LANDFIRE Biophysical Setting Model

Biophysical Setting: 0710270 Mediterranean California Dry-Mesic Mixed Conifer Forest and Woodland

☐ *This BPS is lumped with:*
☐ *This BPS is split into multiple models:*

General Information

Contributors (also see the Comments field) **Date** 7/27/2005

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Vegetation Type
Forest and Woodland

General Model Sources
☑ Literature
☐ Local Data
☑ Expert Estimate

Dominant Species
PSME
PIPO
CADE27
QUKE
PILA

Map Zone
7

Model Zone
☐ Alaska
☐ California
☐ Great Basin
☐ Great Lakes
☐ Hawaii
☐ Northeast
☐ Northern Plains
☐ N-Cent.Rockies
☑ Pacific Northwest
☐ South Central
☐ Southeast
☐ S. Appalachians
☐ Southwest

Geographic Range
This type occurs in the Klamath-Siskiyou region (CA and OR), and may extend to the west side of Mount Shasta and the upper Sacramento river; also occurs in the south western Oregon Cascades up to the south end of the Willamette Valley.

Biophysical Site Description
This type occurs on all aspects in lower montane zones (600-1800m in northern California and south Oregon; 1200-2150m in southern California). This system occurs in a variety of topo-edaphic positions, such as upper slopes at higher elevations, canyon sideslopes, ridgetops, and south- and west-facing slopes which burn relatively frequently.

Vegetation Description
Mixed conifer forests must at least two codominating species, and typically have three or more species. Pseudotsuga menziesii, Pinus ponderosa, Calocedrus decurrens (CADE27) are the most common conifers. Other conifers that can occasionally be present include Pinus jeffreyi, P. attenuata, and P. lambertiana. P. lambertiana can be significant in Oregon.

Common subcanopy trees include Quercus kelloggii and Q. chrysolepis. Arbutus menziesii commonly occurs in the northern extent and in OR. In California, Pseudotsuga macrocarpa and Pinus coulteri can be present but are not dominant species, in this system in the the south.

Understory shrubs include poison oak, Ceanothis intergerrinus, C. velutinus, Arctostaphyllus viscida, Chinqapin (Chrysolepis chrysophylla), Ribes spp., Berberus aquifolium, Symphorocarpus mollis. In Oregon, Holodiscus discolor and Berberis spp. can occur. Herbacewous spp are varied, but Festuca

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californica and Elymus glaucus, Whipplea modesta, important in Oregon.

Disturbance Description

Fire regimes may be similar to mesic mixed conifer types (03-1028). MFRIs range from approximately 7-17yrs. Surface fires were frequent (~10yrs) and replacement fires were relatively rare. Surface fire occurs at an average generally between 10-15yrs (Taylor and Skinner 2003, Taylor and Skinner 1998, Sensenig 2002). Kilgore and Taylor (1979) reported a FRI of 19-39yrs (N/NE aspects), which may favor mixed and replacement fires. Longer return intervals are possible, 70-110yrs (Frost and Sweeney, 2000).

Insect/pathogen and drought-related mortality that does not cause a change in state occurs every 7-10yrs in closed states; that which causes a transition from a late-seral closed to open state occurs about every 100yrs. 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. While model is aspatial, most medium and high severity fire may actually occur on mid and upper slope positions (Taylor and Skinner 1998, Taylor 2000, Bekker and Taylor 2001).

Adjacency or Identification Concerns

May be adjacent to chapparal, oak woodland, and grassland types, or serpentine mixed conifer forests at lower elevations. Upper elevations defined by ecotone with mesic mixed conifer.

This type is generally lower in elevation than Mediteranean California mesic mixed conifer (03-1028). When it occurs at higher elevations it is on south-facing slopes and ridges. This type is distinguishable from the mesic mixed conifer type because it lacks white fir.

The western ecotone occurs with mixed evergreen forests (east of Happy Camp, middle end of Rogue River Canyon).

Native Uncharacteristic Conditions

Uncharacteristic density of Douglas fir and loss of pine species due to selective logging. Some areas converted to hardwood types by historic logging, past prolonged fire free interval and subsequent severe fire.

Scale Description

This forest type occurs in a small to medium patch size (100-1000ac) mosaic, driven by variations of topography, historic fire patterns, and fire intensity. May occur in patchy mosaic with chapparal and oak woodland types.

Issues/Problems

It is unknown if there is a need for a northern (latitude) versus a southern mixed-conifer type. This version is intended to respond to literature inferences that "north" slopes, perhaps especially in the northern Sierra Nevada through the Klamath region, have a longer fire regime and larger patch size than estimated by work in the southern and central Sierra Nevada. Likewise, the Klamath region literature also indicates that the topographic complexity also contributes to disparity between the two types. Even though a FRI difference may exist between N and S aspects, Skinner and Taylor 1998 found that the numbers were not statistically significant in their study. Difference in severity between aspects may be more important.

Comments

Type was derived from CA Mixed Conifer -north slope (R1MCONns) with influence from R#MCONsw. Review at Portland meeting added mapzones in Oregon and adjusted the species and distribution to reflect

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Oregon geography.

Foster decreased the amount of mixed and surface fires in class E (keeping the same proportion) so that the cummulative fire frequency for class E matched the text provided by the modelers.The model result was to move 10% from class D to class E. Final fire regime statistics remained unchanged. Portland reviewers (Oct 2006) accepted the VDDT model from mz03 as is. Model for MZ07 imported from MZ02.
Darren Johnson (darren_johnson@tnc.org) changed development class in Class D of MTDB from MidDev2 Open to Late1 Open.

Vegetation Classes

Class A 10 %

Early Development 1 All Structure

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model
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Indicator Species and Canopy Position
PSME Upper
PIPO Upper
PILA Upper

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	100 %
Height	Tree 0m	Tree 10m
Tree Size Class	Pole 5-9" DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

Early succession, 0-25yrs. Vegetation comprised of grass, shrubs, and shade intolerant tree species seedlings to saplings to poles. Snags are typically present. This stage can occur as small patch (10-100ac) within mixed severity fire, or less likely as large patches from more extensive fire (100-1000ac).

Replacement fire (MFRI=100yrs) resets to 0. Mixed fire (MFRI=15yrs) and surface fire (MFRI=10yrs) also occur. If about 25yrs pass without fire, then it succeeds to class B.

Class B 5 %

Mid Development 1 Closed

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model
10

Indicator Species and Canopy Position
PIPO Upper
PSME Upper
CADE27 Upper
QUKE Middle

Structure Data (for upper layer lifeform)

	Min	Max
Cover	61 %	100 %
Height	Tree 10.1m	Tree 25m
Tree Size Class	Large 21-33"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

Pole to large sized conifers (up to 30in DBH) with canopy cover >60%. These stands, between 26-100yrs in age, develop as an alternate successional pathway in settings and climatic periods that support longer intervals between mixed severity fires. A fire free interval of about 30yrs. Crowded stands of conifers along with hardwood trees in younger stages. Douglas-fir continue to recruit below ponderosa pine and adult Douglas-fir depending on local site conditions. Ladder fuels and subcanopy low enough for crown fire initiation. Depauperate understory. Surface fuel moderate and complex.

Replacement fire (MFRI=200yrs) resets to 0. Mixed fire (MFRI=100yrs) opens it up to class C, and surface

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fire (MFRI=100yrs) maintains in Class B.

Class C 20 %

Mid Development 1 Open

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model

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Indicator Species and Canopy Position

PIPO
Upper
PSME
Upper
CADE27
Upper
QUKE
Middle

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	21 %	60 %
Height	Tree 10.1m	Tree 25m
Tree Size Class	Large 21-33"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

Pole to large sized conifers (up to 30in DBH) with canopy cover averaging between 20-40%, seldom occurs as high as 60%. These stands, between 26-100yrs in age, develop as the typical successional pathway with frequent, low-mixed severity fires, median FRI=7-17yrs. Open stands of predominately pines and Douglas-fir, with hardwood trees scattered throughout. Calocedrus decurrens can be very sparce, or quite common. Douglas-fir continues to seed in under the ponderosa pine overstory. Rich herbaceous and woody understory. Native grasses and forbs favored with frequent fires. Surface fuel light and complex.

Replacement fire (MFRI=200yrs) resets to 0. Mixed fire (MFRI=200yrs) and surface fire (MFRI=10yrs) maintain it in Class C. If about 25yrs pass without fire, then it succeeds to class B.

Class D 40 %

Late Development 1 Open

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model

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Indicator Species and Canopy Position

PIPO
Upper
PSME
Upper
CADE27
Upper
QUKE
Middle

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	21 %	60 %
Height	Tree 25.1m	Tree 50m
Tree Size Class	Very Large >33"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

Large sized conifers (>33in DBH) with canopy cover averaging between 20-40%, seldom occurs as high as 60%. These stands, 100yrs and older develop as the typical successional pathway with frequent, low-mixed severity fires, Median FRI=7-17yrs.Open stands of predominately pines and Douglas-fir, with hardwood trees very patchy, in younger stages, persisting in protected sights, on knolls and noses with many scars. Calocedrus decurrens can be very sparce, or quite common. Rich herbaceous and woody understory. Native grasses and forbs favored with frequent fire. Surface fuel light and complex.

Replacement fire (MFRI=500yrs) resets to 0. Mixed fire (MFRI=100yrs) and surface fire (MFRI=10yrs) maintains it in Class D. If about 25yrs pass without fire, then it succeeds to class E.

**Fire Regime Groups are: I: 0-35 year frequency, surface severity; II: 0-35 year frequency, replacement severity; III: 35-100+ year frequency, mixed severity; IV: 35-100+ year frequency, replacement severity; V: 200+ year frequency, replacement severity.

Class E 25 %

Late Development 1 Closed

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model

10

Indicator Species and Canopy Position

PSME
Upper
PIPO
Upper
CADE27
Upper

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	61 %	100 %
Height	Tree 25.1m	Tree >50.1m
Tree Size Class	Very Large >33"DBH	

☐ Upper layer lifeform differs from dominant lifeform.

Description

Old growth, closed canopy, large sized conifers (>33in DBH) with canopy cover >60%. Multi-layered complex canopy structure. These stands, are >100yrs old, develop as an alternate successional pathway in settings and climatic periods that support longer intervals between mixed severity fires. A fire free interval of >35yrs. Crowded stands of conifers that overtop the hardwood layer. Hardwoods begin to be shaded out. Douglas-fir dominates the canopy and begins to edge out the other species. Ladder fuels and subcanopy may be low enough for crown fire initiation in some stands. Undergrowth is highly variable from depauperate to quite dense, depending on canopy density and local site conditions. Surface fuel moderate to high and complex.

Replacement fire (MFRI=200yrs) resets to 0. Mixed fire (MFRI=100yrs) opens it up to Class D, and surface fire (MFRI=100yrs) leaves it in Class E.

Disturbances

Fire Regime Group:** I

Historical Fire Size (acres)

Avg
Min
Max

Sources of Fire Regime Data

- ☑ Literature
- ☐ Local Data
- ☑ Expert Estimate

Fire Intervals

	Avg FI	*Min FI*	*Max FI*	*Probability*	*Percent of All Fires*
Replacement	250			0.004	4
Mixed	70			0.01429	15
Surface	13	7	17	0.07692	81
All Fires	11			0.09521	

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.

Additional Disturbances Modeled

- ☐ Insects/Disease
- ☐ Wind/Weather/Stress
- ☐ Native Grazing
- ☐ Competition
- ☐ Other (optional 1)
- ☐ Other (optional 2)

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