# 2

# Existing Conditions

# 2 EXISTING CONDITIONS

Mouth of the Russian River, Source: EDAW 2003

## 2.1 SUMMARY OF PARK CONDITIONS AND RESOURCES

### 2.1.1 EXISTING LAND USE

#### CLASSIFICATION

Sonoma Coast SB is part of the California State Parks System and is classified as a State Recreation Unit pursuant to Section 5019.56 of the California Public Resources Code (PRC). Under this classification State Beaches are defined as "consisting of areas with frontage on the ocean or bays designed to provide swimming, boating, fishing, and other beach-oriented recreational activities." PRC §5019.53 further provides for camping as a permitted activity at State Beaches and also states: "Improvements to provide for urban or indoor, formalized recreational activities are normally not permitted."

#### SURROUNDING LAND USES

Sonoma Coast SB is bordered on its eastern side primarily by undeveloped private property. At its southern end is the community of Bodega Bay. The community of Jenner is located adjacent to Sonoma Coast SB approximately 10 miles north of Bodega Bay. Four residential subdivisions, Ocean View, Carmet, Sereno Del Mar, and Salmon Creek, are also located adjacent to Sonoma Coast SB. Two regional parks in the Bodega Bay area are managed by the Sonoma County Regional Parks Department. Doran Park is located across Bodega Harbor from Sonoma Coast SB in the community of Bodega Bay. Westside Regional Park is located east of Sonoma Coast SB on Bodega Head. Fort Ross State Historic Park and Salt Point State Park are located further north along the coast. Until recently a shooting range was located in the Willow Creek Gulch area not far from the Pomo Canyon environmental camp.

As shown in Exhibit 2-1, the land at Sonoma Coast SB is designated by the Sonoma County Local Coastal Plan (LCP) as primarily Institutional, with more recently acquired portions designated for Agriculture or Commercial Center. Most of the areas surrounding Sonoma Coast SB are designated for Agriculture, Recreation, and Rural Residential. Land in the nearby communities of Jenner, Bridgehaven, Duncans Mills, Ocean View, Sereno Del Mar, Carmet, and Salmon Creek are designated for Agriculture, Recreation, Rural Residential, and

Village Commercial. Land use in the Bodega Bay community is varied, consisting of Agriculture, Open Space, Recreation, Institutional, Rural Residential, Low and Medium Density Residential, Planned Community, Commercial Center, Fishing Commercial, and Visitor Serving Commercial land uses. The properties in these communities and subdivisions have generally been developed. Because of the limited water supply in the area, future development is expected to be minimal in the surrounding areas, with the exception of 168 parcels in Sereno Del Mar. If sufficient water supply can be obtained, these parcels may be developed with single-family residences. Aside from these residential developments and potential additions to Sonoma Coast SB, the future land use pattern on the nearby properties is expected to remain mostly unchanged from existing conditions.

## Regional Context

Sonoma Coast SB lies in a sparsely developed area dotted with seasonal residences and resort communities. Because of its abundant natural resources, high scenic value, and mild weather throughout the year, Sonoma Coast SB is one of the primary tourist attractions in the coastal area of Sonoma County. Tourism is one of the principal economic activities in the vicinity of Sonoma Coast SB, as well as Sonoma County, which is famous for its wineries. Fort Ross State Historic Park and Salt Point State Park are located further north along the coast, and several others, including Austin Creek State Recreation Area, are located close to the community of Guerneville. Further south in Marin County are Tomales Bay State Park, Stinson State Beach, and Point Reyes National Seashore. Most of these federal and State recreation areas are located on or near the same roadways that provide access to Sonoma Coast SB.

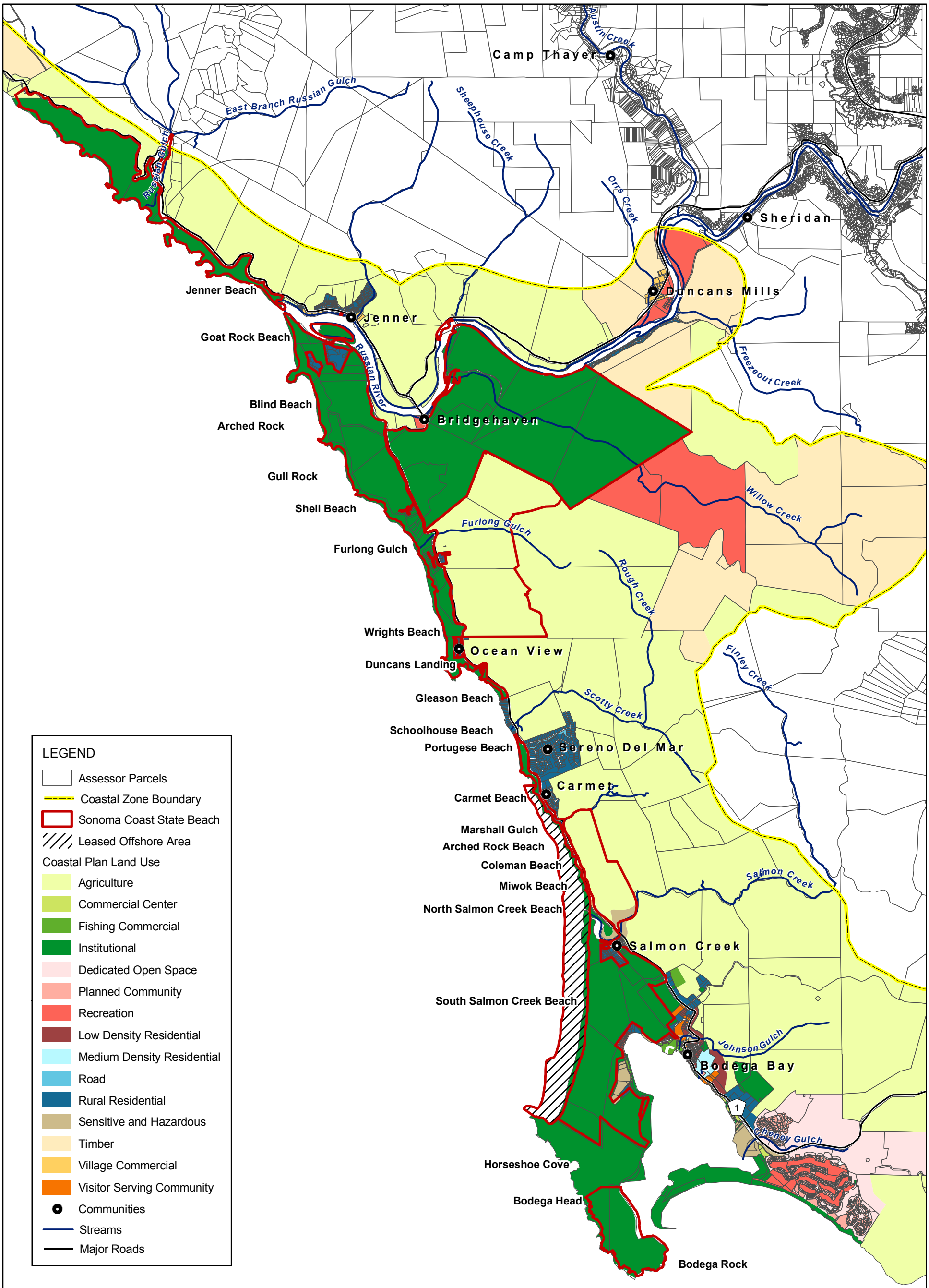
Signage at Duncan's Landing


Visitor Center at Jenner


Coastline north of Jenner


Ranch House at Willow Creek

Source: EDAW 2003




Source: DPR 2003, Sonoma County 2003

N

1 inch = 1 mile

0 4000 8000

Feet

Dec. 9, 2003

EDAW

# Sonoma Coast State Beach

## EXHIBIT 2-1
## Coastal Plan Land Use Designations

#### PARKWIDE LAND USES

Parkwide land uses include open space lands used for recreation and the main transportation corridors of State Route (SR) 1 and SR 116.

#### PARK ACCESS

The primary roadways leading to and from Sonoma Coast SB are SR 1 and SR 116. SR 1, also known as the Pacific Coast Highway, is a regional attraction in itself, drawing visitors from throughout the State and beyond. SR 1 brings visitors north from San Francisco and Marin counties and south from Mendocino County to Sonoma Coast SB. SR 116 connects Sonoma Coast SB at its northern end to Duncan Mills, Guerneville, and other communities located between Sonoma Coast SB and U.S. Highway 101 (US 101). US 101 in turn provides regional access to SR 116 either directly or via SR 12.

To access the Sonoma Coast SB, visitors typically park along SR 1 and other roadways and in turnouts and parking lots off of the roadways.

### 2.1.2 VISITOR PROFILE

#### EXISTING AND POTENTIAL FUTURE PARK VISITORS

#### Existing Visitor Attendance

Visitor attendance surveys conducted since 1995 for all California State Parks show that Sonoma Coast SB is the fourth most visited park in the State Parks system. Sonoma Coast SB received more than 2 million visitors per year (Table 2-1). From a height of 2,460,195 visitors in the 1995–1996 fiscal year, when Sonoma Coast SB was the third most visited State Park, the estimated number of visitors to Sonoma Coast SB decreased to 2,013,574 during 2000–2001. Nonetheless, Sonoma Coast SB remains the fourth most visited State Park in the State and most visited unit in northern California.

**Table 2-1**
**Visitor Attendance at Sonoma Coast State Beach from 1996 to 2001**

| Visitor Type | Fiscal Year [1] | | | | | |
|---|---|---|---|---|---|---|
| | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 |
| Paid Day Use | 33,791 | 40,264 | 42,634 | 50,148 | 49,249 | 51,962 |
| Free Day Use | 2,327,889 | 2,154,292 | 2,317,060 | 2,312,303 | 2,069,547 | 1,869,751 |
| Overnight | 98,515 | 96,494 | 89,226 | 83,660 | 92,606 | 91,861 |
| Total | 2,460,195 | 2,291,050 | 2,448,920 | 2,446,111 | 2,211,402 | 2,013,574 |

[1] Based on fiscal years (i.e., 1995-1996 fiscal year shown as 1996)
Source: Sullivan 2003

Approximately 95% of the visitors at Sonoma Coast SB were day users and most of them were non-paying visitors. However, the number of paying day users steadily increased between 1996 and 2001. People visit Sonoma Coast SB year-round unlike many other Parks.

### Seasonal Use Fluctuations

Because of the mild weather experienced at Sonoma Coast SB throughout the year, visitor attendance is high year-round. However, peak attendance occurs during holiday weekends from April to October.

### Target Populations

In addition to the visitor attendance surveys, the California Department of Parks and Recreation (the Department) has collected visitor satisfaction surveys that include information on the originating counties of the visitors. A total of 270 visitor satisfaction surveys have been collected for Sonoma Coast SB since 1999. These surveys provide some insight into the demographic characteristics of some park users, as shown in Table 2-2. However, since 81% of the 270 survey questionnaires were completed by campers, survey results are not necessarily representative of the demographic characteristics of the majority of park visitors. Specifically, the results would tend to show a wider geographic origin of the visitors, whereas the majority of the park visitors, day users, would not be expected to have originated from areas more than 3 hours away from Sonoma Coast SB. The exception would be tourists to Sonoma County's wineries. An unknown percentage of these tourists, who would originate from locations throughout the State and the country, would be expected to take day trips from the inland areas of the county to Sonoma Coast SB. Aside from these tourists, most of Sonoma Coast SB's day use visitors are believed to originate from Sonoma County and the adjacent counties of Lake, Marin, Mendocino, and Napa, as well as other counties in the San Francisco Bay area and the Sacramento area. These areas together account for 78.5% of the originating counties reported in the 270 surveys.

Overall, the target population of Sonoma Coast SB visitors would be residents from Lake, Mendocino, and Sonoma counties, as well as counties in the San Francisco Bay area and the Sacramento area. These 18 local and regional counties are all within a 3-hour driving range of Sonoma Coast SB. A secondary target population would be tourists who come to Sonoma County primarily for its wineries.

## 2.1.3 Demographic Profile

Notable results of the 270 visitor satisfaction surveys were that 72% of the respondents had at least some level of college education, 73% were age 35 or older, 25% had an annual income greater than $75,000, 63% had an annual income greater than $30,000, and 70% of those who responded to the question on ethnicity listed themselves as white.

| Table 2-2<br>Source of Surveyed Visitors | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Sonoma County and Adjacent Counties | | Regions in California | | | | Outside California |
| | Sonoma County | Adjacent Counties [1] | San Francisco Bay Area [2] | Sacramento Area [3] | Other Northern California [4] | Southern California [5] | Other U.S. States [6] |
| Surveyed Visitors [7] | 36 | 18 | 101 | 105 | 28 | 14 | 22 |
| Percent of Surveyed Visitors | 13.3 | 6.7 | 37.4 | 38.9 | 10.4 | 5.2 | 8.1 |

Notes:
1 Includes visitors from Lake, Marin, Napa, and Mendocino counties.
2 Includes visitors from Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties (all in Association of Bay Area Governments [ABAG] jurisdiction).
3 Includes visitors from El Dorado, Placer, Sacramento, Sutter, Yolo, and Yuba counties (all in Sacramento Area Council of Governments [SACOG] jurisdiction).
4 Includes visitors from Butte, Calaveras, Lake, Mendocino, Nevada, Santa Cruz, San Joaquin, and Shasta counties.
5 Includes visitors from Fresno, Los Angeles, Madera, Orange, San Diego, San Luis Obispo, Santa Barbara, and Tulare counties.
6 Includes visitors from Arizona, Connecticut, Maryland, Minnesota, New Mexico, New York, Indiana, Nevada, Virginia, and Washington states.
7 Based on 270 surveys of visitors between 1996 and 2001. 81% of the surveys were completed by campers; thus, survey results do not necessarily reflect the demographic characteristics of the majority of park visitors.
Source: Veliquette, pers. comm., 2003

### LOCAL AND REGIONAL RESIDENTS

## Population Trends and Projections

As described above, most of the park visitors are expected to have originated from Sonoma County, the adjacent counties, and the metropolitan areas of San Francisco and Sacramento. Visitors can be expected to reflect the population trends of these areas, as shown in Table 2-3. These areas are projected to grow on an annual basis of up to 2.4% through 2010, with a lower growth rate estimated between 2010 and 2020. As such, the number of visitors to Sonoma Coast SB is expected to increase correspondingly.

## Demographic Diversity

Recreation demand and use are affected by changing demographic patterns of the areas served. Aside from overall population growth described above, race/ethnicity, income level, and average age are key factors that will affect the future use patterns of Sonoma Coast SB, as described below.

The Hispanic population in the target counties is increasing proportionally faster than other populations. Relatively large Hispanic populations are present locally in the Sonoma Valley

| Table 2-3<br>Existing and Projected Populations | | | | | |
|---|---|---|---|---|---|
| Population | Sonoma County | Adjacent Counties[1] | San Francisco Bay Area [2] | Sacramento Area [3] | State of California |
| 2000 | 464,800 | 522,400 | 6,783,760 | 1,886,175 | 34,480,300 |
| 2010<br>(yearly growth rate) | 557,300<br>(2.0%) | 588,200<br>(1.3%) | 7,513,800<br>(1.1%) | 2,340,297<br>(2.4%) | 40,262,400<br>(1.7%) |
| 2020<br>(yearly growth rate) | 628,400<br>(1.3%) | 641,900<br>(0.9%) | 8,014,100<br>(0.7%) | 2,696,205<br>(1.5%) | 45,821,900<br>(1.4%) |

Notes:
1 Lake, Marin, Napa, and Mendocino counties.
2 Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties (all in ABAG jurisdiction)
3 El Dorado, Placer, Sacramento, Sutter, Yolo, and Yuba counties, excluding Lake Tahoe Area (all in SACOG jurisdiction)
Sources: DOF 2003, ABAG 2003, SACOG 2001

and regionally in the San Francisco Bay and Sacramento areas. These population concentrations, combined with changing ethnicity patterns in California, will directly affect the pool of potential users of Sonoma Coast SB. According to the U.S. Census, in 1990 there were about 6 million Hispanics out of the total statewide population of 29.8 million (20%). By the year 2000, this increased to about 11 million out of 34 million people (32.4%). This 12% increase in just 10 years suggests that the mix of user groups, and their subsequent facility needs at Sonoma Coast SB, may be changing. For example, Hispanic visitors tend to recreate in large (often family-based) groups, and prefer developed recreation sites, particularly those with picnic tables, barbeque grills, and parking lots (Chavez 2001). Hispanic group picnics also tend to be longer in duration than those for some other ethnic groups, as many food items are prepared from scratch onsite (Carr and Chavez 1993).

Undeveloped/wilderness-type recreation tends to be sought more by people with higher income and education levels (English et al. 1993). The visitor satisfaction surveys for Sonoma Coast SB found that on average, the surveyed visitors had higher income and education levels. The median annual household income in the San Francisco Bay area in 2000 is estimated to be $93,800 (ABAG 2000). The median household income in Sonoma County is $53,076, with 8.1% of the population living below the poverty line. Median household income elsewhere in northern California is closer to the State median; for example, Sacramento County has a median income of $43,816, with 14.1% below the poverty line (U.S. Census 2000). In comparison, the statewide median household income is $47,493, with 14.2% in poverty (U.S. Census 2000). The high income levels in some of the target counties contribute to high demand for undeveloped natural areas and wilderness-type recreation.

The average age of Sonoma County residents is increasing; combined age groups of 45-65 and 65+ represented 31.3% of the total population in 1990, but are expected to comprise 42.2% of the total in 2010 (ABAG 2000). (The 65+ category alone is 12.6% of county

population according to the U.S. Census.) Based on this shift, facility improvements may be needed to meet the needs of an aging, yet often still active, population. For Sonoma Coast SB, this suggests improved interpretation or more easily accessible trails and Americans with Disabilities Act-accessible camping opportunities would also help to satisfy this changing demographic pattern.

### Sub-populations

As mentioned above, an unknown percentage of tourists who come to Sonoma County primarily for its popular wineries are expected to visit Sonoma Coast SB. A study of overnight visitors to Sonoma County indicated that 42% of overnight visitors to Sonoma County originate in the San Francisco Bay area; other Northern California areas, including Sacramento, accounted for another 18%. Most of these overnight visitors came to the county for leisure/pleasure purposes (SCTP 2001).

Another study of day and overnight visitors to Sonoma County indicated that the majority of the visitors to the county are affluent, educated, and without children. Approximately 61% of visitors to Sonoma County are college graduates or have attended graduate school and 58% have an annual income of $75,000 or more. The visitors also tend to be frequent and repeat weekend visitors. Specifically, more than two-thirds (68%) of visitors to Sonoma County are repeat travelers, who are more likely to go to the coastal areas than first-time visitors (MCG 1999). According to a Sonoma County Tourism Program on-line visitor survey, after food and wine, top reasons for visiting the county include Sightseeing (22%), Nature/Wilderness (8%), and Activity/Adventure Sports (6%) (SCTP 2002). Sonoma Coast SB offers all of these activities and is in a prime position to capture the interest and participation of the returning visitor/repeat traveler to Sonoma County (MCG 1999).

Sonoma County itself contributes the largest number of day visitors of any county, providing at least 15% of the day trips. Each of the nine San Francisco Bay area counties contributes from 5%–14.9% of the total Sonoma County visitation (MCG 1999). For Sonoma Coast SB, this indicates that distance to population centers is an important factor affecting day use.

### Local Market Analysis

There is a strong latent demand for outdoor recreation in Sonoma County. Studies conducted from 1988–1996 by the Sonoma County Regional Parks Department indicate that the percentage increase in visitor use for all types of outdoor recreation increased much faster than the increase in county population during the same period. Total visitor use at County-owned and operated outdoor recreation facilities increased 66%, while the county population increased 10.3%. Simultaneously, Sonoma County Regional Parks' recreation acreage increased 49%. This increase in available acreage combined with an increase in use suggests a stronger than average latent demand for outdoor recreation facilities (County of Sonoma 2000). For Sonoma Coast SB, this suggests that visitation level can increase faster than local and regional population growth.

## 2.1.4 PHYSICAL RESOURCES

### METEOROLOGY

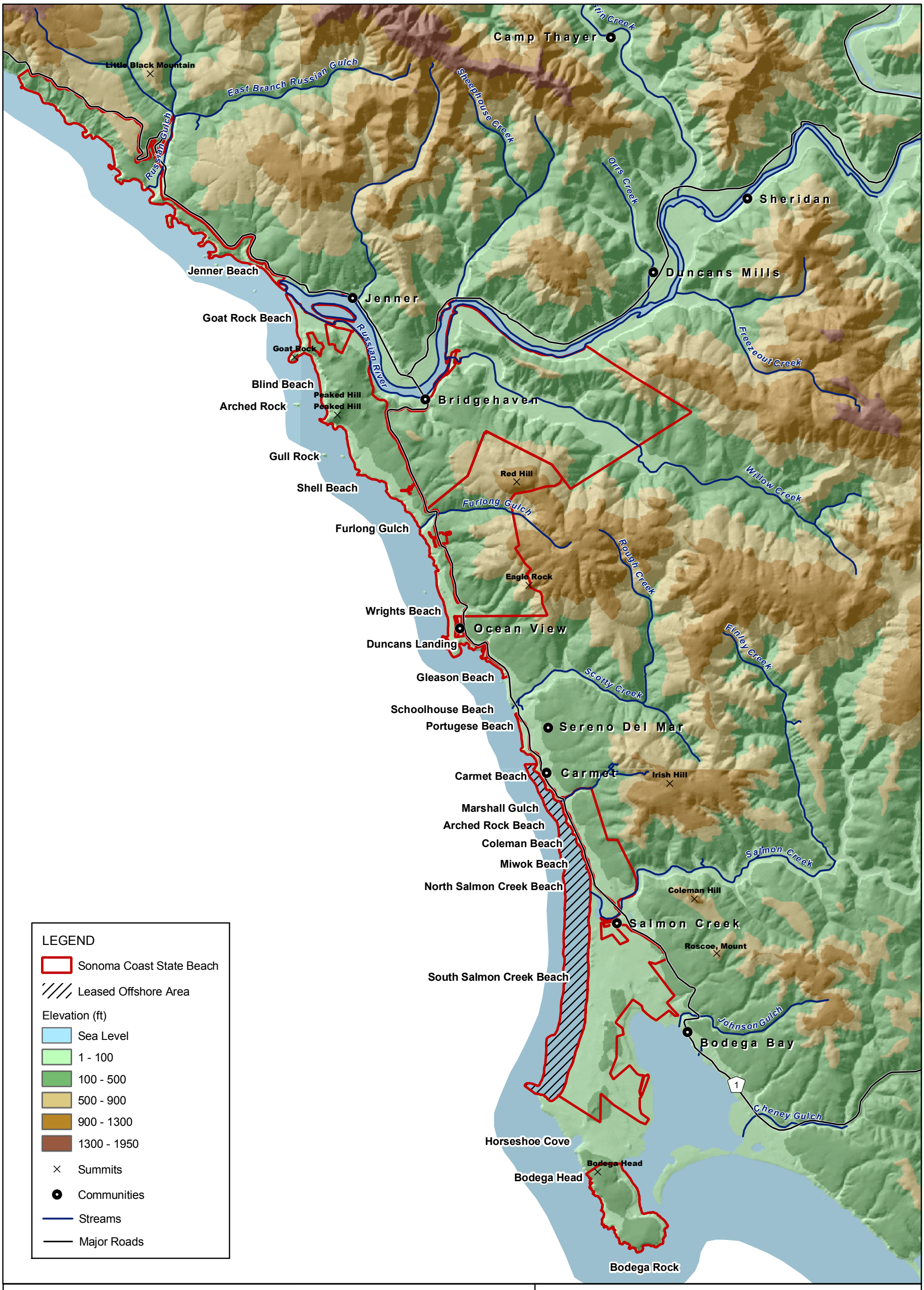
The general climate pattern of the northern California coastal area is characterized by rainy winters with some clear sunny days and dry, cool summers with many foggy or overcast days. Because Sonoma Coast SB is located immediately on or near the coast, it experiences more wind and fog than inland areas. As shown in Exhibit 2-2, the amount of rainfall is higher in the northern portion of Sonoma Coast SB than the southern portion.

As shown in Table 2-4, data on average temperature and rainfall at Sonoma Coast SB are recorded at the two nearest weather gauging stations with available data; the first is located on Bodega Head at the University of California Bodega Marine Laboratory, which is adjacent to Sonoma Coast SB. The second station is located in Fort Ross, approximately 10 miles north of the community of Jenner. Because Fort Ross is also located immediately on the coast, the temperatures and rainfall amounts are similar to those experienced at Sonoma Coast SB. Further inland in the Sonoma Valley, winters are slightly cooler and summers are slightly warmer than on the coast. The amount of rainfall in the Sonoma Valley is similar to the level experienced at Sonoma Coast SB.

**Table 2-4**
**Average Temperature and Precipitation [1]**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UC Bodega Marine Laboratory[1] | | | | | | | | | | | | | |
| Average Maximum Temperature (°F) | 55 | 55 | 56 | 56 | 57 | 59 | 59 | 61 | 61 | 60 | 58 | 55 | 58 |
| Average Minimum Temperature (°F) | 45 | 46 | 47 | 48 | 50 | 51 | 52 | 53 | 53 | 51 | 48 | 44 | 49 |
| Average Total Precipitation (in.) | 7 | 6 | 4 | 2 | 1 | 0 | 0 | 0 | 0 | 2 | 5 | 6 | 33 |
| Fort Ross[2] | | | | | | | | | | | | | |
| Average Maximum Temperature (°F) | 57 | 59 | 59 | 61 | 63 | 66 | 66 | 67 | 68 | 66 | 62 | 58 | 63 |
| Average Minimum Temperature (°F) | 41 | 42 | 42 | 42 | 44 | 47 | 48 | 49 | 49 | 47 | 44 | 41 | 45 |
| Average Total Precipitation (in.) | 8 | 6 | 5 | 3 | 1 | 0 | 0 | 0 | 1 | 2 | 5 | 6 | 39 |

[1] Based on average of data from 1988 through 2001; Source: University of California Bodega Marine Laboratory 2003.
[2] Source: Western Regional Climate Center 2003.


Camp Thayer
Little Black Mountain
East Branch Russian Gulch
Sheephouse Creek
Russian Gulch
Orrs Creek
Sheridan
Jenner Beach
Duncans Mills
Jenner
Goat Rock Beach
Russian River
Goat Rock
Freezeout Creek
Blind Beach
Peaked Hill
Peaked Hill
Arched Rock
Bridgehaven
Gull Rock
Red Hill
Willow Creek
Shell Beach
Furlong Gulch
Furlong Gulch
Rough Creek
Eagle Rock
Wrights Beach
Ocean View
Finley Creek
Duncans Landing
Scotty Creek
Gleason Beach
Schoolhouse Beach
Portugese Beach
Sereno Del Mar
Carmet Beach
Carmet
Irish Hill
Marshall Gulch
Arched Rock Beach
Coleman Beach
Salmon Creek
Miwok Beach
North Salmon Creek Beach
Coleman Hill
Salmon Creek
Roscoe, Mount
South Salmon Creek Beach
Johnson Gulch
Bodega Bay
1
Cheney Gulch
Horseshoe Cove
Bodega Head
Bodega Head
Bodega Rock
LEGEND
Sonoma Coast State Beach
Leased Offshore Area
Elevation (ft)
Sea Level
1 - 100
100 - 500
500 - 900
900 - 1300
1300 - 1950
Summits
Communities
Streams
Major Roads
Source: DPR 2003, Teale GIS Solutions Group 2001, USGS 2000
N
1 inch = 1 mile
0
4000
8000
Feet
Dec. 9, 2003
EDAW
Sonoma Coast State Beach
Exhibit 2-2
Topography

During the summer months when rainfall is scarce at Sonoma Coast SB, the frequent occurrences of fog add moisture to the State Beach. The average monthly temperature experienced at Sonoma Coast SB varies by approximately 10°F throughout the year. Sunny days may be experienced in any season. For this reason, Sonoma Coast SB is considered a year-round destination.

### AIR QUALITY

Air quality in the vicinity of Sonoma Coast SB is regulated by several jurisdictions including the U.S. Environmental Protection Agency (U.S. EPA), California Air Resources Board (ARB), and Northern Sonoma County Air Pollution Control District (APCD). The U.S. EPA has established primary and secondary National Ambient Air Quality Standards (NAAQS) for carbon monoxide (CO), sulfur dioxide ($SO_2$), nitrogen dioxide ($NO_2$), respirable particulate matter ($PM_{10}$), fine particulate matter ($PM_{2.5}$), and lead, which are referred to as criteria air pollutants. The primary standards protect the public health and the secondary standards protect the public welfare. The California ARB has established California Ambient Air Quality Standards (CAAQS) for these same pollutants, as well as sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particulates, which in most cases are more stringent than the NAAQS.

The APCD is the agency primarily responsible for assuring that national and state ambient air quality standards are not exceeded and that air quality conditions are maintained in the northern portion of Sonoma County through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The APCD ensures that air quality is protected through permit approval processes and through the review of local development projects under CEQA.

Sonoma Coast SB is located in the North Coast Air Basin, which is classified by the State as non-attainment (transitional) for ozone and non-attainment for respirable particulate matter ($PM_{10}$). The North Coast Air Basin is in attainment or designated unclassified for all remaining CAAQS and NAAQS (ARB 2003). The nearest air quality monitoring station, located approximately seven miles to the northeast in Guerneville, collects information on particulate matter ($PM_{10}$). The next nearest monitoring station, located approximately twenty miles away at the Healdsburg Municipal Airport, collects data on ambient ozone concentrations. In 2002, the monitoring stations did not record any days during which the federal and the State's ambient air quality standard for ozone and particulate matter were exceeded. In comparison, there were 3 days in 1997 and 7 days in 1998 when the ambient air quality standards were exceeded (ARB 2003). Between 1997 and 2002, ambient air quality in the Air Basin has improved based on data for these two pollutants.

The primary source of air pollutants at Sonoma Coast SB is vehicular traffic; the other typical major sources of air pollutants (intensive agricultural activities and industrial uses) are rare in the vicinity. The air quality at Sonoma Coast SB is better than the rest of the North Coast Air

Basin because of the coastal weather patterns and the relatively light traffic volumes in the area.

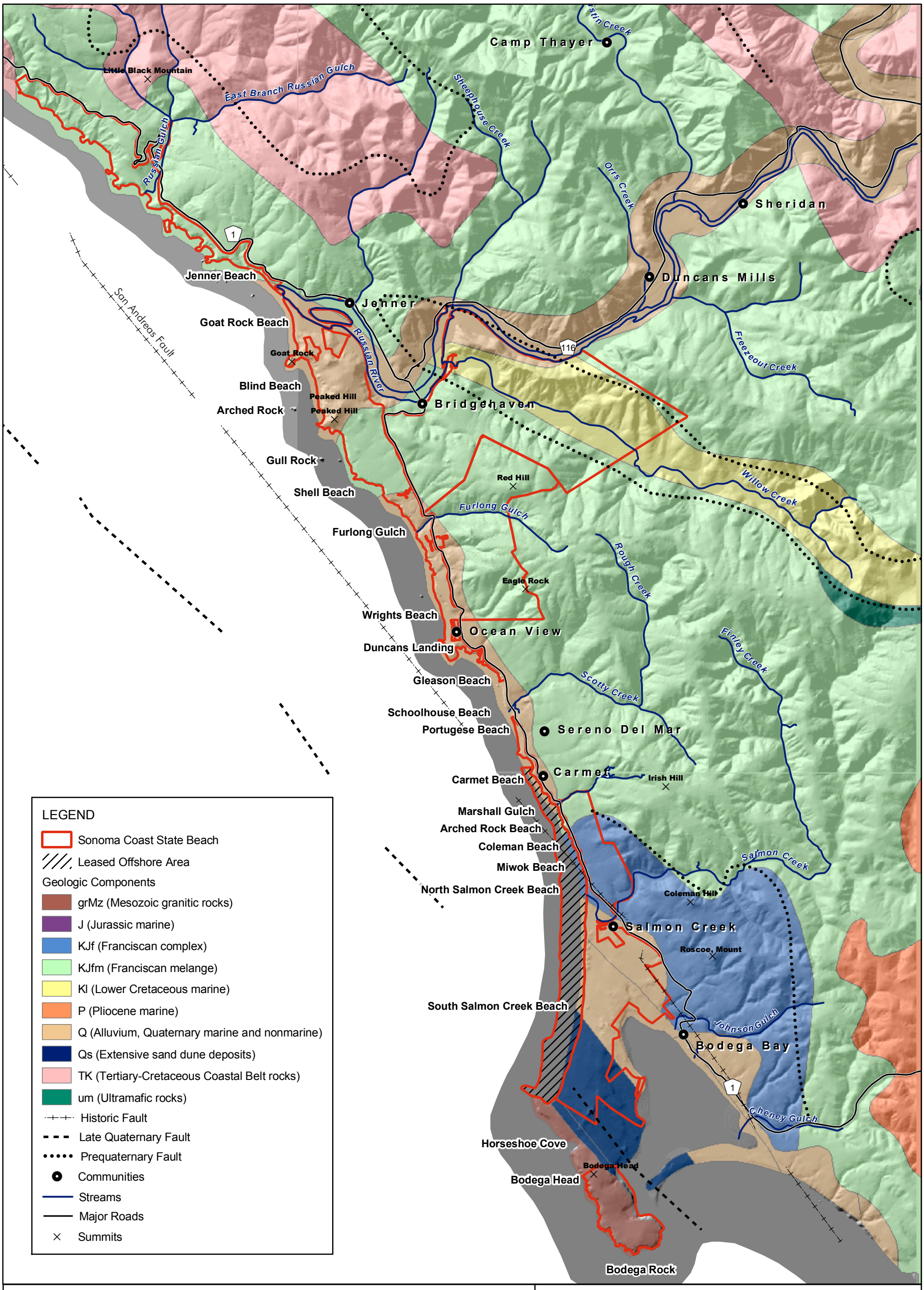
### TOPOGRAPHY

The coastal landscape of Sonoma County is characterized by large, rolling hills and coastal terraces that slope down toward the Pacific Ocean. The north Coast Ranges, which trend north-south from the Oregon border to San Francisco Bay, lie immediately east of Sonoma Coast SB. The immediate shoreline is characterized by rocky cliffs and bluffs, with sandy beaches and dune habitats in several locations. At Sonoma Coast SB, elevations range from sea level along the western edge to approximately 1,300 feet at the Red Hill property, as shown in Exhibit 2-2. The lower lying areas of Sonoma Coast SB, including the coastline along the Pacific Ocean, Bodega Bay, and the mouths of the waterways traversing Sonoma Coast SB, are at sea level and therefore are subject to the risk of tsunamis. Offshore, there are many rock formations, called sea stacks, that rise above the wave baseline. Many of these rocks are part of the recently dedicated California Coastal National Monument.

### GEOLOGY

The geology of Sonoma Coast SB is characterized by two plates divided by the San Andreas Fault, the nearest segment of which runs along the coastline. A segment of the San Andreas Fault trends inland near Bodega Bay where it forms the State Beach boundary between Bodega Head and the mainland (Exhibit 2-3). The San Andreas Fault and smaller parallel faults make up the approximately 1.5-mile-wide San Andreas Fault Zone, which marks the boundary between the North American Plate and the Pacific Plate. Strong earthquakes are created by friction and stress as the two plates grind past one another along the San Andreas Fault. These earthquakes have included the devastating San Francisco Earthquake of 1906 and the Loma Prieta Earthquake of 1989. Because of these historic seismic disasters and the potential for more strong earthquakes in the future, the San Andreas Fault Zone is one of the best known earthquake-producing regions in the world. Surface fault rupture is a potential hazard in the San Andreas Fault Zone.

West of the fault on Bodega Head, the rocks are Cretaceous granites of the Salinia Terrane and overlaying sand and gravel, as shown in Diagram 2-1. Specifically, outcrops of Santa Lucia granodiorite, one of the oldest formations in the Coast Ranges, have weathered into the decomposed granite sand that forms much of Bodega Head (Fredrickson 1962). Granite originated by the cooling of molten igneous rock deep in the earth approximately 100 million years ago. Bodega Head was formed at least 345 miles to the south and was moved along the San Andreas Fault to the present location over the last 29 million years. It is the only part of Sonoma Coast SB located on the Pacific Plate (Wright 1999).




Source: Department of Conservation 2000, DPR 2003, USGS 1993, USGS 2000

N

1 inch = 1 mile

0 4000 8000

Feet

Dec. 9, 2003

EDAW

# Sonoma Coast State Beach

## Exhibit 2-3
## Geology

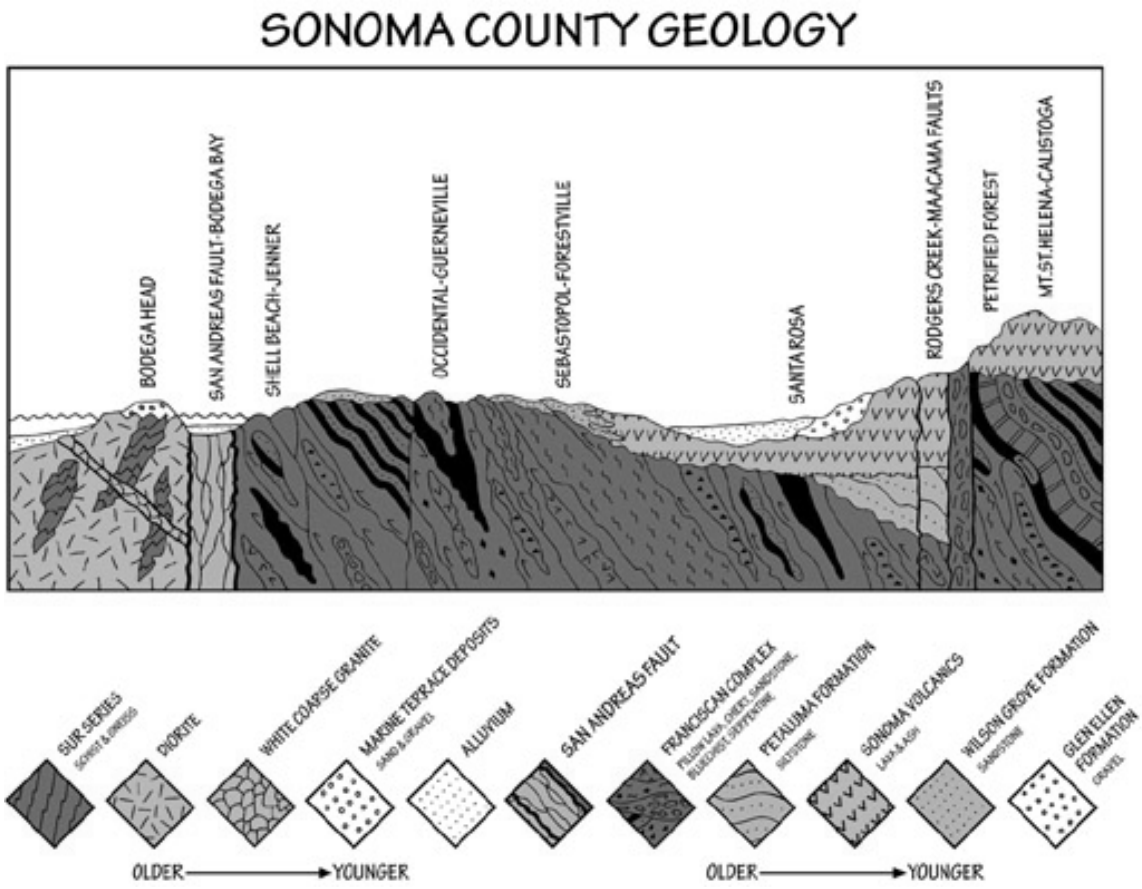



Diagram 2-1. Geologic Cross Section

Source: Wright 1999

To the east of the fault on the North American Plate, the remainder of Sonoma Coast SB lies in the Franciscan Complex, an eclectic collection of various rock types that are mostly oceanic in nature. Marine sediments are mixed with iron-rich igneous volcanic and plutonic rocks and metamorphic rock as a result of faulting at the subduction zone where the Pacific Plate is subducted underneath the North American Plate. The resulting mixture is called a "mélange," a combination of harder and weaker rocks that erode at different rates (Wright 1999).

In northern California, the Franciscan Complex is divided into three belts; Sonoma Coast SB is located in the Central Belt, which is generally given an age range of Late Jurassic to Cretaceous time (approximately 150 million years ago). The Central Belt consists of

abundant blueschist blocks enclosed in a pumpellyitic sheared matrix. Common rock types include greywacke, chert, greenstone, gabbro, serpentinite, rodingite, limestone, eclogite, and exotic blocks of other compositions (Daly 1980).

Gently sloping terraces perch above most of the coastline of Sonoma Coast SB. These are erosional surfaces with a thin covering of sand and gravel that originated beneath a shallow wave base and are pushed up by pressures along the fault (Wright 1999). Because of the seismic activities associated with the San Andreas Fault and the erosion caused by rainfall and ocean waves, many areas of Sonoma Coast SB are prone to landslides; consequently the cliffs have been retreating from the ocean because of periodic landslides. In particular, there are erosion problems on the marine terraces north of Jenner created by concentrated flows across SR 1, necessitating gully repairs. Also, Goat Rock Road has failed in areas, and gullies are in need of repairs.

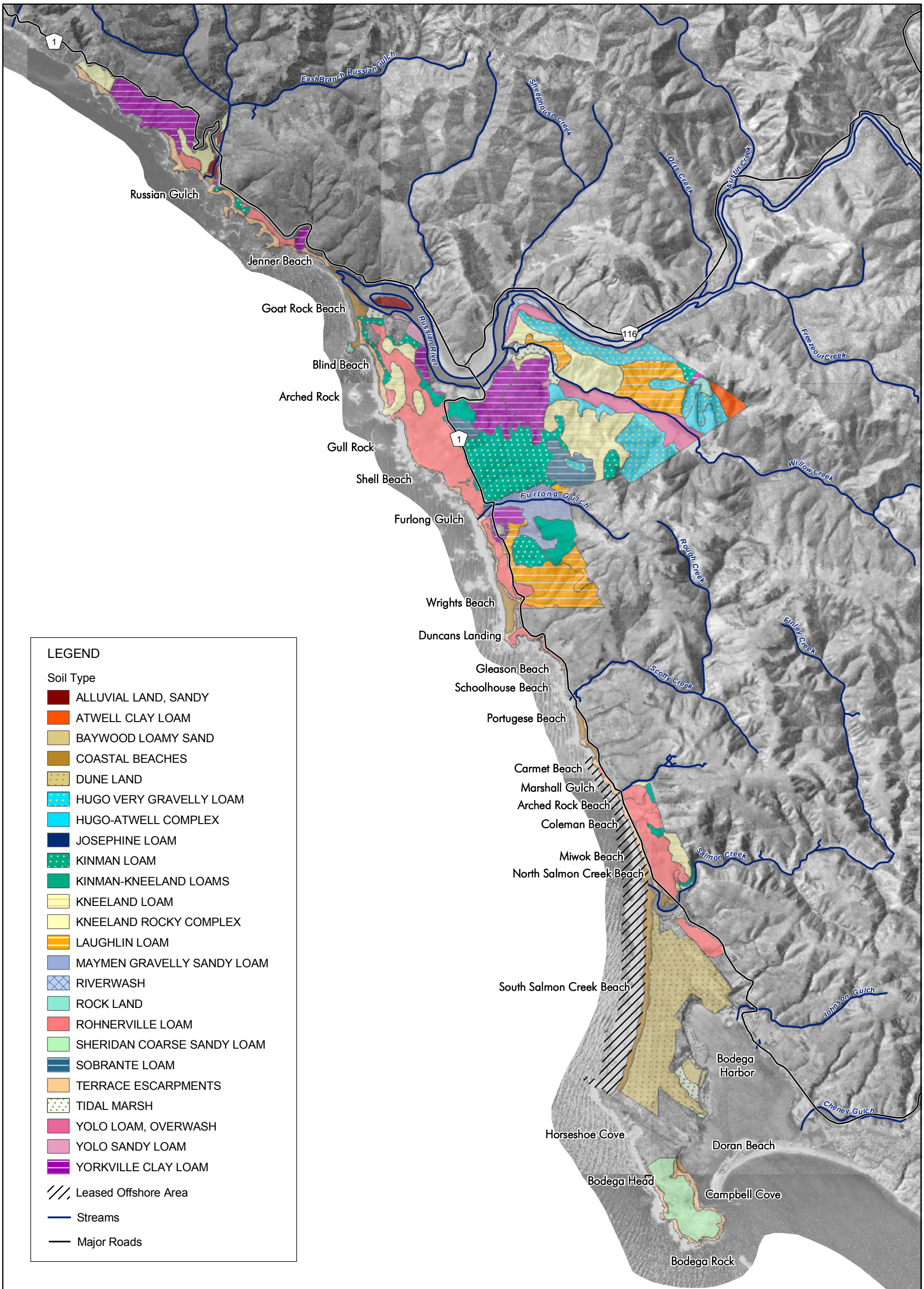
### SOILS

A variety of soil types are found at Sonoma Coast SB (Exhibit 2-4). A description of each of the 32 soil types found at Sonoma Coast SB is included in Appendix A. The soil types, which are categorized by their compositions and slopes, differ in permeability, runoff potential, erosion hazard, and typical uses. These different soil characteristics determine the suitability of a site for various types of development. For example, soils that are generally impermeable are usually considered unsuitable for onsite wastewater disposal systems (e.g., septic tanks and leachfields). Mitigating features (e.g., detention basins, oil traps, grassy swales) may be incorporated into developments on soils with high runoff potential. Soil testing is generally performed before site development to determine compatibility of onsite soils with the proposed development.

### HYDROLOGY AND WATER QUALITY

The Russian River and several other creeks traverse Sonoma Coast SB on their way to the Pacific Ocean. Willow Creek is a major tributary to the Russian River. Exhibit 2-5 shows the location of these waterways and the 100-year floodplain designated by the Federal Emergency Management Agency (FEMA). The 100-year floodplain boundary defines the geographic area of having a 1% chance of flooding in any given year. All streams are subject to areas in the 100-year flow and, therefore, each stream has a 100-year floodplain. However, many minor and intermittent streams do not have 100-year floodplains that are designated on FEMA's Flood Insurance Rate Maps.

The Russian River originates in central Mendocino County, approximately 15 miles north of Ukiah; water from its 1,485-square-mile watershed drains into the 110-mile-long main channel of the Russian River, which flows into the Pacific Ocean near Jenner. The mouth of the Russian River is occasionally closed to all flow between the ocean and the river because of the buildup of sandbar formations. Willow Creek is a major tributary of the Russian River. The Willow Creek watershed, which is characterized by a variety of habitat types (e.g., grasslands, stands of fir and redwood trees, oak woodland, riparian areas), empties into the




LEGEND

Soil Type

- ALLUVIAL LAND, SANDY
- ATWELL CLAY LOAM
- BAYWOOD LOAMY SAND
- COASTAL BEACHES
- DUNE LAND
- HUGO VERY GRAVELLY LOAM
- HUGO-ATWELL COMPLEX
- JOSEPHINE LOAM
- KINMAN LOAM
- KINMAN-KNEELAND LOAMS
- KNEELAND LOAM
- KNEELAND ROCKY COMPLEX
- LAUGHLIN LOAM
- MAYMEN GRAVELLY SANDY LOAM
- RIVERWASH
- ROCK LAND
- ROHNERVILLE LOAM
- SHERIDAN COARSE SANDY LOAM
- SOBRANTE LOAM
- TERRACE ESCARPMENTS
- TIDAL MARSH
- YOLO LOAM, OVERWASH
- YOLO SANDY LOAM
- YORKVILLE CLAY LOAM
- Leased Offshore Area
- Streams
- Major Roads

Source: USDA 2003

N

1 inch = 1 mile

0 4000 8000

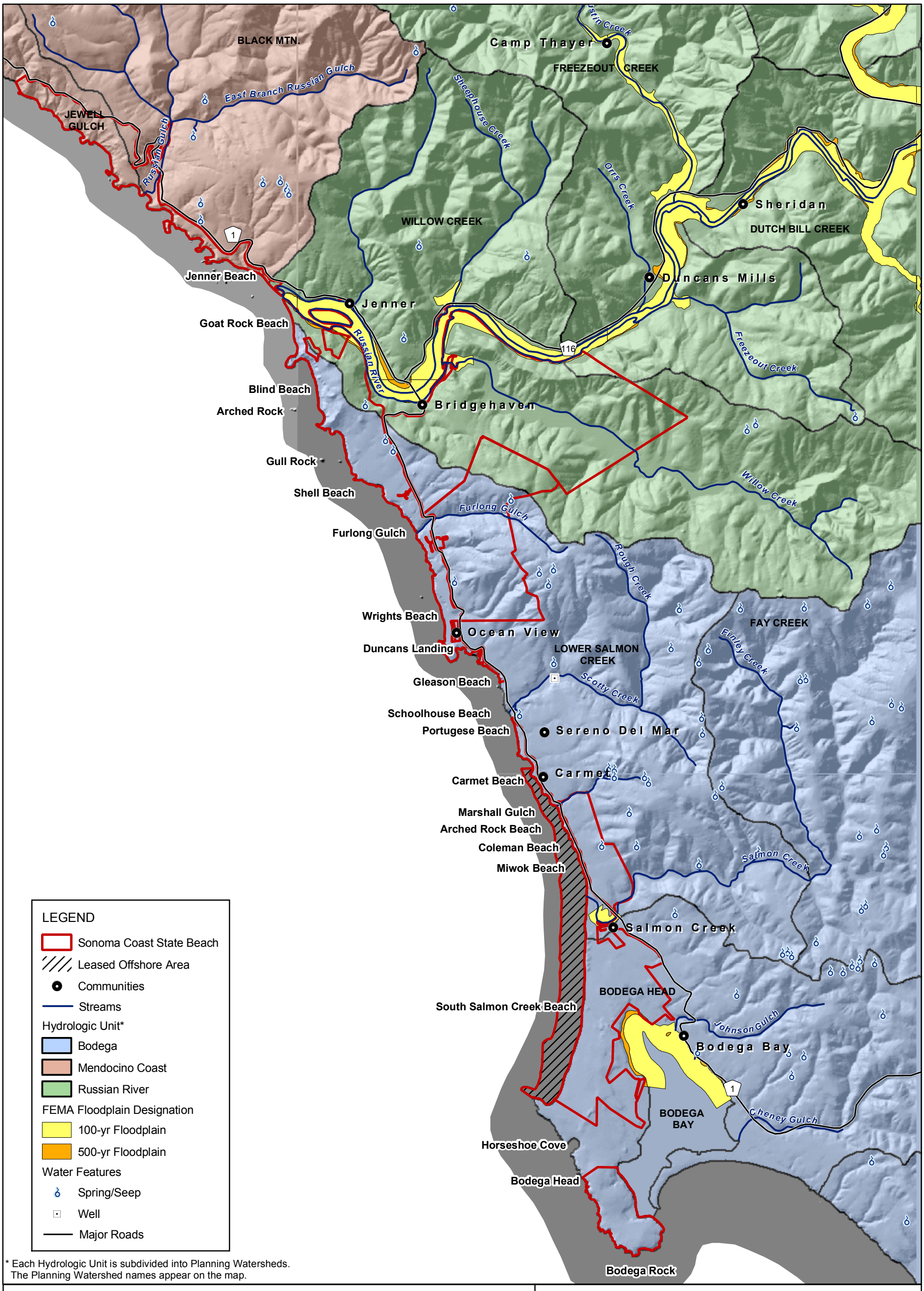
Feet

Dec. 9, 2003

EDAW

# Sonoma Coast State Beach

**Exhibit 2-4**
**Soil Types**




LEGEND

- Sonoma Coast State Beach
- Leased Offshore Area
- Communities
- Streams

Hydrologic Unit*

- Bodega
- Mendocino Coast
- Russian River

FEMA Floodplain Designation

- 100-yr Floodplain
- 500-yr Floodplain

Water Features

- Spring/Seep
- Well
- Major Roads

* Each Hydrologic Unit is subdivided into Planning Watersheds. The Planning Watershed names appear on the map.

Source: California Department of Forestry and Fire Protection 1999, DFG 1999, USGS 1997

N

1 inch = 1 mile

0 4000 8000

Feet

Dec. 9, 2003

EDAW

# Sonoma Coast State Beach

## Exhibit 2-5
## Surface Hydrology

lower reach of the Russian River. Livestock grazing occurs in parts of the upper watershed of Willow Creek but outside Sonoma Coast SB.

Other streams at Sonoma Coast SB include Russian Gulch, Furlong Gulch, Scotty Creek, Marshall Gulch, and Salmon Creek. These streams originate in the mountains to the east of Sonoma Coast SB and flow for a few miles before draining into the Pacific Ocean. All but Salmon Creek and Willow Creek are intermittent streams. The Salmon Creek watershed consists of 34 square miles and empties into a tidewater estuary just north of Bodega Bay. Salmon Creek and its tributaries provide habitat for anadromous fish and other aquatic organisms (e.g., steelhead, coho salmon, tidewater goby, freshwater shrimp).

Groundwater in the vicinity of Sonoma Coast SB originates from infiltration and percolation of precipitation that occurs on the sand dunes and hills to the east. The sand dunes are highly permeable surface deposits that readily absorb surface water so that little if any water drains over the ground surface during rainfall events. The underlying Franciscan geologic formation of the hills to the east is expected to contain very little to no groundwater that is available as a domestic water source. The overlying unconsolidated materials consist of recent marine sedimentary deposits of silts, clay, and sand. The sand deposits have yielded significant and reliable quantities of groundwater. The marine and sand dune materials in the San Andreas Fault Zone, which occur at Sonoma Coast SB near Bodega Head, also contain groundwater. (Todd 1986).

The Russian River is classified by the State Water Resources Control Board (SWRCB) as an Impaired Waterway for exceedances of water quality standards for temperature and sedimentation/siltation. In particular, segments of the river upstream of Sonoma Coast SB, such as the segment near Guerneville, have been identified as Clean Water Act (CWA) §303(d) Water Quality Limited Segments because water quality standards have not been met even after point sources of pollution have installed the minimum required levels of pollution control technology. The CWA requires the North Coast Regional Water Quality Board to establish priority rankings for these river segments and develop action plans, called Total Maximum Daily Loads (TMDL), to improve water quality (SWRCB 2003).

The quality of the seawater along most of Sonoma Coast SB is good. The only locations at Sonoma Coast SB where health standards, based on bacterial counts of the seawater, have been exceeded are at Campbell Cove Beach, located at the tip of Bodega Head, and at Salmon Creek Beach. In 2002, "Beach Warning" signs were posted for a total of 24 days between May and November at Campbell Cove Beach; signs were posted at Salmon Creek Beach for 2 days during 2002. The causes of health standard exceedance were unknown; however, wildlife sources are suspected at Campbell Cove, and Salmon Creek is suspected to be the source at Salmon Creek beach (County of Sonoma Division of Environmental Health 2002). The posting of warning signs alerts the public of a possible risk of illness associated with water contact. The State Water Resources Control Board is cooperating with other agencies on a study to identify the sources and management strategies for control of fecal bacteria at Campbell Cove Beach and in Bodega Bay (SWRCB 2003).

## BIOTIC RESOURCES

A biological resource is significant if it:

- is important to the essential character of Sonoma Coast SB, and contributes, in part, to its statewide significance;
- is regionally significant, is an important component of a systemwide plan, or contributes to the preservation of regional or statewide biodiversity; or
- is documented as significant on recognized preservation or protection lists or otherwise designated with special status by a recognized authority.

Significant biotic resources in the General Plan study area were determined through a review of available documentation and consultation with biologists familiar with the local biological resources. Sources of information also include the DPR's annual conditioning assessment for Sonoma Coast SB (DPR 2001d), the Department's internal database (Cal Flora and Fauna), the California Department of Fish and Game's California Natural Diversity Database (CNDDB 2002), the California Native Plant Society's (CNPS) Electronic Inventory of Rare and Endangered Plants of California (CNPS 2002), and a number of documents on file with the Department, as listed in Chapter 5, References.

### Regulatory Background

Many biological resources in California are protected and/or regulated by laws, regulations, and policies. Key regulatory compliance issues that may need to be addressed before implementation of the General Plan are listed below. A brief description of each of the applicable laws and regulations is provided in Appendix B.

- Federal Endangered Species Act
- Marine Mammal Protection Act
- Clean Water Act
- California Endangered Species Act
- California Coastal Act
- §1600 of the California Fish and Game Code
- §3503.5 of the California Fish and Game Code
- Migratory Bird Treaty Act

#### *Plant Life*

This section contains a description of plant communities that characterize Sonoma Coast SB. Special-status plant species known or with potential to occur at Sonoma Coast SB and sensitive habitats are described as well. Finally, invasive, non-native plants that are particularly problematic at Sonoma Coast SB are discussed.

Plant Communities

In previous studies of Sonoma Coast SB, biologists have mapped plant communities using nomenclature and descriptions derived from the vegetation classifications of Holland (1986) and Sawyer and Keeler-Wolf and wetland classification of Cowardin (1979). The Department has since adopted the California Manual of Vegetation of Sawyer and Keeler-Wolf as its vegetation classification system. Therefore, plant community descriptions for Sonoma Coast SB are presented according to this classification wherever possible. In some cases, previously described vegetation types from other studies were grouped because they are not readily distinguishable in the field or on aerial photographs. In the case of coastal prairie and coastal dune vegetation, it was not possible to apply Sawyer and Keeler-Wolf categories because the level of detail required to do so was beyond the scale of the general botanical surveys and overview vegetation mapping that are part of this planning effort. The following plant communities are present in the General Plan study area:

- Arroyo willow series
- Bulrush–cattail series
- California bay series
- California annual grassland series
- Coastal dunes
- Coastal prairie
- Coyote brush series
- Douglas-fir series
- Douglas-fir–tanoak series
- Dune lupine–goldenbush series
- Eucalyptus series
- European beachgrass series
- Iceplant series
- Landscaped areas
- Mixed willow series
- Red alder series
- Redwood series
- Sand verbena–beach bursage series
- Sedge series
- Yellow bush lupine series

These plant communities are described below in alphabetical order. A map of existing plant communities was produced from reconnaissance-level field surveys and aerial photograph interpretation (Exhibit 2-6).

*Arroyo Willow Series*

This riparian scrub community occurs in and along drainage channels and other seasonally saturated or flooded areas at Sonoma Coast SB. This riparian scrub community can occur as a mono-specific stand of arroyo willow (*Salix lasiolepis*) or include other shrub or tree species.

For example, some portions of this series at Bodega Head are dominated by wax-myrtle (*Myrica californica*), which lacks its own series in the Keeler and Sawyer-Wolf classification. The understory varies from sparse to abundant and is generally composed of herbaceous wetland species.

*Bulrush–Cattail Series*

This freshwater marsh plant community occurs at the mouth of Willow Creek near its confluence with the Russian River and around the "Hole in the Head" at Bodega Head. It is dominated by emergent herbaceous plants including cattails (*Typha* spp.) and spike rush (*Eleocharis macrostachya*, also called bulrush) as well as other wetland species such as basket sedge (*Carex obnupta*), water plantain (*Alisma platago-aquatica*), and rushes (*Juncus effusus*, *J. patens*), horsetails (*Equisetum* spp.), and three square (*Scirpus pungens*). This wetland plant community occurs only in areas that are permanently flooded and qualifies as a wetland community protected under §404 of the CWA. It may also occur in roadside ditches scattered throughout Sonoma Coast SB.

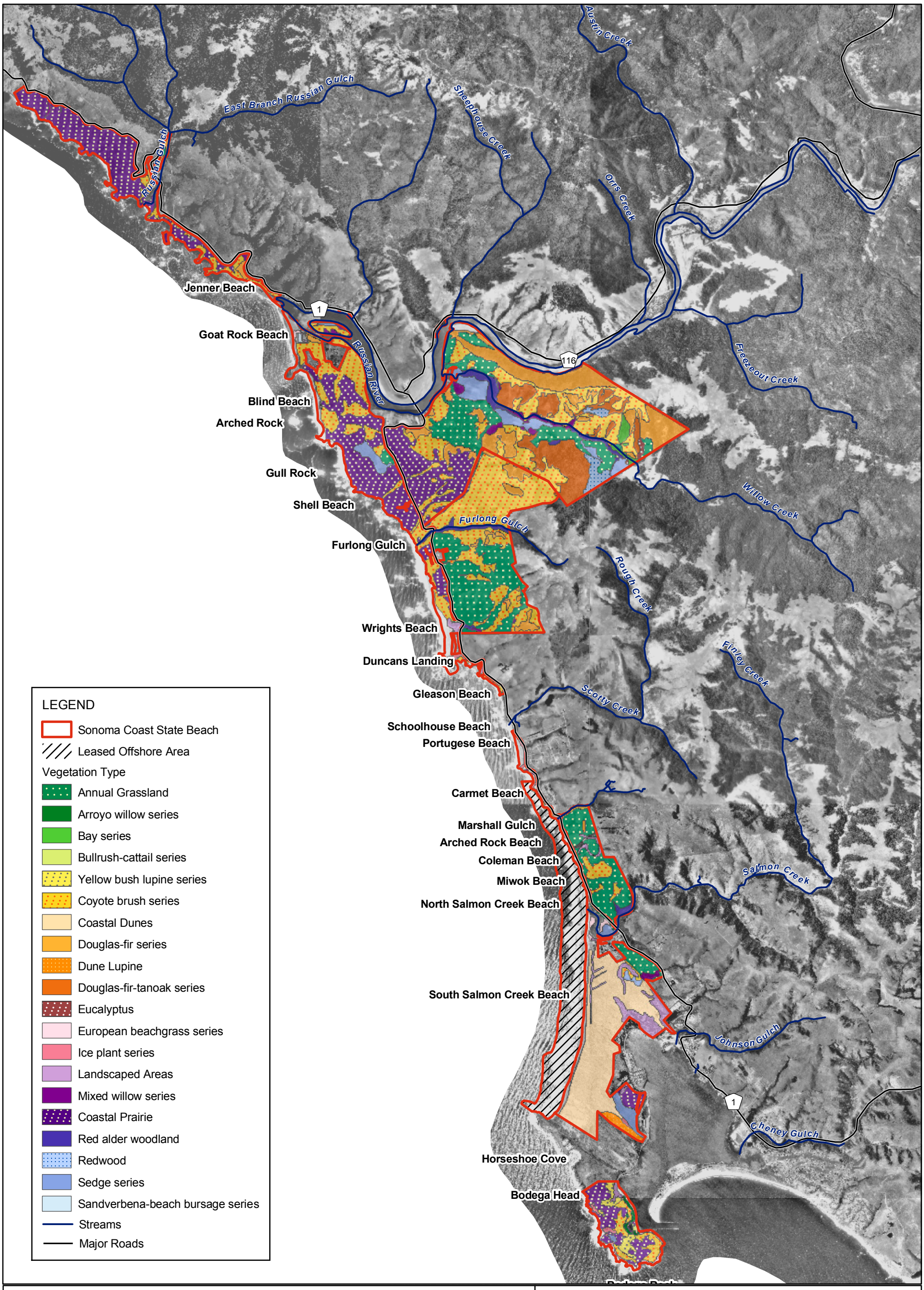
*California Bay Series*

California bay forest occurs on moist, exposed ridges and stream margins in the Willow Creek Subunit. California bay (*Umbellularia californica*) is the sole dominant tree in the dense canopy, and there are few understory shrubs and herbs. This plant community merges with Douglas-fir–tanoak series, which is described below.

*California Annual Grassland Series*

This grassland plant community characterizes areas of Sonoma Coast SB that have been disturbed in the past. The native vegetation in these areas has been altered for the purpose of conversion to various land uses including farming, grazing, homesteading, and logging.

Once these land uses cease and the land is left fallow, it typically becomes dominated by introduced grasses and forbs. On coastal terraces, which formerly supported coastal prairie vegetation, California annual grassland series may contain scattered patches of perennial grasses. Non-native grass species that now dominate disturbed terraces include wild oats (*Avena* spp.), bromes (*Bromus* spp.), Italian ryegrass (*Lolium multiflorum*), velvet grass (*Holcus lanatus*), and canarygrass (*Phalaris aquatica*), which were introduced into California intentionally for livestock forage. Non-native, weedy forbs include wild radish (*Raphanus sativa*), bull thistle (*Cirsium vulgare*), milk thistle (*Silybum marianum*), English plantain (*Plantago lanceolata*), and filaree (*Erodium* spp.). California annual grassland series also occurs in open areas on the slopes above coastal terraces as well as openings in forested areas. Native forbs such as Douglas iris (*Iris douglasiana*), cow parsnip (*Heracleum lanatum*), yarrow (*Achillea millefolium*), California buttercup (*Ranunculus californicus*), California poppy (*Eschscholzia californica*), and blue-eyed grass (*Sisyrinchium bellum*) are also a common component of the dominant vegetation. Because of the level of mapping, the distinction between this vegetation series and coastal prairie was difficult to make. Therefore, most of the grassland vegetation on coastal terraces is mapped as coastal prairie, which is described




Source: DPR 2003, EDAW 2003, Teale GIS Solutions Group 1999, USGS 1993

N

1 inch = 1 mile

0 4000 8000

Feet

Dec. 9, 2003

EDAW

# Sonoma Coast State Beach

## Exhibit 2-6
## Plant Communities

below, and ruderal areas clearly dominated by non-native grasses are mapped as California annual grassland.

*Coastal Dunes*

Because of the broad level of vegetation mapping, it was not feasible to map vegetation series in coastal dunes using the Sawyer and Keeler-Wolf classification. Extensive coastal dune habitat is located in the southern end of Sonoma Coast SB at Bodega Dunes. Coastal dune plant communities are located above the high tide line where sandy beaches and sand dunes occur (Holland and Keil 1995). Coastal dunes are highly dynamic ecosystems that are shaped and influenced by persistent coastal winds. Beaches and active dune areas close to the shoreline are typically barren because of the rapid rate of sand movement. Foredune areas are similar to active coastal dunes but have less wind and/or sand and/or more abundant groundwater, which allows some patches of prostrate, herbaceous plants to establish (Holland 1986). This vegetation generally consists of sand-verbena–beach bursage series, which is described below. Native dunegrass series (areas dominated by *Leymus mollis*) can also occur along the shoreline. Areas of coastal dunes located further away from the immediate shoreline are more sheltered and have become more stabilized. They contain more established vegetation and higher species diversity. Series that occur in these areas include European beachgrass, iceplant, yellow bush lupine, and dune lupine–goldenbush, which are described below.

*Coastal Prairie*

Coastal prairie, also called coastal terrace prairie, is the prevalent vegetation type on coastal terraces throughout Sonoma Coast SB. As mentioned earlier, assigning Sawyer and Keeler-Wolf series to this vegetation was not possible in the mapping effort because of the overview level of the botanical surveys. However, if more detailed mapping is conducted in the future, the following series could apply to coastal prairie: Pacific reedgrass series, California oatgrass series, introduced perennial grassland series, and tufted hairgrass series. Coastal prairie is dominated by grasses such as purple needlegrass (*Nassella pulchra*), Pacific reedgrass (*Calamagrostis nutkaensis*), California oatgrass (*Danthonia californica*), tufted hairgrass (*Deschampsia cespitosa*), bromes, Italian ryegrass, and velvet grass. Native forbs found in coastal prairie include those described above under California Annual Grassland Series as well as Pacific cinquefoil (*Potentilla anserina* ssp. *pacifica*, also called silverweed), seaside daisy (*Erigeron glaucus*), beach strawberry (*Fragaria chiloense*), and many-colored lupine (*Lupinus variicolor*). Coastal prairie intergrades with California annual grassland in more disturbed areas and coyote brush series on terraces undergoing succession. In addition, there are scattered wetlands associated with drainages, seeps, or natural depressions in coastal prairie. These patches are dominated by sedges (*Carex* spp.), rushes, and nutsedge (*Cyperus* spp.). Coastal prairie wetlands qualify as wetlands protected under §404 of the CWA.

*Coyote Brush Series*

Coyote brush series is very common throughout Sonoma Coast SB. It occurs on coastal terraces, hillsides, and bluffs. This broadly circumscribed series includes the coastal bluff scrub and north coastal scrub plant communities described by Holland (1986). This plant community is dominated by coyote brush (*Baccharis pilularis*). In some areas, coyote brush forms an almost continuous layer, whereas other areas are less dense and have an understory composed of a variety of herbaceous species characteristic of the coastal prairie and California annual grassland series.

Although some coastal bluffs at Sonoma Coast SB are bare because of natural erosion, many areas support vegetation. In these areas, coyote brush series is composed mostly of perennial herbs that are tolerant to harsh environmental factors, such as high winds, sand blast, salinity, and little or no soil development, that are typically associated with coastal bluffs. Common associated species on coastal bluffs include grasses as well as coastal buckwheat (*Eriogonum latifolium*), seaside woolly sunflower (*Eriophyllum staechadifolium*), many-colored lupine, iceplant (*Carpobrotus* spp.), beach strawberry, California buttercup, seaside daisy, and yellow bush lupine (*Lupinus arboreus*). Coyote brush series also occurs on other windy, exposed sites such as marine terraces and at the bases of slopes near the coast. Characteristic associated species on more mesic sites include a mix of shrubs such as California coffeeberry (*Rhamnus californicus*), bush lupine, California blackberry (*Rubus ursinus*), sticky monkeyflower (*Mimulus aurantiacus*), and poison oak (*Toxicodendron diversilobum*), as well as herbs including cow parsnip, hedge-nettle (*Stachys ajugoides*), and grasses. In addition, this plant community intergrades with Douglas-fir forest in less exposed areas.

*Douglas-fir Series*

At Sonoma Coast SB Douglas-fir forest occurs mostly on upper slopes and ridge tops. This plant community is characterized by an open to dense canopy of Douglas-fir (*Pseudotsuga menziesii*). Near the coast, Douglas-fir trees can have a stunted, windswept appearance from prolonged exposure to strong coastal winds. In these areas, an understory is typically absent, and this plant community intergrades with coyote brush series. In less exposed areas, Douglas-fir trees grow much taller and straighter, and an understory is present. Common understory plants include sword fern (*Polystichum munitum*), pink-flowering currant (*Ribes sanguineum*), California figwort (*Scrophularia californica*), twinberry (*Lonicera involucrata*), California blackberry, coyote brush, and poison oak. On more mesic sites, Douglas-fir series vegetation can include some riparian species such as California bay, California myrtle (*Myrica californica*), red alder (*Alnus rubra*), and willows (*Salix* spp.). In some areas, distinguishing between this plant community and Douglas-fir–tanoak series can become difficult. However, in general, Douglas-fir series has a one-tiered canopy, whereas Douglas-fir–tanoak series typically has a multilayered canopy.

*Douglas-fir–Tanoak Series*

This forest plant community is dominated by several species of evergreen broadleaved trees and conifers such as California bay, Douglas-fir, coast live oak (*Quercus agrifolia*), madrone (*Arbutus menziesii*), and tanoak (*Lithocarpus densiflorus*). Occasional red alders and willows also occur in this plant community, particularly along Willow Creek. Douglas-fir–tanoak series typically exhibits a well-developed and diverse understory. The shrub layer includes a mix of species such as California buckeye (*Aesculus californica*), silk tassel bush (*Garrya elliptica*), toyon (*Heteromeles arbutifolia*), sticky monkeyflower, pink-flowering currant, oso berry (*Oemleria cerasiformis*), salmonberry (*Rubus spectabilis*), California blackberry, coastal ceanothus (*Ceanothus thyrsiflorus*), coffeeberry, and poison oak. Common herbs in the understory include columbine (*Aquilegia formosa*), bracken fern (*Pteridium aquilinum*), sword fern, milk maids (*Cardamine californica*), wild ginger (*Asarum caudatum*), false solomon's seal (*Smilacina racemosa*), yerba buena (*Satureja douglasii*), and fairy bells (*Disporum hookeri*). Douglas-fir–tanoak series is most well-developed in the Willow Creek area of Sonoma Coast SB and can intergrade with Douglas-fir series on drier sites and California bay series on moister sites. This plant community may be susceptible to Sudden Oak Death syndrome (SOD), a fungal disease that is a serious threat to oaks and other hardwoods in California. SOD has been confirmed in a campground at Sonoma Coast SB (DPR, pers. comm., 2001).

*Dune Lupine–Goldenbush Series*

This plant community occurs on stabilized backdune areas at Bodega Dunes. It consists of a relatively dense shrub cover dominated by dune lupine (*Lupinus chamissonis*) and heather goldenbush (*Ericameria ericoides*). The understory is typically composed of herbaceous species found in sand verbena–beach bursage or coyote brush series. Yellow bush lupine and coastal buckwheat are common in this community at Bodega Dunes.

*Eucalyptus Series*

Eucalyptus trees have been introduced in a few scattered locations at Sonoma Coast SB. In general, the stands are small, isolated, and composed of blue gum (*Eucalyptus globulus*), a tree introduced from Australia. Allelopathic chemicals that are released into the soil from the leaves of eucalyptus species typically prohibit the development of an understory in this plant community. Eucalyptus trees are located on Penny Island and in a few patches along U.S. 101.

*European Beachgrass Series*

European beachgrass (*Ammophila arenaria*), a non-native species, was planted in coastal regions of California including the North Coast and Bodega Dunes to stabilize dunes (DPR 2002, Sawyer and Keeler-Wolf 1995). It has become invasive on coastal dunes and beaches in the state, displacing native vegetation. European beachgrass series is characterized by virtually mono-specific stands of European beachgrass. At Sonoma Coast SB, it has displaced native dune vegetation at Bodega Head, Bodega Dunes, South Salmon Creek

Beach, and Goat Rock Beach and occurs in association with and sand-verbena–beach bursage series.

*Iceplant Series*

Iceplant (*Carpobrotus edulis*, *C. chilensis*), a non-native, invasive plant, is particularly extensive on the coastal bluffs in the southern half of Sonoma Coast SB, on the dunes at Goat Rock Beach, and at Duncans Landing. Iceplant was introduced to California for the purpose of erosion control and has since become extremely invasive in coastal areas. Iceplant forms dense mats and eventually chokes out native plant communities. At Sonoma Coast SB, iceplant is encroaching on coyote brush and sand-verbena–beach bursage series.

*Landscaped Areas*

Landscaped areas occur in scattered locations throughout Sonoma Coast SB, especially near residences, campgrounds, and other development. These areas consist of lawns, gardens, planted non-native trees such as eucalyptus (*Eucalyptus* sp.) and myoporum (*Myoporum laetum*) or California native species that are not indigenous to Sonoma Coast SB such as Monterey cypress (*Cupressus macrocarpa*) and Monterey pine (*Pinus radiata*). Landscape plants have the potential to spread and displace native plant communities at Sonoma Coast SB. For instance, myoporum has spread into potential rare plant habitat at Goat Rock Beach (DPR 2002).

*Mixed Willow Series*

Mixed willow riparian scrub occurs in drainage channels, roadside ditches, and other mesic areas at Sonoma Coast SB. It is typically dominated by one to several willow species including arroyo willow, sandbar willow (*Salix exigua*), and Sitka willow (*S. sitchensis*). The understory, if present, is composed of wetland species characteristic of the bulrush-cattail and sedge series. Mixed willow series often intergrades with red alder series, which is described below.

*Red Alder Series*

Red alder woodlands occur along creek banks and in many drainage channels at Sonoma Coast SB. The moderately dense canopy in this riparian plant community is dominated by red alder (*Alnus rubra*). The open shrub layer can include willows (*Salix* spp.), California blackberry, and red elderberry (*Sambucus racemosa*). The understory varies from sparse to dense and is composed of herbaceous species such as basket sedge, bulrushes, rushes, sword fern, horsetails, and stinging nettle (*Urtica dioica*).

*Redwood Series*

Redwood trees (*Sequoia sempervirens*) comprise the sole or dominant species in the canopy in this series. The understory is sparse except in small openings, where characteristic species include California huckleberry (*Vaccinium ovatum*), redwood sorrel (*Oxalis oregona*), violet (*Viola* sp.), whipplevine (*Whipplea modesta*), California blackberry, strawberry (*Fragaia*

*vesca*), hedge-nettle, sword fern, and thimbleberry (*Rubus parviflorus*). In some stands, Douglas-fir and tanoak are subdominant.

*Sand-verbena–Beach Bursage Series*

This plant community occurs on sandy beaches and dunes at Sonoma Coast SB. It is most extensive in the Bodega Dunes and Goat Rock Dunes areas. This plant community is dynamic because of the shifting substrate and is characterized by harsh growing conditions similar to those described earlier for the coastal bluff environment. Sand-verbena–beach bursage series is characterized by low-growing perennials adapted to high salinity, wind and sand blast, and sandy soils. Common species in this plant community include yellow sand-verbena (*Abronia latifolia*), sea rocket (*Cakile maritima*), beach morning-glory (*Calystegia soldanella*), beach bursage (*Ambrosia chamissonis*), coastal buckwheat, dune sagebrush (*Artemisia pycnocephala*), seashore bluegrass (*Poa douglasii*), seaside woolly sunflower, yellow bush lupine, and beach primrose (*Camissonia cheiranthifolia*).

*Sedge Series*

Sedge series occurs in meadows and wetlands that have developed in association with freshwater seeps, drainages, and natural depressions. It is dominated by sedges but may contain other associated herbaceous wetland species such as rushes and others listed above under bulrush-cattail series. Patches of sedges occur in scattered mesic areas in coastal prairie. Large expanses of sedges occur in marsh or swamp habitats, such as those associated with Willow Creek and Salmon Creek. The sedge series plant community qualifies as wetlands protected under §404 of the CWA.

*Yellow Bush Lupine Series*

This shrub-dominated plant community occurs on stabilized coastal dunes, bluffs, and terraces in the southern half of Sonoma Coast SB. It is characterized by a predominance of yellow bush lupine, but other shrubs such as coyote brush and heather goldenbush may occur as subdominant species in this series. On coastal bluffs, yellow bush lupine series intergrades with coyote bush series. The understory varies in composition but often includes species from adjacent coastal prairie vegetation on coastal terraces. Understory herbs listed as characteristic species in this series include beach bursage, vernal grass (*Anthoxanthum odoratum*), ripgut brome, and California figwort (Sawyer and Keeler-Wolf 1995).

Special-status Plant Species

Special-status plants addressed in this document include those that are federally protected or that are otherwise considered sensitive by federal, state, or local resource conservation agencies and organizations. These include species that are State- and/or federally listed as rare, threatened, or endangered; those considered as candidates or proposed for listing; species identified by DFG and/or USFWS as species of concern; and plants included on the CNPS' lists.

A list of special-status plant species with potential to occur at Sonoma Coast SB was compiled by performing database searches of the CNPS' Electronic Inventory of Rare and Endangered Vascular Plants of California (CNPS 2002) and DFG CNDDB (CNDDB 2002).

Forty-nine special-status plant species (including 1 lichen) have potential to occur at Sonoma Coast SB. Table 2-5 lists these species and provides information on their listing status, habitat, distribution, flowering period, and potential for occurrence. Locations of known special-status plant occurrences are shown in Exhibit 2-7. Descriptions of special-status plants that are federally or State-listed as endangered, threatened, rare, or that are known to occur at Sonoma Coast SB, are provided below. A total of 12 special-status plant species are known to occur at Sonoma Coast SB. These include: pink sand-verbena (*Abronia umbellata* ssp. *breviflora*), Blasdale's bent grass (*Agrostis blasdalei*), Franciscan onion (*Allium peninsulare* var. *franciscanum*), California sedge (*Carex californica*), deceiving sedge (*C. saliniformis*), San Francisco wallflower (*Erysimum franciscanum*), short-leaved evax (*Hesperevax sparsiflora* var. *brevifolia*), Tidestrom's lupine (*Lupinus tidestromii*), Marin knotweed (*Polygonum marinense*), Marin checkerbloom (*Sidalcea hickmanii* ssp. *viridis*), purple-stemmed checkerbloom (*S. malvaeflora* ssp. *purpurea*), and secund jewel-flower (*Streptanthus glandulosus* var. *hoffmanii*). No comprehensive special-status plant surveys have been conducted at Sonoma Coast SB (DPR, pers. comm., 2001).

*Pink Sand-verbena*

Pink sand-verbena (*Abronia umbellata* ssp. *breviflora*) is a federal Species of Local Concern and a CNPS List 1B species (plants rare, threatened, or endangered in California and elsewhere). This perennial herbaceous member of the four o'clock family (Nyctaginaceae) produces attractive pink flowers in round inflorescences. This plant blooms from June to October but is easily identified in vegetative condition by its oblong leaves, as opposed to the common yellow sand-verbena (*Abronia latifolia*), which has thicker, round leaves (Golec and Matthews 1997). Suitable habitat consists of coastal dunes, particularly on fine, silty soils near the mouths of rivers and drainages. This species is known to occur in sand-verbena–bursage series vegetation in the South Salmon Creek Beach area (CNDDB 2002).

*Blasdale's Bent Grass*

Blasdale's bent grass (*Agrostis blasdalei*) is a federal Species of Concern and CNPS List 1B species. It is a rhizomatous herbaceous member of the grass family (Poaceae). It produces small flowers in slender, compact inflorescences from May to July. Suitable habitat consists of coastal bluff scrub, coastal dunes, and coastal prairie. This species often grows in nutrient-poor gravelly or sandy soil close to rocks in areas with sparse vegetation. Blasdale's bent grass has been reported from multiple locations at Sonoma Coast SB growing on sandy slopes above bluffs (CNDDB 2002, DPR 2001).

**Table 2-5**
**Special-Status Plant and Lichen Species with Potential to Occur at Sonoma Coast State Beach**

| Species | Listing Status | | | Habitat | Distribution | Flowering Period | Potential for Occurrence in Study Area |
|---|---|---|---|---|---|---|---|
| | Fed. | State | CNPS | | | | |
| Pink sand-verbena *Abronia umbellata ssp. breviflora* | SLC | -- | 1B | Coastal dunes | Extant in Del Norte, Humboldt, Mendocino, and Marin counties and Oregon; extirpated in Sonoma County | June-October | Present in the South Salmon Creek Beach area |
| Blasdale's bent grass *Agrostis blasdalei* | SC | -- | 1B | Coastal bluff scrub, coastal dunes, and coastal prairie | Mendocino, Marin, Santa Cruz, and Sonoma counties | May-July | Present in multiple locations |
| Franciscan onion *Allium peninsulare* var. *franciscanum* | -- | -- | 1B | Cismontane woodland, valley and foothill grassland; clay, often serpentinite substrate | Santa Clara, San Mateo, and Sonoma counties | May- July | Present on roadside ocean cliffs approximately 3 miles north of Bodega Bay |
| Sonoma alopecurus *Alopecurus aequalis* var. *sonomensis* | FE | -- | 1B | Freshwater marshes and swamps, riparian scrub | Marin and Sonoma counties | May-July | Potentially suitable habitat present |
| Napa false indigo *Amorpha californica* var. *napensis* | -- | -- | 1B | Openings in broadleafed upland forest, chaparral, and cismontane woodland | Monterey, Marin, Napa, and Sonoma counties | April-July | Potentially suitable habitat present |
| Coast rock-cress *Arabis blepharophylla* | SLC | -- | 4 | Broadleafed upland forest, coastal bluff scrub, coastal prairie, coastal scrub | Contra Costa, Monterey, Marin, Santa Cruz, San Francisco, San Mateo, and Sonoma counties | February-May | Potentially suitable habitat present |
| Baker's manzanita *Arctostaphylos bakeri* ssp. *bakeri* | SC | CR | 1B | Broadleafed upland forest and chaparral; often serpentinite substrate | Sonoma County | February-April | Potentially suitable habitat present |
| Bolander's reed grass *Calamagrostis bolanderi* | -- | -- | 1B | Bogs and fens, meadows, freshwater marshes and swamps, coastal scrub, openings in mesic forest | Humboldt, Mendocino, and Sonoma counties | May-August | Potentially suitable habitat present |

**Table 2-5**
**Special-Status Plant and Lichen Species with Potential to Occur at Sonoma Coast State Beach**

| Species | Listing Status | | | Habitat | Distribution | Flowering Period | Potential for Occurrence in Study Area |
|---|---|---|---|---|---|---|---|
| | Fed. | State | CNPS | | | | |
| Thurber's reed grass<br>*Calamagrostis crassiglumis* | -- | -- | 2 | Mesic sites in coastal scrub, freshwater marshes and swamps | Del Norte, Humboldt, Mendocino, Marin, and Sonoma counties; Washington; widespread outside of California | May-July | Potentially suitable habitat present |
| Coastal bluff morning-glory<br>*Calystegia purpurata* ssp. *saxicola* | SLC | -- | 1B | Coastal dunes and coastal scrub | Mendocino, Marin, andSonoma counties | May-August | Potentially suitable habitat present |
| Swamp harebell<br>*Campanula californica* | SC | -- | 1B | Bogs and fens, freshwater marshes and swamps, mesic sites in closed-cone coniferous forest, coastal prairie, meadows, and North Coast coniferous forest | Extant in Mendocino, Marin, and Sonoma counties; extirpated in Santa Cruz County | June-October | Potentially suitable habitat present |
| California sedge<br>*Carex californica* | -- | -- | 2 | Bogs and fens, moist areas in closed-cone coniferous forest, coastal prairie, meadows, margins of marshes and swamps | Mendocino and Sonoma counties, Idaho, Oregon, Washington, and other states | May-August | Historically documented from Bodega Head |
| Bristly sedge<br>*Carex comosa* | -- | -- | 2 | Coastal prairie, marshes and swamps, valley and foothill grassland, lake margins | Extant in Contra Costa, Lake, Mendocino, Shasta, San Joaquin, and Sonoma counties, Idaho, and Washington; widespread outside of California; extirpated in San Bernardino, Santa Cruz, San Francisco counties, and Oregon | May-September | Potentially suitable habitat present |
| Deceiving sedge<br>*Carex saliniformis* | -- | -- | 1B | Mesic sites in coastal prairie, coastal scrub, meadows, coastal salt marshes, and swamps | Extant in Humboldt, Mendocino, and Sonoma counties; extirpated in Santa Cruz County | June | Present near Russian Gulch and Meyers Grade, between SR 1 and the ocean |

**Table 2-5**
**Special-Status Plant and Lichen Species with Potential to Occur at Sonoma Coast State Beach**

| Species | Listing Status | | | Habitat | Distribution | Flowering Period | Potential for Occurrence in Study Area |
|---|---|---|---|---|---|---|---|
| | Fed. | State | CNPS | | | | |
| San Francisco bay spineflower *Chorizanthe cuspidata* var. *cuspidata* | SC | -- | 1B | Coastal bluff scrub, coastal dunes, coastal prairie, coastal scrub; sandy soils | Extant in Marin, Santa Clara, San Francisco, San Mateo, Sonoma counties; extirpated in Alameda County | April-August | Potentially suitable habitat present |
| Woolly-headed spineflower *Chorizanthe cuspidata* var. *villosa* | SC | -- | 1B | Coastal dunes, coastal prairie, coastal scrub; sandy soils | Marin and Sonoma Counties | May-August | Potentially suitable habitat present |
| Sonoma spineflower *Chorizanthe valida* | FE | CE | 1B | Coastal prairie; sandy soils | Extant in Marin County, extirpated in Sonoma County | June-August | Potentially suitable habitat present; last recorded from Fort Ross area; may be extinct in Sonoma County |
| Franciscan thistle *Cirsium andrewsii* | SC | -- | 1B | Broadleafed upland forest, coastal bluff scrub, coastal prairie, coastal scrub; mesic sites, sometimes serpentinite substrate | Extant in Contra Costa, Marin, San Francisco, and Sonoma counties; extirpated in San Mateo County | March-July | Potentially suitable habitat present |
| Round-headed chinese houses *Collinsia corymbosa* | SC | -- | 1B | Coastal dunes, coastal strand | Extant in Humboldt, Mendocino, Marin and Sonoma counties; extirpated in San Francisco County | April-June | Potentially suitable habitat present |
| Point Reyes bird's-beak *Cordylanthus maritimus* ssp. *palustris* | SC | -- | 1B | Coastal salt marshes and swamps | Extant in Humboldt, Marin, and Sonoma counties, and Oregon; extirpated in Alameda, Santa Clara, and San Mateo counties | June-October | Potentially suitable habitat present |
| Baker's larkspur *Delphinium bakeri* | FE | CR | 1B | Coastal scrub, valley and foothill grassland | Extant in Marin County; extirpated in Sonoma County | March-May | Suitable habitat may be present |
| Yellow larkspur *Delphinium luteum* | FE | CR | 1B | Chaparral, coastal prairie, coastal scrub; rocky sites | Marin and Sonoma counties | March-May | Suitable habitat may be present |

**Table 2-5**
**Special-Status Plant and Lichen Species with Potential to Occur at Sonoma Coast State Beach**

| Species | Listing Status | | | Habitat | Distribution | Flowering Period | Potential for Occurrence in Study Area |
|---|---|---|---|---|---|---|---|
| | Fed. | State | CNPS | | | | |
| Western leatherwood *Dirca occidentalis* | SLC | -- | 1B | Broadleafed upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, North Coast coniferous forest, riparian forest and woodland; mesic slopes of rocky hills | Sonoma County | January-April | Potentially suitable habitat present |
| Streamside daisy *Erigeron biolettii* | -- | -- | 3 | Broadleafed upland forest, cismontane woodland, North Coast coniferous forest; rocky, mesic sites | Humboldt, Mendocino, Marin, Napa, Solano, and Sonoma counties | June-September | Potentially suitable habitat present |
| Supple daisy *Erigeron supplex* | -- | -- | 1B | Coastal bluff scrub and coastal prairie | Extant in Mendocino and Sonoma counties; extirpated in Humboldt and Marin counties | May-July | Potentially suitable habitat present |
| San Francisco wallflower *Erysimum franciscanum* | -- | -- | 4 | Chaparral, coastal dunes, coastal scrub, valley and foothill grassland; often serpentinite or granitic substrates | Marin, Santa Clara, Santa Cruz, San Francisco, San Mateo, and Sonoma counties | March-June | Present in coastal dunes behind north Goat Rock restroom |
| Coast fawn lily *Erythronium revolutum* | -- | -- | 2 | Bogs and fens, broadleafed upland forest, North Coast coniferous forest; mesic sites, streambanks | Del Norte, Humboldt, Mendocino, Siskiyou, and Sonoma counties; Oregon, Washington, and other states | March-June | Potentially suitable habitat present |
| Dune gilia *Gilia capitata* ssp. *chamissonis* | SC | -- | 1B | Coastal dunes, coastal scrub | Marin, San Francisco, Sonoma counties | April-July | Present in coastal dunes at Goat Rock |
| Woolly-headed gilia *Gilia capitata* ssp. *tomentosa* | SC | -- | 1B | Coastal bluff scrub; rocky outcrops | Marin and Sonoma counties | May-July | Potentially suitable habitat present |
| Dark-eyed gilia *Gilia millefoliata* | SLC | -- | 1B | Coastal dunes, coastal strand | Extant in Del Norte, Humboldt, Mendocino, Marin, and Sonoma counties and Oregon; extirpated in San Francisco County | April-July | Potentially suitable habitat present |

**Table 2-5**
**Special-Status Plant and Lichen Species with Potential to Occur at Sonoma Coast State Beach**

| Species | Listing Status | | | Habitat | Distribution | Flowering Period | Potential for Occurrence in Study Area |
|---|---|---|---|---|---|---|---|
| | Fed. | State | CNPS | | | | |
| Hayfield tarplant *Hemizonia congesta* ssp. *leucocephala* | -- | -- | 3 | Coastal scrub, valley and foothill grassland | Mendocino, Marin, and Sonoma counties | April-October | Potentially suitable habitat present |
| Short-leaved evax *Hesperevax sparsiflora* var. *brevifolia* | -- | -- | 2 | Sandy sites in coastal scrub, coastal dunes | Extant in Humboldt, Mendocino, Marin, Santa Cruz, and Sonoma counties, and Oregon; extirpated in San Francisco County | March-June | Present in multiple locations |
| Point Reyes horkelia *Horkelia marinensis* | -- | -- | 1B | Coastal dunes, coastal prairie, coastal scrub; sandy substrates | Mendocino, Marin, Santa Cruz, and San Mateo counties | May-September | Potentially suitable habitat present |
| Baker's goldfields *Lasthenia macrantha* ssp. *bakeri* | SLC | -- | 1B | Openings in closed-cone coniferous forest, coastal scrub | Extant in Mendocino and Marin counties; extirpated in Sonoma County | April-October | Possibly present in multiple locations, needs further analysis because of possible hybridization |
| Perennial goldfields *Lasthenia macrantha* ssp. *macrantha* | SLC | -- | 1B | Coastal bluff scrub, coastal dunes, coastal scrub | Mendocino, Marin, San Luis Obispo, San Mateo, and Sonoma counties | January-November | Present in multiple locations |
| Woolly-headed lessingia *Lessingia hololeuca* | -- | -- | 3 | Broadleafed upland forest, coastal scrub, lower montane coniferous forest, valley and foothill grassland; clay, serpentinite substrates | Alameda, Monterey, Marin, Napa, Santa Clara, San Mateo, Solano, Sonoma, and Yolo counties | June-October | Potentially suitable habitat present |
| Coast lily *Lilium maritimum* | -- | -- | 1B | Broadleafed upland forest, closed-cone coniferous forest, coastal prairie, coastal scrub, freshwater marshes and swamps, North Coast coniferous forest | Extant in Mendocino, Marin, San Francisco, and Sonoma counties; extirpated in San Mateo County | May-July | Potentially suitable habitat present |

**Table 2-5**
**Special-Status Plant and Lichen Species with Potential to Occur at Sonoma Coast State Beach**

| Species | Listing Status | | | Habitat | Distribution | Flowering Period | Potential for Occurrence in Study Area |
|---|---|---|---|---|---|---|---|
| | Fed. | State | CNPS | | | | |
| San Mateo tree lupine<br>*Lupinus eximius*<br>(syn. *L. arboreus* var. *eximius*) | SLC | -- | 3 | Chaparral, coastal scrub | San Mateo and Sonoma counties | April-July | Potentially suitable habitat present |
| Tidestrom's lupine<br>*Lupinus tidestromii* | FE | CE | 1B | Coastal dunes | Monterey, Marin, and Sonoma counties | April-July | Present in coastal strand behind north restroom at Goat Rock Beach |
| Curly-leaved monardella<br>*Monardella undulata* | SC | -- | 4 | Closed-cone coniferous forest, chaparral, coastal dunes, coastal prairie, coastal scrub, Ponderosa pine sandhills; sandy soils | Monterey, Marin, Santa Barbara, Santa Cruz, San Francisco, San Luis Obispo, San Mateo, and Sonoma counties | May-September | Potentially suitable habitat present |
| Robust monardella<br>*Monardella villosa* ssp. *globosa* | SLC | -- | 1B | Coastal scrub, cismontane woodland, openings in chaparral | Alameda, Contra Costa, Humboldt, Lake, Mendocino, Napa, San Mateo, and Sonoma counties | June-July | Potentially suitable habitat present |
| Marin knotweed<br>*Polygonum marinense* | SLC | -- | 3 | Coastal salt or brackish marshes and swamps | Marin, Napa, Solano, and Sonoma counties | April-October | Present north of Bodega Head |
| Point Reyes checkerbloom<br>*Sidalcea calycosa* ssp. *rhizomata* | SLC | -- | 1B | Coastal freshwater marshes and swamps | Mendocino, Marin, and Sonoma counties | April-September | Potentially suitable habitat present |
| Marin checkerbloom<br>*Sidalcea hickmanii* ssp. *viridis* | SLC | -- | 1B | Chaparral; serpentinite substrate | Marin, Napa, San Mateo, and Sonoma counties | May-June | Present at Russian Gulch |
| Purple-stemmed checkerbloom<br>*Sidalcea malviflora* ssp. *purpurea* | SLC | -- | 1B | Broadleafed upland forest, coastal prairie | Mendocino, Marin, San Mateo, and Sonoma counties | May | Present in multiple locations |
| Beach starwort<br>*Stellaria littoralis* | SC | -- | 4 | Bogs and fens, coastal bluff scrub, coastal dunes, coastal scrub, marshes and swamps, coastal prairie; mesic sites | Extant in Humboldt, Marin, San Francisco, Sonoma counties; extirpated in Mendocino County | March-July | Potentially suitable habitat present |

**Table 2-5**
**Special-Status Plant and Lichen Species with Potential to Occur at Sonoma Coast State Beach**

| Species | Listing Status | | | Habitat | Distribution | Flowering Period | Potential for Occurrence in Study Area |
|---|---|---|---|---|---|---|---|
| | Fed. | State | CNPS | | | | |
| Secund jewel-flower *Streptanthus glandulosus* var. *hoffmanii* | -- | -- | 1B | Chaparral, cismontane woodland, valley and foothill grassland; rocky sites, often serpentinite substrate | Sonoma County | March-July | Present on steep rocky slopes above Russian Gulch |
| Showy Indian clover *Trifolium amoenum* | FE | -- | 1B | Coastal bluff scrub, valley and foothill grassland; sometimes serpentinite substrate | Extant in Marin and Sonoma counties; extirpated in Alameda, Napa, Santa Clara, and Solano counties | April-June | Potentially suitable habitat present |
| Long-beard lichen *Usnea longissima* | -- | SP | * | Coastal montane coniferous forest; mesic sites | Northern California (Del Norte, Humboldt, and Sonoma counties) to Alaska, Scandinavia, and Eastern Europe | N/A | Potentially suitable habitat present |

Notes/acronyms:
U.S. Fish and Wildlife Service (USFWS) Federal Listing Categories:
FC = Federal Candidate
FE = Federal Endangered
SC = Species of Concern–Other species of concern to the Sacramento Fish and Wildlife Office (no formal protection)
SLC = Species of Local Concern–Other species of concern to the Sacramento Fish and Wildlife Office (no formal protection)
California Department of Fish and Game (DFG) State Listing Categories:
CE = California Endangered
CT = California Threatened
CR = California Rare
SP = Included on Special Plants List but no official listing status (DFG 2002)
California Native Plant Society (CNPS) Listing Categories:
1B = Plants rare, threatened, or endangered in California and elsewhere
2 = Plants rare, threatened, or endangered in California but more common elsewhere
3 = Plants about which we need more information–a review list
4 = Plants of limited distribution–a watch list
* = Included on California Lichen Society's Red List; California Lichen Society recommends a CNPS listing of 1B.

Source: NDDB 2002, CNPS 2002, Potential for Occurrence is based on information contained in the Sonoma Coast State Beach IS/MND (DPR 2001)

*Franciscan Onion*

Franciscan onion (*Allium peninsulare* var. *franciscanum*) is a CNPS 1B species in the lily family (Liliaceae). This species produces showy burgundy-colored flowers in umbels from May to July. Franciscan onion is a bulb-producing herb that typically grows in cismontane woodland as well as valley and foothill grassland. It is often associated with clay or serpentinite substrate. This species has been reported at Sonoma Coast SB approximately 3 miles north of Bodega Bay, growing on dry, roadside ocean cliffs (CNDDB 2002).

*Sonoma Alopecurus*

Sonoma alopecurus (*Alopecurus aequalis* var. *sonomensis*) is federally listed as Endangered and is a CNPS List 1B species. This species is a perennial herbaceous grass that produces small flowers in stout, compact inflorescences. Its blooming period is from May to July, and suitable habitat consists of freshwater marshes and swamps and riparian scrub. Sonoma alopecurus is known from fewer than 10 occurrences statewide, and although suitable habitat is present, it has not yet been reported at Sonoma Coast SB (CNDDB 2002).

*Baker's Manzanita*

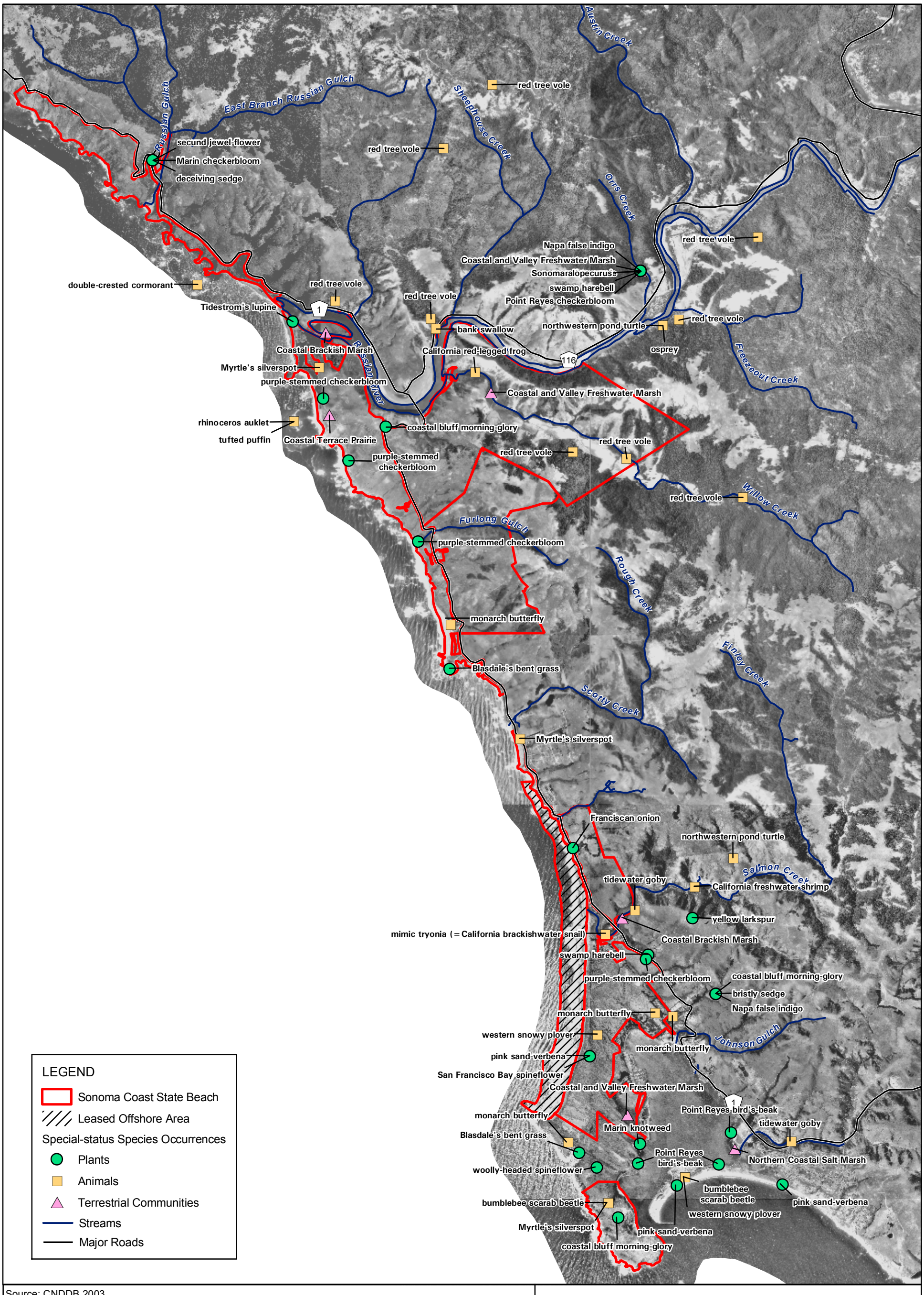
Baker's manzanita (*Arctostaphylos bakeri* ssp. *bakeri*) is a federal Species of Concern, and is State-listed as Rare and a CNPS List 1B species. It is an evergreen shrub in the blueberry family (Ericaceae) that produces small, urn-shaped, white flowers and dark green, shiny leaves. The blooming period is from February to April, and suitable habitat consists of broadleafed upland forest and chaparral. Baker's manzanita often grows on serpentinite substrate. This species is known to occur at the State Beach.

*California Sedge*

California sedge (*Carex californica*) is a CNPS List 2 species (plants rare, threatened, or endangered in California but more common elsewhere). This rhizomatous herb is a member of the sedge family (Cyperaceae) that blooms from May to August. Like other sedges, it produces compact, brownish inflorescences with small, inconspicuous flowers and has triangular stems. Suitable habitat consists of bogs and fens, moist areas in closed-cone coniferous forest, coastal prairie, meadows, and margins of marshes and swamps. California sedge has been historically documented from Bodega Head (DPR 2001).

*Deceiving Sedge*

Deceiving sedge (*Carex saliniformis*) is a CNPS List 1B species that grows in mesic sites in coastal prairie, coastal scrub, meadows, coastal salt marshes and swamps. This rhizomatous sedge blooms in June, producing small, inconspicuous flowers. Deceiving sedge has been reported near Russian Gulch, near the south end of Meyers Grade, between US 101 and the ocean (CNDDB 2002).




LEGEND

- Sonoma Coast State Beach
- Leased Offshore Area

Special-status Species Occurrences

- Plants
- Animals
- Terrestrial Communities
- Streams
- Major Roads

Source: CNDDB 2003

N

1 inch = 1 mile

0 4000 8000

Feet

Nov. 7, 2003

EDAW

# Sonoma Coast State Beach

**Exhibit 2-7**
**Special-status Species Occurrences (CNDDB)**

*Sonoma Spineflower*

Sonoma spineflower (*Chorizanthe valida*) is federally and State-listed as Endangered and is listed on CNPS List 1B. This annual herb belongs to the buckwheat family (Polygonaceae) and blooms from June to August. As its common name suggests, this plant produces spiny flowers in round clusters. The flowers are typically white to pink and small. Suitable habitat for Sonoma spineflower consists of coastal prairie with sandy soils. Although potentially suitable habitat is present at Sonoma Coast SB, this species is presumed extirpated in Sonoma County (CNPS 2002).

*Baker's Larkspur*

Baker's larkspur (*Delphinium bakeri*) is federally listed as Endangered, State-listed as Rare, and listed on CNPS List 1B. It is a perennial herb in the buttercup family (Ranunculaceae) with dark blue to purple flowers. The blooming period is from March to May, and suitable habitat consists of coastal scrub as well as valley and foothill grassland. At Sonoma Coast SB, potentially suitable habitat for Baker's larkspur consists of coyote brush series, coastal prairie, and California annual grassland series. This species has historically been found in only three locations: in Coleman Valley, Sonoma County; near the town of Tomales, Marin County; and approximately 6 miles east of Tomales Bay (USFWS 2003). Botanists believe that the Sonoma County and town of Tomales occurrences have been extirpated. Because of the highly imperiled status of Baker's larkspur, the U.S. Fish and Wildlife Service (USFWS) has recently designated 1,828 acres of critical habitat on two privately owned properties in Marin and Sonoma counties (USFWS 2003). Critical habitat is defined by the Endangered Species Act as an area or areas with physical or biological features that are essential to the conservation of a species and may need special management or protection.

*Yellow Larkspur*

Yellow larkspur (*Delphinium luteum*) has the same listing status as Baker's larkspur. As its common name implies, this species is distinguished by its bright yellow flowers. Identification may be complicated by hybridization with *D. nudicaule* (CNPS 2002). The blooming period is also March through May. In addition to coastal scrub, suitable habitat for yellow larkspur includes chaparral and coastal prairie. These plants typically grow on rocky sites and are known from only seven sites to date (CNPS 2002, USFWS 2003). USFWS has also designated 2,525 acres of critical habitat for yellow larkspur. The critical habitat is privately owned and located on four properties in Marin and Sonoma Counties. Potentially suitable habitat for yellow larkspur at Sonoma Coast SB consists of coastal scrub and coastal prairie.

*San Francisco Wallflower*

San Francisco wallflower (*Erysimum franciscanum*) is a CNPS List 4 species (plants of limited distribution; a watch list). This perennial herb is a member of the mustard family (Brassicaceae) that has white to yellow flowers. It blooms from March to June and grows in chaparral, coastal dunes, coastal scrub, and valley and foothill grassland, often on

serpentinite or granitic substrates. San Francisco wallflower is present in the coastal dunes behind the north Goat Rock restroom (DPR 2001).

*Short-leaved Evax*

Short-leaved evax (*Hesperevax sparsiflora* var. *brevifolia*) is a CNPS List 2 species in the sunflower family (Asteraceae). This annual herb produces small white flowers from March to June. Short-leaved evax grows in sandy sites in coastal scrub and coastal dunes. This species has been reported from several locations at Sonoma Coast SB (DPR 2001).

*Perennial Goldfields*

Perennial goldfields (*Lasthenia macrantha* ssp. *macrantha*) is a federal Species of Local Concern and CNPS 1B species. As its common name suggests, it is a perennial herb that produces gold daisy-like inflorescences. Perennial goldfields belongs to the sunflower family and blooms from January to November. Suitable habitat consists of coastal bluff scrub, coastal dunes, and coastal scrub. Perennial goldfields occurrences have been reported from multiple locations at Sonoma Coast SB (DPR 2001).

*Tidestrom's Lupine*

Tidestrom's lupine (*Lupinus tidestromii*) is federally and State-listed as Endangered and is listed on CNPS List 1B. It is a small rhizomatous herb in the bean family (Fabaceae) that has attractive purple flowers and silvery palmately compound leaves. This species blooms from April to July and grows in coastal dunes. Tidestrom's lupine has been included in a Recovery Plan prepared by USFWS (1998). It is presently growing in sand verbena–beach bursage series vegetation behind the north restroom at Goat Rock Beach (CNDDB 2002, DPR 2001). In fact, the Department recently conducted a Goat Rock Dunes Tidestrom's Lupine and Coastal Dune Enhancement Project (DPR 2002). Restoration activities were initiated to enhance approximately 4 acres of sensitive coastal dune habitat for the protection of this endangered plant species.

*Marin Knotweed*

Marin knotweed (*Polygonum marinense*) is an annual herb in the buckwheat family. It produces small, white to pink flowers in the axils of its leaves. The blooming period is April to October. Marin knotweed is a federal species of Local Concern and a CNPS List 3 species (plants for which more information is needed; a review list). This species is known from fewer than 20 occurrences, but its taxonomic status is uncertain (CNPS 2002). Suitable habitat consists of coastal salt or brackish marshes and swamps. One occurrence of Marin knotweed has been reported just north of Bodega Head (CNDDB 2002).

*Marin Checkerbloom*

Marin checkerbloom (*Sidalcea hickmannii* ssp. *viridis*) is a federal Species of Local Concern and a CNPS List 1B species. It is a perennial herb in the mallow family (Malvaceae) that produces pale pink to pink-lavender flowers from May to June. Suitable habitat consists of

serpentinite substrate in chaparral vegetation. Marin checkerbloom has been reported to occur at Russian Gulch and likely occurs within the State Beach boundaries (CNDDB 2002, DPR 2001).

*Purple-stemmed Checkerbloom*

Purple-stemmed checkerbloom (*Sidalcea malviflora* ssp. *purpurea*) is a rhizomatous herb that also belongs to the mallow family. It produces small, hibiscus-like flowers with purple sepals in May. Suitable habitat consists of broadleafed upland forest and coastal prairies. Purple-stemmed checkerbloom has been reported to occur in multiple locations at Sonoma Coast SB (DPR 2001). However, these occurrences have not been confirmed and are likely to be misidentified species (O'Neil 2003).

*Secund Jewel-flower*

Secund jewel-flower (*Streptanthus glandulosus* var. *hoffmanii*) is a CNPS List 1B species in the mustard family. This annual herb produces white to purple flowers from March to July. It is listed as *S. glandulosus* ssp. *secundus* in the Jepson Manual (Hickman et al. 1993). Suitable habitat for secund jewel-flower consists of chaparral, cismontane woodland, and valley and foothill grassland. This species typically grows on rocky sites and often serpentinite substrate. It has been reported from the steep rocky slopes above Russian Gulch (CNDDB 2002).

*Showy Indian Clover*

Showy Indian clover (*Trifolium amoenum*) is a federally listed as Endangered and is a CNPS List 1B species. This species grows in coastal bluff scrub, and valley and foothill grassland. It has sometimes been found on serpentinite substrate. Showy Indian clover is an annual herb in the bean family that produces pink to purple flowers in rounded clusters. Its blooming period is from April to June. Suitable habitat may be present at Sonoma Coast SB but occurrence is unlikely because of its rarity (DPR 2001). This species was presumed extinct until rediscovered in 1993 and 1996 (CNPS 2002).

Sensitive Plant Communities/Habitats

Sensitive plant communities are natural communities that have been afforded special recognition and protection under local, state, and federal regulations. Many of these plant communities are documented in DFG's CNDDB. A search of the CNDDB (2002) identifies four sensitive plant communities occurring at Sonoma Coast SB and/or surrounding areas: coastal and valley freshwater marsh, coastal brackish marsh, coastal terrace prairie, and northern coastal salt marsh. All of these sensitive plant communities except northern coastal salt marsh occur within Sonoma Coast SB. Coastal terrace prairie is located along much of the coast. Coastal brackish marsh has been documented on Penny Island and at the mouth of Salmon Creek. In addition, coastal and valley freshwater marsh has been documented at the mouth of Willow Creek.

Invasive Non-Native Plants

Non-native (exotic, alien, non-indigenous) species are those that have not evolved in a particular area, and have been introduced through human activities, either incidentally or deliberately. Many non-native plant species are not invasive and do not have adverse effects on natural plant and animal communities. Nevertheless, some non-native species have resulted in the conversion of native habitats to a non-native plant community with resultant reduction of native plants and degradation of wildlife habitat. Non-native plants that are known to be invasive or have potential to become invasive at Sonoma Coast SB are listed in Table 2-6.

**Table 2-6**
**Weeds Known to be Invasive or with Potential to Become Invasive in the Study Area**

| Scientific Name | Common Name | CalIPC/State Status [1] |
|---|---|---|
| *Ammophila arenaria* | European beachgrass | A-1/-- |
| *Bellardia trixago* | Bellardia | B/-- |
| *Brassica nigra* | Black mustard | B/-- |
| *Carduus pycnocephalus* | Italian thistle | B/C |
| *Carduus tenuiflorus* | Slenderflowered thistle | --/C |
| *Carpobrotus chilensis* | Iceplant, sea fig | --/-- |
| *Carpobrotus edulis* | Iceplant | A-1/-- |
| *Cirsium arvense* | Canada thistle | B/B |
| *Cirsium vulgare* | Bull thistle | B/P |
| *Conium maculatum* | Poison hemlock | B/-- |
| *Cortaderia* spp. *(C. jubata, C. selloana)* | Pampas grass | A-1/-- |
| *Cupressus macrocarpa* | Monterey cypress | NMI/-- |
| *Cynara cardunculus* | Artichoke thistle | A-1/B |
| *Echium candicans, E. pininana* | Pride of Madeira, Pride of Tenerife | NMI/-- |
| *Erechtites glomerata* | Australian fireweed | B/-- |
| *Ehrharta calycina* | Veldt grass | A-2/-- |
| *Ehrharta erecta* | Upright veldt grass | B/-- |
| *Eucalyptus globulus* | Blue gum | A-1/-- |
| *Euphorbia lathyris* | Caper spurge | NMI/-- |
| *Festuca arundinacea* | Tall fescue | B/-- |
| *Foeniculum vulgare* | Fennel | A-1/-- |
| *Genista monspessulana* | French broom | A-1/C |
| *Holcus lanatus* | Velvet grass | B/-- |
| *Lupinus arboreus* | Yellow bush lupine | A-2/-- |
| *Mentha pulegium* | Pennyroyal | A-2/-- |
| *Myoporum laetum* | Myoporum | A-2/-- |
| *Oxalis pes-capre* | Bermuda buttercup | NMI/-- |

| Table 2-6<br>Weeds Known to be Invasive or with Potential to Become Invasive in the Study Area | | |
|---|---|---|
| **Scientific Name** | **Common Name** | **CalIPC/State Status [1]** |
| *Phalaris aquatica* | Harding grass | B/-- |
| *Pinus radiata* | Monterey pine | NMI/-- |
| *Potamogeton crispus* | Curlyleaf pondweed | B/-- |
| *Rubus discolor* | Himalayan blackberry | A-1/-- |
| *Senecio mikanioides* | Cape ivy | A-1/P |
| *Silybum marianum* | Milk thistle | NL/-- |
| *Ulex europaeus* | Gorse | A-1/B |
| *Vinca major* | Periwinkle | B/-- |

Notes/acronyms:
[1] CalIPC Status:
A-1 = The most invasive wildland pest plants, widespread.
A-2 = The most invasive wildland pest plants, regional.
B = Wildland pest plants of lesser invasiveness.
NL = Considered but not listed.
NMI = Need more information.
State (CDFA) Status:
B = Eradication, containment, control, or other holding action at the discretion of the commissioner.
C = State endorsed holding action and eradication only when found in a nursery, action to retard spread outside of nurseries at the discretion of the commissioner, reject only when found in a cropseed for planting or at the discretion of the commissioner.
P = Proposed additions to the CDFA Noxious Weed List in the California Code of Regulations.
Source: CalIPC 1999; O'Neil, pers. comm., 2003b; DPR 2001d

The State and federal governments both have laws and regulations protecting commerce and natural lands from damages caused by invasive weeds. The State and federal government each maintain lists of noxious weeds for the purpose of eradication or control. A districtwide invasive species management plan is currently being prepared (O'Neil, pers. comm. 2003).

The California Invasive Plant Council (CalIPC) has developed a list of non-native plants that pose serious problems in native ecosystems and rangelands (CalIPC 1999). These species are classified into different list categories based on the level of threat and invasiveness. List A includes the most invasive wildland pest plants, which have been documented as aggressive invaders, displace natives, and disrupt natural habitat. It includes two sublists: List A-1 (widespread pests that are invasive in more than three Jepson geographic regions) and List A-2 (regional pests that are invasive in three or fewer Jepson geographic regions).

List B includes wildland pest plants of lesser invasiveness than those on the previous lists. Invasive pest plants on this list spread less rapidly and cause a lesser degree of habitat disruption and may be widespread or regional in distribution. The Red Alert List includes pest plants with potential to spread explosively; infestations are small or localized. The Need More Information List includes plants for which current information does not adequately describe nature of threat to wildlands, distribution or invasiveness. The following two lists

were not used in this discussion of invasive weeds at Sonoma Coast SB: Annual Grasses (a preliminary list of annual grasses, abundant and widespread in California that pose significant threats to wildlands. Information is requested to support further definition of this category in the next list edition) and Considered But Not Listed (plants that after review of status, do not appear to pose a significant threat to wildlands).

Nine non-native plant species on CalIPC List A-1 (the most invasive wildland pest plants; widespread) are known to be invasive or likely to become invasive at Sonoma Coast SB: European beachgrass, iceplant, pampas grass (*Cortaderia* spp.), artichoke thistle (*Cynara cardunculus*), blue gum, fennel (*Foeniculum vulgare*), French broom (*Genista monspessulana*), Himalayan blackberry (*Rubus discolor*), cape ivy (*Senecio mikanioides*), and gorse (*Ulex europaeus*). These species have been documented as aggressive invaders that displace natives and disrupt natural habitats.

Plants on List A-2 (at most invasive wildland pest plants; regional) found in the study area include veldt grass (*Ehrharta calycina*), yellow bush lupine, pennyroyal (*Mentha pulegium*) and myoporum. Of these, only pennyroyal and myoporum are problematic at Sonoma Coast SB at this time. Veldt grass is known to be problematic on the central coast, and yellow bush lupine is only known to be invasive on the north coast. Plants in the study area that are on List B (wildland pest plants of lesser invasiveness) include bellardia (*Bellardia trixago*), black mustard (*Brassica nigra*), Italian thistle (*Carduus pycnocephalus*), bull thistle (*Cirsium vulgare*), Canada thistle (*C. arvense*), poison hemlock (*Conium maculatum*), upright veldt grass (*Ehrharta erecta*), Australian fireweed (*Erechtites glomerata*), tall fescue (*Festuca arundinacea*), velvet grass (*Holcus lanatus*), Harding grass (*Phalaris aquatica*), curlyleaf pondweed (*Potamogeton crispus*), and periwinkle (*Vinca major*). Species at Sonoma Coast SB on the Need More Information List include Monterey cypress, Pride of Madeira (*Echium* spp.), caper spurge (*Euphorbia lathyris*), Bermuda buttercup (*Oxalis pes-capre*), and Monterey pine.

Other weed species without an official CalIPC status that may nonetheless pose a threat to native habitats at Sonoma Coast SB are listed in Table 2-6. Several of these additional species appear on lists developed by the California Department of Food and Agriculture (CDFA) or were identified as weeds of concern by DPR resource ecologists (O'Neil, pers. comm. 2003b).

Management of European beachgrass, iceplant (including *Carpobrotus chilensis* and *C. edulis*), Monterey cypress, and myoperum is under way as part of the Department's Tidestrom's Lupine and Coastal Dunes Enhancement Project (DPR 2002). Mechanical and chemical abatement methods have been recommended for these weeds. The Department has reported that mechanical removal of iceplant has been successful in reducing infestations (Pesquanelli, pers. comm., 2001). In addition, caper spurge has been recently discovered in habitats at Sonoma Coast SB and a program of on-going control efforts has been initiated (O'Neil, pers. comm., 2003b).

### *Animals*

Sonoma Coast SB encompasses a rugged and varied segment of dramatic California coast line. Sonoma Coast SB includes marine terraces and offshore rocks, intertidal zones, sand dunes, coastal bluffs, marshes and riparian areas, and forested canyons. The variety of terrain, aquatic ecosystems, and plant communities provides a tremendous diversity of wildlife habitats. Sonoma Coast SB supports abundant and diverse wildlife. Many of the wildlife species found at Sonoma Coast SB are common, but some of the species are considered to have significant resource value.

Special-status animals addressed in this document include those that are legally protected or that are otherwise considered sensitive by federal, state, or local resource conservation agencies and organizations. These include species that are state and/or federally listed as Rare, Threatened, or Endangered; those considered as candidates or proposed for listing; and species identified by DFG and/or USFWS as species of concern.

Significant animal resources were determined through a review of existing documentation and consultation with biologists familiar with the local biological resources. Sources of information also included the CNDDB (DFG 2003) and the Initial Study/Mitigated Negative Declaration for the Proposed Sonoma Coast Beach Trail (DPR 2001).

A list of special-status species known to occur, or that could occur, at Sonoma Coast SB is included in Table 2-7. The locations of previously documented occurrences of these species are shown in Exhibit 2-7. A thorough biological inventory has not been completed for Sonoma Coast SB. However, based on the result of a field reconnaissance and other biological studies, it has been determined that Sonoma Coast SB may provide important habitat for the following special-status animal species and that these species should be considered significant resources: (1) marine resources including nesting colonies of rhinoceros auklet (*Cerorhinca monocerata*), tufted puffin (*Fratercula cirrhata*), and double-crested cormorant (*Phalacrocorax auritus*); (2) freshwater aquatic resources including California freshwater shrimp (*Syncaris pacifica*), western pond turtle (*Clemmys marmorata*), red-legged frog (*Rana aurora*), foothill yellow-legged frog (*R. boylii*), tidewater goby (*Eucyclogobius newberryi*), coho salmon (*Oncorhynchus kisutch*), steelhead (*O. mykiss*), and chinook salmon (*O. tshawytscha*); and (3) terrestrial resources including marbled murrelet (*Brachyramphus marmoratus*), western snowy plover (*Charadrius alexandrinus nivosus*), yellow warbler (*Dendroica petechia*), purple martin (*Progne subis*), northern harrier (*Circus cyaneus*), American peregrine falcon (*Falco peregrinus anatum*), osprey (*Pandion haliaetus*), northern spotted owl (*Strix occidentalis caurina*), and red tree vole (*Arborimus pomo*).

| Table 2-7<br>Special-Status Wildlife Species with Potential to Occur at Sonoma Coast State Beach | | | | |
|---|---|---|---|---|
| Species | Listing Status | | Habitat | Potential for Occurrence in Study Area |
| | Fed. | State | | |
| **INVERTEBRATES** | | | | |
| Myrtles silverspot<br>*Speyeria zerene myrtleae* | FE | -- | Coastal dunes, coastal prairie, and coastal scrub with presence of larval host plant (*Viola adunca*) and nectar sources for adults | Unknown. Although several records for Sonoma Coast SB were reported in the 1960s and 1970s, northern extent of distribution is given as Marin County |
| California freshwater shrimp<br>*Syncaris pacifica* | FE | CE | Endemic to Marin, Sonoma, and Napa counties in lowland streams and pools with undercut banks, exposed tree roots, and overhanging woody debris or vegetation. | Known from Salmon Creek and tributaries to Willow Creek |
| **REPTILES AND AMPHIBIANS** | | | | |
| Northwestern pond turtle<br>*Clemmys marmorata marmorata* | FSC | CSC | Ponds, marshes, streams, and irrigation ditches | Likely to occur at Sonoma Coast SB. Known to occur in Salmon Creek and Willow Creek watersheds |
| Northern red-legged frog<br>*Rana aurora aurora* | -- | CSC | Permanent or temporary water bordered by dense grassy or shrubby vegetation. | May occur in limited suitable habitat at Sonoma Coast SB. Distribution and taxonomy is unclear for subspecies of red-legged frogs |
| California red-legged frog<br>*Rana aurora draytonii* | FT | CSC | Freshwater habitats including pools and backwaters within streams and creeks, ponds, marshes, springs, lagoons and stock ponds. | May occur in limited suitable habitat at Sonoma Coast SB. Distribution and taxonomy is unclear for subspecies of red-legged frogs |
| Foothill yellow-legged frog<br>*Rana boylii* | FSC | CSC | Generally restricted to shallow, flowing streams with some cobble-sized substrate | May occur because suitable habitat is present at Sonoma Coast SB. No documented records |

| Table 2-7<br>Special-Status Wildlife Species with Potential to Occur at Sonoma Coast State Beach | | | | |
|---|---|---|---|---|
| Species | Listing Status | | Habitat | Potential for Occurrence in Study Area |
| | Fed. | State | | |
| **FISH** | | | | |
| Tidewater goby *Eucyclogobius newberryi* | FPD | CSC | Endemic to California coastline in lagoons and the lower reaches of coastal streams in brackish areas | Known to occur in Salmon Creek |
| Coho salmon (Central California Coast Evolutionary Significant Unit [ESU]) *Oncorhynchus kisutch* | FT | -- | Naturally spawning populations in streams between Punta Gorda, Humboldt County and San Lorenzo River, Santa Cruz County | Known to occur in Russian River, Willow Creek, and potentially other coastal streams |
| Steelhead (Central California Coast ESU) *Oncorhynchus mykiss* | FT | -- | Central coastal basins from the Russian River, south to Soquel Creek, including San Francisco and San Pablo Bay basins, but excluding the Sacramento-San Joaquin River basins | Known to occur in Russian River, Willow Creek, and potentially other coastal streams |
| Chinook Salmon (California Coastal ESU) *Oncorhynchus tshawytscha* | FT | -- | Only naturally spawned coastal spring and fall chinook salmon between Redwood Creek in Humboldt County and the Russian River in Sonoma County | Known to occur in Russian River |
| **BIRDS** | | | | |
| Marbled murrelet *Brachyramphus marmoratus* | FT | CE | Old forest stands for nesting within 50 miles of foraging habitat; near shore marine habitats for foraging | Suitable habitat present upslope from Pomo Campground in old-growth Douglas firs. Breeding has been recorded on the Richardson property in the Haupt Creek drainage. Individuals have been observed offshore of Arched Rock, Duncans Landing, and Bodega Head. |

| Table 2-7<br>Special-Status Wildlife Species with Potential to Occur at Sonoma Coast State Beach | | | | |
|---|---|---|---|---|
| Species | Listing Status | | Habitat | Potential for Occurrence in Study Area |
| | Fed. | State | | |
| Rhinoceros auklet *Cerorhinca monocerata* | -- | CSC | Nests in burrows on undisturbed offshore islands along the coast and probably in cliff caves on the mainland; forages in marine habitats | Limited nesting habitat at Sonoma Coast SB on offshore rocks because not enough substrate exists for burrow creation. Few individuals in marine habitat reported during the breeding season in the last 30 years. |
| Western snowy plover *Charadrius alexandrinus nivosus* | FT | CSC | Sandy beaches, salt pond levees, shores of large alkali lakes; nests and forages on open, sandy, gravelly or friable soils with scattered debris and scarce vegetation | Known to occur at Salmon Creek Beach during spring and fall, but no nesting documented. Potentially suitable habitat also occurs at Wright and Goat Rock Beach |
| Northern harrier *Circus cyaneus* | -- | CSC | Grasslands, marshes, and agricultural fields | Known to nest at Bodega Head and forage throughout Sonoma Coast SB. Suitable nesting habitat likely occurs in several areas of Sonoma Coast SB including in the meadow near the Pomo Campground |
| Yellow Warbler *Dendroica petechia* | -- | CSC | Riparian woodland, montane chaparral, and open mixed coniferous habitats | May occur at Sonoma Coast SB during breeding and migration. Although suitable riparian habitat present along creeks and streams, not detected breeding in coastal areas in Sonoma County. |
| American peregrine falcon *Falco peregrinus anatum* | FSC | CE | Cliffs or rocky outcrops for nesting. Forages over a variety of habitats but mostly prefers aquatic associated areas where abundant aerial prey is present | Known to occur at Sonoma Coast SB. Suitable nesting and foraging habitat present along the coastline. Historical nest sites near Goat Rock and Vista Point. |

| Table 2-7<br>Special-Status Wildlife Species with Potential to Occur at Sonoma Coast State Beach | | | | |
|---|---|---|---|---|
| Species | Listing Status | | Habitat | Potential for Occurrence in Study Area |
| | Fed. | State | | |
| Tufted puffin<br>*Fratercula cirrhata* | -- | CSC | Nests along the coasts on islands, islets, or rarely mainland cliffs; requires sod or earth for burrowing on island cliffs or grassy island slopes; forages in marine habitats | Limited nesting habitat at Sonoma Coast SB on offshore rocks because not enough substrate exists for burrow creation. Few individuals in marine habitat reported during the breeding season in the last 30 years. |
| Osprey<br>*Pandion haliaetus* | -- | CSC | Ocean shore, bays, freshwater lakes, larger streams. Nests on top of large trees or snags, rocky outcrops or man-made platforms within 15 miles of good fish-producing bodies of water | Known to nest at Sonoma Coast SB. Suitable nesting and foraging habitat in many areas along coast, near Russian River mouth and other streams. |
| California brown pelican<br>*Pelicanus occidentalis californicus* | FE | -- | Coastal and estuarine waters; roosts on protected islets, sea stacks, sandbars, and piers; nests in southern California and Mexico. | Roosting and loafing sites found along coastline. Non-breeding individuals present at Sonoma Coast SB. |
| Double-crested cormorant<br>*Phalacrocorax auritus* | -- | CSC | Colonial nester on coastal cliffs, offshore islands, and along lake margins; nests along coast on sequestered islets, usually on ground with sloping surface or in tall trees along lake margins | Known rookery site on "Russian River Rocks," an offshore area just north of the mouth of the Russian River |
| Purple Martin<br>*Progne subis* | -- | CSC | Nests in riparian and other lowland habitats where large snags with cavities are present | Possibly may nest near coast north of Jenner |

| Table 2-7<br>Special-Status Wildlife Species with Potential to Occur at Sonoma Coast State Beach | | | | |
|---|---|---|---|---|
| Species | Listing Status | | Habitat | Potential for Occurrence in Study Area |
| | Fed. | State | | |
| Bank swallow<br>*Riparia riparia* | -- | CT | Colonial nester in riparian and other lowland habitats; requires vertical banks or cliffs with fine-textured, sandy soils near streams, rivers, lakes or ocean to dig nesting holes | Unlikely to occur. Historical nesting colony located on Russian River near Jenner. Last observed nesting activity in 1960. |
| Northern spotted owl<br>*Strix occidentalis caurina* | FT | CSC | Old-growth forests or mixed stands of old-growth and mature trees; occasionally in younger forests; high multistory canopy dominated by big trees with cavities or broken tops; forests with woody debris and space under canopy | Known to nest in Willow Creek drainage. |
| MAMMALS | | | | |
| Red tree vole<br>*Arborimus pomo* | FSC | CSC | Coastal fog belt in Douglas-fir, redwood, and montane hardwood-conifer forests. Almost exclusively arboreal | Known to occur at Sonoma Coast SB in the Willow Creek area |
| Steller sea lion<br>*Eumetopias jubatus* | FT | -- | Coastal marina areas | Known to occur at Sonoma Coast SB in the Bodega Head area. |
| Source: DFG 2003, DPR 2001d | | | | |

Although they are not special-status species, three other resources should also be considered of significant resource value because of management concern identified by resource agencies or significant public interest. These significant resources are: abalone (*Haliotis* spp.), monarch butterfly (*Danaus plexippus*) roosts, and harbor seal (*Phoca vitulina*) or other marine mammal haul-outs. Brief descriptions of special-status species and other significant animal resources known to occur or that may potentially occur at Sonoma Coast SB are provided below.

Marine Resources

Sonoma Coast SB spans almost 19 miles of coastline, encompassing rocky shores, marine terraces, tidepools, protected coves, sandy beaches, and offshore rocks. Acreage managed by Sonoma Coast SB includes a marine area from the Salmon Creek river mouth to Mussel Point, which is leased from the State Lands Commission. The offshore rocks, which are under the jurisdiction of the U.S. Bureau of Land Management and designated as the California Coastal National Monument, are managed by the Department and DFG under a cooperative agreement. The California Marine Managed Areas Improvement Act of 2000 sets forth procedures for establishing new marine managed areas and for reclassifying existing areas into the new system. Under the Draft Marine Management Area Plan, the marine managed area may be proposed to expand seaward to include up to 3 nautical miles and northward to the northern boundary of Sonoma Coast SB, with some marine areas classified as marine reserves or marine parks (Barry, pers. comm., 2003). Significant resources in these habitats include abalone, seabird colonies, and marine mammals.

*Abalone Species*

Of the seven species of abalone found in California, Sonoma Coast SB is likely to support three species: red (*Haliotis rufescens*), pinto (*H. kamtschatkana*), and flat (*H. walallenis*). These species are found in intertidal zones to waters up to 80 feet deep. Abalones are found in boulder and rock habitat, and are usually associated with kelp forests. All are long-lived and slow-growing species.

None of these species are given any special-listing status under the California or federal Endangered Species Acts; however, the California Fish and Game Code establishes management of abalone to recovery of their populations under §§5520-5522. DFG has drafted an Abalone Recovery and Management Plan (ARMP) in California to prevent further population declines and ensure the sustainability of current and future fisheries.

Northern California red abalone populations have supported a viable fishery, but recent studies have revealed four trends which are cause for concern: a concentration of fishery effort and increased take, evidence of poor recruitment, declines in deep-water stocks, and serial depletion (DFG 2002). Pinto and flat abalone have not been major components of the commercial or recreational fisheries and less is known about their populations. The management component of the ARMP focuses on the northern California red abalone sport fishery and establishes size and take limits and management zones based on the species biology.

*Seabird Colonies*

The offshore rocks at Sonoma Coast SB have potential to support nesting colonies of several seabird species that are considered California Species of Special Concern: double-crested cormorant, rhinoceros auklet, and tufted puffin. The California brown pelican (*Pelican occidentalis californicus*), a species that is federally listed as Endangered, forages and roosts along the coastline of Sonoma County, but does not nest in northern California. Double-

crested cormorant colonies nest on the offshore rocks at the Russian River mouth. In 1989, 176 nests and 422 individual birds were counted (Burridge 1995). Double-crested cormorants also share nesting colonies with other cormorants, the pelagic cormorant (*Phalacrocorax pelagicus*), and the Brant's cormorant (*P. penicillatus*). Although the Russian River rocks are the only known locations of double-crested cormorant colonies, other cormorant species nest on rocks and smaller sea stacks along the entire Sonoma Coast SB (Burridge 1995).

Auklets and puffins nest in burrows or crevices on protected islands or cliffs. Most of the offshore rocks along Sonoma Coast SB do not have adequate sand and dirt to allow for creation of burrows, which measure 4–25 feet deep (Burridge 1995). Because habitat is so limited, nesting of these species at Sonoma Coast SB is considered very rare. In the past 30 years, there have only been a few sightings of auklets off the coastline of Sonoma County during the breeding season. At Sonoma Coast SB, they have been observed at Arched Rock, approximately 0.5 mile south of Goat Rock, and at Bodega Head (Burridge 1995, DFG 2003). Puffins were observed on the sea stacks near the Russian River mouth in the late 1970s and a pair was observed during the breeding season on Arched Rock in the 1980s (Burridge 1995).

*Marine Mammals*

Harbor seals are one of the most common marine mammals in California. They are nonmigratory and feed in cold water along the coast. They spend much time basking on the shoreline or on offshore rocks. They characteristically congregate onshore in groups to rest and rear their young at traditional sites that are generally used year round. Harbor seals, as well as all marine mammals, are protected under the Marine Mammal Protection Act of 1972. All activities that have the potential to disturb a marine mammal in the wild by causing disruption of behavioral patterns are prohibited under this act. Harbor seals are particularly vulnerable when they are on land, as they have limited mobility to flee from a threat. A historical haul-out of harbor seals is known from the Russian River mouth. A few elephant seals (*Mirounga angustirostris*) have been using this beach and other sheltered beaches at Sonoma Coast SB as haul-outs in recent years. California sea lions (*Zalophus californianus*) may also be found on rocky shores at Sonoma Coast SB and Steller sea lions (*Eumetopias jubatus*) have been observed around Bodega Head area (DPR 2001d). Whales are observed from Sonoma Coast SB, but are not likely to occur in the current management boundary of the State Beach, because they are usually found in deeper, offshore waters.

*Freshwater and Anadromous Aquatic Resources*

Sonoma Coast SB includes several perennial streams including the Russian River, Willow Creek, and Salmon Creek, as well as intermittent streams such as Russian Gulch, Furlong Gulch, and Marshall Gulch. These streams provide habitat for several significant freshwater aquatic resources including California freshwater shrimp, several species of herpetofauna (reptiles and amphibians), and several species of fish.

*California Freshwater Shrimp*

California freshwater shrimp are endemic to Marin, Sonoma, and Napa counties. They are found in lowland (below 380 feet in elevation) perennial streams and favor pools with undercut banks, exposed tree roots, and overhanging woody debris or vegetation. California freshwater shrimp are federally listed as Endangered and considered a California Species of Special Concern. The shrimp is known from only 17 coastal streams and existing populations are threatened by introduced fish and deterioration or loss of habitat (USFWS 1998a). Salmon Creek is documented as supporting this species (USFWS 1998a, DFG 2003). The tributary streams in the lower Russian River drainage are also known to support this species; the mainstem of the Russian River is unlikely to support populations of California freshwater shrimp because of lack of suitable habitat (USFWS 1998a, DFG 2003).

*Herpetofauna*

Sonoma Coast SB contains habitat for one special-status reptile species, the northwestern pond turtle, and two special-status amphibians, the foothill yellow-legged frog and the red-legged frog. Each of these species is discussed below.

The northwestern pond turtle is a California Species of Special Concern. This aquatic turtle is found in a variety of habitats including lakes, rivers, streams, and stock ponds. They usually leave aquatic sites to reproduce and overwinter. Pond turtles nest in upland habitat, sometimes almost 0.25 mile from aquatic sites. Pond turtles have been reported in the Willow Creek and Salmon Creek watersheds at Sonoma Coast SB.

The foothill yellow-legged frog is a federal and California Species of Special Concern. Foothill yellow-legged frogs require shallow, flowing streams with some cobble-sized substrate on which they deposit large masses of eggs. They have been found in streams lacking cobble and in riparian zones at various times of the year, but it is unclear how regularly these habitats are used (Jennings and Hayes 1994). Populations of foothill yellow-legged frogs are threatened by loss of habitat and introduced aquatic predators. The distribution of foothill yellow-legged frogs at Sonoma Coast SB is not known, as comprehensive surveys have not been conducted. However, suitable habitat is known to occur on several small streams at Sonoma Coast SB, such as Willow Creek and Furlong Gulch (DPR 2001).

Two subspecies of red-legged frog may be found along the Sonoma Coast, the California red-legged frog (*Rana aurora draytonii*) and the northern red-legged frog (*Rana aurora aurora*); however, the taxonomy of many red-legged frogs found in this area is unclear. In the listing determination for California red-legged frog, northern Marin County was established as the approximate dividing line between the two subspecies (USFWS 1996a). However, recent research based on intensive field sampling and DNA analysis has indicated that the division between the subspecies may be the Navarro River in Mendocino County (Shaffer, unpublished data, 2002). In addition, some red-legged frogs from southern Del Norte to northern Marin County along the Coast Range exhibit intergrade characteristics of

both subspecies. The two subspecies and intergrades of the subspecies may occur along the Sonoma coast (USFWS 2002).

The California red-legged frog is federally listed as Threatened and is a California Species of Special Concern. Critical habitat for California red-legged frogs was designated in March 2001 (USFWS 2001a); however, the designation has been challenged in court and the status of the case has not been resolved. Although the designation has been vacated, no areas at Sonoma Coast SB were included. The California red-legged frog requires a variety of habitat elements with aquatic breeding areas typically located in a matrix of riparian and upland dispersal habitats. Breeding sites of the California red-legged frog include freshwater habitats such as pools and backwaters in streams and creeks, ponds, marshes, springs, and lagoons. Also, California red-legged frogs frequently breed in artificial impoundments such as stock ponds (USFWS 2002). Potential threats to the species include elimination or degradation of habitat from land development and land use activities, and habitat invasion by non-native aquatic species (USFWS 2002). The California red-legged frog has been extirpated from 70% of its former range and now is found primarily in coastal drainages of central California, from Marin County south to northern Baja California.

The other subspecies of red-legged frog, the northern red-legged frog, is a California Species of Special Concern and occurs along the Pacific coast, west of the Cascade ranges to northern California. Breeding habitat for the northern red-legged frog typically consists of permanent or temporary water bordered by dense grassy or shrubby vegetation. During the non-breeding season, northern red-legged frogs may be found in upland habitats that maintain significant substrate moisture, such as willow thickets and dense sedge swales (Jennings and Hayes 1994). Sonoma Coast SB contains limited suitable habitat for red-legged frogs, primarily in the Willow Creek drainage. One red-legged frog was reported in 1999 at Willow Creek (DFG 2003). Although the sighting was reported as a California red-legged frog, no details are provided regarding the classification of subspecies.

*Fish*

One estuarine and three anadromous special-status fish have potential to occur at Sonoma Coast SB. The Russian River, Willow and Salmon creeks, and other streams at Sonoma Coast SB support anadromous fish at various stages of their life cycles. Each of the special-status fish species with potential to occur is discussed below.

The tidewater goby (*Eucyclogobius newberryi*) is federally listed as Endangered, but has been proposed to be delisted north of Orange County because of the discovery of more populations, and additional information that threats are less severe than previously believed and that the tidewater goby has a greater ability to recolonize habitats from which it was extirpated (USFWS 2002b). Critical habitat was designated for tidewater goby on November 20, 2000, but does not include any area of Sonoma Coast SB (USFWS 2000). Tidewater gobies are found in shallow lagoons and lower stream reaches where the water is brackish to fresh. Tidewater gobies may range upstream into fresh water, up to 2 kilometers from the estuary. They prefer slow-moving but not stagnant waters, and avoid open areas with strong

wave action or strong currents. Particularly important for their persistence in the lagoons is the presence of backwater, marshy habitats where they can avoid winter floodflows. At Sonoma Coast SB, tidewater gobies are known to occur in Salmon Creek, based on surveys in 1996 (DFG 2003).

The coho salmon that occur at Sonoma Coast SB are part of the Central California Coast Evolutionarily Significant Unit (ESU) or distinctive group. This ESU is federally listed as Threatened and includes all naturally spawning populations of coho salmon from Punta Gorda in northern California south to and including the San Lorenzo River in central California, as well as populations in tributaries to San Francisco Bay, excluding the Sacramento–San Joaquin River system (NMFS 1996). Critical habitat was designated in May 1999 to include all river reaches accessible to listed coho salmon from Punta Gorda in northern California south to the San Lorenzo River in central California, including Mill Valley (Arroyo Corte Madera Del Presidio) and Corte Madera Creeks, tributaries to San Francisco Bay (NMFS 1999a). Excluded are areas above specific dams or above longstanding, naturally impassable barriers (i.e., natural waterfalls in existence for at least several hundred years). The coho salmon's life cycle takes 3 years. They normally spend their first year in freshwater and their next 2 years in saltwater before returning to spawn in their natal streams. Some males, called "jacks," return to spawn after only 1 season in the ocean. Spawning migrations begin after heavy, late autumn or winter rains encourage the returning adult to leave the ocean and move upstream. In California, coho salmon are found in many of the short, coastal drainages from the Oregon border south to Monterey Bay. In the larger coastal drainages, coho salmon are found primarily in the lower sections. They are known to use the mainstem and tributaries of Willow Creek for spawning and rearing habitat (Willow/Freezeout Creek Watershed Analysis 2001). Other streams at Sonoma Coast SB may be suitable spawning and rearing habitat. The Russian River at Sonoma Coast SB provides for passage to potentially suitable spawning and rearing habitat farther upstream.

The steelhead that occur at Sonoma Coast SB are in the Central California Coast ESU. This ESU was federally listed as Threatened in August 1997. This ESU includes all naturally spawning populations of steelhead (and their progeny) in California streams from the Russian River to Aptos Creek, and the drainages of San Francisco and San Pablo Bays eastward to the Napa River (inclusive), excluding the Sacramento-San Joaquin River Basin (NMFS 1997). Critical habitat was designated for this ESU in 2000, but was withdrawn in 2002 under litigation that challenged the adequacy of the economic analysis. Steelhead trout exhibit a variety of life history patterns including residents (nonmigratory) at one extreme and individuals that migrate to the open ocean (anadromous) at another extreme. Steelhead along the Central California coast enter freshwater to spawn when winter rains have been sufficient to raise streamflows, generally from late-October through the end of May, but typically the bulk of migration occurs between mid-December and mid-April. Unlike other Pacific salmon, steelhead may survive after spawning and return downstream to re-enter the ocean. They are known to use the mainstem and tributaries of Willow Creek for spawning and rearing habitat (Willow/Freezeout Creek Watershed Analysis 2001). Other streams at Sonoma Coast SB may be suitable spawning and rearing habitat. The Russian River at

Sonoma Coast SB provides for passage to potentially suitable spawning and rearing habitat farther upstream.

Chinook salmon at Sonoma Coast SB are part of the California Coastal ESU which includes all naturally spawning populations of chinook salmon from rivers and streams south of the Klamath River to the Russian River. This ESU was federally listed as Threatened in September 1999 (NFMS 1999b). As with steelhead, critical habitat was designated for this ESU in 2000, but was withdrawn in 2002 under litigation that challenged the adequacy of the economic analysis. Chinook are the largest of the Pacific coast salmon. They spend most of their life in marine waters, and migrate to freshwater habitats to spawn after 2–4 years. The California Coastal ESU typically returns to its natal streams or rivers in fall to spawn. Most young typically migrate to sea in the first 3 months of emergence, but they may spend up to a year in freshwater before emigration. Chinook salmon tend to use estuaries and coastal areas more extensively than other salmon for juvenile rearing. The Russian River provides potentially suitable habitat for chinook passage and rearing.

Terrestrial Wildlife

Sonoma Coast SB includes a tremendous variety of terrestrial habitats including sandy beaches, coastal bluffs and prairies, riparian corridors along streams, and forested canyons. Significant terrestrial wildlife that potentially may occur at Sonoma Coast SB include two species of butterflies (monarch butterfly, Myrtle's silverspot), western snowy plover, two riparian bird species (yellow warbler, purple martin), several raptors (northern harrier, peregrine falcon, osprey, northern spotted owl), and two other old-forest species (marbled murrelet and red tree vole).

*Butterflies*

The monarch butterfly is not a special-status species or protected under local, State, or federal laws, but winter roosts of monarchs are considered a notable resource and attract significant public interest. Monarchs arrive on the coast of California in early October, migrating from the Sierra Nevada, Rockies, and Canada. They migrate from northern areas to escape the cold of northern winters. They often form roosts in groves of Monterey pine, eucalyptus, cypress, or other trees that offer protection from wind. The butterflies will form dense clusters on the trees; each animal will hang with its wings down over the one below it to form a shingle effect that gives some shelter from the rain and warmth for the group. The weight of the cluster helps keep it from whipping in the wind and dislodging the butterflies. On calm, warm days monarchs may leave the roost to feed on nectar sources, such as eucalyptus flowers. They depart in March to reproduce and to complete their life cycle. Several winter roosts of monarchs have been reported in the area, two at Sonoma Coast SB at Wrights Beach and Bodega Dunes campground, and others outside Sonoma Coast SB near Bodega Bay and the UC Davis Marine Laboratory (DFG 2003). The roost at Wrights Beach was reported in 1986, but the roost tree was not identified. The roost at Bodega Dunes campground was most recently observed in January 1996 and contained approximately 300 butterflies on eucalyptus and cypress trees.

The Myrtle's silverspot is a medium-sized butterfly that is federally listed as Endangered. Myrtle's silverspot inhabits coastal dunes, coastal prairie, and coastal scrub up to elevations of 1,000 feet and as far as 3 miles inland (USFWS 1998b). The butterflies prefer areas that are sheltered from onshore winds and that are moderated by fog, keeping temperatures mild and providing ample moisture. Critical factors in the distribution of Myrtle's silverspot include presence of the presumed larval plant, western dog violet (*Viola adunca*), and availability of nectar sources for adults (USFWS 1998b). Historically, Myrtle's silverspot were distributed from coastal San Mateo County to Black Point in northern Sonoma County. At Sonoma Coast SB, they were reported in the 1970s from Bodega Head, Jenner, Portuguese Beach, and near Coleman Valley Road. More recently, populations were found in Sonoma County during surveys from 1991–1993 at Bodega Head and east of the town of Bodega Bay (DFG 2003, USFWS 1998b). The distribution throughout Sonoma Coast SB is unknown as comprehensive surveys have not been conducted, but their preferred food plant has been reported throughout the Sonoma Coast (DPR 2001).

*Western Snowy Plover*

The western snowy plover is federally-listed as Threatened and as a California Species of Special Concern. For nesting, they use barren or sparse vegetated marine and estuarine shorelines, and other salt-influenced areas, such as salt evaporation ponds and levees (USFWS 2001). Most nesting occurs from March through mid-August. The Pacific population of western snowy plovers historically inhabited coastal beaches along the Pacific coastline from Washington to Baja California, but the current population is fragmented throughout the range because of loss of habitat to encroachment of introduced beachgrass and urbanization, nest predation, and human disturbance (USFWS 2001b). Both the Pacific and interior populations of snowy plovers winter on the California coastline. They are found on many beaches used for nesting, and some beaches where they do not nest (USFWS 2001b). In California, the majority of wintering plovers concentrate on sand spits and dune-backed beaches from Bodega Bay southward (USFWS 2001b).

The USFWS recovery plan for western snowy plovers reports that Salmon Creek Beach has supported from 0–19 breeding individuals and 1-43 wintering individuals from 1980 to 1997 (USFWS 2001). Since 2001, the Department's resource ecologists have been conducting surveys for snowy plovers at Salmon Creek, Wright, and Goat Rock beaches at least once a month. Snowy plovers have only been detected at Salmon Creek, but they do not appear to be successfully breeding there because individuals have been absent in May and June in recent years. Most of the detections in 2001 and 2002 were from late July to late October, with a maximum count in September of 27 and 17 individuals in each year respectively. Snowy plovers have also been reported early in the breeding season, seven individuals in late March 2001 and one individual in early April 2002 (DPR, unpublished data, 2002). There are ongoing restoration efforts for snowy plover habitat in areas identified as suitable habitat in the USFWS recovery plan (O'Neil, pers. comm., 2003b).

New policies and restrictions are implemented on State Beaches to protect snowy plovers, particularly in breeding habitats. This also includes enforcement of existing regulations

prohibiting dogs on State Beaches and creation of new rules that may restrict visitor use in some areas.

*Riparian Songbirds*

Two riparian songbirds that potentially may occur at Sonoma Coast SB are both considered California Species of Special Concern: yellow warbler and purple martin. Both species nest in riparian woodlands during spring and summer. Yellow warblers build cup nests and prefer willow and alder thickets and riparian woodlands. Although potentially suitable habitat exists at Sonoma Coast SB, especially in the Willow Creek and Russian Gulch areas, these species may be absent from riparian habitat close to the coast and no nesting was documented on the coast during breeding bird atlas surveys (Burridge 1995). Purple martins nest in cavities in snags and a possible nesting record was reported near the coast north of Jenner (Burridge 1995).

*Raptors*

Special-status raptors known to nest at Sonoma Coast SB include northern harrier, peregrine falcon, osprey, and northern spotted owl. The northern spotted owl is federally listed as Threatened and is a California Species of Special Concern. The peregrine falcon has been federally delisted, but the population is monitored and has the same status as a federal Species of Special Concern. Northern harrier and osprey are California Species of Special Concern. All raptors are protected under §3503.5 of the California Fish and Game Code, which prohibits the destruction of raptors and their nests. Burrowing owls and ferruginous hawk are also California Species of Special Concern, but they do not nest at Sonoma Coast SB. The California Fish and Game Commission was petitioned to list burrowing owls under California Endangered Species Act on April 7, 2003 (CBD et al. 2003). Both of these species use grasslands and agricultural fields for foraging and are considered rare on the coast in the winter.

Northern harriers nest on the ground in marshes, grasslands, or fields and forage in a variety of open habitats. During the site visit in March 2003, EDAW biologists saw them foraging above the coastal prairies and grasslands of Sonoma Coast SB and in the marsh near the Pomo campground. Suitable nesting habitat occurs throughout Sonoma Coast SB and they are reported as a rare to uncommon breeder in Sonoma County. They have been reported nesting near Bodega Head (Burridge 1995) and possibly near Blind Beach (DPR 2001).

American peregrine falcons nest on cliffs or rocky outcroppings and forage over a variety of open habitats where aerial prey are present. Two peregrine falcons were observed by EDAW biologists foraging along the coastline of Sonoma Coast SB north of Jenner in March 2003. Peregrine falcons historically nested south of Goat Rock (DPR 2001). Current nesting at Sonoma Coast SB is unknown, but suitable nesting habitat is present.

Osprey typically nest in large trees or snags near shorelines, bays, or large streams. They are commonly observed at Sonoma Coast SB foraging along the coastline and the Russian River.

Suitable nesting habitat occurs throughout Sonoma Coast SB. Several osprey are known to nest at Sonoma Coast SB along the Russian River and along the coast (Burridge 1995).

Northern spotted owls typically nest in mixed conifer forests with old-growth characteristics. Although Sonoma Coast SB does not include any areas of designated critical habitat for spotted owls (USFWS 1992), suitable nesting, roosting, and foraging habitat occurs in the Willow Creek drainage, particularly along the north facing slopes, extending from the Pomo campground to the west and east (Willow Creek Ranch THP 1995). A resident pair of northern spotted owls was observed occupying a territory in this area in 1995, but did not exhibit any nesting behavior (Willow Creek Ranch THP 1995). Several other territories are known from the Willow Creek drainage (DFG 2003).

*Other Old-Forest Species*

The marbled murrelet is a seabird that is federally listed as Threatened and State-listed as Endangered. Marbled murrelets nest in older forest stands up to 50 miles from the coast. They forage and spend the nonbreeding season in marine environments. Nest trees must have large branches or deformities for nest platforms. Nesting occurs over an extended period from mid-April to late September along the Pacific coast from southeast Alaska and the Aleutian archipelago to south of Monterey Bay in central California. A large break in the main breeding population of murrelets in California occurs in Sonoma and Mendocino counties, where much of the old-growth coastal conifer forests have been logged (USFWS 1997). Critical habitat has been designated for murrelets in Sonoma County north and east of Sonoma Coast SB at Salt Point State Park and Austin Creek State Recreation Area, but does not include any area at Sonoma Coast SB (USFWS 1996b). The recovery plan outlines recovery goals for marbled murrelets based on conservation zones to develop landscape level strategies for each zone. The zone from the southern boundary of Humboldt County to the mouth of San Francisco Bay has a very small nesting and at-sea population of marbled murrelets. Although most of the older forests have been removed from this area, the small population is considered very important to retaining the connection between populations to the north and south and minimizing the gap in current breeding distribution (USFWS 1997). Potential suitable nesting habitat occurs in the Willow Creek drainage near the Pomo campground (DPR 2001). Nesting has been documented at one location in Sonoma County, but this location is not at Sonoma Coast SB or in its immediate vicinity (O'Neil, pers comm. 2003). However, some individuals have been observed off of Arched Rock and Bodega Head during the breeding season (Burridge 1995).

The red tree vole is a federal and California Species of Special Concern. Red tree voles live exclusively along the coastal fog belt. They are almost exclusively arboreal and prefer Douglas-fir, redwood and montane hardwood-coniferous forests. They create nests out of conifer needles that will be reused by many generations. Several red tree vole nests have been observed at Sonoma Coast SB in the Willow Creek drainage.

Exotic Animal Species

Exotic animal species such as feral pigs, feral cats, and black rats can have a substantial negative effect on native wildlife populations. Wild pigs can cause extensive damage to plant communities and wildlife habitat by rooting for acorns or other food in the understory and by wallowing in riparian areas. Pigs can destroy native vegetation, reduce oak regeneration, affect the reproduction of native shrubs and trees, create fertile ground for invasion of exotic plant species, compete directly with native wildlife, cause extensive erosion, and destroy the habitat of sensitive amphibian and reptile species. Feral cats prey heavily on native wildlife, particularly small and medium sized birds and mammals. Black rats have been documented as the primary predators of bird nests in some riparian habitats in northern California. The numbers of invasive or problematic plant and wildlife species can be increased by incompatible management actions and visitor uses. Exotic animal species known to occur in Sonoma Coast SB include wild turkey, black rat, feral cat, bullfrog, and wild pig (DPR 2001d).

### CULTURAL RESOURCES

The topography, coastal setting, presence of numerous perennial and seasonal water sources, and 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 at Sonoma Coast SB range from early Native American archaeological sites, including one of the oldest known sites on the West Coast, to the remains of historic ranching complexes. Early historic activity includes Sir Francis Drake's possible landing site with the Golden Hind in 1579, a Russian trading company, ranching and recreational industries, and more modern development including a proposed but undeveloped nuclear reactor project from the 1960s. In addition, research is conducted to verify the origin of unique rock slicks on the sides of coastal outcrops, which may have been caused by Pleistocene megafauna—mammoths or bison—rubbing against the rocks (Parkman 2002).

## Prehistoric Setting

In the early 1970s, Fredrickson (1973) proposed a sequence of cultural manifestations or patterns for the central districts of the North Coast Ranges, placing them in a framework of cultural periods he believed were applicable to California as a whole. The idea of cultural patterns was distinct from the concepts of previous researchers (Beardsley 1954, Meighan 1955) who tended to emphasize assemblages of material goods as the basis for their classifications. Fredrickson took a much broader view of archaeological material culture and defined the term *pattern* as "…an adaptive mode shared in general outline by a number of analytically separable cultures over an appreciable period of time in an appreciable geographic space" (Fredrickson 1973). These different cultural modes could be characterized by:

- similar technological skills and devices (specific cultural items);

- similar economic modes (production, distribution, consumption), including participation in trade networks and practices surrounding wealth (often inferential); and
- similar mortuary and ceremonial practices (Fredrickson 1973).

Fredrickson also recognized that the economic/cultural component of each pattern could be manifested in neighboring geographic regions according to the presence of stylistically different artifact assemblages. He introduced the term *aspect* as a cultural subset of the pattern, defining it as a set of historically related technological and stylistic cultural assemblages. Fredrickson argued that these temporal periods should be kept separate from the dating and definition of particular patterns given the coexistence of more than one cultural pattern operating at any given point in time in California prehistory (Fredrickson 1974). This integrative framework provides the means for discussing temporally equivalent cultural patterns across a broad geographic space.

The following is a summary of these temporal periods with descriptions of the associated cultural patterns that have been identified for the region. The summaries incorporate recent taxonomic and interpretative revisions that are summarized from the recent work of White and Fredrickson (1992).

Paleo-Indian Period (10000 B.C. to 6000 B.C.)

This period saw the first demonstrated entry and spread of humans into California with most known sites situated along lakeshores. A developed milling tool technology may be present at this time, although evidence regarding this technology is scarce. The social units were not heavily dependent on the exchange of resources, with trading activities occurring on an ad hoc, individual basis.

The Post Pattern is the earliest known occupation of the North Coast Ranges. This Pattern is documented only at the Borax Lake site, and perhaps at the Mostin site (Moratto 1984). Characteristic artifacts noted in the lithic assemblages include fluted projectile points and flaked crescents. Numerous occurrences of this pattern's distinctive artifacts are reported and can be affiliated with better documented assemblages in California and throughout North America.

Lower Archaic Period (6000 B.C. to 3000 B.C.)

The beginning of this period coincides with the middle Holocene climatic shift to more arid conditions that brought about the drying up of the pluvial lakes. Subsistence appears to have been focused more on plant foods, although hunting clearly still provided important sources of food and raw materials. Settlement appeared to be semi-sedentary with little emphasis on material wealth. Most tools were manufactured of local materials, and exchange remained on an ad hoc basis. Distinctive artifact types include large projectile points, milling slabs, and handstones.

The Lower Archaic Borax Lake Pattern has been identified in the North Coast Ranges during this period. The Borax Lake Aspect identified in the Clear Lake Basin is the southernmost of

three identified cultural divisions to this pattern. The most distinctive typological feature associated with the Borax Lake Aspect is wide-stemmed projectile points.

Middle Archaic Period (3000 B.C. to 1000 B.C.)

This period starts at the end of mid-Holocene climatic conditions when weather patterns became similar to present-day conditions. Discernable cultural change was likely brought about in response to these changes in climate and accompanying variation in available floral and faunal resources. Economic systems were more diversified and likely included the introduction of acorn processing technology. Hunting remained an important source of food and raw materials, although reliance on plant foods appears to have dominated the subsistence system. Sedentism appears to have been fully developed and there was an overall growth in population and a general expansion in land use. There is little evidence for the development of regularized exchange relations. Typologically and technologically important artifacts characteristic of this period include the bowl mortar and pestle and the continued use of large projectile points.

The earliest archaeological assemblages identified in the Napa Valley have been interpreted by Bennyhoff (1994) as representing a late component of the Borax Lake Pattern. More recent analysis has included this as part of the Hultman Aspect of the Mendocino Pattern (see White and Fredrickson 1992). Bennyhoff identifies this as the Hultman Phase in the Napa Valley cultural sequence distinguished by stylistically unique obsidian drills, keeled obsidian tools, concave based projectile points and thick lanceolate projectile points. The milling assemblage is composed exclusively of milling slabs and handstones. This phase shows cultural affiliation to the central districts of the North Coast Ranges where the Mendocino Pattern persists up to the Emergent Period.

Upper Archaic Period (1000 B.C. to A.D. 500)

A marked expansion of sociopolitical complexity marks this period, with the development of status distinctions based on material wealth. Group-oriented religions emerge and may represent the origins of the Kuksu religious system that arises at the end of the period. There was a greater complexity of trade systems with evidence of regular, sustained exchanges between groups. Shell beads gained in significance as possible indicators of personal status and as important trade items. This period retained the large projectile points in different forms, but the milling stone and handstone were replaced throughout most of California by the bowl mortar and pestle.

Emergent Period (A.D. 500 to 1800)

This period is distinguished by the advent of several technological and social changes. The bow and arrow were introduced, ultimately replacing the atlatl. Territorial boundaries between groups became well established and were documented in early historic accounts. It became increasingly common for distinctions in an individual's social status to have been linked to acquired wealth. The exchange of goods between groups became more regularized with more raw materials, along with finished products, entering into the exchange networks.

In the latter portion of this period (1500 A.D. to 1800 A.D.), exchange relations became highly regularized and sophisticated. The clamshell disk bead became a monetary unit of exchange and increasing quantities of goods are transported over greater distances. Specialists arose to govern various aspects of production and exchange.

During this period, the Augustine Pattern becomes the predominant economic/cultural manifestation in the Central Valley, Bay, and southern North Coast ranges with numerous regional aspects having been identified in the archaeological record. Cultural traits that distinguish this pattern include pre-interment grave-pit burning, tightly flexed burials and cremation. Artifact assemblages include clam and Olivella shell disk beads, magnesite cylinders, and banjo type Haliotis ornaments, as well as bird bone whistles and tubes and flanged steatite pipes. The mortar and pestle were the predominant milling implements and small arrow points replaced the larger projectile point forms more commonly associated with atlatls. Also found in the tool assemblages were implements such as harpoons, bone fish hooks, and gorge hooks.

## Ethnographic Setting

Sonoma Coast SB includes ethnographic territories of two Native American groups, the Kashaya Pomo (also known as the Southwestern Pomo) to the north and the Coast Miwok to the south (Alvarez and Fredrickson 1989). Because of geographic location, the Pomo appear to have had more contact with the Russian outpost at Fort Ross, and apparently appreciated the relationship as it afforded them some protection from the San Francisco and Sonoma missions, whereas many Coast Miwok were taken by missionaries as converts. Early observations were made, however, by Russian traders in the area (Farris 1998). Both groups focused on a narrow band of territory extending from the coast several miles inland. Settlements included permanent villages and smaller resource exploitation campsites (Stewart 1986).

Fish, shellfish, sea mammals, seaweed, and waterfowl were all readily accessible along the coast. Reeds, willows, and redwood bark collected along the drainages provided raw materials for baskets and nets, clothing, boats, and shelter. Berries, seeds, nuts, and game could all be collected inland. Seashells also provided a vital resource, as a source for beads. In particular, Saxidomus clamshells were cut into beads and used for exchange (Alvarez and Fredrickson 1989).

A number of prehistoric villages have been identified along the coastline of Sonoma County (Appendix C). Kroeber (1925) concluded that this was to remain closer to the more abundant resources even if the environment was more pleasant further from the shore. Native Americans were still occupying some of these villages in the early 20th century (Stewart 1986).

The Kashaya Pomo relationship with Russian traders at Fort Ross was somewhat unique in that it gave the Pomo a chance to slowly acculturate to European ways, learning and adapting them to the point that the Pomo could function in the new society to a greater

degree. In addition, the Pomo were not subject to forcible removal to missions or reservations. For these reasons, they retained more of their traditional ways and knowledge than many other California Indian groups (McLendon and Oswalt 1978). Kashaya territory extended roughly 30 miles, from Stewarts Point in the north to Duncans Point in the south and ranged 5-13 miles inland (McLendon and Oswalt 1978).

Coast Miwok territory included Marin County up to the interface with the Kashaya Pomo, Southern Pomo, and Wappo in Sonoma County (Kelly 1978). Most likely, Native Americans encountered by Drake and Sebastian Rodriguez Cermeño during their voyages would have been Coast Miwok. There are few other records of these peoples until the latter portions of the 18th century, when the enforced missionization of many of the Coast Miwok took its toll on the culture. At the beginning of the American period (ca. 1850), there were approximately 250 Coast Miwok left. By the 1930s, there were reportedly three individuals who retained predominantly Coast Miwok heritage (Kelly 1978).

### Historic Setting

The earliest visitors to the Marin-Sonoma coast were English and Spanish sailors, including Juan Rodriguez Cabrillo in 1542, Drake in 1579, and Cermeño in 1595. Cermeño's ship, in fact, was wrecked in Drakes Bay. Artifacts from his ship were recovered from Native American village sites nearby (Fredrickson 1962). The British and Spanish did not engage in overland explorations, or even thorough exploration of Drake and Bodega Bays, until the late 18th century. Russian seal and sea otter hunters from Alaska made covert poaching trips to Bodega Bay in the early 19th century. They eventually established Fort Ross in 1812. While they continued to hunt sea mammals, a small agricultural community was also established, growing fruits, grains, and livestock for settlements in Alaska. These holdings were sold to John Sutter in 1841, after the seal and otter populations had dwindled to unprofitability.

The Russians established four main ranch complexes: the Khlebnikov Ranch near Bodega, the Tschernisch Farm near Freestone, and the Kostromitinov Ranch, with headquarters located somewhere south of the Russian River, possibly on Sonoma Coast SB lands in the Willow Creek valley, and various fields and surrounding bits of the ranch north of the Russian River. Each of these complexes was sizeable and well established, including farmhouses, barracks, warehouses, Indian worker housing, kitchens, bathhouses, mills, granaries, and the like. When the Russians sold the properties to Sutter, they took some of the structures with them. Sutter likewise dismantled some buildings and took them for use in Sacramento. Haase (1952) made a study of the Russian American Holding Company in California as her master's thesis. The thesis offers many details regarding early development of the project area.

The Mexican government moved to block Russian expansion along the California coast using several methods. General Mariano Guadalupe Vallejo was sent to establish a series of settlements north of San Francisco, beginning in 1833. Rancho Bodega, which included the property of a Russian ranch near Bodega, was granted in 1844 to Captain Steven Smith, who rapidly developed the area with roads and a sawmill (Alvarez and Fredrickson 1989).

Another grant, made to Manuel Torres, covered the area from the Russian River up to Fort Ross. The Willow Creek Watershed contains the first recorded commercial logging operation in California (1846) (Parkman, pers. comm., 2001). Samuel Duncan's mill followed in 1860, as well as chute landings along the coast to transfer the lumber to waiting ships. The attendant town of Duncansville was centered outside of Sonoma Coast SB, although some structures may well have been on what is now Sonoma Coast SB property. A coastal railroad, the North Pacific and San Francisco, soon followed. The Knowles family acquired much of the property south of the Russian River in the 1850s or 1860s, using it for lumber, cattle, and sheep (Stewart 1986). The surrounding area has been used for lumber, agriculture, and recreation ever since.

### Background Research

Background research began with an interview with the District's archaeologist Breck Parkman, who provided an overview of Sonoma Coast SB archaeology, historic documentation, and copies of the Department site record forms for most of the resources at Sonoma Coast SB. It will be noted that almost the entire Sonoma Coast SB has been surveyed archaeologically. However, Carrington, Redhill, and Willow Creek parcels have been subject to very limited surveys since the 1970s. The Sonoma Coast has been the subject of archaeological investigations since the early 20th century, by both professional and vocational archaeologists, and in varying formats as methods changed in the archaeological framework.

An information request was submitted to the Northwest Information Center (NWIC) in Rohnert Park, California, for Sonoma Coast SB as a whole. The purpose of the NWIC search was to determine whether there were previously recorded historic resources or whether archaeological surveys had been performed in or in the vicinity of Sonoma Coast SB. The NWIC had records of more than 20 archaeological surveys that have been conducted at Sonoma Coast SB. These survey areas have included Sonoma Coast SB, the very southern edge of the Carrington Parcel, the northeastern corner of the Red Hill Parcel, and portions of the north, south, west, and central areas of the Willow Creek Parcel. A list of archaeological sites documented at Sonoma Coast SB is included in Appendix C. Maps depict previous archaeological survey coverage and locations of known archaeological sites are confidential and available for limited distribution only.

The NWIC also had site record forms pertaining to resources identified during those surveys. The NWIC search included examination of historic resources such as:

- Office of Historic Preservation Historic Property Directory
- California Inventory (1996)
- California Historic Landmarks (1996)
- National Register of Historic Places (1996 and 2000)
- California Points of Historical Interest (1992 and updates)
- Thompson and West Historical Atlas (1878)
- Illustrated Atlas of Sonoma County, California (1898)
- General Land Office Plat Maps

- A.B. Bowers Map of Sonoma County, California (1867)
- Thos. H. Thompson and Co. Historical Atlas Map of Sonoma County, California (1877)
- Bell and Heymans Map of Sonoma County, California (1888)
- The Kenyon Co. Map of Sonoma County, California (1896-1897)
- Official Map of the County of Sonoma, California (1908)
- Official Map of the County of Sonoma, California (1934)
- U.S. Army Corps of Engineers Tactical Map, Duncans Mills Quadrangle, Grid Zone 6 (1921)
- Duflot De Mofras "Carte Detaillee Des Establissements Russes" n.d.
- Carte detailee du mouillage du Fort Ross et du Port de la Bodega ou Romanzoff.

The historic maps and records cited above depict a number of roads and buildings, and the names of many of the early property owners. These sources also provide a list of extant historic structures in the survey area that have been listed with the Office of Historic Preservation. The senior state archaeologist provided a list of Native American contacts for consultation purposes (Parkman, pers. comm., 2003). Repeated attempts were made to reach these individuals with no success.

### Archaeology of the Project Area

More than 100 cultural resources have been identified at Sonoma Coast SB, mostly prehistoric sites including lithic or shell deposits and villages, as well as historic structures (Table 2-8). Other resources that have not been pinpointed but may well be found at Sonoma Coast SB property include the historic Koistromitinov Ranch, and the more difficult to identify resources such as the original Russian road network laid through the area. Campbell Cove was also a major Russian port in California, visited by many ships and described by many travelers. Drakes's landing point in 1579 may well lie somewhere at Sonoma Coast SB as well, including remnants of a fort that his men built during their 36-day stay while they repaired the Golden Hind. One possible location for this is near the Pacific Gas & Electric Company (PG&E) excavations for a reactor in the 1960s, now known as the Hole in the Head. Debris removed from the excavations may cap Drake's fort, as well as prehistoric sites in the vicinity. Limited remote sensing investigations of several possible structures and areas (Jewett and Lightfoot 2000) documented the existence of resources at the sites, however, their exact nature remains unknown.

Natural artifacts, such as the possible Pleistocene animal rubs, are also at Sonoma Coast SB. These may represent a unique resource, and need to be treated as such while attempts at identification continue. These rub areas are under investigation using a number of methodologies. Samples of the rock have been taken for scanning electron microscopy analysis and residue analysis (Parkman 2002). Another interesting area of investigation has been initiated by University of California, Davis student Michael Kennedy. Kennedy has collected mussel shells, using them to derive dates for various midden layers, especially in the Duncans Landing Rockshelters. These shells are then also submitted for oxygen isotope analysis which indicates changes in sea level over time.

| Table 2-8*<br>Cultural Resources in Sonoma Coast State Beach | |
|---|---|
| Site Type | Number of Sites |
| Shell midden | 28 |
| Shell scatter/lithic scatter | 26 |
| Historic | 7 |
| Prehistoric occupation | 4 |
| Unknown | 34 |
| Petroglyph | 1 |
| *The majority of sites marked as unknown were recorded over 50 years ago and could not be relocated during more recent efforts; they may have been either destroyed or covered by dune deposits.<br>Source: EDAW 2003 | |

The density of sites along the coastline, waterways, and lower-lying landforms demonstrates that the area was used fairly heavily during prehistoric periods. The heaviest use and major sites appear concentrated along the coast, especially near river mouths. The favorable topography, presence of stream courses, and diversity of floral and faunal resources made these coastal zones 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 in the 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. Nearby springs provided other incentives for site location. Conditions at Sonoma Coast SB vary from more open valley floors to steep, dense, brushy slopes and ridges.

Cultural and paleontological resources at Sonoma Coast SB have been subjected to a number of impacts that have caused damage or destruction. Chiefly, the natural process of coastal and drainage erosion has washed away site components, and apparently caused the total destruction of several sites (Appendix C). Other factors, such as rock climbing, grazing, foot and equestrian traffic, looting, and construction or maintenance of Sonoma Coast SB facilities, have caused cumulative damage to some sites. Ongoing efforts are made to assess this damage (Lindahl, pers. comm., 2003) and correlate sites in terms of their data potential and risk factors.

The large number of prehistoric village sites identified at Sonoma Coast SB demonstrates its importance in the local prehistoric history of the area. One site in particular, CA-Son-348/H, is of enormous significance. This site is a rockshelter located near Duncans Landing that was listed on the National Register of Historic Places in 1971. Deeply stratified deposits in the rockshelter span at least 9000 years of use (Schwaderer 1992, Parkman, pers. comm., 2002) beginning in the Lower Archaic Period. Site CA-Son-299 dates to the Middle Horizon. Historic components from the latter portion of the 19th century are associated with a ship loading dock for lumber (Stewart 1986).

## INTERPRETATION AND EDUCATIONAL RESOURCES

### Topics

The following interpretive topics and themes were suggested by park rangers, based on an interpretive prospectus written in 1973 (Roper, pers comm., 2003). The development and adoption of an interpretive master plan incorporating these and other topics and themes have been suggested (DPR, pers comm., 2001).

- Ecological Relationships between Marine and Terrestrial Life
- Comparisons of Individual Biomes
- Cultural Aspects
  - Native American
  - Russian
  - Early Explorers
  - Development of the Area and Modern Inhabitants
- Geological Evolution
  - San Andreas Fault
  - Theory of Continental Drift
  - Coastal Shelf Formation

In addition, the following topics for educational programs are important (DPR, pers comm. 2001):

- Surf safety
- Tide pool ecology
- Whale and seal watching
- Campfire education/story-telling
- Natural history
- Cultural history

### Programs and Special Events

Many interpretation and educational programs are conducted by the Department. Bodega Bay is a major focus for marine education by schools from all over Northern California. While some of these groups are unscheduled, others are led by State Beach Staff, volunteers from the State Beach's programs (e.g. volunteers in Parks Program), and from organizations such as the Stewards of the Coast and Redwoods. Group visits have a significant impact on various areas, particularly the tide pools. Education provided by the Stewards of the Coast and Redwoods and other volunteer organizations, including the use of teacher manuals, on-site activities, and follow-up lessons, can help to reduce the impact on tidepools and other natural resources at Sonoma Coast SB (DPR, pers comm., 2003).

## AESTHETIC RESOURCES

### Visual Resources and Scenic Characteristics

An abundance of visual resources exist in and around Sonoma Coast SB. Among these are coastal cliffs and bluffs, sea stacks (e.g., Arched Rock, Gull Rock) and rock formations, hillsides, inland valleys, coastal terraces, meadows, forests, beaches and dunes, the Pacific Ocean, tidepools, the Bodega Bay, the streams and estuaries, the Russian River and the sandbar. In addition, many areas covered by vegetation, such as woodlands, grasslands, wetlands, and riparian corridors, also have scenic value. The abundance of aesthetic resources at Sonoma Coast SB has attracted amateur and professional artists of all kinds (e.g., painters, sketchers, photographers, sculptors, film makers, and video artists), and Sonoma Coast SB is a regular destination for many painting, drawing and photography groups and classes.

#### *Viewsheds*

Viewshed is the area visible from a particular point of view. The juxtaposition of the visual resources forms a dramatic array of viewsheds surrounding Sonoma Coast SB. The range of elevations available at Sonoma Coast SB provides numerous viewing angles; at each of the many vantage points, separate viewsheds may be appreciated as one looks seawards, landwards, or along the coast. Most visitors view Sonoma Coast SB as they travel on SR 1. This results in highly dynamic views from a continuously changing perspective. As such, most of the areas west of the ridgeline is contained in the viewshed.

Seaward views offer the Pacific Ocean as the backdrop. The coastal cliffs offer uninterrupted views of the Pacific Ocean. The scenic quality is particularly dramatic at sunsets, during which visitors may gaze on the sun as it slowly dips below the painted horizon.

The sea stacks and the irregular coastline are the main attraction as one takes a longitudinal survey of the coast. On a clear day, a visitor standing at Sonoma Coast SB can see past Bodega Bay toward San Francisco.

The rolling pastures lead to a background of hills as one looks landwards to the east. Oak trees punctuate an otherwise gently sloping landscape, which provide a visual contrast against the rocky shores.

<u>Viewshed Classification and Protection</u>

Viewshed classification and protection are vital in preserving the aesthetic and recreational value of Sonoma Coast SB. Viewshed classification as well as the establishment of a recommended review process and evaluation methodology are needed. Aesthetic evaluation is needed for some projects and the associated CEQA review process, as well as for agency review of projects proposed for development outside of Sonoma Coast SB for potential impacts to the viewshed (as seen from at Sonoma Coast SB).

While agencies such as the Bureau of Land Management have established aesthetic evaluation methodologies that may be used for Sonoma Coast SB, the Department has not officially adopted an aesthetic evaluation methodology. The only aesthetic evaluation done in and near Sonoma Coast SB was prepared for the Sonoma County Local Coastal Plan, and this study classifies viewsheds by three categories based on the scenic character and view enclosure levels, as shown in Table 2-9. Scenic character is a measure of the harmony or compatibility of the various elements of the landscape and also a measure of how distinctive the viewshed elements are. These elements include water features, landform types, vegetation types, and modifications such as buildings and bridges. View enclosure is a measure of how visually unobstructed are the views (Sonoma County 1987).

**Table 2-9**
**View Ratings**

| View Category | Visual Character | View Enclosure |
|---|---|---|
| Outstanding | High | Open |
| | High | Partially Enclosed |
| Above Average | High | Enclosed |
| | Medium | Partially Enclosed |
| | Medium | Enclosed |
| Average | Low | Partially Enclosed |
| | Low | Enclosed |

Source: Sonoma County 1987

Most of the Sonoma Coast SB acreage that is visible from roadways is classified as having Outstanding Views or Above Average Views. A large proportion of the viewsheds visible from at Sonoma Coast SB is outside its boundary.

## Designated Scenic Areas and Routes

The Local Coastal Plan also identifies several scenic corridors, including three that are located in the boundaries of Sonoma Coast SB. Two of these are also eligible or designated State scenic highways.

SR 1 is an eligible state scenic highway. From SR 1, visitors can appreciate the scenic quality of Sonoma Coast SB and the surrounding areas and can view the ocean.

SR 116 is a State-designated Scenic Highway. While most of SR 116 is located outside Sonoma Coast SB, SR 116 provides vantage points to the Willow Creek Parcel of Sonoma Coast SB, as well as the Russian River as it flows into the Pacific Ocean.

None of the roadways at Sonoma Coast SB have been designated as National Scenic Byway; and none of the rivers and creeks at Sonoma Coast SB has been classified as a "wild and scenic river" under the federal and state Wild and Scenic River acts.

## NOISE

Noise is often defined as unwanted sound. The intensity of environmental noise fluctuates over time, and several descriptors of time-averaged noise levels are used. The three most commonly used descriptors are $L_{eq}$, $L_{dn}$, and CNEL. The energy- equivalent noise level, $L_{eq}$, is a measure of the average energy content (intensity) of noise over any given period. Many communities use 24-hour descriptors of noise levels to regulate noise. The day-night average noise level, $L_{dn}$, is the 24-hour average of the noise intensity, with a 10-dBA "penalty" added for nighttime noise (10 p.m. to 7 a.m.) to account for the greater sensitivity to noise during this period. CNEL, the community equivalent noise level, is similar to $L_{dn}$ but adds an additional 5-dBA penalty for evening noise (7 p.m. to 10 p.m.). Regarding increases in noise levels, knowledge of the following relationships will be helpful in understanding this report (EPA 1971):

- Except in carefully controlled laboratory experiments, a change of 1 dB cannot be perceived by humans.
- Outside of the laboratory, a 3-dB change is considered a just-perceivable difference.
- A change in level of at least 5 dB is required before any noticeable change in community response would be expected.
- A 10-dB change is subjectively heard as approximately a doubling in loudness and would almost certainly cause an adverse change in community response.

Noise can be generated by a number of sources, including mobile sources, such as automobiles, trucks, and airplanes, and stationary sources, such as construction sites, machinery, and industrial operations. Noise generated by mobile sources typically attenuates (is reduced) at a rate between 3.0 to 4.5 dBA per doubling of distance. The rate depends on the ground surface and the number or type of objects between the noise source and the receiver.

The average ambient noise level is generally low within Sonoma Coast SB. Vehicular traffic is the primary source of ambient noise generated by human activities. Because noise level decreases as the distance from the roadways increases, traffic noise at Sonoma Coast SB is restricted to areas immediate along the roadways and in the parking areas. Human speech and laughter, dogs barking, music from radios, and other recreation-related noises may be heard sporadically on trails, parking areas, beaches, and camp grounds. Visitors can experience times when little or no human activity-related noise is apparent in areas of Sonoma Coast SB that are not near roadways.

## RECREATIONAL RESOURCES

### Recreational Activities

A variety of recreational activities are available at Sonoma Coast SB. Table 2-10 below shows the recreational activities that may occur at various locations at Sonoma Coast SB. Other recreational activities, such as rock stacking, coastal vista viewing, and rock climbing,

also occur at Sonoma Coast SB. Camping is the primary overnight recreational activity at Sonoma Coast SB; in addition, there are campfire programs offered on Saturday nights at the Bodega Dunes Campground from Memorial Day through Labor Day. Other night-time recreational activities that are known to occur include night fishing and gatherings of young adults and teenagers.

Other late afternoon to late night activities include: watching the sunset; watching the night sky (in an area free of the glare and masking of urban lights); evening walks along the beach; evening meditation; gatherings of groups for celebrations, drumming, ceremonies, prayer, group meditation, thanksgiving especially at the times of seasonal and natural significance (e.g., the solstices, the equinoxes, full moons, eclipses, Mayday, Halloween, other holidays, and others).

### Recreation Facilities

Sonoma Coast SB contains a variety of recreational facilities, including both developed facilities and natural features. These facilities support a variety of recreational activities and provide accessibility to people with disabilities at 4 locations in Sonoma Coast SB. Table 2-11 below and Exhibit 2-8 shows the existing facilities at various locations of Sonoma Coast SB.

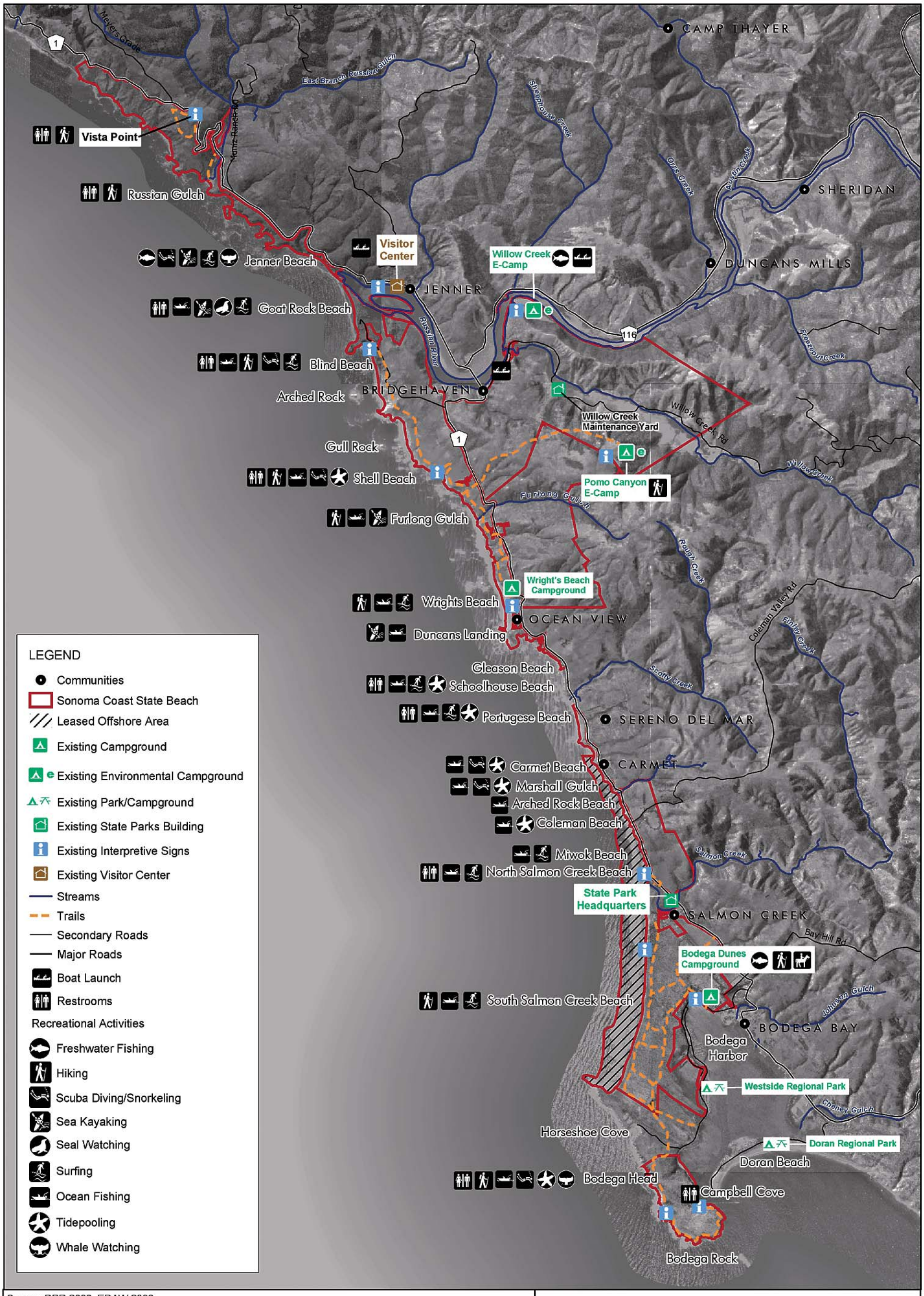
The primary developed recreational facilities at Sonoma Coast SB are the visitor center, the campgrounds, the trails, and the day-use areas. The existing day parking capacity is for approximately 2,000 vehicles, including 1,700 vehicles in approximately 30 paved parking lots and undeveloped turnout areas located throughout the Sonoma Coast SB (Alexander, pers. comm. 2003; Shannon, pers. comm. 2003).

### Trails

Trails are an important component of Sonoma Coast SB for a variety of reasons. Trails provide recreational opportunities for a variety of user groups. Trails also provide an alternative to the automobile for transportation at Sonoma Coast SB, particularly if they are connected to other local and regional trail networks. Trails also provide access to areas of Sonoma Coast SB without roadways for limited-mobility user groups such as families with small children, people with disabilities, seniors, and others who would not be inclined to take cross-country treks. Trails with interpretive panels also provide interpretive opportunities and positive outdoor environmental experiences that are educational for the visitors. In terms of the resource protection role of trails, the California Recreational Trails Plan (DPR, 2002a) states the following:

| Table 2-10<br>Recreational Opportunities | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hiking | Horseback Riding | Tidepooling | Whale Watching | Seal Watching | Ocean Fishing | Freshwater Fishing | Surfing | Scuba or Snorkeling | Sea Kayaking | Camping | Beachcombing | Rock Climbing |
| Bodega Head | ✓ | | ✓ | ✓ | | ✓ | | ✓ | ✓ | | | ✓ | ✓ |
| Campbell Cove | ✓ | | | | | ✓ | | | | ✓ | | ✓ | |
| Bodega Dunes | ✓ | ✓ | | | | ✓ | | ✓ | | | ✓ | ✓ | |
| South Salmon Creek Beach | ✓ | | | | | ✓ | | ✓ | | ✓ | | ✓ | |
| North Salmon Creek Beach | | | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | |
| Miwok Beach | | | | ✓ | | ✓ | | | | | | ✓ | |
| Coleman Beach | | | ✓ | ✓ | | ✓ | | | | | | ✓ | |
| Arched Rock Beach | | | ✓ | ✓ | | ✓ | | | | | | ✓ | |
| Marshall Gulch | | | ✓ | ✓ | | ✓ | | | ✓ | | | | |
| Carmet Beach | | | ✓ | ✓ | | ✓ | | | ✓ | | | ✓ | |
| Schoolhouse Beach | | | ✓ | ✓ | | ✓ | | | | | | ✓ | |
| Portuguese Beach | | | ✓ | ✓ | | ✓ | | | | | | ✓ | |
| Gleason Beach | | | | | | ✓ | | | | | | | |
| Rock Point | | | | | | ✓ | | | | | | | |
| Duncans Landing | | | | ✓ | | ✓ | | | ✓ | | | ✓ | |
| Wrights Beach | ✓ | | | ✓ | | ✓ | | | | | ✓ | ✓ | |
| Furlong Gulch | ✓ | | | ✓ | | ✓ | | | ✓ | ✓ | | ✓ | |
| Shell Beach | ✓ | | ✓ | ✓ | | ✓ | | ✓ | ✓ | | | ✓ | ✓ |
| Blind Beach | ✓ | | | ✓ | | ✓ | | ✓ | ✓ | ✓ | | ✓ | |
| Goat Rock Beach | | | | | ✓ | ✓ | | ✓ | | ✓ | | ✓ | |
| Jenner/Jenner Beach | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | |
| Willow Creek | | | | | | | ✓ | | | ✓ | ✓ | | |
| Pomo Canyon | ✓ | | | | | | | | | | ✓ | | |
| Vista Point | ✓ | | | | | | | | | | | ✓ | |
| Russian Gulch | ✓ | | | | | ✓ | | | ✓ | ✓ | | ✓ | |
| North Jenner Marine Terraces | ✓ | | | | | ✓ | | | ✓ | | | ✓ | ✓ |
| Cliffs north of Meyer Grade Road | ✓ | | | | | ✓ | | | ✓ | | | ✓ | |
| Source: Hinch 1998, Royer 2003, DPR 1984, and EDAW 2003 | | | | | | | | | | | | | |

| Table 2-11<br>Existing Facilities | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Developed Camping | Environmental Camping | Restrooms | Showers | Trailer Sanitary Station | Telephone | Picnic Area | Visitor's Center | Beach Access | Trail Access | Disabled Access | Paved Parking Area | Potable Water | Cartop Boat Launch |
| Bodega Head | | | ✓ | | | | ✓ | | ✓ | ✓ | ✓ | ✓ | | |
| Campbell Cove | | | ✓ | | | | ✓ | | ✓ | ✓ | | | | |
| Bodega Dunes | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | |
| South Salmon Creek Beach | | | ✓ | | | | ✓ | | ✓ | ✓ | | | | |
| North Salmon Creek Beach | | | ✓ | | | | ✓ | | ✓ | ✓ | | ✓ | | |
| Miwok Beach | | | | | | | | | ✓ | ✓ | | ✓ | | |
| Coleman Beach | | | | | | | | | ✓ | | | ✓ | | |
| Arched Rock Beach | | | | | | | | | ✓ | | | ✓ | | |
| Marshall Gulch | | | | | | | | | ✓ | ✓ | | ✓ | | |
| Carmet Beach | | | | | | | | | ✓ | ✓ | | ✓ | | |
| Schoolhouse Beach | | | ✓ | | | | ✓ | | ✓ | ✓ | | ✓ | | |
| Portuguese Beach | | | ✓ | | | | ✓ | | ✓ | ✓ | | ✓ | | |
| Gleason Beach | | | | | | | | | ✓ | | | | | |
| Rock Point | | | | | | | ✓ | | ✓ | | | | | |
| Duncans Landing | | | ✓ | | | | ✓ | | ✓ | ✓ | | ✓ | | |
| Wrights Beach | ✓ | | ✓ | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Furlong Gulch | | | | | | | | | ✓ | ✓ | | ✓ | | |
| Shell Beach | | | ✓ | | | | | | ✓ | ✓ | | ✓ | | |
| Blind Beach | | | ✓ | | | | | | ✓ | ✓ | | ✓ | | |
| Goat Rock Beach | | | ✓ | | | | ✓ | | ✓ | ✓ | | ✓ | | |
| Jenner/Jenner Beach | | | ✓ | | | ✓ | ✓ | ✓ | ✓ | | | | | ✓ |
| Willow Creek | | ✓ | ✓ | | | | ✓ | | ✓ | ✓ | | | | |
| Pomo Canyon | | ✓ | ✓ | | | | ✓ | | | ✓ | ✓ | | | |
| Source: Hinch 1998 and Royer 2003 | | | | | | | | | | | | | | |


CAMP THAYER
SHERIDAN
DUNCANS MILLS
JENNER
BRIDGEHAVEN
OCEAN VIEW
SERENO DEL MAR
CARMET
SALMON CREEK
BODEGA BAY
Meyers Grade
East Branch Russian Gulch
Moniz Ranch Rd
Sheephouse Creek
Oris Creek
Austin Creek
Russian River
Willow Creek Rd
Willow Creek
Furlong Gulch
Rough Creek
Coleman Valley Rd
Finley Creek
Scotty Creek
Salmon Creek
Freezeoutcreek
Bay Hill Rd
Johnson Gulch
Cheney Gulch
Vista Point
Russian Gulch
Jenner Beach
Goat Rock Beach
Blind Beach
Arched Rock
Gull Rock
Shell Beach
Furlong Gulch
Wrights Beach
Duncans Landing
Gleason Beach
Schoolhouse Beach
Portugese Beach
Carmet Beach
Marshall Gulch
Arched Rock Beach
Coleman Beach
Miwok Beach
North Salmon Creek Beach
South Salmon Creek Beach
Horseshoe Cove
Bodega Head
Bodega Rock
Visitor Center
Willow Creek E-Camp
Willow Creek Maintenance Yard
Pomo Canyon E-Camp
Wright's Beach Campground
State Park Headquarters
Bodega Dunes Campground
Bodega Harbor
Westside Regional Park
Doran Regional Park
Doran Beach
Campbell Cove
1
116
LEGEND
Communities
Sonoma Coast State Beach
Leased Offshore Area
Existing Campground
Existing Environmental Campground
Existing Park/Campground
Existing State Parks Building
Existing Interpretive Signs
Existing Visitor Center
Streams
Trails
Secondary Roads
Major Roads
Boat Launch
Restrooms
Recreational Activities
Freshwater Fishing
Hiking
Scuba Diving/Snorkeling
Sea Kayaking
Seal Watching
Surfing
Ocean Fishing
Tidepooling
Whale Watching
Source: DPR 2003, EDAW 2003
N
1 inch = 1 mile
0
4000
8000
Feet
Dec. 9, 2003
EDAW
Sonoma Coast State Beach
Exhibit 2-8
Facilities and Recreational Opportunities

*Trails can be used as a tool for resource protection. When properly designed, trails mitigate damage by controlling public access when they route visitors through or around sensitive resource areas. Vernal pools, unique riparian habitats, archeological sites, and threatened or endangered species habitats are examples of resources that can benefit from well designed and managed trails. (DPR 2002a)*

Sonoma Coast SB contains 44 separate trails, totaling over 18 miles. The majority of trails at Sonoma Coast SB are for hiking only. Trails in the dunes south of Salmon Creek and north of the Bodega Bay Marine Lab, are also available for equestrian use. Because trails have not been fully assessed for appropriate bicycle use, bicycles are currently not permitted on trails at Sonoma Coast SB.

### *Hiking Trails*

The more popular trails are the numerous vertical access trails that provide direct connections from the many parking areas to the beaches. These vertical access trails are situated along the coastal bluffs. They require constant maintenance because of ongoing coastal influences and their high level of use. Other popular trails are the lateral access trails that run along the bluff, parallel to the coastline. These include the Bodega Head Loop Trail, the Overlook Trail, Lower Dunes Trail, Salmon Creek Trail, and the Kortum Trail. All of these lateral trails make up a portion of the California Coastal Trail. Similar to other areas of the State, the California Coastal Trail is not continuous through Sonoma Coast SB because of various private property configurations and a precipitous coastline.

In addition to the two types of coastal trails, there are inland trails at Sonoma Coast SB. Pomo Canyon Trail allows visitors to traverse Sonoma Coast SB from the interior of Willow Creek to the Kortum Trail near the Shell Beach. The trails are shown in Exhibit 2-8.

### *Bike Routes*

SR 1 and SR 116 are designated Class III bikeways, on which cyclists share the road with pedestrians and motor vehicles (Sonoma County 1989). Willow Creek Road, from Bridgehaven to Occidental, is a popular but undesignated bikeway that passes through the Willow Creek Parcel of Sonoma Coast SB. The development and improvement of bikeways must be done in collaboration with the County and/or Caltrans.

### *Equestrian Trails*

Horses are permitted on the trails in Bodega Dunes from the day use boardwalk, on the north end, to Mussel Point on the south. An equestrian staging area with limited parking is available off of Bay Flat Road, adjacent the Bodega Dunes Campground. East of SR 1 and south of Salmon Creek, there is a private horse operation at the Chanselor Ranch.

## Patterns and Levels of Recreational Use

For the over two million annual park visitors, the most popular forms of recreation are beach related activities, such as visiting the tide pools and watching the ocean from vehicles. Other popular ocean-related activities include surfing, fishing, whale watching, seal watching, and, to a lesser degree, scuba diving and abalone sport diving. Another popular activity is kayaking on the Russian River. Visitors can access the river from the boat launch ramp at the Jenner Visitor Center. Popular and-based activities include hiking, horseback riding, camping, and picnicking.

Because of the abundance of recreational opportunities throughout Sonoma Coast SB, recreational activities occur throughout Sonoma Coast SB. Most of the visitors are day users, and the majority of activities occur along the ocean frontage. Typically the heaviest level of recreational activities will occur on the southern end of Sonoma Coast SB, with the visitor concentration spreading northward as the numbers of visitors increase. The Salmon Creek area is normally the first to reach capacity. Shell Beach and the Goat Rock area are also popular and fill to capacity early. Use levels often fluctuate with the weather patterns. Visitors tend to migrate to the coast during ideal conditions and as the interior areas heat up. Weekends and holidays always bring increased visitation.

In addition to the popular day use activities, visitors can enjoy the four campgrounds at Sonoma Coast SB. The Wrights Beach and Bodega Dunes campgrounds are open year-round. Wrights Beach Campground, with 27 camp sites, is the most popular and is well-liked by visitors with trailers and recreational vehicles (RVs). Bodega Dunes Campground, the largest campground at Sonoma Coast SB with 98 sites, is popular for all forms of camping. The Willow Creek and Pomo Canyon Environmental Campgrounds, with 11 and 21 sites respectively, are only open during the primary use season, from April to November. These campgrounds are primarily used for tent camping, because of the requirement that visitors walk to the campsites from the remote parking lots. Of these two environmental campgrounds, the Pomo Campground is the most popular.

## Operational Facilities

The two main categories of facilities at Sonoma Coast SB are those used primarily by visitors and those that support the operation of Sonoma Coast SB. The major visitor-serving facilities include the Jenner Visitor Center, day use restroom buildings, entrance stations, and campgrounds, including the associated restrooms. Operational facilities include the Salmon Creek Ranger Station and maintenance facility, Willow Creek maintenance shop, and park staff residences.

### *Visitor Center*

A small Visitor Center, with a small boat ramp available for public use, is located along the Russian River in Jenner. The Jenner Visitor Center is staffed by volunteers during the summer months only. It floods regularly during high flows of the Russian River associated with winter

storms. While potential sites for a new visitor center are studied, flood-proofing measures, such as raising the visitor center, may be implemented in the interim.

### *Entrance Stations*

There are two entrance stations in the Sonoma County SB: one is located at Wrights Beach Campground and the other at Bodega Dunes Campground. The Wrights Beach Entrance Station was constructed as a temporary structure in the early 1990s. During the summer, both entrance stations are staffed everyday (Bodega Dunes entrance station from 10 a.m. to 10 p.m., and the Wrights Beach entrance station from 10 a.m. to 4 p.m.). During the rest of the year, these two entrance stations are staffed only during weekends and holidays. Day use fees and camping fees are collected at both entrance stations. When the entrance stations are unstaffed, visitors are required to self pay. There are also camp host(s) information kiosks at the campsites available for reservation check-ins. The current fee schedule may be found at the Department's website (www.parks.ca.gov).

### *Restrooms*

The Bodega Dunes Campground has four combination restrooms with flushing toilets and showers located throughout the campground. A trailer sanitation station is also located near the park entrance. The Wrights Beach Campground has two restroom buildings without showers. Showers have not been developed because of insufficient water and waste disposal capacities. The Willow Creek primitive campground has two pit toilet buildings, and the Pomo Campground has five pit toilet buildings.

Restrooms serving the day visitors are located throughout the coastline of Sonoma Coast SB. With the exception of Duncan's Landing and Goat Rock, which contain flushing toilets, these 17 buildings contain only pit toilets, and are at following locations (building type and age noted):

- Vista Point Trailhead (wood, 10 years),
- Russian Gulch (wood, 17 years),
- Jenner Visitor Center (wood, 17 years),
- Blind Beach (concrete, 1 year),
- Shell Beach (concrete, 3 years),
- Duncans Landing (concrete block, 30+ years),
- Portuguese Beach (concrete, 1 year),
- Schoolhouse (concrete, 1 year),
- Bean Ave. (concrete, 3 years),
- Bodega Dunes Day Use area (wood, 17 years),
- Goat Rock north lot building (concrete block, 30+ years),
- Goat Rock south lot building (concrete, 4 years),
- Salmon Creek, with 2 buildings (concrete, 3 years),
- Bodega Head west lot (concrete, 3 years),

- Bodega Head east lot (concrete, 3 years), and
- Bodega Head at Campbell Cove (wood, 17 years, scheduled for replacement with concrete in 2004).

The development and/or improvement of restrooms must consider the availability of water supplies, water pipelines, power lines, and sewer lines, as well as the compatibility and capacity of the sites for vaults, septic systems, and/or leachfields. Other considerations include roadway access for installation and maintenance operational needs.

### Ranger Station and Maintenance Facilities

Sonoma Coast SB contains two primary maintenance facilities. One is located at Salmon Creek, and the other at Willow Creek. The Salmon Creek facility complex includes a ranger station and the original park facilities and residence.

The original park facilities at Salmon Creek were built in 1948, and included a park residence, ranger station, and maintenance shop, which is in two separate buildings. The original ranger station has been converted to serve as an office for the maintenance supervisor. One of the two shop buildings houses a small shop for carpentry, metal work, and plumbing purposes and an associated storage area. The other shop building is used for storing building materials and lifeguard equipment. Materials and equipment, such as a table saw, are stored outside the buildings because of the limited space capacity of the shop buildings. The house remains a park residence. In 2000 a modular office building, with a bathroom and a shower, was constructed to serve as office space for the ranger staff and lifeguards. A gas pump and a trailer for seasonal staff are also located at Salmon Creek facilities complex. The complex is also used as the staging area for marine mammal rescue. Proximity to wetlands, historic significance, building maintenance (e.g., roofing), inadequate space (e.g., lack of lunchroom, showers, lockers, office, etc.), aesthetic compatibility, corrosion to unsheltered equipment and materials, and equipment safety (i.e., separation of plumbing, carpentry, and metal shops) are some of the perceived problems of this facility.

Several buildings at the Willow Creek Ranch are used to support much of Sonoma Coast SB's heavy equipment and vehicle maintenance functions. Because of its central location in the District and the lack of more appropriate space and equipment elsewhere in the District, the Willow Creek Ranch facilities also provide maintenance services for other parks in the District. The barn and a number of outbuildings are used for the storage of materials, supplies and tools. The ranch maintenance shop houses the equipment repair facility, as well as office space for a maintenance supervisor and an equipment mechanic. Willow Creek Ranch is also use to store heavy equipment and vehicles for the District. Two trailer pads have been developed in the Willow Creek Ranch to provide residence for maintenance staff. The primary concerns expressed regarding the Willow Creek Ranch facilities include historic significance, inadequate space, proximity to wetlands, and equipment safety. In addition, the existing ranch house, which remains vacant and unused, is in deteriorating conditions.

### *Concessions*

There are no permanent structures at Sonoma Coast SB that are used for concession purposes. There is one existing concession, a small mobile food concession that operates at the Goat Rock parking lot on weekends from April to September.

### *Employee Housing*

Based on the District's policy, the employee housing units are assigned to staff based on programs needs, such as the need for onsite staff to response to emergency calls and to maintenance calls. There are 9 full-time employee housing units at Sonoma Coast SB, and all of the employee housing units are occupied by existing staff. It is estimated that there is a shortage of 6 full-time employee housing units, based on existing staffing level. There is also a shortage of housing for seasonal staff and volunteer camp hosts, who are limited by the Department policies to a stay of no more than 9 months at Sonoma Coast SB. Because of the high housing costs in the area, it is difficult finding staff willing to relocate to Sonoma Coast SB. Depending on job title, some of the staff qualify for and receive housing subsidy from the Department (Eckstrom 2003, Shannon 2003).

## CIRCULATION

### Regional Highways

State Route 1 is the main road traversing the entire length of Sonoma Coast SB from north to south. In Sonoma County, SR 1 is a conventional two-lane highway with substandard widths and significant horizontal and vertical curvature, and the accident rate at this segment of SR 1 is higher than the State-wide average. Because the geology of the coastline is unstable and is subject to landslide activities, closures of sections of SR 1 are occasionally experienced. Roadway maintenance activities often necessitate closures of one lane, causing traffic delays.

The vehicular trips on this segment of SR 1 are largely recreational in purpose. Near Sonoma Coast SB, SR 1 experienced approximately 1,250 vehicular trips during the peak hour at the junction with Eastshore Road near Bodega Bay in 2000 (Table 2-12). During periods of high recreational activity, the level of service on SR 1 may deteriorate to level of service (LOS) F, indicating severe traffic congestion. For the planning period of 1985–2005, Caltrans has prepared the Route Concept Report Summary for SR 1. This report recommended shoulder widening, slow moving vehicle lanes on significant vertical grades, channelization at connections with major traffic generators to enhance safety, improvements at intersections with major beach access points (e.g., left turn lanes), provisions of parking facilities in areas where people routinely park along SR 1, and prohibition of all but emergency parking along SR 1. A bypass of Bodega Bay was suggested for consistency with Sonoma County planning. No additional lanes were recommended, consistent with the California Coastal Commission's decree that SR 1 remain a scenic two-lane road in rural areas of the coastal zone (Caltrans 1985). All future improvements to SR 1 and other Caltrans-maintained highways (e.g., new pullouts and new connecting driveways) must be designed according to the agency's Highway Design Manual, which addresses structural integrity, drainage, noise, safety, and a number of

other issues (Caltrans 2001). An encroachment permit from Caltrans may also be required (Caltrans 2002).

**Table 2-12**
**Traffic Counts on State Highways**

| Route | Roadway Segment | Peak Hour | | Peak Day | | Average Day | |
|---|---|---|---|---|---|---|---|
| | | 2000 | 2002 | 2000 | 2002 | 2000 | 2002 |
| SR 1 | North of Jenner | 220 | 150 | 2,650 | 1,550 | 2,200 | 1,250 |
| | South of Jenner | 300 | 320 | 3,600 | 3,400 | 2,950 | 2,750 |
| | North of SR 116 Junction | 300 | 320 | 3,600 | 3,400 | 2,950 | 2,750 |
| | South of SR 116 Junction | 410 | 230 | 2,950 | 2,850 | 2,350 | 2,100 |
| | North of Eastshore Road | 820 | 650 | 6,300 | 7,400 | 5,000 | 5,900 |
| | South of Eastshore Road | 1,250 | 650 | 10,000 | 7,200 | 8,000 | 5,900 |
| SR 116 | East of SR 1 Junction | 340 | 380 | 4,000 | 3,650 | 2,750 | 2,850 |

Source: Caltrans Traffic and Vehicle Data Systems Unit All Traffic Volumes on CSHS (Caltrans 2003).

Access to Bodega Head is provided primarily by Westshore Road. When the weather is nice on weekends throughout the year and especially during the summer, SR 1 can become congested with traffic generated by visitors. There is a collaborative effort between the County, Sonoma County Transit, Caltrans, and local organizations to improve bicycle access on SR 1 and other local roads in the Bodega Bay area, such as Bayflat Road (Robertson, pers. comm. 2003).

Access to Willow Creek and the Russian River is provided via Willow Creek Road, a County-owned and –maintained road. Currently, there are no plans to expand or improve Willow Creek Road, aside from regular maintenance and drainage improvements (Robertson, pers. comm. 2003).

State Route 116, while it is not located at Sonoma Coast SB, provides east-west regional connection to SR 1. The section of SR 116 near the coast is a recreational and commuter route that connects the coastal towns and towns along the Russian River to Sebastopol, SR 12, and SR 101. This two-lane highway starts just outside Sonoma Coast SB's boundary at SR 1 near Jenner and the bridge over the Russian River. Traffic volume on SR 116 is heaviest during the holidays and weekends because of visitors who flock to the Russian River and the coast. For the planning period of 1985–2005, Caltrans has prepared the Route Concept Report Summary for SR 116. This report states that Sonoma County suggested rerouting of SR 116 to River Road or SR 181 to avoid congestion in Sebastopol (Caltrans 1985).

Other major roadways used by visitors traveling to the portions of Sonoma Coast SB near Bodega Bay are Bodega Highway and Petaluma-Valley Ford Road, which provide connection to U.S. 101 at Santa Rosa and Petaluma, respectively.

### State Beach Roads and Parking Areas

Sonoma Coast SB contains both paved and unpaved roads and parking areas. The primary unpaved roads and parking areas are the Pomo campground access road and parking area; Bodega Head east and west parking areas as well as the access road to the east lot; a portion of the access road to the south Goat Rock parking area; Russian Gulch access road and parking area; Jenner Visitor's Center parking area; Salmon Creek Ranger Station/Maintenance shop parking; and the Wrights Beach day-use parking area. Other unpaved service roads and parking areas include the access road to the Willow Creek environmental camp sites (near the Russian River); access road and parking at the Willow Creek firing range; and the access road and parking at the Willow Creek maintenance shop.

In terms of road/pavement design criteria, the vast majority of the roads at Sonoma Coast SB are considered to be lightly loaded, low-speed, and low-volume roads. From a structural standpoint, both paved and unpaved roads are appropriate for most park use. The minimum pavement design criteria for most park roads is similar to that for minor residential streets, which in the coastal area of Sonoma County is, by rule-of-thumb, 2-inches of asphalt concrete over 6-inches of base rock. Except for portions of the recently reconstructed Bodega Head entrance road, only a few roads at Sonoma Coast SB meet this minimum standard.

Almost all of the existing paved park roads, campground loop roads and parking lots are multiple layers of penetration and other asphaltic treatments and/or chips seals on native material. Only a few park roads have an underlying compacted base rock foundation or a structurally significant asphalt concrete surfacing (1.5 inches or thicker). Many park roads are a mix of asphalt concrete patches, overlays, chip seals and pot holes. Major repairs, if not total reconstruction, may be appropriate for nearly all roads and parking areas at Sonoma Coast SB.

A factor that adversely affects the condition and longevity of the roads at Sonoma Coast SB is the large amount of winter rainfall and the high water table(s), which combine to create nearly continuous surface water runoff and saturated subsurface conditions. Both of these conditions weaken the structural strength and accelerate the deterioration of the road pavements. In this geographic/climatic area, the key to road longevity and economy is appropriate road drainage design. Pitched or crowned pavement surfaces, functional interceptor and roadside ditches, culverts, subsurface drainage lens, edge and under-drains, as well as porous "open-graded" bases, are features that can be used to greatly improve both surface and subsurface drainage.

Portions of the heavily used entrance roads to both Bodega Head and to Goat Rock are in failure mode due, in part, to their locations in areas of near continuous soil saturation. Use

of techniques to drain and control subsurface water will be needed for the reconstruction of both of these important roads.

Overall, approximately 2,000 parking spaces are available for day use and overnight visitors to Sonoma Coast SB. Because most of the parking spaces at Sonoma Coast SB are not paved or striped, the number of parking spaces are based on estimates provided by the District staff. There are approximately 100 parking spaces in the paid day use areas (40 at Bodega Dunes and 60 at Wrights Beach) and approximately 130 parking spaces in the four camping areas. There are 1,500 free designated parking spaces in other Sonoma Coast SB designated and maintained parking areas (e.g., lots and pullouts along SR 1) between the Vista Trail and Bodega Head. The pullouts located just outside Sonoma Coast SB and along the state routes, managed by Caltrans, provide an addition of approximately 250 parking spaces. Many of the Caltrans-maintained pullouts are located north of Jenner (Alexander, pers comm., 2003; Shannon, pers. comm., 2003).

### Public Transportation

Mendocino Transit Authority provides daily public bus service with stops near the Sonoma Coast SB at Jenner and Bodega Bay. Route 95 Bus, also known as the South Mendocino Coast Bus, runs along SR 1 between Point Arena in Mendocino County and Bodega Bay and continues along Bodega Highway and SR 12 to Santa Rosa. One bus trip per day is scheduled in each direction. Continuing public transportation services to regional locations are available via buses operated by Amtrak, Greyhound, Mendocino Transit Authority, and Sonoma County Transit (MTA, 2003).

## Utilities and Services

### Wastewater Systems

Wastewater generated by the onsite bathrooms is processed and treated by 25 separate septic systems serving the North Goat Rock restroom, Wrights Beach restrooms, Bodega Dunes combination buildings, 3 camp host sites, R.V. dumpstation and kiosk, Willow Creek yard restroom with 2 trailer hookups, Salmon Creek ranger station, Salmon Creek maintenance shop and office with 1 trailer hookup, and all residences. In addition, there are 24 toilets in that are self contained. These vault toilets are periodically pumped out by a sanitation contractor, based on need.

To determine whether septic tanks can be efficiently constructed, operated, and maintained in a given area, knowledge of the soil and topographic characteristics of that area is essential. Physical factors, such as soil type, soil depth, ground slope, and presence of ground water, have bearing on the siting of septic tanks and leach fields. Directional factors, such as distance to property lines, cuts, fills, water wells, and bodies of water also are important.

The physical factors are, perhaps, the most critical in the determination as to whether a septic tank system can be placed in a particular site. Soil permeability, which is the measure of the ability of the soil to absorb and transmit fluids, is one of the most important factors. Soils with

low permeability may not absorb fluids and would not be compatible with septic systems. Generally, soils with a rate of percolation of up to 60 minutes per inch (mpi) or 25 minutes per centimeter (m/cm) have adequate permeability to accept and transmit effluent (Ford 1975). Based on this rule of thumb, some of the soil types at Sonoma Coast SB may be considered to be incompatible with septic systems. Site-specific soil and geotechnical investigations would be required to determine the suitability of each site for septic systems.

The depth of soil cover is also important for a leach field system because there must be sufficient soil mantle underlying the leach field area to filter and purify effluent. A great number of the bacteria contained in sewage effluent are effectively removed by downward percolation through several feet of soil (Ford 1975).

Because of the critical nature of the percolation rates of soils, it is important that percolation tests be performed for each development project. Tests should be carried out during the most adverse time of the year (i.e., when soils are wet and standing water is at its highest level) (Ford 1975).

### Water Systems

Because of the underlying geologic formation, groundwater is available in limited supply throughout most of Sonoma Coast SB and its vicinity. The relative scarcity of water supplies, coupled with the rights owned by local water purveyors over most available water sources, makes water supply a major constraint to development at Sonoma Coast SB.

West of the San Andreas Fault, an area of intrusive granitic rocks is exposed along the western side of Bodega Head. Wells drilled into this rock mass may be able to produce limited quantities of potable ground water from fractures, shears, and deeply weathered zones. In this area is a spring-fed pond, named the "Hole-in-the-Head," which is located at the site of the Bodega Atomic City, where construction of a PG&E nuclear power plant was begun but never completed. The pond is formed from ground water entering the foundation excavation area. The water level in the pond stands about 20 feet (6 meters) above sea level, and there is a constant outflow from the pond into Bodega Bay of from 10 to 20 8pm (38 to 76 1/m) (Ford 1975).

East of the San Andreas Fault, ground water is present in the Franciscan formation as indicated by the great number of springs in the areas of outcrop. Excellent quality water is found at a number of cold springs which issue from these rocks. However, the rocks in the Franciscan formation are not considered water-bearing; ground water is not present in primary openings, as with most water-bearing materials, but rather in secondary openings such as joints, fractures, and shear zones. Wells drilled in these rocks frequently are completed as "hard rock" wells; that is, they usually are uncaged. Well yields generally are low and range from less than 1 to at most 3.8pm (<4 to 12.1/m). These meager yields, however, may be sufficient for domestic purposes if water storage facilities of at least 1,000 gallons (3.78 cubic meters) are available (Ford 1975).

Groundwater is most abundant at Sonoma Coast SB at the San Andreas Fault zone, including the Bodega Dunes. In areas of relatively nonwater-bearing rocks, such as those found at the either side of the San Andreas Fault, faults can create shattered zones which could act as conduits for ground water movement. Ground water along some faults may contain slightly higher amounts of certain mineral constituents, such as fluoride and boron (Ford 1975).

Except at Bodega Dunes, there is usually a shortage of potable water available to visitors and staff at other locations at Sonoma Coast SB; potable water is regularly trucked into Sonoma Coast SB. The main source of water supply in the vicinity of Sonoma Coast SB is groundwater (via springs, seeps, wells, and infiltration galleries) and, to a lesser extent, the creeks. There are 12 separate water systems in and near Sonoma Coast SB, each with its own distribution system. The sources or suppliers of the water systems are shown below:

- 6 water systems purchase water from a local utility.
- 9 water systems obtain water from either a well, a spring or a creek.
- 2 water systems are surface water treatment facilities and are regulated by the California Department of Health Services.

Most of the localized wells are controlled by the local water agencies. The potable water available at Bodega Dunes, which is located at Sonoma Coast SB, is owned and extracted by the Bodega Bay Public Utility District (BBPUD), from which Sonoma Coast SB obtains some of its water at market rate. There are 6 storage tanks associated with these water systems (Alexander, pers comm., 2003).

### *High Voltage Power Lines*

PG&E owns electrical transmission lines at Sonoma Coast SB, including 12kv pole lines roughly parallel to SR 1 along the marine terraces and through the Willow Creek Parcel of Sonoma Coast SB. Electricity used at Sonoma Coast SB is also transmitted by PG&E.

### *Other Utilities*

The source of heat for residences, offices, shops and restrooms with showers is propane.

## EMERGENCY SERVICES

### Fire Protection

Fire protection services for Sonoma Coast SB is provided by the California Department of Forestry and Fire Protection and the Bodega Bay Fire Protection District in the southern portion of Sonoma Coast SB to as far as Wright Beach. The Monte Rio Fire Protection District provides fire protection services in the northern portion of Sonoma Coast SB, from Shell Beach in the south to the Vista Point in the north and Willow Creek in the east.

### Park Security

Park security is provided by the park rangers, as well as the Sonoma County Sheriff's Office and the California Highway Patrol.

### Medical Aid

Emergency medical response is provided in three phases. The first phase consists of first response, which is provided by park rangers, lifeguards, and two fire protection districts mentioned above. The second phase consists of medical transport. If it is determined that the patient must be treated at a health care facility, then the patient is taken either by ambulance or by helicopter to the nearest hospital. Ambulance services are provided at Sonoma Coast SB by the Bodega Bay Fire Protection District, or the Monte Rio Fire Protection District. Medical air transport is provided by Henry 1 and Cal Cord. The nearest hospital is the Palm Drive Hospital in the City of Sebastopol. Other hospitals that may serve patients from Sonoma Coast SB are the Santa Rosa Kaiser Hospital, Santa Rosa Memorial Hospital, and Sutter Medical Center of Santa Rosa. The nearest trauma centers are the Queen of the Valley Hospital, which is located in the City of Napa, and the Santa Rosa Memorial Hospital (Alexander, pers comm., 2003).

## 2.2 Planning Influences

### 2.2.1 System-Wide Planning

#### California State Parks Mission Statement

The Department's mission statement is to "provide for the health, inspiration and education of the people of California by helping to preserve the state's extraordinary biological diversity, protecting its most valued natural and cultural resources, and creating opportunities for high-quality outdoor recreation."

#### Statewide Trails Plan

The California Recreational Trails Plan addresses the mission and overall role of the California State Parks Statewide Trails Office as well as providing guidelines for future actions of the Statewide Trails Office. The mission and vision of the Statewide Trails Office is as follows:

> Establish and maintain a system of trails and greenways that serves California's diverse population while respecting and protecting the integrity of its equally diverse natural and cultural resources. The system should be accessible to all Californians for improving their physical and mental well-being by presenting opportunities for recreation, transportation and education, each of which provides enhanced environmental and societal benefits.

This plan serves as a guideline for establishing and maintaining parks in California and integrates the state parks trail programs with the local and private organizations that operate

and maintain the trails. Moreover, it will serve as a planning and maintenance guide for the existing segment of the California Coastal Trail that runs through Sonoma Coast SB, the existing points of coastal access, and future trails at Sonoma Coast SB.

### California Coastal Trail Project

The California Coastal Trail is a proposed multi-use trail that would stretch 1,300 miles along or near the coastline from Oregon to Mexico. Pursuant to Senate Bill 908, the California Costal Conservancy, in partnership with the Department and other federal, state, local, and private organizations, has released a draft of the Completing the California Coastal Trail report, which includes goals and objectives, general standards, recommendations for action, and maps of the conceptual alignment of the California Coastal Trail.

At Sonoma Coast SB, the report recommends the extension of the Kortum Trail between Wrights Beach and North Salmon Creek Beach for the purpose of providing safe pedestrian access off of SR 1. South of Sonoma Coast SB, the report recommends the completion of a design plan for pedestrian and bicycle access through the community of Bodega Bay, including specific land acquisition and improvements needed to alleviate the current safety problems along SR 1. North of Sonoma Coast SB, the report recommends working with private landowners to design a public trail.

### Inventory, Monitoring, and Assessment Program

As indicated by its name, the purpose of the Department's Inventory, Monitoring, and Assessment Program (IMAP) is to inventory, monitor, and assess the condition of natural resources in the State Park System. The goal of the program is to prepare IMAP plans for each of the state parks using the Environmental Condition Assessment (ECA) process. ECA is a multi-level process for establishing long-term monitoring that uses "environmental indicators" as a primary tool to assess current resource conditions and to detect change in these conditions over time.

The natural resources that may be included in the ECA are wildlife, vegetation, and physical assets. The ECA process is used to identify the significant resources that will be inventoried/monitored. The resulting data is then used to modify and update the monitoring program, in adaptive management of the park, and for proactive planning. ECA emphasizes scientifically based resource management practices and allows park staff to understand how the resource condition of the park affects the visitor experience and the health of ecosystems outside of the park.

The level of ECA (i.e., preliminary, reconnaissance, baseline, comprehensive, intensive) implemented at each park depends on the priority of issues identified during the preliminary-level ECA and Department resource availability. Baseline assessments are performed for new property acquisitions. Limited funding has been obtained since 2000 to initiate the development of IMAP plans for each of the parks in the system (DPR 2001e). The ECA process for Sonoma Coast SB began in 2000.

### EMPLOYEE HOUSING POLICIES

Employee housing policies for Sonoma Coast SB is set by both the Department and by the Russian River Sector of the North Bay District. Currently, the employee housing policies are being revised by the Department, and the district's policies will be revised and clarified by the district superintendent accordingly (Stephenson, pers. comm. 2003).

### SYSTEM-WIDE PARK OPERATIONS AND CONCESSIONS POLICIES

The concessions program provides a very important part of the visitors' experience. Concessionaires offer the facilities, services, and goods that the State could not otherwise provide, ranging from traditional food services and campground grocery stores, to Jeep tours and rafting trips. In the system's historic parks, concessionaires help the Department achieve its educational mission by providing educational programs, known in the park profession as "interpretation." These programs add vitality, interest, and excitement to the State's fascinating heritage as preserved and protected by the Department.

The Department partners with a variety of businesses, non-profits, and public agencies through concession contracts, co-operative agreements, and operating agreements to offer the public these goods and services. The method through which these opportunities are made available to the public is regulated by the California PRC, §§5080 et seq.

### AMERICANS WITH DISABILITIES ACT AND ACCESS TO PARKS GUIDELINES

The Americans with Disabilities Act (ADA), the federal law that prohibits discrimination on the basis of disability, is applicable to all actions by the states, including the preparation of state park general plans. In compliance with the ADA, the Department published the *Access to Parks Guidelines*, which was first issued in 1994 and last revised in 2001. The *Access to Parks Guidelines* details the procedure to make state parks universally accessible while maintaining the quality of park resources. Also included in the guidelines are recommendations and regulations for complying with the standards for accessibility. The Department has also published the *All Visitors Welcome: Accessibility in State Park Interpretive Programs and Facilities (2003a),* which provides guidance on developing accessible interpretive programs and facilities.

The Department's *Transition and Trail Plans for Accessibility in State Parks* (2001) outlines the Department's commitment to achieve programmatic access throughout the State Park System and in each of the parks. The visions of these guidelines and plan are embodied in this General Plan.

### CALIFORNIA HERITAGE TASK FORCE

Established in 1981 by the California state legislature, the California Heritage Task Force (CHTF) was created to develop a set of policies and programs for the State's cultural heritage resources. In 1984, the CHTF Report was published as a guide to cultural resource management legislation writing.

### California Coastal Act

The California Coastal Act (CCA) (California PRC §30000 et seq.) was enacted in 1976 to provide long-term public access and protection of California's 1,100-mile coastline for the benefit of current and future generations. The CCA created a partnership between the State (acting through the California Coastal Commission) and local government (15 coastal counties and 58 cities) to manage the conservation and development of coastal resources through a comprehensive planning and regulatory program. Sonoma Coast SB is located in the Coastal Zone, and management activities with Sonoma Coast SB must be consistent with the Sonoma County Local Coastal Plan (LCP). In addition, the Department is responsible for complying with the CCA by maintaining public access to the coast via trails, roads, and parking facilities.

### California State Lands Commission

The California State Lands Commission (CSLC) was created in 1938 to manage and protect the important natural and cultural resources on certain public lands in California and the public's rights to access these lands. These lands include the beds of California's naturally navigable rivers, lakes and streams, as well as the State's tide and submerged lands along the State's coastline, extending from the shoreline out to three miles offshore.

The Department has a current lease, to the year 2039, with the State Lands Commission for offshore areas to be a part of Sonoma Coast SB. This area consists of the entire length of the Sonoma Coast SB coastline from the mean lower low water line westward to the 18-foot bathymetric contour line. This is approximately 600 feet from the shoreline.

### Marine Managed Areas Improvement Act

The Marine Managed Areas Improvement Act of 2000 established a uniform classification system for state marine managed areas and set forth a schedule for reclassifying and renaming the existing special marine managed areas. Under this Act, the current lease area along Sonoma Coast SB will need to be reclassified because "State Beach" is not one of the six classifications of marine areas in the new state system. As of this writing, there are several unresolved issues with regard to both the process and schedule for reclassifying the existing marine areas, including the offshore areas within Sonoma Coast SB. The most likely classification for the Sonoma Coast SB offshore area under the new system is State Marine Conservation Area or State Marine Park. Both the State Park and Recreation Commission and the Fish and Game Commission would have to concur in order to approve either of these classifications (DPR 2001b).

### California Underwater Parks and Reserves Plan

The draft California Underwater Parks and Reserves Plan is a cumulative and comprehensive summary of laws, policies, documents, studies, and surveys concerning the marine areas of the California State Park System. The draft plan addresses issues and makes recommendations in regard to establishing a more manageable marine classification system;

lists existing state park marine units as well as proposed additions; identifying natural, cultural, and recreational features; identifying management and enforcement within designated areas; and improving public education, research, monitoring, and evaluation activities. The draft plan is consistent with Assembly Bill 993, the Marine Life Protection Act. The act establishes a uniform classification system for state marine managed areas to be used by state agencies.

### PUBLIC RESOURCES CODE

The California PRC vests certain powers and responsibilities to the Department. For example, PRC §5024 defines the requirements regarding the treatment of historic, recreational, and other types of resources. PRC also grants the Department the authority to enter into agricultural leases, contract for concession or operating agreements, operate hostels, and pursue other management activities.

PRC §5019.50-5019.80, Classification of Units of the State Park System, provides guidelines for the designation of state park units and guiding principles for state park improvements. The PRC classifies different types of state park units and provides guidelines for the upkeep and improvements of park units. The PRC will be used as a reference to plan appropriate park improvements at Sonoma Coast SB.

### CALIFORNIA COASTAL MONUMENT

The California Coastal Monument was created by President Clinton in January of 2000 and was proclaimed a biological and geological treasure that is extremely rich in biodiversity and provides essential habitat for many species of scientific interest. The California National Monument consists of all unappropriated or unreserved islands, rocks and outcroppings along the coast of California that are above the mean high tide line and not contiguous to the shore in a distance of 12 nautical miles offshore. The monument includes mores than 11,500 islands, rocks and outcropping, totaling approximately 900 acres. The designation as a National Monument mandates the protection of historic and scientific objects, particularly wildlife species which normally inhabit the monument area.

The Bureau of Land Management (BLM) was originally charged with managing the monument. In June 2000 the DFG signed a Memorandum of Understanding (MOU) with the BLM to collaborate in the management of the Management. The Department also signed an MOU with the BLM, as approximately 25% of California's coastline is under management. The BLM is in the process of developing a Resource Management Plan for the Monument. The plan is suppose to be comprehensive in nature and should address and attempt to resolve issues in the monument area only. The plan will also attempt to integrate, where possible, the numerous related management issues of the various coastal partners who desire to be included in the planning effort.

### CLEAN WATER ACT AND PORTER-COLOGNE WATER QUALITY CONTROL ACT

The Clean Water Act (CWA) is the primary federal law that governs and authorizes water quality control activities, and the Porter-Cologne Water Quality Control Act (Porter-Cologne Act) is California's statutory authority for the protection of water quality. The CWA and Porter-Cologne Act sets forth the obligations of RWQCB pertaining to the adoption of water quality control plans (Basin Plans), in which beneficial uses, water quality objectives, and implementation programs are established for each of the nine regions in California.

### CLEAN AIR ACTS

The federal Clean Air Act (CAA) and the California Clean Air Act (CCAA) authorizes the establishment of ambient air quality standards. Locally, the Northern Sonoma County Air Pollution Control District (APCD) is responsible for preparing plans for the attainment of ambient air quality standards, adopting and enforcing rules and regulations about sources of air pollution, issuing permits for stationary sources of air pollution, inspecting stationary sources of air pollution and responding to citizen complaints, and monitoring ambient air quality and meteorological conditions.

## 2.2.2 REGIONAL PLANNING INFLUENCES

Aside from the Sonoma County General Plan and Local Coastal Plan, the following planning documents and conservation plans are relevant for future management of Sonoma Coast SB.

### DRAFT SONOMA COUNTY OUTDOOR RECREATION PLAN

The Draft Sonoma County Outdoor Recreation Plan (Sonoma County 2003) is prepared by the Sonoma County Regional Parks Department to guide parkland planning, acquisition, improvements and management to meet the needs of Sonoma County through the year 2010. It also establishes a framework for agency coordination to meet parkland and recreation needs on a countywide basis. The Draft Outdoor Recreation Plan identifies existing and future parkland and recreation needs, recommends specific projects that could address these needs, and identifies policies and financing options to assist with implementation of the recommended projects.

In Sonoma County there are twelve park management bodies that provide a variety of parklands for County residents as well as for visitors from outside the County: two Districts, the U.S. Army Corps of Engineers Lake Sonoma Recreation Area, the County Regional Park System, five city parks and recreation department, and three special parks districts.

Sonoma Coast SB is located in the Sonoma Coast planning area designated in the Draft Outdoor Recreation Plan. Several recommended projects identified in the plan, area listed below, would be coordinated with trail development and improvement projects that would be implemented by the Sonoma Coast SB. (The preceding numbers correspond to the numbers in the recommended projects for the Sonoma Coast planning area in the Draft Outdoor Recreation Plan.)

- 1. Develop a Community Park to serve residents of the Bodega Bay Area. This proposed community park would be located on part of an existing 17-acre publicly owned property next to the Community Center. This community park would meet the needs of local residents for active and some passive recreation as identified through Outdoors Recreation Plan Workshops and acreage/population needs assessment.

- 5. Coastal Trail. The proposed trail extends from Black Point southward to the Estero Americano, is consistent with California State Coastal Plan policy 145 which calls for establishment of a coastal trail system statewide. When completed, this trail will connect: Estero Americano, Bodega Bay, Doran Ranch Regional Park, State Beaches, proposed Bodega Bay-Sebastopol Trail (AA), Willow Creek [parcel of Sonoma Coast SB], proposed Willow Creek Trail (AP), proposed Monte Rio to Coast Trail (AZ), Fort Ross State Park, Stillwater Cove Regional Park, Salt Point State Park, proposed Coastal Ridge trail (AB), and proposed Sonoma Coast Trail 2 (AT).

- 6. Bodega Bay to Sebastopol Trail. This proposed trail begins at Bodega Bay and ends at the West County Trail. This trail connects Bodega Bay, Salmon Creek Beach, State and/or County Park property, Finley Creek preserve (Sonoma Land Trust property), Coleman Valley Road, Willow Creek Road, Occidental, and the West County Trail at Occidental Road. The existing West County Trail continues south to Sebastopol.

- 7. Willow Creek Trail. This proposed trail begins at Willow Creek [parcel of Sonoma Coast SB] and ends at Coleman Valley Road. This trail connects Willow Creek, Monte Rio to Coast Trail, Willow Creek Road, proposed state-park expansion, Finley Creek Preserve-Willow Creek Connector, and the Bodega Bay – Sebastopol Trail.

- 10. Coleman Valley-Willow Creek Trail. This proposed trail begins at the Willow Creek Trail and ends at the proposed Bodega Bay – Sebastopol Trail near the Finley Creek Preserve.

- 13. Russian River Waterway Trail. The Russian River is a navigable waterway from Cloverdale to the coast and as such, public access is protected by Article XV, §2 of the California Constitution.

- 14. Monte Rio to Willow Creek Trail. This proposed trail begins at Willow Creek [parcel of Sonoma Coast SB] and ends at Monte Rio. This trail will connect Willow Creek, proposed Willow Creek Trail, proposed state park expansion, the town of Duncan Mills, Dutch Bill Creek Bikeway, and Monte Rio.

In addition to the trails mentioned above, the draft Sonoma Outdoor Recreation Plan included references to "Other Lands." This includes projects that are assumed to be implemented by other state, federal, and local agencies. They are included in the plan because they are intended to protect habitat and/or contribute to public recreation in Sonoma County. "Other Lands" mentioned in the plan that pertain to Sonoma Coast SB are listed below.

- 16. Acquisitions of additional land for the expansion of Willow Creek [parcel of Sonoma Coast SB]. The expansion of the Willow Creek area is intended to expand the State's resource management of the watershed area. The area would be available for passive recreational use. This need has been identified in recreation plans, coastal plans, and restoration plans in addition to the Outdoor Recreation Plan workshops.
- 18. Acquisition of land for a preserve in the Salmon Creek Area (P3). This preserve is intended to be of sufficient size to protect one or more of the following biotic resources: the estuary, salmonid habitat, and fairy shrimp habitat of Salmon Creek.

#### Russian River Action Plan

In March 1997, Sonoma County Water Agency published the first edition of the Russian River Action Plan in response to the listing of coho salmon in the Russian River as "threatened" under the ESA. The Plan provided a detailed listing of actions needed to protect listed fish species, and identified opportunities to coordinate and cooperate with federal, state and local agencies to gain federal and/or state funding for projects. The Russian River Action Plan was updated in 2003 (SCWA 2003).

#### Draft Russian River Basin Fisheries Restoration Plan

As part of its Russian River Watershed Planning and Restoration program, the California Department of Fish and Game has made stream assessments and improved habitat for those areas where re-introductions of coho salmon will occur. The DFG is currently developing a Russian River Basin Fisheries Restoration Plan, which identifies limiting factors for native salmon and recommends habitat improvement and other land management changes (DFG 2002b).

#### Russian River Watershed Adaptive Management Plan

The Russian River Watershed Adaptive Management Plan (WMP) is currently being prepared by the Russian River Watershed Council for the purpose of preventing further degradation and developing a healthy and sustainable Russian River watershed. The WMP will evaluate water quality, water quantity and the physical, hydrologic, and biological health and functions of the watershed. The WMP will provide measurable goals and recommendations to implement improvements and continue watershed assessment for the 50-year planning period (RRWC 2003).

#### Organizations Dedicated To Open Space Preservation

### Sonoma Land Trust

The mission of the Sonoma Land Trust (SLT) is to provide permanent protection of Sonoma County Land, its natural beauty and its biotic resources, and to offer stewartship, education, and guidance for the preservation and enhancement of agricultural, natural, scenic, and open space lands.

### Stewards of the Coast and Redwoods

The Stewards of the Coast and Redwoods are a volunteer association that works in cooperation with the Department to provide interpretive programs and maintenance for parks in the North Bay and Mendocino Districts.

### Land Partners through Stewardship (LandPaths)

LandPaths is a nonprofit organization that assists landowners in defining and implementing practices which maximize resource conservation, insuring protection for ecologically fragile areas, while promoting managed public access. Landpaths also promotes and conducts on-site environmental education programs to involve the community in preserving the diverse natural communities of the region while undertaking watershed restoration activities.

## 2.2.3 Public Concerns and Comments

Public input is an important component of the general planning process. Input for public concern and comment for this general plan and EIR was solicited in the following ways:

- Release of the Notice of Preparation (NOP) for Sonoma Coast SB General Plan and EIR on February 27, 2003;
- Development of a comprehensive mailing list of park stakeholders;
- Announcement of the start of the planning process by Newsletter No. 1;
- Public scoping meeting at Bodega Marine Lab on March 13, 2003;
- Hardcopy and on-line visioning surveys available with Newsletter No. 1, at the scoping meeting, and through the Department website; and
- Public meeting at the Bodega Grange on August 28, 2003.

A summary of the public meeting is included in Appendix D, and a summary of all hardcopy and online surveys received to date is included in Appendix E. In addition, the NOP and letters received from public agencies in response to the NOP are included in Appendix F.

## 2.3 Issues Analysis

This section summarizes key issues addressed in the General Plan prepared for Sonoma Coast SB. These issues were identified during the early phases of the planning process through a public scoping process, agency consultation, and the circulation of visitor surveys. They are grouped by the following topics:

- Local and Regional Planning;
- Infrastructure and Operations;
- Natural Resource;

- Cultural Resources;
- Recreational Opportunities;
- Visitor Experience, Interpretation, and Education; and
- Future Land Acquisitions.

### 2.3.1 Local and Regional Planning

Key Issues:

- Coordination with other local and regional planning efforts.

#### Coordination with Other Local and Regional Planning Efforts

The desire for coordination with other local and regional planning efforts was expressed during the public scoping process. The General Plan is consistent with other local and regional planning efforts. Relevant local and regional plans include the Sonoma County General Plan and Local Coastal Plan, the Draft Sonoma County Outdoor Recreation Plan, and the U. S. Bureau of Land Management's California Coastal Monument Resource Management Plan (RMP). Another planning document with specific bearing on the management of Sonoma Coast SB is the U. S. Fish and Wildlife Service's draft Recovery Plan for the Western Snowy Plover, because this document specifically mentions Salmon Beach as important to the recovery effort.

### 2.3.2 Infrastructure and Operations

Key Issues:

- Public safety
- Shooting range at Willow Creek
- Roads and trails
- Visitor center
- Operations facility at Salmon Creek
- Maintenance yard at Willow Creek
- Water and sewer services
- Staffing
- Grazing on parklands

#### Public Safety

Sonoma Coast SB is the fourth-most visited state park in the system with over two million visitors each year, and the high use levels include some activities that present public safety concerns. SR 1 is a popular bicycle route. Currently, bicycles must share the pavement with motor vehicles, because of the absence of bicycle paths and adequate road widths for bicycle lanes. Bicycle and traffic safety are key issues. Unpredictable ocean currents are prevalent off the coast and there have been approximately 90 aquatic drownings since 1986. Sonoma Coast SB relies on one permanent lifeguard to cover all 19 miles of coastline. Surfing is a

popular activity at Sonoma Coast SB, so swimming and surfing safety are key issues. In addition, Sonoma Coast SB is open to the public 24 hours per day. Night access results in frequent night-time gatherings on the beach, sometimes with large numbers of visitors, which results in litter on the beach, visitor injuries resulting from falls off of rocks or cliffs, some unruly visitors, and traffic safety issues. Park rangers have issued hundreds of citations and arrested an average of 60 to 90 people annually in recent years. Teenage party groups account for less than 10% of the visitors but account for approximately 50% of enforcement actions and trash (Stevenson pers. comm. 2003).

The General Plan evaluates operational measures to improve public safety. Potential measures initially identified included the evaluation of consistency with County Park operations, parking lots, limiting hours of use, postings that differentiate pullouts from parking lots to prevent accidents, addressing bicyclist safety along SR 1, and expanding public education on safety hazards. Priority is given to law enforcement solutions to crime and other public safety issues that are creative, visitor friendly, and appropriate to the mission of Sonoma Coast SB in that they expand and enhance opportunities for visitor use and enjoyment as well as safety.

### Shooting Range at Willow Creek

During the scoping process members of the public expressed concern about the Willow Creek shooting range, including use of lead bullets and firearms noise. An effort to investigate the potential to implement a lead bullet recovery system is currently underway. Noise associated with the shooting range detracts from the Willow Creek "environmental camping" experience. Several northern spotted owl territories are known to occur in this area (DFG 2003) and could potentially be affected by noise disturbance from the shooting range. There is a general interest in relocating the shooting range, but no alternative site has been identified.

### Roads and Trails

Road- and trail-related erosion and the integrity and stability of trails and roads at Sonoma Coast SB have been identified as major concerns. Beach access trails receive heavy use and are subject to the forces of coastal erosion. The level of maintenance necessary to maintain safe and sound conditions for these trails is greater than for most trails. The road leading to Goat Rock is built on a landslide and continues to erode, thus requiring continued maintenance in order to provide safe public access. SR 1 is experiencing erosion as it traverses the marine terraces north of Jenner. The access road to the maintenance yard at Willow Creek floods on a regular basis and may cause adverse effects on the riparian habitat associated with Willow Creek. Erosion damage repair, erosion control and potential realignment of trails are addressed in the trails section of the General Plan.

During the public scoping process the need for clear trail signage for equestrians in the Bodega Dunes area was identified. The overall need for more interpretive signs and trail markers throughout Sonoma Coast SB was identified, as well as the desire for regular patrol of the trails, possibly by volunteers.

The Kortum trail at Sonoma Coast SB is part of the Statewide coastal trail and there is a common desire by multiple agencies to close gaps in the trail through construction of additional segments.

On a broader scale, the General Plan addresses user conflicts and improvements that can be made to reduce impacts to sensitive resources resulting from trail use and erosion. For example, trails may be considered for use as a mechanism for resource protection. Well designed and maintained unpaved roads in areas of low-volume use may be economical and serviceable, and may be considered more appropriate than paved roads in the natural setting of Sonoma Coast SB. Objectionable dust and sediments, which may be generated by the use of unpaved roads, can be greatly reduced with the use of appropriate dust palliatives and other treatments.

### Visitor Center

The current visitor center is located in a boat house on the Russian River in Jenner. It is a very small wood structure (10 feet x 40 feet) constructed on wood pilings. The Jenner Visitor Center is only seasonally open and staffed with volunteers. Recurrent flooding during high river stages continues to be a problem, as does the deterioration of the supporting structure. The need for a new visitor center is apparent. It should be sited at a focal location and present themes related to visitor orientation to Sonoma Coast SB, natural and cultural history, and public safety. A multiple-agency visitor center created through partnership with other agencies may also be considered. The location and general size and character of the visitor center are important considerations. The General Plan provides for the consideration of alternative locations within the potential development areas.

### Operations Facility at Salmon Creek

The operations facility at Salmon Creek does not meet the current needs of Sonoma Coast SB. The facility contains a small maintenance shop, park office, and ranger residence. The maintenance facilities were built in 1948 and have not been upgraded since. The park office was replaced in 2000 and is considered adequate for the visitor services function. Because these facilities are located adjacent to the Salmon Creek Estuary and on top of an archaeological site, expansions and upgrades of the maintenance facility at this location may not be compatible with the protection of natural and cultural resources. The General Plan identifies potential development areas that may be considered for alternative locations for the maintenance station and park office, that would be able to accommodate current and future needs. The location of the existing station could be used for public access in the future. Issues to be considered for the siting of the new maintenance facilities include the protection of vehicles from the corrosive marine environment and viewshed protection. The preferred location would be on the east side of SR 1 at a higher elevation and further from the ocean than the current facility.

### Maintenance Yard at Willow Creek

The maintenance yard at Willow Creek is located in a building complex known as the Willow Creek Ranch, which consists of a ranch house and associated buildings of potential historic significance. While the vacant ranch house is not used for the operations of Sonoma Coast SB, its condition has deteriorated because of neglect. The adaptive reuse of the other Willow Creek Ranch buildings is considered to be inadequate for the needs of the operations of Sonoma Coast SB and the District. Limitations associated with modification of historic structures, funding, and available space contribute to inefficiencies and difficulties for staff responsible for maintaining district-wide and park maintenance services. The access road to the maintenance yard is located in the floodplain of Willow Creek floods annually and occasionally inhibits access to the maintenance yard. The continued frequent use of the road may also adversely affect the riparian habitat associated with Willow Creek.

The maintenance facility at Salt Point State Park will serve as a model of what is needed for Sonoma Coast SB, with the exception that the facility for Sonoma Coast SB needs to be larger and more complete. An ideal new facility should encompass space and facilities for fleet maintenance, heavy equipment repair, sheltered parking, and vehicle storage. It should also include a large yard for materials storage and stockpiling and gasoline and diesel fuel storage and dispensing. Shops need to include spaces for heavy equipment and fleet vehicle repair, routine service, and maintenance; parts; supplies; an air compressor; a tool crib; lubes and oil; a carpenter shop with storage for wood, tools, and hardware; a plumber shop with storage for water and wastewater pipe, fittings, valves, pumps, meters, hardware, tools, and instruments; and an electricians shop. The ideal new facility should also include space for a lunchroom, restrooms, showers, a meeting room, and offices.

### Water and Sewer Services

Water supply and septic system issues exist at several of the campgrounds. Current systems are insufficient to meet user demands and the sites that have flush toilets needs to be pumped regularly. Inadequate septic capacity results in excessive maintenance effort and cost. Some restrooms potentially date back to the CCC era and there is a concern that sewer leakage may enter local waterways. Several facilities have water trucked in from offsite locations. The General Plan sets a framework for facility upgrades, replacements or additions which may include upgrades of the systems at Salmon Creek and Wrights Beach, including new restrooms, and the addition of showers and restrooms at Bodega Dunes. Compatibility of proposed facilities with the underlying soils and rock formations, as well as the availability and transport of potable water, will need to be addressed during the planning process for site-specific development.

The General Plan also addresses water quality issues in the Russian River and its tributaries.

### Staffing

As the fourth-most visited Park in the State Park System, demands on Sonoma Coast SB's staff are considerable. The land within Sonoma Coast SB is spread along the coast and has many

possible entry points. Beach activity occurs 24 hours a day. The overall ranger, maintenance, and operations staffing level at Sonoma Coast SB is about half of the level of other parks among the top ten most visited parks in California. Staffing for resource ecology, landscape architecture, cultural resources, and interpretation are also very limited. The need for additional staff is an important issue in addressing operational needs and to manage the high number of unique and sensitive resources. In addition, housing for current and future staff is extremely limited at Sonoma Coast SB and the General Plan addresses future staff housing.

#### GRAZING ON PARKLANDS

The Redhill Parcel, which was recently added to Sonoma Coast SB, continues to be grazed under an existing lease that expires in June 2006. With the addition of the property to Sonoma Coast SB, future grazing of this parcel could be evaluated as a management tool.

### 2.3.3 NATURAL RESOURCES

Key Issues:

- Control of invasive weeds
- Use of herbicides
- Protection of western snowy plover
- Protection and management of other special-status species
- Marine mammals
- Tide pools
- Watershed protection and restoration
- Habitat fragmentation
- Anadromous fish passage
- Sudden Oak Death Syndrome

#### CONTROL OF INVASIVE WEEDS

Various stakeholders have identified the control of invasive weeds as an important issue. Species specifically mentioned include Pampas grass, European beachgrass and iceplant, but other invasive plants have also been documented at Sonoma Coast SB.

#### USE OF HERBICIDE

During the scoping process some members of the public expressed strong feelings about herbicide use at Sonoma Coast SB and would like to see an effort to control invasive weeds without the use of herbicides. Others supported the use of herbicide as a management tool.

### Protection of Western Snowy Plover

Snowy plovers have been documented at Salmon Beach and the beach is included in the draft recovery plan for the species prepared by the USFWS. Management of snowy plover habitat at Salmon Beach is addressed in the General Plan.

### Protection and Management of Other Special-Status Species

Other special-status species known to inhabit Sonoma Coast SB include steelhead and chinook salmon, California freshwater shrimp, tidestroms lupine, and several other special-status plant and wildlife species. Protection of known and yet to be documented populations of special-status species populations at Sonoma Coast SB is addressed in the General Plan. Impacts to special-status species and other sensitive resources resulting from recreational activities is addressed as well. The need for continued enforcement of fish and game protection laws and the education of visitor of special-status species protection and management are identified in the General Plan.

### Marine Mammals

The protection of marine mammals is mandated by the Marine Mammal Protection Act. A harbor seal haul-out is present at the mouth of the Russian River and the management and protection of this resource is addressed in the General Plan. The specific need for the enforcement of the existing policy regarding dogs on the beach was identified.

### Tide Pools

The Stewards of the Coast and Redwoods, a local non-profit operation, support the Department with an interpretive program of tide pool. In addition, school groups from all over Northern California visit the tide pools at Sonoma Coast SB every year. The potential of damage to this fragile resource is an important issue addressed in the General Plan.

### Habitat Fragmentation

Fragmentation of large habitat areas and wildlife migration corridors is detrimental to the long-term health of many fish and wildlife population. The identification and protection of habitat corridors are important issues addressed in the General Plan.

### Watershed Protection and Restoration

The Willow Creek watershed has experienced degradation in the past, because of land uses such as grazing and logging, resulting in excessive erosion and sedimentation. Efforts are currently underway to plan and implement the restoration of the Willow Creek watershed. The General Plan addresses long-term goals, such as public use and access and the protection and restoration of Willow Creek and its associated resources.

The scoping process also identified the desire for future acquisitions in the Jenner Gulch watershed and the need to counteract sedimentation problem in the Salmon Creek watershed.

#### ANADROMOUS FISH PASSAGE

The Russian River and Salmon Creek support runs of anadromous fish, such as steelhead trout, coho salmon, and potentially chinook salmon. The Sonoma County Water Agency regularly opens the mouth of the Russian River mechanically to control the risk of flooding in the streamside communities and to promote oxygenation of the stream for anadromous fish. The impact of this activity is unclear and studies conducted to date have been inconclusive.

Fish passage problems have been documented at Furlong Gulch, Willow Creek, and the Salmon Creek estuary and need to be addressed in cooperation with Caltrans. The General Plan addresses the protection of aquatic species.

#### SUDDEN OAK DEATH SYNDROME

Sudden oak death syndrome has been confirmed in the campground at Bodega Dunes and may be present at Willow Creek as well. Oaks and other native species susceptible to this disease form an important component of the natural vegetation of Sonoma Coast SB. Sonoma Coast SB is rich in botanical diversity and contains nine different species of oaks. Management of the disease and the prevention of its spread to other parts of Sonoma Coast SB is an important concern for the ecological health of oak stands at Sonoma Coast SB.

### 2.3.4 CULTURAL AND PALEONTOLOGICAL RESOURCES

Key Issues:

- Protection of Duncans Landing
- Protection of Rocks below Peaked Hill
- Protection of other significant historic and prehistoric resources
- Protection of Cultural Landscapes

#### PROTECTION OF DUNCANS LANDING

Duncans Landing is the site of a 9,000-year-old Miwok rock shelter. The site has been and continues to be subject to trampling, illegal digging, and overuse. In addition, the proposed removal of invasive ice plant is controversial, because it may damage the rock shelter structure. Potential establishment of a Cultural Preserve is addressed in the General Plan.

#### PROTECTION OF ROCKS BELOW PEAKED HILL

The rocks below Peaked Hill (known by local climbers as Sunset Rock or Sunset Boulders) are a significant paleontological site with prehistoric animal rubbings. It also is an uncontrolled publicly accessible rock-climbing area in Sonoma County and, as such, attracts significant

use by climbers, whose use could lead to deterioration of the resource. The evaluation of the potential dedication of the site as a Cultural Preserve is included in the General Plan.

#### PROTECTION OF OTHER SIGNIFICANT HISTORIC AND PREHISTORIC RESOURCES

Other significant resources at Sonoma Coast SB include a Victorian ranch house and historic dairy farm at Wrights Ranch, a once-proposed nuclear reactor site at Campbells Cove (Hole in the Head), and a possible landing site of Sir Francis Drake at Campbell Cove. Furthermore, numerous middens and other prehistoric resources located on the marine terraces at Sonoma Coast SB are threatened by naturally occurring coastal erosion. Adequate protection and interpretation of all of these resources are addressed in the General Plan.

### 2.3.5 RECREATIONAL OPPORTUNITIES

Key Issues:

- Camping opportunities
- Carrying capacity
- ADA accessibility
- Environmental living program
- Other recreational opportunities

#### CAMPING OPPORTUNITIES

Demand for camping exceeds the current supply of campsites at Sonoma Coast SB. The General Plan considers potential expansions to existing campgrounds, potential additions of new campgrounds, and the potential addition of additional restrooms and showers. Temporary facilities at Wrights Beach may need to be upgraded to permanent status. The need for more trash and recycling containers and the need for an upgrade of the campfire facilities at the Bodega Dunes Campground have also been identified.

#### CARRYING CAPACITY

Currently, visitors to Sonoma Coast SB have access to areas of cultural, biological and geologic sensitivity, and overuse and misuse of these areas adversely affects the resources. An approach for considering carrying capacity is addressed in the General Plan.

#### AMERICANS WITH DISABILITIES ACT ACCESSIBILITY

Limited Americans with Disabilities Act (ADA)-accessible facilities are present at Sonoma Coast SB. The Boardwalk at Bodega Dunes, the Vista Trail, and a section of the Kortum Trail are wheelchair-accessible and several ADA accessible campsites are present at Bodega Dunes Campground. The General Plan addresses the need to provide ADA access to the beach and to address ADA issues at Sonoma Coast SB as a whole.

### Environmental Living Program

The environmental campgrounds at Willow Creek and Pomo Canyon, provide opportunities to establish an environmental living program for students to encourage stewardship of natural and cultural resources. The General Plan provides for the possibility of establishing an environmental living program at Sonoma Coast SB.

### Other Recreational Opportunities

Other potential recreational opportunities identified during the scoping phase included the designation of quiet areas without motorized equipment, a permit system for fires on the beach for seasonal celebrations, recognition of presences of an historic and active local fishing community, stewardship of trails and programs by user groups, and provisions for other recreational activities that are compatible with resource management goals.

## 2.3.6 Visitor Experience, Interpretation, and Education

Key Issues:

- Opportunities for interpretation
- Concession opportunities
- Scenic views

### Opportunities for Interpretation

Sonoma Coast SB's current interpretive prospectus was prepared in 1973. The interpretive themes need to be reviewed, revised as appropriate, and incorporated into a comprehensive interpretive plan for Sonoma Coast SB. The General Plan presents potential themes for the interpretation of resources at Sonoma Coast SB.

The need for multilingual signage, "symbolic fencing" to protect resources, and use of education as a law-enforcement tool have been identified as potential improvements to interpretive and educational opportunities at Sonoma Coast SB.

### Concession Opportunities

Current concessions at Sonoma Coast SB include a mobile food service that operates during the summer months. The Chanslor-Ranch Horseback riding operation, which currently does not have a concessionary agreement with the Department, is located adjacent to Sonoma Coast SB. The General Plan identifies the need to study potential future concessions at Sonoma Coast SB.

### Scenic Views

The General Plan addresses the effects of proposed developments, both inside and outside Sonoma Coast SB on scenic resources at Sonoma Coast SB, and light pollution of the nighttime sky.

### 2.3.7 New and Planned Land Acquisitions

Key Issues:

- Upper Willow Creek watershed
- Redhill Parcel
- Carrington Parcel
- Jenner Gulch
- Other properties

#### Upper Willow Creek Watershed

The upper half of the Willow Creek watershed is currently owned by the Mendocino Redwood Company, but is planned for addition to Sonoma Coast SB sometime in the future. Issues that will need to be addressed with this addition include existing ranching/grazing leases on the property, private in-holdings to be retained, and the accommodation of recreational uses currently allowed on the property that are not currently allowed at Sonoma Coast SB.

#### Redhill Parcel

The 990-acre Redhill Parcel located immediately south of the lower half of the Willow Creek watershed was recently added to Sonoma Coast SB. Integration of this property into Sonoma Coast SB, and potential management and use issues are addressed in the General Plan.

#### Carrington Parcel

The 330-acre Carrington Parcel was recently added to Sonoma Coast SB. Integration of this property into Sonoma Coast SB, and potential management and use issues are addressed in the General Plan.

#### Jenner Gulch

The desire to purchase property in the Jenner Gulch watershed was identified during the scoping process. The General Plan contains goals and guidelines addressing potential future acquisitions.

#### Other Properties

Other specific properties have not been identified for acquisition and future addition to Sonoma Coast SB at this time. The Sonoma Land Trust completed a Sonoma County Coastal Parcel Study in 1999 that identifies large landholdings in the vicinity and property owners willing to participate in some form of conservation. Exploring opportunities to incorporate additional parcels is important for meeting the overall park vision for Sonoma Coast SB. In particular, sites for facilities development, such as a permanent visitor center, office and maintenance yard would be desirable. As neighboring properties become available, the opportunity for future additions may arise. The General Plan identifies goals

and guidelines addressing the potential future addition of neighboring or other properties and criteria for evaluating other properties for their potential values as biological corridors, public use areas, and/or facility development sites.