

# APPALACHIAN

## LANDSCAPE CONSERVATION COOPERATIVE



### HABITAT TYPE:

## Forest/Woodlands

Forest/Woodland habitats describe large areas primarily dominated by trees, with moderate ground coverage, such as grasses and shrubs. Density, tree height, and land use may all vary, though woodland is typically used to describe lower density forests. A forest may have an open canopy, but a woodland must have an open canopy with enough sunlight to reach the ground and limited shade.

Predicted climate change will largely impact changes in temperature and moisture availability in forest/woodlands systems, likely having a cascading effect on a species habitat and increasing stress to many of these species. The Appalachian LCC funded NatureServe to conduct vulnerability assessments on a suite of plants, animals, and habitats within the Appalachians. These assessments can be used as an early warning system to alert resource managers about changing conditions.

Two such organisms within forest/woodland that managers can use to monitor such change are...



**PIRATEBUSH**  
*Buckleya distichophylla*

**Distribution:** Has only been identified in NC, TN, and VA with the greatest concentration believed to be atop Poor Mountain in Roanoke County, Va.

**Habitat Requirements:** Exclusively found in mountainous areas. Piratebush requires direct sunlight to grow. Though many locations in Appalachian feature habitats that should be able to support piratebush, scientists have yet to determine why it exists in so few places.

**Interactions:** Unique in that in addition to photosynthesis it also receives nutrients through parasitizing other species by attaching itself to the root system of other plants. Originally it was thought to only attach to hemlock trees, though it has been discovered it may attach to many different species.

**Conservation Concern:** Timber industry and road construction in VA have impacted this plants limited range. Though it can attached to plants other than hemlock, it is unknown what the effect of hemlock woolly adelgid will have.



**DIANA FRITILLARY**  
*Speyeria diana*

**Distribution:** Found in the southern Appalachians from VA across the Ohio River Valley down to AK and MO, typically in deciduous and pine woodland areas near streams.

**Habitat Requirements:** Most often found in glades and other open areas within rich, moist mountain forests. Males usually patrol for females deep in woods.

**Interactions:** The violet is this species host plant, though they are also frequently spotted on milkweed. Eggs are laid haphazardly near the base of host plant. They have one flight each year between mid June and early August. Adults may also consume flower nectar and dung from ironweed, red clover, and butterflybush

**Conservation Concern:** Although this species is fairly widespread, populations are scattered within that range and fluctuate greatly. This species is known to be sensitive to habitat change. A forest-dependent species, most threats come from forest management: logging, pest and fire control, and the spread of invasive species.

## Factors Contributing to Vulnerability from Climate Change for Forest/Woodlands

Below is a synthesis of finding on key factors contributing to climate change vulnerability for two species found in Woodlands in the Cumberland and Southern region of the Appalachians. Results from these assessments can help natural resource managers identify other species of conservation interest that share similar habitat requirements, develop research and monitoring needs, and guide prioritization and the development of adaptation strategies.



### Piratebush

*Buckleya distichophylla*



VULNERABILITY SCORE:  
MV= Moderately Vulnerable



of assessed range  
**4.5°F increase in temperature**



of assessed range  
**5 to 7.3% decrease in moisture**

Natural barriers border the current distribution such that **climate change-caused distributional shifts are likely to be significantly** but not greatly or completely **impaired**.

**Required habitat** for this species is **generated by only a few species**.

### DIRECT EXPOSURE TO LOCAL CLIMATE CHANGE:

Assessed using predictions of future changes in temperature and moisture availability based on averages of global circulation models.

### INDIRECT EXPOSURE TO LOCAL CLIMATE CHANGE:

Considers predicted sea-level rise, existence of barriers to movement, and effects of alternative energy development.

### SENSITIVITY AND ADAPTIVE CAPACITY:

Assessed using a variety of factors, including dispersal capability, known sensitivity to changes in temperature and moisture, reliance on interspecific interactions, genetic diversity, and expected phenological shifts with changing climate.



### Diana Fritillary

*Speyeria diana*



VULNERABILITY SCORE:  
MV= Moderately Vulnerable



of assessed range  
**4.5 to 5.5°F increase in temperature**



assessed range  
**7.3 to 9.6% decrease in moisture**

Natural barriers **do not exist** OR barriers exist but **would not likely significantly impair distributional shifts** due to climate change.

Completely or almost completely **dependent on one species as a food resource** during any part of the year, alternative equivalents to this single-species food resource **are not readily available**.

Man-made barriers **do not exist** OR **barriers exist but would not likely significantly impair distributional shifts** due to climate change.

**Moderately affected by specific disturbance regimes**, and climate change is likely to **change frequency, severity, or extent of that disturbance regime**.

## APPALACHIAN LANDSCAPE CONSERVATION COOPERATIVE

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To learn more about the Appalachian LCC, visit <http://applcc.org>



LANDSCAPE CONSERVATION COOPERATIVES  
For information on the national network of LCCs, visit <http://lccnetwork.org>