

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 2004-2005. For more information, please visit www.landfire.gov. Please direct questions to helpdesk@landfire.gov.

Potential Natural Vegetation Group (PNVG):

ROPSMEms

Warm Mesic Interior Douglas-Fir

General Information

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

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Vegetation Type

Forested

Dominant Species*

PSME

PICO

POTR5

ABLA

General Model Sources

- Literature
 Local Data
 Expert Estimate

LANDFIRE Mapping Zones

10	21	18
19	22	16
20	29	

Rapid Assessment Model Zones

- | | |
|---|--|
| <input type="checkbox"/> California | <input type="checkbox"/> Pacific Northwest |
| <input checked="" type="checkbox"/> Great Basin | <input type="checkbox"/> South Central |
| <input type="checkbox"/> Great Lakes | <input type="checkbox"/> Southeast |
| <input type="checkbox"/> Northeast | <input type="checkbox"/> S. Appalachians |
| <input type="checkbox"/> Northern Plains | <input type="checkbox"/> Southwest |
| <input checked="" type="checkbox"/> N-Cent. Rockies | |

Geographic Range

West of the Continental Divide in the northern Rocky Mountains, primarily western Montana and northern Idaho. Also extends into the northern Great Basin.

Biophysical Site Description

PNVG generally occurs within the forest interior on moderately dry sites at mid- to high elevations. PNVG occupies primarily north-facing slopes and drainages on both sides of the continental divide.

Vegetation Description

Douglas-fir dominated mixed conifer forests that may support lodgepole pine and subalpine fir. Western larch may be present (within its range), but its presence may also indicate a different Potential Natural Vegetation Group (see Adjacency/ Identification Concerns below). In some locations ponderosa pine is present but generally as a minor component.

Disturbance Description

Fire regime is predominantly mixed-severity with generally small severely burned areas (<400 ac) and landscape MFI's between 30 and 80 years. Although stand-replacing and mixed-severity fires are less common than low-severity fires, their influence on forest landscape structure is profound.

Adjacency or Identification Concerns

This PNVG corresponds with moist Douglas-fir habitat types (Pfister et al. 1977). It typically occupies sites between the lower subalpine zone (at higher elevations) and the ponderosa pine or xeric Douglas-fir zone (at lower elevations). Western larch may be present, but its presence may also indicate a different Potential Natural Vegetation Group that has larch as a dominant.

Scale Description

Sources of Scale Data Literature Local Data Expert Estimate

This PNVG is usually highly heterogeneous because of micro-climate, topography, and patchy burning

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

patterns. The spatial variability results in relatively small patches and fire effects that are highly variable over fine scales.

Issues/Problems

Most fire studies have used primarily fire scar data to characterize this PVNG. Mixed-severity fire regimes have high spatial heterogeneity, which would be better captured in a spatial model.

Model Evolution and Comments

Workshop code was DFIR2.

This PNVG replaces the PNVG R2PSMEs from the Great Basin model zone because they are nearly identical and the extent in the Great Basin is largely adjacent to the Northern and Central Rockies.

Peer review incorporated on 03/03/2005. Review comments requested a longer overall fire return interval (from about 35 years to approximately 50 years), which resulted in more mid-development and closed conditions. There is some question about whether larch should be included in this type, as its presence may indicate a different potential natural vegetation group.

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

Class A 10%

Early1 PostRep

Description

Grass, forbs, seedling to sapling sized aspen, Douglas-fir, western larch, and ponderosa pine.

Indicator Species* and Canopy Position

POTR5
 PICO
 PSME
 LAOC

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:

Class B 25%

Mid1 Closed

Description

Closed canopy stand with young pole-sized trees, frequently with an upper age cap. Composition is pure or mixed conifer with Douglas-fir, lodgepole pine western larch, and/or ponderosa pine. Low variability in tree diameters or heights. Aspen may be abundant.

Indicator Species* and Canopy Position

PSME
 PICO
 LAOC
 POTR5

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:

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

Class C 15%

Mid1 Open

Description

Open canopy, young stands, frequently with upper age cap. Tree density is low and there is high variability in tree diameters and height. Grassy understory, often with shrubs. Overstory composition can be pure or mixed conifer with Douglas-fir, ponderosa pine, western larch, and/or lodgepole pine.

Indicator Species* and Canopy Position

PSME
PICO
POTR5
LAOC

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 30%

Late1 Open

Description

Open canopy, multi-age Douglas-fir forest with western larch, lodgepole pine, subalpine fir, and/or ponderosa pine. Numerous size classes (including large diameters trees) and relatively open understory, often dominated by grass, shrub, and forbs.

Indicator Species* and Canopy Position

PSME
PICO
ABLA
POTR5

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 20%

Late1 Closed

Description

Closed canopy, multi-age mixed conifer forest with large diameter Douglas-fir, lodgepole pine, subalpine fir, western larch, and/or ponderosa pine. Usually, there is sparse understory vegetation and high variability in tree size classes.

Indicator Species* and Canopy Position

PSME
ABLA
PICO
LAOC

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:

Disturbances

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Non-Fire Disturbances Modeled

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

Fire Regime Group: 3

- 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

Historical Fire Size (acres)

Avg:
Min:
Max:

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 the 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.

Sources of Fire Regime Data

- Literature
- Local Data
- Expert Estimate

	<i>Avg FI</i>	<i>Min FI</i>	<i>Max FI</i>	<i>Probability</i>	<i>Percent of All Fires</i>
<i>Replacement</i>	170	80	400	0.00588	28
<i>Mixed</i>	65	50	250	0.01538	72
<i>Surface</i>					
<i>All Fires</i>	47			0.02128	

References

Agee, James K. 1993. Fire Ecology of Pacific Northwest Forests. Washington, D.C.: Island Press. 493 p.

Arno, S.F. 1980. Forest fire history in the northern Rockies. Journal of Forestry (78): 460-465.

Barrett, S. W., S. F. Arno, and J. P. Menakis. 1997. Fire episodes in the inland Northwest (1540-1940) Based on Fire History Data. USDA, Forest Service, Intermountain Research Station. General Technical Report INT-370.

Barrett, S. W. 2004. Fire Regimes in the Northern Rockies. Fire Management Today 64(2): 32-38.

Barrett, S. W. 2004. Altered fire intervals and fire cycles in the Northern Rockies. Fire Management Today 64(3): 25-29.

Brown, James K.; Smith, Jane Kapler, eds. 2000. Wildland fire in ecosystems: effects of fire on flora. Gen. Tech. Rep. RMRS-GTR-42-vol. 2. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 257 p.

Brown, James K., Arno, Stephen F., Barrett, Stephen W., and Menakis, James P. 1994. Comparing the prescribed natural fire program with presettlement fires in the Selway-Bitterroot Wilderness. International Journal of Wildland Fire 4(3): 157-168.

Crane, M.F. and W.C. Fischer. 1986. Fire ecology of the forest habitat types of Central Idaho. Gen. Tech. Rep. RMRS-GTR-INT-218 Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 86 p.

Fischer; W.C. And B.D. Clayton. 1983. Fire ecology of Montana forest habitat types of east of the Continental Divide. Gen. Tech. Rep. RMRS-GTR-INT-141 Ogden, UT: U.S. Department of Agriculture,

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

Forest Service, Rocky Mountain Research Station. 83 p.

Fischer, W.C. And A.N. Bradley. 1987. Fire ecology of western Montana forest habitat types. Gen. Tech. Rep. RMRS-GTR-INT-223 Ogden, UT: U.S.Department of Agriculture, Forest Service, Rocky Mountain Research Station. 95 p.

Gallant, A.L., A.J. Hansen, J.S. Councilman, D.K. Monte, and D.W. Betz. 2003. Vegetation dynamics under fire exclusion and logging in a Rocky Mountain Watershed, 1856-1996. *Ecological Applications* 13(2): 385-403.

Heyerdahl, E. K., Brubaker, L. B., & Agee, J. K. 2001. Spatial controls of historical fire regimes: A multiscale example from the interior west, USA. *Ecology* 82(3): 660-678.

Keane, Robert E., Arno, Stephen F., and Brown, James K. 1990. Simulating cumulative fire effects in ponderosa pine/Douglas-fir forests. *Ecology* 71(1): 189-203.

Littell, J. S. 2002. Determinants of fire regime variability in lower elevation forests of the northern Greater Yellowstone Ecosystem. Thesis. Montana State University-Bozeman.

Peet, R. K. 1988. Forests of the Rocky Mountains. In: M. G. Barbour and W. D. Billings, eds. *Terrestrial vegetation of North America*. Cambridge: Cambridge University Press. Pp. 64-102.

Pfister, R. D., B. L. Kovalchik, S. F. Arno, and R. C. Presby. 1977. Forest habitat types of Montana. USDA Forest Service, Intermountain Forest and Range Experiment Station, General Technical Report, INT-34.

Schmidt, Kirsten M, Menakis, James P., Hardy, Colin C., Hann, Wendel J., Bunnell, David L. 2002. Development of coarse-scale spatial data for wildland fire and fuel management. Gen. Tech. Rep. RMRS-GTR-87. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 41 p. + CD.

Smith, J.K. and W.C. Fischer. 1997. Fire ecology of the forest habitat types of northern Idaho. Gen. Tech. Rep. RMRS-GTR-INT-363 Ogden, UT: U.S.Department of Agriculture, Forest Service, Rocky Mountain Research Station. 142 p.

U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (2002, December). Fire Effects Information System, [Online]. Available: <http://www.fs.fed.us/database/feis>. [Accessed 01/08/03].