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):

R0MTSB **Mountain Shrub--non Sagebrushes**

General Information

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

Modelers		Reviewers	
Mike Babler	mbabler@tnc.org	Don Bedunah	bedunah@forestry.umt.edu
		C. R. Kyte	clayton_kyte@nps.gov
		Bill Baker	bakerwl@uwyo.edu

Vegetation Type

Shrubland

Dominant Species*

AMELA
PURSH
SYMPH
PRUN

General Model Sources

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

LANDFIRE Mapping Zones

10 21
19 22
20 29

Rapid Assessment Model Zones

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

Geographic Range

Minor but relatively widespread. Occurs throughout the Intermountain West and Northern Rockies.

Biophysical Site Description

This PNVG occupies draws and foothills (all aspects) in the transition zone between grasslands/shrublands and forests, including Aspen and montane forests. Ranges widely in elevation (3000-9000 ft) throughout its geographic range.

Vegetation Description

Various mixes of shrubs such as serviceberry, Prunus spp., snowberry, snowbrush, bigtooth maple, and Rocky Mountain maple. (Society of Range Management Cover Types 317-319, 418-421.) In southwestern Wyoming, Symphoricarpos oreophilus may dominate, though in northern Wyoming, S. occidentalis or S. albus may dominate.

Disturbance Description

Fire Regime Group IV, dominated by replacement fire (80%), but may have a small component of mixed severity fires (20%). The average fire return interval for this system may range from 60 to 100+ years, and there is some debate about the role of mixed severity fire. Fire regimes of adjacent PNVGs will have significant impact on the frequency and severity of this PNVG. This PNVG will have significant variation in plant response to disturbance.

Drought, insects/disease, and native grazing may all impact this PNVG. However, little or no data exist to attribute these disturbances, and they were not included in this model.

Adjacency or Identification Concerns

The fire regime of adjacent PNVGs will dominate the fire regime here. This system is widespread and may

be adjacent to many shrubland systems, mountain grassland systems, and forested types including montane aspen, ponderosa pine, and Douglas-fir forests.

This PNVG may be similar to the PNVG R3MSHB for the Southwest model zone, but fire frequencies are different due to geographic and climatic changes. This PNVG may also be similar to the PNVG R2MSHBwt for the Great Basin model zone, but the Great Basin model has much more frequent fire and more mixed severity fire. There is discrepancy among experts about the amount of mixed severity fire in this system.

Scale Description

Sources of Scale Data ☑ Literature ☑ Local Data ☑ Expert Estimate

Variance in scale is a result of topography and localized moisture variability.

Issues/Problems

Extreme variability in fire regime, scale, and adjacency make this type difficult to model.

Model Evolution and Comments

Workshop code was MSHB01.

Local opinion is that there is only replacement fire in this PNVG. This is a major revision from the FRCC Draft MSHB1 dated 11/4/03.

Peer review incorporated on 4/11/2005. Additional reviewers included Thor Stephenson (thor_stephenson@blm.gov), Curt Yanish (curt_yanish@blm.gov), and Gavin Lovell (gavin_lovell@blm.gov). Peer review resulted in the addition of some mixed severity fire in classes B and C. There were disparate opinions about the frequency of fire in this type, ranging from an average fire return interval of 60-100 years. Adjusting the MFI either direction resulted in only slight adjustments (+/- 5%) in the resulting percent in each class. The model was left at an 80 year MFI.

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

Early succession, usually after frequent stand replacement fires. Dominated by grasses and forbs, with some shrubs sprouting. Grass/forb canopy cover will be high and variable (0-100%), but cover of shrubs will be <15%.

Indicator Species* and Canopy Position

AMELA
SYMPH

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	15 %
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 B **50%**

Mid1 Open

Description

15-40% shrub cover (line intercept method), with sprouting shrubs dominant in scattered openings.

Indicator Species* and Canopy Position

AMELA
SYMPH

LUPIN

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	15 %	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 C **40%**

Late1 Closed

Description

>40% shrub cover (line intercept method); all age classes present but dominated by overmature shrubs and sparse understory except in gaps.

Indicator Species* and Canopy Position

AMELA
SYMPH
LUPIN

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	40 %	60 %
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 **0%**

Description

Indicator Species* and Canopy Position

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	%	%
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 **0%**

Late1 Closed

Description

Indicator Species* and Canopy Position

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	%	%
Height	no data	no data
Tree Size Class	no data	

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

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☐ Tree

☐ Upper layer lifeform differs from dominant lifeform. Height and cover of dominant lifeform are:

Fuel Model no data

Disturbances

Non-Fire Disturbances Modeled

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

Fire Regime Group: **4**

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

	Avg FI	*Min FI*	*Max FI*	*Probability*	*Percent of All Fires*
Replacement	100	20	150	0.01	80
Mixed	400			0.0025	20
Surface					
All Fires	80			0.01251	

References

Arno, Stephen F.; Gruell, George E. 1983. Fire history at the forest-grassland ecotone in southwestern Montana. Journal of Range Management 36: 332-336.

Arno, Stephen F.; Gruell, George E. 1986. Douglas-fir encroachment into mountain grasslands in southwestern Montana. Journal of Range Management 39: 272-275.

Arno, Stephen F.; Wilson, Andrew E. 1986. Dating past fires in curlleaf mountain-mahogany communities. Journal of Range Management 39(3): 241- 243.

Barrett, Stephen W. 1994b. Fire regimes on the Caribou National Forest, Southeastern Idaho. Contract final report on file, Pocatello, ID: U.S. Department of Agriculture, Forest Service, Caribou National Forest, Fire Management Division. 25 p.

Bunting, Stephen C.; Neuenschwander, Leon F.; Gruell, George E. 1985. Fire ecology of antelope bitterbrush in the Northern Rocky Mountains. In: Lotan, James E.; Brown, James K., compilers. Fire's Effects on Wildlife Habitat— Symposium Proceedings. March 21, 1984, Missoula, Montana. Gen. Tech. Rep. INT-186. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station:48-57.

Floyd, M. L., W.H. Romme, and D. D. Hanna. 2000. Fire history and vegetation pattern in Mesa Verde National Park, Colorado, USA. Ecological Applications 10: 1666-1680.

Gruell, George E.; Bunting, Stephen C.; Neuenschwander, Leon F. 1985. Influence of fire on curlleaf mountain-mahogany in the Intermountain West. In: Lotan, James E.; Brown, James K., compilers. Fire's Effects on Wildlife Habitat— Symposium Proceedings. March 21, 1984, Missoula, Montana. Gen. Tech. Rep INT-186. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station: 58-71.

Martin, Robert E.; Driver, Charles H. 1983. Factors affecting antelope bitterbrush reestablishment following fire. In: Tiedemann, Arthur R.; Johnson, Kendall L., compilers. Research and management of bitterbrush and cliffrose in western North America. Gen. Tech. Rep. INT-152. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station: 266-279.

Mueggler, Walter F.; Stewart, William L. 1980. Grassland and shrubland habitat types of western Montana. Gen. Tech. Rep. INT-66. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station, 154p.

Paysen, Timothy E.; Ansley, James R.; Brown, James K.; Gottfried, Gerald J.; Haase, Sally M.; Harrington, Michael G.; Narog, Marcia G.; Sackett, Stephen S.; Wilson, Ruth C. Chapter 6: Fire in Western Shrubland, Woodland, and Grassland Ecosystems. In: Brown, James K.; Smith, Jane Kapler, eds. 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: 121-160.

Rice, C. L. 1983. A literature review of the fire relationships of antelope bitterbrush. In: Tiedemann, Arthur R.; Johnson, Kendall L., compilers. Research and management of bitterbrush and cliffrose in western North America. Gen. Tech. Rep. INT-152. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station: 256-265.

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.

Shiflet, Thomas N., ed. 1994. Rangeland cover types of the United States. Denver, CO: Society for Range Management. 152 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 6/25/03].

Wright, Henry A. 1971. Shrub response to fire. In: Wildland shrubs—their biology and utilization. Gen. Tech. Rep. INT-1. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station: 204-217.