Chapter 1

PURPOSE AND NEED

Introduction

The Daniel Boone National Forest proposes to revise the Land and Resource Management Plan (Forest Plan) that will guide natural resource management on the Forest the next 10 to 15 years.

While the current Forest Plan, in effect since 1985, has been amended 14 times, the National Forest Management Act (NFMA 1976) requires the Regional Forester to periodically review and justify forest management plans. Conditions on the DBNF as well as the public's expectations for Forest resources have altered since adoption of the 1985 Plan. In addition, scientific concepts, such as ecosystem function and biodiversity, have evolved since the mid 1980s.

This Draft Environmental Impact Statement (DEIS) analyzes six Alternatives for revising the 1985 Plan and discloses the environmental effects of each. The DEIS is guided by the implementing regulations of the National Environmental Policy Act (NEPA) found in the Council of Environmental Quality Regulations, Title 40, Code of Federal Regulations (CFR), Part 1500. The companion document to this DEIS, the Proposed Revised Forest Plan, is a detailed presentation of the preferred Alternative. Instructions for revising forest plans, the legal basis for this revision, can be found in the Code of Federal Regulations 36 CFR 219.10(g).

FOREST PLAN DECISIONS

The National Forest System allocates resources and makes management decisions in two stages. Stage One, the Forest Plan, allocates lands and resources to various uses or conditions by establishing Management Areas based on the four major watersheds and Prescription Areas in which appropriate management direction is tailored to various parcels of land. Site-specific project decisions are made in Stage Two.

Forest Plans do not oblige the agency to undertake site-specific projects; rather, they establish overall Goals, Objectives, and Desired Future Conditions that individual national forests strive to meet. Forest Plans also set limitations on what actions may be authorized and what conditions must be met, during project decision-making.

Some of the primary decisions made in a Forest Plan include:

- Establishment of the Forestwide multiple-use Goals and Objectives (36 CFR 219.11(b).
- Establishment of Forestwide management requirements (36 CFR 219.13 to 219.27).
- Establishment of multiple-use Prescription Areas and associated Standards for each Management Area (36 CFR 219.11(c).

- Determination of land that is suitable for the production of timber (16 U.S.C. 1604(k) and 36 CFR 219.14).
- Establishment of allowable sale quantity for timber within a time frame specified in the Plan (36 CFR 219.16).
- Establishment of monitoring and evaluation requirements (36 CFR 219.11(d)).
- Recommendation of roadless areas as potential wilderness areas (36 CFR 219.17).
- Determine lands available for oil and gas leasing (36 CFR 228.102 (d)). Consent the Bureau of Land Management leasing the available lands (36 CFR 228.102 (e)).

Any authorization of a site-specific project must comply with NEPA procedures.

SUPPORTING ENVIRONMENTAL IMPACT STATEMENTS

The following Environmental Impact Statements contain environmental analyses that are not repeated in this FEIS, but provide supporting documentation for some Forest Plan decisions:

- Final Environmental Impact Statement for Gypsy Moth Management in the United States: A Cooperative Approach (USDA, Forest Service and APHIS, Washington DC, November 1995)
- Final Environmental Impact Statement for the Management of the Red-cockaded Woodpecker and its Habitat on National Forests in the Southern Region (RCW EIS) (USDA Forest Service, Southern Region, June 1995)
- Final Environmental Impact Statement for the Suppression of the Southern Pine Beetle (USDA Forest Service, Southern Region, February 1987)
- Final Environmental Impact Statement for Vegetation Management in the Appalachian Mountains (USDA Forest Service, Southern Region, July 1989)
- Final Environmental Impact Statement for Forest Service Roadless Area Conservation (USDA Forest Service, Washington Office, November 2000)

FOREST PROFILE

Proclaimed in 1937, the main stretch of the Daniel Boone National Forest (DBNF) is a relatively narrow strip running 140 miles northeast along the western edge of the Cumberland Plateau from the Tennessee border to the northern tip of Rowan County. On the eastern side of the Plateau, the separate Redbird unit, added in 1964, lies within six counties.

About one-third of the proclamation area's two million acres -- nearly 700,000 acres -- is federally owned and managed by the Forest Service. Federally owned tracts are discontinuous, however, scattered within the proclamation boundary. Individuals hold most of the privately owned land in tracts averaging from 100 to 300 acres, however, some large industrial holdings can be found in Clay and Leslie Counties of the Redbird unit.

Steep-sided, winding valleys and ridges mark the Forest's hilly to mountainous terrain. Local relief varies from about 400 feet in the north to about 2,000 feet in the south. Thousands of miles of small branches and streams dissect this combination of flat-topped ridges and rolling hills.

Three rivers, the Licking, Kentucky, and Cumberland, drain portions of the DBNF. Water quality is generally excellent, except in some fourth and fifth order streams impacted by brine disposal from oil and gas drilling and by acid discharges from abandoned surface and deep coalmines. However, streams with substandard water quality account for only three percent of the water flow. The riparian areas of the forest are home to some distinctive resources and ecosystems, including 100-year flood plains and wetlands.

Forested lands of the Daniel Boone are constituents of the mixed Mesophytic region of the Eastern Deciduous Forest. An extremely wide variety of species thrive in both the under and overstories, including more than 40 commercial tree species. The Forest is a mosaic of various seral stages of mostly upland hardwood types, with oak-hickory most common.

Within the Forest are 18,000 acres of designated Wilderness and 19 miles of Wild and Scenic Rivers. The proclamation area of the Forest is also home to three state parks and four U.S. Army Corps of Engineers lakes. The Big South Fork National River and Recreation Area abuts the Forest's southern boundary.

About 75 percent of subsurface rights on the Forest are either "reserved" by the previous surface owners of "outstanding" in third parties. Minerals currently being extracted include coal, petroleum, natural gas, and limestone.

More than 80 different kinds of soils are currently mapped on the DBNF. Acid sandstone, shale, and some siltstone and limestone in alternating layers underlie the Forest. Soils formed from these materials are mostly of mixed mineralogy, generally acidic, and possess low to moderate fertility.

Soil erosion loses range from an average low of about 0.1 ton per acre per year on undisturbed forested land. Also for comparison purposes, between the initial soil disturbing activity until successful implementation of erosion control BMP's, generally between 0.1 and 2 tons per acre per year erosion losses occur from each tractor logged area; between 10 and 65 tons per acre per year from constructed log skid roads; between 0.01 and 20 tons per acre per year from each acre prescribed burned; and between 0.1 and 6 tons per acre per year for temporary logging roads. In contrast to the above silvicultural activities, agronomic practices involving cultivation generally yield as much as 10 tons per acre per year from cropland areas; to as much as 50 to 100 tons or more per acre at surface mining sites, and construction of developed recreational facilities, and open classified roads.

The DBNF is exceedingly rich in the non-renewable resources that represent over 13 thousand years of people interacting with their environment. The record of those who came before us is held in over 3,800 archaeological sites that have been documented on the Forest with thousands more remaining to be recorded. These sites range from prehistoric camps and rock art to pioneer trails, Civil War battlefields, farmsteads, coal towns and iron furnaces. Each one of these sites is a valuable part of the diverse mosaic that portrays the story of those who preceded us. An overview of the heritage resources on the Daniel Boone was prepared in 1982. Since the majority of the sites known to exist on the forest have been recorded since the publication of that overview, a major update is needed.

These resources are increasingly threatened by development, public use, and vandalism. Much evidence of the past, such as artifacts and architecture, is extremely fragile and can be obliterated by relatively minor modifications of the ground surface. The damage is frequently subtle and inconspicuous and often can be recognized only by a professional or trained person.

The Forest's five million annual visitors make recreation one of the largest of its multiple uses.

Physical Environment

The physical environment is the non-living portion of the environment upon which living organisms depend -- air, soil, water, geology, and climate. This section begins with a description of the ecological classification of the DBNF. Ecological classification is a system, which classifies land and water at various scales through integrating information about climate, geology, landform, soils, water, and vegetation. This classification is a tool to provide a more ecological and scientific basis in land and resource management planning.

Ecological classification is useful for:

- Evaluating the inherent capability of land and water resources
- Predicting changes occurring over time
- Evaluating effects of management
- Allocating land to Management Areas
- Selecting appropriate management indicators
- Discussing and analyzing ecosystems and biodiversity at multiple scales.

The reader will see this ecological classification referred to throughout this chapter. It provides an ecological context for the affected environment descriptions and a more specific and sensitive effects analysis.

Description of Terrestrial Ecological Units

The USDA Forest Service developed a hierarchical ecological classification system for describing terrestrial ecosystem units (Bailey 1995) and describing aquatic ecosystem units (Maxwell et al. 1995). Both systems are designed to facilitate region planning at multiple scales. Only the terrestrial system is described here.

The United States is divided into several Domains, large ecological units defined primarily by regional weather characteristics. A domain may encompass a large area such as the eastern United States. Each domain is further divided into subunits called Provinces that are defined based on narrower weather patterns. A province may encompass an area such as the Mid-Atlantic States or the Gulf coastal states. Each province is divided into subunits called Sections that are defined on broad patterns of topography and surficial geology. Sections are usually smaller than states, with a few too many in a state. They often cross state boundaries. Sections are further divided into Subsections, ecological units based primarily on finer patterns of topography, geology and soils. Subsections generally range from 500,000 to several million acres in size. Keys et al. (1995) provided the framework to define subsections in the eastern United States.

Subsections are divided into Landtype Associations, commonly referred to as LTAs. These units are defined on topography, geology, soils, and broad vegetation patterns. LTAs generally range from 10,000 to 100,000 acres in size. They may be used in eastern forests to define broad biological capabilities of the landscape as related to physical conditions. LTAs may be further divided into Landtypes (LTs). These are defined based on narrow patterns in topography, soils, geology, and vegetation. They generally are several hundred to 10,000 acres in size. Landtypes are divided into

Landtype Phases (LTPs), units defined by local patterns in topography, soils, geology, and vegetation. LTPs may be useful for making predictions about the biological capabilities of stand-sized areas of land, usually 5 to 100 acres.

ECOLOGICAL SECTIONS AND SUBSECTIONS

The ecological classification hierarchy for the terrestrial area covered by the DBNF is defined through LTA. Only small areas of LTs and LTPs on the DBNF are mapped, and these are generally developed on a project-by-project basis as needed. The following outline displays the hierarchy for the DBNF through Subsection. Figure 1 - 1 shows the relationship among these units and the DBNF proclamation boundary. Subsections are further described below. Overall, most of the Forest (88%) is within the Northern Cumberland Plateau Section and its four Subsections.

200 - Humid Temperate DOMAIN
- 221 - Eastern Broadleaf Forest (Oceanic) PROVINCE
  - 221H - Northern Cumberland Plateau SECTION
    - 221Ha - Rugged Eastern Hills Subsection
    - 221He - Low Hills Belt Subsection
    - 221Hb - Central Escarpment Subsection
    - 221Hc - Southwestern Escarpment Subsection
- M221 - Central Appalachian Broadleaf-Coniferous Forest Meadow PROVINCE
  - M221C - Cumberland Mountain SECTION
    - M221Cd - Southern Cumberland Mountain Subsection
    - M221Ce - Pine & Cumberland Mountains Subsection
- 222 - Eastern Broadleaf Forest (Continental) PROVINCE
  - 222E - Interior Low Plateau, Highland Rim SECTION
    - 222En - Kinniconick & Licking Knobs Subsection
    - 222Ej - Eastern Knobs Transition Subsection

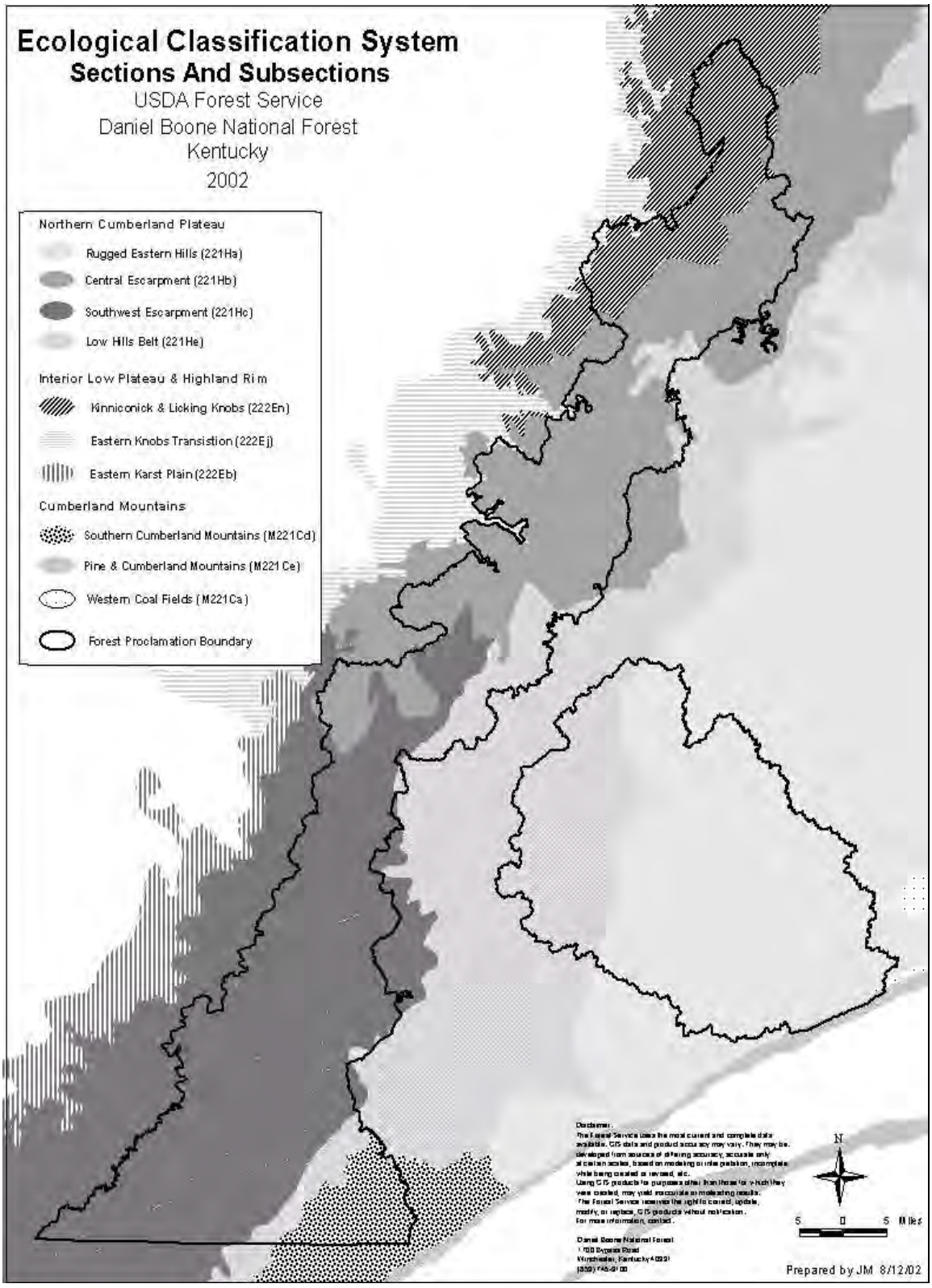

Figure 1 - 1. Ecological Sections and Subsections in the Daniel Boone National Forest.

Subsection Descriptions

The following subsection descriptions where compiled from the Landtype Association (LTA) descriptions developed for the Forest, July 1997. (Taylor et al. 1997)

NORTHERN CUMBERLAND PLATEAU SECTION (221H)

Landscape Character Description: This section encompasses most of the DBNF. At this time, 34 percent of the land within the proclamation boundary is National Forest System land, distributed in a patchwork pattern over 21 counties. As of 2001, approximately 684,000 acres, or 98 percent of National Forest System land was forested. Approximately 14,000 acres (2%) was in non-forest uses such as parking lots, administrative sites, and permitted uses such as water pumping stations, mineral developments, and major highways.

Within the proclamation boundary of the Forest, 95 percent of the land is in a forested condition. Therefore, most private land surrounding the national forest is forested. Satellite imagery indicates a slight land use trend toward forested conditions from 1978 to 1998.

On a broader scale, the Northern Cumberland Plateau ecoregion is somewhat less forested. About 612,624 acres (88.3%) of the Daniel Boone lies within this section. That portion of the Northern Cumberland Plateau outside of the Forest proclamation boundary, within Kentucky, is 81.6 percent forested. Forests have been cleared for agriculture on about 20 percent of the entire Northern Cumberland Plateau section.

Due to the steep terrain roads and trails lay primarily along the stream valleys and the flat ridgetops. Most non-forested activities are concentrated along these corridors. The broader valleys have farm land, pasture land, and communities. Narrower valleys have homes with garden plots, churches and scattered general stores. The broader valleys provide a pastoral setting with a naturally appearing background on the mountains behind. The flat ridge tops have a pastoral setting with farm land, and pasture land. The backdrop for these pastoral settings is a natural appearing valley and ridge beyond.

Rugged Eastern Hills (221Ha): This subsection is located in southeastern Kentucky and includes land on the Redbird Ranger District. Moderate-relief hills and ridges that range in elevation from 1,200 to 2,500 feet characterize the Rugged Eastern Hills. Ridges are capped by a mixture of clay shales, siltstone, sandstone, and coal. Valley floors are soft clay shales and siltstones. The geology consists of Pennsylvanian-Aged Lower and Middle Breathitt formations. The geomorphic processes primarily responsible for shaping this landscape are erosion and mass wasting. The small cliffs found in some valleys are primarily the result of stream incision. Landslides are prevalent throughout this subsection but are most common in its southernmost portion. Ridges are characterized by soils that range in depth from 20 to 40 inches or more. Most subsoils have moderate clay content, and the soils are moderately too well drained. Soils on the slopes are typically over 40 inches deep, with a few rock outcrops occurring on the lower slopes of the more entrenched valleys. Most have moderate to high clay content in the subsoil and are moderately well drained.

The Rugged Eastern Hills subsection has a moderate number of small to medium sized intermittent and perennial streams. Typically, the relatively steep valleys of smaller streams are V-shaped, narrow, and boulder-dominated. Valleys of the larger streams also tend to be narrow but less steep, broader, and have more alluvial deposits. Drainage patterns are dendritic, and dissection is

moderately high, with about 18 miles of perennial, intermittent, and ephemeral streams per square mile. The Middle Fork of the Kentucky River is the largest stream traversing this subsection.

Küchler (1964) classifies the potential natural vegetation of the Plateau as mixed mesophytic forest and Appalachian oak forest. Historical vegetation is similar to existing vegetation, but included a well-developed oak-American chestnut component. Within this subsection, Appalachian oak and its variants are dominant. White, black, chestnut, and scarlet oak, with scattered pignut hickory, are common on the ridges and upper slopes. Rarely, shortleaf and pitch pines with a scattering of oaks form the overstory. White and black oak is common on slopes. Red maple is common throughout. Virginia pine often forms pure stands in disturbed areas. An acid, eastern hemlock/American beech variant of the mixed mesophytic forest occurs in the most sheltered valleys; in many locations, species of magnolias are important components of the overstory.

Common mammals found in this subsection are white-tailed deer, bobcat, gray fox, gray squirrel, opossum, eastern chipmunk, white-footed mouse, short-tailed shrew, and smoky shrew. Common birds include wild turkey, ruffed grouse, tufted titmouse, Carolina wren, hooded warbler, northern cardinal, and ovenbird. Common reptiles and amphibians include eastern box turtle, milk snake, black rat snake, black racer, timber rattlesnake, northern copperhead, five-lined skink, Cope's gray treefrog, Cumberland Plateau salamander, longtail salamander, northern red salamander, and red-spotted newt. Fish commonly encountered include smallmouth bass, creek chub, and a few darters. A rich snail fauna is known in the area, including the near endemic Pine Mountain Disc. A good population of snuffbox, a sensitive species occurs on the Redbird district. Threatened or endangered species found in the area include bald eagles.

Central Escarpment (221 Hb): This subsection is located in east-central Kentucky and includes land on the Morehead, Stanton, and London Ranger Districts. The Central Escarpment is transitional between the Highland Rim and the Cumberland Plateau and is characterized by narrow to broad winding ridges with side slopes averaging 50 percent, but may exceed 65 percent in the most entrenched valleys. Rock outcrops and cliffs are common in all but the shallowest valleys. Single and moniliform knobs, with wide valleys and well-developed flood plains are prevalent to the north and west. Ridges are capped by resistant conglomerate and sandstone, although mixtures of soft clay shales, siltstone, sandstone and coal also are present. Cliffs are sandstone/conglomerate and limestone. The floors of the largest valleys consist of cherty limestone, sandstone, shale, and siltstone. The geology includes Pennsylvanian-Age Lower Breathitt and Lee formations on the ridges and side slopes, and Mississippian-Age Borden and Newman formations lower in the larger valleys. The geomorphic processes primarily responsible for shaping this landscape are erosion and block slides. Soils on the ridges are typically 20 to 30 inches deep and moderately well to well drained with moderate clay content in the subsoil. Rock fragments are common. Side slope soils are usually over 40 inches deep and moderately well drained with moderate to high clay content in the subsoil. Some outcrops and talus slopes are present. Side valleys are narrow with short, steep slopes and waterfalls are frequent. Fourth and fifth order streams have moderately broad, flat valleys with well-developed alluvial bottoms. Stream gradients are moderate and the discharge regime is somewhat modified by karst hydrology. Drainage patterns are dendritic, and dissection is moderately high with about 18 miles of perennial, intermittent, and ephemeral streams per square mile. Parts of both the Kentucky and Licking watersheds are within this subsection.

Küchler (1964) classifies the potential vegetation of the Plateau as mixed mesophytic forest and Appalachian oak forest. Historical vegetation was similar to existing vegetation with the exceptions

of American chestnut dominance and lesser abundance of red maple. Within this subsection, Appalachian oak and its variants are the dominant existing vegetation. White, black, chestnut, and scarlet oaks, with scattered pignut hickory, are common on the ridges and upper slopes. Rarely, shortleaf and pitch pines, with a scattering of oaks, form the overstory. White and black oaks are common on slopes. Red maple is common throughout. Virginia pine often forms pure stands in disturbed areas. Mixed mesophytic forests including sugar maple, cucumbertree, yellow buckeye, and oaks occur in the most sheltered valleys, especially those with limestone influence.

Common mammals found in this subsection are white-tailed deer, bobcat, gray fox, raccoon, gray squirrel, opossum, eastern chipmunk, white-footed mouse, short-tailed shrew, smoky shrew, woodland jumping mice, and meadow vole. The cliff faces and rockhouses in the area provide shelter and feeding habitat for Allegheny woodrat, Rafinesque's big-eared bat and green salamander. Common birds include wild turkey, ruffed grouse, tufted titmouse, Carolina wren, red-eyed vireo, eastern phoebe, Swainson's warbler, Louisiana water thrush, black-throated green warbler, and ovenbird. Common reptiles and amphibians include eastern box turtle, timber rattlesnake, northern copperhead, five-lined skink, Cope's gray treefrog, mudpuppy, hellbender, and red-spotted newt. Fish commonly encountered include smallmouth bass, creek chub, and numerous darters, including eastern sand darter. The wet cliff caddisfly, endemic to the cliff-face subsections, is found in the area. The red-breasted nuthatch found here is not known to nest elsewhere in Kentucky. Threatened or endangered species found in the area include the Indiana bat and Virginia big-eared bat.

Southwestern Escarpment (221Hc): This subsection is located in east-central Kentucky and Tennessee. Included within it are large portions of the London, Somerset, and Stearns Ranger Districts. The Southwestern Escarpment is transitional between the Highland Rim and the Cumberland Plateau and contains characteristics of both. To the west, this subsection is intricately dissected into narrow ridges bordered by deep valleys with precipitous walls and cliffs. Many ridges have been truncated to cliff-bound knobs. To the east, in an area known as the London-Corbin Plain, the southwestern escarpment becomes much flatter with broad ridges and short, gentle slopes. Cliffs are present but much less frequent than to the west. Broad ridges usually are capped in a mixture of soft clay shales, siltstone, and coal with underlying, resistant sandstone that forms cliffs when exposed. Narrow ridges often are capped in sandstone. The valley floors are clay shales and siltstones, or, in some cases, limestone. The ridges are Pennsylvanian-Age Lower Breathitt formation, and the valleys are of the Lower Breathitt and Lee formations. Soils on ridges are up to 40 inches deep, with moderate clay content in the subsoil and are moderately to well drained. Rock outcrops and fragments are common above and below cliff faces; outcrops occur less often on the gentler side slopes. Soils on the slopes are typically deeper than 40 inches, have moderate to high clay content in the subsoil, and are moderately well drained.

Stream channels in this subsection often flow through solid and broken, cliff-lined box canyons and have narrow alluvial bottoms. The valleys are broader to the west and slightly narrower to the east. Stream gradients in the main channels are usually one to two percent. Tributaries have relatively steep channel gradients (2 to 10 percent) and are armored with rocks that sometimes form cascade-like habitat, often with 40-80 foot waterfalls. The drainage pattern is dendritic, and drainage densities are moderate. Typical stream hydrographs for the area show a seasonal increase in flow from November through January in response to increased precipitation and decreased evapotranspiration. The steep slopes of the area cause rapid surface runoff that, coupled with the semi-impervious nature of the soils and geology, limits the infiltration of precipitation to aquifers. As a result, most streams that drain less than 100 square miles dry up occasionally (Leist et al.)

Küchler (1964) classifies the potential natural vegetation of the Plateau as mixed mesophytic forest and Appalachian oak forest. Historical vegetation was similar, but more open and with a larger pine and pine-oak component; with a graminoid herb layer; an oak-American chestnut component was also present. Within this subsection, Appalachian oak and its variants dominate existing vegetation. Chestnut and scarlet oaks, with scattered pignut hickory, are common on the ridges and upper slopes. Frequently, shortleaf and pitch pines, with a scattering of oaks, form the overstory. White and black oaks are common on slopes; northern red oak is sometimes an important component, usually on mesic, calcareous shale/siltstone lenses. Red maple is frequent to common throughout. Virginia pine often forms pure stands in disturbed areas. A mixed mesophytic forest component, which tends toward the acid, eastern hemlock/American beech variant, is found along streams in deep valleys and on cool, north facing slopes.

Common mammals found in this subsection are white-tailed deer, bobcat, gray fox, raccoon, gray squirrel, fox squirrel, opossum, eastern chipmunk, white-footed mouse, short-tailed shrew, and pygmy shrew. Sandstone cliffs and rock shelters in the area offer shelter and feeding habitat for Allegheny woodrat, Rafinesque's big-eared bat, and spotted skunk. Common birds include wild turkey, ruffed grouse, tufted titmouse, Carolina wren, pine warbler, hooded warbler, red-eyed vireo, Louisiana water thrush, and ovenbird. Common reptiles and amphibians include eastern box turtle, common garter snake, timber rattlesnake, northern copperhead, five-lined skink, fence lizard, green salamander, Cope’s gray treefrog, and slimy salamander. Fish commonly encountered include smallmouth bass, creek chub, and numerous darters. The wet cliff-face caddisfly, endemic to the cliff subsections, is found in the area. Threatened or endangered species found in the area include bald eagle, red-cockcaded woodpecker (historic), blackside dace, Cumberland bean pearly mussel, littlewing pearlymussel, and other freshwater unionids.

Low Hills Belt (221He): This subsection is located in central-eastern Kentucky and includes land on the Morehead, Stanton, and London Ranger Districts. The Low Hills Belt is characterized by low-relief rolling ridges with short, gentle slopes that are occasionally broken by rock outcrops in the largest valleys. The relief becomes greater and the valleys more V-shaped in the southern portion of this subsection. Elevations range from 900 to 1,700 feet. Ridges are broad and rolling with some narrow, winding ridges. Side slopes average 30 to 40 percent but may exceed 50 percent in the most entrenched valleys. Rolling ridges are capped with a mixture of soft clay shales, siltstone, and coal and a few ridges have small caps of resistant conglomerate. The geology includes Pennsylvanian-Age, Lower Breathitt and Lee formations. The geomorphic processes primarily responsible for shaping this landscape are erosion and fluvial deposition. Ridges are characterized by soils, which range from 20 to 40 inches deep. Most have moderate clay content in the subsoil and are moderately too well drained. Soils on the slopes are typically over 40 inches deep, with occasional rock outcrops and fragments occurring on lower slopes of the more entrenched valleys. Most have moderate to high clay content in the subsoil and are moderately well drained.

The Low Hills Belt subsection has a moderate number of small to medium sized, moderately high gradient intermittent and perennial streams. Most have moderately wide, flat valleys with some flood plain development. Fourth and fifth order streams have broad alluvial bottoms. Drainage patterns are dendritic and dissection is moderate with about 16 to 18 miles of perennial, intermittent, and ephemeral streams per square mile. The Licking, Kentucky, and Cumberland Rivers all transect this subsection.

Küchler (1964) classifies the potential natural vegetation of the Plateau as mixed mesophytic forest and Appalachian oak forest. Historical vegetation was American chestnut oak dominated, but included areas with a large component of shortleaf pine with a graminoid herb layer. Within this subsection, Appalachian oak and its variants dominate existing vegetation. White, black, and scarlet oaks, with scattered pignut hickory, are common on the ridges and upper slopes. Occasionally, shortleaf and pitch pines with a scattering of oaks form the overstory. White pine plantations are frequently encountered in the area, often on sites historically occupied by yellow pines. White and black oaks are common on slopes; occasional pockets of northern red oak are found, usually in mesic areas on calcareous lenses of siltstone/shale or on limestone. Red maple is common throughout. Virginia pine often forms pure stands in disturbed areas. An acid, eastern hemlock/American beech variant of the mixed mesophytic forest occurs in the most sheltered valleys. Flood plain vegetation occurs as mixed stands of sycamore, tulip poplar, red maple and river birch.

Common mammals found in this subsection are white-tailed deer, bobcat, coyote, Appalachian cottontail, raccoon, gray squirrel, opossum, eastern chipmunk, white-footed mouse, and short-tailed shrew. Common birds include wild turkey, tufted titmouse, Carolina wren, ovenbird, yellow-breasted chat, brown thrasher, and indigo bunting. Common reptiles and amphibians include eastern box turtle, common garter snake, southern black racer, black rat snake, northern copperhead, five-lined skink, fence lizard, Cope's gray treefrog, northern dusky salamander, spotted salamander, American toad, green frog, and red-spotted newt. Strong populations of southern leopard frog and upland chorus frogs in the area represent disjunct, edge of range, populations. Fish commonly encountered include smallmouth bass, creek chub, and numerous darters. The Kentucky River subspecies of arrow darter is found in this subsection. Threatened or endangered species found in the area include bald eagle and blackside dace.

INTERIOR LOW PLATEAU, HIGHLAND RIM SECTION (222E)

Landscape Character Description: Natural vegetation from much of this Section has been cleared for agriculture. The small portion of this area within the proclamation boundary remains primarily as forests. The roads follow broad valleys with farming and communities. This pastoral setting has the forested knobs and hills in the background. Land clearing, openings, and new construction do not significantly alter the form, line and texture of the area.

Kinniconick and Licking Knobs (222En): This subsection is located in northeast Kentucky and includes land on the Morehead Ranger District. The area features broad, plain-like valleys from which rise scattered, moderate-relief ridges and knobs. Elevations range from over 700 to nearly 1,200 feet. The ridges are characteristically steep sided, with slopes of 50 percent or more. Knobs and ridges are capped in cherty limestone, sandstone, shale, and siltstone, and shales, limestones, and sandstone cover valley floors. Silurian-Age and Mississippian/Devonian-Age formations dominate in the valleys and Mississippian-Devonian-Age material is prevalent on the ridges. The primary geomorphic processes responsible for shaping this landscape are erosion and, to a lesser extent, mass wasting. Soils on the slopes of knobs and ridges average 20 inches in depth and are moderately to well drained. Surface horizons are relatively thin, with moderate to high clay content in the subsoil. Soils on the lower slopes and bottoms typically exceed 40 inches in depth and have high clay content in the subsoil. Some soils have fragipans.

The Kinniconick and Licking Knobs subsection has broad valleys with well-developed flood plains, often with multiple terraces. There are a few low-gradient, small to medium sized intermittent and perennial streams. Dissection is greatest in the east, and drainage patterns are dendritic. The Licking River crosses this subsection at a right angle.

Küchler (1964) classifies the potential natural vegetation of this landscape as oak-hickory and redcedar glades. Historical vegetation was similar to that which exists today, but with the addition of an oak-American chestnut association. The predominant existing vegetation is a mix of temperate low land and submontane cold-deciduous broadleaf trees. The oak-hickory cover type, expressed as mixed oak forest, is dominant. Chestnut, scarlet, and black oaks, with pignut hickory, are common on the knobs, ridges, and upper slopes. Virginia pine frequently is dominant, even on slopes. In small cove areas and on northern slopes, black walnut and white ash are common components. Pin oak and occasionally northern red oak are found in the bottoms where forests remain. Other bottomland dominants are slippery elm, sycamore and Ohio buckeye. Eastern redcedar and Virginia pine are common components on disturbed or abandoned land.

Common mammals found in this subsection are white-tailed deer, bobcat, gray fox, coyote, raccoon, gray squirrel, fox squirrel, opossum, eastern chipmunk, white-footed mouse, short-tailed shrew, pygmy shrew, and pine vole. Common birds include wild turkey, mourning dove, tufted titmouse, northern cardinal, Carolina wren, common crow, mockingbird, and American robin. Common reptiles and amphibians include eastern box turtle, common garter snake, northern copperhead, coal skink, ground skink, red-bellied snake, black rat snake, four-toed salamander, and spotted wood frog. Threatened or endangered species found in the area are limited to pass-through occurrences of bald eagle and bats.

Eastern Knobs Transition (222Ej): The Eastern Knobs Transition is located in east-central Kentucky along the western boundary of the DBNF. Forest Service land is limited in this subsection. Within this subsection, the Eastern Karst Plain is characterized by broad, plain-like valleys, from which rise scattered, low relief ridges and knobs. Elevations typically range between 700 to 1,100 feet, but a few peaks are as high as 1,500 feet. The ridges characteristically are steep sided with slopes of 50 percent or greater. Knobs and ridges are capped in shale and sandstones, and the valley floors are soft, acid shales, limestones, and dolomites. The geology is dominated by Silurian/Ordovician-Age formations in the valleys and Mississippian/Devonian-Age material on the ridges. The primary geomorphic process responsible for shaping this landscape is erosion. The average soil depths on the slopes of knobs and domes are 20 inches, with relatively thin surface horizons. Most have moderate to high clay content in the subsoil and are moderately to well drained. Soils on the lower slopes and bottoms are characteristically deep, usually over 40 inches to bedrock. They have high clay content in the subsoil and occasionally in the surface horizon.

This subsection has broad valleys with well-developed flood plains, often with multiple terraces. There are few small to medium sized intermittent and perennial streams. Most flow through wide valleys and have low gradients. Dissection is greatest in the east, and drainage patterns are dendritic. The Licking and Kentucky Rivers cross this subsection at right angles.

Küchler (1964) classifies the potential natural vegetation of this landscape as oak-hickory and redcedar glades. The predominant existing vegetation is a mix of temperate low land and submontane cold-deciduous broadleaf trees. Much of the subsection has been cleared for agriculture. The oak-hickory cover type, expressed as mixed oak forest dominates the forested portion. Chestnut, scarlet, and black oaks, with pignut hickory, are common on the knobs, ridges and upper slopes.

Virginia pine frequently is dominant, even on slopes. In small cove areas and on northern slopes, white oak, black walnut, white ash, and occasionally northern red oak, are common components. Pin oak and occasionally northern red oak are found in the bottoms where forests remain. Other bottomland dominants are slippery elm, sycamore and Ohio buckeye with occasional black walnut and black cherry. Eastern redcedar and Virginia pine are common components on disturbed or abandoned land.

Common mammals found in this area are white-tailed deer, bobcat, gray fox, coyote, raccoon, gray squirrel, fox squirrel, opossum, eastern chipmunk, white-footed mouse, short-tailed shrew, pygmy shrew, and pine vole. Common birds include wild turkey, mourning dove, tufted titmouse, northern cardinal, Carolina wren, common crow, mockingbird, and American robin. Common reptiles and amphibians include eastern box turtle, common garter snake, northern copperhead, coal skink, ground skink, red-bellied snake, black rat snake, four-toed salamander, streamside salamander, and spotted wood frog. Threatened or endangered species found in the area are limited to pass-through occurrences of bald eagle and bats.

NORTHERN CUMBERLAND MOUNTAINS SECTION (M221C)

Landscape Character Description: Natural vegetation has been cleared for agriculture on most of this section. Strip mining for coal has disturbed about five percent of the area. The portion of this section within the proclamation boundary is primarily forested with roads following the narrow valleys and traversing the mountains. Within the valleys are scattered homes, churches and businesses. While the natural appearing forest is briefly interrupted by these land uses, they have a minimal effect. Any land clearing, openings and new construction becomes a significant alteration of the form, line and texture of the area.

Southern Cumberland Mountains (M221Cd): This subsection is located in southern east-central Kentucky and northern east-central Tennessee. Moderately wide and winding ridges characterize the Southern Cumberland Mountains with relatively high relief and side slopes averaging 50 to 60 percent. Elevations range from 1,000 to 2,300 feet. Ridges are capped in a mixture of soft clay shales, siltstone, coal, and resistant sandstone. The sandstone, which frequently is bounded by rock outcrops or small cliffs, often forms ridges that are 300 to 400 feet wide. The floors of the broader, lower valleys are composed of soft clay shales and siltstones. Pennsylvanian-Age, Lower Breathitt formations dominate and erosion and mass wasting are the primary geomorphic processes responsible for shaping this landscape, in which small, localized landslides are frequent. Soils on the ridges are typically 10 to 30 inches deep, and many are rocky. Most have moderate to high clay content in the subsoil and are moderately well drained. Soils on slopes are deeper (typically over 40 inches) with numerous rock outcrops and fragments.

The Southern Cumberland Mountains have a high number of small to medium sized intermittent and perennial streams. Higher elevation valleys are narrow and V-shaped. The largest valleys are moderately broad and have well-developed alluvial bottoms. Drainage patterns are dendritic and dissection is moderately high, with about 18 miles of perennial, intermittent, and ephemeral streams per square mile. Clear Fork and Jellico Creek flow through this subsection and the Cumberland River lies to the north.

Küchler (1964) classifies the potential natural vegetation of the Northern Cumberland Mountains as mixed mesophytic, Appalachian oak and northern hardwoods forest. Historical vegetation was

similar, but with more extensive oak-pine and oak-American chestnut forest types on upper and south slopes, and ridges. Within this subsection, mixed mesophytic forest, with an Appalachian oak element, dominates existing vegetation. North slopes and mid to lower south slopes usually have a mixture of white oak, tulip poplar, sugar maple, yellow buckeye, black walnut, cucumbertree, yellowwood, white ash, northern red oak, black oak, and American beech. Chestnut and scarlet oaks, and shortleaf pine, are common on the ridges and upper south slopes. Shortleaf pine, with a scattering of oaks, often forms the overstory. Red maple is common throughout. Flood plain forests are dominated by river birch and sycamore, but include silver maple, boxelder, slippery elm, and winged elm. A willow oak-swamp white oak forest, unusual for eastern Kentucky and north-central Tennessee, characterizes one floodplain.

Common mammals found in this subsection are white-tailed deer, bobcat, gray fox, raccoon, gray squirrel, opossum, eastern chipmunk, white-footed mouse, short-tailed shrew, pygmy shrew, and pine vole. Common birds include wild turkey, ruffed grouse, blue jay, tufted titmouse, Carolina wren, indigo bunting, common crow, red-eyed vireo, ovenbird, and redtailed hawk. Common reptiles and amphibians include eastern box turtle, timber rattlesnake, northern copperhead, five-lined skink, fence lizard, Cope's gray treefrog, and red-spotted newt. Fish commonly encountered include smallmouthed bass, creek chub, and numerous darters. Ravine salamander and Cumberland Plateau salamander occur in the area as edge-of-range species. Threatened or endangered species found in the area include bald eagle and blackside dace.

Pine and Cumberland Mountains (M221Ce): This subsection is located in southeast Kentucky and northern east-central Tennessee. It borders southwestern Virginia. It includes Pine Mountain on the Redbird District of the Daniel Boone National Forest and the Clinch District of the George Washington-Jefferson National Forest. The northwest face of Pine Mountain is characterized by a long, high relief, linear ridge tilted at about 40 degrees off level, and against the orientation of rock strata. Exposed rock strata are of a range of ages ranging from Devonian to Pennsylvanian. Cliffs are infrequent, but are often well developed. Soils are steep, shallow to very deep, well to excessively drained, forming in loamy colluvium derived from weathered sandstone, siltstone, and shale. The ridgetop is narrow and usually demarcated from the slope by a well-developed cliff. The slope face averages 50-60 percent slope, but is often greater. Spur ridges are narrow and not well developed. Well-developed cliffs and rock outcrops are frequently encountered along the slope length. The small ephemeral and intermittent valleys are narrow and steeply V-shaped. The top ridge is capped in resistant, cliff-forming conglomerate and sandstone. The spur ridges and upper slopes are capped in a mixture of soft clay shales, siltstone, coal, and resistant sandstone. Mid and lower slopes are underlain by siltstone, silty shale, sandstone, and limestone much of which is interbedded. Geomorphic processes primarily responsible for shaping this landscape are erosion and mass wasting. The large to small cliffs encountered at the ridge and on the slope are primarily the result of differential erosion and bedrock block slides. The top ridges are characterized by soils, which range in depth from 10-30 inches. Most have moderate clay content in the subsoil and are moderate to well drained. Most are rocky. Soils on slopes are typically over 40 inches deep, with frequent rock outcrops and fragments occurring along the entire slope. Most have moderate to high clay content in the subsoil and are moderately well drained.

Pine Mountain has a high number of small to medium sized intermittent streams. Gradients are moderately high. Drainage patterns are dendritic with occasional areas of trellis drainage. Dissection is high throughout the area. The Cumberland River, tributary Straight Creek; Mud Creek; and Line Creek, flow at the base of the mountain. Streamflow varies in a pattern similar to the seasonal

variation in rainfall, and varies from stream to stream based on drainage basin size and other physical characteristics. It generally increases during November as precipitation increases and evapotranspiration decreases. Increasing precipitation, both rain and snow, augments flows through the winter months. Spring thunderstorms help to maintain a relatively high runoff through May. Intense precipitation combined with topographic features produce severe, usually short duration, flooding.

Küchler (1964) classifies the potential natural vegetation of the Northern Cumberland Mountains as mixed mesophytic, Appalachian oak and northern hardwoods forest. Historical vegetation was similar, but with a more dominant oak, oak-American chestnut or oak-pine forest type on upper slopes. Mixed mesophytic forest with an Appalachian oak element dominates existing vegetation. The lower and mid-slope usually has a mixture of white oak, tulip poplar, sugar maple, yellow buckeye, black walnut, cucumbertree, white ash, black birch, northern red oak, black oak, and American beech. Chestnut and scarlet oaks, and shortleaf and pitch pines, are common on the ridge and upper slope. The pines, with a scattering of oaks, often form the overstory. Red maple is frequent throughout.

Common mammals found in this subsection are bobcat, gray fox, raccoon, gray squirrel, opossum, eastern chipmunk, smoky shrew, red-backed vole, and cloudland deermouse. Sandstone and limestone caves and rockshelters offer shelter and feeding habitat for Allegheny woodrat. Common birds include wild turkey, ruffed grouse, blue jay, tufted titmouse, Carolina wren, ovenbird, black-throated green warbler, wood thrush, and barred owl. Common reptiles and amphibians include eastern box turtle, timber rattlesnake, northern copperhead, five-lined skink, fence lizard, Cope's gray treefrog, and red-spotted newt. The streams in the area seldom have enough flow to support a fish community. Other species include the near endemic species Pine Mountain Disc; the Cupped Vertigo, a sensitive species very rare in Kentucky; a few endemic, sensitive cave beetle species of the genus Pseudanophthalmus; rock shrew, known in Kentucky only from this location; and masked shrew, found in Kentucky in this subsection and one area in the Rugged Eastern Hills subsection. Pine Mountain supports the richest land snail fauna in the state of Kentucky. Threatened or endangered species found in the area include the Indiana bat.

Climate

The Climate of the state is temperate with moderately cold winters and warm, humid summers.

Precipitation is fairly well distributed throughout the year. October usually has the least precipitation and July the most. There is roughly 6 inches less average annual precipitation in the northern portions of the forest than in the southern portions of the forest. Averaged across the DBNF, annual free-water evaporation from lakes and ponds averages about 35 inches, which is about 11 inches less than the average annual precipitation of 46 inches. Snowfall is quite variable from year to year.

REASON FOR REVISION

The need to revise the Daniel Boones Land and Resource Management Plan is driven by the changing conditions as identified in the AMS, evolving public values associated with the Forest, emerging scientific concepts, and legal requirements. The Forest and Rangeland Renewable Resources Planning Act (RPA), as amended by the National Forest Management Act (NFMA), requires that each national forest be managed under a published Forest Plan that is reviewed and updated every 10 to 15 years, or earlier if conditions change significantly.

THE PLANNING PROCESS

This Forest Plan revision is part of the long-range national resource-planning framework. In addition to the RPA and the NFMA, the Government Performance and Results Act of 1993 and the 2000 Revision of the USDA Forest Service Strategic Plan guide the revision process. This Draft Environmental Impact Statement (DEIS), like the Revised Forest Plan it supports, was developed according to the NFMA implementing regulations at 36 Code of Federal Regulations (CFR) 219 (dated September 30, 1982 and as amended), the National Environmental Policy Act of 1969, and the Council of Environmental Quality regulations at 40 CFR 1500-1508. The DEIS discloses the environmental consequences of each Alternative and how each would respond to the Significant Issues identified in the scoping process.

Planning actions required by the National Forest Management Act include:

- Identification of issues, concerns, and opportunities
- Development of planning criteria
- Inventory of resources and data collection
- Analysis of the Management Situation
- Formulation of Alternatives
- Estimation of effects of Alternatives
- Evaluation of Alternatives
- Recommendation of the preferred Alternative
- Approval and implementation
- Monitoring and evaluation

Appendix B of this document details the Forest Service's 10-Step planning process. The results of Steps 1 through 8 are disclosed in Chapters 1 through 4.

The Daniel Boone National Forest's Interdisciplinary Team is responsible for developing the 2004 Forest Plan. Efforts were made to provide detailed explanations of each step of the revision in the form of process (or planning) records. This EIS contains summaries of the process records and includes references to the parent records. Process records are on file in the Forest Supervisor's Office. To review these records, contact:

Daniel Boone National Forest
Supervisor's Office
1700 Bypass Road
Winchester, KY 40391
Telephone: 859-745-3100

PRELIMINARY ISSUES

Public involvement has been and continues to be a key part of the planning process. Public comments give voice to what citizens expect from their National Forests in the form of goods, services, and environmental conditions. Issues identified by the public, as well as by Forest Service professionals, determined the need to change current management strategies. Some of the issues listed below were obtained from appeals of proposed Forest actions. The public raised other issues during the scoping efforts conducted by Forest Service personnel beginning in 1996. All of these received due consideration in the revision process.

In addition to the emerging issues, the need for change was identified through an Analysis of the Management Situation. This analysis also provides a basis for formulating a broad range of reasonable Alternatives. A detailed account of the public involvement process is in Appendix A, "Summary of Public Involvement."

SIGNIFICANT ISSUES

Public comments expressed in letters and appeals, the Forest Service Chief's directives, and concerns of Forest Service staff are reflected in the 14 Significant Issues. These issues guided the direction of the Revised Forest Plan.

These issue statements were used to develop the Alternatives for the 2004 Forest Plan:

ISSUE 1 – FRAGMENTAT ION

The wide-ranging nature of many forest-wildlife species requires relatively large, continuous parcels of habitat to meet their behavioral needs. This is especially important for wide-foraging, forest-nesting bird species native to the Daniel Boone. How and to what extent the Forest will provide for interior dependent species, particularly by reducing or mitigating the causes of fragmentation is a fundamental issue to be addressed in the Plan revision.

The 2004 Forest Plan should consider the patterns of plant and animal communities across the landscape when evaluating management strategies. Connection and isolation of habitats are important considerations for maintaining species viability and habitat suitability, including genetic diversity. Another concern, in addition to internal Forest management, is the effect of human population growth and development immediately adjacent to National Forest System land. Public and private lands are interspersed throughout the DBNF's proclamation boundary, often with differing uses. Such a patchwork pattern can result in habitat fragmentation. The analysis must look beyond the boundaries of public lands, even the proclamation boundary, to consider the relationships and patterns of private land uses and development and their potential connection to forested environments.

Wide-ranging bird species, from large-area young-aged forest associates, to area-dependant interior forest species, are the most sensitive to habitat fragmentation. Many observers believe National Forests offer some of the best opportunities to ensure that these habitat needs are met on a sustained

basis, helping assure survival of these species. Others have suggested that adequate early-forest conditions for such species can be found on private lands. If private development and land use trends continue, however, habitat quality and long-term sustainability could be imperiled. Other wide-ranging forest species such as black bear were also mentioned in comments on this issue.

ISSUE 2 -- OLD-GROWTH

Although older-aged forest is represented in the 1985 Plan, the old-growth condition of various associations has not been adequately documented and may be an under-represented habitat in the Daniel Boone. On the other hand, old-growth conditions may be adequately provided for within current Wilderness and roadless areas as well as lands identified as unsuitable for timber production. The amount, distribution, and perpetuation of the old-growth community remain issues to be addressed in the 2004 Forest Plan.

The old-growth forest condition is a natural component of the Daniel Boone's ecosystem. However, the age, size, and density of old-growth trees depend on their species' longevity. The public expressed strong interest in old-growth forest, and there is general agreement for greater emphasis on old-growth in the 2004 Forest Plan. But within that consensus, viewpoints vary widely. Many comments focused on the importance of spatial distribution and linkage of patches with differing sizes. It was pointed out that while old-growth communities may be under-represented on private lands, National Forests offer some of the best prospects for providing this habitat. Also noted was that timber harvest on the Daniel Boone could diminish old-growth communities. Other commentators called "protecting" old-growth an inappropriate under-utilization of resources. They believe that old-growth is adequately represented within Wilderness areas, roadless areas, lands identified as unsuitable for timber production, and by the relatively low harvest levels and long rotations on lands allocated for timber production.

Among the diverse values that the public associates with old-growth, some are compatible but others conflict. Old-growth has biological as well as social values. Old-growth communities provide large den trees for wildlife species such as black bear, large snags for birds and cavity nesters, and large cover logs for other species. Ecologically, old-growth contributes elements of biologic richness, gene conservation, and riparian area enhancement. Old-growth areas also allow for certain recreational experiences, research opportunities, and educational study. In addition, historical, cultural, and spiritual values are associated with old-growth areas. Some people may never visit an old-growth site, but receive satisfaction from "just knowing" that it exists. On the other hand, old-growth areas may be a source of large-diameter, high-value hardwoods, which are limited in supply and high in demand to produce such items as furniture and other finished woodwork. Some expressed the opinion that each old-growth community type provides its own unique set of values.

There is also debate about how old-growth should be managed, maintained, or restored. Most of the comments on this subject could be placed in one of two groups -- those who feel that the best old-growth management involves the least human intervention, and those who feel that some degree of human intervention is acceptable, perhaps even necessary.

Many in the first group believe that old-growth areas should be protected or "preserved" with no timber harvested within these areas. They may view old-growth as self-perpetuating with human

intervention unnecessary. Some support varying levels of old-growth management, including undisturbed "core" areas with more actively managed "buffers" of old-growth around them.

Others note that insect and disease risk can be relatively high in old-growth stands and could (for some community types) threaten their retention. Some point out that fire exclusion could favor a buildup of fire-intolerant, shade-tolerant, species that could eventually replace the original old-growth type. Active management, including timber harvest and prescribed fire, could be necessary to accelerate development of old-growth attributes.

Given the dynamic nature of forests, some favor replacement of old-growth communities through long-rotation harvests. Others are concerned that fragmentation of old-growth could result from the shuffling of old-growth emphasis for timber management convenience.

The Draft 1995 Resources Planning Act Program discusses the need for "old-growth management areas," and the 2004 Forest Plan will need to determine a desirable distribution and representation of old-growth communities. The 2004 Forest Plan will also need to specify the management of any areas allocated for old-growth and also determine whether any are suitable for timber production.

ISSUE 3 -- RARE COMMUNITIES

The Daniel Boone contains a diverse landscape with many rare or uncommon communities and associations. These include caves, clifflines, glades, small bogs and wetlands, and others. Many unique or special biological areas contain a relatively high density of rare species, some of which are federally listed as endangered or threatened. The 1985 Plan addresses federally listed and Forest-sensitive species but not their associated communities. Some management actions and forest uses can adversely affect rare communities. What communities or features should have some special designation and how should they be managed?

Numerous concerns have been expressed about the management of rare communities. Identifying these rare communities and determining their need for distinct management direction and potentially their "special" designation are questions to be addressed in the 2004 Forest Plan. Public comments strongly support the identification of rare communities on the forest and the development of management direction for their protection and restoration. The conservation of rare terrestrial communities is the key to conserving rare plant and animal species.

Some public comments maintained that while rare communities and other types of special areas are limited by past land uses, there is greater potential for these communities than currently exists. Some expressed concern that timber harvests and recreational uses could reduce opportunities for rare communities to advance unless these areas and features are protected. Other potential threats to rare communities were cited, including atmospheric depositions, mineral development, and plant material collection. Others expressed concern that existing land allocations already protect most of these areas, leaving no justification for creation of additional "special" areas and restricting public use or the harvesting of forest products.

ISSUE 4 -- ENDANGERED, THREATENED, AND SENSITIVE SPECIES

A number of plant and animal species found in the Forest have declined in number to the point their rarity indicates a potential for loosing viability. However, rebuilding populations of endangered, threatened, or sensitive species remains a possibility. Methods of species recovery should be considered in the revision. The 2004 Forest Plan will also need to identify measures for protecting populations of and habitat for Proposed, Endangered, Threatened, and Sensitive (PETS) species.

The 2004 Forest Plan will also need to determine management Objectives for Threatened, Endangered, and Sensitive species. The challenge is to determine the level of management needed to move PETS toward recovery while minimizing adverse consequences to other plants and animals. There may also be opportunities to re-introduce species into suitable habitats.

Public comments ranged from strong support for recovery of all federally listed species to support only for efforts that would prevent adverse effect to human welfare.

ISSUE 5 -- FISH AND WILDLIFE MANAGEMENT

National Forest System lands provide opportunities to address wildlife management and interests in ways not always possible on most other lands. The DBNF is large enough to accommodate the wide-ranging habitat needs of numerous species. As public land, the Forest can make hunting, fishing, and viewing opportunities available to help fulfill public interests that may be limited or restricted on private lands. Sustaining habitats that can support populations sufficient to meet public expectations for hunting, fishing, and viewing should be a Goal of the 2004 Forest Plan. Where conflicts occur between habitat needs, the revision must determine acceptable trade-offs while retaining diverse and healthy species groups across a wide variety of community types.

A diverse forest ecosystem that supports all forest-associated fish and wildlife was central to many comments. The importance of biodiversity at the genetic and species levels as well as the community and landscape levels was widely recognized. In the past, resource management and planning considered biodiversity largely at the species level, while paying less attention to genetic and community issues.

The recognition that ecological relationships extend across the landscape, interconnecting resources, has brought a new focus to resource analysis and planning. Landscape scale considerations are a matter of perspective and vary among interested parties. Some believe the Daniel Boone should be managed as a unit of the Central Hardwood Forest of the eastern United States, while others think National Forest System land should be managed more autonomously.

Unresolved issues regarding young-aged forest stands remain. What is the minimum area that such tracts require? Should these areas be clustered or evenly distributed over the landscape? Do private lands provide adequate provision for early young-aged forest stands?

Some comments supported, but others discouraged, such direct wildlife habitat “improvements” as the creation of openings and waterholes. Interest was expressed in sustaining mast production

capabilities over the Forest as well as for providing specific habitat attributes such as potential den trees, snags, and woody debris.

Many comments supported stocking species to help ensure viability and re-establish native species within historical ranges. Both black bear and elk were specifically mentioned. Comments on fish stocking focused on sport fishing opportunities on the Forest. Some supported existing stocking efforts while others recommended phasing out fish stocking efforts, at least the stocking of non-native species.

ISSUE 6 -- AQUATIC AND RIPARIAN AREAS

Some Forest uses and management activities can degrade the health of aquatic and riparian habitats as well as water quality. The interrelation of riparian habitat to neighboring lands and streams dictate that an entire watershed be used as the context for managing aquatic systems and riparian habitats. Management options range from excluding any activities in riparian areas to varying levels of vegetative manipulation and use in designated areas.

Restoring and maintaining healthy aquatic ecosystems are the main issues for managing aquatic habitat and associated riparian areas. A supportive riparian forest condition is also important for sustaining the function and productivity of the riparian community.

The public values riparian areas for a variety of reasons. In addition to providing habitats for a multitude of plant and animal species, riparian areas also contain some of the most highly valued recreation sites. Strong competition for these rich but sensitive resources makes this issue important to almost every user group, visitor, and manager. All management-related comments alluded to some level of special consideration to provide this forest component.

The 2004 Forest Plan will need to address how timber harvest, road building, mining, and recreation can be conducted without impairing the functions and values of aquatic and riparian ecosystems as well as water quality. The public recognized that aquatic and riparian corridors could also play a vital role in forest landscape connectivity.

ISSUE 7 -- FIRE MANAGEMENT

Wildland fire can be a serious threat to forest resources as well as to urban and other non-forest development. Prescribed fire can be a valuable tool for manipulating vegetation to achieve such management objectives as improved forest health. Timing, frequency, and location of prescribed burns remain issues. In all cases, the agency must provide adequate protection from the threat of unwanted fire, while also allowing fire to achieve planned objectives.

Some comments revealed that the fear of damage from wildland fire is cause for concern for many individuals living near the Forest. They recognize that wildland fires can threaten private property, destroy commercial timber, ruin hunting areas, endanger archaeological resources, and damage public recreation facilities. As more homes are built and communities developed adjacent to the

Forest, suppressing and minimizing wildland fire becomes a critical issue to an increasing segment of the public.

However, fire, both natural and human-ignited, has been a part of the eastern Kentucky landscape for thousands of years. It has shaped the nature of much of the vegetation found on the DBNF today and some comments noted that fire exclusion is not without drawbacks. Commenters were concerned that fire exclusion, resulting from Smokey Bear's successful campaign, combined with improved fire-fighting techniques, has brought about subtle, unforeseen changes on the forest. Several public comments suggested that fire should be used to promote certain rare species as well as oak/pine regeneration. Many have suggested that the Forest allow lightning fires to burn. Some suggested that fire management should utilize a more flexible and detailed plan for wildland fire use, including lightning-caused fires, under planned prescription.

Some comments suggested prescribed fire be used to supplement lightning-caused fire. However, some prefer allowing the forest to develop without the influence of human-caused fire. Some dislike the appearance of burned areas. As larger areas are burned, smoke is more likely to drift into urban areas. Many citizens are averse to the risk inherent in the application of fire. Concerns about fire damage to developing thin-bark hardwood trees and damage to future sawlogs were also noted. Another concern was whether roadside trees at the boundary of the burned unit would be damaged and die, eventually becoming a hazard to motorists and increases the cost of highway maintenance.

ISSUE 8 -- FOREST HEALTH

The spread of native and non-native invasive species of plants, insects, and pathogens; increased levels of stocking; and the continued suppression of wildland fire take a toll on Forest ecosystem health altering native forest composition, structure, and ecosystem function, while imposing economic and social costs. Some believe these damaging agents should be allowed to act upon the ecosystem without human intervention, but others believe management should act to reduce negative impacts.

A healthy forest can be envisioned as one with the capacity for renewal and resilience to a range of disturbances, while meeting the current and future needs of people. All forests have various levels of continuous mortality. An unhealthy forest, however, could be viewed as having mortality above a predetermined baseline. Some see dead, dying, or down trees as evidence of poor health or lack of good stewardship. They believe active management can improve, and may be essential for, forest health. Others believe that a healthy forest is one with little or no human intervention. They point out that tree mortality provides desirable ecological values such as snags and down trees for wildlife and canopy gaps for new growth.

ISSUE 9 -- TIMBER PRODUCTS

Timber production raises several issues, including methods, amounts, locations, and types for harvest. Appropriate goals, including economic goals, need to be determined for this program.

Comments received concerning timber production ranged from petitions for a ban on all timber harvest to petitions for increased levels of production. Some expressed strong feelings that the DBNF, as public land, should be set aside, either for forest-related values other than timber, or as a timber reserve. Others feel strongly that the Daniel Boone should yield forest products on a regular basis. There were various thoughts on how, when, and where timber should be harvested. Production advocates offered a range of harvest scenarios. Some suggested longer rotations. One recommended shorter rotations for some forest types.

Many comments concerned timber land suitability. According to one public comment, "much of the easily accessible areas have been timbered." The Analysis of the Management Situation also found that many regeneration areas had been concentrated on ridges for easier accessibility and lower logging costs. In addition, new management zones for clifflines and riparian areas, which address environment concerns, make access to many areas below cliffs and near riparian areas difficult, if not impossible.

Many comments expressed concern for "below-cost" timber sales. They questioned how the Forest Service could justify selling timber if costs were greater than revenues. The cost effectiveness of salvage operations is another factor in timber economics. The Forest Service receives particularly low stumpage prices for salvaged timber, but some individuals believe that dead and dying trees (especially when in large groups) should be salvaged to utilize this resource, even if at a net loss to the government. Others feel that such trees should be left to naturally return to the soil.

Some suggested that the focus of the timber program should be on ecosystem stewardship, or on the resulting condition of the forest, rather than product outputs or economic returns. Some comments on ecosystem stewardship suggested that stands be regenerated to maintain forest health and diversity as well as to encourage habitat for game. Selection of tree species is a concern to many individuals.

Comments regarding the environmental impacts of the timber program focused on soil and water issues in addition to biodiversity and aesthetics. There is concern that the potentially higher soil erosion rates or even landslides that occur in certain locations may correlate to timber harvest and road building. The secondary impacts of timber harvest upon the sensitive aquatic ecosystems of associated watersheds are also a concern for a variety of environmental or aesthetic reasons. Comments supported, or opposed, the even-aged method of clearcutting, two-aged shelterwood, and/or uneven-aged regeneration systems. Logging with draft animals (mules, horses, or oxen) was suggested as a replacement to motorized logging as a means to reduce environmental and aesthetic impact. However, such techniques could result in higher logging costs and lower stumpage prices (revenue) to the government.

ISSUE 10 -- MINERALS

The American economy is highly dependent on mineral resources such as petroleum, natural gas, and coal. These resources occur on the DBNF, and in many cases the mineral rights are privately owned. While the rights of property owners must be respected and national needs accommodated, mineral extraction can adversely affect other resources such as soil and water, flora and fauna, heritage, and scenery. The 2004 Forest Plan should seek to balance these sometimes-conflicting interests.

The public is very interested in all National Forest resources, including subsurface minerals. Diverse opinions from the public on mineral extraction projects are common. Some feel the 2004 Forest Plan should allow some opportunities for mineral development as one of the Forest's multiple uses as long as environmental safeguards are in place, others do not want any extraction of minerals on the Daniel Boone National Forest.

ISSUE 11 -- RECREATION OPPORTUNITIES

The Daniel Boone National Forest provides a variety of dispersed and developed recreational opportunities to five million visitors each year. Growth in demand for recreational opportunities is likely to continue and new types of recreation may be introduced. While recreational activities can adversely affect Forest resources in various ways, differing recreational activities may create user conflicts or compete for the same resources. The 2004 Forest Plan should develop an appropriate mix of recreational opportunities that responds to increasing and changing demands and also provides adequate ecosystem protection.

The 2004 Forest Plan will need to consider providing recreational opportunities that appeal to a wide array of the public and offer a variety of experiences. Recreational activities often compete for the same spaces or resources, however, and may even come into direct conflict.

Currently, around eight percent of the southern Appalachian region (including the Great Smoky Mountains National Park) can provide "primitive" recreation settings, and many people feel that the National Forests should be a principal provider of these primitive or semi-primitive non-motorized experiences.

There is strong interest in enlarging the DBNF trail networks to accommodate a greater variety of uses. At the same time, trail system design and management must minimize resource damage and be mindful of potentially conflicting uses. Of particular concern is the regulation of off-highway vehicle use.

Rock climbing is another type of "trail" use that has grown tremendously since the 1985 Plan went into effect. The Red River Gorge is a favorite of rock climbers. As demand for places to climb continues to increase, there is much interest in how this recreational activity is managed. And with growing demand comes increased potential for damage to Forest resources as well as user conflicts.

Congestion in recreational settings tends to occur in high-demand areas such as the shores of lakes and streams as well as trail access areas. Many users are concerned about the lack of adequate

trailhead facilities, particularly the need for parking horse and off-highway vehicle trailers, and for more rest room facilities. In areas where developed sites are congested or resources and facilities have been damaged from overuse, the feasibility of providing additional facilities should be explored. Many comments encouraged the Forest Service to emphasize providing recreational opportunities that are not generally available on private lands. Other comments recommended that the Forest Service emphasize maintaining and upgrading existing facilities before building new ones.

Crowding can affect the quality of recreational experiences. If crowding occurs, then the quality of recreational experiences may be diminished.

Many people are also concerned that a new Forest management direction for recreation could reduce the amount of habitat for various wildlife species, degrade water quality, threaten aquatic PETS species or diminish fishing opportunities.

ISSUE 12 -- SCENERY RESOURCE MANAGEMENT

Visitors generally expect to find natural appearing, visually pleasing landscapes in the National Forest. Many uses and management actions can either enhance or degrade the visual esthetics that users seek in the Forest. This important issue should be kept in mind as management decisions are made.

Many observers agree that high quality scenery is what draws many visitors to the Daniel Boone; however, opinions of existing scenic condition vary. Some regard conditions in parts of the Forest as "good." Others see need for enhancement and restoration as well as additional opportunities to encounter older and larger trees. Many believe scenery management should emphasize a natural appearing forest landscape with certain areas offering opportunities to view high quality scenery along travel and trail corridors, at developed vistas, and at recreational sites. Another concern is the potential visual impact of expanding development on private land.

Many think the 1985 Plan allows for too much scenic degradation and that management activities with a high degree of visual impact, such as clearcutting and road building, should be de-emphasized or eliminated. Others point out that scenic values are determined by an individual's personal perception of what is aesthetically pleasing. While harvest of wood products does cause visual disruption, some noted that this effect is only temporary and that the choice of harvest method should be based primarily on resource objectives. Others commented that the Forest Service should find and implement methods that will reduce the visual impact of timber harvest so harvesting can continue to be used as a management tool.

ISSUE 13 -- ACCESS WITHIN THE FOREST

The DBNF offers a variety of natural resources and recreational opportunities to the public. Access to the Forest via the road and trail systems is essential to fulfill these objectives. On the other hand, too many roads or trails, and inappropriate types, placement or use of roads and trails can limit the Forest's ability to sustain public benefits.

The need for access and the effect that roads and trails have on the environment should be examined. The relationship of roads and trails to the environment and other permitted activities on the Forest will determine the type and quantity of roads and trails proposed.

Many comments identified a need to reduce, increase, or redirect access (roads and trails) to improve total benefits to the public. System roads and trails are the primary means of Forest access, but they are also a source of concern because of their impact on resources. The various effects of roads and trails on riparian areas, PETS species habitat, and land removed from timber production, must be taken into account.

Many people would like to see increased motorized access to the Forest, especially during deer hunting seasons, and for other recreational uses as well as to meet management needs. Others, however, want road and trail construction limited and some existing roads and trails obliterated. Provision of motorized access will have to be balanced with non-motorized recreational opportunities as well as the protection of soil and water resources, and wildlife habitat. The 2004 Forest Plan will also need to develop options for making the Forest accessible for the physically challenged.

The Forest Service may pursue permanent, unrestricted rights-of-way across private land to access isolated tracts of the Forest. Landowners are often reluctant to grant such access because they fear the effects of public use.

ISSUE 14 -- SPECIALLY DESIGNATED AREAS

Management direction can be tailored to distinctive parts of the Forest. While Congress may designate certain waterways as Wild and Scenic Rivers or set aside certain areas as Wilderness, the Forest Service can assign special status to Geological, Botanical, Heritage, or Scenic and other areas. Should any new sections of the Forest receive special administrative status or be recommended for Congressional designation?

There is concern that some areas with special biological or ecological significance are not adequately protected from the adverse effects of some management activities and public uses. Comments have been made that rare communities and other types of special areas are limited by past land uses and that there is greater potential for these rare communities than presently exists. There is a feeling by some that special designation of an area is the only way to permanently provide the desired protection. Others have expressed the belief that existing land allocations already protect most of these areas and establishing additional areas for special protection cannot be justified.

The sufficiency of designated Wilderness and roadless areas continues to be debated. A wide spectrum of feelings and values for more, less, or the same exists among the Forests' community of interests. Some favor designation of all National Forest System land as Wilderness, while others believe that current Wilderness areas are adequate and potential roadless areas should be managed to achieve other resource objectives.

Opinions differ on the fate of potential roadless areas not recommended for Wilderness designation. Some have proposed that these areas be used to counteract habitat fragmentation. They could also be managed as scenic areas or to provide primitive or semi-primitive non-motorized recreation experience. On the other hand, many people think designating an area as roadless or Wilderness does not necessarily promote biological diversity. Different types of disturbances are needed, they contend, to create a variety of forest ages that provide varied, high-quality wildlife habitat.

Some would like to see the entire Forest managed as a roadless area. While certain tracts do not currently meet the criteria for inclusion in the roadless area inventory, some propose that these areas be managed to become roadless so they can be considered for designation as Wilderness in the future.

Concerns have been expressed about the management of areas already designated as Wilderness. These concerns include patterns and intensities of uses; insect and disease management; fire management, including the use of more "controlled" lightning-caused fire; incorporating "limits of acceptable change" into plan direction; and alleviating the effects of air pollution on wilderness resources. Existing Wilderness Standards should to be reviewed to determine if they are effective in achieving the Desired Future Conditions of wilderness resources.

Natural Arch on Somerset Ranger District