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)

R1ALME **Alpine Meadows Barrens**

General Information

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

Modelers

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Reviewers

Vegetation Type

Grassland

Dominant Species*

CASU
ANME
CAVE
CABR

General Model Sources

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

LANDFIRE Mapping Zones

3 6
4
5

Rapid AssessmentModel Zones

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

Geographic Range

Alpine communities are found on the higher peaks of the Sierra Nevada crest mostly south of Lake Tahoe. Alpine communities also occur in the Cascade Mountains and Klamath Mountains of CA.

Biophysical Site Description

The alpine belt is above timberline (approximately > 3000 m) and below the snow level (<4,500 m). Variation in plant communities and plant density vary greatly with soil moisture. Parent material (proportion of granite to metamorphics) also influences plant communities.

Vegetation Description

Corresponds to Kuchler's (1964) Alpine Meadows and Barrens (#45) and is also termed Alpine Talus and Scree or just Alpine. Communities are herbaceous and low-statured with a significant component of forbs relative to graminoids (Carex spp.). Low-statured shrubs, such as Salix spp., are often present. Barren areas are common, consisting of talus, scree, and exposed bedrock. Sierra Nevada communities vary greatly with soil moisture from dry meadows to bogs. Sierra Nevada alpine communities may differ from their Rocky Mountains counterparts by being on very poor, granitic parent material. Alpine communities of the eastern Sierra Nevada, which have a very limited distribution in the California Rapid Assessment modeling zone, are more similar to Great Basin steppe with a significant shrub component (i.e., low sagebrush or Artemisia arbuscula).

Disturbance Description

The greatest disturbance is caused by variation in soil moisture, mostly snow cover, which was not modeled here. Fire was not discussed as an ecological factor in Barbour and Major (1988) and NatureServe (2004; Mediterranean California Alpine Dry Tundra). Very small burns (replacement fire) caused by lightning strikes were included as a rare disturbance. The calculation of lightning strikes frequency was not based on fire return intervals, but on the number of strikes (in this case 5) per 1000 possible locations per year, thus 0.005.

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

Adjacency or Identification Concerns

Identifying dominant species was problematic because the alpine is highly variable (Taylor 1977, Barbour and Major 1988) and not dominated by few species of shrubs or trees. The first four species from NatureServe (2004; Mediterranean California Alpine Dry Tundra) were chosen, but many others would be considered dominant (e.g., Eriogonum ovalifolium).

Scale Description

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

Stand-replacement fires may be caused by lightning strikes that do not spread due to the sparse cover of fine fuels and extensive barren areas acting as fire breaks.

Issues/Problems

1) The modeler is not an expert of the alpine. The issue of whether fire is a factor in the alpine needs to be researched. Therefore, the early development state is not well defined in terms of duration and cover, and the dominant species are not known, although it was assumed that graminoids and willows resprout rapidly compared to perennial forbs. The literature does not offer cover values or descriptions of seral stages, however cover values and descriptions of dominant species were found in the USFS Web publication (gray literature) listed in References. 2) This type may be difficult to map. The early development state, in addition to being rare, may not be distinguishable from the natural barren areas because bare soil may look just like talus and screen from satellite imagery. Therefore, creating a one box model should be considered.

Model Evolution and Comments

Several experts claim that, over the next decades, the alpine is one of the more threatened community types by global climate change. Essentially, the treeline is moving up.

*Succession Classes***

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

Class A 2 %

Early1 PostRep

Description

Very exposed (barren) state following a lightning strike. Soil (not rock) may dominate the area.

Dominant Species* and Canopy Position

CAREX
STOC2
SALIX

Structure Data (for upper layer lifeform)

	Min	Max
Cover	1 %	5 %
Height	no data	no data
Tree Size Class	no data	

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

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

Fuel Model no data

Class B 98 %

Mid1 Closed

Description

Alpine community is dominated by herbaceous perennials and low-growing shrubs. Plant cover may vary from 2% on exposed sites to as much as 25% on mesic and more protected sites.

Dominant Species* and Canopy Position

CASU7
ANME2
CABR
CAVE5

Structure Data (for upper layer lifeform)

	Min	Max
Cover	2 %	25 %
Height	no data	no data
Tree Size Class	no data	

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

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

Fuel Model no data

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

Class C **0 %**

Mid1 Open

Description

Dominant Species* and Canopy Position

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	%
Height	no data	no data
Tree Size Class	no data	

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

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

Fuel Model no data

Class D **0 %**

Late1 Open

Description

Dominant Species* and Canopy Position

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	%
Height	no data	no data
Tree Size Class	no data	

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☐ Tree

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

Fuel Model no data

Class E **0 %**

Late1 Closed

Description

Dominant Species* and Canopy Position

Structure Data (for upper layer lifeform)

	Min	Max
Cover	0 %	%
Height	no data	no data
Tree Size Class	no data	

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

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Disturbances Modeled

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

Historical Fire Size (acres)

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

Sources of Fire Regime Data

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

Fire Regime Group: 5

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	200	400	0.005	100
Mixed					
Surface					
All Fires	200			0.00502	

References

Barbour, M. G. and J. Major. 1988. Terrestrial vegetation of California. California Native Plant Society. Special publication number 9. pp. 601-675.

Kuchler, A. W. 1964. Potential Natural Vegetation of the Conterminous United States: Manual to Accompany the Map. Special Publication No. 36, American Geographical Society, N. Y.

NatureServe. 2004. International ecological classification standard: Terrestrial ecological classifications. Terrestrial ecological systems of California: Draft legend for LANDFIRE project. NatureServe Central Databases, Arlington, VA. Data current as of 12 October 2004.

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U.S. Forest Service. Snow Canyon candidate Research Natural Area. Available [2004 November 1] at: www.fs.fed.us/psw/programs/rna/publications_pdf/20snow_canyon_es.pdf.