

Ecological site F004BX110CA

Sitka spruce-red alder/salmonberry/western swordfern, hills, sandstone and mudstone, clay loam

Accessed: 09/19/2026

General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

Associated sites

F004BX111CA	Redwood/western swordfern-redwood sorrel, floodplains and terraces, loam This ecological site slowly transitions into Redwood/Western swordfern-Redwood sorrel ecosite, F004BX110CA.
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Table 1. Dominant plant species

Tree	(1) <i>Picea sitchensis</i> (2) <i>Alnus rubra</i>
Shrub	(1) <i>Rubus spectabilis</i> (2) <i>Polystichum munitum</i>
Herbaceous	Not specified

Physiographic features

This ecological site is found along the coast throughout the survey area. It occurs on moist, uniform to slightly convex summits, shoulders, and backslopes of hills and debris slide areas. These hills are moderately steep to very steep.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Debris flow (3) Ridge
Flooding frequency	None
Ponding frequency	None
Elevation	0 – 290 m

Slope	20 – 80 %
Water table depth	80 – 150 cm
Aspect	Aspect is not a significant factor

Climatic features

The climate is humid with cool, foggy summers and cool, moist winters. Coastal influence limits the diurnal range in temperatures. Summertime temperatures range from 42 to 70 degrees F. Mean annual precipitation ranges from 65 to 90 inches and usually falls from October to May.

Table 3 Representative climatic features

Frost-free period (average)	330 days
Freeze-free period (average)	330 days
Precipitation total (average)	2,290 mm

Influencing water features

There are no influencing water features on this site.

Soil features

These well-drained, very deep soils are developed from colluvium and residuum derived from sandstone and mudstone. They are moderately to very strongly acidic at 40 inches with a dominantly loamy subsurface, and a rock content ranging from non-gravelly to very gravelly. Some soils on moderately steep summit positions may have a clayey subsurface texture group with minimal rock content.

Soils that have been tentatively correlated to this ecological site include the following:

Soil Survey Area: CA605 - Redwood National and State Parks

Map Unit Component

Sasquatch 593
 Sisterrocks 593
 Yeti 593
 Sisterrocks 594
 Houda 594
 Sasquatch 599

Table 4. Representative soil features

Surface texture	(1) Gravelly loam (2) Loam (3) Clay loam
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Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderately slow to slow
Soil depth	200 cm
Surface fragment cover <=3"	Not specified
Surface fragment cover >3"	Not specified
Available water capacity (0-101.6cm)	5.08 – 22.86 cm
Calcium carbonate equivalent (0-101.6cm)	Not specified
Electrical conductivity (0-101.6cm)	Not specified
Sodium adsorption ratio (0-101.6cm)	Not specified
Soil reaction (1:1 water) (0-101.6cm)	4.5 – 10
Subsurface fragment volume <=3" (Depth not specified)	0 – 60 %
Subsurface fragment volume >3" (Depth not specified)	Not specified

Ecological dynamics

Sitka spruce (*Picea sitchensis*) occupies a thin band along the northern coast of California, as well as following drainages inland from the coast for short distances. Red alder (*Alnus rubra*) is a common associate, and may temporarily dominate sites that have been disturbed.

This site is largely contained within the coastal fog belt. Coastal fog ameliorates the effects of solar radiation on conifer transpiration rates (Daniel, 1942). Research in this region (Dawson 1998) has indicated that fog drip and direct fog uptake by foliage may contribute significant amounts of moisture to the forest floor during summer months and over the course of the year.

The Sitka spruce/red alder ecological site has evolved with a low natural disturbance regime in coastal areas with a fog influence. Natural fire intervals near the ocean range from 250 to 500 years; they are rare and of low intensity. Its close proximity to the coastal zone has caused the site to evolve with small to moderate disturbances from wind events. However, winter winds from the northwest can be extreme. Most commonly, winter windstorms cause broken tops and windthrow. Repeated disturbance by wind is evidenced by a hummocky ground appearance caused by fallen trees and root wads (Agee, 1993). Rarely, more severe wind events could lead to larger amounts of windthrow.

Sitka spruce may rapidly invade adjacent coastal prairies that have been managed through burning or farming (Franklin and Dyrness, 1984). Red alder may also rapidly invade disturbed areas and form dense even-aged stands. The persistence of red alder on this site is thought to be related to the frequent soil movement and natural disturbance found along the coastal areas. Red alder fixes nitrogen which results in a higher availability of nitrogen in the soil (Uchytel, 1989).

Small disturbance events that leave wind-created openings are likely to favor the establishment of shade-tolerant species including: Sitka spruce, western hemlock (*Tsuga heterophylla*) and in rare cases, redwood (*Sequoia sempervirens*). Colonization of areas by Sitka spruce or red alder may occur in areas subject to debris flow. Larger disturbances, though rare, may favor the establishment of shade-intolerant species such as Douglas-fir (*Pseudotsuga menziesii*) (Agee, 1993).

Salmonberry (*Rubus spectabilis*) and salal (*Gaultheria shallon*) may become very dense following a disturbance and can potentially form large brushfields (Tirmenstien,1989). Both species can reproduce vegetatively following timber harvesting or fire. Though these brush species are most prevalent in early to mid-seral successional stages, they persist in the openings of climax stands. Coyotebrush (*Baccharis pilularis*) and Himalayan blackberry (*Rubus discolor*) may occur more frequently where fire has been previously utilized. Windborne spores from western swordfern (*Polystichum munitum*) may also rapidly infill new openings. It is found throughout successional communities, and will increase over time to become dominant (Zinke,1977).

State and transition model

Figure 3. State and Transition Model

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 6. Community 2.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 7. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Table 8. Community 4.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production ()	Foliar Cover (%)
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Animal community

The redwood forest provides habitat for 61 species of mammals. Predators include the black bear, fisher and marten, mountain lion, fox, and bobcat. Ungulates include deer and elk. Approximately 100 native bird species use the redwood forest on a seasonal basis. Common bird species include warblers, tanagers, sparrows, and blackbirds. Other bird species include the Marbeled Murrelet, the Northern spotted owl, and the Bald Eagle. Common reptiles found in forested areas include the alligator lizard and garter snake. Amphibians are mostly associated with riparian and wetland areas; however the northwest salamander and two newt species spend much of their lives in upland habitat. Salmonberry provides cover and a source of food for birds and mammals.

Hydrological functions

Soils have a moderate infiltration rate when thoroughly wet. The site is subject to erosion where adequate vegetative cover is not maintained. Road building, timber harvest, and site preparation for planting may increase surface erosion and potential for mass wasting. Hydrologic Group Map Unit Component 593 Sasquatch--B 593 Sisterrocks--C 593 Yeti--D 594 Sisterrocks--C 594 Houda--C

Recreational uses

Recreational development and use may be limited by slopes ranging from 15 to 50 percent.

Wood products

Sitka spruce is used as saw timber, wood pulp and plywood. It has a high weight to strength ratio which is valuable for use as masts for sail boats, oars, boats and racing sculls. It is also valued for use in making guitars and for piano sounding boards.

Other products

Salmonberries are eaten fresh or preserved. They are an important food source for birds and other animals.

Table 9. Representative site productivity

Common Name	Symbol	Site Index Low	Site Index High	CMAI Low	CMAI High	Age Of CMAI	Site Index Curve Code	Site Index Curve Basis	Citation
Sitka spruce	<i>PISI</i>	176	200	265	300	—	—	—	

Inventory data references

Forestry data was collected at the following soil pits and soil notes: Component Map unit Plot # Sasquatch 593 05-018, 05-021, 05-026, 05-027, 05-001 Sisterrocks 593 05-024 Sisterrocks 594 05-022, 05-025, 05-034, 6052 Yeti 593 05-028 Sasquatch 599 09-052, 09-053, 09-055

Type locality

Location 1: Del Norte County, CA	
Township/Range/Section	T14N R1E S19
UTM zone	N
UTM northing	4605028
UTM easting	0408251
General legal description	Coastal Trail, between hidden beach and Lagoon Creek.

Other references

Agee, James K., 1993. Fire Ecology of Northwest Forests. P 187-225.

Noss, Reed, F., editor. 2000. The Redwood Forest. 377 pages.

Silvics of North America. 1990. USDA Handbook 654

Steinburg, (Coyotebrush)

Viers, Stephen D. 1996. Ecology of the Coast Redwood. Conference on Coast Redwood Forest Ecology and Management. P 9-12.

Griffith, Randy Scott. 1992 *Picea sitchensis*

In: Fire Effects Information System, [Online]. U. S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: <http://www.fs.fed.us/database/feis> [2006, February 8]

Contributors

Judy Welles

Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	
Contact for lead author	
Date	
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. Number and extent of rills:

2. Presence of water flow patterns:

3. Number and height of erosional pedestals or terracettes:

4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):

5. Number of gullies and erosion associated with gullies:

6. Extent of wind scoured, blowouts and/or depositional areas:

7. Amount of litter movement (describe size and distance expected to travel):

8. Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):

9. Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):

10. Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:

11. Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):

12. Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):

Dominant:

Sub-dominant:

Other:

Additional:

13. Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):

14. Average percent litter cover (%) and depth (in):

15. Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):

16. Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:

17. Perennial plant reproductive capability:
