

10220

Klamath-Siskiyou Upper Montane Serpentine Mixed Conifer Woodland

BpS Model/Description Version: Aug. 2020

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Reviewers: Darren Borgias, Clint Emerson, Kerry Metlen

Vegetation Type

Forest and Woodland

Map Zones

2, 3, 6, 7

Model Splits or Lumps

This BpS is lumped with: Klamath-Siskiyou Lower Montane Serpentine Mixed Conifer Woodland (BpS 10210). The descriptions and models are identical.

Geographic Range

This type occurs in the Klamath-Siskiyou region (California and Oregon). It occurs in southwest Oregon primarily in map zone (MZ) 2, but also in MZ07 and parts of northern California (MZ03).

Biophysical Site Description

This type occurs in all aspects. The serpentine, peridotite soil type is the significant factor that distinguishes this type from the more common mixed conifer. It occurs most often on low, mid, and upper slope positions. Typically occurs with wide range of precipitation: 35-130in annually. It is found from 1,200-4,500ft in the Siskiyous.

Vegetation Description

A wide variety of conifer trees are present. These include PSME, CADE27, PISA2, PILA, PIJE, and CHLA. In the northern range of this type and at higher elevations, PIMO3 is increasingly common. In the southern extent of this type, PISA2 and PILA can be significant components. Small amounts of PIAT and ABCO may be present. Hardwoods include LIDE3, CACH6, QUCH2, ARME, and UMCA. Shrub species include QUVA, GABU2, QUSA2, ARNE, RHOC, RHDI6, RHCA, ARPA6, and CECU. CHLA (Port Orford Cedar) is not present in all stands, but is found in a narrow band where proper climatic conditions occur.

BpS Dominant and Indicator Species

Symbol	Scientific Name	Common Name
PSME	<i>Pseudotsuga menziesii</i>	Douglas-fir
CADE27	<i>Calocedrus decurrens</i>	Incense cedar

CHLA	<i>Chamaecyparis lawsoniana</i>	Port Orford cedar
PIJE	<i>Pinus jeffreyi</i>	Jeffrey pine
PIMO3	<i>Pinus monticola</i>	Western white pine
LIDE3	<i>Lithocarpus densiflorus</i>	Tanoak

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

Disturbance Description

This type has a very limited distribution and, consequently, limited information for fire occurrence history. Adjacent mixed-conifer forest types have similar characteristics and are detailed later. Surface and mixed-severity fires occur at an average of about 10-15yrs (Taylor and Skinner 2003; Sensenig 2002; Taylor and Skinner 1998). Kilgore and Taylor (1979) reported a fire return interval of 19-39yrs (north/northeast aspects), which may favor mixed fires. With historic fire regimes, insect outbreaks may have been much reduced compared to current conditions. Snow breakage occurs in the mid-seral closed state (Class B) about every 5yrs (this is not modeled). Although model is aspatial, most medium- and high-severity fires may actually occur on mid and upper slope positions (Taylor and Skinner 1998; Taylor 2000; Bekker and Taylor 2001).

Fire Frequency

Severity	Avg FI	Percent of All Fires	Min FI	Max FI
Replacement	232	4	100	400
Moderate (Mixed)	70	13	36	100
Low (Surface)	11	83	3	35
All Fires	9	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

This forest type occurs in a small to medium patch-size (10-100ac) mosaic, driven by soil type and variations in topography, historical fire patterns, and fire intensity. Insect-caused mortality has a minor contribution to overall forest pattern.

Adjacency or Identification Concerns

This type is found mostly on ultra-mafic soils. Adjacent types are dry and mesic mixed conifer. Klamath Siskiyou Xeromorphic Serpentine Savanna and Chaparral occurs along or adjacent to this type. The distinguishing characteristic is that more serpentine leads to more PIJE. This type is essentially the same as the Klamath Siskiyou Upper Montane Serpentine Mixed Conifer. The difference is that the Upper version is 4,500+ft and has some slight species changes. For example, Shasta Red fir is present in the Upper but not in the Lower.

Issues or Problems

This type can occur in very small patches and may be difficult to distinguish from mixed conifer. The difference is species composition driven by presence of ultra-mafic soil types. The model was criticized for not listing PIJE in any of the S-classes.

It is possible that this type shows greater variability in northern California and in MZ03, and that it will need to be modeled in its component parts.

Native Uncharacteristic Conditions

Due to fire exclusion, many of these stands currently exhibit higher density of understory species and young conifer and hardwoods.

Comments

During the 2016 review period, it was recognized that there were only slight differences in the modeled fire frequency between the zone 2 and zone 3/6/7 models, and that otherwise the models and descriptions were nearly identical. Reviewers Darren Borgias, Clint Emerson, and Kerry Metlen suggested that one model could cover zones 2, 3, and 7, although there was some uncertainty about the extent to which this model fit in California. It was assumed by K. Blankenship that the zone 6 model could also be combined because it was quantitatively identical to the zone 3 and 7 models. Descriptive differences were rectified, and the model from zones 3/6/7 was adopted for all zones.

LANDFIRE National Review Comments:

One reviewer felt that combining 1021 with 1022 glossed over very real differences in replacement fire frequency, especially in the late-open condition.

One reviewer felt that the return interval was too low, and suggested 20-30yrs. It should have a less frequent fire than 1031 -- PIPO-PIJE. Two anonymous reviewers felt there should be a separate model for *Pinus attenuata* because it occurs in large patches and has a distinct fire regime that can be described separately from this type. However, another reviewer indicated that *P. attenuata* did not occur in large patches and that it would not be necessary to map in Oregon.

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	A	A	A	A	A	A	A	A	A	A
Tree	10-25	C	C	C	C	C	B	B	B	B	B
Tree	25-50	D	D	D	D	D	E	E	E	E	E
Tree	>50	D	D	D	D	D	E	E	E	E	E

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	18	Early Development 1 - All Structures
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
LIDE3	Lithocarpus densiflorus	Tanoak	All
PSME	Pseudotsuga menziesii	Douglas-fir	All
CADE27	Calocedrus decurrens	Incense cedar	All
QUCH2	Quercus chrysolepis	Canyon live oak	All

Description

Early succession. Vegetation comprised of grass, shrubs, and shade-intolerant tree species seedlings, saplings, and poles. Snags are typically present. Initial stages of this type are dominated with shrubs; later, tree-form species start to express dominance. Tree cover >40% is unlikely. This type has great variation in which species will express early dominance. Both precipitation and existing vegetation patterns contribute to the early seral species composition: RHDI6 in dryer situations; LIDE3 in moister sites.

Maximum Tree Size Class

Pole 5-9" DBH

Class B	2	Mid Development 1 - Closed
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
LIDE3	Lithocarpus densiflorus	Tanoak	Low-Mid
PSME	Pseudotsuga menziesii	Douglas-fir	All
CADE27	Calocedrus decurrens	Incense cedar	All
QUCH2	Quercus chrysolepis	Canyon live oak	Low-Mid

Description

Pole to large conifers (up to 30in DBH). These stands are comprised of conifers along with hardwood trees and shrubs. Ladder fuels and sub-canopy may provide conditions to allow crown fire initiation. Surface fuels moderate. Closed conditions occur with less frequent fires or on more productive sites. These younger patches tend to occur on southern and western slopes.

Maximum Tree Size Class

Large 21-33" DBH

Class C	23	Mid Development 1 - Open
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
LIDE3	Lithocarpus densiflorus	Tanoak	Low-Mid
PSME	Pseudotsuga menziesii	Douglas-fir	All

CADE27	Calocedrus decurrens	Incense cedar	All
QUCH2	Quercus chrysolepis	Canyon live oak	Low-Mid

Description

Pole to large conifers (up to 30in DBH). These stands are comprised of conifers along with hardwood trees and shrubs. Ladder fuels and sub-canopy may provide conditions to allow crown fire initiation. Surface fuels moderate. Open conditions occur with more frequent fires or on less productive sites.

Maximum Tree Size Class

Large 21-33" DBH

Class D	54	Late Development 1 - Open
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
LIDE3	Lithocarpus densiflorus	Tanoak	Low-Mid
PSME	Pseudotsuga menziesii	Douglas-fir	All
CADE27	Calocedrus decurrens	Incense cedar	All
QUCH2	Quercus chrysolepis	Canyon live oak	Low-Mid

Description

Generally older stands may have larger trees, but never in the numbers or size of better sites, such as mixed-conifer sites. These stands are comprised of conifers along with hardwood trees and shrubs. Ladder fuels and sub-canopy may provide conditions to allow crown fire initiation. Surface fuels moderate. Open conditions occur with more frequent fire or on less productive sites.

Maximum Tree Size Class

Large 21-33" DBH

Class E	3	Late Development 1 - Closed
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Indicator Species

Symbol	Scientific Name	Common Name	Canopy Position
LIDE3	Lithocarpus densiflorus	Tanoak	Low-Mid
PSME	Pseudotsuga menziesii	Douglas-fir	All
CADE27	Calocedrus decurrens	Incense cedar	All
QUCH2	Quercus chrysolepis	Canyon live oak	Low-Mid

Description

Generally, older stands may have larger trees, but never in the numbers or size of better sites, such as mixed-conifer sites. Canopy cover >80% is unlikely. These stands are comprised of conifers along with hardwood trees and shrubs. Ladder fuels and sub-canopy may provide

conditions to allow crown fire initiation. Surface fuels moderate. Closed conditions occur with less frequent fire or on more productive sites at the bottoms of canyons and in riparian areas.

Maximum Tree Size Class

Large 21-33" DBH

Model Parameters

Deterministic Transitions

From Class	Begins at (yr)	Succeeds to	After (years)
Early1:ALL	0	Mid1:OPN	49
Mid1:OPN	50	Late1:OPN	150
Mid1:CLS	50	Late1:CLS	150
Late1:OPN	151	Late1:OPN	999
Late1:CLS	151	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
Alternative Succession	Early1:ALL	Mid1:CLS	1	1	Yes	45
Replacement Fire	Early1:ALL	Early1:ALL	0.006	167	Yes	0
Mixed Fire	Early1:ALL	Early1:ALL	0.013	77	No	0
Surface Fire	Early1:ALL	Early1:ALL	0.08	13	No	0
Alternative Succession	Mid1:OPN	Mid1:CLS	1	1	Yes	45
Replacement Fire	Mid1:OPN	Early1:ALL	0.0065	154	Yes	0
Mixed Fire	Mid1:OPN	Mid1:OPN	0.015	67	No	0
Surface Fire	Mid1:OPN	Mid1:OPN	0.09	11	No	0
Replacement Fire	Mid1:CLS	Early1:ALL	0.005	200	Yes	0
Mixed Fire	Mid1:CLS	Mid1:OPN	0.007	143	Yes	0
Surface Fire	Mid1:CLS	Mid1:CLS	0.08	13	No	0
Alternative Succession	Late1:OPN	Late1:CLS	1	1	Yes	45
Replacement Fire	Late1:OPN	Early1:ALL	0.0025	400	Yes	0
Mixed Fire	Late1:OPN	Late1:OPN	0.015	67	No	0
Surface Fire	Late1:OPN	Late1:OPN	0.09	11	No	0
Mixed Fire	Late1:CLS	Late1:OPN	0.007	143	Yes	0
Replacement Fire	Late1:CLS	Early1:ALL	0.01	100	Yes	0
Surface Fire	Late1:CLS	Late1:CLS	0.08	13	No	0

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