10140

Central and Southern California Mixed Evergreen Woodland

BpS Model/Description Version: Aug. 2020

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| --- | --- | --- | --- |
| **Modelers** |  | **Reviewers** |  |
| Neil Sugihara | nsugihara@fs.fed.us | Hugh Safford/Dave Schmidt | hughsafford@fs.fed.us |
| Darren Borgias | dborgias@tnc.org | None | None |
| Tim Bradley | Tim\_Bradley@nps.gov | None | None |

Vegetation Type

Forest and Woodland

Map Zones

4, 5

Geographic Range

This system occurs from Monterey, CA, south across the outer Central Coast Ranges to crests of Peninsular Ranges.

Biophysical Site Description

This Biophysical Setting (BpS) occurs on all aspects at elevations predominantly below 3,500ft (1,050m) elevation, possibly up to 4,000ft. The distribution of the BpS is influenced by the maritime climate but does not exist on the coast itself. In California, it occurs inland from the redwood type throughout the outer and middle Coast Ranges on Franciscan-formation soils (metasedimentary sandstones, schists, shales -- Dothan in southwestern Oregon) and with moderate to high rainfall. In Oregon, it occurs inland of Sitka spruce type, as far as summer fog reaches (Applegate Valley).

Vegetation Description

This type is characterized by broad-leaved trees with emergent conifers. Characteristic hardwoods include *Quercus chrysolepis*, *Q. keloggii*, *Q. agrifolia*, *Arbutus menziesii*, *Acer macrophyllum*, and *Umbellularia californica*. Conifers could include Douglas-fir and Coulter pine. Species composition is primarily determined by the environmental gradients, including moisture availability, temperature, elevation, and proximity to the coast. These stands tend to have dense, or diverse, shrub understories, including *arctostahpyos* spp. and *ceanothus* spp.

BpS Dominant and Indicator Species

|  |  |  |
| --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** |
| QUCH2 | *Quercus chrysolepis* | Canyon live oak |
| QUAG | *Quercus agrifolia* | California live oak |
| QUKE | *Quercus kelloggii* | California black oak |
| UMCA | *Umbellularia californica* | California laurel |
| ACMA3 | *Acer macrophyllum* | Bigleaf maple |
| PICO3 | *Pinus coulteri* | Coulter pine |
| ARME | *Arbutus menziesii* | Pacific madrone |
| PSME | *Pseudotsuga menziesii* | Douglas-fir |

Species names are from the NRCS PLANTS database. Check species codes at http://plants.usda.gov.

Disturbance Description

Fire is the dominant disturbance event. The vast majority of fires occur in late summer or early fall and are associated with lightning storms. Native American burns locally increased the frequency and may have been extensive prior to 1850. Mixed-severity fires have been common (about every 60yrs), creating patches of varying age and species composition. Hardwoods typically provide the greatest cover after fire due to root-crown sprouting. Depending upon fire severity, many hardwoods may have epicormic sprouting well into the crown. Species composition, density, and inter-specific competition within stands contribute to multiple pathways following disturbance. In stands with high tanoak cover, tanoak may dominate the stand for many years before conifers can reestablish. Typically, it may take 15yrs or longer before Douglas-fir can establish and emerge through the hardwood canopy. Other disturbance events include wind storms and landslides. Low-severity fires (2-12yrs) favor dominance of large old conifers. Moderate-severity fires favor development of multi-aged stands of mixed species composition. High-severity fires (200-400yrs), driven by weather, climate, and stand condition, favor development of hardwood-dominated stands. Frequent, low-severity fires following a high-severity fire will maintain a hardwood-dominated stand.

Fire Frequency

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Severity** | **Avg FI** | **Percent of All Fires** | **Min FI** | **Max FI** |
| Replacement | 340 | 2 | 65 | 500 |
| Moderate (Mixed) | 35 | 22 |  |  |
| Low (Surface) | 10 | 76 | 7 | 15 |
| All Fires | 8 | 100 |  |  |

Fire interval is expressed in years for each fire severity class and for all types of fire combined (All Fires). Average FI is the central tendency modeled. Percent of all fires is the percent of all fires modeled in that severity class. Minimum and Maximum FIs show the relative range of fire intervals as estimated by model contributors, if known.

Scale Description

Fires of mixed severity often are large in area due to the high number of ignition points associated with fire events. There are historic records of 150,000ac fires in southwestern Oregon (Atzet 1988). These fires included low-, moderate-, and high-severity patches and spanned this type and adjacent types. The 1977 and 1987 fires on Klamath NF covered ~50,000ac and 75,000ac respectively. During both of these events, 100s of ignitions occurred within a 24hr period.

Due to fire suppression, low-severity fires have been most restricted and thus most lacking from the system.

Patch size and severity patterns can be strongly influenced by topography and species composition.

Adjacency or Identification Concerns

Surrounding types include the mixed conifer types (upslope and/or east), pine-oak woodlands (south), redwoods, or Sitka spruce (west).

Serpentine patches within this type may contain *Pinus jeffreyi*. *Chamaecyperis lawsonii*, and *Rhamnus californicus*, which also tolerate these soil types.

Currently, sudden oak disease (SOD; *Phytophora ramorum*) has become established in the southern portions of the range of the type and is spreading northward. SOD is often lethal to tanoak but may affect black oak and some shrub species. Also, a combination of management activities (or other disturbances) that seriously affect site potential (tractor logging and/or salvage with plantation planting) can result in establishment of persistent chaparral.

Issues or Problems

Native Uncharacteristic Conditions

Comments

Map zones (MZs) 04 and 05 were combined during 2015 BpS Review.

Succession Classes

**Mapping Rules**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Upper Layer Lifeform** | **Height (m)** | **Canopy Cover (%)** | | | | | | | | | |
| **0-10** | **11-20** | **21-30** | **31-40** | **41 - 50** | **51-60** | **61-70** | **71-80** | **81-90** | **91-100** |
| Herb | 0-0.5 | A | A | A | A | A | A | A | A | A | A |
| Herb | 0.5-1.0 | A | A | A | A | A | A | A | A | A | A |
| Herb | >1.0 | A | A | A | A | A | A | A | A | A | A |
| Shrub | 0-0.5 | A | A | A | A | A | A | A | A | A | A |
| Shrub | 0.5-1.0 | A | A | A | A | A | A | A | A | A | A |
| Shrub | 1.0-3.0 | A | A | A | A | A | A | A | A | A | A |
| Shrub | >3.0 | A | A | A | A | A | A | A | A | A | A |
| Tree | 0-5 | A | A | A | A | A | A | A | A | A | A |
| Tree | 5-10 | B | B | B | B | B | B | B | B | B | B |
| Tree | 10-25 | B | B | B | B | B | B | B | B | B | B |
| Tree | 25-50 | B | B | B | B | B | B | C | C | C | C |
| Tree | >50 | B | B | B | B | B | B | C | C | C | C |

Succession class letters A-E are described in the Succession Class Description section. Some classes use a leafform distinction where a qualifier is added to the class letter: Brdl (broadleaf), Con (conifer), or Mix (mixed conifer and broadleaf). UN refers to uncharacteristic native or a combination of height and cover that would not be expected under the reference condition. NP refers to not possible or a combination of height and cover which is not physiologically possible for the species in the BpS.

**Description**

Class A 7 Early Development 1 - All Structures

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| QUCH2 | Quercus chrysolepis | Canyon live oak | Upper |
| QUAG | Quercus agrifolia | California live oak | Upper |
| QUKE | Quercus kelloggii | California black oak | Upper |
| PICO3 | Pinus coulteri | Coulter pine | Mid-Upper |

Description

Less than 10in DBH. Openings within forest with dense cover of hardwood sprouts (*Quercus agrifolia*, *Quercus chrysolepis*, *Quercus kelloggii*, *Acer macrophyllum*, and *Arbutus menziesii*). Sprouting shrubs such as *arctostaphylus* spp. and *ceanothus* spp. may be significant. Shrub growth from seed banks, e.g., deer brush (*Ceanothus integerrimus*), can also be high. There is evidence that suggests that the reference percent of this class could be closer to 25% (Skinner 1995). Douglas-fir and Coulter pine seedlings will be present.

*Maximum Tree Size Class*  
Pole 5-9" DBH

Class B 47 Mid Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| QUCH2 | Quercus chrysolepis | Canyon live oak | Mid-Upper |
| QUAG | Quercus agrifolia | California live oak | Upper |
| QUKE | Quercus kelloggii | California black oak | Mid-Upper |
| PICO3 | Pinus coulteri | Coulter pine | Mid-Upper |

Description

DBH range=10-20in. Dense hardwood cover (60-100%), sometimes with emergent conifers. Characteristic species include *Quercus agrifolia*, *Quercus chrysolepis*, *Quercus kelloggii*, *Acer macrophyllum*, and *Arbutus menziesii*.

*Maximum Tree Size Class*  
Medium 9-21" DBH

Class C 46 Late Development 1 - Closed

Indicator Species

|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Scientific Name** | **Common Name** | **Canopy Position** |
| QUCH2 | Quercus chrysolepis | Canyon live oak | Upper |
| QUAG | Quercus agrifolia | California live oak | Middle |
| QUKE | Quercus kelloggii | California black oak | Middle |
| PICO3 | Pinus coulteri | Coulter pine | Middle |

Description

Tree DBH generally >30in for larger species. Hardwood-dominated class with some emergent conifers.

*Maximum Tree Size Class*  
Very Large >33" DBH

Model Parameters

Deterministic Transitions

|  |  |  |  |
| --- | --- | --- | --- |
| **From Class** | **Begins at (yr)** | **Succeeds to** | **After (years)** |
| Early1:ALL | 0 | Mid1:CLS | 24 |
| Mid1:CLS | 25 | Late1:CLS | 49 |
| Late1:CLS | 50 | Late1:CLS | 999 |

Probabilistic Transitions

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Disturbance Type** | **Disturbance occurs In** | **Moves vegetation to** | **Disturbance Probability** | **Return Interval (yrs)** | **Reset Age to New Class Start Age After Disturbance?** | **Years Since Last Disturbance** |
| Replacement Fire | Early1:ALL | Early1:ALL | 0.003 | 333 | Yes | 0 |
| Surface Fire | Early1:ALL | Early1:ALL | 0.1 | 10 | No | 0 |
| Replacement Fire | Mid1:CLS | Early1:ALL | 0.003 | 333 | Yes | 0 |
| Insects or Disease | Mid1:CLS | Mid1:CLS | 0.005 | 200 | No | 0 |
| Mixed Fire | Mid1:CLS | Mid1:CLS | 0.028 | 36 | No | 0 |
| Surface Fire | Mid1:CLS | Mid1:CLS | 0.1 | 10 | No | 0 |
| Insects or Disease | Late1:CLS | Mid1:CLS | 0.0025 | 400 | Yes | 0 |
| Insects or Disease | Late1:CLS | Late1:CLS | 0.0025 | 400 | No | 0 |
| Replacement Fire | Late1:CLS | Early1:ALL | 0.003 | 333 | Yes | 0 |
| Mixed Fire | Late1:CLS | Mid1:CLS | 0.035 | 29 | Yes | 0 |
| Surface Fire | Late1:CLS | Late1:CLS | 0.1 | 10 | No | 0 |

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