

Rapid Assessment Reference Condition Model

The Rapid Assessment is a component of the LANDFIRE project. Reference condition models for the Rapid Assessment were created through a series of expert workshops and a peer-review process in 2004 and 2005. For more information, please visit www.landfire.gov. Please direct questions to helpdesk@landfire.gov.

Potential Natural Vegetation Group (PNVG)

R1SCRBnc Coastal Scrub/Coastal Prairie

General Information

Contributors (additional contributors may be listed under "Model Evolution and Comments")

Modelers

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Reviewers

Vegetation Type

Shrubland

General Model Sources

- Literature
- Local Data
- Expert Estimate

Rapid Assessment Model Zones

- California
- Great Basin
- Great Lakes
- Northeast
- Northern Plains
- N-Cent. Rockies
- Pacific Northwest
- South Central
- Southeast
- S. Appalachians
- Southwest

Dominant Species*

BAPI
 NAPU
 ARCA
 DACA

LANDFIRE Mapping Zones

3 6
 4
 5

Geographic Range

California Northern and Southern Coast Ranges, which includes: Section 263A-Northern California Coast, Section 261A-Central California Coast, and Section 261B-Southern California coast (Mcnab and Avers 1994). Coastal scrub/prairie communities grow in discontinuous patches in a thin band near the coast stretching from about northern Los Angeles County, California northward to southern Oregon. Coastal scrub communities are considerably more widespread in Southern California, occurring both along the coast and in low elevation valleys.

Biophysical Site Description

Environmental conditions that preclude forest development are the unifying factors for these communities, including sustained salt-laden winds of coastal terraces and headlands, excessively drained and windy ridgetops, hot interior valleys with high fire frequencies, and sites with heavy or infertile soils. The vegetation in this vegetation group occurs along the Pacific Coast (usually occurs within about 45 km (20 mi) of the ocean) along an elevation gradient (0-900 m). Communities generally found on coastal slopes and elevated marine terraces that grow in variety of soils, including old, stabilized dunes. Climatic conditions for coastal scrub/coastal prairie range from quite wet on the North Coast to near desert in Southern California. In nearly all cases, temperature regimes are moderated by oceanic influences, with limited winter frost and frequent summer fog. Fog reduces evapotranspiration, and greatly influences potential natural vegetation. Precipitation is highly variable, ranging from 25-200 cm annually, with a pronounced dry period in summer.

Vegetation Description

Coastal scrub communities are shrub-dominated communities that are usually, but not always, found near the coast. The dominant shrubs are usually less than 2m in height. The dominant shrub species are mostly 1-2 meter tall evergreens, with no single species being typical of all Coastal Scrub stands. With change from mesic to xeric sites, dominance appears to shift from evergreen species in the north to drought-deciduous species in the south, and is called northern coastal scrub in the north and coastal sage scrub in the south.

*Dominant Species are from the NRCS PLANTS database. To check a species code, please visit <http://plants.usda.gov>.

Variation in coastal influence at a given latitude produces less pronounced composition changes, with northern coastal scrub moving to largely north facing slopes towards the south and coastal sage scrub moving towards south-facing slopes as you move north.

Across this broad geographic range, associated species vary widely. Two types of northern Coastal Scrub are usually recognized. A minor sub-type (limited in range) occurs as low-growing patches of bush lupine and many-colored lupine at exposed, ocean-side sites. Some stands are considered ones that develop into forest (mixed evergreen forest, e.g., Douglas-fir and/or oaks), and to the south chaparral types may invade some portions of this community, while others are permanent. A second and more common type in the northern range (Northern Coastal Scrub) usually occurs at less exposed sites.

Coastal prairies are most common in semi-arid areas where precipitation totals are in the 25cm-50cm range and summer temperatures are hot. The lack of woody plants in some grasslands are likely the result of Native American proto-agriculture, since practices involving intentional burning of rangeland by indigenous groups were apparently widespread. Even though the majority of these sites are probably fire-maintained, some percentage may be stable communities on certain soil types, particularly Lithosols and deep, fine-textured, self-mulching soil. The rate of invasion is generally positively correlated with the amount of spring rainfall, because wet springs maximize early root growth. Height of the grasses typically is 0.5-1 m when flowering, and total cover can approach 100%. Species composition is highly variable and consists of low (10 cm height) annual and perennial forbs.

Grasslands were probably altered more quickly and profoundly by European contact than any other plant communities in California. Europeans brought sheep, cattle and horses that exerted heavy grazing pressures on grasslands that had been subject to only light grazing pressures since the end of the last ice age. At the same time, non-native species from the Mediterranean that were well adapted to both the climate and the heavy grazing were inadvertently or intentionally introduced and soon out-competed the native species in many locations. In addition, large areas of the California grasslands were plowed and dry-farmed for a short period in the 19th century and then abandoned. The resulting grasslands are highly modified versions of the native grasslands composed primarily of non-native species. Much speculation has been made about the detailed characteristics of most of the original native grasslands.

Many of the shrub species are semi-deciduous and drop their leaves during the summer drought. A number of coastal scrub species have close relatives in desert scrub communities. Southern coastal scrub is often called coastal sage scrub since many of the dominant shrubs are aromatic, including California sagebrush (*Artemisia californica*) and various true sages (genus *Salvia*). Southern coastal scrub is often grouped with chaparral and referred to as soft chaparral, in reference to the soft leaves and flexible branches of most of the common shrub species. Ecologists refer to changes in the grassland, chaparral, and oak woodland mosaic of California as “non-directional fluctuations” rather than succession. Coast live oak may be considered seral or climax depending on habitat, but it is tolerant of shade throughout its life. Because deer and cattle prefer coast live oak, it is gradually replaced by California bay, in some areas of coastal northern California, where the two species co-dominate.

Disturbance Description

Fires and other disturbances in this group can be characterized as follows: variable frequency, season and intensity, depending on the size of and proximity to, Native American to village sites. The following is based on the information from fire regime workshops held for revision of the Manual of California Vegetation (Table 2; *Artemisia californica*, *Baccharis pilularis*, and *Nassella pulchra* combined). Frequency: 1-100+. Seasonality: Jun-Nov. Size/extent: variable: up to or beyond stand size (spotty to stand replacing (400 ha). Complexity: low-high. Intensity: low-high. Severity: mod-very-high. Type: dependent-independent crown.

Adjacency or Identification Concerns

Historic occurrence is changing from frequent, low to high intensity surface fires to infrequent, moderate to high intensity stand replacing fires. Southern coastal scrub communities are much less widespread now due to the extensive urban development across coastal Southern California. The prairie portion of this association has probably been greatly reduced in extent and quality as a result of increased grazing and introduction of exotics. With the increase in winter precipitation forecast by the majority of global climate change models for California, model results suggest a widespread expansion of forest, overtaking both woodland and shrubland, and constrained only where climate is still arid enough to support sufficient grass biomass to fuel frequent fire.

Scale Description

Sources of Scale Data Literature Local Data Expert Estimate

Patch size variable from 0.1 to 400 ha.

Issues/Problems

The differences from the northern end of this group to the southern end of this group will probably lead to future workers to divide this group into southern and northern aspects.

Model Evolution and Comments

Potential reviewers: Jon Keeley; V. Thomas Parker; Michael Barbour

Succession Classes**
Succession classes are the equivalent of "Vegetation Fuel Classes" as defined in the Interagency FRCC Guidebook (www.frcc.gov).

Class A 40%

Early1 postrepl

Description

Coastal prairie with herbs, occasional pyrophyte endemics

Dominant Species* and Canopy Position

NAPU4
DACA3

Structure Data (for upper layer lifeform)

	Min	Max
Cover	2 %	90 %
Height	no data	no data
Tree Size Class	no data	

Upper Layer Lifeform

- Herbaceous
- Shrub
- Tree

Upper layer lifeform differs from dominant lifeform. Height and cover of dominant lifeform are:

Fuel Model no data

Class B 15%

Mid1 Closed

Description

>50% cover short-lived shrub species (e.g., Artemisia californica, Baccharis pilularis), some longer-lived species

Dominant Species* and Canopy Position

ARCA1
BAPI

Structure Data (for upper layer lifeform)

	Min	Max
Cover	50 %	90 %
Height	no data	no data
Tree Size Class	no data	

Upper Layer Lifeform

- Herbaceous
- Shrub
- Tree

Upper layer lifeform differs from dominant lifeform. Height and cover of dominant lifeform are:

Fuel Model no data

*Dominant Species are from the NRCS PLANTS database. To check a species code, please visit <http://plants.usda.gov>.

Class C 43%

Mid1 Open
Description

<50% cover short-lived shrub species (e.g., Artemisia californica, Baccharis pilularis), some longer-lived species

Dominant Species* and Canopy Position

ARCA1
BAPI

Upper Layer Lifeform

- Herbaceous
- Shrub
- Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	20 %	49 %
Height	no data	no data
Tree Size Class	no data	

Upper layer lifeform differs from dominant lifeform. Height and cover of dominant lifeform are:

Class D 1%

Late1 Open
Description

<50% cover short-lived shrub species (e.g., Artemisia californica, Baccharis pilularis), some longer-lived species with mixed evergreen woodland (e.g., Quercus dumosa/ Q. berberidifolia or Q. agrifolia/wislizenii, Pseudotsuga menziesii or Umbellularia californica); diversity of shrub species, including Ceanothus, Cercocarpus

Dominant Species* and Canopy Position

QUAG
QUDU
ARCA1
BAPI

Upper Layer Lifeform

- Herbaceous
- Shrub
- Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	30 %	49 %
Height	no data	no data
Tree Size Class	no data	

Upper layer lifeform differs from dominant lifeform. Height and cover of dominant lifeform are:

Class E 1%

Late1 Closed
Description

>50% cover mixed evergreen woodland (e.g., Quercus dumosa/ Q. berberidifolia or Q. agrifolia/wislizenii, Pseudotsuga menziesii or Umbellularia californica); diversity of shrub species, including Artemisia californica, Baccharis pilularis, Ceanothus, Cercocarpus and in some areas succeeding to Mixed Evergreen Forest with California laurel.

Dominant Species* and Canopy Position

QUAG
QUDU
UMCA

Upper Layer Lifeform

- Herbaceous
- Shrub
- Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	50 %	100 %
Height	no data	no data
Tree Size Class	no data	

Upper layer lifeform differs from dominant lifeform. Height and cover of dominant lifeform are:

Disturbances

*Dominant Species are from the NRCS PLANTS database. To check a species code, please visit <http://plants.usda.gov>.

Disturbances Modeled

- Fire
- Insects/Disease
- Wind/Weather/Stress
- Native Grazing
- Competition
- Other:
- Other

Historical Fire Size (acres)

Avg: no data
 Min: no data
 Max: no data

Sources of Fire Regime Data

- Literature
- Local Data
- Expert Estimate

Fire Regime Group: 1

- I: 0-35 year frequency, low and mixed severity
- II: 0-35 year frequency, replacement severity
- III: 35-200 year frequency, low and mixed severity
- IV: 35-200 year frequency, replacement severity
- V: 200+ year frequency, replacement severity

Fire Intervals (FI)

Fire interval is expressed in years for each fire severity class and for all types of fire combined (All Fires). Average FI is central tendency modeled. Minimum and maximum show the relative range of fire intervals, if known. Probability is the inverse of fire interval in years and is used in reference condition modeling. Percent of all fires is the percent of all fires in that severity class. All values are estimates and not precise.

	<i>Avg FI</i>	<i>Min FI</i>	<i>Max FI</i>	<i>Probability</i>	<i>Percent of All Fires</i>
<i>Replacement</i>	40	8	900	0.025	8
<i>Mixed</i>	10	1	900	0.1	31
<i>Surface</i>	5	1	6	0.2	62
<i>All Fires</i>	3			0.325	

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