USDA Natural Resources Conservation Service

Ecological site R019XI116CA Clayey 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.

Associated sites

R019XI100CA	**Loamy slopes 13-31" p.z.** The boundaries of this sagebrush site and the native grassland is often unclear do to disturbance.
R019XI113CA	**Loamy volcanic slopes 13-24" p.z.** The boundaries of this sagebrush site and the native grassland is often unclear do to disturbance.

Similar sites

R019XI118CA	**Marine terraces 21-34" p.z.** This is a grassland site dominated by Distichlis spicata (saltgrass).

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Nassella pulchra* (2) *Nassella lepida*

Physiographic features

This ecological site is found on all aspects on coastal hills and marine terraces, with slopes ranging from 2 to 75 percent. Elevation ranges from just above sea level to 2470 feet, but is most common below 1500 feet.

Table 2. Representative physiographic features

Landforms	(1) Hill (2) Marine terrace
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 19 inches with a range between 13 to 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 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 wetland water features.

Soil features

This ecological site is found on numerous soil components, including: ahoy, ballast, halyard, hawser, lodestone, topdeck, typic haploxerolls, and lithic and typic argixerolls. These soils have developed from residuum weathered from andesite, basalt, volcanic breccia, sandstone, limestone, and calcareous shale. Another soil that is found, Fiale, is developed from slope alluvium derived from volcanic breccia, basalt, and andesite. Another soil, Windage, has developed from uplifted marine deposits derived from clayey shale. These soils are generally mollisols with an argillic horizon, or vertisols with high shrink-swell potentials, they moderately deep to deep with clayey soil textures.

Mean annual soil temperatures (MAST) on Santa Cruz Island ranges from 59 to 71 degrees F, which are classified as thermic. On Santa Rosa, MAST ranges from 59 to 64 degrees, and are also classified as thermic.

This ecological site occurs on the following soil components on several mapunits:

Area Symbol Component
CA688 670 Ahoy
CA688 700 Ahoy
CA688 700 Ahoy - Moderately steep
CA688 950 Ahoy
CA688 713 Ballast
CA688 724 Ballast
CA688 730 Ballast
CA688 762 Ballast
CA688 800 Ballast
CA688 100 Fiale
CA688 101 Fiale
CA688 102 Fiale
CA688 103 Fiale
CA688 155 Fiale
CA688 153 Halyard
CA688 155 Halyard
CA688 762 Halyard
CA688 700 Hawser
CA688 700 Hawser - Moderately steep
CA688 711 Hawser
CA688 763 Hawser
CA688 910 Hawser
CA688 910 Hawser - Moderately steep
CA688 723 Lithic Argixerolls
CA688 730 Lodestone - Very deep
CA688 761 Lodestone
CA688 762 Lodestone
CA688 763 Lodestone - Very deep

CA688 100 Topdeck
CA688 102 Topdeck
CA688 150 Topdeck
CA688 153 Topdeck
CA688 291 Topdeck
CA688 800 Typic Argixerolls
CA688 725 Typic Haploxeralfs
CA688 710 Windage
CA688 711 Windage
CA688 712 Windage
CA688 713 Windage
CA688 761 Windage

Table 4. Representative soil features

Surface texture	(1) Very gravelly (2) Extremely gravelly (3) Extremely paragravelly
Family particle size	(1) Clayey
Drainage class	Moderately well drained to well drained
Permeability class	Moderate to very slow
Soil depth	7–72 in
Surface fragment cover <=3"	5%
Available water capacity (0-40in)	1.3–6 in
Calcium carbonate equivalent (0-40in)	1–40%
Electrical conductivity (0-40in)	0 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	5.6–9
Subsurface fragment volume <=3" (Depth not specified)	3–90%
Subsurface fragment volume >3" (Depth not specified)	1–12%

Ecological dynamics

The reference state for the ecological site is a native grassland community, which is characterized by open, clumped bunches of native perennial bunchgrasses, including purple needlegrass (*Nassella pulchra*) and foothill needlegrass (*Nassella lepida*). Historically, the total canopy cover in the native grasslands was most likely between 50 to 70 percent (Dudek, 2000 p.55), with native annual and perennial forbs occupying the open areas. In the past there was probably a higher diversity of perennial grasses and native forbs than is seen today. In many areas, non-native grasses and forbs have replaced the native species.

This community has been severely impacted and altered since Anglo-European settlement. Undisturbed native grasslands are hard to find, and in their place several different plant communities have established. These communities can be considered transitional states, because in most cases they can convert back to the historical state. The most widespread altered state is the non-native annual grassland state. The other states include the invasive non-native forbs and the coastal sagebrush state. Several factors have promoted these transitions, primarily the introduction of non-native Mediterranean species and the severe long-term over-grazing by livestock and feral animals. This, in turn, has led to a change in the natural fire regime. Currently there is a debate concerning whether the non-native annual grassland should be treated as a state within the native grassland community, or if it has crossed a threshold to become its own new plant community. For this ecological site description it will be treated as a state since the native bunchgrasses are still present and reproducing well, thus showing potential for recovery (Corbin and D'Antonio, 2004).

In the context of this description, the area included as valley and foothill grassland is strongly tied to soils with high clay content, most of which have high shrink-swell potential (vertisols). These types of soils have been repeatedly documented as favoring native bunchgrasses in southern California (Knecht, 1971). The non-native forbs of the site include invasive weeds such as yellow star-thistle (*Centaurea solstitialis*), black mustard (*Brassica nigra*), and fennel (Foeniculum spp.). These Mediterranean species are extremely difficult to eliminate. Of these weeds, yellow star-thistle has the greatest ability to alter the soil's water recharge and depletion pattern within the grasslands (Enloe et al., 2003). Yellow star-thistle has been shown to have a drier soil profile than that of either the non-native annual grasses or the native perennial grasses. It continues to deplete the soil's water later into the season, and to greater depths than either of the grass communities studied. This can cause a drought-like condition for the grasses even in a normal water year.

In other areas, the non-native annual grasslands are in a state of transition with the coastal sagebrush community. The non-native grassland is composed of slender oat (*Avena barbata*), wild oat (*Avena fatua*), ripgut grass (*Bromus diandrus*), soft brome (*Bromus hordeaceus*), Spanish brome (*Bromus madritensis*), stork's bill (Erodium), common barley (*Hordeum vulgare*), Darnel ryegrass (*Lolium temulentum*), and a variety of other native and non-native species.

The coastal sagebrush community can invade native grasslands when the disturbance from grazing and fire is removed. Invasion of coastal sagebrush into the native grasslands is uncommon and different from the recovery of coastal sagebrush in its historical territory. The latter example is described in the coastal sagebrush ecological sites, R020XI113CA and R020XI100CA.

During the mid 1800s and the early 1900s the Channel Islands were heavily impacted by grazing from sheep, goats, cattle, horses and pigs. During this time, many acres of the islands were also cultivated for various crops, with hay as the primary production. In 1922, 800 acres of hay were cultivated at Christi Ranch, Scorpion Ranch, and near Prisoners Harbor (Junak et al., 1995). Livestock may have been brought to Santa Rosa Island as early as 1805. The first cattle were brought to Santa Cruz Island in 1830 to support 100 exiled Mexican convicts. Ranching began in 1839 with the first private land owner, Andres Castillero. By 1853 the Santa Cruz Island Ranch had a good reputation for its well-bred, healthy Merino sheep. The sheep population steadily increased as they began to roam wild. Their population was estimated to be over 50,000 between 1870 and 1885, and up to 100,000 by 1890. In 1939, as a response to their detrimental effects to the island, 35,000 sheep were rounded up for sale to the mainland and efforts began to eliminate them. An estimated 180,000 sheep were shot during the 1960s and 1970s. In 1987 The Nature Conservancy became the sole owner of the western 90 percent of Santa Cruz Island. They continued to eliminate the sheep, and also began removing cattle from the island. Pigs were reportedly introduced to the island in 1853, and by 1854, were roaming freely. The pigs are currently being eliminated section by section from Santa Cruz Island. (Junak et al., 1995)

The heavy grazing by the livestock eventually caused the death of many natural shrubs, grasses and forbs on the island. The livestock also ate the flowers and seeds, reducing the chance of reproduction and causing a lack of leaf area to support photosynthesis. The lack of vegetative cover and the trampling of hooves caused severe erosion over most of the island. With high winds and seasonal rains, much of the nutrient rich topsoil was lost and replaced with shallower soils and harsh subsurface soils. The sheep and goats were perhaps the most devastating of the introduced livestock. These animals grazed everything down to the soil level even eating some of the roots. In hot summers, the remaining grass roots were exposed and quickly died in the heat. This reduced vegetative cover and the ability of the plants to stabilize the soil. Since the removal of the herbivores, there have been many positive signs of recovery in the grasslands. The active erosion has decreased and overall plant cover has increased. Mostly non-native grasses have recovered, but areas of native grassland also seem to be in good health.

While there are areas where vegetation is recovering, the continued up-rooting of the vegetation by the pigs still causes significant damage to large areas across Santa Cruz Island. The pigs dig through the soil looking for roots, acorn seeds, bulbs, and young shoots of plants. This continual disturbance creates bare soil and favors the non-native annual grasses and forbs (Cushman et al., 2004). A pattern has been noticed that seems to suggest that the pigs will avoid areas of dense perennial grasses. Entire areas around native grassland patches tend to be uprooted, but the areas inside the dense perennial grasses are likely to be left alone (Dresser, 2004). It could be that the dense root masses are more work for the pigs to get through.

A study of the pollen in soil cores taken from an estuary on Santa Rosa Island reveal dramatic changes since the 1800s (Cole and Liu, 1994). The pollen analysis shows increases in grass pollen of more than double any period recorded in the prior 5,000 years. It was suggested this could be due to the introduction of non-native annual grasses. The decline of grass pollen coincides with the introduction of large numbers of grazing livestock in the 1840s. Charcoal fragments also increased at this time, possibly attributed to ranchers burning areas to clear brush or an increased fire potential from the annual grasses. The first stork's bill (Erodium) pollen was dated to 1850, with a peak in 1894. The non-native stork's bill thrives on disturbed bare soil. A peak in fungal spores between 1874 and 1894 coincides with the peak in soil erosion and the sheep population. (Cole and Liu, 1994)

Historical data on the natural fire regime for this area is lacking. Natural, lightning-initiated fires are infrequent on the Channel Islands, which is similar to the southern California mainland. The introduction of non-native grasses, grazing, and intentional fires have changed the spatial distribution of the plant communities, in turn altering the natural fire regime. Fires in Southern California naturally occur and spread in summer and fall when the grasses are dormant. The fuels in the native grasslands were discontinuous and patchy. Fire frequencies may have increased since settlement due to the increase in fuel loads, the continuity of the annual grasses, and the addition of human caused fires (Klinger and Messer, 2000).

The use of fire by Native Americans and its affect on the historical landscape mosaic are unclear (Keeley, 2002). The Chumash Indians lived on and visited many of the Channel Islands. Records show habitation for more than 6,000 years, and estimate about 2,000 people living on Santa Cruz Island in 1542. It is believed that fire was used to clear shrublands in favor of grasslands in the coastal mountains of California (Keeley, 2002). It is likely this practice was used to some extent on the Channel Islands as well.

The competition from non-native annual grasses can be reduced with early spring fire, which will kill the seed crops. Both native and annual grasses are affected, but the natives are more likely to resprout. However, spring burning would also affect the desired native annual seeds (Keeley, 2003). Native grassland species are relatively fire adapted, due to the ability to resprout after fire. One study reports increased vigor growth and higher germination in purple needlegrass (*Nassella pulchra*) seeds after fire (Dyer, 2002). However, the overall effects of using fire for restoration and in changing species composition are not clear, some say it is favorable for native grasslands, while others say that it is detrimental, especially if the fires are too frequent. Native bunchgrasses must be present within the grassland or seedlings need to be planted for the restoration efforts to work.

State and transition model

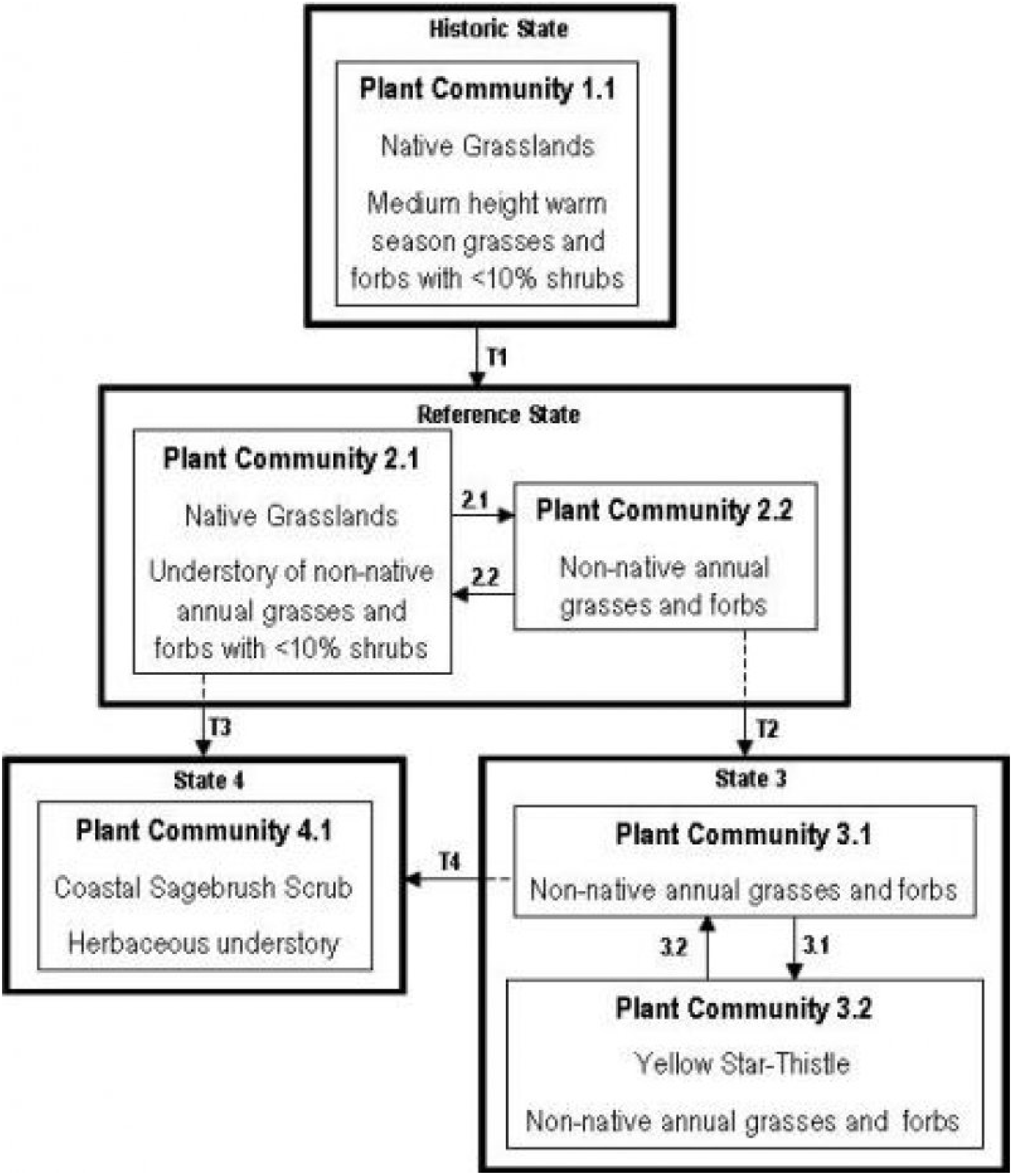

Figure 3. State Transition Model

State 1
Reference State - Plant Community

Community 1.1
Reference State - Plant Community

Figure 4. Native Grassland

This state is similar to the historic state and is dominated by open, clumped bunches of native perennial bunchgrasses, including purple needlegrass (*Nassella pulchra*) and foothill needlegrass (*Nassella lepida*). Several non-native annual grasses and forbs have become interspersed throughout the bunchgrasses. Common non-native species include slender oat (*Avena barbata*), wild oat (*Avena fatua*), ripgut grass (*Bromus diandrus*), soft brome (*Bromus hordeaceus*), Spanish brome (*Bromus madritensis*), stork's bill (Erodium), common barley (*Hordeum vulgare*), and Darnel ryegrass (*Lolium temulentum*), Community Pathway 2.1: The shift from PC 2.1 to PC 2.2 occurs with fire. Natural, lightning-initiated fires are infrequent on the Channel Islands, however the introduction of non-native grasses, grazing, and intentional fires have changed the spatial distribution of the plant communities, and in turn altered the natural fire regime. Fire frequencies may have increased since settlement due to the increase in fuel loads, the continuity of the annual grasses, and the addition of human caused fires (Klinger and Messer, 2000). Transition 3: In the absence of disturbance from fire or grazing, coastal sagebrush can slowly encroach into PC 2.1, leading to State 4. The invasion of coastal sagebrush into the native grasslands is uncommon and different from the recovery of coastal sagebrush in its historical territory. The latter example is described in the coastal sagebrush ecological sites, R020XI113CA and R020XI100CA.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	820	1250	2000
Forb	20	60	80
Shrub/Vine	5	10	20
Total	**845**	**1320**	**2100**

Table 6. Soil surface cover

Tree basal cover	0%
Shrub/vine/liana basal cover	0-8%
Grass/grasslike basal cover	40-80%
Forb basal cover	1-20%
Non-vascular plants	0-2%
Biological crusts	0-2%
Litter	15-60%
Surface fragments >0.25" and <=3"	1-10%
Surface fragments >3"	0-3%
Bedrock	0%
Water	0%
Bare ground	1-25%

Table 7. Canopy structure (% cover)

Height Above Ground (Ft)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.5	–	0-2%	1-10%	1-10%
>0.5 <= 1	–	0-2%	20-40%	1-10%
>1 <= 2	–	0-2%	30-70%	0-2%
>2 <= 4.5	–	0-8%	0-10%	–
>4.5 <= 13	–	–	–	–
>13 <= 40	–	–	–	–
>40 <= 80	–	–	–	–
>80 <= 120	–	–	–	–
>120	–	–	–	–

State 2
Plant Community 2.2

Community 2.1
Plant Community 2.2

This state is dominated by non-native annual grasses and forbs that have established in place of the native grasslands, post-fire. Purple needlegrass and foothill needlegrass will still be present, but the recent fires have removed competition and allowed the non-native annual species to germinate and sprout. We do not have plot data for this state, due to the lack of fire in native grasslands on the Channel Islands. This state lasts only 1 to 2 years before returning to PC 2.1 (Klinger and Messer 2001; Keeley 2001). Community Pathway 2.2: After a fire, the top-killed perennial grasses will resprout from the root crown with increased vigor and seed production. After an extended period of time without disturbance, purple needlegrass and foothill needlegrass will reclaim their dominance. The non-native grasses and forbs will be shaded out as the native grassland returns to its original pre-fire cover. Transition 2: The transition to state 3 can take place under frequent fire regimes or extreme grazing which put stress on the reference state. This can cause the non-native grasses and forbs seen in PC 2.2 to become a permanent state. The perennial bunchgrasses do not compete well with the annual grasses, because they produce less seeds and grow slower. The annual grasses also germinate earlier in the season than do the perennial grasses and use more of the available soil water, leaving the soil profile drier by the time the perennial grasses begin to sprout. The increased amount of mulch from the annual grasses has been shown to be detrimental for the germination of most warm season native species (Young et al., 1972). The competition from non-native annual grasses can be reduced with early spring fire and restoration efforts.

State 3
State 3 - Plant Community 3.1

Community 3.1
State 3 - Plant Community 3.1

Figure 6. non native annual grassland

The non-native grassland community is common through out California. The primary species are slender oat (*Avena barbata*), wild oat (*Avena fatua*), ripgut grass (*Bromus diandrus*), soft brome (*Bromus hordeaceus*), and Spanish brome (*Bromus madritensis*). The annual production for the non-native annual grasses is precipitation dependent, and highly variable. Site specific factors such as aspect, soil moisture, marine influences, and landscape position also influence annual production. Community Pathway 3.1: The shift from PC 3.1 to PC 3.2 may be linked to severe pig disturbance and the introduction of non-native Mediterranean species. The seeds of the most invasive of these species, yellow star-thistle, are easily spread by car tires, hikers' socks and shoes, and by wildlife, all of which can cause infestation of new areas. Transition 4: In the absence of disturbance from fire or grazing, coastal sagebrush can slowly encroach into PC 3.1, leading to state 4. This tends to be a rare transition.

Table 8. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	1000	2800	3500
Forb	10	60	200
Shrub/Vine	2	15	50
Total	**1012**	**2875**	**3750**

Table 9. Soil surface cover

Tree basal cover	0%
Shrub/vine/liana basal cover	0-10%
Grass/grasslike basal cover	1-95%
Forb basal cover	1-10%

Non-vascular plants	0-1%
Biological crusts	0-2%
Litter	1-40%
Surface fragments >0.25" and <=3"	5-20%
Surface fragments >3"	1-5%
Bedrock	0%
Water	0%
Bare ground	5-25%

Table 10. Canopy structure (% cover)

Height Above Ground (Ft)	Tree	Shrub/Vine	Grass/ Grasslike	Forb
<0.5	–	0-2%	10-40%	1-10%
>0.5 <= 1	–	0-5%	20-50%	1-5%
>1 <= 2	–	0-10%	30-90%	1-5%
>2 <= 4.5	–	0-5%	1-5%	–
>4.5 <= 13	–	–	–	–
>13 <= 40	–	–	–	–
>40 <= 80	–	–	–	–
>80 <= 120	–	–	–	–
>120	–	–	–	–

State 4
Plant Community 3.2

Community 4.1
Plant Community 3.2

Figure 8. non native invasive forbs

This community was dominated by non-native grasses, but increasingly became invaded by yellow star-thistle (*Centaurea solstitialis*), Maltese star-thistle (*Centaurea melitensis*), black mustard (*Brassica nigra*), shortpod mustard (*Hirschfeldia incana*), sweet fennel (*Foeniculum vulgare*), horehound (*Marrubium vulgare*), and many others. These Mediterranean species are extremely difficult to eliminate. Of these weeds, yellow star-thistle (*Centaurea solstitialis*) has the greatest ability to alter the soil's water recharge and depletion pattern within the grasslands (Enloe et al., 2003). Yellow star-thistle has been shown to have a drier soil profile than that of either the non-native annual grasses or the native perennial grasses, and continues to deplete the soil's water later into the season, and to greater depths than either of the grass communities studied. This can cause a drought-like condition for the grasses even in a normal water year. Community Pathway 3.2: The shift from PC 3.2 back to PC 3.1 could occur after an extended time without disturbance, and in conjunction with extensive restoration efforts to remove the yellow star-thistle.

State 5
State 4 - Plant Community 4.1

Community 5.1
State 4 - Plant Community 4.1

Figure 9. Coastal Sagebrush Scrub

The coastal sagebrush community can invade either the native grasslands or the non-native annual grasslands when the disturbance from grazing and fire is removed. Invasion of coastal sagebrush into the native grasslands is uncommon and different from the recovery of coastal sagebrush in its historical territory. Coyotebrush (*Baccharis pilularis*) often invades first, with California sagebrush coming in afterwards. See the coastal sagebrush ecological sites R020XI100CA and R020XI113CA for more information on this community.

State 6
Historic State - Plant Community 1.1

Community 6.1
Historic State - Plant Community 1.1

Historically, the total canopy cover in the native grasslands was most likely between 50 to 70 percent (Dudek, 2000 p.55), with native annual and perennial forbs occupying the open areas. In the past there was probably a higher diversity of perennial grasses and native forbs than is seen today. Native annuals were probably more abundant as well. Some native species mentioned in literature and found in the NRCS vegetation transects include early onion (*Allium praecox*), Coulter's saltbush (*Atriplex coulteri*), blow wives (*Achyrachaena mollis*), Menzies' fiddleneck (*Amsinckia menziesii* var. menziesii), common goldenstar (*Bloomeria crocea*), bluedicks (*Dichelostemma capitatum*), California goldfields (*Lasthenia californica*), coastal tidytips (*Layia platyglossa*), clustered tarweed (*Hemizonia fasciculata*), California barley (*Hordeum brachyantherum* ssp. californicum), bobtail barley (*Hordeum intercedens*), alkali desert parsley (*Lomatium caruifolium*), miniature lupine (*Lupinus bicolor*), western blue-eyed grass (*Sisyrinchium bellum*), Johnny-jump-up (*Viola pedunculata*), sticky sandspurry (*Spergularia macrotheca* var. macrotheca) (Dudek et al., 1995). Transition 1: Many non-native annual grasses and forbs were introduced to the Channel Islands when Anglo-European settlements began, which lead to the reference state. Several areas were cultivated and planted with these non-native species. Since then, the non-native grasses and forbs have spread to all areas of the islands. The digging and uprooting caused by the feral pigs and livestock left bare, disturbed soils that became suitable for annual invaders. The disturbance also made it difficult for perennial grasses and shrubs to survive. Erosion, caused by prolonged heavy grazing in the past, has also created disturbed bare soil for the annual grasses.

Additional community tables

Table 11. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**native grasses**			700–1000	
	foothill needlegrass	NALE2	*Nassella lepida*	10–550	–
	purple needlegrass	NAPU4	*Nassella pulchra*	150–400	–
	saltgrass	DISP	*Distichlis spicata*	1–15	–
2	**non native annual grasses**			70–350	
	ripgut brome	BRDI3	*Bromus diandrus*	10–180	–
	soft brome	BRHO2	*Bromus hordeaceus*	5–75	–
	slender oat	AVBA	*Avena barbata*	8–50	–
	Darnel ryegrass	LOTE2	*Lolium temulentum*	10–30	–
	annual fescue	VUMY	*Vulpia myuros*	1–10	–
	compact brome	BRMA3	*Bromus madritensis*	5–10	–
	barley	HORDE	*Hordeum*	0–5	–
Forb					
3	**native forbs**			5–40	
	western blue-eyed grass	SIBE	*Sisyrinchium bellum*	1–40	–
	common goldenstar	BLCRC	*Bloomeria crocea var. crocea*	1–15	–
	American wild carrot	DAPU3	*Daucus pusillus*	1–10	–
	miniature lupine	LUBI	*Lupinus bicolor*	0–5	–
	sanicle	SANIC	*Sanicula*	0–5	–
	Johnny-jump-up	VIPE3	*Viola pedunculata*	0–2	–
4	**non native forbs**			5–10	
	stork's bill	ERODI	*Erodium*	5–10	–
	smooth cat's ear	HYGL2	*Hypochaeris glabra*	0–2	–
Shrub/Vine					
5	**shrubs**			1–10	
	Australian saltbush	ATSE	*Atriplex semibaccata*	1–5	–
	Menzies' goldenbush	ISME5	*Isocoma menziesii*	1–5	–

Table 12. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	**non native grasses**			1000–3500	
	slender oat	AVBA	*Avena barbata*	900–2600	–
	ripgut brome	BRDI3	*Bromus diandrus*	80–400	–
	common barley	HOVU	*Hordeum vulgare*	10–210	–
	Darnel ryegrass	LOTE2	*Lolium temulentum*	5–100	–
	soft brome	BRHO2	*Bromus hordeaceus*	10–50	–
	compact brome	BRMA3	*Bromus madritensis*	1–50	–
Forb					
2	**native forbs**			1–75	
	fiddleneck	AMSIN	*Amsinckia*	0–50	–
	thistle	CIRSI	*Cirsium*	0–50	–
	cryptantha	CRYPT	*Cryptantha*	0–5	–
	island bristleweed	HADE4	*Hazardia detonsa*	0–5	–
	Wright's cudweed	PSCAM	*Pseudognaphalium canescens ssp. microcephalum*	0–5	–
3	**non native forbs**			5–100	
	smooth cat's ear	HYGL2	*Hypochaeris glabra*	1–50	–
	burclover	MEPO3	*Medicago polymorpha*	1–15	–
	stork's bill	ERODI	*Erodium*	1–10	–
	shortpod mustard	HIIN3	*Hirschfeldia incana*	1–10	–
	common sowthistle	SOOL	*Sonchus oleraceus*	0–5	–
	lettuce	LACTU	*Lactuca*	1–5	–
Shrub/Vine					
4	**shrubs**			2–50	
	coyotebrush	BAPI	*Baccharis pilularis*	2–50	–
	Australian saltbush	ATSE	*Atriplex semibaccata*	0–5	–

Table 13. Community 5.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Shrub/Vine					
1	**shrubs**			175–3000	
	coastal sagebrush	ARCA11	*Artemisia californica*	100–2000	–
	redflower buckwheat	ERGRG5	*Eriogonum grande var. grande*	50–900	–
	Santa Cruz Island buckwheat	ERAR6	*Eriogonum arborescens*	0–540	–
	coyotebrush	BAPI	*Baccharis pilularis*	25–100	–
Grass/Grasslike					
2	**grasses**			50–2500	
	ripgut brome	BRDI3	*Bromus diandrus*	10–1800	–
	wild oat	AVFA	*Avena fatua*	10–800	–
	purple needlegrass	NAPU4	*Nassella pulchra*	0–200	–
	perennial ryegrass	LOPEP	*Lolium perenne ssp. perenne*	0–200	–
	soft brome	BRHO2	*Bromus hordeaceus*	0–100	–
	slender oat	AVBA	*Avena barbata*	0–100	–
	foothill needlegrass	NALE2	*Nassella lepida*	0–90	–
	compact brome	BRMA3	*Bromus madritensis*	0–10	–
Forb					
3	**forbs**			1–450	
	lupine	LUPIN	*Lupinus*	0–400	–
	common catchfly	SIGA	*Silene gallica*	0–50	–
	bluedicks	DICA14	*Dichelostemma capitatum*	0–1	–

Animal community

The endemic Channel Island fox (Urocyon littoralis)is a critically endangered species and utilize the grasslands as well as other habitats. They eat a variety of food, from mice to large insects to fruit. The Channel Island deer mouse also uses the grasslands for food and cover.

The feral pigs still roam Santa Cruz Island causing ground disturbance similar to a roto-tiller, eating tubers, acorns, other vegetation, and insects along the way. At this time, a pig eradication project is underway.

Hydrological functions

None

Recreational uses

This area is primarily utilized for recreation such as hiking and wildlife viewing.

Wood products

None

Inventory data references

Native grassland plots include:
SRV-7
SRV-9
SRV-10
SCV-107
Non-native grassland plots include:
SR-81
SR-101
SCV-4
SC-8
Non-native forb plots:
SCV-2

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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:**

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2. **Presence of water flow patterns:**

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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:

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

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

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

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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:**

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17. **Perennial plant reproductive capability:**
