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):

R8PIVlap **Appalachian Virginia Pine**

General Information

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

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Vegetation Type

Forested

Dominant Species*

PIVI2 EPIGA
GAYLU SCHIZ4
VACCI
CHUM

General Model Sources

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

LANDFIRE Mapping Zones

57 48
59 53
54 47

Rapid Assessment Model Zones

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

Geographic Range

Throughout the Southern Appalachians into the Cumberlands and Piedmont. VA,WV,KY,NC, TN, GA (North), AL North),MS (North), SC and others.

Biophysical Site Description

Similar to NatureServe (2005) Ecological System CES202.332 Southern Appalachian Low Mountain Pine Forest. Usually found at lower elevations and on infertile, shallow soils. The natural habitat of Virginia pine is xeric fire refuges such as exposed rock outcrops with patchy and light fuels. It is thus somewhat comparable to Table Mountain pine, but at lower elevations. Under natural conditions, it would occupy minor land area as a type but would have scattered individuals surviving in mixture with the other yellow pines

Vegetation Description

This potential natural vegetation group is common to the Southern Appalachians, typically occupying xeric to dry sites at elevations generally below 3500 feet on ridge tops, western, south and southwestern aspects. Occasionally Virginia pine is also found dry-mesic sites as a pioneering vegetation. In the absence of fire to maintain the ecosystem, natural Virginia pine stands could succeed to varying vegetation cover: (a) xeric oaks such as scarlet oak, chestnut oak, blackjack oak, and post oak; (b) mountain laurel, sourwood, red maple, and huckleberry; and (c) eastern white pine overstory Virginia pine dominates with up to 70% species specific. Other overstory components vary with moisture regimes but could include several other pine species, red and white oaks, other hardwoods and/or eastern red cedar. Many stands are strongly even-aged and density-dependent based on age. Virginia pine is an aggressive invader following disturbance and might be considered uncharacteristic vegetation on some sites. The frequency of its occurrence in the Southern Appalachian forested landscapes today is undoubtedly greater than in pre-settlement times. Its niche appears best fitted to xeric sites on thin soils (e.g. “necklace” stands adjacent to bluff lines in the Cumberlands and Appalachians). Virginia pine is increasingly at risk of mortality to disturbance agents as

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

it matures. Older trees are particularly susceptible to pine beetle attacks due to slow radial growth and relatively high growing densities on often poor sites. Older trees are also more prone to windthrow. Few stands reach 100 years of age with most stands "breaking up" at 50 to 75 years of age.

Disturbance Description

Virginia pine is very shallow rooted and susceptible to windthrow. Heavy snow and ice can create significant stand openings. Initial openings give rise to further windthrow and even larger openings as trees fall into gaps. As a tree species. Virginia pine (VAP) is less adapted to fire with thinner bark and higher mortality rates (particularly in young stands) than other southern yellow pines, and VAP seedlings are easily killed by fire and will not resprout. It can survive repeated low intensity fires however. The natural occurrence of VAP on infertile, thin soils allows the community to persist in a specialized edaphic niche. It is a prolific seeder and is able to pioneer on these and other disturbed sites. VAP often develops 'red heart' rot, caused by Fomes pini, at ages beyond about 60 years

Adjacency or Identification Concerns

NatureServe description groups VAP with Shortleaf pine with an elevational range to 2300 feet. While the two communities do often occur together at lower elevations, there are distinct differences in how disturbances affect regeneration and sustain ecological patterns and processes.

Scale Description

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

Spatial scale and pattern are generally characterized as large patch. In its most natural setting, topography generally limits the patch size of the ecological community.

Issues/Problems

This PNVG has invaded and supplanted other ecological communities where altered fire regimes and/or land use have provides it with an opportunity. It may persist on these sites but is more subject to stand-replacing perturbations that more stable fire-adapted communities.

Model Evolution and Comments

QA/QC changes: No model changes. Changed Upper Layer Lifeform max heights from herb to tree. Removed incomplete sentence in Disturbance Description. Added missing Mixed Fire probability. Peer review changes: wove additional descriptive comments in Biophysical Site Description, Vegetation Description and Disturbance Description. Did not reorganize into Fire and NonFire at this time as suggested, although this could be done in a LANDFIRE workshop. Peer Review Changes: Added comments from reviewer into various descriptions.

Succession Classes

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

Class A 30 %

Early1 All Structures

Description

Dense seedling and sapling stands with very little herbaceous or woody understory vegetation

Indicator Species* and Canopy Position

PIVI2	Upper
GAYLU	Upper
VACCI	Upper
CHUM	Upper

Upper Layer Lifeform

☐ Herbaceous
☐ Shrub
☑ Tree

Fuel Model 8

Structure Data (for upper layer lifeform)

	Min	Max
Cover	1 %	10 %
Height	Tree Regen <5m	Tree Short 5-9m
Tree Size Class	Sapling >4.5ft; <5"DBH	

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

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Class B 60 %

Mid1 Closed

Description

Poletimber and small sawtimber stands with minor components of other woody and herbaceous vegetation. Stands are often dense.

Indicator Species* and Canopy Position

PIVI2	Upper
VACCI	Upper
GAYLU	Upper
CHUM	Upper

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 8

Structure Data (for upper layer lifeform)

	Min	Max
Cover	35 %	100 %
Height	Tree Short 5-9m	Tree Medium 10-24m
Tree Size Class	Pole 5-9" DBH	

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

Class C 10 %

Late1 Closed

Description

Small sawtimber stands with gaps occurring from tree mortality caused by native insects, wind, ice and snow.

Indicator Species* and Canopy Position

PIVI2	Upper
VACCI	Upper
GAYLU	Low-Mid
CHUM	Low-Mid

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model 8

Structure Data (for upper layer lifeform)

	Min	Max
Cover	35 %	100 %
Height	Tree Medium 10-24m	Tree Medium 10-24m
Tree Size Class	Medium 9-21"DBH	

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

Class D 0 %

Late1 Open

Description

Indicator Species* and Canopy Position

	Upper
	Low-Mid
	Low-Mid
	Upper

Upper Layer Lifeform

- ☐ Herbaceous
- ☐ Shrub
- ☑ Tree

Fuel Model no data

Structure Data (for upper layer lifeform)

	Min	Max
Cover	%	%
Height		
Tree Size Class		

☑ 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

	Upper
	Mid-Upper
	Mid-Upper
	Middle

Structure Data (for upper layer lifeform)

	Min	Max
Cover	%	%
Height		
Tree Size Class		

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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: 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: 100
Min: 10
Max: 1000

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	110	25	125	0.00909	20
Mixed	145			0.0069	15
Surface	35	10	40	0.02857	64
All Fires	22			0.04456	

References

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