

Appendix D

Description of Ecological Units

Following is a brief description of the ecological units in the Southern Appalachian Assessment (SAA) area as they occur in the framework from domain to subsection. Information for domains, divisions, and provinces was obtained from Bailey (1995). Section descriptions are based on McNab and Avers (1994).

The Humid Temperate domain (200) encompasses the SAA area. Precipitation exceeds evapo-transpiration, dominant vegetation is forests of evergreen and deciduous species. Seasons exhibit marked differences in temperature, but precipitation is generally well distributed throughout the year. This domain is divided into two divisions based on influence of frost. They are the hot continental division and the sub-tropical division.

The Hot Continental division (220) is characterized by hot summers and cool winters with a 3- to 6-month growing season. Snow cover can be long-lasting with deep accumulations in northern areas. The prevailing climate during the growing season is dry, especially in late summer. Vegetation is mainly broadleaf deciduous trees. Soils are chiefly Inceptisols, Ultisols and Alfisols. This division consists of two provinces.

The Eastern Broadleaf Forest (Oceanic) province (221) ranges in altitude from 1,000 to 3,000 feet. Terrain is hilly with some small mountains. Winters are cold, and summers are warm. There is more precipitation in summer than in winter. Vegetation is mainly deciduous broadleaf hardwoods, with pines on drier, more exposed ridges. In the SAA area, this province has three sections.

The Northern Cumberland Plateau section (221H) ranges from about 1,200 to 2,000 feet and consists of low hills. Soils are mostly Udults that have a mesic temperature regime, a udic moisture regime, and mixed or siliceous mineralogy. Predominant vegetation is mixed mesophytic forest and Appalachian oak forests.

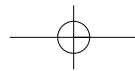
Principal species include oaks and hickories. This section has been subdivided into two subsections.

The Southwestern Escarpment subsection (221Hc) features high hills from 500 to 1,000 feet. Soils are Hapludults or Dystrochrepts with mixed mineralogy, a mesic temperature and a udic moisture regime. Principal species include chestnut oak, northern red oak, pignut and mockernut. Mean annual precipitation is about 46 inches, and the mean annual temperature is 55 degrees F.

The Sequatchie Valley North subsection (221Hd) features open low mountains from 1,000 to 3,000 feet. The features and vegetation are similar to that of the Southern Ridge and Valley section. Soils are mostly Paleudults or Dystrochrepts with kaolinitic or mixed mineralogy and an udic moisture regime. They have a temperature regime ranging from thermic at lower elevations to mesic at higher elevations. Principal species include southern red oak, white oak (post oak), and hickories. Principal species include southern red oak, white oak, mockernut, and pignut. Mean annual precipitation is 36 to 55 inches. Mean annual temperature ranges from 55 to 61 degrees F.

The Southern Cumberland Mountains section (221I) consists of low mountains and open hills from 1,200 to 3,000 feet. Soils are mainly Udults with a mesic temperature regime, an udic moisture regime and mixed mineralogy. The oak-hickory forest type dominates vegetation, with oaks as the main species. Precipitation averages 46 inches: temperature averages about 55 degrees F. This section has two subsections.

The Pine Mountain Thrust Block subsection (221Ia) soils are Hapludults that have mixed mineralogy and mesic temperature and udic moisture regimes. Principal species include chestnut oak, red oak, and hickories. Principal species include chestnut oak, mockernut, and



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pignut. Mean annual precipitation is approximately 46 inches; mean annual temperature is 55 degrees F.

The Cleveland subsection (221Ib) features mountains from 1,000 to 3,000 feet. Soils are primarily Dystrachrepts with mixed mineralogy and mesic temperature and udic moisture regimes. Principal species include chestnut oak, northern red oak, white oak, southern red oak, black oaks, and mockernut. The mean annual precipitation is 46 inches and the mean annual temperature is 55 degrees F.

The Central Ridge and Valley section (221J) is a distinctive, repeating pattern of parallel ridges and valleys that have been strongly dissected by differential erosion and mass wasting. Soils are Udults with smaller amounts of Ochrepts and Paleudults. Soils depths range from shallow on sandstone ridges to deep in limestone valleys. Vegetation is Appalachian oak forest, but much of the section has been cleared for pastures, agriculture, and urban land use. This section has been subdivided into three subsections.

The Rolling Limestone Hills subsection (221Ja) has open hills from 300 to 500 feet in elevation. Soils are Paleudults, Dystrachrepts, and Hapludults that have kaolinitic or mixed mineralogy, a thermic temperature and udic moisture regimes. Principal species include chestnut and scarlet oaks, with red-cedar on soils derived from limestone. Shortleaf and pitch pines are present on disturbed sites. Mean annual precipitation ranges from 36 to 55 inches; mean annual temperature from 55 to 66 degrees F.

The Sandstone Hills subsection (221Jb) consists of open hills from 300 to 500 feet. Soils are Rhodudults, Paleudults, and Hapludults with oxidic, kaolinitic, and mixed mineralogy. They have a thermic temperature and udic moisture regime. Principal species include scarlet, chestnut, and blackjack oaks. Eastern red-cedar is commonly found on limestone soils. Mean annual precipitation ranges from 36 to 55 inches; mean annual temperature ranges from 55 to 61 degrees F.

The Holston Valley subsection (221Jc) features open hills 300 to 500 feet in elevation. Soils consist of Eutrochrepts, Hapludults, and Dystrachrepts with mixed mineralogy and mesic temperature and udic moisture regimes. Principal species include black oak, white oak, pignut and shagbark. Mean annual

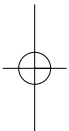
precipitation is 36 to 55 inches.

The Central Appalachian Broadleaf Forest-Coniferous Forest-Meadow province (M221) is in the predominately mountainous area of the Central and Southern Appalachian Mountains. Altitudes range from 700 to more than 6,000 feet. Climate is characterized by short, mild winters and long, warm summers. Precipitation is evenly distributed throughout the year, but varies widely, less than 33 inches in the Massanutten Mountains of the northern Shenandoah Valley to more than 100 inches along parts of the Blue Ridge escarpment, North Carolina. Vegetation is mainly broadleaf deciduous species with conifers on ridge crests and southern exposures. Vegetation also exhibits zonation with increasing altitudes and precipitation. Forests dominated by spruce and fir occur above 5,000 feet. This province is subdivided into four sections:

The Northern Ridge and Valley section (M221A) is characterized by a series of parallel, generally narrow valleys and mountain ranges. Elevations range from 300 to 4,000 feet. Soils are mostly Ultisols, Alfisols and Inceptisols with a mesic temperature regime and udic moisture regime. Vegetation is Appalachian oak forest, oak-hickory forest, with some northern hardwoods and mixtures of yellow pine on southern exposures. Precipitation averages 30 to 45 inches, but increases to 100 inches along the escarpment of the Allegheny Plateau on the western edge of the section. Annual temperature ranges from 4 to 14 degrees F. This section has been delineated into two subsections.

The Appalachian Ridges subsection (M221Aa) consists of plains and low mountains ranging from 1,000 to 4,500 feet. Soils are Dystrachrepts and Fragiudults with mixed mineralogy, mesic temperature and udic moisture regimes. Principal species include chestnut oak, white oak, northern red oak and black oak, mockernut, and white and pitch pines. Table Mountain pine is also present in localized areas. Mean annual precipitation ranges from 30 to 55 inches; mean annual temperature ranges from 60 to 62 degrees F.

The Great Valley of Virginia subsection (M221Ab) is dominated by a broad valley with low hills and mountains having elevations of 700 to 3,000 feet. Numerous caves and extensive karst areas are found in this subsection. Soils are Paleudults and Hapludults with mixed mineralogy, mesic temperature and udic



moisture regimes. Principal species include white, chestnut, red and black oaks, mockernut and pignut. Other species include shortleaf and pitch pines along with black walnut, elm and sycamore along river courses. Historically this subsection likely had extensive acreage in grasslands and savannas interspersed with wetlands. The mean annual precipitation is 33 to 50 inches and the mean annual temperature is 46 to 55 degrees F.

The Allegheny Mountains section (M221B) is a maturely dissected plateau characterized by high, sharp ridges and narrow valleys. Elevation ranges from 500 to 800 feet. Soils are mostly Ultisols, Inceptisols, and Alfisols. The temperature regime is mostly mesic although extensive areas of frigid soils occur at the highest elevations. Vegetation is predominantly red spruce northern hardwoods, mixed mesophytic, and oak-hickory-pine. Several areas of high-elevation wetlands occur within the section. Precipitation averages 45 to 60 inches annually. Only the eastern-most edge of this section is in the SAA area.

The Northern Cumberland Mountains section (M221C) has elevations ranging from 2,000 to 2,600 feet. Landforms are mainly low mountains with a folded, faulted, and uplifted structure. Soils are mostly Ochrepts, Udults, and Aquults. The temperature regime of soils is mesic; the moisture regime is udic or aquic. Vegetation is mostly mixed mesophytic forest, Appalachian oak forest, and northern hardwoods. Precipitation averages 34 to 47 inches. A single subsection has been delineated within the SAA area.

The Central Coalfields subsection (M221Ca) consists of low mountains ranging from 1,000 to 3,000 feet. Soils are Dystrochrepts and Hapludults of mixed mineralogy, with mesic temperature and udic moisture regimes. Principal species include chestnut oak, white oak, and black oak. Sycamore, deciduous magnolias, and yellow-poplar are common along major river bottoms. The mean annual precipitation is approximately 46 inches, and mean annual temperature is around 55 degrees F.

The Blue Ridge Mountains section (M221D) contains the highest peaks in the eastern United States, with altitudes over 6,000 feet. Landforms consist of mountain peaks and ranges separated by intermountain basins. Vegetation is mainly mixed mesophytic and oak-pine mixtures at lowest elevations. oaks at

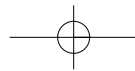
moderate elevations, and spruce-fir on highest peaks. Precipitation averages 40 to 50 inches annually, but ranges to 100 inches or more on the highest peaks of the Southern Blue Ridge Escarpment. Four subsections have been delineated in this section:

The Northern Blue Ridge Mountains subsection (M221Da) consists of narrow mountains from 1,000 to 4,000 feet. Soils are Kanhapludults and Dystrochrepts with kaolinitic and mixed mineralogy, with mesic temperature and udic moisture regimes. Principal species include chestnut oak and scarlet oak on the uplands. Yellow-poplar, black cherry, red maple, and black birch are common on mesic sites. The mean annual precipitation ranges from 40 to 50 inches, and the mean annual temperature ranges from 50 to 61 degrees F.

The Central Blue Ridge Mountains subsection (M221Db) is characterized by low, plateau-like mountains ranging from 1,000 to 3,600 feet. Soils are Hapludalfs, Hapludults, and Kanhapludults with mixed and kaolinitic mineralogy and mesic temperature and udic moisture regimes. Principal species include scarlet, chestnut, white, and black oak with an abundance of white pine. There was an abundance of American chestnut before the blight. Historically, numerous small wetlands occurred. The mean annual precipitation ranges from 40 to 50 inches, and mean annual temperature ranges from 50 to 60 degrees F.

The Southern Blue Ridge Mountains subsection (M221Dc) consists of mountains from 2,000 to 6,000 feet. Soils are Dystrochrepts, Kanhapludults, and Hapludults with mixed, kaolinitic and micaeous mineralogy, respectively with mesic temperature and udic moisture regimes. Common species are white and scarlet oak, with mixed mesophytic and yellow-poplar at low elevations with pitch pine on dryer and disturbed sites, and chestnut oak, and northern red oak at moderate elevations. Red spruce and Fraser fir occur at the highest elevations, above 5,500 feet. The mean annual precipitation ranges from 40 to 50 inches, and the mean annual temperature ranges from 50 to 60 degrees F.

The Metasedimentary Mountains subsection (M221Dd) features mountains ranging from 2,000 to over 6,000 feet. Soils are Dystrochrepts, Kanhapludults, and Hapludults with mixed and kaolinitic mineralogy and



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mesic temperature and udic moisture regimes. Common species include white, chestnut, and scarlet oaks on dry sites. Mesophytic species, such as yellow-poplar and Canadian hemlock are on moist sites. Spruce-fir vegetation occurs over 5,500 feet. The mean annual precipitation ranges from 50 to 60 inches, and the mean annual temperature ranges from 50 to 60 degrees F.

The Subtropical division (230) has a summer climate of high humidity. Winters are mild with only brief periods of prolonged freezing temperatures; snow occurs, but accumulations are uncommon. Because this division is relatively close to the Atlantic and Gulf coasts, air masses are generally oceanic in origin and summer rainfall is adequate for tree growth during most years. Vegetation is a mixture of deciduous hardwoods and evergreen conifer species. Soils are predominantly Ultisols and many are eroded due to extensive past agriculture. Within the SAA area, one province occurs in this division.

The Southeastern Mixed Forest province (231) consists of the foothills part of the Appalachian Piedmont. Precipitation averages 40 to 60 inches and is generally evenly distributed during the year. Vegetation is dominated by species of southern yellow pines and deciduous hardwoods. Understory vegetation consists of shade-tolerant trees, such as dogwood and sourwood. Soils are typically Ultisols.

The Southern Appalachian Piedmont section (231A) is a region mainly of irregular plains with smaller areas of high hills and tablelands. Elevation ranges from 330 to 1,300 feet. Udufts are the predominant soils. In many areas soils are severely eroded as a result of past intensive agricultural practices, especially for cotton production. Vegetation is mostly oak-hickory-pine forest and southern mixed forest. Loblolly pine and southern red oak with an understory of dogwood and sweetgum is a common vegetative community on uplands. The annual precipitation ranges from 45 to 55 inches.

The Midland Plateau Central Uplands subsection (231Aa) is characterized by irregular plains ranging from 100 to 1,300 feet. Soils are Kanhapludults and Rhodudults of kaolinitic mineralogy with thermic temperature and udic moisture regimes. Principal species include white, chestnut, southern red and black oaks; and mockernut, pignut, and shagbark hickories. The mean annual precipitation ranges from 45

to 55 inches, and the mean annual temperature ranges from 57 to 64 degrees F.

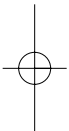
The Piedmont Ridge subsection (231Ab) consists of table lands of moderate relief, elevations ranging from 300 to 500 feet. Soils are Kanhapludults, Rhodudults, and Udifluvents with kaolinitic and mixed mineralogy. They have a thermic temperature and a udic moisture regime. Principal species include white, chestnut, southern red, and black oaks; mockernut; and pignut. The mean annual precipitation ranges from 45 to 55 inches, and the mean annual temperature ranges from 57 to 64 degrees F.

The Schist Plains subsection (231Ac) is characterized by table lands of moderate relief with elevations ranging from 300 to 500 feet. Soils are Kanhapludults and Rhodudults with kaolinitic mineralogy and thermic temperature and udic moisture regimes. Principal species include white, chestnut, southern red, and black oaks; and mockernut and pignut hickories. The mean annual precipitation ranges from 45 to 55 inches, and the mean annual temperature ranges from 57 to 64 degrees F.

The Lower Foothills subsection (231Ad) is an area of open high hills with elevations ranging from 500 to 1,000 feet. Soils are Kanhapludults with kaolinitic mineralogy, a thermic temperature regime, and udic moisture regime. Principal species include white, red, black, and chestnut oaks; and mockernut, pignut, and shagbark hickories. The mean annual precipitation ranges from 40 to 55 inches, and the mean annual temperature ranges from 50 to 64 degrees F.

The Schist Hills subsection (231Ag) is characterized by open high hills ranging from 500 to 1,000 feet. Predominant soils are hapludults with micaceous mineralogy, a thermic temperature regime, and udic moisture regime. Principal species include white, red, black, and chestnut oaks; and mockernut, pignut, and shagbark hickories. The mean annual precipitation ranges from 39 to 55 inches, and the mean annual temperature ranges from 50 to 60 degrees F.

The Lynchburg Belt subsection (231Ak) consists of irregular plains with elevations ranging from 100 to 1,300 feet. Soils are Kanhapludults, Hapludults, and Dystrochrepts of kaolinitic and mixed mineralogy with a thermic temperature and udic moisture regimes. Principal species include white, scarlet



red, and black oaks; and mockernut, pignut, and shagbark hickories. Virginia pine is common on disturbed areas. The mean annual precipitation ranges from 50 to 55 inches, and the mean annual temperature ranges from 57 to 64 degrees F.

The Northern Piedmont subsection (231A) is characterized by plains with high hills from 500 to 1,000 feet. Soils are Hapludults and Dystrichrepts with kaolinitic and mixed mineralogy. They have a mesic temperature regime and udic moisture regime. Principal species include white, scarlet, red, and black oaks; and mockernut, pignut, and shagbark hickories. The mean annual precipitation ranges from 35 to 45 inches, and the mean annual temperature ranges from 50 to 64 degrees F.

The Triassic Basins subsection (231Ap) consists of table lands of moderate relief ranging from 300 to 500 feet. Soils are Hapludults, Hapludalfs, and Dystrichrepts with mixed mineralogy and mesic temperature and udic moisture regimes. Principal species include white oak, red oak, shagbark, pignut, and mockernut hickories on the more mesic sites and post oak and blackjack oak on the xeric sites. The mean annual precipitation ranges from 16 to 45 inches, and the mean annual temperature ranges from 50 to 57 degrees F.

The Southern Cumberland Plateau section (231C) generally consists of open-hill landforms with some table lands and high hills. Soils are mainly Udults and Ochrepts with a udic moisture regime and a thermic temperature regime. Vegetation is mostly oak-hickory-pine forest. Principal species include loblolly pine, sweetgum, water oak, red maple, southern red oak, and white oak. The mean annual precipitation ranges from 50 to 55 inches.

The Table Plateau subsection (231Cc) is characterized by table lands of considerable relief with elevations ranging from 500 to 1,000 feet. Soils are Hapludults and Paleudults of siliceous and mixed mineralogy with thermic temperature and udic moisture regimes. Principal species include white oak, red oak, shagbark, pignut, and mockernut hickories, and eastern red-cedar on limestone soils. Mean annual precipitation ranges from 36 to 55 inches; mean annual temperature ranges from 55 to 61 degrees F.

The Southern Cumberland Valleys subsection (231Cf) is generally table land with considerable relief elevations ranging from

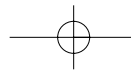
500 to 1,000 feet. Soils are Paleudults and Dystrichrepts with siliceous mineralogy, a thermic temperature regime, and udic moisture regime. Principal species include white oak, red oak, shagbark, pignut, and mockernut hickories, and eastern red cedar on limestone soils. The mean annual precipitation ranges from 51 to 55 inches, and the mean annual temperature ranges from 60 to 62 degrees F.

The Southern Ridge and Valley section (231D) is an area of folded, faulted and uplifted belts of parallel valleys and ridges. Landforms are mainly plains with hills, with elevations ranging from 650 to 2,000 feet. Soils are mostly Udults with some Ochrepts. Moisture and temperature regimes are udic and thermic or mesic, respectively. Oak-hickory-pine and southern mixed forests form most of the arborescent vegetative communities. Precipitation averages 35 to 55 inches annually.

The Chert Valley subsection (231Da) consists of plains with hills from 300 to 500 feet. Soils are predominantly Paleudults with kaolinitic to siliceous mineralogy, a thermic temperature regime, and udic moisture regime. Principal species include white, chestnut, southern red, and black oaks, and mockernut and pignut hickories. Mean annual precipitation ranges from 36 to 55 inches; mean annual temperature ranges from 55 to 61 degrees F.

The Sandstone, Shale and Chert Ridge subsection (231Db) is characterized by plains and hills from 300 to 500 feet. Soils are Dystrichrepts and Paleudults with siliceous mineralogy with thermic temperature regime and udic moisture regime. Principal species include white, scarlet, red, and black oaks; and mockernut, pignut, and shagbark hickories. Mean annual precipitation ranges from 36 to 55 inches; mean annual temperature ranges from 55 to 61 degrees F.

The Sandstone Ridge subsection (231Dc) is an area of plains with hills from 300 to 500 feet. Limestone outcrops are common. Soils are Dystrichrepts with a siliceous mineralogy, a thermic temperature regime, and an udic moisture regime. Principal species include white, chestnut, southern red, and black oaks, and mockernut and pignut hickories. The dominant species of the mountain longleaf alliance includes longleaf and short leaf pines and post oak and southern red oak. The mean annual precipitation ranges from 51 to 55 inches, and the mean annual temperature ranges from 51 to

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60 degrees F.

The Quartzite and Talledega Slate Ridge subsection (231Dd) is characterized by open, high hills from 500 to 1,000 feet. Soils are predominantly Hapludults with micaeous or mixed mineralogy and have a thermic temperature regime and an udic moisture regime. Principal species include chestnut, white, southern red, and black oaks; and mockernut and pignut hickories. Mean annual precipitation ranges from 36 to 55 inches; mean annual temperature ranges from 55 to 61 degrees F.

The Shaley Limestone Valley subsection (121De) consists of plains with hills ranging from 300 to 500 feet. Soils are predominantly Paleudults with siliceous or kaolinitic mineralogy with a thermic temperature regime and a udic moisture regime. The principal species include white oak, scarlet oak, red oak, black oak, and hickories. The mean annual precipitation ranges from 36 to 55 inches, and the mean annual temperature ranges from 55 to 61 degrees F.

