

**Programmatic Biological Assessment
for the
Revised Land and Resource Management Plan
Daniel Boone National Forest**

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Programmatic Biological Assessment for the Revised Land and Resource Management Plan for the Daniel Boone National Forest

Introduction

The Daniel Boone National Forest (DBNF) proposes to revise the existing Land and Resource Management Plan (1985, as amended) for all of the land's resources. This Biological Assessment (BA) addresses expected programmatic effects associated with the revised Forest Plan under the preferred alternative (Alternative C-1) only. Relative effects of alternatives on federally listed species can be found in the Revised Forest Plan FEIS. The objectives of this BA are:

1. Comply with requirements of the Endangered Species Act (ESA), as amended, that actions by federal agencies not jeopardize the existence of federally listed species or destroy or adversely modify their critical habitat.
2. Assess the effects that implementation of proposed Revised Forest Plan management direction and standards will have on threatened and endangered species known to exist on or near the DBNF and their proposed critical habitat.
3. Provide biological input to ensure Forest Service compliance with the National Forest Management Act (NFMA) and Forest Service Manual (FSM) 2670.

Forest plans are permissive in that they allow, but do not mandate, certain activities to take place; they do not make any irrevocable commitment of resources, and they do not contain site-specific decisions [*Ohio Forestry Assn. v. Sierra Club*, 523 U.S. 726 (1998)]. Therefore, a forest plan EIS is limited in its ability to predict what will occur over the next 10 to 15 years. Likewise, a forest plan EIS does not display effects of site-specific activities. Planning does not end with approval of the forest plan

The direction in the DBNF Revised Forest Plan is general and does not preclude or replace the requirement for site-specific, project-level consideration of threatened, endangered, or proposed species or their proposed critical habitat and further consultation, as necessary, with the U.S. Fish and Wildlife Service. Project areas will be inventoried for these species in accordance with procedures outlined in the Region 8 supplement to the Forest Service Manual §2672.

Forest Service Manual (FSM) 2670.31 states that the Forest Service shall, through the biological evaluation process, review actions and programs authorized, funded, or carried out by the Forest Service to determine their potential for effect on threatened and endangered species and species proposed for federal listing. In addition, the agency shall initiate consultation or conference with the U.S. Fish and Wildlife Service (USFWS) when the Forest Service determines that proposed activities may have an effect on threatened or endangered species; is likely to jeopardize the continued existence of a

proposed species; or result in the destruction or adverse modification of critical or proposed critical habitat.

Planning Area

The DBNF covers approximately 700,000 acres of federally owned land distributed in 21 counties in Eastern Kentucky. The forest lies as a relatively narrow strip running 140 miles along the western edge of the Cumberland Plateau from the Tennessee border in the southwest to Rowan County, Kentucky in the northeast. On the eastern side of the Plateau, the separate Redbird unit occurs in six Kentucky counties. The federally owned tracts within the DBNF proclamation boundary are discontinuous and interspersed with land that is privately owned.

Steep-sided, winding valleys and ridges characterize the DBNF terrain. Local relief varies from about 400 feet in the north to about 2,000 feet in the south. Three large rivers, the Licking, Kentucky and Cumberland, drain portions of the forest. Thousands of miles of small tributaries and streams dissect this combination of narrow to flat-topped ridges and rolling hills.

Forested lands of the DBNF are constituents of the mixed Mesophytic region of the Eastern Deciduous Forest. The plant, and animal communities of this region are widely known to be some of the richest and most diverse ecosystems in temperate deciduous forests (Martin et al. 1993). This high level of diversity still persists despite the intensive land use and abuse of the early 1900's that left much of the region deforested and barren.

Proposed Management Action

The purpose of the proposed action is to revise the 1985 Daniel Boone National Forest Land and Resource Management Plan. The Revised Forest Plan (FEIS Alternative C-1) guides all natural resource management activities on the Forest to meet the objectives of federal law, regulations, and policy. The Revised Forest Plan updates DBNF management direction including; Desired Future Condition of Prescription Areas, management Goals, Objectives, and Standards, along with monitoring requirements for the 10-15 year planning period. The proposed action also affects a wide range of socioeconomic factors as they relate to natural resources. Revision is now needed to satisfy legal requirements and address new information about the forest and its uses.

Existing habitat conditions within the DBNF today are often far different from those found in the pre-settlement forests. Goals and objectives within the Revised Forest Plan are geared at restoring major forest communities and designed to begin to restore habitat structure, composition, and distribution to a desired condition needed to maintain viability of species associated with these communities. It is recognized that compensation for significant ecological changes (loss of American chestnut, recent loss of southern yellow pine, presence of non-native invasive species, suppression of wildland fires, etc.) cannot be expected in the short term. Future habitat conditions will depend on far-sighted

management decisions as they are directed toward the attainment of desired future conditions as delineated in the Revised Forest Plan.

Since this is a programmatic BA it does not address the site-specific effects of individual projects, but rather the direct, indirect, and cumulative effects of broad program level management direction as described in the Revised Forest Plan (FEIS Alternative C-1) for the Daniel Boone National Forest.

Species Considered

All federally Threatened, Endangered or Proposed species identified as occurring or potentially occurring on or adjacent to the Daniel Boone National Forest, as identified by US Fish and Wildlife Service in a letter dated 9 October 2002, were considered in this BA. These 32 species are listed in Table 1.

In addition, four stream segments occurring on or adjacent to the Daniel Boone National Forest, were proposed for designation as critical habitat by the U. S. Fish and Wildlife Service in the Federal Register notice dated 3 June 2003. These four stream segments and their associated listed species are outlined in Table 2.

Table 1. Species considered in this Biological Assessment.

Group	Species	Common Name	Status
Mammal	<i>Myotis grisescens</i>	Gray Bat	E
	<i>Myotis sodalis</i>	Indiana Bat	E
	<i>Corynorhinus townsendii virginianus</i>	Virginia Big-eared Bat	E
Bird	<i>Haliaeetus leucocephalus</i>	Bald Eagle	T
	<i>Picoides borealis</i>	Red-cockaded Woodpecker	E
Fish	<i>Etheostoma percnurum</i>	Duskytail Darter	E
	<i>Notropis albizonatus</i>	Palezone Shiner	E
	<i>Phoxinus cumberlandensis</i>	Blackside Dace	T
Mussel	<i>Alasmidonta atropurpurea</i>	Cumberland Elktoe	E
	<i>Cyprogenia stegaria</i>	Fanshell	E
	<i>Dromus dromas</i>	Dromedary Pearlymussel	E
	<i>Epioblasma brevidens</i>	Cumberlandian Combshell	E
	<i>Epioblasma capsaeformis</i>	Oyster Mussel	E
	<i>Epioblasma florentina florentina</i>	Yellow Blossom	E
	<i>Epioblasma florentina walkeri</i>	Tan Riffleshell	E
	<i>Epioblasma obliquata obliquata</i>	Catspaw	E
	<i>Epioblasma torulosa rangiana</i>	Northern Riffleshell	E
	<i>Epioblasma torulosa torulosa</i>	Tuberled Blossom	E
	<i>Hemistena lata</i>	Cracking Pearlymussel	E
	<i>Lampsilis abrupta</i>	Pink Mucket Pearlymussel	E
	<i>Obovaria retusa</i>	Ring Pink	E
	<i>Pegias fabula</i>	Little-wing Pearlymussel	E
	<i>Pleurobema clava</i>	Clubshell	E
	<i>Pleurobema plenum</i>	Rough Pigtoe	E
	<i>Villosa trabilis</i>	Cumberland Bean Pearlymussel	E
Plant	<i>Arenaria cumberlandensis</i>	Cumberland Sandwort	E
	<i>Conradina verticillata</i>	Cumberland Rosemary	T
	<i>Helianthus eggertii</i>	Eggert's Sunflower	T
	<i>Schwalbea americana</i>	American Chaffseed	E

	<i>Solidago albopilosa</i>	White-haired Goldenrod	T
	<i>Spiraea virginiana</i>	Virginia Spiraea	T
	<i>Trifolium stoloniferum</i>	Running Buffalo Clover	E

Status 'E' means the species is listed as 'Endangered' by USFWS.

Status 'T' means the species is listed as 'Threatened' by USFWS.

Table 2. Proposed critical habitat stream segments.

Stream Name	Associated Species	Administrative Location	Segment Proposed for Designation
Buck Creek Unit 10	Cumberlandian combshell and oyster mussel	Somerset Ranger District	Buck Creek mainstem from State Road 192 bridge, upstream to the State Road 328 bridge
Marsh Creek Unit 12	Cumberland elktoe	Stearns Ranger District	Marsh Creek mainstem from its confluence with the Cumberland River, upstream to State Road 92 bridge
Rock Creek Unit 8	Cumberland elktoe	Stearns Ranger District	Rock Creek mainstem from its confluence with White Oak Creek, upstream to River Mile 15.9
Sinking Creek Unit 11	Cumberland elktoe	London Ranger District	Sinking Creek mainstem from its confluence with the Rockcastle River, upstream to its confluence with Laurel Branch

Species Evaluated

Nine federally listed species, from Table 1 above, were eliminated from further consideration on the DBNF. These nine species are; dromedary pearl mussel, yellow blossom, catspaw, tubercled blossom, cracking pearl mussel, ring pink, clubshell, rough pigtoe and red-cockaded woodpecker. These species are now considered either: (1) likely to be extinct or (2) likely extirpated from the DBNF area with no suitable habitat remaining that would allow for recovery. Consequently, the proposed action of revising the Forest Plan will have “no effect” on these species and they will not be considered further in this BA. Should new information arise concerning these species on the DBNF, they will again receive further evaluation and possible re-initiation of consultation with the USFWS. This “no effect” finding is supported in; 1) “Biological Assessment and Evaluation of the Daniel Boone National Forest Land and Resource Management Plan,” dated 3 February 2000, 2) USFWS concurred with this finding in their Biological Opinion (BO) dated May 2000, 3) DBNF annual federally listed species review letters to USFWS dated 30 January 2002 and 9 October 2002.

MAMMALS

Indiana Bat

Environmental Baseline

The distribution of Indiana bats is generally associated with limestone caves in the eastern U.S. (Menzel et al., 2001). Within this range, the bats occupy two distinct types of habitat. During winter, the Indiana bat hibernates in caves (and occasionally mines) referred to as hibernacula. Bats are often readily found and easily counted at this time. Census of hibernating Indiana bats is the most reliable method of tracking population trends range-wide. As such, winter distribution of the Indiana bat is well documented. Less is known about the abundance and distribution of the species during the summer maternity season, and even less is known about its migratory habits and associated range. During summer months, maternity colonies of more than 100 adult females roost under sloughing bark of dead and partially dead trees of many species, often in forested settings (Callahan et al., 1997). Reproductive females may require multiple alternate roost trees to fulfill summer habitat needs. Adults forage on winged insects within three miles of the occupied maternity roost. Swarming of both males and females and subsequent mating activity occurs at cave entrances prior to hibernation (MacGregor et al., 1999). During this autumn period, bats roost under sloughing bark and in cracks of dead, partially dead and live trees.

The Indiana bat is known from virtually throughout the DBNF, with over 90 records forestwide, mostly from hibernation caves which harbor anywhere from a few occasional individuals to several thousand bats each winter. Although the DBNF contains no USFWS designated critical habitat nor any Priority I hibernacula (defined as harboring 30,000 or more Indiana bats since 1960), it does contain 8 Priority II winter caves (harboring 500 to 30,000 bats), 16 Priority III caves (with < 500 bats) that regularly support 100 or more through each winter, and perhaps 30 more Priority III caves that contain fewer than 35 Indiana bats in winter. Seven of the 8 Priority II caves and 7 of the top 16 Priority III caves located within the proclamation boundary are on National Forest System lands, and most of the others are on private tracts immediately adjacent to the Forest. The nearest designated critical habitat, Bat Cave, is located about ten miles east of the DBNF, in Carter County, Kentucky.

Indiana bat winter populations are censused every 2nd year in the hibernacula. Since 1985, the DBNF area has harbored 20-25% of the total known Indiana bat winter population in Kentucky, and has remained relatively stable or exhibited a slight increase. Some of the Indiana bats that hibernate on the Forest migrate to other areas in summer. A female that had been banded at a maternity site in extreme northern Indiana was observed during two winters at a Lee County hibernaculum on the DBNF and a male banded in Michigan in July 1998 was recorded in a hibernation cave on the DBNF in October 1999. Other Indiana bats apparently remain on the DBNF year round. Summer maternity colonies, consisting of females and their young, have been documented by mist netting on the Morehead (2 sites), Somerset (1 site), and Redbird (3 sites) Ranger Districts (RD), and might be expected to occur anywhere on the DBNF. A summer maternity colony was documented in 2001 near the Morehead RD, just off National Forest System land, but well within the proclamation boundary. Summer resident male Indiana bats have been captured or observed on the Morehead, Stanton, London, Somerset, and Redbird RDs and

a single Indiana bat was found in an abandoned coal mine in Big South Fork NRRA (near the Stearns RD) during the fall migration period (USFS et al. 1988, 1989, 1990, 1992, 1993;1995; K. Huie-Netting field notes; J. MacGregor field notes).

Indiana bats hibernate in caves and mines during the winter months, typically roosting in large, dense clusters in passages where temperatures are low (4-8 degrees C) and relative humidity is moderately high (generally 74% to just under 100%). Only a small proportion of the caves and mines in a given area provide suitable winter microclimate conditions to support hibernation; cave suitability is largely determined by air flow patterns and cave passage configuration in relation to where entrances and air chimneys are located (USFWS 1983).

On the DBNF, suitable winter habitat for Indiana bats is largely confined to areas where limestone caves occur; large sections of the Stanton RD, the northern part of London RD and smaller portions of the Morehead, Somerset, Stearns, and Redbird RDs. Sandstone caves (rock shelters with well developed dark zones), underground workings in limestone quarries, and abandoned coal mines may also provide suitable winter habitat and can be found in varying numbers on all Ranger Districts.

Spring, summer, and fall roosting habitat for Indiana bats consists primarily of dead trees with exfoliating bark or split boles, but live trees with large dead branches or damaged limbs, or live shagbark hickories or other species such as white oaks (which characteristically develop loose flaking bark or bark plates), are also used. At times, single individuals or small groups of Indiana bats can be found roosting in the warmer parts of some caves during the day in summer and early fall, but such roosts appear to be very temporary in nature.

In October 1996, following a 2-year study of autumn Indiana bat roosting and foraging habitat that took place on the London RD (Kiser and Elliott 1996), the DBNF began monitoring roost tree use by Indiana bats during the fall on the Somerset RD. The majority of the roost trees used by Indiana bats during the autumn months were located in stands greater than 50 years old with relatively closed canopies (80%-93% canopy cover), in natural canopy gaps that had been formed by the death of one or more canopy trees (primarily from wind or ice damage), and in prescribed burns which had been managed primarily for red-cockaded woodpecker. The bats also roosted extensively in 2-age shelterwood harvest areas within which snags and other potential roost trees had been retained, and in high-graded stands with many snags and culls. Similar roost tree use was reported by Gumbert (2001) on the Somerset RD during the spring and summer months.

Suitable roosting and foraging habitat and potential maternity habitat for the Indiana bat occur throughout the Forest. At least a portion of the bats that spend the winter in the large and medium-sized hibernacula on the Stanton, London, and Somerset RDs remain in the vicinity of these areas through the summer. Some of the Indiana bats from hibernating sites on Pine Mountain (adjacent to the Redbird RD), Carter Caves (not far from the Morehead RD), and caves in Campbell and Fentress Counties in Tennessee (near the Stearns RD), and perhaps from other areas, may also occur in the DBNF in

summer. Recent work in Missouri (Romme et al. 2002) and Kentucky (Kiser and Elliott 1996; and Gumbert 2001) have found that Indiana bats range up to 5 miles from hibernacula during autumn and spring swarming activity periods.

Potential Effects (Direct, Indirect and Cumulative)

This analysis is programmatic in that it deals only with Revised Forest Plan direction, as established within various Prescription Areas including; Desired Future Conditions, Goals, Objectives and associated Standards that provide limitations on management activities for the protection or enhancement of PETS species, their habitats and other resource needs. All actions authorized and proposed under the Revised Forest Plan are subject to second level, site-specific analysis and subsequent ESA Section 7 consultation with the USFWS through the BA/BE process.

Potential habitat (forests with trees having exfoliating bark) exists across the entire Forest and contains tree species of the size and type known to be used by the Indiana bat. The retention of snags, shagbark hickory, and hollow trees, in active habitat management areas, will allow for potential Indiana bat roost sites. Decreasing canopy closure as occurs with timbering and prescribed fire activities will increase the degree of exposure of some potential maternity roost trees to solar radiation, providing improved thermal conditions for raising young during a wide range of weather conditions. Pond/waterhole construction will increase the number of upland water sources available for Indiana bats. Persistence of early successional habitats and forests with an open understory and patchy overstory would create insect-rich foraging areas and flight corridors leading to any potential roost trees. Harvesting would produce a mosaic of regeneration areas intermixed with mature and late successional forests. Likewise prescribed fire would also create a mosaic of forest habitat conditions resulting from varying fire intensities. This will indirectly benefit Indiana bats by providing feeding areas since bats are known to forage within the canopy openings of upland forests, over clearings with early successional vegetation, and over ponds.

The direction contained in the Revised Forest Plan, particularly the creation of several Prescription Areas, should provide programmatic, long-term benefits to Indiana bat populations on the DBNF. While the entire DBNF is recognized as potentially providing suitable habitat, the Cliffline Community (111,200 acres), Riparian Corridor (155,370 acres) and Significant Bat Cave (6,100 acres) Prescription Areas were created, in part, with habitat maintenance or improvements for the Indiana bat in mind. Generally, habitat management in these areas is limited and is primarily designed to improve conditions with species associated with these prescription areas. Long term, management actions in these areas should move the habitat conditions toward the desired future condition and provide beneficial effects to the Indiana bat. Forest Plan Standards within these Prescriptions Areas provide additional protective measures and/or habitat enhancement direction.

The Habitat Diversity Emphasis Prescription Area (376,000 acres) is an area of active forest management that should continue to provide for a mosaic of habitat diversity

within the general forested community. Forest-wide Standards in the Revised Forest Plan, particularly DB-WLF-1 through 14, are designed to retain and/or create habitat conditions particularly suitable for the Indiana bat and should provide long-term beneficial effects for the species. Revised Forest Plan Standards avoids the cutting of trees that are most likely to contain a maternity colony or a roosting bat.

Potential negative impacts to the Indiana bat could occur from the slight chance that individuals or small groups of roosting bats (including summer maternity colonies) could be unintentionally taken by the intentional felling of live trees harboring undetected roosts (e.g. dead limbs with loose bark, small cavities in the boles, or naturally occurring exfoliating plate bark conditions exhibited by some tree species), or by the accidental felling of occupied snags, or damaged or hollow trees during timber harvest or other activities. Although the likelihood is very low, tree-cutting activities could result in the inadvertent loss of individual Indiana bats or small groups of Indiana bats, via removal of some large-diameter trees occupied by bats during the period from approximately April 1 to September 15.

Potential negative impacts to the Indiana bat could also occur from prescribed burning activities on the DBNF. Prescribed burning activities have increased over the past several years and this activity will become more prevalent during the next decade. The Revised Forest Plan anticipates this increase to continue with perhaps between 15,000-50,000 acres being burned each year. Most of these burns will occur during the winter and spring with some occurring during the late summer and early fall. Indiana bats roosting in trees could be negatively affected by either smoke or heat from the prescribed burn. A Forest Plan Standard prohibits prescribed burning in Indiana bat roosting areas between May 1 and August 31.

Cumulative effects are those effects of future State, local, or private actions that are reasonably certain to occur within the action area of the DBNF. This programmatic BA addresses only those activities that are authorized by the Revised Forest Plan on lands that are under the jurisdiction of the U.S.D.A. Forest Service. Thus, any future State, local or private actions that could potentially occur on the DBNF would require a permit from the Forest Service and will require compliance with the consultation provisions of Section 7 of the ESA. There are no State, local or private actions reasonably certain to occur as a result of implementation of the Revised Forest Plan. Therefore, cumulative effects, as defined by the ESA, will not occur.

Determination of Effect

The programmatic implementation of the Revised Forest Plan has the potential to adversely affect the Indiana bat through the accidental take of individual bats. In the long term, foraging and roosting habitat should generally be improved and increased by the implementation of active prescribed fire and timber harvest programs that decrease overstory cover and increase the numbers and quality of potential roost trees. Forest wide standards and prescriptions will greatly reduce the potential for adverse effects to levels that are almost insignificant and discountable, but the possibility for take (as defined by

ESA) still exists. However, green tree harvest activities, salvage activities and prescribed burning activities have the potential to harm individual Indiana bats roosting under the bark within the project area between the dates of 1 April and 15 September. It is anticipated that these three categories will take place on an annual basis on the DBNF in the following approximate acreages:

- Cutting of green trees – 4,000 acres
- Salvage or sanitation sale activities resulting from stochastic events – 350 acres
- Prescribed burning activities – 50,000 acres.

Therefore, the determination of effect for the Indiana bat is; “may effect – likely to adversely affect.”

Gray Bat

Environmental Baseline

The gray bat occupies a limited geographic range in limestone Karst areas of the southeastern U.S. from southwest Virginia west to Missouri then south to eastern Oklahoma and northern Florida (USFWS 1982). Similar to bat species like the Virginia big-eared bat, the gray bat is narrowly restricted to cave habitats and occupies caves year-round. They hibernate in huge numbers in a few caves then spread-out in the summer with females forming smaller summer maternity colonies and males forming small bachelor colonies in separate caves. About 95% of the known population inhabits eight major caves during the winter (Harvey 1992). The recovery plan recommends actions focused on cave acquisition and gating.

The gray bat is more or less an obligate cave-roosting species, using caves that trap warm air as summer maternity sites and caves that trap cold air as winter hibernacula. A few summer colony sites have been found in man-made structures (in abandoned mines, in storm sewers, and in deep vertical crevices under concrete bridges). Nearly all foraging activity takes place over rivers, streams, and reservoirs that are bordered by forest or forested strips, or nearby in riparian woods. In addition, gray bats usually fly in the protection of forest canopy when traveling to and from feeding areas (USFWS 1982).

The gray bat is known from about 12 locations within the DBNF proclamation boundary, scattered on the Stanton, London, and Somerset RDs. Most of the records are of single individuals that have been captured in mist nets, found roosting under concrete bridges in summer, or found hibernating in caves during the winter months. Ceiling stains and old guano deposits indicate that two large summer maternity colonies, each once harboring 30,000 or more bats, formerly occurred within the Sloans Valley Cave system on private land near the Somerset RD; these colonies were long ago eliminated, probably by habitat changes associated with the impoundment of the Cumberland River and/or by repeated human disturbance at cave roosts. Additional stains and guano deposits that may have been from this species have been found in two caves on the Stanton RD, one on private land and the other in a cave on National Forest System lands that also harbors a summer maternity colony of endangered Virginia big-eared bats. This cave is protected by an

interpretive/ warning sign and by a road gate and barricades that exclude vehicle access, and it apparently receives little or no human visitation. A cave that regularly harbors 1200 to 2500 adults and volant young from mid-July through early October is located just outside the DBNF proclamation boundary along Buck Creek. This site indicates that a viable gray bat maternity colony occurs somewhere nearby, possibly on the DBNF. Currently, no large hibernating, bachelor or maternity colonies of gray bats are currently known to exist on the DBNF. In addition to the records mentioned above, gray bats have been recorded from within 10 miles of the DBNF proclamation boundary near the Morehead, Stearns, and Redbird RDs.

Potential Effects (Direct, Indirect and Cumulative)

This analysis is programmatic in that it deals only with Revised Forest Plan direction, as established within various Prescription Areas including; Desired Future Conditions, Goals, Objectives and associated Standards that provide limitations on management activities for the protection or enhancement of PETS species, their habitats and other resource needs. All actions authorized and proposed under the Revised Forest Plan are subject to second level, site-specific analysis and subsequent ESA Section 7 consultation with the USFWS through the BA/BE process.

The Cliffline Community Prescription Area encompasses just over 111, 000 acres and provides programmatic protection for most cave entrances on the DBNF. Forest Plan standards relevant to the gray bat and its cave habitat would protect all caves that are discovered or purchased that support gray bats. Although no hibernacula or large summer roost caves have been identified on the Forest, forestwide standards maintain a minimum 200 foot buffer area around cave entrances located outside the Cliffline Community Prescription Area.

Effects on foraging habitat are expected to be beneficial since riparian corridors will be managed for the benefit of aquatic/riparian resources. The Riparian Corridor Prescription Area allocates just over 155,000 acres of riparian habitat along all perennial and intermittent streams. The objective of this prescription area is to retain, restore or enhance ecological processes and functions of these systems. The minimum forested corridor width provided is 100 feet and 50 feet on either side of perennial and intermittent streams, respectively. These standards will not only provide forest cover for bat foraging and protection from predation, but will also ensure high water quality to support the aquatic insect prey base.

Cumulative effects are those effects of future State, local, or private actions that are reasonably certain to occur within the action area of the DBNF. This programmatic BA addresses only those activities that are authorized by the Revised Forest Plan on lands that are under the jurisdiction of the U.S.D.A. Forest Service. Thus, any future State, local or private actions that could potentially occur on the DBNF would require a permit from the Forest Service and will require compliance with the consultation provisions of Section 7 of the ESA. There are no State, local or private actions reasonably certain to occur as a result of implementation of the Revised Forest Plan. Therefore, cumulative effects, as defined by the ESA, will not occur.

Determination of Effect

The two primary prescription areas likely to be utilized by the gray bat are the Cliffline Community and the Riparian Corridor. Habitat within these prescription areas is managed to enhance conditions for PETS species on the DBNF. These two prescription areas also serve as mature forest travel corridors providing overstory protection from potential predators. Implementation of the Forest Plan protects and maintains key habitat elements, specifically caves and riparian areas.

Therefore, the determination of effect for the gray bat is; “not likely to adversely affect.”

Virginia Big-eared Bat

Environmental Baseline

Formerly included in the genus *Plecotus*, the Virginia big-eared bat is a subspecies of the more common and widespread Western (or Townsend's) big-eared bat that occurs throughout the western U.S., southwest Canada, and most of Mexico. The subspecies, *virginianus*, occupies a very limited geographic range in the Central Appalachians. Population numbers have shown moderate to strong increases rangewide over the past 15 years. In the late 1980's it was estimated the total population of the subspecies in West Virginia, Virginia, Kentucky, and North Carolina to be approximately 10,000 bats (Dalton 1987). By 1997 the rangewide population of Virginia big-eared bats was estimated to have almost doubled at less than 20,000 individuals (Pupek 1997). In West Virginia some cave populations grew as much as 350% from 1983 to 1995 (Pupek 1997). The Virginia big-eared bat occupies caves year-round. These bats are not migratory remaining in the vicinity of their hibernation caves yearround. Males and females hibernate singly or in mixed clusters then move in the spring to other nearby cave(s) with females forming smaller summer maternity/nursery colonies and males being solitary or in bachelor groups during that season. Declines appear to be primarily related to human disturbance and loss of cave habitat quality. The Virginia big-eared bat is extremely intolerant of any human disturbance. The recovery plan (USFWS 1984) recommends recovery actions focused on cave acquisition and gating of entrances to control human access.

The Virginia big-eared bat is primarily a feeder on moths. Foraging activity typically occurs within two miles of summer roost caves. Bats have been observed foraging over open fields as well as mature upland forests, and especially along clifflines on the DBNF. A radio telemetry study conducted by Adam et al. (1994) found that most foraging took place along clifflines and in forested areas. Burford and Lacki (1995) found that activity of bats was greatest in old fields, and that small weed fields (openings) and the upper sections of clifflines were used much more frequently by the Virginia big-eared bat than the base of clifflines, forested habitats 30 years old or older, or forested habitats less than 30 years old.

This species is known from about 90 locations within the DBNF proclamation boundary, mostly from National Forest System lands, all from the Morehead, Stanton, and London RDs. Nearly all of the records represent single individuals or small groups that have been encountered in caves and sandstone rock shelters, but five maternity colonies have been found on the Forest, two in limestone caves, one in a small limestone cave with a sandstone ceiling, and two in cave-like sandstone rock shelters. In addition, several pregnant or lactating females have been captured in mist nets, and one limestone cave harbors a bachelor colony in summer and a large hibernating population in winter. These five known summer colony sites are all located within about two miles of one another and together they account for the summer whereabouts of about 30 percent of the population in the winter hibernacula. Bat populations at individual summer roosts fluctuate greatly from year to year, and even from week to week within a year, apparently as a result of the frequent movement of adult bats between roost sites.

Potential Effects (Direct, Indirect and Cumulative)

This analysis is programmatic in that it deals only with Revised Forest Plan direction, as established within various Prescription Areas including; Desired Future Conditions, Goals, Objectives and associated Standards that provide limitations on management activities for the protection or enhancement of PETS species, their habitats and other resource needs. All actions authorized and proposed under the Revised Forest Plan are subject to second level, site-specific analysis and subsequent ESA Section 7 consultation with the USFWS through the BA/BE process.

The Cliffline Community Prescription Area provides for the maintenance of over 111,000 acres of potential foraging habitat. Effects on foraging habitat along clifflines are expected to be beneficial. This prescription area will not only provide forest cover for bat foraging and protection from predation, but will also provide travel corridors between other forested communities. This prescription area also provides programmatic protection for most cave entrances on the DBNF. Forest Plan standards would protect all caves that are discovered or purchased that support this species. In addition, forestwide standards maintain a minimum 200-foot buffer area around all cave entrances located outside the Cliffline Community Prescription Area.

The Revised Forest Plan delineates a Significant Bat Cave Prescription Area (6,100 acres). All caves with five or more Virginia big-eared bats are included in this ¼ mile radius prescription area. Within this zone forest cover is left undisturbed unless an activity is designed to improve habitat for species at risk. An additional objective of this prescription area is the acquisition of lands containing caves important to this species. Effects associated with management of this prescription area are expected to be beneficial.

Cumulative effects are those effects of future State, local, or private actions that are reasonably certain to occur within the action area of the DBNF. This programmatic BA addresses only those activities that are authorized by the Revised Forest Plan on lands that are under the jurisdiction of the U.S.D.A. Forest Service. Thus, any future State,

local or private actions that could potentially occur on the DBNF would require a permit from the Forest Service and will require compliance with the consultation provisions of Section 7 of the ESA. There are no State, local or private actions reasonably certain to occur as a result of implementation of the Revised Forest Plan. Therefore, cumulative effects, as defined by the ESA, will not occur.

Determination of Effect

The Revised Forest Plan implementation establishes two Prescription Areas (Cliffline Community and Significant Bat Cave) that are important to Virginia big-eared bat protection and potential recovery. Along with associated Standards, these prescription areas should provide programmatic beneficial affects to this species and minimize habitat alterations that could decrease habitat quality.

Therefore, the determination of effect for the Virginia big-eared bat is; “not likely to adversely affect.”

BIRDS

Bald Eagle

Environmental Baseline

The bald eagle ranges over most of the North American continent, from as far north as Alaska and Canada, down to Mexico. Experts believe that in 1782 when the bald eagle was adopted as the United States’ national bird, their numbers may have ranged from 25,000 to 75,000 nesting pairs in the lower 48 states. Since that time the species has suffered from habitat destruction and degradation, illegal shooting, and most notably from contamination of its food source by the pesticide DDT. In the early 1960’s, only 417 nesting pairs were found in the lower 48 states. In 1999, more than 5,748 nesting pairs of bald eagles were recorded for the same area, resulting primarily from the banning of DDT in the United States in 1972 aided by additional protection afforded under the Endangered Species Act (USDI 1999).

Wintering eagles are closely associated with aquatic environments (Gerrard and Bortolitti 1988; Millar 1995). The bald eagle is known from several locations on the DBNF. During the winter, between December and March, bald eagles are commonly seen around Laurel River Lake, Cave Run Lake, Lake Cumberland, the Cumberland River corridor and the Kentucky River. Since 1990 midwinter surveys have been conducted with population numbers ranging from 2 to 13 on Laurel River Lake, 1 to 13 on Cave Run Lake and 2 to 8 on Lake Cumberland. These populations vary depending on time of year and local and regional weather conditions.

Nesting is also associated with aquatic environments and nests are usually not found further than two miles from water (McEwan and Hirth 1979;Gerrard and Bortolitti 1988). Nests are usually placed in large trees along shorelines in relatively remote areas

away from human disturbance (Millar 1995; Andrew and Mosher 1982). In the last several years' eagles have also been seen during the summer around both Cave Run and Laurel River Lake. Bald eagles currently nest at one location on Laurel River Lake. A primary management zone was delineated around these sites based on site-specific consultation with the USFWS. Nest building activities in short-leaf pine trees have been observed as early as December on the DBNF. Most recently, in the summer of 2003, two young were successfully fledged. Fish and carrion of various types comprise the main portion of eagle diets (Lincer et al. 1979).

Potential Effects (Direct, Indirect and Cumulative)

This analysis is programmatic in that it deals only with Revised Forest Plan direction, as established within various Prescription Areas including; Desired Future Conditions, Goals, Objectives and associated Standards that provide limitations on management activities for the protection or enhancement of PETS species, their habitats and other resource needs. All actions authorized and proposed under the Revised Forest Plan are subject to second level, site-specific analysis and subsequent ESA Section 7 consultation with the USFWS through the BA/BE process.

Vegetation management, road building, and prescribed burning activities have the potential to impact the bald eagle or its habitat, especially near rivers and lakes. Human disturbance from recreational use of roads, trails, and campgrounds along shoreline habitat can also adversely affect the use of an area for nesting or roosting by eagles.

Riparian Corridor and Large Reservoir Prescription Area standards in the Revised Forest Plan, with emphasis on low levels of disturbance and maintenance of mature forest, would minimize potential adverse effects of vegetation management, road building and prescribed burning activities in the areas most suitable to bald eagle nesting activities. Documented nest sites will continue to be protected by site-specific restrictions after consultation with the USFWS. Forested habitat on the DBNF, especially along rivers, lakes is projected to continue maturing during the next ten to fifteen years, therefore increasing suitable nesting habitat for bald eagles during the life of this Forest Plan.

Cumulative effects are those effects of future State, local, or private actions that are reasonably certain to occur within the action area of the DBNF. This programmatic BA addresses only those activities that are authorized by the Revised Forest Plan on lands that are under the jurisdiction of the U.S.D.A. Forest Service. Thus, any future State, local or private actions that could potentially occur on the DBNF would require a permit from the Forest Service and will require compliance with the consultation provisions of Section 7 of the ESA. There are no State, local or private actions reasonably certain to occur as a result of implementation of the Revised Forest Plan. Therefore, cumulative effects, as defined by the ESA, will not occur.

Determination of Effect

The Revised Forest Plan management direction addresses the habitat needs and protection of nesting areas from human disturbance. Further, it establishes prescription areas that would minimize the programmatic alteration of habitats utilized by the bald eagle.

Therefore, the determination of effect for the bald eagle is; “not likely to adversely affect.”

PLANTS

Virginia Spiraea

Environmental Baseline

Virginia spiraea is a southern Appalachian endemic occurring in the southern Blue Ridge and Appalachian Plateau physiographic provinces (Ogle 1991a). It is a clonal shrub that reproduces completely or almost completely through vegetative means. Virginia spiraea inhabits deposition rock bars along large rivers that are subject to yearly high water scouring. Current documented distribution indicates the species is an Appalachian endemic with extant or historic occurrences from Pennsylvania to Alabama and Georgia. In Kentucky the documented occurrences are on Kinniconnick Creek near the Ohio River and on the Rockcastle River, part on private land, part on National Forest land (Ogle 1991b; USFWS 1992). The species is found on Laurel River on private land below the dam on Laurel River Lake. Habitat that appears suitable for the species may occur on tributaries to the Red, Licking, Kentucky, and Redbird Rivers. Two of the four populations with eight or more clones each occur in Kentucky. One of these populations is on Sinking Creek of the Rockcastle River. The species is known from about 20 sites within the DBNF proclamation boundary, at least 16 of which are located on National Forest System lands on the London and Somerset RDs.

Virginia spiraea nearly always occurs in riverine habitats where there is enough seasonal erosion to inhibit or control arboreal competition. Colonies (clones) typically grow on the scoured banks of high gradient streams; on outwash islands, meander scrolls, point bars, natural levees, or braided stream channels; or occasionally in disturbed rights-of-way. In natural sites, scour is needed to control competition, and must be sufficient to topple the larger, heavier trees and wash out many of the other herbs and vines without being so strong as to remove the fine fibrous root mass or heavy lateral rhizome. Individual clones can usually regenerate themselves successfully if the aboveground parts are scoured away. Seed viability from individual clones is typically low, and reproduction is primarily asexual and involves the fragmentation of stem or rhizome fragments that are washed downstream and deposited in suitable areas by floodwaters (USFWS 1992).

In the DBNF area, Virginia spiraea occurs on seasonally scoured gravel bars and gravelly islands along the Rockcastle River, Sinking Creek, and Laurel River. Additional sites for the species may have been eliminated by the impoundment of the lower Rockcastle and Cumberland Rivers behind Wolf Creek Dam (forming Lake Cumberland) and the

impoundment of the Laurel River (creating Laurel River Lake). Apparently suitable habitat for Virginia spiraea in the DBNF area occurs along a few additional large streams and rivers on or near the Forest (Cumberland River, other sections of the Rockcastle River, Big South Fork, and perhaps Little South Fork, Station Camp Creek, Sturgeon Creek, or Triplett Creek to name some of the most likely) and it seems at least possible that other colonies will eventually be discovered here.

Potential Effects (Direct, Indirect and Cumulative)

This analysis is programmatic in that it deals only with Revised Forest Plan direction, as established within various Prescription Areas including; Desired Future Conditions, Goals, Objectives and associated Standards that provide limitations on management activities for the protection or enhancement of PETS species, their habitats and other resource needs. All actions authorized and proposed under the Revised Forest Plan are subject to second level, site-specific analysis and subsequent ESA Section 7 consultation with the USFWS through the BA/BE process.

This species and its potential habitat occur entirely within the Riparian Corridor Prescription Area (155,370 acres). This prescription area is managed to retain, restore an enhance the ecological processes and functions of the community, including the riparian and associated upland components. In general, the management of this prescription should result in beneficial effects to the Virginia spiraea.

Several species of exotic plants can be serious competitors with Virginia spiraea when these invaders become established along streambanks. Activities such as road or trail maintenance result in soil disturbance that potentially leads to an increase in numbers and spread of the exotic plants. The Revised Forest Plan does provide certain limitations on the construction of roads and trails in this prescription area. Spread of these exotics also occurs by recreational river uses as they walk from roadsides to the riparian area. River scouring and wildlife also spread these seeds. However, when this situation does occur, regardless of the cause of spread, action can be taken at the project level, with appropriate site-specific analysis, to control these invasive weeds or the factors leading to their spread and establishment. Revised Forest Plan direction regarding monitoring of road and trail areas should allow for timely site-specific action to limit the potential impacts of invasive species.

Cumulative effects are those effects of future State, local, or private actions that are reasonably certain to occur within the action area of the DBNF. This programmatic BA addresses only those activities that are authorized by the Revised Forest Plan on lands that are under the jurisdiction of the U.S.D.A. Forest Service. Thus, any future State, local or private actions that could potentially occur on the DBNF would require a permit from the Forest Service and will require compliance with the consultation provisions of Section 7 of the ESA. There are no State, local or private actions reasonably certain to occur as a result of implementation of the Revised Forest Plan. Therefore, cumulative effects, as defined by the ESA, will not occur.

Determination of Effect

The Revised Forest Plan provides programmatic protective measures and allows for habitat improvements for the suitable habitat associated with this species. Monitoring of forest user created impacts on the Riparian Corridor Prescription Area are also scheduled.

Therefore, the determination of effect for the Virginia spiraea is; “not likely to adversely affect.”

Eggert’s Sunflower

Environmental Baseline

In Kentucky, pure Eggert's sunflower occurs in the Mammoth Cave region of west-central Kentucky. A specimen collected near the Somerset RD, and within the DBNF proclamation boundary, during the summer of 2002 has been confirmed as Eggert's sunflower by Dr. Ron Jones at Eastern Kentucky University (Taylor personal communication). The Recovery Plan does not consider the Daniel Boone area to be within the range of the species (USFWS 1998). Typical habitat for Eggert's sunflower consists of xeric landscapes with scattered groups of trees surrounded by open stands of native grasses and forbs; this habitat type is maintained under natural conditions by a combination of drought, fire, and perhaps light grazing. In west-central Kentucky, the species was observed to respond well to the use of prescribed fire at one site while continuing to decline where only canopy thinning was done at another site (USFWS 1998a).

Habitat that appears to be suitable for Eggert's sunflower occurs in limited quantity on all DBNF Ranger Districts. At the present time, powerline rights of way areas on dry upper slopes and ridges appear to provide conditions under which this species could grow, especially in areas where grasses and forbs typical of barrens-type communities (big bluestem, little bluestem, Indian grass, blazing-star, etc.) are well established.

Potential Effects (Direct, Indirect and Cumulative)

This analysis is programmatic in that it deals only with Revised Forest Plan direction, as established within various Prescription Areas including; Desired Future Conditions, Goals, Objectives and associated Standards that provide limitations on management activities for the protection or enhancement of PETS species, their habitats and other resource needs. All actions authorized and proposed under the Revised Forest Plan are subject to second level, site-specific analysis and subsequent ESA Section 7 consultation with the USFWS through the BA/BE process.

The initiation of a large-scale prescribed burning program should provide some open forest habitat with a grass/forb ground layer that would likely meet the needs of Eggert's sunflower. The Revised Forest Plan calls for a much as 50,000 acres per year of prescribed burning near the end of the ten-year planning period. Prescribed burning,

occurring mainly in the 327,900 acre Habitat Diversity Emphasis Prescription Area, would allow habitat conditions to become more favorable to the Eggert's sunflower. Specific objectives, within this prescription area, create open woodlands and grasslands. These would have the potential to provide long-term benefits to the species on the DBNF.

Cumulative effects are those effects of future State, local, or private actions that are reasonably certain to occur within the action area of the DBNF. This programmatic BA addresses only those activities that are authorized by the Revised Forest Plan on lands that are under the jurisdiction of the U.S.D.A. Forest Service. Thus, any future State, local or private actions that could potentially occur on the DBNF would require a permit from the Forest Service and will require compliance with the consultation provisions of Section 7 of the ESA. There are no State, local or private actions reasonably certain to occur as a result of implementation of the Revised Forest Plan. Therefore, cumulative effects, as defined by the ESA, will not occur.

Determination of Effect

The Revised Forest Plan provides programmatic direction for management activities, specifically prescribed burning, that should improve habitat conditions for this species.

Therefore, the determination of effect for the Eggert's sunflower is; "not likely to adversely affect."

American Chaffseed

Environmental Baseline

Known historically (collections made in 1934 and 1935 by E. Lucy Braun) from two sites in the vicinity of what now is the DBNF. One site occurred on the Somerset RD near Natural Arch and the other on the Stearns RD along Alum Creek Road (USFS et al. 1988). American chaffseed has not been seen on the DBNF or in Kentucky since these collections were made, and it may now be extirpated.

Characteristic habitat for American chaffseed in the portion of its range that includes the Piedmont and the Cumberland Plateau consists of open fire-maintained pine forest (pine flatwoods and fire-maintained pine savannas) with acidic, sandy soils and with a well-developed grass/forb community between the trees. Chaffseed appears to be shade-intolerant, and can do well in open roadsides and in utility R-O-W areas as well as in open woodlands (USFWS 1994).

Potentially suitable habitat for American chaffseed occurs in good quantity on pine-dominated ridges on the Stearns, Somerset, London RDs, in fair quantity on the Stanton RD, and in low quantity on the Morehead RD. In many of these areas, the essential missing habitat component seems to be fire. At the present time, power line R-O-W areas on dry upper slopes and ridges appear to provide conditions under which this species could do well.

Potential Effects (Direct, Indirect and Cumulative)

This analysis is programmatic in that it deals only with Revised Forest Plan direction, as established within various Prescription Areas including; Desired Future Conditions, Goals, Objectives and associated Standards that provide limitations on management activities for the protection or enhancement of PETS species, their habitats and other resource needs. All actions authorized and proposed under the Revised Forest Plan are subject to second level, site-specific analysis and subsequent ESA Section 7 consultation with the USFWS through the BA/BE process.

American Chaffseed is not currently known to be on the DBNF. However, the initiation of a large-scale prescribed burning program on the DBNF should provide considerable acreages of open forest habitat with a grass/forb ground layer that would likely meet the needs of American chaffseed. The Revised Forest Plan calls for a much as 50,000 acres per year of prescribed burning near the end of the ten-year planning period. Prescribed burning, occurring mainly in the 327,900 acre Habitat Diversity Emphasis Prescription Area, would allow habitat conditions to become more favorable to American chaffseed. Specific objectives, within this prescription area, create open woodlands and grasslands. These would have the potential to provide long-term benefits to the species on the DBNF. The Recovery Plan (USFWS 1994) specifically mentions that many of the most vigorous surviving populations of American chaffseed occur in areas that are burned frequently, often annually.

Portions of two other Prescription Areas, Cliffline Community and Rare Community, should contribute to habitat protection and/or enhancement. The tops of sandstone cliffines are suitable habitat for American chaffseed. Within the Rare Community Prescription Area two habitats in particular provide suitable habitat for this species; sandstone glades and native warm-season grasslands. Prescribed fire is specifically identified as an important tool for habitat development and maintenance.

Cumulative effects are those effects of future State, local, or private actions that are reasonably certain to occur within the action area of the DBNF. This programmatic BA addresses only those activities that are authorized by the Revised Forest Plan on lands that are under the jurisdiction of the U.S.D.A. Forest Service. Thus, any future State, local or private actions that could potentially occur on the DBNF would require a permit from the Forest Service and will require compliance with the consultation provisions of Section 7 of the ESA. There are no State, local or private actions reasonably certain to occur as a result of implementation of the Revised Forest Plan. Therefore, cumulative effects, as defined by the ESA, will not occur.

Determination of Effect

Prescription area desired future conditions and activities authorized under the Revised Forest Plan should improve habitat conditions associated with this species.

Therefore, the determination of effect for the American chaffseed is; “not likely to adversely affect.”

Running Buffalo Clover

Environmental Baseline

Running buffalo clover is known from a single site within the DBNF proclamation boundary on the London RD where a small remnant colony was discovered within The Nature Conservancy, Horse Lick Creek, Bioreserve. During recent years, several new populations of running buffalo clover have been found in Kentucky, and there is a good chance that the species will eventually be found on National Forest System Lands. Running buffalo clover requires rich soil and moderate to light shade from the overstory canopy in concert with a grazing, mowing, flooding, or burning regime capable of controlling many of the more weedy grasses and forbs that share its habitat. Many surviving populations are in wooded stream valleys that are grazed by cattle, often in loamy soils on small stream terraces that are sparsely vegetated. Other populations, located primarily in parks, old cemeteries, or along trails, appear to be maintained by mowing (USFWS 1989a).

In Kentucky, much of its former habitat has been converted to agricultural or residential use, and most of the remaining known colonies are small and isolated from one another. In the past it is likely that soil disturbance may have eliminated some colonies and encouraged site invasion by weeds and exotics. Thick stands of second growth forest have made some potential habitat unsuitable for the species, and the loss of large native grazing herbivores such as bison and elk has removed what was likely a major element in the survival and spread of this native clover (USFWS 1989a). Long-term fire suppression has possibly played a role in the decline of running buffalo clover as well. Suitable habitat for running buffalo clover likely occurs on all DBNF Ranger Districts.

Potential Effects (Direct, Indirect and Cumulative)

This analysis is programmatic in that it deals only with Revised Forest Plan direction, as established within various Prescription Areas including; Desired Future Conditions, Goals, Objectives and associated Standards that provide limitations on management activities for the protection or enhancement of PETS species, their habitats and other resource needs. All actions authorized and proposed under the Revised Forest Plan are subject to second level, site-specific analysis and subsequent ESA Section 7 consultation with the USFWS through the BA/BE process.

Running buffalo clover is not known to occur on the DBNF although one population of the species occurs on private land, near the forest, in Horse Lick Creek. Because of this proximity to National Forest System Lands and the suitability of habitat in this and other areas on the forest, it is likely that populations of this species will be eventually discovered on the DBNF.

The Revised Forest Plan calls for the initiation of a large-scale prescribed burning program on the DBNF. This management activity should provide areas of more open forest habitat with a grass/forb ground layer that would likely benefit habitat conditions for running buffalo clover. The Revised Forest Plan calls for a much as 50,000 acres per year of prescribed burning near the end of the ten-year planning period. Prescribed burning, would occur mainly in the 327,900 acre Habitat Diversity Emphasis Prescription Area. Specific objectives, within this prescription area, create open woodlands and grasslands. The Riparian Corridor Prescription Area management direction would also help to create habitat conditions that would favorable to running buffalo clover. Programmatically, the Revised Forest Plan has the potential to provide long-term benefits to the species on the DBNF.

Cumulative effects are those effects of future State, local, or private actions that are reasonably certain to occur within the action area of the DBNF. This programmatic BA addresses only those activities that are authorized by the Revised Forest Plan on lands that are under the jurisdiction of the U.S.D.A. Forest Service. Thus, any future State, local or private actions that could potentially occur on the DBNF would require a permit from the Forest Service and will require compliance with the consultation provisions of Section 7 of the ESA. There are no State, local or private actions reasonably certain to occur as a result of implementation of the Revised Forest Plan. Therefore, cumulative effects, as defined by the ESA, will not occur.

Determination of Effect

Moving toward desired future conditions, in both the Riparian Corridor and the Habitat Diversity Prescription Areas, and management direction authorized under the Revised Forest Plan should improve habitat conditions associated with this species.

Therefore, the determination of effect for the running buffalo clover is; “not likely to adversely affect.”

Cumberland Rosemary

Environmental Baseline

In Kentucky, Cumberland rosemary is known from about a dozen sites on seasonally scoured rockbar habitats along the Big South Fork Cumberland River, all on National Park System lands. One historical record occurs in similar habitat along the Cumberland River main-stem downriver from the DBNF. This site is now inundated by Lake Cumberland (USFWS 1995a). The known historical range of Cumberland rosemary in the DBNF area would probably include the Big South Fork, perhaps the lower portion of the Little South Fork, and the main stem of the Cumberland River below Big South Fork. Much of this area was rendered unsuitable when Wolf Creek Dam was constructed in the 1950's.

Cumberland rosemary grows along the floodplains of large streams and rivers, living in full to moderate sun in seasonally-flooded but otherwise well-drained sites on boulder bars, gravel/boulder bars, sand/gravel bars, sand terraces, and in pockets of sand that have been trapped between boulders. Periodic flooding is an important habitat component, serving to eliminate or damage trees and shrubs that would compete with the species for sunlight while at the same time dispersing seeds and/or viable plant fragments to other rockbars and/or rocky islands located downstream. At a few locations, Cumberland rosemary occurs with another federal listed plant (Virginia spiraea) that has similar habitat requirements (USFWS 1995a).

Apparently suitable habitat for Cumberland rosemary occurs on the DBNF, upstream from Lake Cumberland along both the Rockcastle River and the Cumberland River, and includes the lower portions of some of their larger tributaries. No occurrence of this species has been documented on the DBNF.

Potential Effects (Direct, Indirect and Cumulative)

This analysis is programmatic in that it deals only with Revised Forest Plan direction, as established within various Prescription Areas including; Desired Future Conditions, Goals, Objectives and associated Standards that provide limitations on management activities for the protection or enhancement of PETS species, their habitats and other resource needs. All actions authorized and proposed under the Revised Forest Plan are subject to second level, site-specific analysis and subsequent ESA Section 7 consultation with the USFWS through the BA/BE process.

Currently, Cumberland rosemary is not known to occur on the DBNF. However, it does exist on several sites located near the DBNF and the historical range of the species indicates that it could be located along a few forest streams. The establishment and management direction in the Riparian Corridor Prescription Area provides conditions suitable for the establishment of this species. Within the prescription area, (155,370 acres) habitat is managed to retain, restore and/or enhance the inherent ecological processes and functions of this biotic community. Standards associated with this prescription area limit management actions that could negatively impact the development of suitable habitat. Monitoring requirements in the Riparian Corridor Prescription Area are designed to detect potential impacts to habitat caused by public use.

Cumulative effects are those effects of future State, local, or private actions that are reasonably certain to occur within the action area of the DBNF. This programmatic BA addresses only those activities that are authorized by the Revised Forest Plan on lands that are under the jurisdiction of the U.S.D.A. Forest Service. Thus, any future State, local or private actions that could potentially occur on the DBNF would require a permit from the Forest Service and will require compliance with the consultation provisions of Section 7 of the ESA. There are no State, local or private actions reasonably certain to occur as a result of implementation of the Revised Forest Plan. Therefore, cumulative effects, as defined by the ESA, will not occur.

Determination of Effect

This species is not currently known to occur on the DBNF. Establishment of the Riparian Corridor Prescription Area should maintain or develop habitat conditions suitable for this species.

Therefore, the determination of effect for the Cumberland rosemary is; “not likely to adversely affect.”

Cumberland Sandwort

Environmental Baseline

Cumberland sandwort has been reported from three rock shelters in two areas in Kentucky, both in McCreary County and both within the DBNF proclamation boundary. There is one extant population that occupies two different shelters along a tributary stream in Big South Fork National River and Recreation Area (BSF) on National Park Service lands, and one possibly extirpated colony within the Rock Creek corridor on the Stearns RD of the DBNF. The Rock Creek population was discovered in 1984 by Max Medley, formerly a botanist with the Kentucky State Nature Preserves Commission (KSNPC), and was vouchered with a collection. However, directions to the location where the plants were found were vague and several subsequent attempts to rediscover the colony have been unsuccessful. KSNPC and/or Forest Service personnel have repeatedly searched for additional sites within BSF and along the cliffs that border Rock Creek, but thus far no additional sites have been discovered. The historical range of Cumberland sandwort on the DBNF should include at a minimum all sandstone cliffline habitats within the Big South Fork Cumberland River drainage including those that form the gorges of Rock Creek, Roaring Paunch Creek, Big South Fork, and their tributaries.

Cumberland sandwort occurs in moist sandy soil on the floors of sandstone rock shelters. It also can occupy solution pockets and sand-filled crevices along overhanging sandstone clifflines. The species requires some shade, relatively constant cool temperatures, and relatively high humidity levels (USFWS 1995b).

Habitat that appears to be suitable for this species occurs virtually throughout the Cliff Section of the Cumberland Plateau. The Stearns, Somerset, and London RDs all contain large amounts of cliffline habitat with many rock shelters that appear ideal for Cumberland sandwort. Much of this habitat lies within the Upper Cumberland River drainage and is more or less connected with similar cliffline that lies within the range of the species. Much of this habitat has not been completely surveyed; DBNF personnel and various contractors have checked approximately 360 miles of cliffline habitat on the London, Somerset, and Stearns Ranger Districts while conducting field inventories for various projects. Suitable cliffline habitat is also abundant on the Stanton and Morehead RDs. The Redbird RD offers very little suitable habitat for Cumberland sandwort. Cumberland sandwort appears to have limited ability to disperse from existing colony

sites into suitable unoccupied habitat. Thus, the reintroduction of this species, on National Forest System lands, remains a potential option for at least limited recovery.

Potential Effects (Direct, Indirect and Cumulative)

This analysis is programmatic in that it deals only with Revised Forest Plan direction, as established within various Prescription Areas including; Desired Future Conditions, Goals, Objectives and associated Standards that provide limitations on management activities for the protection or enhancement of PETS species, their habitats and other resource needs. All actions authorized and proposed under the Revised Forest Plan are subject to second level, site-specific analysis and subsequent ESA Section 7 consultation with the USFWS through the BA/BE process.

Currently, no known sites for Cumberland sandwort occur on the DBNF. Undetected populations may still occur along sandstone cliffs on the BDNF in the Big South Fork Cumberland River drainage.

All suitable habitat for this species on the DBNF occurs within the Cliffline Community Prescription Area (111,200 acres). Management activities within this prescription area are limited and designed to enhance conditions for cliffline-associated species. In addition, a standard directed toward limiting possible human impacts, prohibits camping with 100 feet of the base of a cliff or within rockshelters unless the site is designated for such use. Thus, habitat conditions suitable for this species or its reintroduction to the DBNF should improve during the effective time period of the Revised Forest Plan.

Cumulative effects are those effects of future State, local, or private actions that are reasonably certain to occur within the action area of the DBNF. This programmatic BA addresses only those activities that are authorized by the Revised Forest Plan on lands that are under the jurisdiction of the U.S.D.A. Forest Service. Thus, any future State, local or private actions that could potentially occur on the DBNF would require a permit from the Forest Service and will require compliance with the consultation provisions of Section 7 of the ESA. There are no State, local or private actions reasonably certain to occur as a result of implementation of the Revised Forest Plan. Therefore, cumulative effects, as defined by the ESA, will not occur.

Determination of Effect

This species is not currently known to occur on the DBNF. Establishment of the Cliffline Community Prescription Area should maintain or develop habitat conditions suitable for this species. Existing suitable habitat is further protected from human recreational disturbance. **Therefore, the determination of effect for the Cumberland sandwort is; “not likely to adversely affect.”**

White-haired Goldenrod

Environmental Baseline

White-haired goldenrod is known from over 90 occurrences in individual rock shelters and cliff overhangs, all of which are within the DBNF proclamation boundary on the Stanton RD. The majority of these sites occur on National Forest System lands. White-haired goldenrod is endemic to Kentucky and to the Red River Gorge and adjacent portions of the DBNF. The entire known range of the species lies in only three counties; Powell, Wolfe, and Menifee (USFWS 1993a).

White-haired goldenrod is a habitat specialist that is restricted to sandy soils within sandstone rock shelters and on rock ledges behind the dripline zones of overhanging cliffs composed of Pennsylvanian sandstones. The species grows in partial shade provided by the cliffs themselves and by adjacent forest. The rock shelters protect the plants from direct rainfall except during the most severe storms, and the species appears to thrive in the dry sandy soils that occur there (USFWS 1993a). In the Red River Gorge Geological Area, as well as elsewhere within the range of the species, there are often long stretches of cliffline habitat where rock shelter development is lacking. Colonies of white-haired goldenrod thus tend to be discontinuously distributed along the cliffs, and dispersal into new rock shelters (or the recolonization of shelters from which the species has been extirpated) is probably a very slow process. Although habitat that appears excellent for this plant occurs virtually throughout the Cliff Section of the Cumberland Plateau on other portions of the Stanton RD and in large sections of the Morehead, London, Somerset, and Stearns RDs, the species has never been found outside of the small range where it presently occurs.

The entire known range of white-haired goldenrod is included within the proclamation boundary of Daniel Boone National Forest, nearly 80 percent of the known occurrences are situated on National Forest System lands, and the Forest contains much cliffline habitat that appears to meet the specific habitat needs for this species. These three factors should allow the DBNF to play a major role in maintaining and recovering this species.

Potential Effects (Direct, Indirect and Cumulative)

This analysis is programmatic in that it deals only with Revised Forest Plan direction, as established within various Prescription Areas including; Desired Future Conditions, Goals, Objectives and associated Standards that provide limitations on management activities for the protection or enhancement of PETS species, their habitats and other resource needs. All actions authorized and proposed under the Revised Forest Plan are subject to second level, site-specific analysis and subsequent ESA Section 7 consultation with the USFWS through the BA/BE process.

White-haired goldenrod is only known to occur within three counties in Kentucky, all within the DBNF proclamation boundary. Undetected population occurrences may occur along clifflines on the DBNF. All suitable habitat for this species on the DBNF occurs within the Cliffline Community Prescription Area (111,200 acres). Management activities within this prescription area are limited and designed to enhance conditions for cliffline-associated species. In addition, a standard directed toward limiting possible

human impacts, prohibits camping with 100 feet of the base of a cliff or within rockshelters unless the site is designated for such use. Additional restrictions are applied to rock climbing and associated activities. Thus, habitat conditions suitable for white-haired goldenrod should improve during the effective time period of the Revised Forest Plan.

The Revised Forest Plan designates two additional Prescription Areas, Red River Gorge Geological Area (16,000 acres) and Clifty Wilderness (12,000 acres) that will provide protection for the habitat associated with white-haired goldenrod. In addition to Cliffline Community Prescription Area limitations, these two prescription areas further limit human disturbance by programmatically prohibiting fire building within 100 feet of the base of a cliffline or within a rockshelter. Horseback riding in these areas is restricted to designated trails only.

In addition to the programmatic protections for white-haired goldenrod inherent with the Cliffline Community, Red River Gorge Geological Area, and Clifty Wilderness Prescription Area, a specific Goal of the Revised Forest Plan is to bring about the delisting of this species. Work will be ongoing throughout the planning period to accomplish the Objectives associated with this Goal. Thus, the overall direction established by Revised Forest Plan should benefit the species.

Cumulative effects are those effects of future State, local, or private actions that are reasonably certain to occur within the action area of the DBNF. This programmatic BA addresses only those activities that are authorized by the Revised Forest Plan on lands that are under the jurisdiction of the U.S.D.A. Forest Service. Thus, any future State, local or private actions that could potentially occur on the DBNF would require a permit from the Forest Service and will require compliance with the consultation provisions of Section 7 of the ESA. There are no State, local or private actions reasonably certain to occur as a result of implementation of the Revised Forest Plan. Therefore, cumulative effects, as defined by the ESA, will not occur.

Determination of Effect

Nearly all known occurrences of white-haired goldenrod are located on the DBNF. Establishment of the Cliffline Community Prescription Area should maintain or develop habitat conditions suitable for this species. Existing and potential suitable habitat is further protected from human recreational associated disturbances. A specific Goal of the Revised Forest Plan is to facilitate the delisting of this species.

Therefore, the determination of effect for the white-haired goldenrod is; “not likely to adversely affect.”

CRITICAL HABITAT

Critical habitat has been defined by the USDI. Fish and Wildlife service as:

A specific geographic area(s) that is essential for the conservation of a threatened or endangered species and that may require special management and protection. Critical habitat may include an area that is not currently occupied by the species but that will be needed for its recovery (USDI 1998).

No designated critical habitat currently exists on the DBNF for any federally listed species.

Proposed Critical Habitat

On the DBNF, proposed Critical Habitat exists for three species of mussels (Cumberlandian combshell, Cumberland elktoe, and oyster mussel) (USDI 2003).

Portions of four stream segments, occurring within or adjacent to the DBNF, were proposed by the USFWS for designation as critical habitat. These four stream segments and their associated mussel species are delineated in Table 2. These stream segments are, as identified in the Federal Register: Unit 8, Rock Creek; Unit 10, Buck Creek; Unit 11, Sinking Creek; and Unit 12, Marsh Creek. All stream segments are considered to be occupied habitat.

Potential Effects (Direct, Indirect and Cumulative)

This analysis is programmatic in that it deals only with Revised Forest Plan direction, as established within various Prescription Areas including; Desired Future Conditions, Goals, Objectives and associated Standards that provide limitations on management activities for the protection or enhancement of PETS species, their habitats and other resource needs. All actions authorized and proposed under the Revised Forest Plan are subject to second level, site-specific analysis and subsequent ESA Section 7 consultation with the USFWS through the BA/BE process.

Programmatically, all streams on the DBNF, including those segments proposed for critical habitat designation (Units 8, 10, 11, and 12), and their associated mussel fauna receive many protections under the Revised Forest Plan. For example Goal 1.1 states “Protect and/or enhance current and potential habitat for Proposed, Endangered, Threatened (PET) species, or Sensitive (S) species and Conservation species.” Goal 3 states “protect or enhance the individual values and ecological functions of flood plains, groundwater, lakes, riparian areas, springs, streams and wetlands.” These two goals apply forest-wide to all streams.

The DBNF Revised Forest Plan includes approximately 155,370 acres within a designated Riparian Corridor Prescription Area that includes both perennial and intermittent streams as well as adjacent upland components. Along perennial streams this area includes the 100 year flood plain or 100 feet either side of the stream channel, whichever is greater. Within the context of Desired Future Condition, this Prescription Area is managed “to retain, restore, and/or enhance the inherent ecological processes and functions of the associated aquatic, riparian and upland components. Primarily, only

natural processes (floods, erosion, seasonal fluctuations, etc.) modify the landscape and resources within the area.”

Five primary constituent elements are delineated by the USFWS in the June 3, 2003 Federal Register proposed rule regarding critical habitat designation. Specific Goals within the Riparian Corridor Prescription Area of the Revised Forest Plan address each of these primary constituent elements. Therefore, from a programmatic standpoint, consideration of these elements is built into the Revised Forest Plan. Below are listed the primary constituent elements (*in italics*) and the Goal statements in the Revised Forest Plan which specifically apply to each.

1. *Permanent, flowing stream reaches with a flow regime necessary for normal behavior, growth, and survival of all life stages of the mussels and their host fish.*
 - Goal 1.E.3. Maintain and restore the water quality (biological and chemical integrity) necessary to support healthy riparian, aquatic, and wetland ecosystems, and to ensure survival, growth, reproduction, and migration of aquatic or riparian-associated species.
2. *Geomorphically stable stream and river channels and banks.*
 - Goal 1.E.4. Maintain and restore the physical integrity of aquatic ecosystems, including stream banks, substrate, shorelines, coarse woody debris, and other components of this habitat.
3. *Stable substrates consisting of mud, sand, gravel, and/or cobble/boulder, with low amounts of fine sediments or attached filamentous algae.*
 - Goal 1.E.4. See above
 - Goal 1.E.5. Restore and maintain a stable sediment regime that includes the timing, volume, rate and character of sediment input, storage, and transport.
4. *Water quality (including temperature, turbidity, oxygen content, and other characteristics) necessary for the normal behavior, growth, and survival of all life stages of the mussels and their host fish.*
 - Goal 1.E.4. See above
 - Goal 1.E.5. See above.
5. *Fish hosts with adequate living, foraging, and spawning areas.*
 - Goal 1.E.1. Restore and maintain native aquatic biodiversity.
 - Goal 1.E.7. Provide for unrestricted movement of aquatic fauna, except for existing approved dams.

Additionally, many Revised Forest Plan Standards apply to the Riparian Corridor Prescription Area and relate to the primary constituent elements in the proposed rule. These Standards apply to minerals, roads and engineering, wildlife, recreation, vegetation management and prescribed fire.

Cumulative effects are those effects of future State, local, or private actions that are reasonably certain to occur within the action area of the DBNF. This programmatic BA addresses only those activities that are authorized by the Revised Forest Plan on lands that are under the jurisdiction of the U.S.D.A. Forest Service. Thus, any future State, local or private actions that could potentially occur on the DBNF would require a permit from the Forest Service and will require compliance with the consultation provisions of

Section 7 of the ESA. There are no State, local or private actions reasonably certain to occur as a result of implementation of the Revised Forest Plan. Therefore, cumulative effects, as defined by the ESA, will not occur.

Determination of Effect

Forest-wide and riparian management direction is designed to not only minimize adverse impacts to aquatic and riparian areas, but to maintain and/or restore them as healthy, functioning systems. Implementation of the Revised Forest Plan would result in no destruction or adverse modification to proposed critical habitat

Therefore, the determination of effect for all four stream segments currently proposed for critical habitat designation is; “not likely adversely modify proposed critical habitat.”

MUSSELS

Cumberlandian Combshell

Environmental Baseline

The Cumberlandian combshell was historically known from the Cumberland River below Cumberland Falls and the Rockcastle River but has apparently been extirpated from those streams (USFWS 1998b). Historically, the species is known from about 30 sites within or near the DBNF proclamation boundary, about 8 of which are located on National Forest System lands. The present distribution on the DBNF includes only Buck Creek and portions of the Big South Fork (NPS).

The Cumberlandian combshell occurs in medium-sized to large rivers, and is usually found in shoals and riffles where the substrate includes coarse sand, gravel, cobble, and boulders. Although most remaining populations are located in free-flowing sections of streams, this species has persisted in some Tennessee reservoirs where there is still a fairly strong current present. Known host fish for Cumberlandian combshell glochidia that occur in DBNF streams include the greenside darter, logperch, and banded sculpin (USFWS 1998b).

Potential Effects (Direct, Indirect and Cumulative)

This analysis is programmatic in that it deals only with Revised Forest Plan direction, as established within various Prescription Areas including; Desired Future Conditions, Goals, Objectives and associated Standards that provide limitations on management activities for the protection or enhancement of PETS species, their habitats and other resource needs. All actions authorized and proposed under the Revised Forest Plan are subject to second level, site-specific analysis and subsequent ESA Section 7 consultation with the USFWS through the BA/BE process.

The decline and extirpation of most populations of the Cumberlandian combshell may be attributed to habitat modification, sedimentation, eutrophication, and other forms of water quality degradation. Restricted movement of host fish may also be a factor in the decline of this species. For populations of the Cumberlandian combshell on or near the DBNF, potential management influences include: sedimentation, altered flow, and blockage of host fish passage associated with roads and crossings. Forest-wide Standards and management direction associated with the Riparian Corridor Prescription Area will protect the Cumberlandian combshell and its habitat from potential negative impacts during management activities. Instream flow needs will be quantified and maintained to protect aquatic organisms when new water use authorizations are proposed.

Cumulative effects are those effects of future State, local, or private actions that are reasonably certain to occur within the action area of the DBNF. This programmatic BA addresses only those activities that are authorized by the Revised Forest Plan on lands that are under the jurisdiction of the U.S.D.A. Forest Service. Thus, any future State, local or private actions that could potentially occur on the DBNF would require a permit from the Forest Service and will require compliance with the consultation provisions of Section 7 of the ESA. There are no State, local or private actions reasonably certain to occur as a result of implementation of the Revised Forest Plan. Therefore, cumulative effects, as defined by the ESA, will not occur.

Critical Habitat has been proposed for the Cumberlandian combshell. Discussion of proposed Critical Habitat and the determination of effect occur in a previous section of this BA.

Determination of Effect

Forest-wide and Riparian Corridor Prescription Area management direction is designed to avoid or mitigate potential management actions which could negatively impact this species.

Therefore, the determination of effect for the Cumberlandian combshell is; “not likely to adversely affect.”

Oyster Mussel

Environmental Baseline

The oyster mussel is known about 30 sites within or near the DBNF proclamation boundary, seven of which are located on National Forest System lands. In the general area of the DBNF, the Oyster mussel was historically known from the Cumberland River below Cumberland Falls and from the Rockcastle River, but appears to now have been extirpated from those streams (USFWS 1998b). The present distribution on the Forest includes only Buck Creek, a tributary to the Cumberland River and Big South Fork (NPS).

The oyster mussel typically inhabits small to medium-sized rivers (occasionally larger rivers) in areas with moderate to swift current and a substrate which varies from coarse sand and gravel to boulders, including pockets of gravel between bedrock ledges (USFWS 1998b; Parmalee and Bogan 1998). Known host fishes for oyster mussel glochidia that occur in DBNF streams include the dusky darter and banded sculpin (USFWS 1998b).

Potential Effects (Direct, Indirect and Cumulative)

This analysis is programmatic in that it deals only with Revised Forest Plan direction, as established within various Prescription Areas including; Desired Future Conditions, Goals, Objectives and associated Standards that provide limitations on management activities for the protection or enhancement of PETS species, their habitats and other resource needs. All actions authorized and proposed under the Revised Forest Plan are subject to second level, site-specific analysis and subsequent ESA Section 7 consultation with the USFWS through the BA/BE process.

The decline and extirpation of most populations of the oyster mussel may be attributed to habitat modification, sedimentation, eutrophication, and other forms of water quality degradation. Restricted movement of host fish may also be a factor in the decline of this species. For populations of the oyster mussel on or near the DBNF, potential management influences include: sedimentation, altered flow, and blockage of host fish passage associated with roads and crossings. Forest-wide Standards and management direction associated with the Riparian Corridor Prescription Area will protect the oyster mussel and its habitat from potential negative impacts during management activities. Instream flow needs will be quantified and maintained to protect aquatic organisms when new water use authorizations are proposed.

Cumulative effects are those effects of future State, local, or private actions that are reasonably certain to occur within the action area of the DBNF. This programmatic BA addresses only those activities that are authorized by the Revised Forest Plan on lands that are under the jurisdiction of the U.S.D.A. Forest Service. Thus, any future State, local or private actions that could potentially occur on the DBNF would require a permit from the Forest Service and will require compliance with the consultation provisions of Section 7 of the ESA. There are no State, local or private actions reasonably certain to occur as a result of implementation of the Revised Forest Plan. Therefore, cumulative effects, as defined by the ESA, will not occur.

Critical Habitat has been proposed for the oyster mussel. Discussion of proposed Critical Habitat and the determination of effect occur in a previous section of this BA.

Determination of Effect

Forest-wide and Riparian Corridor Prescription Area management direction is designed to avoid or mitigate potential management actions which could negatively impact this species.

Therefore, the determination of effect for the oyster mussel is; “not likely to adversely affect.”

Cumberland elktoe

Environmental Baseline

The Cumberland elktoe is known from about 40 sites within the DBNF proclamation boundary, about half of which are located on National Forest System lands. The Cumberland elktoe was historically known from the Cumberland River above Cumberland Falls, Laurel River, Lynn Camp Creek, and Horse Lick Creek but may be extirpated from those streams (USFWS 1998b). The present distribution on the Forest includes Marsh Creek (23 locations), a tributary to the Cumberland River; Big South Fork (NPS); Rock Creek (11 locations), a tributary to Big South Fork Cumberland River; and Sinking Creek, a tributary to the Rockcastle River. The populations in Marsh Creek and Rock Creek are the some of the largest remaining for the species range wide (USFWS 1998b). The population in Sinking Creek is as yet to be fully documented, but appears to be substantial. Within the DBNF proclamation boundary, the Cumberland elktoe could potentially occur within virtually any suitable stream or river in the Cumberland River drainage from Rock Creek/Big South Fork upstream along the Cumberland to Clear Fork at Williamsburg, including the Rockcastle River system and the Laurel River system (which is now largely unsuitable due to the influence of Laurel River Dam).

The Cumberland elktoe, which is endemic to the Upper Cumberland River drainage in Kentucky and Tennessee, inhabits medium-sized rivers and smaller waterways, and sometimes occurs in relatively small creeks where it may be the only native mussel species present. It is most common in shallow pools and runs where the current is slow-moving and the bottom is composed of sand with scattered boulder/cobble material, but it also can occur in riffles and runs with swifter current and a mud, sand, and gravel substrate (USFWS 1998b) and in the cracks of bedrock ledges (Parmalee and Bogan 1998). Known host fish species for Cumberland elktoe glochidia that occur in DBNF streams include the whitetail shiner, northern hogsucker, rock bass, longear sunfish, and rainbow darter (USFWS 1998b).

Potential Effects (Direct, Indirect and Cumulative)

This analysis is programmatic in that it deals only with Revised Forest Plan direction, as established within various Prescription Areas including; Desired Future Conditions, Goals, Objectives and associated Standards that provide limitations on management activities for the protection or enhancement of PETS species, their habitats and other resource needs. All actions authorized and proposed under the Revised Forest Plan are subject to second level, site-specific analysis and subsequent ESA Section 7 consultation with the USFWS through the BA/BE process.

The decline and extirpation of most populations of the Cumberland elktoe may be attributed to habitat modification, sedimentation, eutrophication, and other forms of water quality degradation. Restricted movement of host fish may also be a factor in the decline of this species. For populations of the Cumberland elktoe on or near the DBNF, potential management influences include: sedimentation, altered flow, and blockage of host fish passage associated with roads and crossings. Forest-wide Standards and management direction associated with the Riparian Corridor Prescription Area will protect the Cumberland elktoe and its habitat from potential negative impacts during management activities. Instream flow needs will be quantified and maintained to protect aquatic organisms when new water use authorizations are proposed.

Cumulative effects are those effects of future State, local, or private actions that are reasonably certain to occur within the action area of the DBNF. This programmatic BA addresses only those activities that are authorized by the Revised Forest Plan on lands that are under the jurisdiction of the U.S.D.A. Forest Service. Thus, any future State, local or private actions that could potentially occur on the DBNF would require a permit from the Forest Service and will require compliance with the consultation provisions of Section 7 of the ESA. There are no State, local or private actions reasonably certain to occur as a result of implementation of the Revised Forest Plan. Therefore, cumulative effects, as defined by the ESA, will not occur.

Critical Habitat has been proposed for the Cumberland elktoe. Discussion of proposed Critical Habitat and the determination of effect occur in a previous section of this BA.

Determination of Effect

Forest-wide and Riparian Corridor Prescription Area management direction is designed to avoid or mitigate potential management actions which could negatively impact this species.

Therefore, the determination of effect for the Cumberland elktoe is; “not likely to adversely affect.”

Fanshell

Environmental Baseline

The fanshell mussel is not presently known to occur within the DBNF proclamation boundary. However, a shell was collected in 1967 from the Red River near Clay City, just downriver from the Stanton RD. The species was most recently documented in 1994 in the Licking River approximately forty miles downstream from the DBNF at the confluence of Greasy Creek in Harrison and Robertson Counties. The possibility remains that fanshell either occurs on the DBNF or could be reintroduced in suitable habitat. The fanshell inhabits large to medium-sized rivers, where it occurs in areas with moderate to swift current and a substrate of coarse sand, gravel, and cobble (USFWS 1991). The host fish for the glochidia of this species are unknown (Parmalee and Bogan 1998).

Potential Effects (Direct, Indirect and Cumulative)

This analysis is programmatic in that it deals only with Revised Forest Plan direction, as established within various Prescription Areas including; Desired Future Conditions, Goals, Objectives and associated Standards that provide limitations on management activities for the protection or enhancement of PETS species, their habitats and other resource needs. All actions authorized and proposed under the Revised Forest Plan are subject to second level, site-specific analysis and subsequent ESA Section 7 consultation with the USFWS through the BA/BE process.

The decline and extirpation of most populations of the fanshell mussels may be attributed to habitat modification, sedimentation, eutrophication, and other forms of water quality degradation. Restricted movement of host fish may also be a factor in the decline of this species. For populations of the fanshell that may occur on or near the DBNF, potential management influences include: sedimentation, altered flow, and blockage of host fish passage associated with roads and crossings. Forest-wide Standards and management direction associated with the Riparian Corridor Prescription Area will protect the fanshell mussel and its habitat from potential negative impacts during management activities. Instream flow needs will be quantified and maintained to protect aquatic organisms when new water use authorizations are proposed.

Cumulative effects are those effects of future State, local, or private actions that are reasonably certain to occur within the action area of the DBNF. This programmatic BA addresses only those activities that are authorized by the Revised Forest Plan on lands that are under the jurisdiction of the U.S.D.A. Forest Service. Thus, any future State, local or private actions that could potentially occur on the DBNF would require a permit from the Forest Service and will require compliance with the consultation provisions of Section 7 of the ESA. There are no State, local or private actions reasonably certain to occur as a result of implementation of the Revised Forest Plan. Therefore, cumulative effects, as defined by the ESA, will not occur.

Determination of Effect

Forest-wide and Riparian Corridor Prescription Area management direction is designed to avoid or mitigate potential management actions that could negatively impact this species.

Therefore, the determination of effect for the fanshell mussel is; “not likely to adversely affect.”

Cumberland Bean Pearlymussel

Environmental Baseline

The Cumberland bean is known from over 120 sites within or near the DBNF proclamation boundary, many of which are located on National Forest System lands. The Cumberland bean was historically known from the Rockcastle River system (Rockcastle River, Laurel Fork, Middle Fork, South Fork, Horse Lick Creek, Roundstone Creek, and Sinking Creek), the Cumberland River below Cumberland Falls, the Big South Fork Cumberland River system (Big South Fork, Little South Fork, Kennedy Creek, and Brushy Creek), and Buck Creek. Although still extant, many of these populations have been severely impacted by man. Since the early 1980's, populations of the Cumberland bean have declined and/or disappeared from much of its former range in the Little South Fork system and from many sites in the Rockcastle River system (USFWS 1984b). Most recently, population declines have been noted in Horse Lick Creek on the London RD.

The Cumberland bean occupies medium-sized to small rivers and streams, where it usually occurs in gravelly riffles and runs with fast current (Parmalee and Bogan 1998). It also lives adjacent to riffles in the transition zone between gravel and sand substrates (USFWS 1984b). Host fish for glochidia of the Cumberland bean on the DBNF include the arrow darter, barcheek darter, fantail darter, rainbow darter, striped darter, and stripetail darter (Parmalee and Bogan 1998).

Potential Effects (Direct, Indirect and Cumulative)

This analysis is programmatic in that it deals only with Revised Forest Plan direction, as established within various Prescription Areas including; Desired Future Conditions, Goals, Objectives and associated Standards that provide limitations on management activities for the protection or enhancement of PETS species, their habitats and other resource needs. All actions authorized and proposed under the Revised Forest Plan are subject to second level, site-specific analysis and subsequent ESA Section 7 consultation with the USFWS through the BA/BE process.

The decline and extirpation of most populations of the Cumberland bean pearlymussel may be attributed to habitat modification, sedimentation, eutrophication, and other forms of water quality degradation. Restricted movement of host fish may also be a factor in the decline of this species. For populations of the Cumberland bean that may occur on or near the DBNF, potential management influences include: sedimentation, altered flow, and blockage of host fish passage associated with roads and crossings. Forest-wide Standards and management direction associated with the Riparian Corridor Prescription Area will protect the Cumberland bean and its habitat from potential negative impacts during management activities. Instream flow needs will be quantified and maintained to protect aquatic organisms when new water use authorizations are proposed.

Cumulative effects are those effects of future State, local, or private actions that are reasonably certain to occur within the action area of the DBNF. This programmatic BA addresses only those activities that are authorized by the Revised Forest Plan on lands that are under the jurisdiction of the U.S.D.A. Forest Service. Thus, any future State, local or private actions that could potentially occur on the DBNF would require a permit from the Forest Service and will require compliance with the consultation provisions of

Section 7 of the ESA. There are no State, local or private actions reasonably certain to occur as a result of implementation of the Revised Forest Plan. Therefore, cumulative effects, as defined by the ESA, will not occur.

Determination of Effect

Forest-wide and Riparian Corridor Prescription Area management direction is designed to avoid or mitigate potential management actions that could negatively impact this species.

Therefore, the determination of effect for the Cumberland bean pearl mussel is; “not likely to adversely affect.”

Little-wing Pearlymussel

Environmental Baseline

The little-wing pearl mussel is known from about 35 sites within the DBNF proclamation boundary; fewer than 10 of these are located on National Forest System lands. The little-wing was historically known from the Rockcastle River and Buck Creek, but it is likely now extirpated from those streams (USFWS 1989b). Recent distribution on the DBNF includes Horse Lick Creek (15 locations), a tributary to the Rockcastle River; Big South Fork Cumberland River (NPS); Little South Fork Cumberland River (13 locations), a tributary to Big South Fork; and Kennedy Creek, a tributary to Little South Fork. Since the early 1980's, populations of the little-wing pearl mussel have disappeared from most of its former range in Little South Fork (USFWS 1989b). Most recently, population declines have been noted in Horse Lick Creek on the London RD. The little-wing pearl mussel is currently known from only a few locations on the DBNF all within Horse Lick Creek.

The little-wing occurs in cool, clear streams and smaller rivers with low turbidity and moderate to relatively high gradient, where it typically inhabits shallow runs and the heads of riffles in sand or fine gravel between cobbles (Parmalee and Bogan 1998) or beneath boulders and slabrock (USFWS 1989b). Known host fish for the glochidia of this species on the DBNF include the greenside darter and emerald darter (Parmalee and Bogan 1998).

Potential Effects (Direct, Indirect and Cumulative)

This analysis is programmatic in that it deals only with Revised Forest Plan direction, as established within various Prescription Areas including; Desired Future Conditions, Goals, Objectives and associated Standards that provide limitations on management activities for the protection or enhancement of PETS species, their habitats and other resource needs. All actions authorized and proposed under the Revised Forest Plan are subject to second level, site-specific analysis and subsequent ESA Section 7 consultation with the USFWS through the BA/BE process.

The decline and extirpation of most populations of the little-wing pearl mussel may be attributed to habitat modification, sedimentation, eutrophication, and other forms of water quality degradation. Restricted movement of host fish may also be a factor in the decline of this species. For populations of the little-wing that may occur on or near the DBNF, potential management influences include: sedimentation, altered flow, and blockage of host fish passage associated with roads and crossings. Forest-wide Standards and management direction associated with the Riparian Corridor Prescription Area will protect the little-wing and its habitat from potential negative impacts during management activities. Instream flow needs will be quantified and maintained to protect aquatic organisms when new water use authorizations are proposed.

Cumulative effects are those effects of future State, local, or private actions that are reasonably certain to occur within the action area of the DBNF. This programmatic BA addresses only those activities that are authorized by the Revised Forest Plan on lands that are under the jurisdiction of the U.S.D.A. Forest Service. Thus, any future State, local or private actions that could potentially occur on the DBNF would require a permit from the Forest Service and will require compliance with the consultation provisions of Section 7 of the ESA. There are no State, local or private actions reasonably certain to occur as a result of implementation of the Revised Forest Plan. Therefore, cumulative effects, as defined by the ESA, will not occur.

Determination of Effect

Forest-wide and Riparian Corridor Prescription Area management direction is designed to avoid or mitigate potential management actions that could negatively impact this species.

Therefore, the determination of effect for the little-wing pearl mussel is; “not likely to adversely affect.”

Tan Riffleshell

Environmental Baseline

The tan riffleshell is known from one location located just outside the DBNF proclamation boundary ("Cumberland River near Burnside, Pulaski County, KY") (USFWS 1984b), where it was reported by Ortmann in 1924. However, a recent record from the Big South Fork in Tennessee, within a few miles of the Kentucky border (J. Widlak, USFWS, personal communication), indicates that there could well be a population of the tan riffleshell surviving in that stream on NPS land within the DBNF proclamation boundary.

The tan riffleshell typically inhabits small to medium-sized rivers in riffles and shoal areas with moderate to swift current and a coarse sand and gravel substrate, where it is often associated with gravel bars that support colonies of water willow (USFWS 1984c)

(Parmalee and Bogan 1998). Known host fish for tan riffleshell glochidia that occur in DBNF streams include the greenside darter, fantail darter, and banded sculpin (Parmalee and Bogan 1998).

Potential Effects (Direct, Indirect and Cumulative)

This analysis is programmatic in that it deals only with Revised Forest Plan direction, as established within various Prescription Areas including; Desired Future Conditions, Goals, Objectives and associated Standards that provide limitations on management activities for the protection or enhancement of PETS species, their habitats and other resource needs. All actions authorized and proposed under the Revised Forest Plan are subject to second level, site-specific analysis and subsequent ESA Section 7 consultation with the USFWS through the BA/BE process.

The decline and extirpation of most populations of the tan riffleshell mussel may be attributed to dam construction and impoundments, habitat modification, sedimentation, eutrophication, and other forms of water quality degradation. Restricted movement of host fish may also be a factor in the decline of this species. For populations of the tan riffleshell that may occur on or near the DBNF, potential management influences include: sedimentation, altered flow, and blockage of host fish passage associated with roads and crossings. Forest-wide Standards and management direction associated with the Riparian Corridor Prescription Area will protect the tan riffleshell and its habitat from potential negative impacts during management activities. Instream flow needs will be quantified and maintained to protect aquatic organisms when new water use authorizations are proposed.

Cumulative effects are those effects of future State, local, or private actions that are reasonably certain to occur within the action area of the DBNF. This programmatic BA addresses only those activities that are authorized by the Revised Forest Plan on lands that are under the jurisdiction of the U.S.D.A. Forest Service. Thus, any future State, local or private actions that could potentially occur on the DBNF would require a permit from the Forest Service and will require compliance with the consultation provisions of Section 7 of the ESA. There are no State, local or private actions reasonably certain to occur as a result of implementation of the Revised Forest Plan. Therefore, cumulative effects, as defined by the ESA, will not occur.

Determination of Effect

Forest-wide and Riparian Corridor Prescription Area management direction is designed to avoid or mitigate potential management actions that could negatively impact this species.

Therefore, the determination of effect for the tan riffleshell mussel is; “not likely to adversely affect.”

Pink Mucket Pearlymussel

Environmental Baseline

Historically, The pink mucket pearlymussel occurred in the Mississippi, Ohio, Cumberland, and Tennessee Rivers. In Kentucky, the species once occurred in the Cumberland River below Cumberland Falls downstream to at least Mill Springs in Wayne County. Suitable Cumberland River habitat for this species on the DBNF was eliminated by the construction of Wolf Creek Dam. In 1997 a single specimen was identified near Moores Ferry in the Licking River approximately 20 miles downstream from the DBNF proclamation boundary. The pink mucket pearly mussel is not known to presently occur within the DBNF proclamation boundary.

The pink mucket pearly mussel inhabits medium to large rivers, living in moderate to fast-flowing water on substrates ranging from silt to sand, gravel or boulders (USFWS 1985). Known host fish for pink mucket pearly mussel glochidia include the sauger and freshwater drum (Parmalee and Bogan 1998).

Potential Effects (Direct, Indirect and Cumulative)

This analysis is programmatic in that it deals only with Revised Forest Plan direction, as established within various Prescription Areas including; Desired Future Conditions, Goals, Objectives and associated Standards that provide limitations on management activities for the protection or enhancement of PETS species, their habitats and other resource needs. All actions authorized and proposed under the Revised Forest Plan are subject to second level, site-specific analysis and subsequent ESA Section 7 consultation with the USFWS through the BA/BE process.

The decline and extirpation of most populations of the pink mucket pearlymussel may be attributed to dam construction and impoundments, habitat modification, sedimentation, eutrophication, and other forms of water quality degradation. Restricted movement of host fish may also be a factor in the decline of this species. For populations of the pink mucket that may occur on or near the DBNF, potential management influences include: sedimentation, altered flow, and blockage of host fish passage associated with roads and crossings. Forest-wide Standards and management direction associated with the Riparian Corridor Prescription Area will protect the pink mucket and its habitat from potential negative impacts during management activities. Instream flow needs will be quantified and maintained to protect aquatic organisms when new water use authorizations are proposed.

Cumulative effects are those effects of future State, local, or private actions that are reasonably certain to occur within the action area of the DBNF. This programmatic BA addresses only those activities that are authorized by the Revised Forest Plan on lands that are under the jurisdiction of the U.S.D.A. Forest Service. Thus, any future State, local or private actions that could potentially occur on the DBNF would require a permit from the Forest Service and will require compliance with the consultation provisions of

Section 7 of the ESA. There are no State, local or private actions reasonably certain to occur as a result of implementation of the Revised Forest Plan. Therefore, cumulative effects, as defined by the ESA, will not occur.

Determination of Effect

Forest-wide and Riparian Corridor Prescription Area management direction is designed to avoid or mitigate potential management actions that could negatively impact this species.

Therefore, the determination of effect for the pink mucket pearl mussel is; “not likely to adversely affect.”

Northern Riffleshell

Environmental Baseline

The northern riffleshell mussel is known historically from a single record (“Licking River at Moores Ferry, Bath/Rowan County line, 1/2 subfossil shell collected 7/12/83 by G. Fallo”) just outside the DBNF proclamation boundary near the Morehead RD. Smathers (1990) completed an extensive survey of the mussel community in the Licking River at Moores Ferry, about 20 miles downstream from the DBNF proclamation boundary. The northern riffleshell was not found in her study. This species has recently been found at several archaeological sites in rock shelters in the Red River Gorge on the Stanton RD indicating that a population of this species may have formerly inhabited the Red River in what is now the DBNF. However, the species is not known to presently occur within the DBNF proclamation boundary.

The northern riffleshell typically inhabits small to large rivers, living in riffles and runs with swift current and a firm substrate of coarse sand and/or gravel (USFWS 1993b, Parmalee and Bogan 1998). Known host fish for northern riffleshell glochidia that occur in DBNF streams include the bluebreast darter and banded darter (Parmalee and Bogan 1998).

Potential Effects (Direct, Indirect and Cumulative)

This analysis is programmatic in that it deals only with Revised Forest Plan direction, as established within various Prescription Areas including; Desired Future Conditions, Goals, Objectives and associated Standards that provide limitations on management activities for the protection or enhancement of PETS species, their habitats and other resource needs. All actions authorized and proposed under the Revised Forest Plan are subject to second level, site-specific analysis and subsequent ESA Section 7 consultation with the USFWS through the BA/BE process.

The decline and extirpation of most populations of the northern riffleshell mussel may be attributed to dam construction and impoundments, habitat modification, sedimentation, eutrophication, and other forms of water quality degradation. Restricted movement of

host fish may also be a factor in the decline of this species. For populations of the northern riffleshell that may occur on or near the DBNF, potential management influences include: sedimentation, altered flow, and blockage of host fish passage associated with roads and crossings. Forest-wide Standards and management direction associated with the Riparian Corridor Prescription Area will protect the northern riffleshell and its habitat from potential negative impacts during management activities. Instream flow needs will be quantified and maintained to protect aquatic organisms when new water use authorizations are proposed.

Cumulative effects are those effects of future State, local, or private actions that are reasonably certain to occur within the action area of the DBNF. This programmatic BA addresses only those activities that are authorized by the Revised Forest Plan on lands that are under the jurisdiction of the U.S.D.A. Forest Service. Thus, any future State, local or private actions that could potentially occur on the DBNF would require a permit from the Forest Service and will require compliance with the consultation provisions of Section 7 of the ESA. There are no State, local or private actions reasonably certain to occur as a result of implementation of the Revised Forest Plan. Therefore, cumulative effects, as defined by the ESA, will not occur.

Determination of Effect

Forest-wide and Riparian Corridor Prescription Area management direction is designed to avoid or mitigate potential management actions that could negatively impact this species.

Therefore, the determination of effect for the northern riffleshell mussel is; “not likely to adversely affect.”

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Blackside Dace

Environmental Baseline

Historically, the blackside dace likely inhabited many of the small, moderate gradient cool water streams in the upper Cumberland River system in Kentucky and Tennessee. The range of this species has decreased to approximately 35 stream stretches. The species is known from about 85 DBNF area locations in the Upper Cumberland River drainage, ranging from the Beaver Creek and Big Lick Branch watersheds in Pulaski County along the Cumberland River to below the mouth of the Rockcastle River eastward to the Clear Fork watershed at the edge of the DBNF proclamation boundary in Whitley County. There is also a recently discovered population of blackside dace in White Oak Creek, McCreary County (Rock Creek drainage) that is isolated from all other known occurrences for the species. All sites located within the DBNF proclamation boundary are on the London, Somerset, and Stearns RDs, most either in streams located on National Forest System lands or with National Forest located nearby.

The blackside dace inhabits small, cool-water upland streams with moderate flow and moderate gradient in the Upper Cumberland River system. The species is generally found in pools and runs, and is often associated with large rocks and undercut stream banks. Streams located in stable, well-vegetated watersheds with at least 70 percent forested canopy cover and with sufficient stream flow to remove silt from areas just downstream from riffles appear to offer the best habitat for blackside dace. The fish has not been found in silty low-gradient streams or in high-gradient mountain tributaries (USFWS 1988). The species could possibly occur in nearly any small, permanent stream in the Upper Cumberland River drainage (including those in at least the lower sections of the Rockcastle River and those which flow into Laurel River Lake), especially those located upriver from Beaver Creek and Big Lick Branch.

Potential Effects (Direct, Indirect and Cumulative)

This analysis is programmatic in that it deals only with Revised Forest Plan direction, as established within various Prescription Areas including; Desired Future Conditions, Goals, Objectives and associated Standards that provide limitations on management activities for the protection or enhancement of PETS species, their habitats and other resource needs. All actions authorized and proposed under the Revised Forest Plan are subject to second level, site-specific analysis and subsequent ESA Section 7 consultation with the USFWS through the BA/BE process.

The decline of this species is linked to siltation from coal mining and other ground disturbing activities, acid mine drainage, impoundments, habitat modification, and other forms of water quality degradation. For populations of the blackside dace that occur on or near the DBNF, potential management influences include: sedimentation, altered flow, and mineral development. The Surface Mining Control and Reclamation Act of 1977 prohibits the surface (strip) mining of coal on the DBNF. Forest-wide Standards and management direction associated with the Riparian Corridor Prescription Area will protect the blackside dace and its habitat from potential negative impacts during management activities. Instream flow needs will be quantified and maintained to protect aquatic organisms when new water use authorizations are proposed. Restoration activities could occur as additional areas of suitable habitat are identified.

Cumulative effects are those effects of future State, local, or private actions that are reasonably certain to occur within the action area of the DBNF. This programmatic BA addresses only those activities that are authorized by the Revised Forest Plan on lands that are under the jurisdiction of the U.S.D.A. Forest Service. Thus, any future State, local or private actions that could potentially occur on the DBNF would require a permit from the Forest Service and will require compliance with the consultation provisions of Section 7 of the ESA. There are no State, local or private actions reasonably certain to occur as a result of implementation of the Revised Forest Plan. Therefore, cumulative effects, as defined by the ESA, will not occur.

Determination of Effect

Forest-wide and Riparian Corridor Prescription Area management direction is designed to avoid or mitigate potential management actions that could negatively impact this species. Long-term management direction should improve habitat conditions associated with this species.

Therefore, the determination of effect for the blackside dace is; “not likely to adversely affect.”

Duskytail Darter

Environmental Baseline

The species is endemic to the upper Tennessee and Cumberland River systems. The species is known from about six locations in Kentucky, all in the area of the DBNF, but all located within NPS holdings in the Big South Fork Cumberland River. The Big South Fork population, which extends from the mouth of Bear Creek (Barthell Quadrangle) southward into Tennessee, is one of only four that remain for the species rangewide. It is unlikely that the duskytail darter occurs in any streams located on the DBNF, but the species is difficult to find by conventional survey methods (seining, electroshocking) and there remains the possibility that it could eventually be discovered in a large, good quality stream like the Rockcastle River.

The duskytail darter occurs in large streams and rivers, and appears limited to pool and run habitats with relatively slow to moderate current and with rocky substrates that contain a mix of pea gravel, cobble, slabrock, and boulders. The species lives beneath and among rocks and is absent from heavily silted areas where the silt has filled spaces between the rocks (USFWS 1993c)

Potential Effects (Direct, Indirect and Cumulative)

This analysis is programmatic in that it deals only with Revised Forest Plan direction, as established within various Prescription Areas including; Desired Future Conditions, Goals, Objectives and associated Standards that provide limitations on management activities for the protection or enhancement of PETS species, their habitats and other resource needs. All actions authorized and proposed under the Revised Forest Plan are subject to second level, site-specific analysis and subsequent ESA Section 7 consultation with the USFWS through the BA/BE process.

The decline and extirpation of most populations of the duskytail darter is linked to siltation from coal mining and other ground disturbing activities, acid mine drainage, impoundments, habitat modification, and other forms of water quality degradation. Relict populations are isolated by reservoirs. For populations of the duskytail darter that may occur on or near the DBNF, potential management influences include: sedimentation, altered flow, and mineral development. The Surface Mining Control and Reclamation

Act of 1977 prohibits the surface (strip) mining of coal on the DBNF. Forest-wide Standards and management direction associated with the Riparian Corridor Prescription Area will protect the duskytail darter and its habitat from potential negative impacts during management activities. Instream flow needs will be quantified and maintained to protect aquatic organisms when new water use authorizations are proposed.

Cumulative effects are those effects of future State, local, or private actions that are reasonably certain to occur within the action area of the DBNF. This programmatic BA addresses only those activities that are authorized by the Revised Forest Plan on lands that are under the jurisdiction of the U.S.D.A. Forest Service. Thus, any future State, local or private actions that could potentially occur on the DBNF would require a permit from the Forest Service and will require compliance with the consultation provisions of Section 7 of the ESA. There are no State, local or private actions reasonably certain to occur as a result of implementation of the Revised Forest Plan. Therefore, cumulative effects, as defined by the ESA, will not occur.

Determination of Effect

Forest-wide and Riparian Corridor Prescription Area management direction is designed to avoid or mitigate potential management actions that could negatively impact this species. Long-term management direction should improve habitat conditions associated with this species.

Therefore, the determination of effect for the duskytail darter is; “not likely to adversely affect.”

Palezone Shiner

Environmental Baseline

The palezone shiner is known from about 20-30 sites in Little South Fork Cumberland River along the western edge of the DBNF proclamation boundary. These locations constitute the only recent Kentucky records for this species, and private lands border all of the sites. Although the documented collection sites cover a total of about 31 miles of stream in the Little South Fork, the only large concentrations of the species that have been found are located in a 6-mile stretch that extends from Freedom Church Ford upstream to the mouth of Corder Creek. The palezone shiner was historically known from only four populations two of which have been extirpated due to reservoir construction and surface mining for coal. The species now occurs only in the Paint Rock River in Alabama and the Little South Fork in Kentucky.

Habitat for the species includes flowing pools and runs in streams with clean, clear water and a substrate of bedrock, cobble, pebble, gravel, and clean sand (USFWS 1997; Henry et al. 1999). A detailed study of the habitat requirements and life history of the palezone shiner in the Little South Fork has recently been completed (Henry et al., 1999).

Potential Effects (Direct, Indirect and Cumulative)

This analysis is programmatic in that it deals only with Revised Forest Plan direction, as established within various Prescription Areas including; Desired Future Conditions, Goals, Objectives and associated Standards that provide limitations on management activities for the protection or enhancement of PETS species, their habitats and other resource needs. All actions authorized and proposed under the Revised Forest Plan are subject to second level, site-specific analysis and subsequent ESA Section 7 consultation with the USFWS through the BA/BE process.

The decline and extirpation of most populations of the palezone shiner is linked to siltation from coal mining and other ground disturbing activities, acid mine drainage, impoundments, habitat modification, eutrophication and other forms of water quality degradation. Since most of the Little South Fork watershed is privately owned, and about half of the watershed is outside the DBNF proclamation boundary, the Forest can play only a very limited role in managing habitat for this species. For populations of the palezone shiner that may occur on or near the DBNF, potential management influences include: sedimentation, altered flow, and mineral development. The Surface Mining Control and Reclamation Act of 1977 prohibits the surface (strip) mining of coal on the DBNF. Forest-wide Standards and management direction associated with the Riparian Corridor Prescription Area will protect the palezone shiner and its habitat from potential negative impacts during management activities. Instream flow needs will be quantified and maintained to protect aquatic organisms when new water use authorizations are proposed.

Cumulative effects are those effects of future State, local, or private actions that are reasonably certain to occur within the action area of the DBNF. This programmatic BA addresses only those activities that are authorized by the Revised Forest Plan on lands that are under the jurisdiction of the U.S.D.A. Forest Service. Thus, any future State, local or private actions that could potentially occur on the DBNF would require a permit from the Forest Service and will require compliance with the consultation provisions of Section 7 of the ESA. There are no State, local or private actions reasonably certain to occur as a result of implementation of the Revised Forest Plan. Therefore, cumulative effects, as defined by the ESA, will not occur.

Determination of Effect

Forest-wide and Riparian Corridor Prescription Area management direction is designed to avoid or mitigate potential management actions that could negatively impact this species. Long-term management direction should improve habitat conditions associated with this species.

Therefore, the determination of effect for the palezone shiner is; “not likely to adversely affect.”

Table 3. Effects determination summary for T&E species on the DBNF.

Group	Species	Determination of Effect
Mammal	Gray Bat	not likely to adversely affect
	Indiana Bat	likely to adversely affect
	Virginia Big-eared Bat	not likely to adversely affect
Bird	Bald Eagle	not likely to adversely affect
	Red-cockaded Woodpecker	no effect
Fish	Duskytail Darter	not likely to adversely affect
	Palezone Shiner	not likely to adversely affect
	Blackside Dace	not likely to adversely affect
Mussel	Cumberland Elktoe	not likely to adversely affect
	Fanshell	not likely to adversely affect
	Dromedary Pearlymussel	no effect
	Cumberlandian Combshell	not likely to adversely affect
	Oyster Mussel	not likely to adversely affect
	Yellow Blossom	no effect
	Tan Riffleshell	not likely to adversely affect
	Catspaw	no effect
	Northern Riffleshell	not likely to adversely affect
	Tubercled Blossom	no effect
	Cracking Pearlymussel	no effect
	Pink Mucket	not likely to adversely affect
	Ring Pink	no effect
	Little-wing Pearlymussel	not likely to adversely affect
	Clubshell	no effect
Rough Pigtoe	no effect	
Cumberland Bean Pearlymussel	not likely to adversely affect	
Plant	Cumberland Sandwort	not likely to adversely affect
	Cumberland Rosemary	not likely to adversely affect
	Eggert's Sunflower	not likely to adversely affect
	American Chaffseed	not likely to adversely affect
	White-haired Goldenrod	not likely to adversely affect
	Virginia Spiraea	not likely to adversely affect
	Running Buffalo Clover	not likely to adversely affect

Signature of Preparer

I prepared this Biological Assessment and made the effects determinations.

/s/ James W. Bennett _____ Date: November 6, 2003

James W. Bennett
Forest Threatened and Endangered Species Biologist

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