

Mesic Forest

Mid-Atlantic Coastal Plain

Coastal Plain mesic forest occurs on moist portions of upland habitat protected from fire, north-facing slopes, high sections of outer floodplains and less commonly on upland flats surrounded by peatland. They may also be found on island ridges surrounded by swamps. These habitats can have well-developed understory and shrub layers, and are characterized by mesophytic canopy species such as American beech, tulip poplar, sweetgum, bitternut hickory, shagbark hickory, American elm, black walnut, white oak, swamp chestnut oak and red oak.

Coastal Plain subtypes include Mesic Mixed Hardwood Forest, found throughout the Coastal Plain, and Basic Mesic Forest, scattered and found primarily in the area of marl outcrop in the eastern Coastal Plain south of the Neuse River but also on basic alluvial traces along the Roanoke River (Schafale and Weakley 1990). Mixed Mesic Hardwood Forests are distinguished from Basic Mesic Forests by having acidic rather than circumneutral to basic soils, a less well developed herb layer, lower floristic diversity and no or few basic indicator species (Schafale and Weakley 1990).

Mesic forests usually occur on sites that are sheltered from fire by topography and moisture. Fires in these systems were likely much less frequent and intense than in uplands. Under natural conditions, mesic forests are uneven-aged, with some old trees present. Reproduction occurs primarily in canopy gaps, and disturbed areas have increased amounts of pines and weedy hardwoods such as tulip poplar and sweetgum, as well as exotics such as Japanese honeysuckle (Schafale and Weakley 1990). Table 1 provides a list of priority species for which there is conservation concern.

Table 1. Priority species associated with coastal plain mesic forest.

Group	Scientific name	Common name	State status* (Federal status)
Birds	<i>Coccyzus americanus</i>	Yellow-billed Cuckoo	
	<i>Colaptes auratus</i>	Northern Flicker	
	<i>Contopus virens</i>	Eastern Wood-pewee	
	<i>Helminthos vermivorous</i>	Worm-eating Warbler	
	<i>Hylocichla mustelina</i>	Wood Thrush	
	<i>Limnothlypis swainsonii</i>	Swainson's Warbler	
	<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker	
	<i>Oporornis formosus</i>	Kentucky Warbler	
	<i>Picoides villosus</i>	Hairy Woodpecker	
	<i>Wilsonia citrina</i>	Hooded Warbler	
Mammals	<i>Lasionycteris noctivagans</i>	Silver-haired Bat	SR
	<i>Lasiurus intermedius</i>	Northern Yellow Bat	SR
	<i>Mustela frenata</i>	Long-tailed Weasel	
	<i>Peromyscus gossypinus</i>	Cotton Mouse	
	<i>Scalopus aquaticus</i>	Eastern Mole	
Amphibians	<i>Ambystoma mabeei</i>	Mabee's Salamander	SR
	<i>Ambystoma maculatum</i>	Spotted Salamander	

Table 1. Priority species associated with coastal plain mesic forest.

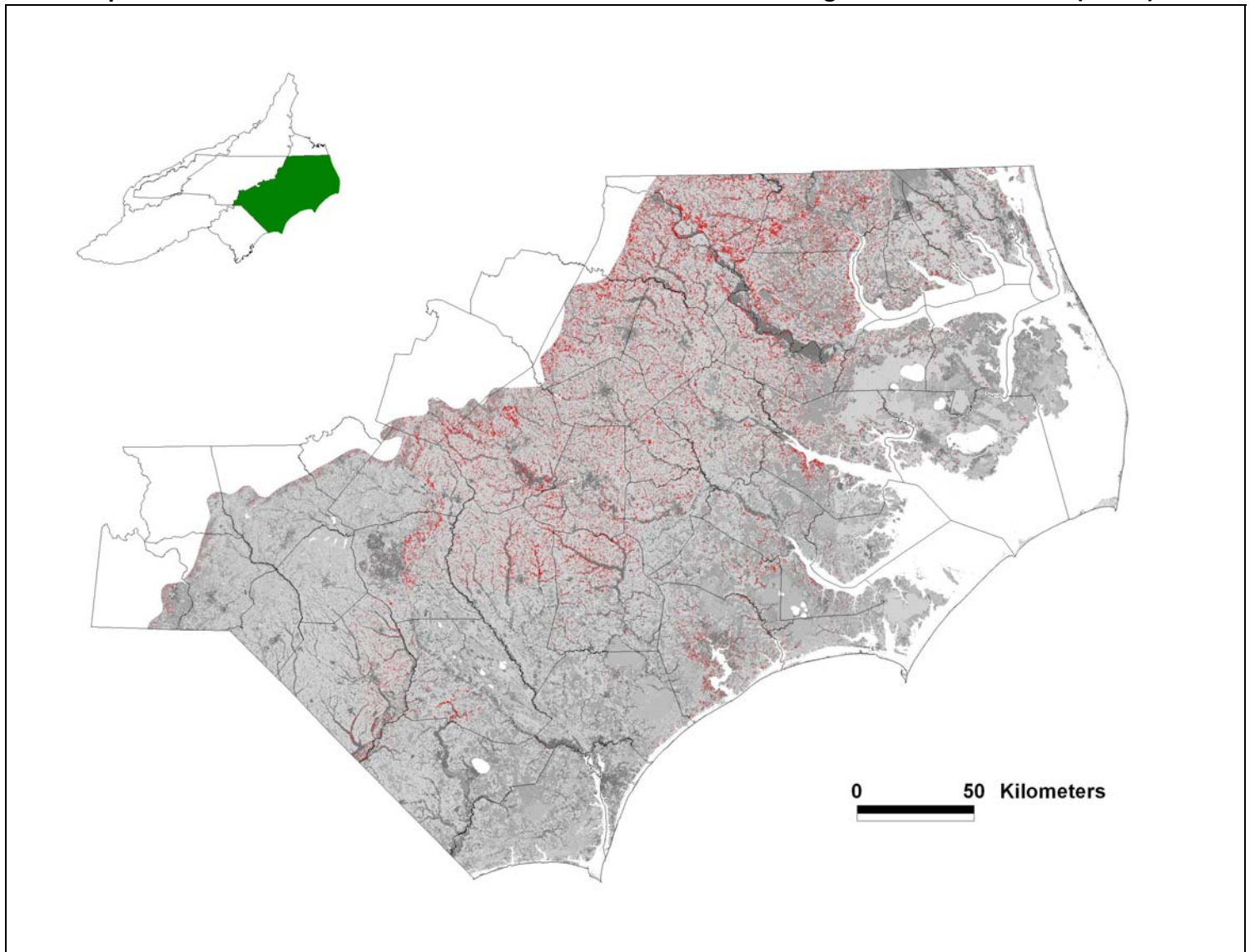
Group	Scientific name	Common name	State status* (Federal status)
	<i>Ambystoma opacum</i>	Marbled Salamander	
	<i>Hemidactylium scutatum</i>	Four-toed Salamander	SC
	<i>Hyla gratiosa</i>	Barking Treefrog	
	<i>Plethodon glutinosus sensustricto</i>	Northern Slimy Salamander	
	<i>Pseudacris brimleyi</i>	Brimley's Chorus Frog	
	<i>Pseudacris nigrita nigrita</i>	Striped Southern Chorus Frog	
	<i>Pseudacris ornate</i>	Ornate Chorus Frog	SR
	<i>Rana capito</i>	Carolina Gopher Frog	T
	<i>Scaphiopus holbrookii</i>	Eastern Spadefoot	
Reptiles	<i>Clemmys guttata</i>	Spotted Turtle	
	<i>Crotalus horridus</i>	Canebrake Rattlesnake	SC
	<i>Elaphe guttata</i>	Corn Snake	
	<i>Eumeces laticeps</i>	Broad-headed Skink	
	<i>Lampropeltis calligaster rhombomaculata</i>	Mole Kingsnake	
	<i>Rhadinaea flavilata</i>	Pine Woods Littersnake	
	<i>Terrapene carolina</i>	Eastern Box Turtle	
	<i>Virginia valeriae valeriae</i>	Eastern Smooth Earthsnake	
*Abbreviations			
SC Special Concern			
SR Significantly Rare			

Location And Condition Of Habitat

Examples of the Mesic Mixed Hardwood Forest bluff/slope variant are found in Croatan National Forest, Merchant's Millpond State Park and Cliffs of the Neuse State Park. Examples of the swamp island variant are found in the Dismal Swamp National Wildlife Refuge and along the Waccamaw River in Columbus County and examples of the upland flat variant are found in Perquimans and Bertie County. Both variants of Basic Mesic Forest (marl outcrop and terrace slope) are rare because of the rarity of basic substrates on the Coastal Plain (Schafale and Weakley 1990). Map 1 depicts locations of mesic forests in the Mid-Atlantic Coastal Plain ecoregion.

The condition of coastal plain mesic forest is relatively poor due to almost complete fire suppression (infrequent fires helped control the extent of mesic vegetation), high-grading of stands, exotic species, and habitat fragmentation.

Map 1. Mesic forest habitats in the Mid-Atlantic Coastal Plain ecoregion of North Carolina (in red).



Data source: NC GAP, 1992.

Problems Affecting Species And Habitats

Due to the relatively flat topography, coastal plain mesic forests are scarce compared to the Piedmont. Most sites are quite narrow bands on the landscape. In many cases, the flat land above these slopes has been converted to agriculture or loblolly pine plantations, compromising the quality of the mesic forest habitat. Development has fragmented the habitat and high-grading has changed the forest condition and composition. Although fires would have naturally swept through these sites relatively infrequently, even these infrequent fires have been suppressed, likely affecting the community composition of mesic plant species and exotics. Logging has depleted the amount of dead and downed material as well as other old growth characteristics such as tree cavities, hollow trees, vine tangles, etc. Exotic plants such as autumn olive, Japanese grass, Japanese honeysuckle, and privet have taken resources from native vegetation.

A lack of canopy gaps in this habitat type has probably lead to a reduced number of some avifauna such as the eastern wood-pewee, red-headed woodpecker, northern flicker, hooded warbler, worm-eating warbler and Kentucky warbler. This reduction in canopy gaps has also caused a decline in midstory and understory vegetation which has impacted species such as the Swainson's warbler, Kentucky warbler, hooded warbler and wood thrush, as well as many small mammals and reptiles.

Species And Habitat Conservation Actions and Priorities For Implementation

Conservation actions will need to include land acquisition, easements and protection to promote remaining large, unfragmented tracts as well as management to maintain and re-establish mesic forest.

Land acquisition and easements should be the top priority for conservation actions; Land Trusts will serve as a major partner in these efforts. This is a relatively rare forest type and great effort should be made to protect mesic forest and their species assemblages.

We must continue to work with non-industrial foresters to promote and increase silvicultural practices that benefit birds of conservation concern (e.g., promote canopy gap management, longer rotations, introduction of fire) as well as small mammals, bats and reptiles and amphibians.

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 mesic forests (especially those that are state-listed or believed to be declining) for which that information is lacking. 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 -

- Conduct selective surveys to determine the status and distribution of birds hard to track by BBS (e.g., Swainson's warbler, worm-eating warbler, Kentucky warbler, hooded warbler, yellow-billed cuckoo) as well as more common breeding birds.
- Determine distribution and status information for all bat species and many other mammals, especially for long-tailed weasel and cotton mouse.
- Survey amphibians for which we have little information on status and distribution (e.g., Mabee's salamander, four-toed salamander, Brimley's chorus frog, ornate chorus frog) as well as other more common amphibians.
- Determine the status and distribution of canebrake rattlesnake.
- Determine the status and distribution of hard to track snakes such as mole kingsnake, pine woods littersnake and eastern smooth earthsnake.

- **Monitoring**

- Current monitoring systems and protocols (e.g. MAPS and BBS) may need to be enhanced to better cover certain species not well covered by current monitoring efforts.
- Expand MAPS and migration banding stations to better identify breeding bird and migratory bird productivity and other demographic information.
- Establish long-term monitoring for small mammals and bats following initial surveys.
- Conduct general long-term herpetofauna monitoring to track the effects of the loss of old growth characteristics in this habitat type.

- **Research**

Productivity

- Conduct bird nest productivity studies, including nest-searching and spot mapping, and studies of predator effects on bird nest productivity.

Genetics

- Examine the possibility of a sub-species for the coastal worm-eating warbler.

Population demographics

- Collect demographic information on all bat species; investigate specific habitat needs and conduct life history studies.

Supporting References

Hunter, W. C., L. Peoples, and J. Collazo. 2001. Partners in Flight bird conservation plan for the South Atlantic Coastal Plain. American Bird Conservancy.

Johns, M.E. 2004. North Carolina Bird Species Assessment. N.C. Partners in Flight.

Pashley, D.N., C.J. Beardmore, J.A. Fitzgerald, R.P. Ford, W.C. Hunter, M.S. Morrison, K.V. Rosenberg. 2000. Partners in Flight: Conservation of the land birds of the United States. American Bird Conservancy, The Plains, VA.

Rich, T.D., C.J. Beardmore, H. Berlanga, P.J. Blancher, M.S.W. Bradstreet, G.S. Butcher, D.W. Demarest, E.H. Dunn, W.C. Hunter, E.E. Inigo-Elias, J.A. Kennedy, A.M. Martell, A.O. Panajabi, D.N. Pashley, K.V. Rosenberg, C.M. Rustay, J.S. Wendt, T.C. Will. 2004. Partners in Flight North American landbird conservation plan. Cornell Lab of Ornithology. Ithaca, NY.

Schafale, M. P., and A. S. Weakley. 1990. Classification of the natural communities of North Carolina, third approximation. N.C. Department of Environment and Natural Resources, Natural Heritage Program, Raleigh, NC.