, and California bay (*Umbellularia californica*) dominate other forest canopy strata, and understory vegetation typically consists of evergreen huckleberry (*Vaccinium ovatum*), salal (*Gaultheria shallon*), sword fern (*Polystichum munitum*), and younger individuals of overstory species.

Various forest successional stages (i.e., pole; early-, mid-, and late- mature; and old-growth) are represented throughout the King Range and result from a combination of natural (e.g., fire, landslides, and other disturbance events) and anthropogenic (e.g., timber harvest or salvage operations) causes. On the western slope of the King Range, forested habitats are largely undisturbed due to the difficulty in accessing this area. Historically timber was extracted primarily from portions of the eastern slope of the King Range mostly during the 1950s and 1960s prior to the land being acquired by the federal government.

Douglas fir habitat supports a high abundance of wildlife (Mayer and Laudenslayer 1988). A number of amphibians do well in this habitat type, including the northwestern salamander, Pacific giant salamander, Olympic salamander, black salamander, clouded salamander, tailed frog, and ensatina salamander. Northwest coastal coniferous forests reportedly support higher bird densities than any other forest type in North America (Weins 1975, reprinted in Mayer and Laudenslayer 1988). Typical bird species include western flycatcher, chestnut-backed chickadee, golden-crowned kinglet, Hutton's vireo, solitary vireo, hermit warbler, varied thrush and spotted owl. Common mammals include deer mouse, dusky-footed woodrat, western red-backed vole, creeping vole, Douglas' squirrel, Trowbridge's shrew, and shrew mole.

FIGURE 2-13: DOMINANT HABITAT TYPES

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Late mature Douglas fir forest in Honeydew Creek drainage.

Small areas of coastal oak woodland habitats occur on the eastern edge of the KRNCA, with more extensive acreage on adjoining private lands in the Mattole Valley. This habitat type is home to at least sixty mammal species and 110 bird species (Mayer and Laudenslayer 1988), many of which include acorns for their diet. Several woodpecker species utilize this habitat, especially the acorn woodpecker. Acorn woodpeckers store acorns in granary trees, with the same tree often shared by a family for several generations. Western scrub jays similarly store or cache acorns that are often forgotten and end up germinating. California quail and wild turkeys also rely heavily on acorns during fall and winter. Many rodent species, such as dusky-footed woodrat and western gray squirrels, cache acorns, and deer and black bear also consume them. Oak woodland is also a rich habitat for herpetofauna, supporting approximately 20 reptile and amphibian species; the arboreal salamander, skinks, gopher snake, and slender salamander are common (Mayer and Laudenslayer 1988).

Vegetation associated with forested riparian areas is characterized as the Red Alder Series (Sawyer and Keeler-Wolf 1995). This series colonizes substrates that are seasonally or permanently flooded or saturated, such as along the margins of perennial and ephemeral watercourses, and in some forests on the immediate coastline. Even-aged stands of deciduous tree species such as red alder (*Alnus rubra*) are typical of these habitats, with sword fern (*Polystichum munitum*), chain fern (*Woodwardia fimbriata*), and other herbs and shrubs dominating the understory. Such riparian habitats provide food, nesting, and migration/dispersal corridors for many wildlife species. Black salamander, tailed frog, and rubber boa are common herpetofauna (CWHR 2001). Common bird species include Anna's hummingbird, yellow-breasted chat, California yellow warbler, winter wren, orioles, black-headed grosbeak, and many other song birds. Typical mammals include Virginia opossum, skunks, raccoon, gray fox, and river otter (CWHR 2001).

### 2.10.3.2 Grassland Habitats

The grasslands that occur in the northern portion of the King Range and extend south along the coastline are characterized as coastal prairie and coastal terrace prairie by the California Natural Diversity Database (Holland 1999). These prairies exist on marine terraces within and beyond the zone of coastal fog incursion, and are typically underlain by sandy loams. The vegetation forms dense grasslands, usually less than one meter in height, composed predominantly of sod/tussock-forming perennial grasses in the California Oatgrass, Idaho Fescue, Pacific Reedgrass, Introduced Perennial Grassland, and California Annual Grassland Series (Sawyer and Keeler-Wolf 1995). These vegetation series are dominated by both native perennial grasses such as California oatgrass (*Danthonia californica*), Pacific reedgrass (*Calamagrostis*

*nutkaensis*), seaciff bluegrass (*Poa unilateralis*), and non-native annual and perennial grasses such as velvet grass (*Holcus lanatus*), hairy oatgrass (*Danthonia pilosa*), hedgehog dogtail (*Cynosurus echinatus*), bromes (*Bromus* spp.), and fescues (*Festuca* spp.). Isolated islands of native stands of Idaho fescue (*Festuca idahoensis*) and California melic (*Melica californica*) also exist along the coast and represent rare examples of remnant, unaltered coastal prairies.

The southern extension of the grasslands along the coast is periodically interrupted by coastal scrub and forested habitats. Introduced perennial grasses often inhabit mesic meadows and non-native annual species tend to favor more xeric and disturbed sites in these grasslands.

Herpetofauna typical of grasslands include red-legged frog, Pacific tree frog, western fence lizard, common garter snake, and western rattlesnake (Mayer and Laudenslayer 1988). Birds that commonly breed within this habitat include savannah sparrow and western meadow lark. Grasslands are important foraging habitat for the turkey vulture, northern harrier, American kestrel, white-tailed kite, peregrine falcon, as well as many song birds. Mammals that utilize this habitat include the black-tailed jackrabbit, Roosevelt elk, striped skunk, California vole, pocket gopher, and coyote.

#### 2.10.3.3 Chaparral Habitats

Chaparral habitats in the King Range often occur along ridge-tops and other dry sites, where moisture availability is insufficient to support forested vegetation. These habitats are comprised of dense stands of fire-adapted plant communities such as those characterized as Blue Blossom, Manzanita, Chaparral Whitethorn, and Wedgeleaf Ceanothus Series (Sawyer and Keeler-Wolf 1995). Species such as manzanita (*Arctostaphylos* spp.), and ceanothus (*Ceanothus* spp.) dominate this habitat, where the vegetation rarely exceeds three meters in height. Chaparral often hosts species adapted for sites with unique or unusual edaphic conditions.

Shrubs within this habitat provide important shade during hot weather and moderate protection from wind and temperature in winter. Herpetofauna include Pacific tree frog, fence lizard, gopher snake, and rattlesnake. Birds common in chaparral habitats include turkey vulture, red-tailed hawk, California quail, and Anna's hummingbird. Elk, deer, brush rabbits, black-tailed jackrabbit, squirrel, voles, coyote, and striped skunk all utilize chaparral habitats.

#### 2.10.3.4 Coastal Scrub Habitats

Coastal scrub habitats within the King Range are often found adjacent to coastal prairies or covering steep rocky terrain on the immediate coastline. Three main vegetative series can be found in the coastal scrub habitats of the King Range: Coyote Brush, Salal-Black Huckleberry, and Pacific Reedgrass Series (Sawyer and Keeler-Wolf 1995). Dominant species of this habitat type include coyote brush (*Baccharis pilularis* ssp. *consanguinea*), salal (*Gaultheria shallon*), evergreen huckleberry (*Vaccinium ovatum*), California blackberry (*Rubus ursinus*), Pacific reedgrass (*Calamagrostis nutkaensis*), and poison oak (*Toxicodendron diversilobum*). The vegetation in these habitats is dense, typically less than two meters in height, and potentially represents an intermediate vegetative successional stage. Currently, the only land use issues affecting the coastal scrub habitats are recreation and grazing.

The herpetofauna assemblage in coastal scrub is similar to surrounding habitats and may include Pacific tree frog, western fence lizard, common garter snake, and western rattlesnake. Bird species occurring in this habitat type include the California thrasher. Common mammals include fox, raccoon, and skunk.

#### 2.10.3.5 Coastal Dune Habitats

The coastal dune habitat found at the mouth of the Mattole River represents a rare scenario, as European beachgrass (*Ammophila arenaria*), a common exotic invader along much of the Pacific coastline, has not yet become established. The vegetation supported by the unstable dunes is characterized as the Sand-Verbena-Beach-Bursage Series (Sawyer and Keeler-Wolf 1995). Mat-forming species assemblages include seashore bluegrass (*Poa macrantha*), beach sweet pea (*Lathyrus littoralis*), beach evening primrose (*Camissonia cheiranthifolia*), yellow sand verbena (*Abronia latifolia*), beach bursage (*Ambrosia chamissonis*), and the rare beach layia (*Layia carnosae*). Such habitats are often threatened by substrate stabilization caused by the establishment of non-native vegetation such as European beachgrass. Consequently this habitat is often associated with a sensitive flora. The dune habitats found at the mouth of the Mattole River are affected by human use as it is a popular area for coastal access and recreation.

Dune habitat is utilized by a diversity of fauna. Herpetofauna include Pacific tree frog and red-legged frog. Falcons, hawks, vultures, and owls hunt over the area; black-tailed jackrabbits, brush rabbits, striped skunks, porcupines, raccoons, gray foxes, deer mice, and Western harvest mice forage on dune vegetation.

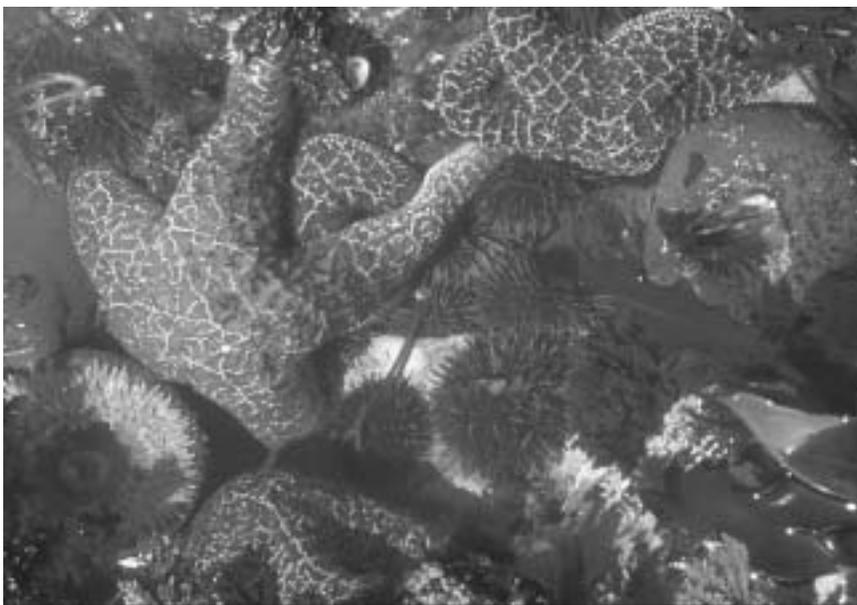
#### 2.10.3.6 Coastal Beach Habitat

Coastal beach habitat is located on the immediate coastline, between the mean high tide line and the water, where abiotic factors, rather than stabilizing vegetation, influence the landscape. High winds, waves, cyclic tidal inundation, and sand transport by littoral action restrict vegetative growth in this zone. Western and least sandpipers and semipalmated plovers commonly occur on fresh water pond edges and the beach waveslope. Other shorebirds such as whimbrel, sanderling, long-billed curlew, and marbled godwit forage along the wet sand of the waveslope. Western, California, and many other gull species commonly forage along the wrack line and roost on the waveslope. Brown pelicans and terns commonly utilize coastal beaches. Harbor seals and sea lions may haul out anywhere along the waveslope but prefer the larger intertidal and offshore rock outcrops.

#### 2.10.3.7 Rocky Intertidal Habitat

The plants and animals that live in the rocky intertidal habitat must withstand pounding waves and, when the tide is out, hours of dryness. During low tide, small pools remain between the rocks. Animals such as crabs, anemones, urchins, abalone, snails, mussels, and barnacles thrive in this habitat. There are also many kinds of seaweed. When the tide comes in, larger animals like fish take advantage of the shelter and food these rocky settings provide.

Many of the rocks that are overwashed during high tide and heavy sea events are important feeding sites for black oystercatchers and a suite of wintering and migrating shorebirds such as black turnstones, surfbirds, wandering tattlers, whimbrels and, rarely, rock sandpipers. Brown pelicans, harbor seals, and sea lions commonly occur in these areas.



*The intertidal habitat along the King Range coastline is very rich and diverse.*

The intertidal zone is subject to extensive foot traffic which has the potential to cause resource damage. Recreation users access the tidepools, especially those in Shelter Cove, to view the readily visible marine life. The tidepools are also accessed extensively by abalone hunters. Harvest of abalone, mussels and other marine invertebrates as well as fish and marine vegetation are regulated by CDFG. Although no formal species surveys have been completed, the tidepools along the King Range Coastline are thought to be some of the most diverse on the California Coast (interview with Eileen Wolfe, Marine Biologist, 1998).

#### 2.10.4 Vegetation—Existing Conditions/Species

Thirty-one sensitive botanical species are known to occur within the King Range, including one endangered species. Table 2-17 lists their names, status, preferred habitat types and occurrence or blooming period in the planning area. In addition, several species are listed which have not been documented in the KRNCA but the habitats they rely on has; they are included in this plan because they may yet be found in the area. Species names in the chart in **bold type** indicate known presence in the project area.

Table 2-17: Federally and State Listed/Proposed Endangered or Threatened, and BLM Sensitive Botanical Species

SPECIES	STATUS	PREFERRED HABITAT	OCCURRENCE / BLOOMING PERIOD
<b>VASCULAR PLANTS</b>			
<i>Astragalus pycnostachyus</i> var. <i>pycnostachyus</i> <b>Coastal Marsh Milk Vetch</b>  Family: Fabaceae	Federal: None State: None BLM: Sensitive CNPS: List 1B	Coastal salt marshes or seeps <30m. Coastal dunes (mesic), marshes and swamps (coastal salt, stream sides); 0-30m.	The coastal marsh milk vetch was previously thought to have been extirpated from Humboldt County. It is currently known in Humboldt County from a single documented occurrence near the mouth of the Mattole River, and from fewer than ten occurrences in Marin and San Mateo Counties.  Blooms April – October
<i>Calamagrostis foliosa</i> <b>Leafy Reedgrass</b>  Family: Poaceae	Federal: None State: Rare BLM: None CNPS: List 4	<i>Calamagrostis foliosa</i> (leafy reedgrass) is a tufted perennial grass < 1 meter tall, found growing in coastal scrub and coniferous forest plant communities from Mendocino, Humboldt, and Del Norte counties. <i>C. foliosa</i> is often found growing in rocky substrates below 1,220 meters.	The majority of the documented locations of this species occur along the coast in the King Range.
<i>Castilleja affinis</i> ssp. <i>littoralis</i> <b>Oregon Coast Indian Paintbrush</b>  Family: Scrophulariaceae	Federal: None State: None BLM: None CNPS: List 2	Coastal bluff scrub, coastal dunes, coastal scrub/ sandy; 15-100m. The distribution of <i>C. affinis</i> ssp. <i>littoralis</i> occurs in Mendocino, Humboldt, and Del Norte counties, and extends into Oregon.	Currently this species is known to occur in the vicinity of the King Range. Appropriate habitat exists throughout the coastal portion of the King Range and a historical occurrence was reported near the mouth of the Mattole River.  Blooms June
<i>Castilleja mendocinensis</i> <b>Mendocino Coast Indian Paintbrush</b>  Family: Scrophulariaceae	Federal: None State: None BLM: Sensitive CNPS: List 1B	Known only from coastal habitats in southern Humboldt and northern Mendocino counties. Specific habitat includes coastal bluffs, scrub, prairie, dune, and closed-cone coniferous forests, below 160 meters in elevation.	Although no occurrences of the Mendocino coast Indian paintbrush have been found within the King Range, the species has been documented on adjacent lands in habitat types that also occur throughout the King Range.  Blooms April - August
<i>Epilobium septentrionale</i> <b>Humboldt County Fuchsia</b>  Family: Onagraceae	Federal: None State: None BLM: None CNPS: List 4	<i>E. septentrionale</i> is generally found growing in sandy or rocky soils growing in forests dominated by both coniferous and/or broad-leaved species between 45 and 1,800 meters.	Many of the known occurrences for this species of the Humboldt County fuchsia have been documented along the Lost Coast Trail in the King Range and it is known from other locations in Mendocino and Trinity Counties.  Blooms July and September
<i>Gilia capitata</i> ssp. <i>pacifica</i> <b>Pacific Gilia</b>  Family: Polemoniaceae	Federal: None State: None BLM: Sensitive CNPS: List 1B	The preferred habitats for the Pacific gilia are coastal scrub and prairies below 300 meters. The distribution of <i>G. capitata</i> ssp. <i>pacifica</i> ranges from Mendocino,	This species is known to occur in the vicinity, and appropriate habitat exists throughout the coastal portions of the King Range, though it has not been

Table 2-17: Federally and State Listed/Proposed Endangered or Threatened, and BLM Sensitive Botanical Species

SPECIES	STATUS	PREFERRED HABITAT	OCCURRENCE / BLOOMING PERIOD
		Humboldt, and Del Norte counties, and extends north into Oregon.	documented within the King Range. Annual herb, blooms May-August
<b><i>Gilia millefoliata</i></b> <b>Dark-eyed Gilia</b> Family: Polemoniaceae	Federal: None State: None BLM: Sensitive CNPS: List 1B	<i>Gilia millefoliata</i> occurs in coastal dunes; 2-20m.	It has been documented in its preferred habitat within the King Range. Thought to be extirpated from San Francisco County, <i>G. millefoliata</i> ranges north through Marin, Sonoma, Mendocino, Humboldt and Del Norte counties in California, and into Oregon.  Blooms April-July
<i>Lathyrus palustris</i> Marsh Pea Family: Fabaceae	Federal: None State: None BLM: None CNPS: List 2	This species is restricted to wetland habitats and mesic coastal environments, below 100 meters in northern California, Oregon, Washington, and elsewhere. It is listed as an obligate wetland species in California according to the U.S. Fish and Wildlife Service (National Wetlands Inventory 1997).	In California, occurrences of this species are limited to Del Norte and Humboldt Counties. It has been documented near Shelter Cove, and although limited habitat does exist, marsh pea is not known to occur within the King Range.  Blooms March – August
<b><i>Layia carnosa</i></b> <b>Beach layia</b> Family: Asteraceae	Federal: Endangered State: Endangered BLM: Sensitive CNPS: List 1B	<i>Layia carnosa</i> (beach layia) inhabits coastal dunes and scrub habitats below 60 meters in elevation. This species is typically restricted to dune mat and foredune plant communities, but also occurs in lower densities along margins of lupine scrub, herbaceous hollows, trails, and open areas with moving sand.	Beach layia is only known to occur in Monterey, Marin, and Humboldt counties, and has been documented near the mouth of the Mattole River in the King Range.  Blooms May – June
<i>Lilium occidentale</i> Western Lily Family: Liliaceae	Federal: Endangered State: Endangered BLM: Sensitive CNPS: List 1B	The preferred habitat of the western lily consists of openings in coniferous forests, freshwater bogs, fens, and marshes, in addition to coastal habitats such as bluffs, scrub and prairies below 185 meters in elevation. Reedgrass ( <i>Calamagrostis nutkaensis</i> ) is a common dominant plant species often found in association with <i>L. occidentale</i> .	Western lily is known only from Humboldt and Del Norte Counties in California and southern Oregon. It has not been documented in the King Range (closest verified occurrence is Table Bluff), but suitable habitat exists throughout the King Range. Threats include development, herbivory, grazing, vegetative succession, and horticultural collection.  Blooms June and July
<b><i>Lilium rubescens</i></b> <b>Redwood Lily</b> Family: Liliaceae	Federal: None State: None BLM: None CNPS: List 4	Appropriate habitat for <i>Lilium rubescens</i> (redwood lily) includes chaparral and forests dominated by both broad-leaved and/or coniferous species. The redwood lily apparently can tolerate serpentine soils.	<i>L. rubescens</i> is believed to have been extirpated from Santa Cruz County, and currently its distribution extends from Sonoma County, north to Del Norte, and inland into Shasta County. Urbanization, horticultural

Table 2-17: Federally and State Listed/Proposed Endangered or Threatened, and BLM Sensitive Botanical Species

SPECIES	STATUS	PREFERRED HABITAT	OCCURRENCE / BLOOMING PERIOD
			collection, and grazing have been implicated in <i>L. rubescens</i> becoming increasingly rare in the southern portion of its range. Within the King Range the redwood lily is known to inhabit upland habitats.  Blooms June - August
<i>Mitella caulescens</i> Leafy-Stemmed Mitrewort  Family: Saxifragaceae	Federal: None State: None BLM: None CNPS: List 2	<i>Mitella caulescens</i> inhabits mesic shaded areas in meadows, and coastal and lower montane forests dominated by both broad-leaved and/or coniferous species between 610 and 1,700 meters.	To date, <i>M. caulescens</i> has not been documented within the King Range, although it is known to occur in the vicinity, including the Sinkyone Wilderness State Park. It has also been reported from elsewhere in California (i.e., Del Norte, Humboldt, Mendocino, Siskiyou, and Tehama Counties) in addition to Oregon and Idaho.  Blooms May -July
<i>Montia howellii</i> Howell's Montia  Family: Portulacaceae	Federal: None State: None BLM: None CNPS: List 2	Howell's montia inhabits vernally mesic sites below 600 meters on compacted soils such as vernal pools, roadsides, and cattle tracks. Known suitable habitat for <i>M. howellii</i> includes wet meadows, seeps, and north coast coniferous forests	Suitable habitat is abundant in the King Range. Although this species has not been documented within the King Range, there are multiple occurrences reported from the vicinity. Threats include road maintenance and construction and activities associated with timber harvest operations.  Blooms March through May
<i>Oenothera wolfii</i> Wolf's Evening Primrose  Family: Onagraceae	Federal: None State: None BLM: Sensitive CNPS: List 1B	<i>Oenothera wolfii</i> is known to occur in mesic, sandy soils below 800 meters in coastal bluff scrub, dune, and prairie habitats, and has also been reported from lower montane coniferous forests. This species is found along roadsides and consequently such occurrences are threatened by road maintenance and foot traffic.	This species is not known to occur in the King Range, but has been documented in the vicinity. The distribution of <i>O. wolfii</i> extends from Humboldt County north into Del Norte County and Oregon, and east into Trinity County.  Blooms May-October
<b><i>Sidalcea malachroides</i></b> <b>Maple-leaved</b> <b>Checkerbloom</b>  Family: Malvaceae	Federal: None State: None BLM: Sensitive CNPS: List 1B	Maple-leaved checkerbloom can be found below 700 meters on sandstone soils in coastal prairie, coastal scrub, broadleaved and/or coniferous forests, and in disturbed areas.	The distribution of this species is restricted to coastal regions in northern California and is thought to have been extirpated from southern Oregon. In California <i>S. malachroides</i> occurs from Santa Clara County, north to Del Norte County. It occurs in the King Range near the mouth of the Mattole River and associated public facilities.

Table 2-17: Federally and State Listed/Proposed Endangered or Threatened, and BLM Sensitive Botanical Species

SPECIES	STATUS	PREFERRED HABITAT	OCCURRENCE / BLOOMING PERIOD
			Blooms April – August
<i>Sidalcea malviflora</i> ssp. <i>patula</i> Siskiyou Checkerbloom  Family: Malvaceae	Federal: None State: None BLM: Sensitive CNPS: List 1B	Habitat associated with known occurrences includes open coastal coniferous and broad-leaved forests below 700 meters, and coastal bluffs, scrub, and prairies.	Although not known from the King Range, this species does occur in the vicinity, and appropriate habitat occurs within the study area.  Blooms May – June
<b>BRYOPHYTES</b>			
<i>Anomobryum filiforme</i>  Family: Bryaceae	Federal: None State: None BLM: None CNPS: List 2	Suitable habitat for this species consists of mesic sites in upland forests dominated by coniferous and/or broadleaved species. <i>A. filiforme</i> can be found growing on moist rock and soil on outcrops, escarpments, and roadcuts between 100 and 1000 meters.	This species is not known from the King Range, but has been reported from the vicinity and is known to occur in Humboldt and Santa Cruz Counties in California, Oregon, and elsewhere.
<b>FUNGI</b>			
<i>Cantharellus subalbidus</i> <b>White Chanterelle</b>  Family: Cantharellaceae	Federal: None State: None BLM: S&M Category D	This fungus species produces “fruiting bodies” from late summer through early winter that are highly sought after for human consumption. Exposed ridges and coastal mountains are a preferred habitat for <i>C. subalbidus</i> . Common vascular plant associates include manzanita ( <i>Arctostaphylos</i> spp.), madrone ( <i>Arbutus menziesii</i> ), and tanoak ( <i>Lithocarpus densiflorus</i> ).	<i>C. subalbidus</i> occurrence has been documented in suitable habitat of the King Range.
<i>Craterellus tubaeformis</i> <b>Funnel Chanterelle</b>  Family: Cantharellaceae	Federal: None State: None BLM: S&M Category D	<i>Craterellus tubaeformis</i> is a fungus that is often collected for human consumption. This species can be found growing in humus, moss, or rotting wood in coniferous forests from late summer, and into winter.	<i>C. tubaeformis</i> occurrence has been documented in suitable habitat of the King Range.
<i>Choiromyces venosus</i> ( <i>Fries</i> ) <i>Th. Fries</i> <b>Hard Truffle</b>  Family: Tuberaceae	Federal: None State: None BLM: S&M Category B	This species is often associated with Douglas fir, western hemlock ( <i>Tsuga heterophylla</i> ), and other members of the Pinaceae.	<i>C. venosus</i> occurrence has been documented in suitable habitat of the King Range.
<i>Clavariadelphus pistillaris</i> <b>Common Club Coral</b>  Family: Clavariaceae	Federal: None State: None BLM: S&M Category B	This species produces sporocarps during the winter months and is predominantly found under hardwoods.	<i>C. pistillaris</i> occurrence has been documented in suitable habitat of the King Range.
<i>Otidea leporina</i> ( <i>Batsc:Fries</i> ) <i>Fuckel</i> <b>Rabbit Ears</b>  Family: Otideaceae	Federal: None State: None BLM: S&M Category D	<i>Otidea leporina</i> is a cup-fungus that forms “ear-shaped” sporocarps between October and December. This species is typically associated with Douglas fir, western hemlock, and spruce ( <i>Picea</i> spp.) and assists in the decomposition of organic material.	<i>O. leporina</i> occurrence has been documented in suitable habitat of the King Range.
<i>Phaeocollybia californica</i>	Federal: None	<i>Phaeocollybia californica</i> is a fungus	<i>P. californica</i> occurrence has been

Table 2-17: Federally and State Listed/Proposed Endangered or Threatened, and BLM Sensitive Botanical Species

SPECIES	STATUS	PREFERRED HABITAT	OCCURRENCE / BLOOMING PERIOD
<b><i>A.H. Smith</i> (= <i>P. scatesiae</i>) <i>Phaeocollybia</i></b> Family: Cortinariaceae	State: None BLM: S&M Category B	that produces sporocarps (mushrooms) in March, May, October, and November. Common associates are Pacific silver fir ( <i>Abies amabilis</i> ), Sitka spruce ( <i>Picea sitchensis</i> ), Douglas fir, and western hemlock. <i>P. californica</i> is presumed to be an ectomycorrhizal associate with members of the Pinaceae.	documented in suitable habitat of the King Range.
<b><i>Phaeocollybia kauffmanii</i></b> <b><i>A.H. Smith</i></b> <b>Giant <i>Phaeocollybia</i></b> Family: Cortinariaceae	Federal: None State: None BLM: S&M Category D	<i>Phaeocollybia kauffmanii</i> is a gilled Basidiomycete in the Cortinariaceae that produces sporocarps (mushrooms) from late September through early January. Common associates are Pacific silver fir, Sitka spruce, Douglas fir, and western hemlock. <i>P. kauffmanii</i> is presumed to be an ectomycorrhizal associate with members of the Pinaceae.	<i>P. kauffmanii</i> occurrence has been documented in suitable habitat of the King Range.
<b><i>Ramaria rubrievnescens</i></b> <b>Marr &amp; Stuntz Coral Mushroom</b> Family: Ramariaceae	Federal: None State: None BLM: S&M Category B	<i>Ramaria rubrievnescens</i> is a coral fungus that produces sporocarps in June, September, and October. This species can be found in humus or soil and is associated with tree species in the Pinaceae.	<i>R. rubrievnescens</i> occurrence has been documented in suitable habitat of the King Range.
<b><i>Sarcodon fuscoindicum</i></b> <b>(= <i>Hydnum fuscoindicum</i>) Violet Hedgehog</b> Family: Hydnaceae	Federal: None State: None BLM: S&M Category B	<i>Sarcodon fuscoindicum</i> produces sporocarps in the fall and winter months. This species is often found in association with either coniferous trees in the Pinaceae, or broadleaved trees such as tanoak ( <i>Lithocarpus densiflorus</i> ) and madrone ( <i>Arbutus menziesii</i> ).	<i>S. fuscoindicum</i> occurrence has been documented in suitable habitat of the King Range.
<b>LICHENS</b>			
<b><i>Lobaria oregana</i></b> <b>(Tuck.) Müll. Arg.</b> Family: Lobariaceae	Federal: None State: None BLM: S&M Category A	<i>Lobaria oregana</i> is a foliose chlorolichen with localized colonies of cyanobacteria embedded in the thallus that allow this species to fix atmospheric nitrogen. <i>L. oregana</i> has been shown to contribute substantial amounts of nitrogen to forest ecosystems in the Pacific Northwest (Denison 1973).	<i>L. oregana</i> is largely restricted to late seral coniferous coastal forests in California, but is also found in the Cascades extending from California to Alaska, and is known to be sensitive to air pollution. It has been documented within the King Range.
<b><i>Pannaria rubiginosa</i></b> <b>(Ach.) Bory</b> Family: Pannariaceae	Federal: None State: None BLM: S&M Category E	<i>Pannaria rubiginosa</i> is a rosette-forming foliose chlorolichen. <i>P. rubiginosa</i> is found growing on the bark of both coniferous (e.g., Douglas fir, Sitka spruce, etc.) and hardwood (i.e., willows, ericaceous shrubs) vegetation in mesic	<i>P. rubiginosa</i> ranges from British Columbia along the Cascades, south into the coast range of California, and has been documented within the King Range.

Table 2-17: Federally and State Listed/Proposed Endangered or Threatened, and BLM Sensitive Botanical Species

SPECIES	STATUS	PREFERRED HABITAT	OCCURRENCE / BLOOMING PERIOD
		forested and thicket habitats. Although the distribution of this species is widespread, occurrences tend to be patchy and discontinuous.	
<b><i>Usnea longissima</i></b> <b>Ach. Long-Beard Lichen</b>  Family: Parmeliaceae	Federal: None State: None BLM: S&M Category A	<i>Usnea longissima</i> is mostly restricted to coastal regions that receive substantial amounts of precipitation in the form of fog and rain (Esseen et al. 1981; Ahti 1977). In California, occurrences of <i>U. longissima</i> are known to be restricted largely to forests along the coast dominated by redwood ( <i>Sequoia sempervirens</i> ), Douglas fir ( <i>Pseudotsuga menziesii</i> ), and Sitka spruce ( <i>Picea sitchensis</i> ),	<i>U. longissima</i> has been documented in the King Range.

Species in **bold type** indicate known presence in the project area.

#### 2.10.4.1 Invasive Plant Species

The establishment of nine species of aggressive, non-native plants have been documented within the King Range: *Ammophila arenaria* (European beachgrass), *Carduus pycnocephalus* (Italian thistle), *Cortaderia jubata* (pampas grass), *Cirsium vulgare* (bull thistle), *Silybum marianum* (milk thistle), *Raphanus sativus* (radish), *Senecio jacobaea* (tansy ragwort), *Cytisus Scoparius* (scotch broom), and *Euphorbia lathyris* (gopher plant). The establishment of these exotic species adversely affects native plant communities by out-competing the native vegetation and altering the edaphic conditions of native habitats. However, with the exception of pampas grass, which has colonized inaccessible bluffs on the coastal slope, the King Range is free of large weed infestations.

### 2.10.5 Current Vegetation Management Practices

#### 2.10.5.1 Threatened, Endangered, and Other Sensitive Species

All known occurrences of sensitive species are currently monitored and managed under the various regulatory requirements covered above. The dune habitat along Mattole Beach is monitored annually for frequency and distribution of beach layia. Monitoring has indicated continuous population increases since the beach was closed to motorized vehicle use. Annual monitoring programs have also been recently initiated for coastal milkvetch and maple leaf checkerbloom.

#### 2.10.5.2 Habitat Restoration

No specific native plant restoration efforts have been completed. Current habitat restoration efforts are primarily watershed enhancement projects related to salmonid habitat and road decommissioning.

### 2.10.5.3 Noxious Weed Eradication

Establishment of the nine species of noxious plant species mentioned previously has been documented within the King Range. The locations of these occurrences are currently monitored. Where infestations occur, eradication efforts have been implemented and are on-going. Specific efforts have focused on scotch broom, tansy ragwort, and European beach grass. All eradication has been through mechanical means, i.e., hand pulling. Herbicides and pesticides have not been used as a management tool in the King Range. The Lost Coast Trail and all grazing allotments have been mapped for invasive weeds. Where possible, prevention efforts have also been initiated, and focused mainly on education of visitors to identify and remove weed seeds from their clothing and equipment (and stock) before entering the King Range.

### 2.10.5.4 Sudden Oak Death

A specific management concern is the spread of sudden oak death to the King Range. Sudden oak death is a disease caused by a fungus-like pathogen (*Phytophthora ramorum*) that infects a wide variety of host species, but has only been found to cause mortality in a handful of these (e.g., tanoak, black oak, coast live oak, and others). Other infected species develop more benign foliar and twig infections, which serve as a major source of inocula. The propagules are most likely spread by wind blown rain.

The agent of dispersal of this pathogen is not yet understood and therefore the most appropriate measures to prevent its establishment in the King Range are not known. Extensive research is currently being done throughout the state that may inform future management needs at the KRNCA. Although sudden oak death has not yet been identified in the KRNCA, there is an occurrence in the vicinity, near Redway.

## 2.11 FOREST MANAGEMENT

### 2.11.1 Introduction

The Douglas fir forests of the KRNCA and surrounding Mattole Valley were bypassed for many decades as the region's timber industry focused on nearby redwood forests. Interest in Douglas fir timber increased in the 1950s with the post World-War II housing boom and the advent of tractor logging. After initial timber harvests of about nine million board feet, the original public domain lands included in the present KRNCA were placed under a moratorium for timber sales in 1965 pending the outcome of the conservation area proposal. The original KRNCA management program called for timber production in two of the management zones, both located on the eastern slope of the area, with a total allowable cut potential of 1.9 million board feet annually. The management program also called for a number of timber stand improvement projects, and reforestation of cutover private lands when acquired. However, only three timber sales have occurred since the KRNCA was designated, and all were fire salvage operations. These included two large salvage sales (2.8 and 3.5 million board feet) in Noonung Creek after the 1974 Finley Creek Fire and a small five-acre 0.024 million board foot sale along King Peak Road in 1988 following the Saddle Mountain Fire.

The full depiction of the present forest stand conditions in the KRNCA requires an understanding of the logging history of lands under private ownership that have been acquired by the BLM. The present public land acreage in the KRNCA is the product of a major land tenure adjustment program conducted in the 1970s and 80s. During this period, over 25,000 acres of private land was acquired through exchange and purchase. Most of the acquired lands had either been harvested historically, or were cut just prior to BLM acquisition. Harvest methods included high grading, or removal of the best trees, leaving scattered large Douglas fir trees. Reforestation was not practiced and a large percentage of the previously harvested acreage was left to regenerate naturally. Tanoak and madrone now dominate many lands that had once been old-growth Douglas fir forest. Several areas were planted upon acquisition by the BLM, including the Bear Trap Creek (125,000 Douglas fir trees on 200 acres since 1985), and Noonong Creek (500,000 Douglas fir seedlings).

In addition to timber, there are other special forest products utilized in the KRNCA, including the harvesting or collecting of mushrooms, firewood, beargrass, and other specialty products. None of these activities constitute major economic uses, but may be of cultural and/or subsistence value to the subgroups involved in their collection. Management decisions that affect availability of these products could have substantial effects on these communities. Demand for permits fluctuates somewhat from year to year, depending on the quality of the resource, but has remained fairly steady overall. Local residents have also expressed an interest in the continued availability of these products on a sustainable basis.

### **2.11.2 Applicable Regulatory Framework/Current Management**

Authority for harvesting and sale of timber and other vegetative products on public lands is described under the Code of Federal Regulations Subpart 5400, Sale of Forest Products. Management direction and land use allocations for KRNCA forest resources is contained in the Northwest Forest Plan (NWFP) (1994) which amended the KRNCA Management Program. As stated above, under the NWFP, the KRNCA is managed as a late successional reserve (LSR) land use allocation. The purpose of these reserves are to represent a network of old-growth forests retained in their natural condition with natural processes allowed to function (including fire) to the extent possible. They are designed to serve a number of purposes including:

- € Provide a distribution, quantity, and quality of old-growth forest habitat sufficient to avoid foreclosure of future management options.
- € Provide habitat for populations of species associated with late successional forests.
- € Help ensure that late successional species diversity is conserved.

Silvicultural treatments in late successional reserves must be “beneficial to the creation and management of late-successional forest conditions,” such as to help restore old-growth ecosystem conditions (1994 USFS and BLM Record of Decision for Late-Successional and Old-Growth Forest Standards and Guidelines). Objectives of silvicultural treatments include: 1) Development of old-growth forest characteristics including snags, logs on the forest floor, large trees, and canopy gaps that enable establishment of multiple layers and diverse species composition. 2) Prevention of large-scale disturbances by fire, insects, wind, and diseases that would destroy or limit the ability of the reserves to sustain viable forest species populations.

Under the NWFP, stand management in late successional reserves can include thinnings, underplanting, killing trees to create large woody debris, reforestation, and planting. In response to the NWFP, the BLM completed a Late Successional Reserve Assessment for the KRNCA in June, 1998.

### 2.11.3 Existing Conditions

#### 2.11.3.1 Forest Stand Characteristics

The major forest vegetation type is a mixed evergreen forest of Douglas fir/tanoak/madrone. Due to the unusual climatic factors in the area, including the hot offshore winds in the summer and the associated absence of fog, it is thought that historic vegetation patterns were shaped primarily by moisture availability and the prevalence of lightning-caused and/or indigenous use of fire. Large continuous stands of late-successional or old-growth forests are thought to have been absent from this area (BLM 1998, citing Barbour and Majors 1977). (See Section 2.x, Terrestrial Habitats, for more detailed description of the species common in forest habitats.)

Though fragmented due to past land use practices, the KRNCA contains the second largest aggregation of old-growth lowland mixed evergreen forest in the California Coast Province. Figure 2-14 shows the vegetation by seral stage. The large areas of young hardwood dominated sites covering previously harvested lands in the KRNCA contribute little in the way of late successional old-growth values. These stands became established as a result of timber harvesting practices without any additional follow-up treatments. As a result these stands are lacking the necessary structure and species components to develop into the late-successional forest characteristics in the foreseeable future. On these sites additional forest treatments are desirable if the objective is to accelerate these hardwood stands to a more diverse late-successional stage. They are also extremely dense with heavy fuel loading (BLM 1998).

#### 2.11.3.2 Mushrooms

While not much is known about the specific locations and other important population characteristics of mushrooms found in the KRNCA, it is known the area has at least 57 species of edible and/or commercially valuable mushrooms. Some of these include matsutake (*Tricholoma magnivelare*), chanterelles (*Cantharellus cibarius*), oyster mushrooms (*Pleurotus ostreatus*) and king boletes (*Boletus edulis*), which can fetch high prices in local and foreign markets. Matsutake are especially valuable and are used for ceremonial purposes in Japan. Three species of chanterelles, two species of hedgehog mushrooms and two species of coral mushrooms found in the KRNCA are managed as “Survey and Manage” species under the Northwest Forest Plan.

Mushrooms vary greatly in occurrence, abundance, and distribution from year to year and numerous factors influence fruiting. Forest age, composition, and structure likely constitute a major influence on wild mushroom occurrence and productivity. For example, in the King Range matsutake occur mostly in closed-canopy tanoak stands (50-150 years old) with scattered Douglas fir, madrone, and knobcone pine (Hosford et al. 1997). Forest management that affects the extent of this type of habitat could influence matsutake abundance and distribution. A variety of wildlife species, including deer and elk, consume wild mushrooms, but little is known about their role in these animals' diets.

In the KRNCA, mushrooms generally are collected within a relatively short distance from roads (i.e., people do not hike extensive distances to get to patches, particularly for commercial use), such as King Range Road, King Peak Road, Saddle Mountain Road. Collecting occurs primarily in tanoak stands. Harvesters generally operate independently, and sell the mushrooms they collect to wholesale buyers who set up shop in local motels during the mushroom season. Prices can fluctuate widely, depending on seasonal variations and regional availability, etc.

Interest in mushroom collecting is on the rise, particularly since the 1980s, as is international demand for matsutake in particular.<sup>21</sup> With the overall decline of timber industry, increasing demand, and high value for the mushrooms, more people are picking commercially than in the past. Yet a great deal of scientific uncertainty exists regarding effects of harvest on mushroom ecology, diversity, reproductive habits, etc. Some biologists liken harvesting mushrooms to picking apples off trees, having no effect on the trees' productivity from year to year. Others express concern about potentially harmful activities, such as raking, trampling, or improper harvesting techniques, that could adversely affect the mycelium and reduce regeneration. While careful harvesting of mushroom caps and other portions of a mushroom's mycelium may avoid permanent damage to individual plants, there is growing concern that a large increase in harvesting and/or damage caused by uneducated or careless collectors could cause major adverse impacts to the KRNCA's mushroom populations. The USFS Pacific Northwest Research Station currently has a research program investigating productivity and sustainable harvest information for edible mushrooms in the region.

### *2.11.3.3 Other Specialty Forest Products*

Other specialty forest products harvested in the King Range include madrone, tanoak, and Douglas fir collected and used as firewood. The BLM currently issues firewood collection permits on a case-by-case basis, usually for collection of downed wood on roadways after storms. Salal, huckleberry shrubs, and bay leaves are also collected from time to time, mostly for use in floral arrangements. Salal has attractive, dark green leaves and bell-shaped pink or white flowers and berries that hang like a necklace. The berries and leaves of the huckleberry are also attractive, and along with salal are collected for flower arrangements. Bay leaves are a popular spice for cooking and can be used to make wreaths. In addition, beargrass is collected by a small number of people for traditional basket-making and other indigenous crafts; please see the Cultural and Historic Resources section (Section 2.4) for further discussion.

## **2.11.4 Current Management Practices**

### *2.11.4.1 Forest Management*

The potential timber harvest base was initially reduced through the 1988 designation of sections of the KRNCA as Wilderness Study Areas. Then, after the listing of the northern spotted owl as a threatened species, the remainder of the KRNCA was designated as a late successional reserve under the Northwest Forest Plan (NWFP) in 1994. This land use allocation does not prescribe/allow timber harvesting,

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<sup>21</sup> Japan began importing matsutake in mid-1970s, and this demand has increased dramatically since the mid-1980s. Imports from North America averaged 500,000 kg/year in 1997. Note that the King Range is south of the heaviest areas of commercial matsutake harvest, which are more in the Klamath Range and then north through the Cascades in Oregon to the Olympic Peninsula in Washington, as well as farther north in Canada (Hosford et al 1997).

FIGURE 2-14: VEGETATION SERAL STAGE

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although thinning and other silvicultural treatments may be used in stands up to eighty years in age if the treatments are beneficial to the creation and maintenance of late successional old growth (LSOG) conditions (NWFP ROD at 8).

Under the NWFP, the King Range and adjoining lands in the planning area have 45,437 acres designated as late-successional reserves. Of these, 12,147 acres provides LSOG habitat (32 percent). An additional 15,688 acres are administratively withdrawn (i.e., already designated by existing plans), of which 4,622 acres contains LSOG habitat (21 percent). These administratively withdrawn lands are treated the same as late successional reserves for the purposes of management under the NWFP. The administratively withdrawn lands are on the western coastal slope which contains significantly less LSOG forest. A small parcel, 142 acres (Honeydew Creek Campground parcel) is classified as matrix, which technically allows timber harvest; however, this parcel contains a mixture of riparian forest and oak woodlands with no commercial timber. The forest resources in the King Range are currently managed to maintain and/or enhance late successional stand characteristics consistent with the NWFP.

Current management efforts are focused on improving the structure of previously-harvested, dense hardwoods stands to meet LSR objectives and better reflect historic vegetation conditions. Data collected in 1948 in the Honeydew Creek Watershed, prior to any large scale timber harvests, suggests a historic successional stage class distribution of approximately 60 percent late successional or old-growth stands, 20 percent mid-mature stands and 20 percent early successional stands (BLM 1996). This stand class breakdown will be used as a reference condition for forest management activities in this plan. Thinning treatments can be used to treat previously harvested stands to accelerate their development to late successional characteristics. Thinning of some forest stands is a desirable method of increasing the forest stand's structural complexity and thereby developing late successional forest characteristics. Treatments involve stem-density management and tanoak removal in sapling, pole, and early mature stands. All treatments provide for the retention of snags and large woody debris for the development of stand structure and diversity.

#### *2.11.4.2 Special Forest Products Management*

All specialty forest products are managed via a permit system, and the BLM generally issues between 50-80 permits per year for all uses. Permits are available for collecting almost any kind of greenery, as long as it is not an ecologically sensitive species. Mushrooms have a special permitting program because of their high commercial value.

The BLM issues both commercial and individual/personal permits for mushroom collecting, modeled on the U.S. Forest Service's permit program, and tries to coordinate with that agency so as to have similar specifications. These permits are not species-specific, but allow collection of any kind of mushroom under the conditions of the permit. Permittees are given a map for locations and special instructions and restrictions for collection (no driving off-road, no raking, etc.), and are required to post the permit on their windshield while collecting so that a passing ranger can see it.

Most of the commercial permittees in the KRNCA are Southeast Asians (Hmong/Laotians).<sup>22</sup> Commercial permits are issued during a season of four to six weeks around the month of December (when the valuable matsutake are fruiting), and at any given time there are only thirty permits available. This limit is intended to prevent adverse effects on the resource while much is still unknown about the ecological effects of collection. Permits are available for a varying number of days, i.e., three, seven, or thirty days, or for the whole season, at a cost of \$25/week or \$100/season. According to BLM staff, people seem relatively content with this system. There is no weight limit on the amount one can collect with a commercial permit. The BLM requires one permit per commercial collector; whole families are not allowed to collect on a single permit.

Individual, non-commercial collection permits are allowed year-round, and are limited by weight at five pounds per day. Personal use collectors must cut matsutake mushrooms in a particular way so that they have no commercial resale value. Personal users are mostly locals who have become interested in mushroom collecting. Their numbers have gradually increased in recent years, but can fluctuate unpredictably from year to year.

In contrast, demand from commercial collectors is directly related to the prevailing market for mushrooms and the weather in December, the only month when commercial permits are available. Buyers set up shop in Garberville or Redway; it is unknown how collectors connect with sellers or distribute the mushrooms. BLM staff have not encountered any tension or violence with regard to collectors “claiming” particular territories.

The BLM also issues occasional firewood collection permits, primarily as a way to clear downed wood from roadways after a storm. Permittees can collect any wood that has been blown down and that can be reached without driving off the road. No cutting of standing trees is allowed. The BLM generally will issue up to ten permits per storm on a case-by case basis, and there is almost always a waiting list of people interested in permits. Commercial beargrass collection permits are also issued, usually about ten to twelve per year, at \$20 per permit.

## 2.12 GRAZING

### 2.12.1 Introduction

Use of the King Range for livestock grazing goes back to the earliest Euro-American settlers in the area, but the actual grazing-dependent ecology of California grasslands goes back much further. Grassland-grazing ecology in California evolved with native mammalian megafauna from ten thousand years to as far back as millions of years ago. The north coast of California has produced fossil evidence of mastodon, bison, and mammoth dated between 100,000 to 500,000 years old. Modern cattle (and much of modern grassland flora) were brought to California by the Euro-Americans in the mid-1700s (Burcham 1981) and are not native. However, their effect on grasslands, when properly managed, can mimic the impacts of prehistoric and native megafauna.

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<sup>22</sup> Amaranthus and Pilz (1996) note that “recent immigrants can harvest mushrooms profitably without the language skills and education required for other jobs” (at 45). Also many wild mushrooms (particularly matsutake) collected commercially are sold to Asian markets, both in Japan and in Asian communities across the western U.S. and Canada, and so there may be some traditional/cultural connections to the activity as well.

Light to moderate grazing in productive grasslands and during the proper season can conserve the biodiversity of plants and wildlife. An inverse relationship exists between dominance and diversity regardless of the plant community described. If dominant plant species can be reduced in some manner, rare and infrequently encountered (i.e., subdominant) species can increase. Generalist grazers such as domestic cattle and bison tend to increase species diversity by reducing dominant species through non-preferential foraging. In contrast, non-generalist grazers such as deer, rabbits, and voles can decrease biodiversity because they eat selectively which can heavily impact subdominant plant species. When considering biodiversity in grasslands, these kinds of non-generalists can be harmful without light-to-moderate grazing from large ungulates, domestic or otherwise. Failure to permit some grazing in productive grasslands typically results in dramatic decreases in subdominant plant species diversity (Howe 1999).

Sustaining healthy biodiversity depends on balance. In the King Range, there is light to moderate grazing in portions of the grasslands, and although there are deer, rabbits, and plenty of rodents, there are also large populations of raptors such as hawks, vultures, and falcons, as well as coyotes, bear, mountain lion, and other predatory animals that help balance subdominant grazers.

### **2.12.2 Applicable Regulatory Framework**

Grazing Use for the King Range planning area is regulated by the Code of Federal Regulations, Part 4100—Grazing Administration and the Northwestern California Standards for Rangeland Health and Guidelines for Livestock Management. Grazing use will be consistent with the goals and objectives described in the King Range Act of 1970 (PL 91-476).

### **2.12.3 Existing Conditions and Management Practices**

#### *2.12.3.1 Early Grazing History*

The BLM does not have records for grazing use prior to the 1950s, but there are anecdotal reports of year-round sheep grazing numbering into the thousands on private lands in the area. Since roughly 1900, sheep and wool production had been increasing all along the North Coast, as predation by coyotes was controlled for decades by government-sponsored predator control programs (Roscoe 1977). By 1920, fully one-third of the ranchland in Humboldt County had converted to wool production, with a woolen mill constructed at Eureka exporting up to 500,000 pounds of wool annually (Nash 1996). But by the 1950s and '60s the changing state environmental laws and the end of federally-sponsored predator control programs pushed many operators away from sheep, despite high wool prices, and into cattle markets (Criley 2003).

This trend wasn't immediately evident in the King Range; in 1983 there were still about 1300 sheep on public lands, in addition to about 300 cattle. However, over the coming decade, sheep grazing did gradually phase out, and by March of 1994, the last 60 sheep were gone leaving cattle as the sole livestock type.

By 1983, the BLM had acquired a number of new parcels that included active grazing lands, and so issued a number of new grazing leases. These leases authorized a total of 2,971 Animal Unit Months (AUMs)

within the KRNCA, and are the same allotments that are still in effect today. Since 1983, BLM has reduced the number of AUMs authorized to 2,050, representing a decrease of 921 AUMs. This reduction resulted partly from the expiration of leases in several allotments that were never grazed (Big Flat at 60 AUMs), or that had converted back to forest types unsuitable for grazing (Bear Trap 400 AUMs, Etter Lease 8 AUMs, and Jewett Ridge 13 AUMs), representing a total of 483 AUMs. These inactive allotments are discussed further in Section 3.12.4. Of the remaining 440 AUMs, 300 AUMs were reduced at the Strawberry Rock allotment and 255 AUMs reduced at Windy Point allotment, where livestock numbers and the season of use were reduced to promote resource health—leaving a deficit of 115 AUMs. This is accounted for by a 115 AUM increase in the Spanish Flat allotment.

### 2.12.3.2 *Current Allotments, Use and Conditions*

Approximately 11,100 acres of the KRNCA are currently grazed, divided into four allotments (see Figure 2-15). A total of 2,050 AUMs of forage is available for domestic livestock use; however, approximately 1,500 AUMs are actually utilized in an average year, by about 220 cattle. Lessees on the four allotments are issued ten-year leases, which are reviewed before being renewed. These leases contain terms and conditions that define grazing intensity and season of use required to meet rangeland health standards or any other pertinent resource objective.

- € **Strawberry Rock Allotment:** 550 acres, 300 AUMs, 37 yearlings/cow calf pairs; season of use: Sept. 15 – May 15. Actual use in 2002: 38, 9/10-5/23, 320 AUMs. All standards and guidelines for rangeland health received a “met” rating as of November 1998.
- € **Windy Point Allotment:** 300 acres, 105 AUMs, 6/cow calf pairs; season of use: September 15 – May 15. Actual use in 2002: “non-use.” All standards and guidelines of rangeland health were “met” as of December 1998.
- € **HJ Ridge Allotment:** 1,160 acres, 540 AUMs, 50/95 yearlings/cow calf pairs; season of use: #50 at Oct. 1- Feb. 28 and #95 at March 1 – June 15. Actual use in 2002: 44 cattle, 1/11-6/29, 241 AUMs (actual use on this allotment has run at half or less of the AUMs capacity allowed for by the lease since 1989). All standards and guidelines of rangeland health received a “met” rating as of November 1998 with the exception of the Riparian/Wetland standard which received a “not met and not progressing towards” rating. Failure to meet this standard was based on the following: “The one lentic site identified as not meeting the standards is a trampled, seasonal water collection area that as far as anyone’s living memory, has always appeared as it does today. It should be noted that this is a very small site approximately 30 square feet in size in an allotment 1160 acres in size. The priority for corrective action was determined to be low.
- € **Spanish Flat Allotment:** 9,100 acres, 1,105 AUMs, 145 yearlings/cow calf pairs; season of use: November 1 – May 31/June 30. Actual use in 2002: 129, 11/25 – 6/30, 912 AUMs. A rangeland health assessment was completed for this allotment in December 1998. The Biodiversity standard was “met,” the Soils Health and Riparian/Wetland standards were “not met but progressing towards,” and the Water Quality standard was “not met and not progressing towards.”

The water quality standard was “not met and not progressing towards” for reasons that may be independent of livestock grazing. Summer water temperatures in Cooskie Creek tend to exceed state water quality standards which may be caused by the bedrock of the stream, the morphology

FIGURE 2-15: GRAZING ALLOTMENTS

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of the watershed, and annual winter flushing of the system including any new stream bank vegetation. It is unknown if grazing is impeding to some degree, the natural rate of recovery for the watershed.

The Soils Health standard was found to be “not met but progressing towards” because of the following: “Soils are generally healthy over most of the area. However, in the uplands there are problems with lack of plant cover which leaves areas susceptible to wind and rain erosion. This condition may have been created or exacerbated by historical overgrazing by sheep, or it is possible that a degree of ridgetop vegetation reduction is natural. There are rills and numerous gullies that are actively eroding in many areas. Granted, this grazing allotment is very steep so inherent gullying is likely. It does not appear, however, that current levels of grazing use are contributing to these conditions. Residual dry matter was collected in all the key grazing areas and lbs/acre exceeded all guidelines for residual mulch, the mean being about 3,000 lbs/acre.”

The Riparian/Wetland standards were “not met but progressing towards” for Cooskie, Spanish, and Randall Creeks. A full length analysis was included in the 1998 Environmental Assessment.

Since this rangeland health assessment, half of the Spanish Flat allotment has not been grazed due to cultural and water quality issues. Cooskie Creek has been fenced and the Spanish Flat pasture, that includes Spanish and Randall creeks are being rested.

## 2.13 FIRE MANAGEMENT

Past fires have been instrumental in shaping the current vegetative patterns and fuel conditions on the KRNCA. Fire will continue to be a key element of vegetative conditions in the area, particularly for maintaining or improving grasslands, chaparral, and other fire-adapted communities. Despite these beneficial aspects, fire—particularly very hot and intense fires—can also be a negative force, posing a serious threat to the human improvements, visual opportunities, wildlife, and vegetative communities existing throughout the area.

### 2.13.1 Applicable Regulatory Framework

The BLM is the principal agency responsible for fire protection in the KRNCA. To fulfill its responsibility for fire protection, the agency has entered into a cooperative fire protection agreement that includes BLM-California and Nevada; U.S. National Park Service, Pacific-West Field Area; U.S. Forest Service, Regions Four, Five and Six; and the State of California Department of Forestry and Fire Protection (Cooperative Protection Agreement 1997). An extension of this agreement is the preparation and execution of an annual operating plan between the BLM field offices (Arcata, Bakersfield, Redding, and Ukiah), the CDF Northern Region and U.S. Forest Service, Mendocino National Forest. This agreement sets the framework for CDF to provide resources for the suppression of all wildfires occurring within the KRNCA. A BLM fire resource unit provides for prevention/suppression in addition to CDF. Specific regulations and agreements that affect fire management include:

- € BLM Handbook H-9211-1 Fire Management Activity Planning
- € BLM Handbook H-9214-1 Prescribed Fire Management Handbook

- ∞ Cooperative Fire Protection Agreement between BLM and CDF (January 1, 2002)
- ∞ Cooperative Fire Protection Agreement Operating Plan between BLM, CDF Northern Region, and U.S. Forest Service (2002)
- ∞ King Range Fire Management Plan (1992)

## 2.13.2 Existing Conditions

### 2.13.2.1 *Historic Fire Patterns*

Throughout all of California, lightning fires have occurred naturally for untold years. Native Americans have existed in this area for at least 2,000 years and used fire to actively manage the landscape. The earliest U.S. settlers and ranchers came into the area about 1850, and also burned grasslands to improve range for their cattle and sheep, yet the use of fire gradually decreased as the area became more settled, and active suppression of wildfires increased.<sup>23</sup> Research conducted in the neighboring Sinkyone Wilderness State Park indicates that coastal prairie areas were historically more prevalent; about 300 acres of this vegetative type exist today, but evidence shows that it covered roughly 450 acres during earlier periods (Bicknell, Biggs, Godar, and Austin 1993). This research suggests that the reduction in this type of fire application (broadcast burning) has contributed to encroachment of other species into the grassland areas that exist today.

Fire frequency and fire interval research has not been conducted specifically on the KRNCA. However, some parallels can be found in research conducted in the Douglas fir and coast redwood forests at Point Reyes National Seashore (Brown, Kaye, and Buckley 1999). Examination of charcoal layers in the soil revealed a pattern of frequent surface fires in the area over a period of several centuries, with a mean return fire interval, or fire frequency, averaging between eight and nine years. These fires functioned to maintain more open forest stands by killing young trees before they could become established. Frequent fires on forest margins also would have tended to maintain the relative position of forest/grassland or forest/scrubland ecotones. The study concluded, “Historical references and records of vegetation patterns on the California coast in the vicinity of Point Reyes document less forest on the coastal hill than at present.”

The study also found that interruption of this fire cycle had caused shifts in forest structure and changes in fuel loads, leading to stand replacement crown fires which have become more prevalent in recent times: “In the absence of human ignitions, it is likely that fires would not have been as common. Lightning ignitions are rare for this area, especially during the later summer/early fall period when grasses and herbaceous fuels cure and the majority of fires occurred. However, regardless of the source of ignitions in pre-settlement or early settlement fire regimes, forests of the Point Reyes Peninsula are not burning today with nearly the frequency they did in the past. Shifts from understory to overstory dominance, increases in fuel loads, and changes in forest structure (i.e., increases in “ladder fuels”) may lead to increased incidence of overstory, stand-destroying fires that have been documented in other forests that experienced frequent surface fires prior to widespread non-Native American settlement (e.g., Covington et al. 1994). Conversion of grasslands to forest also will continue in the absence of fires”

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<sup>23</sup> Also see ethnographic information in Appendix of Honeydew Creek Watershed Analysis (BLM 1996), with interviews of old-time residents talking about set fires and frequency.

(Brown, Kaye, and Buckley 1999). These conditions are similar to the existing conditions today in the KRNCA.

### *2.13.2.2 Current Fuel Conditions*

No existing data is available for determining fuel load conditions and no current sampling is planned. However, local fire management personnel estimate that current fuel loads exist in a range that varies from 80 to 200 tons/acre. Visual observations reflect a variety of fuel conditions, including areas having both sparse and heavy duff/litter layers. Some areas have little to no existing ladder fuels, while other areas have very heavy ladder fuels, conditions that allow wildfire to reach into the canopy structure of stands.

### *2.13.2.3 Recent Fire History*

An examination of large wildfires (300+ acres) that occurred in the KRNCA area between 1950-2001 reveals a total of 18 fires, or an average of 0.35 large wildfires per year (see Figure 2-16). These fires were mostly started during extreme drought periods and/or periods with heavy dry lightning concentrations, and often under northeast to east wind conditions. The King Fire of 1990, which burned about 3,500 acres within the KRNCA boundary, occurred when roughly 35 individual lightning fires came together to form a single large fire. An example of a human-caused fire was the Saddle Mountain Fire of 1988, burning about 6,000 acres within the area. The Finley Creek Fire of 1973 was also human-caused; it began on private land and burned into the KRNCA, covering a total of about 11,000 acres with approximately 2,500 acres burning in the KRNCA.

Most recently, a thunderstorm on September 3, 2003, resulted in 59 lightning-ignited fires in Humboldt County. Most of these fires were contained within the first week; however, due to remote and extremely steep terrain, two fires, the Honeydew Fire in the KRNCA, and the Canoe Fire in nearby Humboldt Redwoods State Park, proved difficult to control. Both fires continued to grow, and by the time they were each contained, the Canoe Fire had burned 11,200 acres, and the Honeydew Fire burned 13,778 acres. Suppression costs for the two fires exceeded \$34 million, with an estimated 40 percent (\$13.6 million) expended on the Honeydew Fire.



*The 2003 Honeydew Fire was the largest ever recorded in the King Range NCA, burning almost 14,000 acres.*

The Honeydew Fire was a 100-year event for the KRNCA. The entire fire burned in the King Range Wilderness Study Area (WSA). Extreme fire behavior threatened the community of Shelter Cove, so approximately four miles of bulldozer lines were constructed within the WSA. Preliminary observations indicate that the fire was a stand-replacing event over large portions of the burn area.

During the period of 1981-2003, a total of 44 fires were reported to have occurred on the KRNCA. Humans caused all but eight of these fires. No fires were reported on the King Range during the years 1980, 1982, 1985, 1986, 1987, 1989, 2000, and 2002 (see Appendix F for detail). Table 2-18 represents a summary of the size in acres and cause for fires that occurred during the 23-year period.

Table 2-18: Fire Size by Acre Distribution and Cause  
(Classification, 1980-2003)

SIZE BY ACRES	HUMAN	LIGHTNING	TOTALS
0 – 10	29	4	33
11 – 100	3	1	4
101 – 300	1	1	2
301 –1000	2	0	2
1001 +	1	2	3
<b>Totals</b>	<b>36</b>	<b>8</b>	<b>44</b>

A breakdown of these wildfires by size class reflects an average of 1.91 fires of all sizes per year for this period. Of the 44 fires, 33 fires ranged between 0.1 and 10 acres in size, with 19, or slightly under half, burning in the 0.1-acre category. An average of 0.22 fires per year was found to occur when combining all of the size classes greater than 300 acres.

The number of wildfires reported on the KRNCA is rising as reflected by data in Table 2-19, which reflects the number of incidents on a decadal basis, by human and lightning causes:

Table 2-19: Distributions of Wildfires by Decadal Period  
and Cause Classification

PERIOD	HUMAN	LIGHTNING	TOTALS
1980 - 89	6	0	6
1990 - 99	25	3	28
2000 - 03	5	5	10
<b>Totals</b>	<b>36</b>	<b>8</b>	<b>44</b>

FIGURE 2-16: FIRE HISTORY AND FUEL BREAKS

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back of Figure 2-16

Two decades of fire history are represented in Table 2-19 beginning with the year 1980. The period of 2000-03 (only four years) has been added to bring the number of incidents in alignment with the total numbers of incidents reflected in Table 2-18. It can be seen from the values in Table 2-19 that lightning occurrences are not very common. This fact is also reflected by the data from the study reports cited above. However, the number of human-caused fires is significant. Humans caused 36 of 44 fires (82 percent) of the total fires that have occurred over the 24-year period. Some years there have been no incidents reported. However, it is evident from this data that human caused fires are increasing. There is a four-fold increase in human caused fires in the 1990 decade when compared against the 1980 decade.

Recreation use has increased along the coastal strip greatly since the KRNCA was established. With this increasing use, a corresponding increase in human caused wildfires has occurred along the coast. To try to reverse this trend, in 2002 the KRNCA began providing the services of a backcountry ranger. That year the ranger extinguished approximately 24 illegal or unattended campfires. Those fires were found mostly in the beach area and were in a smoldering state. There were no wildfires ignited by recreation visitors during the first year of this program. It should be noted that although the majority of human caused wildfires in the KRNCA have been caused by recreation visitors, almost all of these fires have been small and limited to the coastal slope. In contrast, most of the large devastating wildfires began on private lands east of the KRNCA and spread onto public lands, or from lightning strikes on the ridgetops. This can be attributed to the fact that severe fire conditions are associated with offshore wind conditions.

The data presented above points to a situation where increased human use simultaneously increases the potential of fire starts beyond naturally-occurring lightning events. Increasing numbers of fires also increase the concern that large damaging stand-replacement fires will occur. The combination of steep terrain and heavy fuel accumulations (excessive stems per acre, ladder fuels, and dead and down fuels) set the stage for such fire events to occur. This is particularly so under extreme drought and lightning conditions that periodically occur throughout this area because of natural weather phenomena.

### 2.13.3 Current Management Practices

#### 2.13.3.1 Presuppression

The BLM has undertaken a gradual increase in developing a fuels management program. Some efforts have begun on the coastal prairie grassland areas to reduce the Douglas fir encroachment. The activities have included removal of Douglas fir saplings and small pole-sized trees to eliminate competition. Little to no prescribed fire (broadcast burning) applications have occurred. Instead, slash has been cut, piled, and burned, which is labor intensive and costly work. A shaded fuel-break system is an integral part of BLM's suppression planning, and is approximately twenty miles long. The system is currently about 55 percent completed (see Figure 2-16).

Past use of prescribed fire (broadcast burning) by the BLM has been very limited. Areas do exist providing the opportunity to use prescribed fire (broadcast burning and pile burning) to reduce tree and brush encroachment into existing coastal prairie areas. There are other areas that have opportunities for the use of prescribed burns. Areas adjacent to shaded fuel-breaks could be treated to enhance the beneficial aspects of the fuel-breaks by using prescribed fire applications. Some areas exist along the

wildland-urban interface where prescribed fire could be used to protect against wildfires encroaching into or from private land holdings when coupled with shaded fuel breaks (see Figure 2-16).

As mentioned earlier, in 2002 the BLM added the position of backcountry ranger, which supplements its ongoing fire prevention program. The program depends heavily on fire prevention signing and personal contact with local residents and other users of the KRNCA.

### *2.13.3.2 Suppression*

CDF, by agreement with the BLM, has the principal responsibility for suppressing wildfires. CDF has a station located just west of Honeydew, and a second one in Whitethorn. The BLM has an engine at the King Range Fire Station located just west of Thorn Junction. There are other resources available from CDF such as an air tanker at Rohnerville and a helitack and helicopter unit at Kneeland. Additional engines, hand crews, and aircraft suppression resources are available as needed. The Cooperative Fire Protection Agreement is the legal structure for all suppression agencies to provide resources when needed. This agreement is connected to what is nationally referred to as the “total mobilization concept.” Access for suppression resources into the entire KRNCA is somewhat limited by its extreme ruggedness, remote nature, and steep topography.

## **2.14 TRANSPORTATION AND ACCESS**

### **2.14.1 Introduction/Overview**

The region surrounding the KRNCA became known as “the Lost Coast” based on the difficulty of road building across the area’s rugged landscape. Highway engineers building California Coastal Route 1 were forced inland by the harsh terrain at the southern end of the Lost Coast, about 20 miles south of the KRNCA. U.S. 101, the primary access route through northwestern California, passes 20 miles inland from the KRNCA. Only steep winding secondary roads penetrate the remote mountains of the Lost Coast region. Three Humboldt County roads provide the primary access from U.S. 101 to the KRNCA, and a combination of County and BLM roads provide access within the NCA. The rough terrain, highly erosive soils, frequent seismic activity, and high rainfall combine to create challenges for both use and maintenance of the road system.

### **2.14.2 Specific Mandates and Authority – Regulatory Framework for Transportation**

Vehicle use in the KRNCA is managed under the following direction and authority: 43 CFR Part 8340 Off-Road Vehicles, Subpart 8342, Designation of Roads and Trails.

All BLM lands in the planning area are designated through the land use planning process as open, limited, or closed to vehicle travel under the BLM Off-Highway Vehicle (OHV) Regulations. Under this system, in an “Open Area” all vehicle types are allowed to access all parts of an area (including cross-country travel) at all times. In a “Limited Area” vehicle use is allowed only during certain times of year, by certain types of vehicles, and/or in certain parts of the area such as designated roads and trails. Vehicle use is not allowed in closed areas. The OHV regulations apply to use of routes by the general public. Certain

other routes may be open to private inholders, grazing or other permittees to meet specific access needs or legal rights.

Existing OHV designations are outlined in the “No Action” alternative of this plan (see Chapter 3). Current vehicle management is based on the 1986 *King Range Transportation Plan and Supplement*. This plan addressed a variety of concerns related to vehicle use, roadways, and resource protection, and provided guidelines for future road improvements, maintenance activities, and management decisions. The 1986 Transportation Plan identified several management objectives:

- ∞ Objective 1—Obtain or assure public rights for recreation use of all suitable lands in the King Range.
- ∞ Objective 2—Provide safe and orderly recreation use.
- ∞ Objective 3—Enhance and maintain the natural character of the landscape on the west slope and lands adjacent to recreation roads and trails on the east slope.
- ∞ Objective 4—Eliminate adverse physical and biological impacts of OHVs on vegetation, soil, wildlife, and cultural resources.
- ∞ Objective 5—Minimize conflicts among non-OHV recreationists and OHV users.

Previous vehicle management decisions were published in a 1979 *Federal Register* Notice (non-motorized use only from Mattole Beach to Lighthouse); and additional vehicle management decisions include the 1990 California Statewide Wilderness Study Report (closure of coastal slope portion of the Smith-Etter Road) and the 1998 Black Sands Beach Plan Amendment (closure of 3.5 mile beach open riding area).

County roads within the KRNCA are public routes and are managed by Humboldt County, except for a short stretch of Chemise Mountain Road at the southern tip of the NCA which is under Mendocino County jurisdiction.

### 2.14.3 Existing Conditions—Transportation System

Figure 2-17 identifies the County and BLM managed roads that provide access to and within the KRNCA. The primary access route for visitors to the King Range from the south is via Garberville/Redway exit off U.S. 101, following the Briceland-Thorn Road and Shelter Cove Road to the coast. The KRNCA Office is seventeen miles west of Redway along this paved two-lane route, and the town of Shelter Cove is nine miles farther. The primary northern access route is from Ferndale via the Mattole or Wildcat Road, reaching the Mattole Campground 35 miles south of Ferndale. A third corridor accesses the central part of the KRNCA from the Eel River Valley at the South-Fork/Honeydew exit of U.S. 101. Known as Bull Creek or Panther Gap Road, this route winds for 26 miles through redwood forests and open ridgetops to the Honeydew Creek Campground. All of these access corridors traverse dramatic mountain landscapes and are highlighted as scenic driving destinations in travel guides for the region.

From where Mattole Road intersects with Bull Creek Road at Honeydew, Wilder Ridge Road runs south near the eastern edge of the King Range to link up with Shelter Cove Road about three miles east of the KRNCA administrative office. This road is the main north-south link between area trailheads and recreation sites. Although the route is mostly paved, it has numerous one lane stretches and a steep

winding descent into Honeydew that limits north-south access by visitors with trailers or larger recreation vehicles. The King Peak Road parallels Wilder Ridge Road to the west, and traverses the KRNCA. This route is unpaved and mostly one lane, and provides access to several camping areas, trailheads, and BLM roads. North of the Horse Mountain Campground, this route becomes extremely narrow, steep and winding, and is inaccessible to even small trailers or recreational vehicles. Chemise Mountain Road traverses the Bear Creek Valley south from Shelter Cove Road and provides access to Wailaki and Nadelos Campgrounds. A number of County roads in Shelter Cove also serve as access routes to BLM recreation sites within the subdivision.



*Humboldt County roads serve as scenic access corridors to the KRNCA.*

The *Regional Transportation Plan for Humboldt County* is the primary strategic planning document for the area's County roads. This plan also identifies priorities for funding of roadway improvements with federal and state highway funds. Table 2-20 lists the estimated traffic volumes and functional classifications of the primary County access roads to and within the KRNCA. The plan recognizes the importance of the tourism industry to the County economy and the use of transportation routes as recreation travel corridors. It identifies needs for improving access corridors, providing adequate parking for recreational vehicles, and coordinated signing as priority needs for the County.

FIGURE 2-17: ROADS AND TRANSPORTATION SYSTEM

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Table 2-20: Estimated Traffic Volumes

ROAD NAME	ESTIMATED TRAFFIC VOLUME	FUNCTIONAL CLASSIFICATION
Mattole Road	900 Vehicles Per Day	Major Collector
Bull Creek/Panther Gap Road	800 Vehicles Per Day	Major Collector
Wilder Ridge Road	140 Vehicles Per Day	Major Collector
Shelter Cove Road	800 Vehicles Per Day	Major Collector
Chemise Mountain Road	Unknown	Major Collector
King Peak Road	Unknown	Minor Collector
Lighthouse Road	Unknown	Minor Collector

Source: Humboldt County Regional Transportation Plan, 2000-2002

The BLM maintains a 44-mile network of unpaved roads that links the County road system to KRNCA trailheads and other recreation sites and provide for fire and administrative access. Many of the routes also provide access to private lands, with Nooning Creek, Prosper Ridge, and Windy Point Roads serving as primary access for year-round residents. Below are listed the BLM roads in the KRNCA that are maintained for public access and their approximate mileage. No traffic volume data exists for these routes.

- € Prosper Ridge Road, 2.2 miles
- € Nooning Creek Road, 2.0 miles
- € King Range Road, 6.6 miles
- € Finley Ridge, 1.5 miles
- € Smith-Etter Road, 10.2 miles
- € Windy Point Road, 1.6 miles
- € Telegraph Ridge Road, 3.2 miles
- € Etter Road, 1.9 miles
- € Paradise Ridge Road, 9.0 miles
- € Saddle Mountain. Road, 5.4 miles

A variety of issues affect road use and maintenance on routes to and within the KRNCA. Some of the major issues are as follows:

- € Erosive soils, steep topography and heavy precipitation events combine to make roads extremely susceptible to erosion and failure from landslides. Sedimentation from abandoned logging roads and improperly maintained roads impacts anadromous fish spawning success and other aspects of watershed health.
- € Winter storms often make area roads temporarily impassible due to landslides, fallen trees, heavy snow in the higher elevations and muddy/soft surfaces.

- € Visitors with large motorhomes and travel/boat trailers often have improper braking/towing capacity for the steep grades in the area. As a result, brake failures and vehicle fires from overheated brakes are safety issues.
- € Slow moving vehicles cause numerous traffic slowdowns on area roads, where the steep terrain limits available pullouts.
- € Parking capacity is often exceeded at popular sites during peak summer weekends, especially at Black Sands Beach in Shelter Cove.

A variety of actions have been taken to minimize impacts from the above issues, including improved visitor information, corrective road maintenance, and vigilant inspections/maintenance during winter storm events. Also, several BLM managed roads are limited to four-wheel drive vehicle use only, and/or are also closed in winter for visitor safety and to prevent road damage from wet weather travel.

#### **2.14.4 Off-Highway Vehicles (OHVs)**

A BLM-maintained 44-mile road network provides for OHV opportunities in the KRNCA. This road network ranges from two-wheel drive accessible routes to four-wheel drive “two-track” roads. Several of these routes serve as scenic driving corridors into some of the most remote reaches of the Lost Coast. They offer access to trails, scenic vistas, hunting opportunities, and undeveloped camping.

Motorized use of the King Range coastline by OHVs has been a controversial management issue since the KRNCA was established. In addition to OHV enthusiasts, other recreation users (particularly surfers and abalone divers) have used vehicles to reach more remote areas along the coastal corridor. In contrast, backcountry users, whose numbers have increased dramatically since the 1974 Management Program was written, feel their experience is diminished by the presence of vehicles on the coast (BLM 2003b).

Initially the 1974 Management Program allowed OHV use on a three-mile stretch of beach in the north section of the King Range, but use was discontinued in 1979, under authority from the California State Lands Commission, due to damage to archeological sites. In 1986, the KRNCA Transportation Plan allowed continued OHV use of the beach between Telegraph and Gitchell Creeks, citing popularity of the riding area and minimal resource impacts. However, it proved difficult to prevent vehicles from traveling north of Gitchell Creek onto the closed portion of the beach, and generally OHV use conflicted with primitive recreation and wilderness values (BLM 1997b). The 1986 Transportation Plan called for increased on-the-ground BLM presence to enforce the beach closure at Gitchell Creek, increased public information and signage, and monitoring to determine effectiveness of the plan, but these efforts met with minimal success. Nearly ten years later the BLM revisited the issue in the 1997 Environmental Assessment and Plan Amendment, which closed the remaining 3.5 mile stretch of Black Sands Beach to OHVs.

#### **2.14.5 Current Management Practices**

BLM maintains the 44-mile network of roads identified for public use in the KRNCA Transportation Plan. These roads are maintained on an as-needed basis through road grading and drainage work such as culvert maintenance or improvements. Grading and major improvements are completed through

contracts with the BLM performing other routine maintenance. The BLM also provides directional and other signs on these routes.

Maintenance and reconstruction of the road network to minimize erosion/sedimentation of area watersheds is an ongoing management priority. Current efforts are focused on outslipping and removing berms from the road network to improve road drainage and reduce the need for inboard ditches and culverts. Clogged culverts are a major source of road failures during heavy rains.

Several cooperative projects have been initiated to upgrade road surfaces and drainage structures on county roads in the KRNCA. Cooperative agreements established with the Humboldt County Department of Public Works and the BLM allow for joint projects on County roads within the KRNCA. Projects to date include the paving of 2.6 miles of Chemise Mountain Road (adjacent to the South Fork of Bear Creek, a prime salmon spawning stream) in 1996-97 (in cooperation with USFWS grant), and the replacement of culverts and other drainage structures on King Peak Road (1998). Humboldt and Mendocino County road departments regularly perform routine maintenance on all county roads in the planning area.

## 2.15 RECREATION RESOURCES

### 2.15.1 Introduction

The KRNCA is best known to outdoor enthusiasts as the location of the Lost Coast Trail, an oceanfront backpacking route that is regularly featured in magazines and travel guides. However, the area offers opportunities for a diverse array of activities including camping, hiking, equestrian use, hunting, fishing, surfing, mountain biking, wildlife watching, photography, and driving for pleasure, among others. The public lands in the King Range were accessed for dispersed recreation opportunities well before its designation as a National Conservation Area in 1970. However, the lack of facilities and public access limited use. The first recreation facilities were constructed in the 1960s and included the King Crest, Chemise Mountain and Lightning Trails, and the Wailaki, Nadelos, Horse Mountain, and Tolkan Campgrounds. Additional trails and facilities have been constructed as public demands have increased and changed. However, the area continues to retain its rustic character as a place for more adventurous outdoor enthusiasts.

This diversity of recreation resources leads to a wide array of often-overlapping uses. For example, at Mal Coombs Park in Shelter Cove, a wedding party may gather in the same parking area as several abalone fishermen preparing to dive, while tidepoolers and beachcombers get out of their cars and head for the shoreline. Backpackers walk to the Lost Coast trailhead at Black Sands Beach alongside elderly couples preparing for a quiet picnic. At Mattole Beach, local school children learn about the area's ecology or native cultures while vacationers from across the country set up their tents adjacent to the wild coastline. The area must be many things to many people, even while retaining its distinctive primitive character.

The King Range is a nationally-designated conservation area, but also a local resource for surrounding communities, particularly Shelter Cove and Petrolia where public lands provide community greenspace

for picnics, birthdays, weddings, and other social gatherings. Shelter Cove is also the main coastal access areas for residents of southern Humboldt County, including Briceland, Redway, and Garberville.

### *2.15.1.1 Regional Perspective*

The King Range offers recreation opportunities unique to the region and the entire West Coast, particularly the coastal backcountry experience available on the Lost Coast Trail. For the purposes of this discussion, the recreation region can be defined as the general area along the coast from the Oregon border south to Mendocino, plus a wide inland arc reaching the Mendocino National Forest in the south and the Shasta-Trinity and Six Rivers National Forests in the north (see Figure 2-18). This area contains numerous state parks as well as national forests, parks, and recreation areas.

With the exception of adjoining Sinkyone Wilderness State Park and a small section of Prairie Creek Redwoods State Park, all of the region's coastal recreation opportunities at major recreation sites are oriented towards front country (developed, easily accessed) use, mainly beach access and camping, with no backcountry or primitive opportunities. There are several inland wilderness areas where backpacking is a common activity, such as the Yolla Bolly Middle Eel Wilderness and the Trinity Alps, but these offer much different settings and experiences. Other inland sites focus on more developed recreation; for example, the Ruth Lake area is geared towards lake-oriented recreation such as shoreline camping and watercraft use and Benbow Lake State Recreation Area is suited to non-motorized watercraft, swimming, and picnicking.

The King Range is unique as a place where visitors can take an extended, backcountry camping trip in a coastal setting. Combined with Sinkyone Wilderness State Park, the trail system on the Lost Coast is the largest coastal backcountry trail network in the nation. Although the U.S. has numerous sizable areas of mountain and desert ecosystems that offer backcountry recreation opportunities, primitive coastal settings are extremely limited. In addition to the King Range/Sinkyone coast, only a handful of areas are sizable enough to offer a coastal wilderness experience; the only comparable area on the west coast is Olympic National Park. Point Reyes National Seashore and Prairie Creek Redwoods State Park offer some backcountry opportunities, but on a smaller scale.

## **2.15.2 Applicable Regulatory Framework**

BLM manages recreation in the KRNCA using the following regulations and policies.

### *2.15.2.1 Fire Permits*

Campfire permits are required for anyone who builds or maintains a campfire that is outside developed campgrounds, as well as for the operation of all cooking stoves or other open flame. During high fire seasons, campfires may be temporarily suspended until the conditions change. Campfire permits may be obtained free of charge from any BLM, USFS, or CDF offices (BLM website 2003).

### *2.15.2.2 OHV Designations*

See Section 2.14.

FIGURE 2-18: REGIONAL RECREATION AREAS

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### *2.15.2.3 Rehabilitation Act and Americans with Disabilities Act*

BLM facilities are covered under Section 504 of the Rehabilitation Act of 1978 (Public Law 93-112), which requires that “programs and facilities be, to the highest degree feasible, readily accessible to and usable by all persons who have a disability, including mobility, visual, hearing, or mental impairments.”

### *2.15.2.4 Hunting and Fishing*

BLM manages the KRNCA in a manner consistent with California Department of Fish and Game (CDFG) regulations for all applicable fish and game species found in the area. The King Range falls within the CDFG’s Zone B4, which sets the season dates for specific species. The deer rifle season (by far the most popular) begins the fourth Saturday in August and extends for 37 consecutive days. Squirrel season opens the second Saturday in September and ends the last Sunday in January. Bear season opens the same day as the deer rifle season and extends until the last Sunday in December or when 1,500 bear are taken statewide, whichever comes first. BLM also assists CDFG in the management of marine life such as abalone and tidepool organisms that are available for permitted collecting. Coastal waters off-shore from Mattole beach to the Punta Gorda Lighthouse were designated a Marine Resources Protection Act Ecological Reserve in 1994, and the entire coastline from Punta Gorda south to Point No Pass (39° 57’) was also designated an Area of Special Biological Significance by the California State Water Resources Control Board in 1974.

### *2.15.2.5 Special Recreation Permits*

BLM policy (FLPMA and Title 43 CFR 8372 – Special Recreation Permits, Other than on Developed Recreation Sites) and the 1992 King Range Visitor Services Plan require that commercial and organized non-commercial groups obtain Special Recreation Permits prior to utilizing the KRNCA for their activities. All groups charging fees, including outfitters, must obtain a commercial use permit and meet associated fee and insurance requirements. Noncommercial use permits are required for non-commercial or educational groups using the backcountry for overnight use, but no fee is charged and insurance is not required. Non-organized groups, individual or family use does not require a Special Recreation permit. Groups are considered “non-organized” when no formal advertising of the trip occurs, no fees are charged, and the group is not affiliated with any established organization.

Special Recreation Permits are required for several reasons. Commercial recreation fees are collected to ensure a fair return to the public for private financial gain from use of public land. Backcountry group permits, both commercial and non-commercial, provide the opportunity to stress “leave no trace” backcountry ethics, and dispense other information. In addition, routing permitted groups to certain campsites during high use times can help spread use out and reduce social and environmental impacts on smaller more fragile sites.

### *2.15.2.6 Recreation Fees*

In 1996 the BLM, U.S. Forest Service, National Park Service, and U.S. Fish and Wildlife Service were mandated by Congress to implement a Recreational Fee Demonstration Program. Under the program, all recreation fees are retained by the office collecting the fees. The Recreational Fee Demonstration Program will continue until September 30, 2005, at which time it may or may not be extended. Fees are

currently charged for commercial Special Recreation Use permits, bear-canister rentals for overnight backcountry travel, and campground use (BLM 2003b).

#### *2.15.2.7 Bear Canisters*

As use has increased on the coast, so have encounters with black bears, likely drawn to popular camping areas by improperly stored food and/or refuse. BLM implemented an emergency rule in 2002 to reduce conflicts between visitors and bears, requiring visitors to use a hard-sided bear-proof food storage container (manufactured specifically for this purpose) for storing food, trash, toiletries, and other scented items. To date this effort appears to be having a positive effect, as damage to backpacking equipment, food supplies, and reported encounters with bears have decreased since the rule went into effect.

#### *2.15.2.8 Camping Stay Limit*

The BLM limits camping stays to fourteen nights per year on all agency administered lands in northwest California.

#### *2.15.2.9 Law Enforcement*

BLM has one fully commissioned law enforcement ranger who patrols the King Range National Conservation Area. An additional three law enforcement rangers work out of the Arcata field office and occasionally patrol the King Range as well, particularly during holidays, busy weekends, or during “events” in the area. BLM also has a non-law enforcement Backcountry Ranger on staff that patrols the Backcountry on foot to provide public contact for visitors and to conduct resource monitoring in support of management objectives.

#### *2.15.2.10 Resource Monitoring*

A resource monitoring program was developed in 2002 to assess resource impacts from backcountry use along the Lost Coast. The monitoring program assesses all campsites and surrounding trails and auxiliary use areas during both early spring and mid-autumn. The reason for monitoring twice a year is to assess conditions after the winter storms have altered the beach environment, often removing campsites and driftwood shelters along the beach, and then to evaluate the change in conditions after the heavy use season in summer. Monitoring assesses impacts such as littering, fire ring proliferation, condition of driftwood shelters, sanitation problems, and vegetation and soil disturbance for all sites between Mattole and Black Sands Beach. Information from this monitoring program will be used in combination with visitor surveys and visitor use counts, reports from employees in the field and other information to determine the need for a more comprehensive visitor use allocation system in the future.

### **2.15.3 Existing Conditions**

#### *2.15.3.1 Recreation Sites and Opportunities*

Recreation has long been a part of the King Range landscape, perhaps starting with early hunting lodges built in the 1920s and '30s (see Section 2.4.3.2, Historic Sites). As early as 1964, before the KRNCA was

formally established, there were already four developed campgrounds and three “hunter camps” (described below) on public-owned lands. Currently, BLM manages approximately eighty miles of trails, six developed campgrounds, four upland backcountry campsites, five coastal access areas, a Visitor Center, and other visitor and recreation features and destinations.

### Hiking Trails and Trailheads

The King Range contains approximately eighty miles of hiking trails spanning from the coast to the tallest ridges and mountain peaks (see Figure 2-19). The majority of these trails were developed between 1964 and 1970, but since 1970 many have been expanded, developed, or even re-routed. There have been several recent trail installations since 1999, including Cooskie Spur Trail, Rattlesnake Ridge Trail, Horse Mountain Creek Trail, and the Chinquapin Trail. Two trails, the King Crest Trail and Lost Coast Trail, have been designated as National Recreation Trails. This designation identifies these routes as being in the “hall of fame” of U.S. trails.



*The Lost Coast Trail is the most popular destination in the KRNCA.*

Established trailheads include the following: Black Sands Beach, Mattole Beach, Northslide Peak, Kinsey Ridge, Spanish Ridge, Lightning, Saddle Mountain, Horse Mountain Creek, Hidden Valley, Nadelos and Wailaki Campgrounds, and Windy Point. Major trails in the King Range include:

- € **Buck Creek Trail:** This 3+ mile long trail drops nearly 3,300 vertical feet from the King Crest Trail (one mile from Saddle Mountain Trailhead) to the beach.
- € **Kinsey Ridge Trail:** This old road, gated at the Kinsey Ridge trailhead along the Smith-Etter Road, drops 2,450 feet over four miles from the trailhead to the beach.
- € **Spanish Ridge Trail:** This trail follows an unmaintained dirt road for about two miles from the Spanish Ridge Trailhead (end of Telegraph Ridge Road) before splitting off from the Cooskie Creek Trail and plunging down a decommissioned road 2,400 vertical feet over three miles to the ocean.

FIGURE 2-19: RECREATION SITES AND FACILITIES

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back of Figure 2-19

- € **Rattlesnake Ridge Trail:** This five mile long trail drops 3,500 vertical feet from the King Crest near the Miller Loop Trail to Big Flat.
- € **Cooskie Creek Trail and Spur:** This 13 mile trail generally follows old ranch roads from the Spanish Ridge Trailhead to the beach between Fourmile Creek and the Punta Gorda Lighthouse. The Cooskie Creek Spur is a shortcut to the beach, dropping 750 vertical feet in 1.2 miles along an old ranch road.
- € **Lost Coast Trail, north section:** This main portion of the Lost Coast Trail is the “heart” of the KRNCA. It extends 25 miles along the beach from Mattole Campground/Trailhead to the Black Sands Beach trailhead at the north end of Shelter Cove.
- € **Lost Coast Trail, south section:** The BLM portion extends for a little over five miles from Hidden Valley Trailhead, rising 900 feet vertical elevation to Chemise Mountain before winding down into the Sinkyone Wilderness State Park.
- € **Lightning Trail:** This 2 mile trail begins at the Lightning Trailhead at the end of the King Range Road and rises 1,800 vertical feet to King Peak, passing Maple Camp (with water) along the way.
- € **Horse Mountain Creek Trail:** This connector trail from the beach to the ridge, drops 1,500 feet from the Horse Mountain Creek Trailhead along the King Peak Road to the beach in 3.8 miles.
- € **Chemise Mountain Trail:** This connector trail is less than one mile long and links both Nadelos and Wailaki campgrounds with the southern Chemise Mountain portion of the Lost Coast Trail. It rises about 700 feet.
- € **King Crest Trail:** This 11 mile trail traverses the King Crest, the “spine” of the King Range.

Additional, shorter trails in the King Range include the Chinquapin Trail, Miller Loop, Maple loop, and the nature trail between Nadelos and Wailaki campgrounds. Miller Loop and Maple Loop Trails connect Miller and Maple Camps (each near water sources) with the King Crest Trail. The Chinquapin Trail provides access to the Chinquapin Camp.

The Lost Coast Trail is particularly distinctive as one of the longest stretches of backcountry coastal trail remaining in the western United States. Only Olympic National Park in Washington has a similarly long stretch of backcountry coastline. The Lost Coast Trail follows approximately 56 miles of coastline; the King Range segment is 37 miles long, and the trail then continues south for another 19 miles through the Sinkyone Wilderness State Park.

### Camping/Campgrounds

There are six developed campgrounds in the King Range, with a total of 54 sites, varying in terms of site layout, screening, proximity to residential areas and roads, and water availability (see Figure 2-18). They are listed here from north to south:

- € **Mattole Campground:** Includes 14 tent/trailer campsites with picnic tables, fire rings, and vault toilets, and is the only beach campground in the King Range.

- € **Honeydew Creek Campground:** 5 tent/trailer campsites in a riparian setting, with picnic tables, fire rings, and vault toilets. No potable water is available.
- € **Horse Mountain Campground:** Offers 9 tent/trailer campsites with picnic tables, fire rings, and pit toilets. No water is available.
- € **Tolkan Campground:** 5 trailer/4 tent campsites with picnic tables, fire rings, and vault toilets.
- € **Nadelos Campground:** “walk-in” campground with 8 tent campsites, picnic tables, fire rings, potable water, and vault toilets. Entire campground may be reserved for overnight group use (up to 60 people).
- € **Wailaki Campground:** 13 tent/trailer campsites with picnic tables, fire rings, potable water, and vault toilets.

In addition to the BLM-managed campgrounds, A. W. Way Park, operated by Humboldt County, offers camping and picnic sites along the Mattole River between Honeydew and Petrolia. Visitors wishing more amenities (hookups, showers) can camp in privately operated campgrounds in Shelter Cove, Redway, Garberville or Ferndale.



*The heavily forested Wailaki Campground is one of the most popular in the KRNCA.*

Additionally there are four primitive backcountry camps in the King Range, some that have been established and used for many years, stemming from early “hunter camps.” Maple Camp, Bear Hollow Camp, and Miller Camp are located on upland trails near King Peak, with water (although it must be filtered or purified) available from streams or developed springs that flow all or most of the year. Chinquapin Camp is the only established backcountry campsite on Chemise Mountain and is near a perennial stream. All of these backcountry campsites are small, shaded woodland sites, and historically have received light, sporadic use. However, with increasing visitation and organized groups being re-

routed to alternative trailheads (other than Black Sands Beach and Mattole), use of these campsites is increasing.

### Day Use Areas

The BLM maintains three day-use areas in the community of Shelter Cove. Mal Coombs Park lies in the heart of Shelter Cove, and includes the newly relocated Cape Mendocino Lighthouse (see description below). A stairwell perched on the rocky cliffs of Mal Coombs Park allows access to frequently visited tidepools and sea lion resting areas. BLM maintains a restroom, an information kiosk, interpretive panels, and a picnic area with barbeque facilities at Mal Coombs Park. In addition, Seal Rock and Abalone Point day-use areas have pull-outs off Lower Pacific Drive that offer sightseers a place to picnic with unobstructed views of the ocean. Other than picnic tables and interpretive panels, Seal Rock and Abalone Point day-use areas are undeveloped. Mal Coombs Park has become a popular location for special events such as weddings, memorials, non-profit fundraisers, etc., that require a permit. The BLM processes each request through the Special Recreation Permit process.

Black Sands Beach, known for its distinctive geological composition of greywacke stone, is located just to the north of Shelter Cove, and is a popular day-use area among both visitors and local residents. To keep up with visitor demand, a recently constructed parking lot with restrooms, kiosk, overlooks with interpretive displays, and drinking water resides on a bluff overlooking Black Sands Beach. An emergency telephone with 911 access is located at a smaller universal access parking lot closer to the beach. Black Sands Beach is the most heavily used trailhead to access the King Range portion of the Lost Coast Trail. This causes crowding problems on popular summer weekends when the parking area is filled beyond capacity.

The mouth of the Mattole River is also heavily used for easy beach access by visitors and local residents. The Mattole Beach trailhead is the northern terminus of the Lost Coast Trail and the primary access route for day hikes to Punta Gorda Lighthouse.

### King Range Office/Visitor Center

The King Range Visitor Center, located on Shelter Cove Road near Whitethorn Junction, was completed in 1999 and serves as the key resource for KRNCA public information and regional land stewardship meetings. Visitors can ask BLM staff questions about recreation facilities and uses, pick up maps and tide charts, obtain fire permits, rent bear canisters, and enjoy a variety of photographic, educational, and interpretive displays. The facility also serves as the administrative office for the King Range staff.

### Lighthouses

The historic Punta Gorda Lighthouse is located about three miles south of the Mattole Campground/Trailhead on the Lost Coast Trail. Historically, high winds and dangerous shoals caused many shipwrecks in this area, promoting the construction of the lighthouse in 1911. Light-keepers generally did not look forward to duty at isolated and lonely Punta Gorda, which earned the reputation of being the "Alcatraz" of lighthouses. No electric lines ever connected it to the outside world, and fierce winds and flooded streams kept it cut off from civilization for much of the winter. Punta Gorda was decommissioned in 1950. The site is a popular destination for day hikers.

The Cape Mendocino Lighthouse was carved into the Cape 400 feet above the surf in 1868. The conditions for the light-keepers here were brutal. Near constant gales and frequent earthquakes literally shook their homes apart. The Lighthouse was decommissioned in 1950. By 1999, when it was in danger of slipping from its original location into the ocean, the Cape Mendocino Lighthouse Preservation Society worked with the BLM and Humboldt County to restore and relocate it to Mal Coombs Park in Shelter Cove. The original lens from the lighthouse is displayed at the county fairgrounds in nearby Ferndale. Today, Society volunteers open the Lighthouse and provide information to visitors during heavy use periods. Interpretive displays both outside and inside the facility tell the story of this interesting and historic lighthouse.

### *2.15.3.2 Recreation Activities*

#### Sightseeing

Many people visit the KRNCA area as part of or major destination point for sightseeing trips. Shelter Cove is a frequent destination for people wanting to fish, gain spectacular ocean views, picnic by the sea, or drive for pleasure and enjoy the surrounding scenery, to name a few reasons. Those wishing to see more of the King Range while sightseeing can also drive roads such as the King Peak, King Range, Saddle Mountain, Smith Etter and Telegraph Ridge Roads. People also visit the King Range specifically to simply watch the waves, particularly in the winter when the surf is especially large and spectacular after storms.

#### Wildlife Viewing and Photography

The King Range has a diversity of wildlife, both terrestrial and marine. Points within the King Range are often used for observing and photographing whales as they migrate past the area during late fall and early spring. Seals and sea lions can easily be seen at a number of locations, particularly from Shelter Cove sites, the Punta Gorda Lighthouse area, and Sea Lion Gulch. Exploring intertidal life is a popular activity, particularly below Mal Coombs Park at Shelter Cove, and the Punta Gorda Lighthouse area. Elk viewing in the Hidden Valley area is also very popular.

#### Backpacking and Hiking

The primary recreational attraction to the KRNCA is the backpacking, hiking, and camping opportunities in the backcountry, particularly along the Lost Coast Trail. The classic “through” hike is the 25 mile stretch between Mattole Beach to Black Sands Beach, usually done north to south in the summer due to the prevailing, often strong, north winds. Approximately two thirds of the Lost Coast trek involves hiking directly on the beach, on sand, gravel, and cobbles, which can slow the pace of even the strongest hiker. The remaining third of the trail, mainly in the Big Flat and Spanish Flat areas, traverse uplifted benches above the ocean and provide much easier walking. Creeks and springs are plentiful along the coast but all water must be filtered. During the rainy season (generally November through April), winter storms can cause major obstacles to backpackers. Heavy rains swell the major creeks, making them impassable while large waves make the beaches dangerous. Two major areas along the coast (from just south of Buck Creek to Miller Flat, and between Sea Lion Gulch and Randall Creek) can be difficult to pass at higher tides and extremely dangerous during times of rough seas with large

swells. Other natural hazards include poison oak, ticks, and rattlesnakes are found close to the beach as well as along the upland trails.

Despite the sometimes adverse conditions, the Lost Coast provides the backcountry traveler a myriad of wondrous sights and sounds. Tidepools, archaeological and historic sites, diverse and abundant wildlife, wildflowers, and the ever present ocean produce unique experiences for visitors. While the King Range NCA receives visitors from throughout the country and world, the majority of backcountry users come from the greater San Francisco Bay area (Martin and Widner 1997). Many hear about it from word of mouth or travel articles. Others read articles from magazines such as *Outside*, *National Geographic*, *Backpacker*, *Sunset*, and others which frequently write about the Lost Coast.

Backcountry campers may camp anywhere within the King Range. Numerous campsites have become established through frequent use along the coast, particularly at the mouths of the major creeks. Along the upland trails, most people camp at the established backcountry campsites (Maple Camp, Miller Camp, Bear Hollow, and Chinquapin Camp) as these locations essentially provide the only sources of drinking water. While the majority of backcountry overnight users are drawn to the Lost Coast, an increasing number of people are backpacking the sixty miles of upland trails. Completion of the Rattlesnake Ridge Trail greatly expanded the loop trail opportunities combining upland trail and beach backpacking. The Buck Creek-King Crest-Rattlesnake Ridge-Lost Coast Trail loop trip is becoming more popular while fewer people connect the upland trails with the beach via other connector trails such as the Kinsey Ridge trail. These upland/beach loop trail opportunities give people more diversity in their backpacking outing but require extensive elevation gains and losses and demand that the hiker be in excellent physical condition.

### Equestrian Use

Horseback riding as a recreation activity in the King Range has a relatively long history, predominantly with local equestrian enthusiasts. Present equestrian use is light, with most activity focused along the Lost Coast Trail. It is not uncommon for llama and goat packers to use the area as well as the more traditional horse and mule packers. BLM has worked to address equestrian demand including recently developing the Horse Mountain Creek Trail and staging area, with help from equestrian organizations. Horse use is partly limited due to difficulty in accessing trailheads on narrow mountain roads with large trailers. Many trails also have narrow stretches that are difficult for pack stock to negotiate. Opportunities exist to improve equestrian access on a portion of the trails.

### Mountain Biking

When the 1974 Management Program was developed, mountain bicycles had not yet been invented, but in the past ten to fifteen years their use has sky-rocketed nationwide. To date the King Range has received relatively little use, due to a relatively low number of suitable roads and trails. Large portions of the King Range are managed as Wilderness Study Areas (WSAs) and thus may become off-limits to bicycles if they are eventually designated wilderness under the 1964 Wilderness Act. In addition, according to BLM policy, new trails constructed within existing WSAs are also off limits to mountain bikes so as not to develop a pattern of use, only to be prohibited in the future if the area is formally designated. Opportunities exist to develop mountain bike trails in non-WSA parts of the area.

### Hunting

Several types of animals, including deer and squirrels, are hunted in the King Range, especially the northern part of the area. Similar to national trends, the number of licensed hunters has decreased in California (based on license sale data from 1996 to 2002). However, not all types of hunting permits have decreased in sales; non-resident deer tags, duck stamps, and two-day waterfowl permits have all increased (CDFG 2002). Informal field observations indicate that hunting trends in the King Range are decreasing as well. However, the area continues to be popular among hunters, especially since it is the largest block of public land available for hunting in the region. Opening day of deer rifle season in the King Range brings in a moderate influx of hunters into a comparatively small region, resulting in some user conflicts. Most conflicts arise between hunters and private landowners bordering the KRNCA. The landowners cite trespass and safety as major concerns. The BLM has worked to minimize these conflicts by increasing hunter information and providing additional field staff and ranger patrols in popular hunting areas.

### Surfing

The wave breaks off the King Range, particularly in the area around Big Flat (8.5 mi. north of Black Sands Beach), are well known for excellent surfing conditions. The best conditions occur from fall until spring when winter storms build large ocean swells. Many surfers hike the 8.5 miles from Black Sands Beach to Big Flat. However, in recent years, increasing numbers of drive-in boaters make trips from Shelter Cove to access backcountry surf destinations, particularly Big Flat. Many of these boats are used for day trips and are anchored off shore while their owners surf. However, increasing numbers of surfers are landing boats and bringing in supplies for camping. This trend has raised the question about the appropriateness of using motorized watercraft in an otherwise non-motorized backcountry setting. A trend of increased littering may be a result as some visitors that arrive by boat are unwilling or unable to pack out the larger amount of supplies brought in during the winter surf season.

### Fishing

The community of Shelter Cove is a major sport-fishing destination in California, featuring a public boat launch ramp, commercial chartering services, a parking area for car/trailer combinations, and a fish cleaning station. Anglers are drawn to the area for the summer ocean salmon season, but also fish for halibut, albacore and bottom fish. Some fishermen park at Mal Coombs Park which was designed for pull-through boat trailer parking. However, with the increased use of the park for other activities, the lot is often congested during peak summer weekends. The BLM has a design in place to expand parking, but funding has been unavailable for construction. Fresh water fishing is closed in the King Range except in to the lower Mattole River below Honeydew Creek which is open to catch and release steelhead fishing. The remaining streams are closed to fishing to protect threatened salmon and steelhead populations.

### Other Uses of the Area

While most recreational activities in the King Range focus on hiking, backpacking, camping, wildlife viewing, surfing, hunting, fishing, and sightseeing in general, new interests and evolving technologies also bring less traditional uses to the area. Geocaching, a technology-based treasure hunt, is becoming more popular, with at least one geocache site established in the King Range. Mattole Beach is occasionally

used for paragliding. These and other activities receive very light use and tend to have little to no impact on the area.

### *2.15.3.3 Recreation Use Levels and Demand Analysis*

Demand for specific recreation activities available in the King Range has, in most cases, increased significantly since the area was first established. Primitive camping, including backpacking, has rapidly increased in popularity over the past several decades. And, as mentioned above, there are several new types of recreation activities occurring in the King Range, including mountain biking, paragliding, and geocaching.

At a local level, BLM compiles visitor use information from observation sheets, trailhead registers, visitor feedback at the visitor center and direct contact in the field, bear canister rental information, Special Recreation Permit information, and will rely heavily on the 2003 Lost Coast Trail Backcountry Visitor Study. Preferences and use levels of visitors have been estimated, using the best available information and professional knowledge.

The 1997 Lost Coast Trail Backcountry Visitor Study (Martin and Widner 1998) was designed to gauge visitor demographics, likes and dislikes, and to establish trends in visitor satisfaction with the King Range, specifically the Lost Coast. A similar Visitor Study was conducted during the summer of 2003 (report not completed at the time of publication of this draft plan) and is planned for completion every five years to continue to identify trends in visitor satisfaction. Some key findings and conclusions from the 1997 survey are contained in Appendix G.

Use levels have grown steadily in the area over the past three decades. In 1973, there were an estimated 1,000 visitor days on the Lost Coast Trail and 65,000 total King Range visitor days. By 1986, use of the Lost Coast Trail had increased to 3,200 visitor days, and by 1996 use numbers were estimated at 14,000 visitor days. In 2001, the Lost Coast Trail had an estimated 17,000 visitor days and the entire King Range had 150,000 visitor days (BLM Recreation Management Information System Data 2002).

Because the majority of King Range visitors come from outside the immediate area, it is important to consider recreation demand trends at a larger scale. Nationally, demand for non-consumptive outdoor recreation is generally increasing compared to consumptive types (Cordell 1999). This would include an increase in participation of many of the types of outdoor recreation available in the King Range such as hiking.

At the state level, a 1998 recreation study conducted by the California Department of Parks and Recreation (DPR) provides the most recent regional demand data for 43 recreation activities, including several activities that occur in the King Range (DPR 1998). Participants in the DPR study were asked to rank activities they would increasingly pursue if good opportunities were available, and the activities were then categorized according to level of demand; the results are listed in Table 2-21.

Table 2-21: Demand for Selected Recreation Activities in California

ACTIVITY	EXISTING DEMAND
Trail hiking	High
Mountain biking (unpaved surfaces)	Low
Driving for pleasure	Low
Primitive camping	High
Developed camping	High
Nature study/wildlife viewing	High
General use of open space	High
Picnicking	High
Beach activities	High
Fishing (freshwater)	High
Hunting	Low

Source: DPR 1998

## 2.15.4 Recreation Management Issues

### 2.15.4.1 Use Capacity at King Range Facilities

Black Sands Beach, Mal Coombs Park, and Mattole Beach are popular destinations for both local residents and visitors. Heavy use occurs at these easily accessible beach locations on summer weekends, and especially on Memorial Day, Fourth of July, and Labor Day weekends. At these times, facilities such as parking lots serving these sites reach or exceed their physical design capacity. Future use projections indicate a need to consider either limiting use or expanding capacity at these locations. Currently, campgrounds are rarely filled, except at Mattole, which can reach capacity during summer weekends.

### 2.15.4.2 Use Levels of Lost Coast Trail and Big Flat

As discussed above, use along the Lost Coast Trail has been steadily increasing, reaching approximately 17,000 visitor days of use in 2002. In the Lost Coast Trail Backcountry Visitor Study, researchers found that camping was fairly well spread between ten locations along the coast; Big Flat received the most use of any campsite location along the coast, totaling 22 percent of all campsite use, followed by Gitchell Creek (14 percent) and Cooskie Creek (11 percent). At that time, 28 percent of users felt that controls were needed to limit the number of users on the Lost Coast Trail, and 47 percent of respondents believed that controls were not needed now, but that they should be imposed in the future if overuse occurs. The preferred method of controlling use was by achieving better spacing between groups rather than limiting access to the area. Visitors clearly did not want use to be controlled by the use of a lottery permit system, with over 60 percent of all visitors opposing this method. Over 60 percent of all visitors would support a first-come first-served or a mail reservation system for the delivery of a use permit system (Martin and Widner 1998).

The increasing intensity of recreational use on the King Range coast creates several management challenges, particularly between Big Flat and Shelter Cove. Big Flat has always experienced heavy use due

to its location and unique setting. Big Flat features a major trail junction leading to and from King Peak, the distance from Shelter Cove makes it a desirable overnight campsite, fresh water is available, it is a renowned surfing location, and there is ample space for visitors to find campsites away from others. Although Big Flat receives heavier use than any other campsite on the Lost Coast, it can accommodate larger numbers of people. Over one hundred people were counted camping on Big Flat in one night during 2003 Memorial Day weekend. Greater impacts (overcrowding, sanitation issues, etc.) occur at Buck Creek and Shipman Creek, both very popular but much smaller sites. Many people backpacking from Mattole to Black Sands Beach or other routes prefer to camp at these locations to position themselves for a shorter hike out to Black Sands Beach or to avoid the high tide. Others start from Black Sands Beach camp at Gitchell Creek, Buck Creek, or Shipman Creek, and take day hikes up to Big Flat.

One particular use trend at Big Flat is the use of boats to access the area for one-day surfing trips, or to unload equipment and supplies for surfers or other groups of visitors wishing to camp at Big Flat for longer periods of time. Consequently, this new form of access allows people to bring more heavy equipment and gear than backpacking generally allows, and this has led to an increase in trash at the site. In the 1997 Lost Coast Trail Backcountry Visitor Study, respondents rated few potential management problems as “major” or “moderate,” but litter was identified as a problem by 30 percent of all users (Martin and Widner 1998). In recent years, the BLM has removed between 500 and 1,000 pounds of trash annually from Big Flat including tarps, pots and pans, extra food, and miscellaneous garbage. However, BLM has no direct management authority over off-shore resources; mechanized boat use along the shore is legal, although the actual “landing” of watercraft on the beach, which is where BLM’s jurisdiction begins, is not consistent with current management goals. It has also been observed that boat-in users occasionally have had trouble returning to their watercraft with their belongings, particularly if the weather is bad, and this may significantly contribute to the trash problem, as boaters are forced to hike out and cannot carry everything with them.

#### *2.15.4.3 Sanitation*

Sanitation, particularly in regard to human waste, is a growing problem at popular camping sites on the Lost Coast Trail, not only at Big Flat but also near the mouths of major creeks such as Buck Creek, Shipman Creek, and Cooskie Creek. Human waste directly adjacent to creeks and within or close to campsites is both an ecological and human health issue. Educational materials encourage coastal backcountry hikers to bury human waste on the beach in the wet sand below the high tide mark.

#### *2.15.4.4 Campfires in Summer*

As discussed in Section 2.15.2 (Applicable Regulatory Framework), fires are permitted in the King Range during much of the year, although campfire permits are required at all times for campfires and camping stoves. During declared fire season (usually starting July 1), campfires are prohibited, until rainstorms return to the Lost Coast, generally in early fall. Fires have been known to spread from campsites along the Lost Coast Trail to the west slope from poorly located or excessively large campfires. In particular, driftwood logs or open grasslands can be ignited if visitors build fires too close to them and wind can then spread the flames. Over the last few years, BLM has been improving education for visitors about the proper use of campfires. This includes building fires a safe distance from driftwood piles, selecting properly sized sticks and fuels to burn, and completely extinguishing fires with water instead of sand.

#### *2.15.4.5 Conflicts/Crowding Among Recreational Users*

Based on current management, there have been relatively few recent reports in the KRNCA of conflicts between user groups. In the 1997 Lost Coast Trail Backcountry Visitor Study, conflict between users was measured using an index of three questions: crowding, behavior of others, and resource impacts. Survey respondents felt that hiker groups, which were the most frequently encountered, were not a problem. In fact, only 12 percent of respondents indicated that they saw too many hikers. However, 27 percent said that the behavior of others interfered with their enjoyment of the Lost Coast Trail (Martin and Widner 1998). Most of this concern was attributed by respondents to vehicle use on the beach, which is no longer permitted.

Field observations indicate some conflicts may be attributable to group size on the Lost Coast Trail. The presence of large groups, although they make up a relatively small percentage of overall use, results in the over-crowding of isolated small camping spots like Buck Creek and Shipman Creek. In addition, larger groups have a higher impact on the level of solitude visitors feel when traveling the Lost Coast Trail. The 1997 Lost Coast Trail study found that the average group size on the trail was 3.1 people (Martin and Widner 1998). Preliminary data from a similar study completed in 2003 indicated that the majority of users preferred a maximum group size of 10 or fewer people (Martin 2003). As a result of the above concerns, limits have been set for Special Recreation Permittees, which usually represent the largest groups on the Lost Coast Trail. Current limits include group size, number of groups allowed from each trailhead, and limiting number of groups camping at smaller and/or more sensitive campsites.

## **2.16 INTERPRETATION AND EDUCATION**

### **2.16.1 Introduction**

The KRNCA's interpretive and educational program emphasizes the rugged isolation of the King Range and how dynamic physical processes influence its natural and cultural resource values, and explains the role of the BLM in maintaining those values while providing a diversity of recreation opportunities for the public (1992 Interpretive Prospectus). Interpretive materials are aimed at helping visitors appreciate the uniqueness of the King Range while learning to use the area in a safe and responsible manner. This may include preparing visitors for exploring the backcountry, such as conveying information about the highly variable weather, tides, and trail conditions, as well as suggesting strategies for better safety and preparedness on the trail. However, not all visitors have the time or the ability to experience the backcountry directly, and so for them, interpretive materials convey an understanding and appreciation of the primitive qualities of the area while remaining on the more developed margins.

### **2.16.2 Existing Facilities and Programs**

As described in the Recreation section above, most developed sites and facilities in the King Range have associated interpretive materials, including extensive exhibits at the King Range Office. A fold-out glossy map is available for all visitors, which includes both basic geographic information plus brief descriptions of area resources, recreation opportunities, regulations for use, and safety suggestions. BLM also maintains kiosks at trailheads and other developed sites throughout the King Range with basic maps, area conditions, and natural history information. The information is updated seasonally, and is intended as an

additional effort to communicate the basics of safety and preparedness to visitors, as well as to further encourage the “leave no trace” ethic.

Most developed recreation sites in the KRNCA feature interpretive panels intended as destinations for people interested in learning about on-site features, rather than emphasizing safety or general orientation to the area. These include two panels about archeological resources at Mattole Beach, panels at both the Punta Gorda and Cape Mendocino lighthouses on their particular histories, and a number of panels throughout Shelter Cove describing the area’s history, marine mammals, and tidepools. There is also an interpretive trail between Nadelos and Wailaki campgrounds offering background on Native American stewardship and use of natural resources. In 2003, BLM developed interpretive panels for Black Sands Beach to educate day-use visitors about the KRNCA’s natural processes and help prepare backpackers for hiking the Lost Coast Trail.

A number of King Range interpretive programs are designed specifically to involve local school children, to educate them about their surrounding ecosystems and create a stronger relationship with the KRNCA as well. An example was the Petrolia School coastal prairie education effort, where local kids first learned about these unique habitats, and then developed interpretive signs to educate visitors about staying on the roads and protecting the prairies. Local classes have also adopted the Mattole Beach and have produced signs advocating a leave-no-trace ethic and respect for natural resources. Other school groups have adopted watersheds and participate in tree planting, stream turbidity monitoring, and a variety of other hands on resource management projects.

BLM staff, sometimes with interns or volunteers (see below), also conduct guided interpretive walks in the King Range, covering a wide variety of natural and cultural history subjects. Walks are offered routinely during the more popular summer months, then scaled back to on-demand tours during the rest of the year. Staff will also set up topical presentations for special groups, such as the American Hiking Society or a local basketweavers’ group.

### **2.16.3 Local Collaboration and Partnerships**

Significant education and interpretation is done in partnership with local organizations. For example, BLM works with the Lost Coast Interpretive Association (LCIA), a non-profit group who’s purpose is to “provide education about and advocacy for the natural environment and cultural history of the Southern Humboldt and Northern Mendocino Coast, and the Mattole River Valley, for residents and visitors to the area” (LCIA Articles of Incorporation). In 2001 the BLM and LCIA jointly produced the “Lost Coast Adventure” video to educate visitors on planning a safe, low-impact backpacking trip along the coast. Other joint projects include local nature fairs and periodic theme-based educational programs for visitors and residents. Similarly, the non-profit Mattole Restoration Council works in partnership with the BLM to educate K-6 school children about watershed health and fisheries management.

In another collaborative effort, in 1999 BLM worked with the Cape Mendocino Lighthouse Preservation Society to relocate the lighthouse from its original location to Mal Coombs Park in Shelter Cove. The partnership project currently focuses on the development of interior and exterior interpretive and educational displays about the lighthouse’s history and relocation. Also, Society members guide interpretive tours during the summer months.

BLM also has a number of programs aimed at helping community students gain technical and career-oriented skills. For example, BLM assists South Fork High School in nearby Miranda, CA, with its wildland fire fighting program, through which students can receive certification as trained fire fighters. BLM has a formal relationship with Humboldt State University (HSU) in order to place students in King Range internship (and other) positions, which both assist BLM in its management of the King Range and the education and career development of HSU students.

## 2.17 PUBLIC SAFETY AND EMERGENCY SERVICES

### 2.17.1 Existing Conditions

Emergency services providers including local volunteer fire departments, the Humboldt County Sheriffs Department, U. S. Coast Guard, California Department of Forestry and Fire Protection and the BLM respond to hazardous conditions and distress calls in the KRNCA. The dynamic processes of the ocean, intense storms, and steep topography of the coastal mountain range create challenges for both visitors and emergency response teams trying to access remote locations in the KRNCA.

The KRNCA does not possess an inordinate number of risks and dangers for visitors when compared to other remote public land locations. However, due to its coastal location, several hazards exist that are not commonly encountered by backcountry visitors in other areas. Foremost among these are tides and large ocean swells, which can render parts of the coastline impassible. Other hazards, common to many backcountry areas, include steep trail segments with limited water supplies, loose sand and cobblestone footing, and swift stream-crossings. In addition, unpredictable natural hazards such as tsunamis, landslides, and earthquakes pose potential threats to King Range visitors, and so are management concerns for BLM and area emergency response organizations and agencies.

Each agency involved with emergency response maintains its own records; no formal interagency incident tracking system is in place. However, based on records compiled by the BLM, approximately eight to twelve search-and-rescue or emergency response incidents occur each year in the KRNCA (excluding fire and law enforcement actions). Most of these incidents take place along the coast and/or in the backcountry. In recent years, these incidents have covered a wide range of medical emergencies, including overexertion and dehydration, falls, drownings, hunting accidents and watercraft accidents.

The growing number of visitors each year is resulting in corresponding increased demands on emergency services providers. The nature of the area (unstable cliffs, large surf, etc.) also requires special skills, equipment, and training for emergency services personnel.

### 2.17.2 Current Management Practices

#### *2.17.2.1 Emergency Agencies*

The following agencies routinely assist the BLM in providing emergency services on public lands in the KRNCA:

- € U.S. Coast Guard

- € U.S. Forest Service (dispatch)
- € California Department of Forestry and Fire Protection (fire protection and emergency response)
- € Fortuna Emergency Command Center (interagency coordination)
- € County of Humboldt Sheriff's Office
- € County of Mendocino Sheriff's Office
- € Shelter Cove, Honeydew and Petrolia Volunteer Fire Departments

Local volunteer fire departments play a vital role in emergency services and are often first on the scene at incidents. BLM has entered into Cooperative Assistance Agreements with the two departments, Shelter Cove and Petrolia, closest to the most popular access points to the KRNCA. As funding is available, the BLM assists these departments by providing equipment, training, and other resources. The closest hospitals are in Eureka and Garberville.

#### *2.17.2.2 Emergency Responses*

Search and rescue is a local county responsibility on public lands throughout the U.S., and the closest medical aid resources are dispatched to render medical assistance. In the KRNCA, 911 calls go to the Humboldt County Sheriff's Offices, who then call BLM, CDF, volunteer fire departments, and/or Coast Guard to assist with search operations and provide local knowledge of the area. Due to their proximity, local volunteer fire departments often arrive to the scene before other agencies. The BLM assists these local fire departments by providing funding for training and equipment.

Response to any particular emergency incident in the KRNCA varies on a case-by-case basis, depending on the type and location of incident, weather conditions (for example, low fog can prevent helicopter use), the agency or organization initially contacted, and personnel available to respond. In some cases, BLM learns of backcountry injuries and emergency extractions well after the incident, particularly if the Coast Guard is the first responder.

#### *2.17.2.3 Emergency Communications*

All BLM public information materials direct visitors to dial 911 in case of emergency. Pay phones are located in the communities surrounding the KRNCA. An emergency phone was installed at the Black Sands Beach Trailhead in 2000 to improve emergency response times and reduce assistance requests on the surrounding residents.

Each agency maintains their own communication system and is assigned specific frequencies by the FCC. Frequencies of CDF, Forest Service, Coast Guard, and local volunteer fire departments are programmed into BLM radios to allow for scanning and communication. In addition, BLM has a cooperative agreement with the Forest Service for dispatch and monitoring of BLM frequencies. BLM law enforcement rangers also have access to California Highway Patrol and County Sheriff radio communications. BLM maintains radio repeater sites on Cooskie Mountain, Toth Road (Shelter Cove), and Pratt Mountain (Garberville) to provide radio coverage for the KRNCA. However, due to the area's

topography, radio communication is limited, especially along the coast and interior valleys. Cell phones and satellite phones are used as backup communications.

#### *2.17.2.4 Natural Disasters*

The California Governor's Office of Emergency Services is responsible for assuring the state's readiness to respond to and recover from natural disasters, and for assisting local governments in their emergency preparedness, response, and recovery efforts. Under this program, disaster preparedness plans have been developed or are under development for Humboldt and Mendocino Counties to respond to a variety of natural disasters. Within Humboldt County, BLM has been assigned lead responsibility to warn public land visitors about an infrequent but very real threat: an earthquake-triggered tsunami. Due to the short warning timeframe for these events, there is no way to alert backcountry visitors to the approach of a tsunami, so efforts are focused on proactively educating visitors about proper responses (climbing to higher ground away from the coast if they have felt an earthquake) at trailhead kiosks.

#### *2.17.2.5 Prevention-Safety Education Programs*

A significant component of the KRNCA's safety program focuses on prevention, providing information and education to make backcountry visitors aware of possible hazards and proper preparation for area conditions. Although no data is available to measure the effectiveness of this program, the ratio of search and rescue incidents is relatively low when compared with the level of visitation. Area brochures and the KRNCA website inform visitors of potential hazards unique to the King Range and how to prepare for and/or avoid them. Kiosks at trailheads contain additional safety/current condition information, such as tide charts and trail closure/condition advisories. Registers are also located at each trailhead to assist search and rescue teams in locating visitors.

Observations have indicated that an inordinate number of search and rescue efforts have been required for clients of organized group permittees. To reverse this trend, additional orientation materials have been targeted to these visitors, and groups are now required to view an orientation and safety video.

## **2.18 SOLID AND HAZARDOUS WASTE MANAGEMENT**

Solid and hazardous waste management practices in the King Range are regulated under both state and federal law. The state and federal laws and regulations that address waste management in the King Range are:

- € Resource Conservation and Recovery Act (federal)
- € California Health and Safety Code, Title 22

The BLM currently complies with all pertinent laws and regulations regarding solid and hazardous waste disposal. Non-hazardous solid waste is routinely collected from receptacles and facilities by BLM personnel or contractors and transported to a properly licensed and operated waste transfer station. The BLM does not burn waste or dispose of waste on-site. Occasionally, illegal dumping occurs on public land within the King Range. The waste is disposed properly by the BLM and, when feasible, the responsible party is identified and legal remedies are sought. Another source of potentially hazardous

waste is flotsam and jetsam that washes up along the KRNCA shoreline. Oil drums and other containers containing potentially hazardous materials occasionally wash onto the beach corridor. These items are removed and disposed of properly. No known landfills or other hazardous waste sites are known to occur on public lands in the KRNCA.

Currently, the volume of hazardous waste that is generated in the King Range does not exceed the small quantity generator threshold. The small volume of hazardous waste that is generated at the King Range Administrative Facility is either recycled or disposed through the Humboldt County Small Quantity Generator Program. The hazardous waste stream consists of used motor oil, expired or obsolete hazardous materials such as paint, solvents, batteries, and lubricants. Used motor oil is routinely collected by a properly licensed hauler and transported to a recycling facility. Personnel associated with the King Range have also been identifying less-toxic alternatives to hazardous materials that have been used traditionally.

Due to the remote nature of the King Range, only certain non-hazardous waste streams (paper, aluminum, and glass) can be economically recycled. Currently, most King Range public facilities are not equipped with receptacles for recyclable materials. As stated above, when possible, excess hazardous materials are recycled through the Humboldt County Small Quantity Generator Program which collects and provides excess paint and similar hazardous materials free to the public.

## **2.19 ADMINISTRATIVE SITE FACILITIES**

The King Range Administrative Site currently includes the King Range Project Office, a fire barracks, a workshop, an historic milk barn, an historic hay barn, and a “Butler” building. Except for the two barns and the Butler building, the facilities date from the mid-1990s and are currently in very good condition. The existing site plan for the Administrative Site was developed prior to construction of the fire barracks, shop building, and project office and includes a vehicle barn, which has yet to be constructed. Existing policy is to ensure that facilities are properly maintained by performing routine preventative maintenance and annual condition assessments.

Several facilities within the King Range are equipped with potable water supply systems. BLM policy regarding public water supplies is to operate and maintain the systems in accordance with applicable federal and state drinking water regulations. It is anticipated that the current program of upgrading public drinking water systems to meet state and federal requirements will continue. Specifically, public water supply systems are currently located at Nadelos, Wailaki, and Mattole Campgrounds. Although the water system at the King Range Administrative Facility is not considered to be a public water supply, Occupational Safety and Health Administration regulations require the system to be operated in accordance with the same requirements. In addition, several developed springs are located in the backcountry. These springs are interpreted to fall under the Safe Drinking Water Act and therefore must be monitored routinely.

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