MESIC MIXED HARDWOOD FOREST (COASTAL PLAIN SUBTYPE)

Concept: Mesic Mixed Hardwood Forests are forests of moist but not wet sites lacking indicators of unusually high pH or base-rich soils. They are characterized by vegetation dominated or codominated by *Fagus grandifolia* or other mesophytic hardwoods. The Coastal Plain Subtype covers the examples on Coastal Plain substrates, where a distinct component of Coastal Plain flora occurs. They may occur on steep north-facing bluffs, on moist upland flats associated with nonriverine wetlands, or on mesic ridges within river floodplains.

Distinguishing Features: Mesic Mixed Hardwood Forests are distinguished from Basic Mesic Forests by lower species richness and by lacking the species that in the Piedmont and Coastal Plain are indicators of higher pH soils (e.g., *Actaea racemosa*, *Asarum canadense*, *Adiantum pedatum*, *Sanguinaria canadensis*, *Cynoglossum virginianum*, *Cubelium (Hybanthus) concolor*, and *Actaea pachypoda*). *Ostrya virginiana*, *Carpinus caroliniana*, *Fraxinus americana*, *Lindera benzoin*, and *Aesculus pavia* tend to be common in Basic Mesic Forest and scarce in Mesic Mixed Hardwood Forest.

The Coastal Plain Subtype is distinguished from the Piedmont Subtype by occurrence in the Coastal Plain and by accompanying floristic differences. Distinctive species of the Coastal Plain Subtype include *Quercus nigra*, *Stewartia malacodendron*, *Symplocos tinctoria*, *Gaylussacia frondosa*, and a variety of shrubs and herbs that more typically occur in wetlands, such as *Arundinaria tecta*, *Ilex glabra*, *Persea palustris*, *Steinchisma areolata*, and *Osmundastrum cinnamomeum*. A few Coastal Plain Small Stream Swamp communities may share some of the mesophytic hardwoods, but generally will have a substantial component of wetland species or floodplain species. *Nyssa biflora* is usually present in floodplains. However, a few bottomland species such as *Quercus michauxii* may frequently occur in Mesic Mixed Harwood Forest.

Synonyms: *Fagus grandifolia* - *Quercus (alba, nigra) / Symplocos tinctoria* – (Stewartia malacodendron) Forest (CEGL007211).

Ecological Systems: Southern Atlantic Coastal Plain Mesic Hardwood Forest (CES203.242).

Sites: Mesic Mixed Hardwood Forests occur on upland areas protected from fire. They are primarily on north-facing river bluffs and ravine slopes, less commonly on upland flats or islands surrounded by peatland or swamp communities.

Soils: These communities occur on a great variety of soils, with 30 different series map units recorded with occurrences. Among the more frequently mapped soils are Craven (Aquic Hapludult), Winton (Aquic Hapludult), Norfolk (Typic Kandiudult), Roanoke (Typic Endoaquult), Wagram (Arenic Kandiudult), Conetoe (Arenic Hapludult), and Wickham (Typic Hapludult). Less frequently recorded series include Spodic Paleudults, Aquic Quartzipsamments, Typic Humaquepts, Udipsamments, and Dystrochrepts.

Hydrology: Moisture levels are mesic overall, though local small areas with seepage are common in the Coastal Plain Subtype. These communities are often on the best-drained sites in the vicinity, located between wet floodplains or swamps below and wetlands of upland flats above. However, they also often are associated with drier upland communities.
Vegetation: The Coastal Plain Subtype forests are dominated by *Fagus grandifolia*, sometimes codominant with *Quercus alba* or *Quercus nigra*, *Liquidambar styraciflua*, *Liriodendron tulipifera*, or *Pinus taeda*. Other canopy species sometimes abundant in CVS plots include *Quercus michauxii*, *Quercus laurifolia*, *Quercus pagoda*, *Carya tomentosa*, *Carya glabra*, *Carya pallida*, and *Quercus shumardii*. The understory is often well developed and may be dominated by *Ilex opaca*, *Carpinus caroliniana*, *Nyssa sylvatica*, *Acer rubrum*, or *Cornus florida*. *Stewartia malacodendron*, *Acer floridanum*, *Oxydendrum arboreum*, or *Magnolia tripetala* may be abundant in some examples. The shrub layer is generally open and may include *Hamamelis virginiana*, *Lindera benzoin*, *Symlocos tinctoria*, *Euonymus americana*, *Clethra alnifolia*, *Asimina parviflora*, *Callicarpa americana*, *Vaccinium spp.*, *Gaylussacia frondosa*, *Arundinaria tecta*, and a wide variety of other occasional species. Vines may be abundant, particularly *Muscodinia rotundifolia* or *Smilax rotundifolia*. *Parthenocissus quinquefolia*, *Smilax glauca*, and *Bignonia capreolata* are also frequent. The herb layer may be sparse to dense. *Polystichum acrostichoides* sometimes forms dense beds, and *Athyrium asplenioides*, *Parathelypteris noveboracensis*, or *Mitchella repens* are extensive in some plots. A variety of other species may occur in the herb layer, including *Chimaphila maculata*, *Asplenium platyneuron*, *Lorinseria areolata*, *Chasmanthium laxum*, *Galium circaezans*, *Galium uniflorum*, *Hexastylis arifolia* var. *arifolia*, *Dichanthelium commutatum*, and *Sanicula canadensis*.

Range and Abundance: Ranked G3. Examples occur irregularly throughout the Coastal Plain of the state; they are largely limited to narrow bands of dissected lands along stream systems, but a few examples also occur on “swamp islands” in the flat lands of the outer Coastal Plain in the northeastern part of the state. The equivalent association ranges from southern Virginia to South Carolina, but most of its range may be in North Carolina.

Associations and Patterns: This subtype occurs as small patches, though some may aggregate into larger occurrences in bluff systems. It usually grades downhill to a Coastal Plain floodplain community, but a few may be surrounded by or occur on edges of Nonriverine Wet Hardwood Forest or Nonriverine Swamp Forest. Examples on bluffs usually grade uphill to Dry-Mesic Oak–Hickory Forest or Dry Oak–Hickory Forest. Enough are now bordered by altered vegetation on flatter uplands that the range of transitions may not be known.

Variation: Three variants are distinguished, corresponding to different landscape settings, which are believed to have effects on hydrology and fire dynamics. Vegetation differences among them are not known but have not been sought. Further study may show them to warrant treatment as subtypes, but the boundaries between them may not be well marked and the floristic differences are not as strong as between the recognized subtypes.

1. Bluff/Slope Variant occurs on locally relatively steep or dissected lands near streams. Examples are well drained but may have seepage, grade to drier communities above, and probably were naturally subject to more frequent fire than the other subtypes.

2. Swamp Island Variant occurs on isolated ridges surrounded by wetter communities, generally nonriverine wetlands. Examples are usually small and remote from other examples. They must have limited gene flow for plants and sessile animals and may be depauperate (nevertheless, examples have the surprising presence of large-seeded species not shared with the surrounding
communities. Surrounding vegetation generally is not flammable, and this variant must rarely if ever burn naturally.

3. Upland Flat Variant occurs on very gentle rises on wet upland flats of the outer Coastal Plain or of relict high river terraces without flooding. Examples are often in a mosaic with marginal wetlands such as Nonriverine Wet Hardwood Forest, with which they can share some species, but they generally are not associated with drier communities. They may be more subject to high water tables than the other variants. Surrounding vegetation generally is not very flammable, but fire is more likely to occur occasionally than in the Swamp Island Variant.

Dynamics: Dynamics are generally similar to other Piedmont and Coastal Plain Mesic Forests. However, at least some examples of the Bluff/Slope Variant are at greater risk of fire because of their association with drier, more flammable upland vegetation. This subtype also is more subject to disturbance by hurricanes than the Piedmont Subtype, because it occurs closer to the coast and because soils are less dense.

Comments:

*Fagus grandifolia - Quercus alba - Quercus laurifolia / Galax urceolata* Forest (CEGL007863) has been described for Virginia and could possibly occur in NC. It is an unusual community, presumably strongly acidic. *Quercus laurifolia*, though common in floodplains in North Carolina, is rare in mesic forests. *Fagus grandifolia - Liquidambar styraciflua - Quercus (michauxii, nigra)* Forest (CEGL007866) is a Coastal Plain small stream bottom association of South Carolina and Georgia. Peet has assigned plots from the Roanoke River floodplain to it, which apparently would better fit in this subtype. *Fagus grandifolia - Quercus (alba, rubra) - Liriodendron tulipifera / (Ilex opaca var. opaca) / Polystichum acrostichoides* Forest (CEGL006075) is a Coastal Plain mesic forest of northern Virginia and northward but is not expected to occur in North Carolina.

Rare species:

References: