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Oak / Heath Forests

These are our state's most abundant forests on dry, acidic sites. They come in various flavors with oaks of all colors and heaths of all heights. These resilient forests have high ecological integrity and they provide tasty berry treats for people, bears, and birds alike.

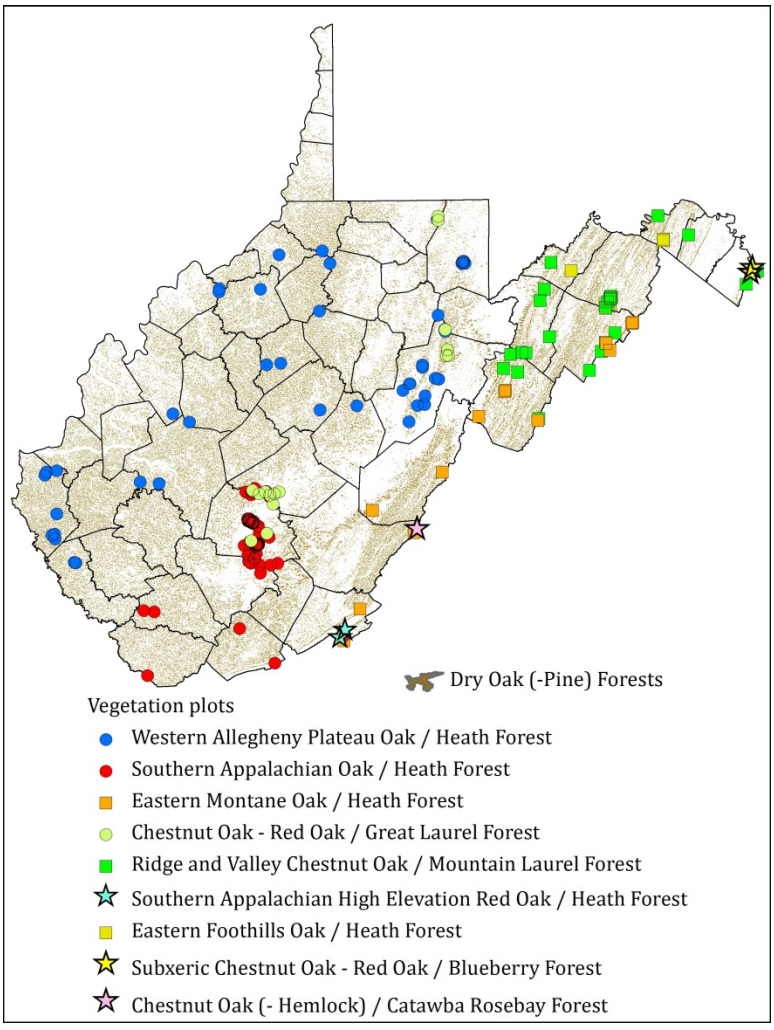
Ecological Description: Oak / Heath Forests are mostly deciduous forests with tree canopies dominated by oaks (*Quercus* spp.) over shrubby understories dominated by heaths (shrub species in the Ericaceae family). The trees are often stunted from drought stress. Dominant oak species include chestnut oak (*Quercus prinus*), white oak (*Quercus alba*), black oak (*Quercus velutina*), scarlet oak (*Quercus coccinea*), and northern red oak (*Quercus rubra*). Additional characteristic trees, often in the subcanopy, include red maple (*Acer rubrum*), black gum (*Nyssa sylvatica*), serviceberry (*Amelanchier arborea*), and sourwood (*Oxydendrum arboretum*). Sourwood, the only Ericaceae tree species native to West Virginia, has a distinct distribution in the state, common in the west, absent in the east. Some Oak / Heath Forests may have a small component of pines (*Pinus* spp.) especially where there are pine dominated communities nearby. Root sprouts of American chestnut (*Castanea dentata*) are present in many areas, indicating possible dominance by this tree species prior to the chestnut blight, which decimated the species in the early 1900s. The heath shrub layers in these forests are characteristic and diverse. Some associations have dense thickets ("laurel hells") of tall evergreen species, which may include great laurel (*Rhododendron maximum*), mountain laurel (*Kalmia latifolia*), and rarely, Catawba rosebay (Rhododendron catawbiense) or mountain fetterbush (*Pieris floribunda*). Other associations lack the evergreens and have low to high cover by low deciduous species, most commonly upland low blueberry (*Vaccinium pallidum*), deerberry (*Vaccinium stamineum*), and black huckleberry (*Gaylussacia baccata*). A group of heath species that occur in Oak / Heath Forests at relatively high elevations in the eastern mountains includes minnie-bush (*Menziesia pilosa*), northern lowbush blueberry (*Vaccinium angustifolium*), highbush blueberry (*Vaccinium corymbosum*), and southern mountain cranberry (*Vaccinium erythrocarpum*). The lowest of subshrub heaths include teaberry (*Gaultheria procumbens*) and trailing arbutus (*Epigaea repens*), which are common in most Oak / Heath Forest associations. Herbs are usually sparse in these forests, but include a distinctive guild of drought and acid tolerant species including Indian pipe (*Monotropa uniflora*), rattlesnake-weed (*Hieracium venosum*), forked panicgrass (*Dichanthelium dichotomum ssp. dichotomum*), poverty oatgrass (*Danthonia spicata*), four-leaved wild yam (*Dioscorea quaternata*), Indian cucumber root (*Medeola virginiana*), false Solomon's seal (*Maianthemum racemosum*), mountain bellwort (*Uvularia puberula*), and moccasin flower (*Cypripedium acaule*). Common white cushion moss (*Leucobryum glaucum*) is common in all associations.

Oak / Heath Forests occur on warm, dry sites, typically on ridgetops and southerly facing slopes, but also on lower slopes, foothills, and alluvial terraces with warm aspects and/or coarse, well drained soils. Most Oak / Heath Forest associations occupy dry soils, but the moisture regime of the Chestnut Oak - Red Oak / Great Laurel Forest may grade to somewhat moist. Oak / Heath Forests occur almost exclusively on highly acidic (pH < 5) soils. Oaks and heaths depend upon their relationships with mycorrhizal fungi to flourish in these dry, acidic, infertile soils.

Oak / Heath Forests may be fire tolerant and many stands have evidence of past fires (fire scars, charcoal), but no published research is known on the historical fire regimes of these forests in West Virginia. Oaks and many heaths can resprout following fires and other disturbances. Although many stands exhibit poor oak regeneration, in general Oak / Heath Forests have better oak regeneration compared to less dry oak forests in West Virginia (e.g. oak-hickory and dry-mesic oak forests). Some stands exhibit successional trajectories toward more mesic forest types but others appear to be edaphically maintained.

Animals that need these habitats: eastern spotted skunk (*Spilogale putorius*), black bear (*Ursus americanus*), ruffed grouse (*Bonasa umbellus*), wormeating warbler (*Helmitheros vermivorum*), a moth: Doll's merolonche (*Acronicta dolli*), bumblebees (*Bombus* spp.)

Distribution: Oak / Heath Forests cover large areas and have a broad distribution across West Virginia. They occur as extensive matrix forests (especially in the Ridge and Valley), as large patches (typical in the Allegheny and Cumberland Mountains), or as numerous small patches repeated on warmer topographic positions (as in the Western Allegheny Plateau). They are absent from the moist, higher elevations in the Allegheny Mountains, but occur at equally high elevations in the Ridge and Valley where it is dryer. Shaded areas of the map represent a distribution model of the Dry Oak (-Pine) Forests in West Virginia, of which Oak / Heath Forests is a major component. Locations of classified vegetation plots show the (incomplete) distribution patterns of individual associations.



Places to see and visit: Monongahela National Forest (Redman Trail up east flank of North Fork Mountain, Allegheny Mountain Trail from Lake Sherwood), George Washington National Forest (trail to Big Schloss), Camp Creek State Forest (Farley Ridge trail), Mountwood Park (Dark Side of the Moon Trail), ridgetops in Sleepy Creek Wildlife Management Area.

Conservation issues: Some Oak / Heath Forests in West Virginia are barely recognizable today because the heaths are browsed to the ground by white-tailed deer. Oak regeneration is also widely suppressed by deer herbivory. Prescribed burns have been conducted in these habitats in recent years by the U. S. Forest Service, but no published research is known on the effects of burning Oak / Heath Forests in West Virginia. The non-native gypsy moth (*Lymantria dispar*) arrived in West Virginia from the north in the 1980s and has caused extensive oak

defoliation and mortality in most years as it has spread south across the state. Chemical and biological insecticide spraying for gypsy moth may have unintended effects on the native insect communities in these forests. Due to dry, acidic, infertile soils, Oak / Heath Forests are generally resistant to invasions of non-native invasive plant species. Due to poor growth form of drought stunted trees, and low value of chestnut oak, many stands have been repeatedly skipped by logging cycles, resulting in numerous known old growth stands.

Classification:

NatureServe Ecological Systems: Allegheny-Cumberland Dry Oak Forest and Woodland, Central Appalachian Dry Oak-Pine Forest,

USNVC Association WV Scientific Name [Common Name]	Code	G Rank	S Rank	Links
Quercus prinus - Quercus (alba, coccinea, velutina) / Oxydendrum arboreum / Vaccinium pallidum Forest Western Allegheny Plateau Oak / Heath Forest	CEGL005023	G4?	S4	NatureServe EXPLORER
Quercus prinus - Quercus (velutina, coccinea) / Oxydendron arboreum / Kalmia latifolia / (Galax urceolata) Forest Southern Appalachian Oak / Heath Forest	CEGL006271	G5	S4	NatureServe EXPLORER
Quercus prinus - Quercus rubra / Vaccinium pallidum - Gaylussacia baccata - Menziesia pilosa (-Vaccinium angustifolium) Forest Eastern Montane Oak / Heath Forest	CEGL006282	G5	S3	NatureServe EXPLORER
Quercus prinus - Quercus rubra / Rhododendron maximum / Leucobryum glaucum Forest Chestnut Oak - Red Oak / Great Laurel Forest	CEGL006286	G4	S3	NatureServe EXPLORER
Quercus prinus - Quercus (rubra, velutina, coccinea) / Nyssa sylvatica / Kalmia latifolia Forest Ridge and Valley Chestnut Oak / Mountain Laurel Forest	CEGL006299	G5	S4	NatureServe EXPLORER
Quercus rubra / Vaccinium corymbosum - Vaccinium erythrocarpum / Dennstaedtia punctilobula Forest Southern Appalachian High Elevation Red Oak / Heath Forest	CEGL007300	G4	S1	NatureServe EXPLORER
Quercus alba - Quercus (coccinea, velutina, prinus) / Gaylussacia baccata Forest Eastern Foothills Oak / Heath Forest	CEGL008521	G5	S2S3	NatureServe EXPLORER
Quercus prinus - Quercus rubra / Vaccinium pallidum Forest Subxeric Chestnut Oak - Red Oak / Blueberry Forest	CEGL008523	G3G4	S3	NatureServe EXPLORER

Quercus prinus - (Tsuga canadensis) / Oxydendrum arboreum / Rhododendron catawbiense - Rhododendron maximum Forest Chestnut Oak (- Hemlock) / Catawba Rosebay Forest	CEGL008524	G4	S2	NatureServe EXPLORER

Key to Associations:

1. Oak / Heath Forests with a shrub layer dominated or codominated by evergreen *Rhododendron* species **2**

1. Oak / Heath Forests lacking or with sparse cover by evergreen *Rhododendron* species **3**

2. *Rhododendron catawbiense* present, may be codominant with *Rhododendron maximum.* Known only from southeastern WV. **Chestnut Oak (- Hemlock) / Catawba Rosebay Forest**

2. *Rhododendron catawbiense* absent. *Rhododendron maximum* usually codominant with *Kalmia latifolia.* Known from west of the Allegheny Front, from northern to southern WV. **Chestnut Oak - Red Oak / Great Laurel Forest**

3. Oak / Heath Forests dominated by *Quercus rubra*, other oak species lacking. Shrub layer with *Vaccinium corymbosum* and/or *Vaccinium erythrocarpum.* Known from high elevations in extreme southeastern WV. **Southern Appalachian High Elevation Red Oak / Heath Forest**

3. Oak / Heath Forests with other oak species in addition to or replacing *Quercus rubra*. *Vaccinium corymbosum* and *V. erythrocarpum* absent. **4**

4. Oak / Heath Forests in western and southern WV, within the range of *Oxydendron arboreum*, and this species usually common. **5**

4. Oak / Heath Forests in eastern WV, outside the range of *Oxydendron arboreum* **6**

5. Oak / Heath Forests in southern WV, in the Cumberlands and Southern Ridge and Valley. *Galax urceolata* often present. **Southern Appalachian Oak / Heath Forest**

5. Oak / Heath Forests in western WV, in the Western Allegheny Plateau and lower elevations on the west slope of the Allegheny Mountains. *Galax urceolata* absent. **Western Allegheny Plateau Oak / Heath Forest**

6. Oak / Heath Forests with a large component of *Quercus alba* over deciduous *Vaccinium* spp. and *Gaylussacia baccata.* Known from low elevations in the eastern panhandle **Eastern Foothills Oak / Heath Forest**

6. Oak / Heath Forests lacking or with low cover by *Quercus alba*. **7**

7. Sub-xeric forests with patchy cover by *Vaccinium pallidum*. Confined to the Blue Ridge in Jefferson County **Subxeric Chestnut Oak - Red Oak / Blueberry Forest**

7. Dryer forests with well-developed shrub layers. More broadly distributed in eastern WV. **8**

8. Forests strongly dominated by *Quercus prinus* with *Kalmia latifolia* dominating the shrub layer. Occurs on steep, rocky slopes in the Ridge and Valley. **Ridge and Valley Chestnut Oak / Mountain Laurel Forest**

8. Forests usually codominated by *Quercus prinus* and *Quercus rubra*. Shrub layer is predominantly deciduous, with indicator species including *Menziesia pilosa* and *Vaccinium angustifolium*. Occurs at relatively high elevations in the Ridge and Valley and Greenbrier Valley. **Eastern Montane Oak / Heath Forest**

Photo gallery:














References:

Binion, D. S. Stephenson, W. Roody, H. H. Burdsall, Jr., O. K. Miller, Jr. and L. Vasilyeva. 2008. Macrofungi associated with oaks of eastern North America. West Virginia University Press, Morgantown, WV. 468 pp. http://wvupressonline.com/binion_macrofungi_associated_with_oaks_of_eastern_north_america_9781933202365

Schweitzer, Dale F. 2004. Gypsy Moth (Lymantria dispar): Impacts and Options for Biodiversity-Oriented Land Managers. 59 pages. NatureServe: Arlington, Virginia. http://www.natureserve.org/library/gypsyMothReport.pdf