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):

R0PIPObl **Ponderosa Pine-Black Hills-Low Elevation**

General Information

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

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Vegetation Type

Forested

Dominant Species*

PIPO
PRVI
QUMA
ORAS

General Model Sources

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

Black Hills region of Wyoming and South Dakota.

Biophysical Site Description

This PNVG is found below Ponderosa Pine Black Hills high elevation and above Ponderosa Pine Northern Plains (generally 4000-6000 ft), predominately on the lower limestone plateau and material weathered from metamorphic rocks. This type is generally on sites with sandy loam to clayey loam soils.

Vegetation Description

Ponderosa pine, bur oak (in northern Hills and Bear Lodge Mts.), chokecherry, Saskatoon serviceberry, aspen, Ribes species, rose species, ironwood, hawthorn, Oregon grape, raspberry, roughleaf ricegrass, Canada wildrye, needlegrasses, sideoats grama, sedges.

Disturbance Description

Generally frequent fire return interval with surface fire. Mixed severity fire occurs if fire return intervals are missed, and stand replacement fire is very infrequent (300+ years). Precipitation is concentrated in April through June, but occurs throughout the growing season, resulting in good pine regeneration and dense patches of saplings. Elk, and to a lesser extent, bison, were important ungulates. Windthrow, storm damage, and mountain pine beetles were important disturbances in this type, especially when stands reached high densities.

Adjacency or Identification Concerns

This type occurs at elevations above Ponderosa Pine Northern Plains and at elevations below Ponderosa Pine Black Hills High Elevation. This type differs from Ponderosa Pine Black Hills High Elevation because it has more frequent surface fires, less frequent replacement fires, and less closed canopy forest.

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

Scale Description

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

Patch size probably ranged from 10's to 1000's of acres. Most disturbances would have been relatively small and patchy in nature.

Issues/Problems

There is considerable debate over the role of mixed severity and surface fires in the historical range of variability in this and other ponderosa pine forests in the northern and central Rockies (Baker and Ehle 2001, 2003; Barrett 2004; Veblen et al. 2000).

Model Evolution and Comments

Quantitative model was developed post-workshop by Kelly Pohl with input from Cody Wienk and Carolyn Sieg. Additional input was provided during the workshop by Deanna Reyher, Blaine Cook, Bill Baker and factored into the model development. Because of the model's late development it received no peer review.

Succession Classes

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

Class A 5%

Early1 PostRep

Description

Herbaceous/shrubby post-replacement class, persists 0-15 years. In Bear Lodge this stage dominated by bur oak. In the Black Hills proper, lower limestone, it is dominated by grass/forb with chokecherry, serviceberry, leadplant, raspberry, rose, and current present.

Indicator Species* and Canopy Position

QUMA
PRVI
AMAL
PIPO

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 15%

Mid1 Closed

Description

Pole (dog hair), persists 15-50 years. Very few understory species present due to canopy closure.

Indicator Species* and Canopy Position

PIPO

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	*Max*
Cover	50 %	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 20 %

Mid1 Open

Description

Open pole with patches of 100+ year old trees, persists 15-50 years. In Bear Lodge Mountains, bur oak persists, particularly in open canopy stands.

Indicator Species* and Canopy Position

PIPO
AUMA
ORAS
PRVI

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	50 %
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 50 %

Late1 Open

Description

Open canopy stand; persists 50+ years. Patches of dense doghair and 200+ year old trees persist. Bur oak mostly restricted to northern Black Hills and Bear Lodge. Common juniper and rough leaf ricegrass common.

Indicator Species* and Canopy Position

PIPO
ORAS
JUCO
QUMA

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	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 E 10 %

Late1 Closed

Description

Closed canopy, multi-layer stand, persists 50+ years. At >70% canopy closure, mountain pine beetle outbreaks occur, opening up the canopy. Ironwood and bur oak in northern Black Hills and Bear Lodge Mountains.

Indicator Species* and Canopy Position

PIPO
JUCO
OSVI
QUMA

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	60 %	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

Non-Fire Disturbances Modeled

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

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

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

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

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

	Avg FI	*Min FI*	*Max FI*	*Probability*	*Percent of All Fires*
Replacement	300	200	400	0.00333	7
Mixed	100	50	400	0.01	21
Surface	30	5	50	0.03333	71
All Fires	21			0.04667	

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