USDA Natural Resources
Conservation Service

Ecological site R019XI106CA
Shallow slopes 13-31" p.z.

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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.

Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

Similar sites

R019XI109CA	**Shaly slopes 13-24" p.z.** This is a chaparral community dominated primarily by Quercus pacifica
R019XI108CA	**Convex slopes 13-24" p.z.** This is a chaparral site found on shist and is dominated by island scrub oak and Santa Cruz island manzanita.
R019XI105CA	**Deep slopes 13-24" p.z.** This is a chaparral ecological site generally found on south slopes with coastal sage.
R019XI110CA	**Concave slopes 13-24" p.z.** This is a dense and diverse chaparral community found on the shist geology.
R019XI112CA	**Moderately deep volcanic slopes 13-31" p.z.** This is an oak woodland-chaparral ecological site found on volcanic soils.

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Adenostoma fasciculatum* (2) *Quercus pacifica*
Herbaceous	Not specified

Physiographic features

This ecological site is found on all aspects of the backslopes, ridges, and shoulders of hills. Slopes range from 2 to 75 percent, and elevations range from sea level to 2470 feet.

Table 2. Representative physiographic features

Landforms	(1) Hill
Flooding frequency	None
Ponding frequency	None
Elevation	0–2,470 ft
Slope	2–75%
Aspect	Aspect is not a significant factor

Climatic features

This ecological site is found on two of the five northern Channel Islands, Santa Cruz and Santa Rosa. Each island has a different temperature and precipitation range, however for the purposes of this description, they have all been averaged together to capture the entire range of variance.

The average annual precipitation is 26 inches with a range between 13 and 31 inches, mostly in the form of rain in the winter months (November through April). The average annual air temperature is approximately 56 to 73 degrees Fahrenheit, and the frost-free (>32F) season is 320 to 365 days.

NOTE: Data collected for monthly precipitation and temperatures is only from one climate station/island, and may not capture the variance in climates on each of the five islands.

Table 3. Representative climatic features

Frost-free period (average)	365 days
Freeze-free period (average)	365 days
Precipitation total (average)	31 in

Influencing water features

This site is not influenced by riparian or wetland water features.

Soil features

These soils are shallow and loamy, and formed from either sandstone (Bereme) or residuum weathered from andesite, basalt or volcanic breccia (Spinnaker).

Mean annual soil temperatures (MAST) on the Santa Cruz Island sites range from 54 to 59 degrees F on north-facing slopes, which are classified as isomesic, and 59 to 71 degrees F on south-facing slopes, which are classified as thermic. The mean annual soil temperatures (MAST) on the Santa Rosa Island sites range from 59 to 64 degrees F, and are classified as thermic.

This ecological site is found on the following mapunits and soil components:

SSA MU SYM Component
CA688 292 Bereme
CA688 320 Spinnaker moist
CA688 321 Spinnaker moist

Table 4. Representative soil features

Surface texture	(1) Very gravelly loam (2) Extremely cobbly sandy loam
Family particle size	(1) Loamy
Drainage class	Somewhat excessively drained to well drained
Permeability class	Moderately rapid to moderate
Soil depth	6–20 in
Available water capacity (0-40in)	1–2.1 in
Electrical conductivity (0-40in)	0 mmhos/cm
Sodium adsorption ratio (0-40in)	0

Soil reaction (1:1 water) (0-40in)	5.6–7.3
Subsurface fragment volume <=3" (Depth not specified)	5–20%
Subsurface fragment volume >3" (Depth not specified)	25%

Ecological dynamics

The reference state for this ecological site is the prostrate chamise chaparral. The largest representation of this community is on the wind blown ridge-tops and side-slopes of Santa Rosa Island by Black Mountain, on the Tbsh (resembles Monterey Shale) and Tbs (tuffaceous sandstone) geologies. Common species include prostrate chamise (*Adenostoma fasciculatum* var. prostratum), Channel Island scrub oak (*Quercus pacifica*), Santa Rosa Island manzanita (*Arctostaphylos confertiflora*), bush monkeyflower (Mimulus longiflorus), and island monkey flower (Mimulus flemingii). The shrubs are less than two feet high, with open patches of gravel and bare soil. This community is most likely similar to the historic plant community in species composition, but grazing may have reduced the cover of the shrub species, and reduced the diversity of native forbs. Several non-native species have been introduced to this area as well, mostly non-native annual grasses.

The historical fire regime for this community is unclear. Many of the shrubs are dependent on fire for regeneration. Lightning, the primary natural ignition source, is very uncommon on these islands (Keeley, 2000). Only three lightning-ignited fires have been documented on the Channel Islands in the last 140 years (Junak et al., 1995). When fires are ignited in the spring they will tend to remain small in size. Autumn fires can spread rapidly and cover large areas with the fall Santa Ana winds. If fire becomes too frequent (less than 10 year intervals) it can detrimentally affect chaparral species that rely heavily on establishing seedlings rather than re-sprouting after a burn. These reseeding species do not reach maturity during short fire intervals, and so will be unable to replenish their seed banks in time.

Very little research can be found concerning the fire effects on the island’s endemic chaparral species. More research is needed to determine which shrubs tend to re-sprout and which are obligate seeders. Species lacking data include Santa Rosa Island manzanita (*Arctostaphylos confertiflora*) and Channel Island scrub oak (*Quercus pacifica*). Similar species indicate that both of these could resprout and reseed after fire.

The natural fire return interval for the chaparral in this area was approximately 70 to 200 years (Keeley and Fotheringham, 2001). Intervals have generally increased to 40 to 50 year with the increase in human caused fires. The prostrate growth form and the open patches of bare soil cause fires to burn less often, and with smaller fire size and intensity, which is different than most of the southern chaparral fire regimes. After a fire, a few scattered native grasses and annual forbs will sprout and become the most common vegetation for a couple of years, the chaparral shrubs quickly regain dominance by re-sprouting and establishing seedlings.

The harsh exposure of the soils of this ecological site makes it unlikely that the prostrate chaparral community would convert to a grassland community. In the event of heavy grazing, it would most likely become fingered with eroded gullies with sparsely covered scattered grasses and small forbs, with bare soil and gravel on the surface.

State and transition model

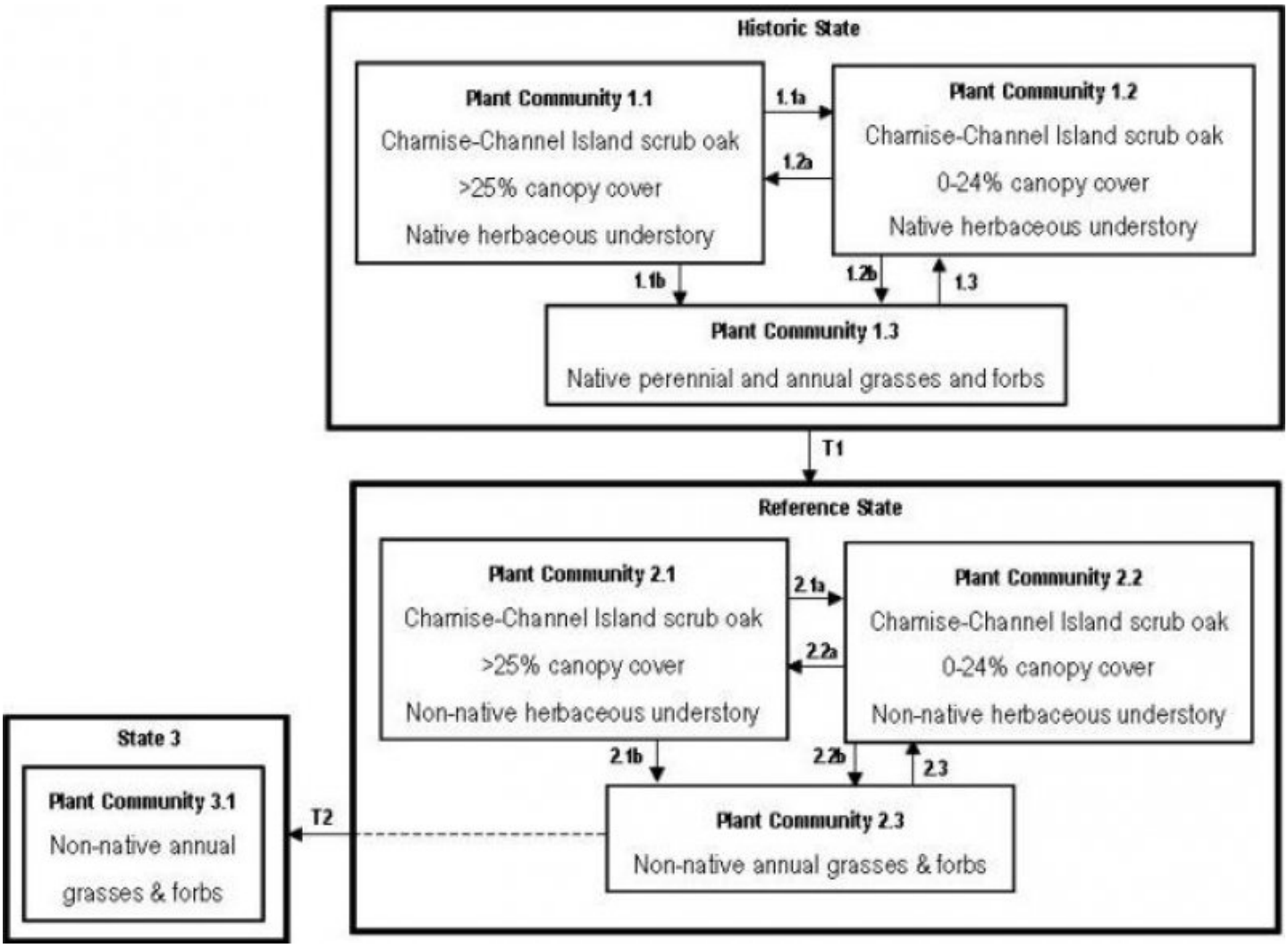

Figure 3. State Transition Model

State 1
Reference State - Plant Community 2.1

Community 1.1
Reference State - Plant Community 2.1

This state is similar to the reference state, PC 1.1, and is still dominated by chamise and Channel Island scrub oak, however it is now intermixed with a non-native annual grassland understory. Community Pathway 2.1a: The shift from PC 2.1 to PC 2.2 occurs under a fire regime of approximately 70 to 200 years, with lightning being the primary ignition source. Fires have generally increased to 40 to 50 years due to an increase in human-caused fires since the arrival of European settlers. Fires result in a decrease in shrub cover and an increase in the non-native understories dominated by exotic annual grasses. Community Pathway 2.1b: The shift from PC 2.1 to PC 2.3 occurs if fires become more frequent (less than 10 year intervals). Non-natural grazing by livestock and non-native wildlife can also push PC 2.1 towards PC 2.3.

State 2
Plant Community 1.2

Community 2.1
Plant Community 1.2

After a fire, the amount of bare soil will be high. There will probably be some resprouting of prostrate chamise (*Adenostoma fasciculatum* var. prostratum), Channel Island scrub oak (*Quercus pacifica*), and Santa Rosa Island Manzanita (*Arctostaphylos confertiflora*) from the root crowns, which could create a canopy with a cover between 0 to 24 percent. Some species, such as chamise, will produce abundant seedlings. Scattered native grasses and

annual forbs will germinate from seed and resprout from rhizomes to create an herbaceous understory. Community Pathway 1.2a: The shift from PC 1.2 back to PC 1.1 generally occurs 1 to 3 years after a fire event. Given an extended period of time without disturbance from fires or grazing, new shrubs will resprout and begin to increase in size and cover. Prostrate chamise, Channel Island scrub oak, and Santa Rosa Island Manzanita will continue to increase in cover, eventually reaching the pre-fire canopy cover. Community Pathway 1.2b: The shift from PC 1.2 to PC 1.3 will take place under continued grazing or frequent fires (less than 10 year intervals). These disturbances will hinder the new growth of shrubs, leading to a state dominated by native perennial and annual herbaceous species.

State 3
Plant Community 1.3

Community 3.1
Plant Community 1.3

If frequent fire or heavy grazing continually impacts the site, the regeneration of the shrubs will be negatively affected. The cover of shrubs will remain low, and the percent of bare ground will increase. Gullies may form in the bare areas. Other vegetative cover also remains low, due to the shallow droughty soils and the extreme wind exposure of this area. Community Pathway 1.3: The shift PC 1.3 back to PC 1.2 could occur after an extended time without disturbance, and in conjunction with restoration efforts. Transition 1: Continued frequent fires and non-natural grazing by livestock and non-native wildlife can place a stress on PC 1.3. This pressure can give an advantage to encroaching non-native plant species and may lead to the invasion of non-native annual grasslands.

State 4
Historic State - Plant Community 1.1

Community 4.1
Historic State - Plant Community 1.1

This community is dominated by prostrate chamise (*Adenostoma fasciculatum* var. prostratum) and Channel Island scrub oak (*Quercus pacifica*). Other common species include Santa Rosa Island Manzanita (*Arctostaphylos confertiflora*), bush monkeyflower (Mimulus longiflorus), and island monkey flower (Mimulus flemingii). The shrubs are less than 2 feet high, with open patches of gravel and bare soil. In adjacent wind sheltered areas, Channel Island scrub oak (*Quercus pacifica*) will grow taller, with toyon (*Heteromeles arbutifolia*) as a common associate. Community Pathway 1.1a: The shift from PC 1.1 to PC1.2 occurs under the natural fire regime of approximately 70 to 200 years. Fire results in a decrease in shrub cover and an increase in the native herbaceous understory community. Community Pathway 1.1b: The shift from PC 1.1 to PC 1.3 occurs if fires become more frequent (less than 10 year intervals). Non-natural grazing by livestock and non-native wildlife can also push PC 1.1 towards PC 1.3.

State 5
Plant Community 2.2

Community 5.1
Plant Community 2.2

This community is dominated by non-native annual grasslands, which will grow well while the canopy is open during the first couple of years following a fire. Most of the chamise and Channel Island scrub oak will recover and grow after a fire, which will eventually lead back to PC 2.1. Community Pathway 2.2a: The shift from PC 2.2 back to PC 2.1 generally occurs after an extended period of time without disturbance by fire or grazing. New chamise and Channel Island scrub oak will resprout and begin to increase in size and cover. Eventually, the non-native annual grasslands will start to diminish as they are shaded out by the shrubs. Community Pathway 2.2b: The shift from PC 2.2 to PC 2.3 will take place under continued grazing or frequent fires (less than 10 year intervals). These disturbances will hinder the new growth of shrubs, leading to a state dominated by annual grasses and forbs.

State 6
Plant Community 2.3

Community 6.1
Plant Community 2.3

If frequent fire or heavy grazing continually impacts this site, the regeneration of the shrubs will be considerably hindered. Annual non-native grasses and forbs will dominate as the cover of shrubs remains low and the percent bare ground increases. Community Pathway 2.3: The shift from PC 2.3 back to PC 2.2 could occur after an extended time without disturbance, and in conjunction with restoration efforts. Transition 2: Continual grazing as well as frequent fires occurring more often than the natural range could transition PC 2.3 into a long term state.

State 7
State 3 - Plant Community 3.1

Community 7.1
State 3 - Plant Community 3.1

This state is dominated by annual grasses and forbs with no chamise or Channel Island scrub oak present. Extensive restoration efforts could transition this state back to PC 2.2.

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Shrub/Vine					
1	**shrubs**			500–1200	
	chamise	ADFA	*Adenostoma fasciculatum*	200–1000	–
	Channel Island scrub oak	QUPA6	*Quercus pacifica*	50–150	–
	Santa Rosa Island manzanita	ARCO13	*Arctostaphylos confertiflora*	10–100	–
	coyotebrush	BAPI	*Baccharis pilularis*	0–50	–
	toyon	HEAR5	*Heteromeles arbutifolia*	1–50	–
Forb					
2	**forbs**			10–200	
	trefoil	LOTUS	*Lotus*	1–200	–
	southern bush monkeyflower	DILO6	*Diplacus longiflorus*	1–30	–
	island bush monkeyflower	DIPA10	*Diplacus parviflorus*	1–30	–
	golden-yarrow	ERCOC12	*Eriophyllum confertiflorum var. confertiflorum*	1–30	–
	common yarrow	ACMI2	*Achillea millefolium*	1–10	–
Grass/Grasslike					
3	**grasses**			5–100	
	needlegrass	NASSE	*Nassella*	1–50	–
	soft brome	BRHOH	*Bromus hordeaceus ssp. hordeaceus*	1–50	–
	common barley	HOVU	*Hordeum vulgare*	1–20	–

Hydrological functions

there is very high runoff and soil movement caused by the soils harsh exposure and low ground cover.

Inventory data references

The Following NRCS plots were used for describing this ecological site.

SCV-109 %
SRV-14 %
SRV-11 Lbs
SRV-1 Lbs - Site location

Type locality

Location 1: Santa Barbara County, CA	
General legal description	The site location is on Santa Rosa Island about 2 miles east of Black Mountain.

Other references

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Contributors

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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:**