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)

R1PIPO Ponderosa Pine

General Information

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

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Vegetation Type

Woodland

Dominant Species*

PIPO
PIJE
PUTR
2GP

General Model Sources

- [x] Literature
- [ ] Local Data
- [x] Expert Estimate

LANDFIRE Mapping Zones

3 6
4
5

Rapid AssessmentModel Zones

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

Geographic Range

Ponderosa pine (PIPO) dominated stands occur on the east slope of the Cascades into northern California, Blue Mountains, Wallowa Mountains, Central Idaho, and adjacent northern Great Basin.

Biophysical Site Description

Ponderosa pine is largely found on volcanic substrates, dry sites, usually mesic soil temperature regimes.

Vegetation Description

PIPO stands are a lower montane forest type. Understory may include mountain big sagebrush, bitterbrush, bunchgrasses, mesic shrubs such as service berry and snowberry, and patches of montane chaparral (manzanita and Ceanothus, especially C. velutinus and C. prostratus)

Disturbance Description

Surface fire regimes dominate this PNVG, with infrequent mixed severity and very infrequent high-severity fires, except in patches of highly flammable early-seral shrubs. Insect and disease outbreaks associated with drought and high stem densities.

Adjacency or Identification Concerns

PIPO are primarily adjacent to mixed conifer, juniper, sagebrush, and grassland communities. Jeffrey pine (PIJE) ecosystems should be assessed using R1PIJE (Jeffrey pine PNVG).

Scale Description

Sources of Scale Data [x] Literature [ ] Local Data [ ] Expert Estimate

According to Agee (1993), most fires were apparently small and scattered, although this study may include ecosystems that are not completely similar to R1PIPO. Skinner and Chang (1996) describe a spatially complex pattern.

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

Issues/Problems

In these types, stand replacing fire can result in two general types of postfire veg: +/- dense shrub fields, and patches of open areas with grasses and forbs and +/- dense thickets of pine seedlings. In California, we estimated the proportion of the landscape in each type after fire to be about 60/40 (shrubs/pine thickets-open). We were restricted by the five-box constraint to having to lump these two postfire types into one box. We got around this by having the deterministic path from A to C being the shrub type (which requires +/- 75 years to get the pines up and out of the shrub canopy to where they begin to shade the shrubs out and move to C), and adding an alternative succession path to B where 40% of Class A goes to Class B every year after 30 years have passed (which was our best guess at how long it would take seedlings to grow to 5" dbh poles averaged over dense and less dense stands of regenerating pines). We used the min-max age function to do this, setting min age at 30 years. We have also included a lot of different disturbance pathways in B, which drives some of this back to A and some to C. Shlisky reduced the amount of replacement fire, increased the amount of surface fire, and increased the reference percentage of the late-seral closed state (E) relative to the original Safford et al. model as per reviewer comments.

Model Evolution and Comments

This type considered generally to be one of the most affected by fire suppression (and other disturbances, including logging). Very little open old-growth left.

*Succession Classes***

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

Class A 20 %

Early1 All Struct

Description

Following canopy-replacing fire, some sites are dominated by dense shrub stands (bitterbrush, manzanita, Ceanothus velutinus, C. prostratus, Ceanothus spp., etc., depending on location). Other postfire sites are more open and dominated by dense pine seedlings, bunchgrasses and forbs. In the dense shrublands: in the absence of fire, growing pines very gradually overtop and shade out understory shrubs and move to Class C. In more open postfire sites: in the absence of fire, pine thickets develop and move to Class B.

Dominant Species* and Canopy Position

2GP
ARPA6
PUTR
CEVE

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	0 %	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:

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Class B 5 %

Mid1 Closed

Description

Dense mid-development forest; "overstocked" pole to large pole size trees susceptible to stagnation. Marginal understory associated with limited site resources. Develops where fire frequency is too low to thin small trees.

Dominant Species* and Canopy Position

PIPO
PIJE

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	40 %	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:

Class C 15 %

Mid1 Open

Description

Open mid-development forest with diverse herbaceous understory and scattered woody shrubs. Herbs and shrub species gradually decline as growing trees begin to shade understory. Maintained by frequent burning.

Dominant Species* and Canopy Position

PIPO
PIJE
2GP

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	40 %
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 55 %

Late1 Open

Description

Open late-development forest; widely spaced trees, open and often diverse understory, and limited surface fuels due to frequent burning.

Dominant Species* and Canopy Position

PIPO
PIJE
2GP

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	40 %
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 5 %

Late1 Closed

Description

Dense late-development forest, often with significant within-stand mortality. Substantial surface fuel accumulation and ladder fuels.

Dominant Species* and Canopy Position

PIPO
PIJE

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	40 %	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:

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Disturbances

Disturbances Modeled

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

Historical Fire Size (acres)

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

Sources of Fire Regime Data

- [x] Literature
- [ ] Local Data
- [x] 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.

	Avg FI	*Min FI*	*Max FI*	*Probability*	*Percent of All Fires*
Replacement	200			0.005	5
Mixed	60			0.01667	17
Surface	13			0.07692	78
All Fires	10			0.09859	

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