

Dry Coniferous Woodlands

Piedmont Ecoregion

This habitat type occurs on extremely dry Piedmont sites, including ridgetops and steep slopes. These sites contain rocky, shallow, often extremely acidic soil. Canopy tree species may include table mountain and pitch pine (uncommon), Virginia pine, shortleaf pine, chestnut oak, scarlet oak, post oak, blackjack oak, and some hickories. Hemlocks (especially Carolina hemlock) occur on some rocky areas and exposed bluff slopes in the western Piedmont.

Piedmont Monadnock Forest is a specific community type (distinguished from other dry oak-pine communities by the dominance of chestnut oak) that can include pine species such as Virginia and shortleaf pine in the canopy, a patchy shrub layer and a sparse herb layer (Schafale and Weakley 1990). Monadnocks are exposed and subject to disturbance by high winds and lightning and can contain old trees. Because of the dryness and disturbance, pines were likely a more important component of Piedmont Monadnock Forests than of other piedmont forests (Schafale and Weakley 1990).

Piedmont Acidic Cliff communities occur on very steep to vertical slopes on acid soils, stream bluffs, and other slopes. They typically lack a closed tree or shrub canopy due to the rocky, dry sites, but may occur in areas with softer substrate that has been exposed by stream undercutting (Schafale and Weakley 1990). Pine species include Virginia and shortleaf pine, and hemlocks may occur on sites that are more sheltered along with rhododendron. Cliff communities are distinguished from forest communities by having an absent or open canopy and abundant bare substrate due to steepness and rockiness (Schafale and Weakley 1990).

Pine-Oak Heaths are more typical of the mountain region but Piedmont examples occur on high ridges and monadnocks in the western Piedmont (Schafale and Weakley 1990). The typical pines found include Virginia, pitch and table mountain pine. These communities depend on periodic fires, which allow for seeding by shade-intolerant species such as pines, but the natural fire regime that is needed to maintain these areas is not clearly understood. Table 1 provides a list of priority species associated with this habitat for which there are conservation concerns.

Table 1. Priority species associated with piedmont dry coniferous woodlands.

Group	Scientific name	Common name	State status* (Federal status)
Birds	<i>Accipiter cooperii</i>	Cooper's Hawk	SC
	<i>Accipiter striatus</i>	Sharp-shinned Hawk	SR
	<i>Caprimulgus carolinensis</i>	Chuck-will's-widow	
	<i>Caprimulgus vociferus</i>	Whip-poor-will	
	<i>Colaptes auratus</i>	Northern Flicker	
	<i>Contopus virens</i>	Eastern Wood-pewee	
	<i>Falco sparverius</i>	American Kestrel	
	<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker	
	<i>Picoides villosus</i>	Hairy Woodpecker	
	<i>Sitta pusilla</i>	Brown-headed Nuthatch	

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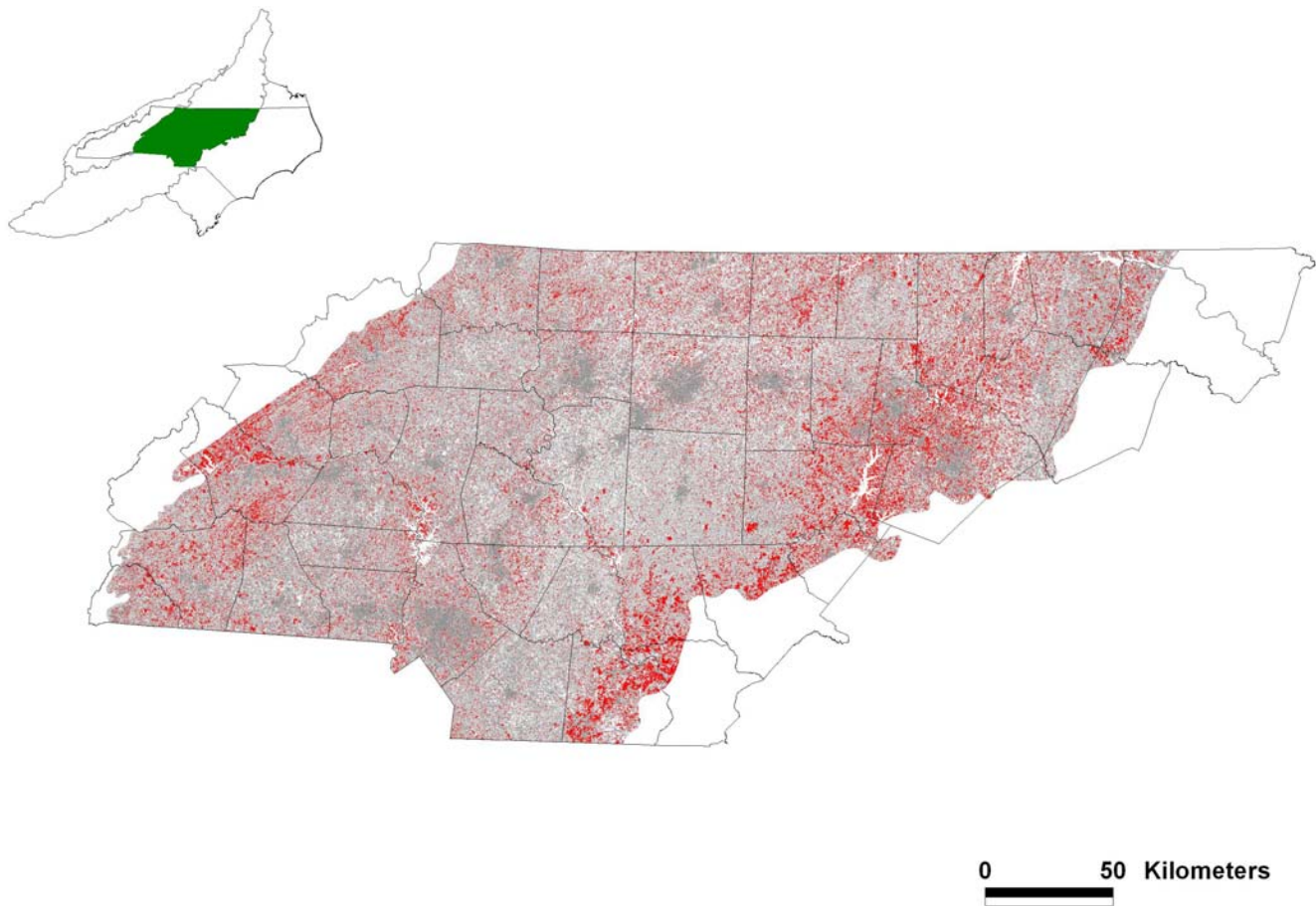
Group	Scientific name	Common name	State status* (Federal status)
Mammals	<i>Lasiurus seminolus</i>	Seminole Bat	
Reptiles	<i>Crotalus horridus</i>	Timber Rattlesnake	SC
	<i>Sistrurus miliarius</i>	Pigmy Rattlesnake	SC
	<i>Tantilla coronata</i>	Southeastern Crowned Snake	
*Abbreviations			
SC Special Concern			
SR Significantly Rare			

Location And Condition Of Habitat

Dry coniferous woodlands along ridgetops and steep slopes are relatively rare in the Piedmont, occurring mostly in counties that border the mountains. In a 2002 forest inventory (Brown and Sheffield 2003), 8,300 acres were classified as pitch-pine dominated and 1,400 acres as table-mountain pine dominated in the Piedmont. A reduction in fire events in these habitats is impacting species composition. The overall condition of this habitat, however, is comparatively stable but this will change unless fire is used to manage these areas. Map 1 depicts locations of dry coniferous woodlands in the Piedmont ecoregion.

Piedmont Monadnock Forests with conifers present occur throughout the Piedmont, but are most common in the western Piedmont and in the Uwharrie Mountains. These areas grade into oak-hickory forests downslope, may grade into Piedmont Acidic Cliff, and may grade into pine-oak heath on sharp high ridges (Schafale and Weakley 1990). Piedmont Acidic Cliff communities occur throughout the Piedmont and generally border floodplain forests or stream channels. There is tremendous variation in plant composition among these sites based on elevation, aspect, and geographic location and in the amount and quality of the conifers present. Pine-Oak Heath occurs mainly in the upper Piedmont. Pilot Mountain, Hanging Rock and Crowders Mountain State Parks all have examples of this community.

Map 1. Dry coniferous woodland habitat in the Piedmont ecoregion of North Carolina (in red).



Data source: NC GAP, 1992

Problems Affecting Species And Habitats

The location of dry coniferous woodlands along ridgetops and well-drained slopes makes this habitat more prone to fire, including occasional catastrophic fires, than more mesic or sheltered habitats. Many of the climax tree species in this habitat depend at least in part upon fire for regeneration.

Human disturbance leads to erosion and mass movement of soil. Construction activities, clear cutting, and other causes of the removal of plant cover can make steep slopes prone to “slides” of mud and/or rock, causing loss of topsoil and potentially causing property damage and threatening human safety, as seen during the hurricanes of 2004.

There are numerous native and exotic pests that can impact coniferous trees in this habitat (e.g., southern pine beetle, tip moths, pine webworm, Schweinitzii root and bud disease, red

heart of pine disease). Localized and non-lethal infestations can be beneficial for wildlife by creating snags, a food source, and habitat diversity. However, extensive lethal outbreaks can dramatically shift the composition of the tree community, with implications for conifer-specialists like brown-headed nuthatch.

Development projects are impacting dry coniferous woodlands, as with many other habitat types, in the Piedmont. As slopes are a prime location for new housing, development in this habitat can lead to fragmentation and disrupts connectivity between patches for most wildlife except birds. Road crossings can lead to mortalities, especially for reptiles and amphibians.

Species And Habitat Conservation Actions and Priorities For Implementation

The highest priority for protecting dry coniferous forest and associated species is to identify the best remaining examples of this habitat in the western Piedmont and then to pursue easements or acquisition. The efforts of land trusts and government agencies should be coordinated to target the highest priority sites. At a larger scale, land use planning is needed to minimize development within large, unfragmented tracts of all woodland types in the western Piedmont.

The greatest habitat management need is the reintroduction of controlled fire on dry ridges to encourage pine regeneration, understory development, and structural diversity. Steep topography and smoke management concerns can make controlled burning a challenge. The NC Forest Service will be a critical partner for promoting an increase in controlled burning in this habitat. Another priority is regulation of human activities on steep slopes that may cause excessive erosion or mud slides, and the development and implementation of best management practices to mitigate erosion. Where feasible, efforts should be made to control large outbreaks of tree-killing insects and diseases.

Priority Research, Survey, And Monitoring

Initial efforts need to be directed towards surveys to determine the current baseline distribution and status of species mainly associated with dry coniferous forest (especially those that are state-listed or believed to be declining). Data is most severely lacking for reptiles, small mammals, and nocturnal birds. Since we lack baseline information about even common species and their distribution and status in this habitat type, we need to direct secondary efforts to conduct surveys to understand current status from which we can then measure future population changes over time. Protocols and procedures developed from baseline surveys should then provide a means to convert from a baseline survey mode to a long-term population monitoring mode.

- **Surveys**

- Determine the distribution and status for pigmy rattlesnake, timber rattlesnake, southeastern crowned snake, and other reptiles (especially lizards).
- Determine the distribution and status for small mammals and bats (e.g., seminole bat).
- Conduct population status surveys for chuck-will's-widow, whip-poor-will (nocturnal), brown-headed nuthatch and woodpeckers.

- **Monitoring**

- Current monitoring systems and protocols (e.g. MAPS and BBS) may need to be enhanced to better cover species not well covered by current monitoring efforts
- Establish MAPS and migration banding stations (although less of a priority than in Piedmont mesic forest, floodplain forest, oak forest and early successional communities).
- Establish long-term monitoring efforts for small mammals and reptiles in the habitat.

- **Research**

Population demographics

- Conduct Seminole bat life history research, as little is known about the life history of this species in the Piedmont.

Management practices

- Determine impacts of prescribed fire on these communities and the resulting effects on wildlife communities.
- Develop logistically and economically effective control strategies for controlling outbreaks of the most damaging insect pests and diseases.

Supporting References

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