#28

BIOLOGICAL OPINION
FOR PROPOSED SALVAGE HARVEST
NECESSITATED BY
1998 STORM DAMAGE
ON THE DANIEL BOONE NATIONAL FOREST,
KENTUCKY

Prepared by:

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Sincerely,

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INTRODUCTION

The U.S. Fish and Wildlife Service (Service) has reviewed the biological evaluation for the proposed salvage harvest of timber necessitated by severe damage caused by storms in 1998 on the Daniel Boone National Forest (DBNF) in Kentucky. Your February 4, 2000, request for formal consultation was received on February 8, 2000. This document represents the Service's biological opinion on the effects of that action on the federally endangered Indiana bat (*Myotis sodalis*) in accordance with Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.).

0 Consultation history

The Forest Service initiated formal consultation for the proposed storm damage salvage on behalf of the Daniel Boone National Forest by letter of February 4, 2000. A subsequent request for formal consultation was received by the Forest Service on February 29, 2000, regarding revision of and amendment to the Daniel Boone National Forest's Land and Resource Management Plan. As a result, the Service requested a time extension for completion of the salvage harvest consultation by letter of March 24, 2000. An extension until July 30, 2000, was granted by letter of April 10, 2000.

This biological opinion is based on information provided in the October 25, 1999, biological

assessment; field investigations in April and May 1998 attended by Lee Barclay (Supervisor) and Jim Widlak of the Cookeville Office; and Linda Perry, John MacGregor, and Mike Melton of the DBNF to inspect damaged areas and to discuss proposed salvage activities; a June 2, 2000, telephone discussion between Jim Widlak and Jim Bennett of the DBNF; and other sources of information. A complete administrative record of this consultation is on file in the Ecological Services Field Office, 446 Neal Street, Cookeville, Tennessee; telephone, 931/528-6481; fax 931/528-7075.

BIOLOGICAL OPINION

0 Project Description

The proposed action is the salvage, by timber harvest, of trees on the Daniel Boone National Forest that were damaged by storms. On February 3, 1998, a heavy snow storm passed through southern Kentucky. Approximately two feet of heavy, wet snow fell, causing significant damage across the Stearns and Somerset Districts on the southern half of the DBNF. On April 16, 1998, a tornado, accompanied by strong straight-line winds, hit the Stearns District. A severe wind storm hit the Stearns and Somerset Districts on May 31, 1998, resulting in further damage on the southern end of the DBNF.

The snow storm damaged forest stands composed primarily of Virginia pine located on ridge tops. Damage to these pines mainly consisted of trees with snapped stems, uprooted trees, and severely bent trees. Other tree species such as shortleaf pine and hardwoods were mostly uprooted or suffered crown damage. A significant portion of the 191,000 acres on the Stearns and Somerset Districts was affected by this storm.

Approximately 3,000 acres of hardwood and hardwood/pine forest were affected by the tornado and wind storm. Damage to large-diameter trees from these storms consisted mostly of uprooting. Other trees were twisted, snapped, bent, or suffered root damage from being lifted by the winds. The extent of damage from these storms was significant; all or most trees were leveled on entire hillsides by these two storms.

The effects of these natural events on the forest landscape on the Stearns and Somerset Districts resulted in development of a range of alternatives for treatment of the most heavily damaged areas to meet forest plan objectives for the resources in those areas, which are identified as multiple-use management of the wildlife, water, air, recreational, and timber resources. The purpose of the proposed action is to allow for timely treatment of storm-damaged areas to meet the following objectives:

1. Reduce current fuel loads and modify their arrangement where they present a wildfire hazard to the life and property on adjacent private lands.

2. Reduce current fuel loads and modify their arrangement to minimize damage to Forest resources that may result from a catastrophic wildfire.

3. Restore the ability to manage damaged areas towards the objectives outlined in the Daniel Boone National Forest Land and Resource Management Plan for Management Areas 7, 9, and 11.

4. Provide for the safety of forest users and employees within the damaged areas.

The action areas are located on the DBNF on the Stearns and Somerset Ranger Districts in McCreary and Pulaski Counties, Kentucky. A "no action" alternative and five action alternatives were considered, but this biological opinion will address only Alternative D, which was identified as the preferred alternative.

Alternative D consists of removal or modification of damaged trees and slash using commercial timber sales, hand tools or mechanized equipment to get fuels closer to the ground and to break up concentrated piles of fuels (lop and scatter), and/or low-intensity prescribed burning. Commercial salvage operations may not be feasible in areas dominated by pine species because damaged pines deteriorate more rapidly than hardwoods and consequently lose commercial value faster. Those areas will likely be treated with prescribed burning. Stands containing tree species which retain commercial value longer will be treated by commercial timber sale. Combinations of one or more of the above-listed treatments may be used in some areas. The condition of each

area at the time of implementation will determine the treatment method(s) which will be used.

A total of 122 areas will be treated by one or more of the methods described above. Commercial timber harvest will be used on 1,832 acres; 1,645 acres will undergo prescribed burning; lop and scatter will be used to treat 407 acres; and 1.2 acres will be used to construct fire breaks. Forty areas have been identified as being critical to treat for the protection of resources or private property. Twelve are located within the Rock Creek Corridor; ten of these areas will be treated by commercial timber harvest and two will be used for construction of fire breaks using equipment and hand tools to construct a 15-foot wide break. Three additional critical areas are located within the Marsh Creek Corridor which will be treated by prescribed burn. The remaining 25 critical areas will be treated with commercial salvage harvest and/or lop and scatter and/or prescribed burning as determined to be appropriate.

The DBNF has developed the following general mitigation requirements and management standards that will be applied to all treatment areas:

A. Standing damaged trees which pose a threat to human safety may be removed if they occur along access routes, prescribed burn control lines, or trails within the proposed areas. Hazard trees which are identified in condition classes 1 to 6 for retention and are not located along access routes, prescribed burn control lines, or trails will be designated by the timber sale administrator prior to removal.

B. If any cultural resource sites are found during implementation, all implementation activities within that unit will be stopped, and the zone archaeologist will be notified immediately.

C. Road ruts located on level ground should be left if the rut can be retained without affecting other resources.

D. Standards and guidelines contained in Chapter IV of the DBNF Forest Plan will be followed.

E. Management requirements and mitigation measures contained in the Record of Decision for the Final Environmental Impact Statement for Vegetation Management in the Appalachian Mountains (Exhibit A) will be followed.

F. Trees identified for treatment will either be removed during commercial salvage harvesting or will be treated according to the alternative-specific methods for non-commercial activities. Tree removal guidelines and condition classes are as follows:

1. In areas that are dominated by pine pole timber (5 to 9 inches in diameter at breast height [dbh]) and are in an understocked (<40 basal area of undamaged trees) condition, all damaged trees will be treated to facilitate

future regeneration of shade-intolerant shortleaf pines to maintain shortleaf pine ecosystem characteristics (**Condition Class 1**).

2. In areas that are dominated by pine pole timber and are adequately stocked (>40 basal area of undamaged trees), downed or uprooted trees and trees that have greater than 50 percent of the live crown broken or severed will be treated. Standing damaged hardwoods that are not uprooted and all standing damaged pines that are greater than 9 inches dbh will be retained (**Condition Class 2**).

3. In areas that are dominated by pine saw timber (dbh of 10 inches or larger) and are in an understocked condition (<40 basal area of undamaged trees), all downed and uprooted trees may be treated. Trees with more than 50 percent of the live crown that has been broken or severed will be removed only if needed to facilitate future regeneration and maintenance of shortleaf pine ecosystem characteristics. An average of six standing damaged trees larger than 9 inches dbh will be retained per acre. Retention priorities for those trees are: (1) standing damaged hardwoods with more than 50 percent of the live crown broken or severed, and (2) standing shortleaf pine that has more than 50 percent of the live crown broken or severed (**Condition Class 3**).

4. In areas that are dominated by pine saw timber and are adequately stocked (>40 basal area of undamaged trees), all downed and uprooted trees will be treated. All standing damaged trees larger than 9 inches dbh will be retained (**Condition Class 4**).

5. In areas that are dominated by hardwood saw timber (dbh of 12 inches or larger) and are in an understocked (<40 basal area of undamaged treed) condition, all downed trees and uprooted trees will be treated and all standing damaged trees larger than 9 inches dbh will be retained. Standing damaged trees smaller than 9 inches dbh and which have more than 50 percent of the live crown broken or severed may be treated (**Condition Class 5**).

6. In areas that are dominated by hardwood saw timber and are in an adequately stocked (>40 basal area of undamaged trees) condition, all downed trees and uprooted trees will be treated and all standing damaged trees larger than 9 inches dbh will be retained. Standing damaged trees smaller than 9 inches dbh and which have more than 50 percent of the live crown broken or severed may be treated (**Condition Class 6**).

G. Within cliffline treatment zones, no new mechanical fireline construction, temporary road construction, landing deck construction, or repeated skid trail use

(i.e., >5 passes) will be allowed within 100 feet above or 200 feet below a cliffline (any necessary exceptions to this must be reviewed and approved by a biologist and the contract administrator).

H. Within riparian treatment zones (RTZ's), damaged trees that are completely within the RTZ will not be removed. Downed material that is partially within the RTZ may be removed as long as no part of the material is within the wet channel of the stream. If the RTZ is less than 66 feet (horizontal distance), downed and uprooted trees leaning away from the stream may be treated or removed between the RTZ and the 66-foot point unless the material is within the stream channel or is contributing to stream bank stability. Downed trees which are blocking culverts or drainage structures on existing roads may also be treated or removed.

Motorized equipment will not be allowed within the RTZ's except at designated crossings. All crossings of perennial streams will be surveyed by a biologist and agreed upon by the biologist and the contract inspector prior to use. No motorized equipment will be allowed within 66 feet of the stream bank, except at designated crossings or on existing roadways, regardless of the RTZ width. Stream crossings will be made at right angles to the stream and at pre-determined locations only.

If a portion of an intermittent stream is within the RTZ, the above-listed RTZ perennial stream guidelines will apply to that portion. If the intermittent stream is

outside the RTZ, the following general guidelines will be applied: (1) no motorized equipment will be allowed within 33 feet (horizontal distance) of the stream bank, except at designated crossings; (2) only downed or uprooted damaged trees will be treated or removed from within 33 feet of the stream bank; (3) any downed material that appears to be stabilizing the stream bank will not be treated or removed; and (4) crossings will be at pre-determined locations only and will cross the stream channel at right angles.

I. Wherever seeding is called for, a seed mixture will be chosen from the following list:

Fescue (endophyte free)	Annual (cereal) rye
Orchard grass	Switchgrass
Timothy	Big bluestem
Dutch white clover	Little bluestem
Winter wheat	Indian grass

The measures listed above, and those included within the management standards for Alternative D, are specific measures considered to be most important for that alternative. However, they are not meant to be all-inclusive; standards and guidelines contained in Chapter IV of the DBNF's Forest Plan and Chapter II of the Vegetation Management environmental impact statement will also be followed during implementation. Soil and water requirements were developed based on

site-specific needs and are considered to be in compliance with the DBNF Forest Plan and Kentucky's Best Management Practices.

Special areas are defined as follows:

Cliffline Treatment Zones

Clifflines are defined as naturally occurring, exposed vertical rock structures that are 10 feet or more in height and a minimum of 100 feet in length. Clifflines may be composed of sandstone or limestone parent material, and may have accumulations of boulders at the base. Clifflines typically contain fissures and openings of various sizes that have been created from rock sloughing, erosion, or other geological forces. A cliffline is considered to be continuous if segments of such are separated by no more than 300 feet.

Riparian Treatment Zones

Perennial Streams

Perennial streams are defined as any watercourses that contain fish or aquatic insects with larvae having multi-year life cycles, and which flow in a well-defined channel that always is below the water table. Perennial streams may have sub-surface flow, and are located entirely within the RTZ. The RTZ is defined as the 100-year floodplain to a point where soil types and vegetation

indicate historic high water level.

Intermittent Streams

Intermittent streams are defined as watercourses that flow in response to seasonally fluctuating water tables in a well-defined channel. Intermittent streams do not provide habitat for fish year-round. Typically, aquatic insects with larvae having multi-year life cycles are not present, although some exceptions may occur. Intermittent streams may or may not be within the RTZ, but the lower sections in the vicinity of the stream mouth will be within the RTZ.

To protect fish and wildlife resources, including federally listed species, during implementation of salvage activities, the DBNF has developed the following management standards that will be implemented in addition to the general mitigation requirements and management standards:

1. If the proper treatment is determined to be prescribed burning alone, standing damaged trees would not be felled. Trees will only be felled if necessary for fireline construction or safety.

2. Existing natural and man-made firebreaks will be utilized for prescribed burning activities where possible. Any fireline constructed mechanically will avoid removal of snags larger than 9 inches dbh if possible.

3. In cliffline treatment zones to be treated by commercial removal or mechanical methods, only downed or uprooted trees will be removed or treated within 75 feet above or below clifflines. All standing damaged trees within 75 feet above or below the cliffline will remain. Treatment areas that fall within condition class 3 and are within one mile of a Rafinesque's big-eared bat colony site will have the retention zone of standing damaged trees expanded to 100 feet above and 200 feet below the cliffline face.

4. In cliffline treatment zones to be treated by non-mechanical methods, no treatment of standing damaged trees within 75 feet above or below the cliffline will occur. Treatment areas that fall within condition class 3 and are within one mile of a Rafinesque's big-eared bat colony site will not be treated or have standing damaged trees removed from within 100 feet above and 200 feet below the cliffline face.

5. In RTZ's to be treated by commercial removal, crossings of perennial streams will be made at pre-determined locations only, and at right angles to the stream channels. Temporary bridges, concrete planks, or bedrock stream crossings will be used with gravel and/or vegetation establishment for soil stabilization at entry and exit points.

6. In RTZ's to be treated by non-commercial mechanical methods, equipment

crossings of perennial streams will be made at pre-determined locations only, and will be considered for use only during the operational period for each specific unit. No temporary road access will be constructed.

7. In RTZ's to be treated by non-commercial mechanical methods, perennial streams may be used as natural fire control lines where feasible. No new fireline construction will occur within the RTZ using mechanical equipment (e.g., bulldozers) except where a pre-existing, mechanically constructed fireline occurs.

8. In RTZ's to be treated by non-commercial mechanical methods, intermittent streams may be used as natural fire control lines where feasible. No new fireline construction will occur within the RTZ using mechanical equipment except where pre-existing, mechanically constructed firelines occur.

9. In RTZ's to be treated by non-mechanical methods, no treatment will occur within RTZ's containing perennial streams. Downed material that is partially within the RTZ may be treated as long as no part of the material is within the wet channel of the stream.

10. In RTZ's to be treated by non-mechanical methods, only downed or uprooted damaged trees will be treated within 33 feet (horizontal distance) of the banks of intermittent streams. Any downed material that appears to be stabilizing the

streambank will be retained.

11. All temporary roads, landings, tractor skid roads, and log storage areas will be ripped or scarified, as needed, to ameliorate compaction, and will be waterbarred, seeded, and fertilized after their use is completed so as to establish a minimum of 70 percent vegetative cover within two growing seasons for erosion control and restoration of hydrologic functions and productivity.

12. Logging and mechanical scattering of fuel concentrations will be suspended during periods of high soil moisture content to protect soil productivity and reduce potential for erosion and stream sedimentation.

13. Skid road and temporary road locations will be marked and approved by the Forest Service prior to construction. This will control and help the Forest Service monitor the amount of ground disturbance and soil compaction associated with timber harvest activities.

14. To minimize the width and number of skid roads and the area of soil exposed, landing placement and the skid trail system will be planned at the same time.

15. Skid roads and other ground-disturbing activities will not constitute more than 10 percent of the harvested areas.

16. Skid roads will be located with grades of 15 percent or less. Skid roads with steeper grades will be allowed for short distances (>200 feet). Cable systems will be used on steeper slopes or where slope stability and sensitive soils are of concern.

17. Blade construction of skid roads will be avoided where possible. Where blading is necessary, the width and depth of blading will be minimized to remove obstructions and provide safe access for ground-based equipment within the harvest units.

18. Winching will be used and the distances between secondary skid trails and primary skid roads will be maximized to accommodate best practicable line pull distances given existing ground conditions, percent slope and obstructions, bull-line size and length, and tractor capabilities to balance efficiency of log removal and resource protection.

19. In treatment areas having been previously tractor-logged, existing skid roads/trails will be used wherever possible. Designated skidding systems will be located to effectively serve all future harvest entries. If this is not possible, new roads and trails will be located and existing roads rehabilitated so that, over time and operating under a policy of using planned, designated skidding systems in combination with restorative tillage of compacted areas, the impact of compaction

on forest productivity will be reduced to favor plant growth.

20. When use of temporary roads is completed and future use is not planned, these roads will be obliterated as per guidelines in "Road Closure and Obliteration in the Forest Service" manual. If these roads are to be used in the short-term in support of other objectives, they will be waterbarred and closed by gate or tank trap; surface drainage will be improved and the roads will be revegetated.

21. At stream crossings and approaches, appropriate drainage facilities will be constructed and any other measures will be implemented that contribute toward control of erosion and stream sedimentation during dry weather and time periods not critical for the aquatic ecosystem where risks of resource damage are high (e.g., in streams containing federally listed species or sensitive species).

22. If treated commercially, all trails within units 84D, 84G, 94A, 94I, 94R, and 94Z will have all material created by logging operations removed. Additionally, all material created by logging operations will be lopped and scattered within 2 feet of the ground and for 25 feet on both sides of the trail.

23. Trails in the above-listed units may be used as skid trails or roads if they are old woods roads, or system roads. Exceptions to this will be considered on a case-by-case basis.

24. Trail tread will be returned to pre-logging condition or better on all trails in the above-listed units that are used or crossed during logging operations.

25. For safety reasons, trees identified for retention in condition classes 1 through 6 will not be retained if they are located within a distance less than or equal to one and one-half tree heights from a trail in the above-listed units.

26. In areas treated non-commercially in units 30, 32, 37A, 38, 47, 80, 84B, 94H, 525B, and 525C, all material created by lop and scatter operations will be removed from all trails.

27. All trails in the above-listed units will be lopped and scattered within 2 feet of the ground and for 25 feet on both sides of the trails.

28. For safety reasons, in unit 94H, trees identified for retention in condition classes 1 through 6 will not be retained if they are located within a distance less than or equal to one and one-half tree heights from a trail.

29. In units 84A, 84B, 84D, 84F, 84I, 84K, 84L, 84M, 84O, 85A, 86A, 86C, 86G, 87, 88, and 100 within the Rock Creek River Corridor, all skid trails or roads constructed or re-opened as part of commercial or non-commercial operations will be immediately blocked and reclaimed in a manner to prevent use by off-highway

vehicles. Methods will include, but not be limited to tank traps, pull roots, placement of tops and rocks back onto skid trails and roads.

30. If concrete planks are used and retained in the three improved stream crossings in Rock Creek, they will be set in a manner that will allow natural stream rock to cover over them in time.

31. In units 49, 50A, 50B, and 55A within the Marsh Creek River Corridor, all skid trails or roads constructed or re-opened as part of commercial or non-commercial operations will be immediately blocked and reclaimed in a manner to prevent use by off-highway vehicles.

32. Prescribed burning plans will be prepared for all proposed burning activities. Plans will include information such as burning objectives, firing and containment methods, personnel requirements, burning parameters, burning organization, risk assessment, smoke management guidelines, maps, and necessary contacts.

33. Fuels will be removed around resources that should not receive fire damage prior to initiating prescribed burns.

0 Background Information

◆ Indiana bat

The Indiana bat, *Myotis sodalis*, is a medium-sized bat, growing to lengths of 41 to 49 millimeters, and having forearm lengths of 35 to 41 millimeters (USFWS 1983). It is similar to the little brown bat in appearance, but differs in several morphological characters. The Indiana bat is a monotypic species that is known to occur in much of the eastern half of the United States. Large hibernating populations are known to exist in Indiana, Kentucky, and Missouri; smaller populations and individual records are also known from Alabama, Arkansas, Connecticut, Florida, Georgia, Illinois, Iowa, Maryland, Massachusetts, Michigan, Mississippi, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Tennessee, Vermont, Virginia, West Virginia, and Wisconsin (USFWS 1983).

The DBNF is known to support winter and summer colonies of Indiana bats. Historical and current records of Indiana bats are known from caves on the Morehead, Stanton, and Somerset Ranger Districts. In addition, DBNF biologists recently captured reproductive females during mist net surveys on the Morehead, Somerset, London, and Redbird Districts. Male Indiana bats have also been collected during the summer season on the Morehead, Stanton, London, Somerset, and Redbird Districts. Although the actual maternity colony sites were not located, these captures indicate that maternity colonies exist on those four districts and possibly on other districts on the DBNF.

Based on the known and suspected range of the Indiana bat (USFWS 1983), the Indiana bat ranges over an area of approximately 580,550 square miles in the eastern one-half of the United States. The DBNF's surface land area is approximately 1,050 square miles, which represents less than two-tenths of one percent (0.18 percent) of the total range of the species.

The Indiana bat was listed as an endangered species on March 11, 1967 (USFWS 1998). Bat Cave in Carter County, Kentucky; Coach Cave in Edmonson County, Kentucky; White Oak Blowhole Cave in Blount County, Tennessee; the Blackball Mine in LaSalle County, Illinois; Big Wyandotte Cave, Crawford County, Indiana; Ray's Cave, Greene County, Indiana; Cave 021, Crawford County, Missouri; Cave 009, Franklin County, Missouri; Pilot Knob Mine, Iron County, Missouri; Bat Cave, Shannon County, Missouri; Cave 029, Washington County, Missouri; and Hellhole Cave, Pendleton County, West Virginia, have been designated as critical habitat for the Indiana bat.

Bat Cave in Carter County, Kentucky, is approximately 10 miles east of the DBNF and Coach Cave in Edmonson County, Kentucky, is approximately 75 miles west of the DBNF. In addition, there are a number of other caves in Kentucky that are known to support hibernating colonies of Indiana bats; and since the 1980's, there have also been documented records of maternity colonies in various parts of the State, ranging from extreme western Kentucky (Carlisle and Hickman Counties) to eastern Kentucky (Bath, Harlan, and Pulaski Counties). On the DBNF, there are substantial acreages of suitable habitat that could potentially be used by females during the maternity season, and there are recently documented records for summer colonies on the

DBNF. Recent mist netting surveys have documented the presence of pregnant, lactating, and post-lactating females and newly volant young Indiana bats on the DBNF. Although actual maternity roosts have not been located to date, it is a certainty that maternity colonies of Indiana bats exist on the DBNF.

Indiana, Kentucky, and Missouri are currently known to contain the largest hibernating populations of Indiana bats. Although Indiana's populations are reported to be stable or increasing, numbers have continued to decline in Missouri and in many parts of Kentucky (USFWS 1983). In 1985, the winter population on the DBNF was estimated to be approximately 8,950. Biennial winter counts since then indicated that the Indiana bat population increased to 10,718 in 1987; 10,993 in 1989; 12,306 in 1991; 14,512 in 1993; and was at its highest in 1995 at 15,154. Since 1995, however, the biennial counts dropped to 14,045 in 1997 and to 11,150 in 1999 (U.S. Forest Service, unpublished). Causes of decline of Indiana bat populations are not presently known and have continued despite intensive efforts to protect the major known hibernacula (i.e., gating, fencing, etc.).

Indiana bats hibernate in caves and mines that provide specific climatic conditions; preferred hibernacula have stable winter temperatures below 10 degrees Celsius (optimal temperature is 4 to 8 degrees Celsius) and relative humidity above 74 percent. Few caves or mine shafts provide these conditions; therefore, approximately 85 percent of the species hibernates in only seven caves or abandoned mine shafts (USFWS 1983). Prior to hibernation, Indiana bats undergo swarming, an activity in which the bats congregate around the hibernacula, flying into and out of

the cave, but roosting in trees outside. Swarming continues for several weeks, during which time the bats replenish fat reserves prior to hibernation (USFWS 1983). Depending upon local weather conditions, swarming may continue through October, or longer. Males generally remain active longer than the females during this pre-hibernation period, but all Indiana bats are usually hibernating by late November (USFWS 1983). Indiana bats typically hibernate in dense clusters, with bat densities ranging in size from 300 to approximately 500 individuals per square foot (Clawson et al. 1980).

During the summer, Indiana bats utilize two types of habitat. Females emerge from hibernation first, generally in late March or early April, followed by the males. Although most hibernating colonies leave the hibernacula by late April, some males may spend the summer in the vicinity of the hibernaculum. Those leaving the hibernaculum migrate varying distances to their summer habitats. Some males may roost in caves during the summer, and recent data indicates that loose bark or cavities in trees also provide suitable roosting habitat for males.

In addition to replenishing fat reserves prior to hibernation, mating occurs during the swarming season after which the females enter directly into hibernation. Females become pregnant soon after emergence from the hibernacula and form small maternity colonies under loose bark or in cavities of snags or mature live trees in riparian or upland forest. Each female gives birth to a single young in late June or early July and the young become volant (i.e., are able to fly) in approximately one month. By late August, the maternity colonies begin to disperse.

Indiana bat maternity sites generally consist of one to several primary maternity roost trees (i.e., trees used repeatedly by relatively high numbers of bats in the maternity colony during the maternity season) and varying numbers of alternate roost trees (i.e., those trees used by smaller numbers of bats through the course of the maternity season). Primary roost trees that have been studied to date have ranged in size from 12.2 to 29.9 inches in diameter at breast height (dbh) (Romme et al. 1995). Studies have shown that adults in maternity colonies may use as few as two, to as many as 33, alternate roosts (Humphrey et al. 1977; Gardner et al. 1991; Callahan 1993; Callahan et al. 1997; Romme et al. 1995). Alternate roost trees also tend to be large, mature trees, but the range in size is somewhat wider than that for primary roosts (7.1 to 32.7 inches dbh [Romme et al. 1995]). In Missouri, maximum distances between roost trees used by bats from the same maternity colony have ranged from 1.0 to 1.9 miles (Callahan 1993; Callahan et al. 1997). Snags (i.e., dead trees) exposed to direct solar radiation were found to be used most frequently by Indiana bats as summer roosts, followed by snags not fully exposed to solar radiation and live trees not fully exposed (Callahan 1993; Callahan et al. 1997).

Until recently, most documented Indiana bat maternity colonies were located in riparian or floodplain forest (Humphrey et al. 1977). Recent studies and survey results, however, indicate that upland forest provides important maternity habitat for Indiana bats (Gardner et al. 1990; Romme et al. 1995). In addition, females are known to exhibit relatively strong loyalty to summer roosting and foraging habitat (Bowles 1981; Gardner et al. 1991, 1991a). It was also found that Indiana bats occupy distinct home ranges during the summer (Gardner et al. 1990). Average home range sizes vary from approximately 70 acres (juvenile males) to more than 525

acres (post-lactating adult females). Roosts occupied by individuals ranged from 0.33 mile to over 1.6 miles from preferred foraging habitat, but are generally within 1.2 miles of water (e.g., stream, lake, pond, natural or manmade water-filled depression).

A habitat suitability index model was recently developed for the Indiana bat (Romme et al. 1995) which identifies nine variables that comprise the components of summer habitat for the species. The model was developed for use in southern Indiana, but may also be applicable in other areas within the species' range. Five variables considered important for roosting habitat within analysis areas include the amount of overstory canopy, diameter of overstory trees, density of potential live roost trees, density of snags, and the amount of understory cover. Variables considered to be important foraging habitat components include the amount of overstory canopy and the percentage of trees in the 2.0 to 4.7 inch dbh class. Distance to water and percentage of the analysis area with forest cover are also considered to be important habitat variables. The habitat model classifies species of trees that may provide roosts for Indiana bats. Class I trees include:

Silver maple	Shagbark hickory	Shellbark hickory
Bitternut hickory	Green ash	White ash
Eastern cottonwood	Red oak	Post oak
White oak	Slippery elm	American elm

These species are likely to develop the loose, exfoliating bark as they age and die that are

preferred by Indiana bats as roosting sites. However, several of these species are typical of bottomland hardwood forest in areas where much of Romme's research was done, and they do not occur in significant numbers on the DBNF. Romme also identified Class II trees, including sugar maple, shingle oak, and sassafras as tree species believed to be of somewhat lesser value for roosting Indiana bat. Class III trees are all other species not included in the other two classes. Class II and III trees are species that are less likely to provide optimal roosting habitat, but may develop suitable cracks, crevices, or loose bark after death.

In June 2000, the Forest Service completed a formal consultation with the Service concerning revision of and amendment to the DBNF's Land and Resource Management Plan (LRMP). One part of the amendment includes provisions for the management of the Indiana bat and its habitat on the DBNF which will be incorporated as general direction and standards and guidelines in the LRMP. This portion of the amendment identifies the following species of trees as potential Indiana bat roost trees:

Red hickory	Shortleaf pine	Virginia pine
Pitch pine	Red maple	Silver maple
Sugar maple	Bitternut hickory	Shellbark hickory
Pignut hickory	Shagbark hickory	American beech
White ash	Green ash	Tulip tree
Black gum	Sourwood	Sycamore
Eastern cottonwood	White oak	Scarlet oak

Shingle oak	Chestnut oak	Northern red oak
Post oak	Black oak	Black locust
Sassafras	American elm	Slippery elm

Radio telemetry studies conducted during the spring and fall have revealed that Indiana bats utilize these tree species on the DBNF as summer roosts. This list includes the 12 species identified as Class I species in the habitat suitability model (Romme et al. 1995). The additional 18 species of trees provide suitable roosting habitat for Indiana bats because they have bark characteristics, bark retention after tree death or injury, and hollow bole development similar to Romme's Class I species.

In southern Indiana where the habitat suitability index model was developed, optimal Indiana bat roosting habitat consists of areas that are located within one kilometer (0.6 mile) of open water and that contain at least 30 percent forest cover which meets the following requirements: (a) roosting habitat consisting of overstory canopy cover of 60 to 80 percent, overstory trees with an average dbh of 15.7 inches at a density of at least 16 or more per acre, snags with a dbh of at least 8.7 inches at a density of at least six snags per acre, and understory cover (i.e., from two meters above the forest floor to the bottom of the overstory canopy) of 35 percent or less; and (b) foraging habitat consisting of overstory canopy cover of 50 to 70 percent, with 35 percent or less of the understory trees in the two to five inch dbh size class (Romme et al. 1995). Although optimal habitat values were developed for southern Indiana for the nine variables, these optimal values may be applicable to the DBNF.

A number of factors have been identified that have likely contributed to declines in numbers of the Indiana bat in the eastern United States. Disturbance of hibernating and summer maternity colonies by humans may be the primary factor. Bats enter hibernation with only enough energy reserves to last through the winter. When disturbed, the bats awaken and use up some of these accumulated reserves. Each time a bat awakens, it may expend as much as 20 to 30 days worth of its stored reserves. Frequent disturbance would likely cause the bats to use up all of their stored energy reserves and force them to emerge from hibernation too early in the year to search for food. Since insect prey are scarce or completely unavailable in late winter, the bats would likely die of starvation.

Disturbance of maternity colonies can also result in significant mortality. Disturbance of the colony at the height of the maternity season, between late May and mid-July, could result in mortality to large numbers of flightless young. It may also cause the colony to abandon the cave or maternity roost tree and roost in less than optimal habitat elsewhere, resulting in reduced productivity or high mortality.

Vandalism is also a serious problem that has resulted in the deliberate destruction of many roosting bat colonies. Bats are generally viewed by the public as nuisances or threats to public health and, as a result, colonies containing thousands of bats have reportedly been destroyed.

Other causes of decline in numbers of Indiana bats include natural disasters, alteration of habitat, and use of pesticides. Caves occupied by this species occasionally flood or collapse, killing a

few, to thousands of individuals. Impoundment of rivers can have significant effects on bats if the reservoir inundates the caves used by the bats. A cave in central Kentucky that contains a large maternity colony of gray bats during the summer is periodically flooded when reservoir levels are high. Thousands of bat carcasses (including gray bats) have been observed on the floor of the cave, indicating that the bats either drowned or were trapped in the cave and starved (Mike Turner, Corps of Engineers, personal communication). Timber harvest, water quality degradation, stream channelization, and other actions can in some cases result in destruction or alteration of actual or potential roosting and/or foraging habitat.

Forested habitat is especially important to Indiana bats. This species is known to forage in riparian or upland forest canopy, and forms its maternity colonies in trees. To avoid predation by owls, the bats utilize forest canopy during their nightly foraging activities. Additionally, an individual tree does not provide permanent habitat, thus, Indiana bats have likely adapted to searching for new roosting sites periodically. However, large-scale removal of occupied forested habitat forces the bats to seek new roosting habitat at a time of year when food may not be readily available, when they are caring for their young, and/or when they are already expending significant amounts of energy.

Several studies have indicated that insectivorous bats are exposed to agricultural pesticides and are adversely affected by them (Clark et al. 1978; Clark and Prouty 1976), and a recent study indicates that the Indiana bat is among the species that may be affected (McFarland 1998). Detectable levels of organo-chlorine, organo-phosphate, carbamate, and pyrethroid pesticides

have been found in the fur and tissues of several species, including the little brown bat and northern long-eared bat. Bats roosting in trees in the vicinity of agricultural fields may be directly affected by pesticides if their roosting sites are incidentally sprayed. Other endangered bat species such as gray bats and Virginia big-eared bats roost in caves and they are not likely to be subjected to direct application of pesticides. However, Indiana bats roost in trees and may be directly affected by pesticide application to trees or agricultural crops. All three species may be indirectly affected as a result of reduction in insect prey, or by ingesting contaminated insects.

Indiscriminate collecting, handling, and banding of bats by biologists are also thought to have contributed to declines in Indiana bat population numbers. When conducted during the winter, these activities cause hibernating bats to awaken; during the summer, they may disturb sensitive maternity colonies. Banding of bats collected by mist netting during the summer, however, likely has negligible effects on the bats (John MacGregor, personal communication). Poorly designed or installed cave gates restrict bat movement and alter air flow into caves. Air flow alterations may change the climatic conditions within the cave and render it unsuitable for hibernation or for use by summer roosting colonies. Furthermore, poorly designed gates provide convenient perches that may allow predators to easily catch bats as they emerge from the cave.

Siltation resulting from a variety of human activities may also contribute toward the decline of endangered bats. Indiana bats forage over water, feeding on mayflies, stoneflies, and caddisflies; some individuals are also known to forage in the upper canopy in riparian or upland forest, feeding on beetles and moths. Many species in these insect groups are sensitive to changes in

water quality; populations decline or disappear as water quality becomes more degraded. The Indiana bat occurs in areas in which there is significant mining, logging, construction, and agricultural activity. These activities, if conducted without proper precautions, can result in significant sedimentation of adjacent streams.

Indiana bats are extremely selective in their habitat requirements. Few caves provide climatic conditions suitable to support a hibernating colony. Given that, and given the species' extreme loyalty to traditional caves and maternity habitats, destruction or alteration of only one of the caves which the bats use could result in a substantial and permanent reduction in that species' total numbers.

0 Environmental Baseline

The Daniel Boone National Forest, located in eastern Kentucky, encompasses approximately 690,000 acres in portions of 23 counties, forming a narrow strip 140 miles long along the western edge of the Cumberland Plateau; one tract of the DBNF, the Redbird Purchase Unit, is located in the eastern part of the Cumberland Plateau. The northern boundary of the DBNF is located on the Rowan County/Lewis County line, and the southern boundary is on the Kentucky/Tennessee border. The DBNF is comprised of six ranger districts: Morehead, Stanton, London, Somerset, Stearns, and Redbird. The majority of the DBNF lies within the Cumberland Mountain Section, Cumberland Plateau Section, and Un-glaciated Allegheny Plateau Section of the Appalachian

Plateau Province. Topography on the DBNF is generally rugged, characterized by steep slopes, narrow valleys, and precipitous clifflines; elevations range from approximately 400 feet to over 2,000 feet above sea level.

Data on forest types contained in the DBNF's LRMP indicate that approximately 328,000 acres (49 percent) of the DBNF contain upland hardwood forest habitat, composed primarily of various combinations of white oak, chestnut oak, northern red oak, black oak, scarlet oak, southern red oak, hickories, and scattered pines. Approximately 161,000 acres (24 percent) contain cove hardwood forest, consisting mostly of northern red oak, white oak, basswood, yellow poplar, hemlock, sugar maple, and beech. Approximately 101,000 acres (15 percent) contain yellow pine forest, consisting primarily of shortleaf pine; however, some stands in this forest type also contain pitch pine and Virginia pine, and some areas are planted in loblolly pine. Approximately 80,000 acres (12 percent) are mixed pine/hardwood or hardwood/pine, consisting mostly of scarlet oak, chestnut oak, black oak, white oak, and hickory mixed with yellow pine or white pine. Pine forest types exist primarily on ridge tops, although mixed pine/hardwood or hardwood pine stands are often found at lower elevations.

The DBNF lies within three major river drainages. Streams on the northern districts and some of the central portions of the DBNF generally flow in a northerly direction and are drained by the Kentucky and Licking Rivers. Streams on the remainder of the DBNF flow in a southerly direction and are drained by the Cumberland River. Annual water production from the DBNF is more than one million acre-feet, 97 percent of which meets state water quality standards.

Although portions of some streams on the DBNF have been impacted to some degree by past mining, logging, and other activities, many streams currently contain highly diverse and abundant aquatic communities, including rare and endangered fish and mussel species. In addition, there are approximately 12,500 acres of riparian habitat associated with riverine habitat on the DBNF.

Karst formations exist on most districts on the DBNF. Surveys of caves on the DBNF for possible use by bats have revealed that the DBNF currently supports a number of hibernating colonies of endangered Indiana bats and Virginia big-eared bats annually. Identified hibernacula contain from a few to several thousands of individuals. Other caves on the DBNF that have not yet been surveyed may also contain Indiana bat, Virginia big-eared bat, and possibly gray bat hibernating colonies. In addition to caves, the DBNF contains several thousand miles of clifflines (a cliffline is defined as a contiguous, naturally occurring, exposed vertical rock structure that is 10 or more feet in height composed of limestone or sandstone parent material, having cliffline plant and animal species [e.g., crickets, spiders] present, and containing fissures or openings of various sizes that have been created from rock sloughing, erosion, or geological forces) which have been found to provide summer foraging, roosting, and maternity habitat for Virginia big-eared bats. Summer surveys have also revealed that the DBNF provides summer maternity habitat and associated foraging habitat for the Indiana bat. Gray bats have been found recently at two locations on the DBNF; a small roosting colony was discovered under a bridge, and foraging male gray bats were captured during a mist net survey at another bridge site.

The DBNF has consulted with the Service on numerous actions, but primarily timber sales, on all

of the Ranger Districts. Consultations have also been conducted with regard to the development of various types of recreational facilities, construction of waterlines across DBNF lands, oil and gas exploration and drilling operations, construction of access roads, removal of storm-damaged hazard trees, use of off-highway vehicles on the DBNF, and land transfers. The DBNF consulted with the Service on interim guidelines developed for management of the red-cockaded woodpecker and on a final environmental impact statement for management of the red-cockaded woodpecker on National Forests in the Southern Region. A programmatic-level consultation was recently conducted regarding forest management activities carried out by the DBNF and its effects to the endangered Indiana bat. A consultation is currently ongoing in regard to the effects of southern pine beetle control activities on the endangered red-cockaded woodpecker. Another programmatic consultation was recently completed for the DBNF Land and Resource Management Plan and an amendment to that Plan.

0 Direct/Indirect Effects

Removal of storm-damaged trees may directly affect the Indiana bat as a result of direct mortality to individuals. A tree containing a roosting bat or maternity colony that is felled may result in the death of one or more individuals. Those bats that survive felling of the tree will be forced to find alternate roosts. Additional mortality may occur if the surviving individuals must fly for prolonged periods of time or long distances to find suitable roosts. Effects to reproductive females and young, aside from direct mortality, may not be severe since Indiana bat maternity

colonies generally consist of primary and alternate roost trees. However, the magnitude of effect would increase if removal included all or most of the trees used as roosts by the maternity colony.

Because Indiana bats exhibit some degree of loyalty to particular areas, they may be indirectly affected if tree removal activities resulted in loss of all or most of the suitable roost trees. The bats would be forced to seek new roosting habitat upon returning from hibernacula the following year. Additionally, removal of substantial numbers of canopy trees could result in increased predation on the bats or could render the habitat unsuitable as roosting or foraging habitat.

The DBNF contains thousands of acres of forest that are currently or potentially suitable as roosting and foraging habitat for the Indiana bat. The proposed action will result in removal of only a small portion of suitable habitat; areas adjacent to treated areas will remain suitable. In addition, because of the large amount of suitable roosting and foraging habitat present, the potential for cutting a tree containing a roosting Indiana bat or a maternity colony is low; snags and suitable roost trees will be retained in most treated areas. Effects of the proposed action therefore are likely to be of short duration and low to moderate intensity.

0 Cumulative effects

Cumulative effects include the effects of future State, local, or private actions that are reasonably

certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the ESA.

The proposed action will occur on National Forest lands under the jurisdiction of the U.S. Forest Service, Daniel Boone National Forest. Any future actions proposed on those lands will be authorized, funded, or carried out by the Forest Service and will require compliance with Section 7 of the Endangered Species Act. Therefore, cumulative effects, as defined by the Endangered Species Act, will not occur.

0 Conclusion

After reviewing the current status of the Indiana bat, the environmental baseline for the action area, the effects of the proposed storm damage salvage activities, and the cumulative effects, it is the Service's biological opinion that the salvage of storm-damaged trees on the DBNF, as proposed, is not likely to jeopardize the continued existence of the Indiana bat, and is not likely to destroy or adversely modify designated critical habitat. Critical habitat for this species has been designated at White Oak Blowhole Cave (Blount County, Tennessee); Bat Cave (Carter County, Kentucky); Coach Cave (Edmonson County, Kentucky); Blackball Mine (LaSalle County, Illinois); Big Wyandotte Cave (Crawford County, Indiana); Ray's Cave (Greene County, Indiana); Cave 021 (Crawford County, Missouri); Cave 009 (Franklin County, Missouri); Pilot

Knob Mine (Iron County, Missouri); Bat Cave (Shannon County, Missouri); Cave 029 (Washington County, Missouri); and Hellhole Cave (Pendleton County, West Virginia); however, this action does not affect any of those areas and no destruction or adverse modification of the designated critical habitats are anticipated.

INCIDENTAL TAKE

Sections 4(d) and 9 of the ESA, as amended, prohibit taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or the applicant. Under the terms of Section 7(b)(4) and Section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary, and must be implemented by the agency so that they become binding conditions of any grant or permit issued to an applicant, as appropriate, in order for the exemption in Section 7(o)(2) to apply. The Forest Service has a continuing duty to regulate the activities covered by this incidental take statement. If the Forest Service (1) fails to require contractors or applicants to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the work order or permit or grant document, or fails to adhere to the terms and conditions of the incidental take statement, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions or fails to comply with the terms and conditions, the protective coverage of Section 7(o)(2) may lapse.

0 Amount or extent of incidental take

The Service can not, at this time, estimate how many Indiana bats could be taken as a result of the proposed storm damage salvage activities because some of the bats that hibernate on the DBNF likely migrate to other areas during the maternity season while some Indiana bats that hibernate in caves off of the DBNF probably migrate to the DBNF for the summer. The proposed salvage activities will result in removal or disturbance to approximately 3,100 acres (roughly four-tenths of one percent [0.4 percent] of the total area of the DBNF). It is anticipated that all suitable roost trees (and any Indiana bats using those trees as roosts) within that acreage could potentially be taken by salvage activities.

Incidental take of Indiana bats during salvage activities is expected to be in the form of killing, harming, or harassing. Cutting trees during the non-hibernation season may result in mortality to females and young, or to individually roosting, non-reproductive Indiana bats. If the bats are not directly killed, the colony (or roosting individuals) will be forced to find alternate roosts or may be forced to abandon a roosting area. Growing season prescribed burns may result in burning of occupied roost trees. Smoke generated during prescribed burns could also cause roosting bats to abandon trees, or may result in a maternity colony abandoning a traditionally used maternity site.

The Service anticipates incidental take of Indiana bats will be difficult to detect for the following reasons: (1) Indiana bats are relatively small and they form small (i.e., 50 or fewer to 100 or more individuals), widely dispersed colonies under loose bark or in cavities of trees; or a particular tree may harbor a single roosting individual. Detection of a roosting colony or individual bats in a treatment area would, therefore, be difficult. (2) Unless a dead individual was present in a tree that has been felled, it would be virtually impossible to conclude that Indiana bats were present in a felled tree. Although, to the best of our knowledge, no Indiana bat maternity colony or individually roosting Indiana bats have been incidentally taken on the DBNF during tree cutting or other habitat-modifying activities, the following level of incidental take of this species can be anticipated by loss of suitable roosting trees of foraging habitat. The Service believes that if a maternity colony or roosting individuals are present in an area proposed for salvage activities, loss of suitable roosting and/or foraging habitat could result in incidental take of Indiana bats. The potential for loss of suitable habitat, and consequent take of Indiana bats is, however, significantly reduced through implementation of the general and specific protective measures

described previously in this biological opinion.

0 Effect of the take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat. However, implementation of the proposed salvage activities as described in this biological opinion and the reasonable and prudent measures (with terms and conditions) presented below should minimize the effects of incidental take of Indiana bat maternity colonies and individually roosting bats. Incidental take in excess of the minimized level presented below is considered to be an adverse effect which will require reevaluation of this incidental take statement and discussion of the need for reinitiation of consultation.

0 Reasonable and prudent measures

The Service believes the following reasonable and prudent measure is necessary and appropriate to minimize incidental take of Indiana bats:

1. Salvage activities will be planned and implemented consistent with measures

developed for protection of the Indiana bat and its habitat.

0 Terms and conditions

In order to be exempt from the prohibitions of Section 9 of the ESA, the Forest Service must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

1. Removal of known Indiana bat roost trees will be avoided to the maximum extent possible. In the event that it becomes absolutely necessary to remove a known Indiana bat roost tree, such removal will be conducted during the time period when the bats are most likely to be in hibernation–i.e., November 15 through March 31.

2. Suitable roost trees will be identified for retention in all areas treated by commercial harvest. Trees with exfoliating bark, cracks, or crevices that would be immediately suitable as Indiana bat roosts will be retained at a minimum density equivalent to 15 basal area per acre. These trees may be physically marked or identified in contract language to be retained.

3. Timber sale administrators or harvest inspectors will conduct normal inspections

of all treated areas during salvage activities and will, along with normal inspection duties, ensure that trees identified for retention have not been harvested or inadvertently felled. If such trees have been harvested or felled, the appropriate DBNF biologists, and this office, will be notified to determine if additional protective measures are needed to avoid future losses.

Upon locating a dead, injured, or sick specimen of an endangered or threatened species, initial notification must be made to the nearest Fish and Wildlife Service Law Enforcement Office (Gene Moore, Special Agent, 600 Federal Place, #327-A, Louisville, Kentucky; telephone 502/582-5989). Care should be taken in handling sick or injured specimens to ensure effective treatment and care, and in handling dead specimens to preserve biological materials in the best possible state for later analysis of cause of death. In conjunction with the care of sick or injured endangered species or preservation of biological materials from a dead animal, the finder has the responsibility to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. With implementation of these measures, the Service believes that no more than 50 trees identified for retention will be incidentally taken within the 1,832 acres proposed for treatment by commercial harvest. It is assumed that this level of take of suitable roost trees would equate to incidental take of two maternity colonies of Indiana bats. If, during the course of the action, this minimized level of incidental take is exceeded, such incidental take represents new information requiring

review of the reasonable and prudent measures provided. The Federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities intended to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

We believe that this provision of the ESA places an obligation on all Federal agencies to implement conservation programs to benefit endangered and threatened species, and a number of recent court cases appear to support that belief. Agencies have some discretion in choosing conservation programs, but Section 7(a)(1) places a mandate on Federal agencies to implement some type of positive conservation programs.

The Service encourages the DBNF to implement one or more of the following conservation recommendations:

1. Initiate a monitoring study of untreated storm-damaged areas on the DBNF to determine use of those areas by Indiana bats. Several areas could be selected and monitored using different techniques (i.e., mist netting, Anabat, infra-red scopes) for several seasons. Results of such monitoring might reveal if severe storms significantly increase the amount of suitable roosting habitat in an area and how suitability changes over time.

2. If roosting Indiana bats are detected in areas proposed for treatment, those areas should be monitored during and after treatment to determine how particular treatments affect use of the area as roosting and/or foraging habitat.

3. Drinking water sources constructed by the DBNF should be monitored to determine the proportion of constructed ponds used by bats and how soon after construction bats begin to use them. Results of this effort would be helpful in determining the efficacy of various sizes of ponds, permanent versus seasonal, and various sizes of ponds.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the actions outlined in the consultation request. As provided in 50 CFR Sec.402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified to include activities that cause an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

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June 28, 2000

Ms. Elizabeth Estill
Regional Forester
U.S. Forest Service
1720 Peachtree Road, Northwest
Room 760
Atlanta, Georgia 30303

Re: FWS #00-960

Dear Ms. Estill:

Enclosed is the Fish and Wildlife Service's biological opinion for the salvage harvest necessitated by 1998 storm damage on the Daniel Boone National Forest in Kentucky. This biological opinion completes Section 7 consultation as required by the Endangered Species Act of 1973, as amended.

The assistance and cooperation of your staff and the staff of the Daniel Boone National Forest during this consultation is greatly appreciated. If you have any questions or if we can be of further assistance, please contact me or Jim Widlak of my staff at 931/528-6481, ext. 212 or 202, respectively.