## Potential Natural Vegetation Group (PNVG):

**R2PSMEdy** Great Basin Douglas-Fir - Dry

### General Information

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

<table>
<thead>
<tr>
<th>Modelers</th>
<th>Reviewers</th>
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<tbody>
<tr>
<td>Lynn Bennett</td>
<td>Hugh Safford</td>
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<tr>
<td>Louis Provencher (ed.)</td>
<td>Hugh Safford</td>
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<td></td>
<td>Steve Barrett</td>
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<td></td>
<td><a href="mailto:sbarrett@mtdig.net">sbarrett@mtdig.net</a></td>
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### Geographic Range

PNVG found primarily in Idaho, northern Nevada, and Utah.

### Biophysical Site Description

This type is generally located just above sagebrush ecosystems and adjacent to ponderosa pine woodlands. Elevation ranges from 4,000 to 8,700 feet. The xeric Douglas fir type is most strongly expressed on low- to mid-elevation southerly aspects and represents the transition between grasslands and continuous Douglas fir forest.

### Vegetation Description

This PNVG was dominated by mostly mid- and late-open forest structure of Douglas-fir; however, some mid- and late-closed forest structure also occurred. Minor amounts of lodgepole pine may have been present in the mid- and late-closed forest structure. Closed forest structure was most likely to occur in areas where site features modified fire behavior to allow for increased tree stocking. Aspen may have been present in smaller patch sizes in mesic sites or riparian areas, mostly in the closed forest structure conditions.

Undergrowth was mostly fire-resistant grasses and forbs that resprouted after fires. This PNVG’s fire regime allowed an open overstory of mature Douglas-fir to survive many fires. Small trees and associated less fire-resistant species were heavily thinned by moderate-intensity burning. Additionally, some nonlethal underburns occurred in lodgepole pine stands having light fuels. Occasional stand-replacing fires were also part of the mixture making up this fire regime.

### Disturbance Description

This PNVG is in a Fire Regime Group I. Some portions of these sites are transition zones to Fire Regime Groups II and III. Frequent surface and mixed severity fires were the common fire regime characteristics.

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*Dominant and Indicator Species are from the NRCS PLANTS database. To check a species code, please visit [http://plants.usda.gov](http://plants.usda.gov).
Surface fires intervals ranged from 10 to 50 years, and replacement severity occurred at intervals of 150 to 400+ years (Crane 1986; Barrett 1988; Bradley et al. 1992a, 1992b; Brown et al. 1994; Morgan et al. 1996). Mixed severity fires were assumed to have an intermediate FRI of 45 to 75 years on average. Stand replacement fires were generally restricted to the closed canopy forest and the stand initiation conditions.

The Fire Regime Group I characteristics were facilitated by understory vegetation dominated by fine fuels (grasses, sedges, forbs), landscape position, and adjacency to other frequent fire PNVG’s. Much of the forest structure was open canopy overstory that resulted in an understory dominated by healthy and vigorous plants (grasses, sedges, and forbs) and generally continuous fine fuels layer. These fine fuels facilitated fire spread and thinning of the conifer or aspen seedlings (thus promoting aspen suckering).

In this PNVG, aspen patches occurred at smaller scale than the Douglas fir forest. The aspen tended to be located in the more mesic sites. These more mesic sites would have had grass understories that did not cure as early in the year as surrounding areas, especially under a closed forest canopy, and these mesic areas often experience quicker humidity recovery in the evenings. These circumstances tended to lessen the fire severity in the aspen stands which acted as fire-safe sites compared to the surrounding landscape. This was important because aspen is much less resistant to fire than Douglas fir. Greater suckering would occur at the edges of aspen patches.

Other disturbances included insect (return interval of 100 yrs), disease, drought, and wind and ice damage (every 1,000 yrs in closed stands; every 250 yrs in open stands). Competition among trees was also a factor that increasingly slowed successional dynamics in more closed stands. Fire was by far the dominant disturbance agent.

**Adjacency or Identification Concerns**

PNVG is often transitional between non-forested areas or between Pinus ponderosa (at lower elevations) and Abies spp. At higher elevations. Sites are dry montane with a variety of slopes, aspects, and soil conditions.


This PNVG includes small areas of ABLA habitat types that are transitional between FRG I, III, and IV. This is especially true for the ABLA sites with HRV fine fuel understory vegetation conditions such as pine grass or elk sedge.

This PNVG may be similar to the PNVG R0PSMEdy from the Northern and Central Rockies model zone.

**Scale Description**

This PNVG occurs in patches ranging from 1000's to 10'000's of acres.

**Issues/Problems**

1) Competition/maintenance among trees was used as a disturbance in all classes but A. This disturbance, however, is only theoretical because the ecological setback was zero in all classes. In fact, the disturbance is non-existent in the model, which does not seem appropriate. 2) Stand replacement is used in class A with a FRI of surface fire. Although this appears ecologically correct, it greatly lowers the MFI for stand replacement, which is much longer in other classes. One expert suggested that the total fire probability in class A was 0.05/year with 80%/20%, respectively, for stand replacement and mixed severity fires. Those values were used. 3) The model is most sensitive to the FRI of stand replacement in class A and D, and the
return interval of wind/weather/stress in class D (stand replacing event). These transitions are responsible for the large percentage of class A in this xeric PNVG.

Model Evolution and Comments

This PNVG includes much of the dry Douglas-fire ecosystems. This model was based on the original FRCC model DFIR!. For the Rapid Assessment, this model was originally coded as R2PSMEpw and was changed to R2PSMEdy on 12/13/2004.

Both expert suggested a need to distinguish this PNVG from the mesic Douglas fir (R2PSMEms) one. The shorter FRIs, especially in class A, were added to this PNVG to reflect that need.

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 PostRep

Description
Grass/forb/shrub/tree seedlings. Replacement fire is frequent (FRI of 25 yrs) and causes an ecological setback of 35 yrs. Mixed severity fire (FRI of 100 yrs) does not cause an ecological setback. Vegetation will succeed to the mid-development closed (class B) condition in 35 yrs.

Indicator Species* and Canopy Position
CARU
CAGA3
PSEUD7

Upper Layer Lifeform
Herbaceous
Shrub
Tree

Fuel Model
no data

Structure Data (for upper layer lifeform)

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Class B  5 %

Mid1 Closed

Description
Forest canopy closure is >35%. Closed stand with trees, poles, saplings, grass, and scattered shrub, 75 to 100% Douglas fir. In the absence of fire, vegetation will succeed to E (closed, late-development) after 70 years. Replacement fire (average FRI of 150 yrs) and infrequent weather-related stress (return interval of 250 yrs) returns vegetation to class A. Mixed severity fire (FRI of 45 yrs) and insect/diseases every 100 yrs on average will cause a transition to an open mid-development forest (class C). Competition (probability/year = 0.01) maintains the stand in its

Indicate Species* and Canopy Position
PSEUD7
PICO
POTR5

Upper Layer Lifeform
Herbaceous
Shrub
Tree

Fuel Model
no data

Structure Data (for upper layer lifeform)

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*Dominant and Indicator Species are from the NRCS PLANTS database. To check a species code, please visit http://plants.usda.gov.
Forest canopy closure is 16% to 35%. Open trees, poles, saplings, and grass scattered shrubs, 100% Douglas fir. With surface fire (FRI of 10 yrs), mixed severity fire (FRI of 75 yrs), weak adult tree competition, and insect/diseases (every 100 years), primary succession is to D, the open late-development condition. Infrequent stand-replacing fire (FRI of 400 yrs) and infrequent weather-related stress (return interval of 1,000 yrs) will cause transitions to A. The stand will succeed on an alternative path to a closed late-development condition after 70 yrs without fire.

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**Class C** 10%

Mid1 Open

**Description**
Forest canopy closure is 16% to 35%. Open large tree/ grass and scattered shrubs; 100% Douglas fir. Surface fire (FRI of 10 yrs) and mixed severity fire (FRI of 75 yrs) maintain the stand in the open condition (i.e., succession from D to D). This open condition, however, will close after 70 years without fire (alternative path to E). Adult tree competition (probability/yr of 0.001) and insect/diseases (100 yrs return interval) also disturb this class, but do not affect the successional age. Replacement fire every 500 yrs on average and weather-related stress (1,000 yrs return interval) will cause a transition to A.

**Indicator Species' and Canopy Position**

PSEUD7

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model** no data

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

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**Class D** 60%

Late1 Open

**Description**
Forest canopy closure is 16% to 35%. Open large tree/ grass and scattered shrubs; 100% Douglas fir. Surface fire (FRI of 10 yrs) and mixed severity fire (FRI of 75 yrs) maintain the stand in the open condition (i.e., succession from D to D). This open condition, however, will close after 70 years without fire (alternative path to E). Adult tree competition (probability/yr of 0.001) and insect/diseases (100 yrs return interval) also disturb this class, but do not affect the successional age. Replacement fire every 500 yrs on average and weather-related stress (1,000 yrs return interval) will cause a transition to A.

**Indicator Species' and Canopy Position**

PSEUD7

**Upper Layer Lifeform**

- Herbaceous
- Shrub
- Tree

**Fuel Model** no data

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

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**Class E** 5%

**Description**
Forest canopy closure is >35%. Closed large trees, pole-sapling trees, scattered shrubs, 80 to 100% Douglas fir. Replacement fire (FRI of 150 yrs) and infrequent weather/wind-related stress (return interval of 250 yrs) cause a transition to class A. Mixed severity fire (FRI of 45 yrs) and insect/diseases (return interval of 100 yrs) open the structure of the stand (transition to D), whereas surface fire (FRI of 50 yrs) and competition, although present, do not cause transitions to other classes. Succession is from E to E in the closed condition.

**Disturbances**

**Non-Fire Disturbances Modeled**
- Insects/Disease
- Wind/Weather/Stress
- Competition
- 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

**Historical Fire Size (acres)**
- Avg:
- Min:
- Max:

**Sources of Fire Regime Data**
- Literature
- Local Data
- Expert Estimate

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