

## **Shawnee National Forest**

### **Biological Evaluation of Regional Forester Sensitive Species Animals and Animal Species of Concern (including four that are also Management Indicator Species)**

**For the**

**Buttermilk Hill/Talbott Hollow Blowdown Project  
Mississippi Bluffs RD, Jackson County, Illinois  
May 19, 2008**

#### **SUMMARY**

The Shawnee National Forest (Forest) proposes to treat woody fuels on approximately 5650 acres of National Forest and private land that were affected by a 2006 tornado. Prescribed burning and some mechanical fuels treatment will be applied to the project areas. Approximately 25 acres of down and dead trees and tree parts would be cut and removed from private lands as part of fuels reduction efforts. The project is located in the Shawnee Hills Natural Division west of Kinkaid Lake approximately eight miles west of Murphysboro in Jackson County, Illinois. It is within the Mississippi Bluffs Ranger District of the Forest.

This action is needed to reduce the heavy fuel buildups and fire dangers caused by many, downed mature hardwood and pine trees and broken tops and limbs. It also is needed to regenerate the native, dry and dry-mesic, hardwood forests in aftermath of the tornado damages to and losses of mature oak/hickory forests in the project vicinities. The proposed actions would also enhance recreation use of these damaged areas by removing much of the physical impediments to hikers and hunters utilizing the general forest areas.

In addition to the proposed action, the following alternatives were considered:

- *No action*—no treatment of the tornado damaged areas and letting the trees and tree parts naturally decompose overtime and living with the threat of high fire danger in the proposed project areas.
- *Proposed action(see below)*

## **Proposed Action**

The Proposed Action includes:

- Prescribed burning on approximately 5650 acres of Forest land and some cooperating private land. The project area will be subdivided to make burns more manageable, yet keeping unit size large enough to mimic presettlement fire regimes and keep per acre costs down. Burns will be lit by hand or with the aid of a helicopter.
- Mowing, chipping, or cutting fuels around selected structures (~25 acres) to provide defensible space and reduce intensity during prescribed burning prior to burning.
- Improving preexisting control features or building up to 9 miles of firelines where necessary, approximately 8 miles of handline and one mile of dozer or equipment-constructed fireline are planned.
- Notifying the public
- Coordinating the timing and/or placement of burns with specialists to minimize negative impacts on wildlife, recreation opportunities, or public safety
- Protecting recreational infrastructure and cultural resource sites where needed
- Firelines would be rehabilitated where necessary to avoid erosion and establishment of non-native invasive species
- Post-burn monitoring would be conducted to measure the effectiveness of any treatments and mitigation measures

Burns would be conducted between September 1 and May 1. First entry on all units should be made within two years. Successive burns would be made after 2-5 years. Burn frequency may be adjusted if monitoring shows that the desired future condition is already reached or is not going to be reached within 10-15 years.

## **Purpose of and Need for Action**

Oak and hickory regeneration in most of the area is not adequate to maintain its dominance in the stand. Seedlings of these species cannot survive in the intense shade created by planted pines and invading native and non-native species. As all stands tend towards maple-beech forests, there is a loss of landscape and community diversity, and a corresponding loss of plant and animal diversity. Non-native invasive species are found in the area and further contribute to degraded ecosystems.

Current fuel loadings in the area would increase the intensity and severity of any wildfires that could take place, leading to higher risk to private property and natural, cultural, and human resources. Wildfires here could experience rapid rates of spread, higher intensities, longer and more profuse spotting, and would therefore inevitably grow larger and cost more to suppress. Since the project area lies partially within a municipal watershed and is intermingled with private land and property, such a wildfire is not desirable. Changes in fuel bed properties are needed to lessen the risk to private property and natural and cultural resources.

## **CURRENT AND DESIRED FUTURE CONDITION (FOREST PLAN DIRECTION)**

This project is tiered to the 2006 Shawnee National Forest Land and Resource Management Plan (Forest Plan) and the Final Environmental Impact Statement for the Forest Plan. This plan provides

management direction for the project area. This direction is described under two management prescriptions.

**Even-Aged Hardwood Forest (EH) Management Prescription** provides for the production of high-quality hardwoods. Management provides for the maintenance of the oak-hickory forest-type and ecological restoration of areas that have been planted with non-native pine. The desired future condition is a continuous, closed-canopy forest interspersed with permanent and temporary openings. The proposed actions directly address the management of this prescription within the project area through the application of prescribed burning.

**Water-Supply Watershed (WW) Management Prescription** provides for the protection of water quality in municipal water-supply watersheds, including Kinkaid Lake. The desired future condition is maintenance of the landscape in mature and old-growth, hardwood forests including oak-hickory forests to protect water quality of important water supplies. Prescribed burning, some timber management, and invasive species control are activities that can occur in this management area. The proposed actions are consistent with this prescription. Prescribed fire and some mechanical fuels treatments would reduce the effects of severe wildfires and maintain oak-hickory forests.

## **ALTERNATIVES**

Based on input from the scoping process and on studies carried out during the formulation of the proposed action, a series of alternatives were developed for management of the project area. This chapter describes and compares these alternatives.

### **Alternative 1- No Action**

Under this alternative, the Forest Service would carry out no actions including no treatments of the tornado damage and no maintenance of oak-hickory forests. Fire severity risks would remain high, and nothing would be done to encourage oak-hickory dominance over these acres.

### **Alternative 2 - The Proposed Action**

See “Proposed Action” above.

## **WILDLIFE RESOURCES**

### **Project and Cumulative Effects Background Information**

**Spatial Boundary:** The geographic boundary of cumulative effects for terrestrial species is primarily the uplands of western Southern Illinois in the Shawnee Hills and the watershed for Kinkaid Lake and the Big Muddy River and its floodplain south of Kinkaid Lake. These are the geographic areas where terrestrial animal populations from the project area interact with others of their species and where habitats in the project area are affected by landscape scale habitat changes and modifications.

Wildlife resources farther downstream in the Big Muddy River and Mississippi Rivers were excluded from consideration based on the resources being outside of, or isolated from measurable effects of the proposed activities due to the large amounts of agricultural land in these areas south and west of the project area and the barriers these lands presents to most forest wildlife species. The analysis for cumulative effects takes into account all known past actions, the proposed action, present actions, and reasonably foreseeable future actions, that could or will affect the analysis areas.

**Temporal Boundary:** The temporal boundary for the cumulative effects analysis is the 15-20 year life of the Forest Plan (2006) for present and future actions. The plan actions on National Forest for the next 15-20 years are logical actions for the Forest during these timeframes. Actions on non-federal land in the project area vicinity are anticipated to be similar to present actions on these areas during this timeframe. The temporal boundaries for past actions is the last ten years. Any projects beyond ten years in the past are considered part of the baseline.

**Past, Present, and Reasonably Foreseeable Future Actions:** Table 1 includes a comprehensive list of the past, present, and future actions within the project watersheds where potential cumulative effects may occur. A subset of these actions was used in the analysis of potential cumulative effects for Regional Forester Sensitive Species and Species of Viability Concern. These actions are discussed in detail within the analyses for individual species below.

<b>Table 1. Past (last ten years) present actions, and reasonably foreseeable future actions, with potential for cumulative effects, within the three project area watersheds.</b>	
<b>Action</b>	<b>Scope of Action</b>
Agriculture (row-cropping)	About 27,500 acres (past, present and future).
Agriculture (pastureland)	About 9,000 acres (past, present and future).
Wildfires	About 10 acres per year (past, present and future).
Prescribed burning	About 65 acres per year (past). About 900 acres per year (future).
Timber harvest	About 100 acres per year (past, present and future).
Timber Stand Improvement	About 80 acres per year (future).
ATV use	Variable use in the watershed (past, present and future).
Road maintenance	About 20 miles maintained per year (past, present and future).
Road right of way maintenance	About 10 acres maintained per year (past, present and future).
Tree planting	About 10 acres per year (past, present and future).
Utility right of way maintained	About 25 miles maintained (past, present and future).
Trail maintenance	About 10 miles maintained per year (past, present and future).
Horseback riding	Variable use in the watershed (past, present and future).
Non-system trails	Estimate less than 25 miles of trail (past, present and future).
Special-use permits (telephone, electric, water, and driveways)	Estimate less than 2 acres per year (past, present and future).
Utility right of way maintenance	About 6 miles maintained per year (past, present and future).
Invasive species control	About 10 acres manual treatment per year (past and present). About 100 acres herbicide treatment (future).
Wildlife brush pile creation	About 120 acres (past).
Openlands management	Disking and planting food plots on about 230 acres (future).
Trail construction	About 0.5 miles of trail reroute of an existing trail (future).
Shoreline stabilization	About 6 miles along Kinkaid Lake (future).
Gully stabilization	About 900 feet near Kinkaid Lake (future).

Past actions in the project area vicinities were farming, grazing, land clearing of forest and old fields for agriculture and residential developments, pine and hardwood plantation establishment, timber harvest, recreational facility construction and maintenance, abandoned well and cistern filling, road construction, maintenance and use, power line construction and maintenance, homesteads, user-created equestrian and hiker trails, unauthorized user-created all terrain vehicle (ATV) trails, increased

equestrian trail use especially in the last ten years, mining, tree planting and timber stand improvements including tree thinning and use of herbicides to reduce vegetative competition, ATV and off highway vehicle (OHV=4-wheel drive and sport utility vehicles (SUV) and trucks and off-road motorcycles) use, outdoor recreational uses (hunting, fishing, and hiking), wildfires, prescribed burning, fire suppression, wildlife opening construction and maintenance, artifact hunting and collection, pond and waterhole construction, reservoir construction and use, and railroad construction and use.

Present actions in the project area vicinities include trail maintenance, construction and use of existing trails; power line maintenance, ATV (mostly unauthorized on National Forest) and OHV use, timber harvest (predominantly on private lands), agricultural management (row cropping and pasture) on private lands, fires (wild and prescribed), fire suppression, user-created equestrian trails, road maintenance and use, tree planting, reservoir management and bank erosion control, trail rehabilitation, continued and increasing equestrian use; recreational facility management and maintenance, and outdoor recreation use (hiking, hunting and fishing).

Reasonably foreseeable future actions in the project area vicinities include all of the above present actions, proposed actions include up to 6,800 additional acres of prescribed burning on National Forest, north of the project area, and some repeat of the past actions including residential and agricultural development on private lands.

### **Project Area**

The project area is defined as the area of potential site-specific effects on wildlife habitat and populations, including mammals, birds, reptiles, amphibians and terrestrial invertebrates. The project area includes the forests and fields of the Shawnee Hills Natural Division on slopes and ridges west of Kinkaid Lake.

### **Analysis Area**

The analysis area used in this effects analysis includes the project area as defined above as well as the Kinkaid Lake and the adjacent Mississippi River floodplain areas just west of the project area. Wildlife resources farther downstream in the Big Muddy River and Mississippi Rivers were excluded from consideration based on the resources being outside of, or isolated from measurable effects of the proposed activities.

### **Issues/Analysis Methods**

Information for this analysis was collected in several ways: 1) reviewing the current list of Regional Forester's Sensitive Species (1/16/2007) and Species of Viability Concern of the Shawnee National Forest and their habitat preferences (Shawnee National Forest Plan 2006, pp.295-297); 2) consulting element occurrence records of Regional Forester's Sensitive Species and Species of Viability Concern as maintained by the Illinois Natural Heritage Program; 3) consulting with previously prepared Biological Evaluations for the same area; 4) Conservation Assessments prepared to date for RFSS animals on the Shawnee NF; and 5) Literature Summaries including Meeting Minutes for Species Viability Evaluation (SVE) Workshop for the Hoosier and Shawnee National Forest 2002. The analysis began with this list. Species that do not occur in Jackson County and species that are known not to occur within the Big Muddy watershed (based on literature search and/or survey results) or are not likely to occur (based on a lack of suitable habitat) were removed from the list of species considered. Life history and distribution information was also obtained from the following websites:

- <http://www.natureserve.org/explorer>.
- <http://www.inhs.uiuc.edu/cbd/collections/>
- <http://midwest.fws.gov/endangered/>
- <http://www.fs.fed.us/r9/wildlife/wildlife/index.shtml>
- [http://www.fs.fed.us/r9/wildlife/wildlife/species\\_info.html](http://www.fs.fed.us/r9/wildlife/wildlife/species_info.html)
- [http://www.fs.fed.us/r9/wildlife/tes/docs/rfss\\_plants.pdf](http://www.fs.fed.us/r9/wildlife/tes/docs/rfss_plants.pdf)
- <http://www.fs.fed.us/r9/forests/shawnee/>
- <http://www.inhs.uiuc.edu/cbd/collections/mammal/mammalintro.html>

## **Affected Environment**

### *Terrestrial Habitat*

Specific habitat surveys of the project and analysis areas were conducted in October and November of 2007. The area was also surveyed many times by Steve Widowski, wildlife biologist on the Mississippi Bluffs Ranger District in association with many district projects in the vicinities since 1992. The surveys consisted of examining habitats within the project and analysis areas as well as existing effects. Also, Ava Cave (located north and west of the project area boundaries) was surveyed for bats utilizing a harp trap in early October, 2007 to determine bat species in the general project vicinities. No bats of any species were caught or seen during this survey. The survey was conducted during the normal, fall, bat-swarmling periods at Southern Illinois caves.

Habitats within the project area include upland hardwood forests, small pockets of bottomland and riparian hardwoods, some forested lakeshores, some hardwood plantations of tulip popular, some non-native pine plantations, some regenerating, former wildlife openings on some of the ridges; and some karst habitats including some sinkholes and small caves on slopes adjoining the Mississippi River floodplains on the west side of the project area.

### *Terrestrial Wildlife Populations*

*Eleven* Regional Forester Sensitive (RFSS) wildlife species and *eight* wildlife Species of Viability Concern (Forest Plan) including four of the latter that are also Management Indicator Species (MIS) are known or suspected from Jackson County, Illinois and are considered in this evaluation.

### ***Regional Forester's Sensitive Species***

A sensitive species (S) is a species appearing on the Regional Forester's Sensitive Species list for the Region. These species are known to occur on the Shawnee Forest or there is reason to believe they occur on the Forest based on collections, observations and suitable habitat. Five Regional Forester's Sensitive wildlife species, shown in Table 2, were included in the more detailed analysis for this project based on records of occurrence, suspected occurrence and/or availability of species-type habitat in the project area.

**Table 2. Regional Forester Sensitive Species (S)**

<b>Scientific Name</b>	<b>Common Name</b>	<b>Habitat</b>	<b>Comment</b>
<b><i>Invertebrates</i></b>			
<i>Stenotrema (Euchemotrema) hubrichti</i>	Carrinate pillsnail	Rock (limestone) ledges in the Pine Hills section of the Larue/Pine Hills/Otter Pond Research Natural Area (RNA).	There is no habitat for this species in the project area. The project area is outside of the known range for the species.
<i>Stygobromus subtilis</i>	subtle cave amphipod	Groundwater seeps and drip pools in caves (Lewis 2002).	The species is not known from the project area. However there is some karst habitat within the project area that could be considered, unoccupied, suitable habitat.
<b><i>Reptiles</i></b>			
<i>Crotalus horridus</i>	Timber rattlesnake	High, dry ridges with oak-hickory forest interspersed with open areas, deciduous forest, hardwood forests, river bottoms, swampy areas and floodplains, cane fields. Hibernacula usually in rocky area with underground crevices, fissures, talus (rock slide), and open skree slopes.	Known to occur and a common species in the project area.
<i>Macrolemys temminckii</i>	Alligator snapping turtle	Slow moving, deep water of rivers, sloughs, oxbows, swamps, bayous, and ponds near rivers, Shallow creeks that are tributary to occupied rivers with mud bottom and some aquatic vegetation but may use sand-bottomed creeks. Almost entirely aquatic; rarely out of water except to nest.	Known to occur in Jackson and Union Counties. Aquatic habitats within bottomland and floodplain forests. No habitat is present in the project area.
<b><i>Amphibians</i></b>			
<i>Hyla avivoca</i>	Bird-voiced treefrog	Forested and swampy floodplains of large rivers and smaller streams with semi-permanent and permanent pools that support stands of baldcypress and tupelo trees (Brandon 2005; Dundee and Rosman, 1989; Mount, 1975; Redmer et al., 1999a; Smith, 1961)	Known to occur in Jackson County in wetlands in the bottomland and floodplain forests of the Big Muddy and Mississippi rivers. No habitat for the species in the project area.
<b><i>Birds</i></b>			
<i>Dendroica cerulea</i>	Cerulean warbler	Forested wetlands, riparian areas. Mixed hardwood forests	No documented occurrence in the project area. Some, unoccupied, suitable habitat present in the project area.
<i>Lanius ludovicianus</i>	Loggerhead shrike	Openland with scattered trees and shrubs.	Known to occur in Jackson county. No known populations in the project area. Some unoccupied, suitable, habitat present in project area on private land.
<i>Limnothlypis swainsonii</i>	Swainson's warbler	Deciduous floodplain and swamp forests; requires areas with deep shade from both canopy and understory cover	Known to occur in Jackson county. No known populations in the project area. No habitat present in project area.

**Table 2. Regional Forester Sensitive Species (S)**

Scientific Name	Common Name	Habitat	Comment
<i>Haliaeetus leucocephalus</i>	Bald eagle	Mature forest and snags bordering or very near large, perennial bodies of water with good fish populations.	Known to occur in Jackson county. No known nesting populations in the project area but probably in the project vicinity around Kinkaid Lake. Some unoccupied, suitable habitat for species in the project area.
<b>Mammals</b>			
<i>Corynorhinus rafinesquii</i>	Rafinesques Big-eared Bat	Forested wetlands and riparian areas, snags and hollow trees, old, abandoned buildings in bottomland forests.	Known from historical information for Jackson County. Not known to occur in project area. No unoccupied, suitable habitat present in the project area.
<i>Myotis leibii</i>	Eastern small-footed bat	Caves and mines in fall and winter and trees with exfoliated bark, rock outcrops and caves in spring and summer.	Not known from Jackson County. Not known to occur in the project area. Some unoccupied, suitable habitat (small caves and some sandstone bluffs) is present in the project area.
<i>Neotoma floridana</i>	Eastern woodrat	Wooded areas, ravines, floodplain forests, and swamps.	Known to occur in Jackson county south of the project area in the Illinois Ozark Natural Division. Habitat is not present in project area.

**Species of Viability Concern (SVC)**

Species of Viability Concern are indicators of biodiversity whose viability has been determined to be under stress. These species are known to occur on the Shawnee Forest or there is reason to believe they occur on the Forest based on collections, observations and suitable habitat. Eight Species of Viability Concern (Table 3) were included in the analysis for this project based on records of occurrence and/or availability of species-type habitat in the project area.

**Table 3. Species of Viability Concern (SVC)**

Scientific Name	Common Name	Habitat	Occurrence
<b>Amphibians</b>			
<i>Hyla versicolor</i>	Gray treefrog	Upland and bottomland hardwood forests under bark, in cavities, and under leaves; and shallow woodland ponds and lakes, swamps, and potholes.	Known from the project area.
<b>Birds</b>			
<i>Colinus virginianus</i>	Northern bobwhite	Openland and forest-edge	Known to occur in Jackson county. Habitat present in project area.
<i>Helmitheros vermivorum</i>	Worm-eating warbler	Riparian areas, hardwood forests, and woodlands	Known to occur in Jackson county. Occurs in the the project area.

<b>Table 3. Species of Viability Concern (SVC)</b>			
<b>Scientific Name</b>	<b>Common Name</b>	<b>Habitat</b>	<b>Occurrence</b>
<i>Hylocichla mustelina</i>	Wood thrush	Forested wetlands, riparian areas, hardwood and mixed forests, woodlands	Occurs in project area
<i>Icteria virens</i>	Yellow breasted chat	Forested wetlands, shrubland, bottomland hardwoods.	Occurs in project area
<i>Melanerpes erythrocephalus</i>	Red-headed woodpecker	Riparian areas, open woodlands with scattered trees	Known to occur in Jackson county. Suitable habitat in the project area.
<i>Scolopax minor</i>	American woodcock	Forested wetlands, riparian areas, hardwood/mixed forests, grasslands, old fields, and woodlands	Known to occur in Jackson county. Known from old fields just north of the project area.
<b><i>Mammals</i></b>			
<i>Lutra canadensis</i>	Northern river otter	Primarily along rivers, ponds, marshes, and lakes in wooded areas	Known to occur in Jackson and Union counties. Not known from the project area. Unoccupied, suitable habitat for the species in Kinkaid Lake adjacent to the project area.

## **ENVIRONMENTAL CONSEQUENCES**

The following terrestrial RFSS and animal species with viability concerns will be considered in the following detailed effects analysis for the project area based upon known or historical presence in the project area and/or the presence of occupied or unoccupied, suitable habitat for the species. These include subtle cave amphipod, timber rattlesnake, cerulean warbler, loggerhead shrike, Eastern small-footed bat, gray treefrog, northern bobwhite quail, worm-eating warbler, wood thrush, yellow-breasted chat, red-headed woodpecker, American woodcock, and northern river otter.

### **Direct and Indirect Effects**

#### **Alternative 1**

With the no action alternative, the condition of the forest will continue to decline and eventually not provide necessary habitat conditions for species dependent upon oak-hickory forests. The majority of existing oak-hickory forest stands will slowly shift to more mixed hardwood forest dominated by shade tolerant species (beech and maple), with less hard mast diversity and abundance. This decline in mature oak (*hard-mast*) habitat abundance would have direct and indirect negative effects on some Regional Forester Sensitive wildlife species and wildlife Species of Viability Concern addressed in this biological evaluation by not being able to use these habitats for food and/or cover.

Reduction in mast diversity, habitat quality and quantity for mast dependent wildlife species would likely occur in a majority of the existing hardwood stands in the project area with implementation of this alternative. This would have adverse direct and indirect effects leading to a decline in species that utilize oak/hickory forest habitats and hard mast resources. This decline will continue as the upland forest component continues to trend towards shade tolerant tree species.

## Alternative 2

This alternative includes: implementation of prescribed burn and mechanical fuel treatment to favor continuation of oak-dominated, upland hardwood forest in the project area. Under this alternative, prescribe burns would occur in approximately 19 units in the project area totally about 5,650 acres and some mowing or cutting of down and dead trees and/or tree parts on approximately 25 acres adjacent to private dwellings.

Positive effects would include the control of shade-tolerant, competing species and promotion of mast-producing hardwood regeneration. There would also be some increase of herbaceous ground cover in some areas especially in existing old fields. The killing of thin-barked tree species by prescribed burns will directly benefit some of the Regional Forester Sensitive wildlife species and Species of Viability Concern addressed in this biological evaluation by increasing snag density, creation of some small, interior forest openings, release of hard-mast producing tree species and creation of some early successional hardwood forests within the project area. Suppression of the shade-tolerant timber component will allow oak understory to grow rapidly, hardwood regeneration would be released, resulting in a more diverse mixed hardwood forest component that would provide habitat on and near the forest floor. Increases in herbaceous plant abundance will have the effect of creating additional foraging habitats for some species such as the northern bobwhite quail which is both a SVE and MIS.

Some vegetation removal by prescribed burning may temporarily increase local flows (when adjacent to stream channels) in proportion to the amount of vegetation removed. Increased stream flows could cause a temporary increase in available foraging habitat for some wildlife species such as the northern river otter. The increased flow would be negligible by the time it enters the lower reaches of the project area streams and/or Kinkaid Lake. Therefore, it is unlikely that an indirect effect, such as sedimentation from heavy rains would affect wildlife species. Implementation of the protection measures and management recommendations presented in the FW25 Water, Soil, and Air Management of the Forest Plan (Forest Plan 2006, pages 40-41) will prevent excessive sedimentation. These include the following standards and guidelines: FW25.1(G) Guidelines for Protection of Water Quality, FW25.2 (S) Standards for protection of soil and water in Riparian Corridors (Filter Strips) and Riparian Areas, FW25.2.2 (G) Guidelines for the reduction of bare soil disturbance and exposure in Riparian corridors (filter strips), FW25.3 (S) Standards for restoration of disturbed soil areas; FW25.5 (S) Standards for the limitation and use of heavy equipment, and FW25.6 (S) Standards for soil disturbance limitations.

Indirect effects of the proposed action may include some altered reproductive or foraging success and altered community structure caused by migration of other species out of the affected areas. These will be short-term effects, and wildlife species will quickly reenter the affected areas. No acute incidents of sedimentation within the project and analysis areas are predicted.

### **Subtle cave amphipod**

The species has not been documented in the project area. The species is not known from Ava Cave just north of the project area or from any of the existing small sink holes or caves in the project area. The closest known population of the species is outside of the project area and outside the geographic boundary for cumulative effects. It is separated from the project area by a major state highway. It is found in Jackson County, Illinois in karst habitat, about eight miles south of the project area. There are some karst habitats in the southern parts of the project area. Some small, sink holes and some small cave entrances are present in these locations and provide unoccupied, suitable habitat for the species.

Alternative one would not have any direct effects on the species since no actions are planned that would affect caves and/or karst areas. In the long term, there could be some indirect, negative effects on the karst habitats from possible large and hot wildfires developing in the heavy, untreated, fuel beds of the project area.

Alternative two would have no direct effects on springs in the project area since these would be protected by standards and guidelines according to the Forest Plan (p. 293). This standard states that groundwater quality should be maintained or improved in karst areas of Jackson County. Caves in the area should not be directly affected by planned burns. Prescribed burns would usually be done at lower intensities than wildfires. They would also not be done in all units in the project areas in every year and burns themselves would generally leave approximately 30% or greater of the treated areas unburned in most burn units. Thus, many areas within the project area would not be affected by burning during each burning season and many, unburned areas and habitats for the species would be unaffected each year. There still is a small, possibility that this alternative may have some inadvertent, small negative and positive, indirect effects on karst and spring habitats. These would be indirect effects from some small amounts of increased sediments immediately following fires and subsequent rain events in the areas prior to plant green-ups that follow the prescribed fires. Small and localized, increases in sediments can have both positive and negative, indirect effects on the species. Negative effects would result from any short term changes in water quality in springs and caves where the species may reside. Positive effects would be the increased nutrients and food availability for the species from small pulses of sediments and their nutrients to the cave and spring habitats. Positive effects may also be the increased base flows of existing springs for the species as a result of burning and its reduction of some woody vegetation that maybe reducing existing spring flows.

### **Cumulative Effects**

The proposed project may contribute sediment that can have both positive and negative effects on the unoccupied suitable habitat. Sediment producing activities such as timber harvest and the lack of road maintenance and ATV use (minor) near the sinkholes and cave may add some sediment to the habitat. There would be a cumulative effect but it would not be measurable from either the project or the other activities. Since the species is not known from the area, and burning will not change or add negatively to these existing habitats for the species, cumulative effects on the species should be minimal and no known populations of the species would be affected. Any effects in either alternative would be on unoccupied, suitable habitats and would not affect known populations on the Forest. Neither alternative would result in the species trending toward federal listing.

### **Timber rattlesnake**

Timber rattlesnakes in Southern Illinois hibernate in rock dens or underground in borrows from late October and early November to mid-April (Brandon 2005). Den sites are extremely important to the

maintenance of populations. Summer habitats for upland forest populations are mature hardwood forest or second growth containing rocky outcrops, rocky ledges, and talus slopes that usually have western or southern exposures suitable for winter denning and for summer sunning of pregnant females (Brandon 2005). Old fields or old wildlife openings near dens are used for foraging in the summer as well.

Timber rattlesnakes are known from the project areas. They are common in the project area vicinity and generally on the westside of the Forest but are an uncommon species across the rest of the Forest and in most of southern Illinois. They are relatively uncommon in Illinois and listed as a state threatened species.

There are some known dens within or adjacent to the project area. Burning in these den locations would be done only during hibernation seasons when individuals are in the dens (11/1-3/31). Burning after April 1 could affect the species at den sites and individuals that are moving from dens to forested foraging areas. Burning in denning locations while the species is in the dens (from November 1-March 31 only) is important for maintenance of open, sunny habitats that are necessary for thermo-regulation of the species. Den sites are primarily open, oak/hickory forests. Brush/woody debris piles and pockets of dense, forest understories provide high quality foraging habitats for the species. The tornado damage in the project area has created many brushpiles and dense forest understory habitats for rattlesnakes in the project area. Burning will reduce the abundance of these newly, created brushpiles.

Alternative one would have no direct effects on the species as there would be no action directly affecting the species. This alternative could have some indirect, negative effects on the species in the vicinity of den sites as no action would not maintain oak/hickory forests in these important habitats. No action could also result in high intensity wildfires in the project area that could indirectly remove all the brushpile habitats and/or could occur in the vicinity of dens at seasons when the species is out of the dens and more vulnerable to direct effects of burning.

Alternative two would have no or very minor, direct effects on the species as burns would not be conducted in den sites when the species would be out of hibernation. There would be burning in the project area outside of den sites from April 1-May 1 and from September 2-October 31. There maybe some individual snakes (primarily non-pregnant females and males) scattered out in summer foraging habitats during these periods and a few individuals could be negatively affected by ground fires that they could not avoid. This alternative then could have a small, negative direct effect on some individuals of the species as some individual rattlesnakes may be harmed by burns in April, September, and October. However, so few individuals would be so affected that there would be no affect on overall population viability of the species on the Forest or in the project area.

Alternative two would have an overall, positive, indirect effects on the species by maintaining the oak/hickory forests that are high quality habitats for the rattlesnake. Some brushpiles would be consumed but not all by low intensity, prescribed fires. Prescribed fires would also increase the densities and diversity of understory vegetation. This would have an indirect, positive effect on the species by improving the quality of foraging habitats.

#### Cumulative effects

Road and trail use in the area will continue to have negative, impacts on the species by increasing snake visibility and subsequent harm by vehicles or people. Some individual snakes would continue to

be killed by the haying of pastureland and the maintenance of road and utility right of ways. Future burning north of the project area is planned and could have effects on rattlesnake populations in the project area as habitat is improved. There would be some loss of brushpile habitat for the species, but not all of this habitat would be consumed by the fire. Overall, the effect of the burning, similar to the proposed action would have a beneficial effects on snake habitat due to improvements of den and foraging habitats. When combined with the effects of the project the cumulative effect would be a net benefit to rattlesnake habitat and populations.

Neither alternative would result in the species trending toward federal listing.

### **Cerulean warbler**

The cerulean warbler is a neotropical migrant songbird species that nests and forages in large-sized blocks (greater than 1000 acres) of mature bottomland and floodplain, hardwood forests, riparian forests, and mature upland forests, dominated by large white oaks on the Shawnee National Forest (SVE Species Literature Summaries 2002). The species is insectivorous and forages in the canopies. The species is not known from the project area; however the project area does include some, unoccupied suitable habitat for the species, primarily upland oak forests dominated by white oak.

Alternative one would not have any direct or indirect effects on the species as mature, hardwood forests would not be directly or indirectly affected by no action.

Alternative two would have no direct effect on the species as mature forest cover would not be directly affected by planned actions. It would have an indirect effect on the species, by maintaining the oak forests that the species prefers for nesting and foraging in the uplands on the Shawnee National Forest (SVE literature summary for the Cerulean Warbler 2002). Positive, indirect effects would be on unoccupied, suitable habitat for the species.

### **Cumulative Effects**

Alternative one would have no cumulative effects on the species since it would not have any direct or indirect effects on it.

Under the proposed alternative, actions such as road and utility right of way maintenance, openland management, residential development and brush-pile creation continue to fragment habitat for the warbler. Future prescribed burning and timber stand improvement work help to perpetuate the oak hickory forest preferred by the warbler. Indirect habitat improvements combined with these past and present actions would not improve overall fragmentation and poor habitat quality for the species in the project area. Populations of the species would continue to be low or non-existent in the project area vicinity. Populations of the species on the Forest would not change.

Neither alternative would result in species trending toward federal listing.

### **Loggerhead shrike**

The loggerhead shrike is rare bird species in old fields and pasture and cropland fence rows and edges. Suitable nesting habitat for this species in Southern Illinois consists of small trees or shrubs interspersed among short grass or herbaceous vegetation with areas of bare ground, such as pastures, upland prairies, hay and alfalfa fields, and golf courses (Maddox and Robinson 2004). The species preys upon insects and many different species of terrestrial vertebrates including small mammals and birds.

Alternative one would have no direct effects on the species since no actions would occur in unoccupied, suitable habitats for it. Indirect effects of Alternative one on the loggerhead shrike would be loss of most, unoccupied suitable, old field habitats without management.

Maddox and Robinson (2004) conclude that prescribed burning of old field habitats would be beneficial for the species by maintaining the open, grassland habitats preferred by the species for foraging. The species is also documented to be an early nesting species in Southern Illinois with egg-laying occurring in early April (Graber et. al. 1973). Alternative two has the potential to have some direct effects on the species from burning in old fields after April 1. However, since the species is not known from the project area to date, no actual direct effects of Alternative 2 are predicted for the species. Indirect effects of Alternative 2 on the species should be positive, as foraging habitats would be improved in old fields that would be burned. Effects would be on unoccupied, suitable habitat.

#### Cumulative effects

Presently, brushy, old fields and maintained orchards are rare in the analysis area. There are some brushy old fields north and west of the project area on three openland sites. Current agricultural management on the private lands in or adjacent to the project areas does not include fencerows with brush and small trees growing in them. This continues to limit habitat for the shrike. Taking into account these present and future actions in the project area vicinities (see above), Alternatives one and two would not result in any overall improvement of any unoccupied, suitable habitat for the species in the project area and project area vicinities. Populations of the species would remain low or non-existent in the project area in both alternatives since there would be only small improvements in overall habitat quality in the project area landscape. Known populations for the species on the Forest would continue to be low and unaffected by either alternative.

Neither alternative would result in species trending toward federal listing.

#### **Bald eagle**

Bohlen (1978) considered the bald eagle a common migrant and winter resident along the Illinois and Mississippi Rivers and in southern Illinois. In the last 10-15 years, local bald eagle nesting pairs have increased dramatically in southern Illinois including on the Forest, with approximately 10-20 known pairs in southern Illinois. At least six of those are within the Forest Boundary.

The bald eagle is considered a fairly common migrant and winter resident along major river systems in Southern Illinois. Bald eagles require relatively undisturbed, wooded roosting habitat and nesting sites located in close proximity to larger rivers, lakes, or other large water bodies, where food sources are plentiful. Bald eagles normally nest in large trees where there is a relatively unrestricted view of a large water body.

Suitable nesting and foraging habitat for the species is present on National Forest in the project area. However, no bald eagle nests were found while conducting field surveys in October and November 2007. Eighteen active eagle nests were documented during a 2002 aerial census for the lower eleven Illinois counties (R. Lindsey, personal communication, May 2002) but none were observed in the Kinkaid Lake vicinity. This is consistent with Grier et al. (1983) who predicted that with proper management, available habitat in Illinois could support up to 20 breeding eagle pairs by the year 2000.

Bald eagles require undisturbed roost and nesting sites located near these rivers or other large bodies of water, where they can obtain fish for food. There are a number of reported nests in southern Illinois but none within the project areas. There is also a sizeable overwintering population on the nearby Union County refuge northwest of Ripple Hollow burning area. Cedar and Kinland lake areas are yeararound foraging areas for eagles. There maybe some small amounts of winter roosting habitat in the Kinkaid, Pine Hills, and Cedar Lake burning unit vicinities. Bald eagles are occasionally observed in the project area vicinity adjacent to Kinkaid Lake. However, no nest trees or feeding perches or wintering roosts for the eagles have been identified in the project area to date.

No direct or indirect effects on bald eagles are predicted from any of the alternatives as known nesting and roosting habitats would not be affected.

Prescribed burns as proposed in Alternative 2 are generally of the type, size, intensity, location, frequency and execution that there is little, if any, soil exposed after the burn is completed. Control lines for prescribed burns are laid out along natural fuelbreaks where possible, minimizing the need for line construction. Large snags which are currently suitable as potential roosts might be rendered unsuitable during a fire. They might catch fire, burn completely through, and fall to the ground. Some snags may be cut down if they are burning sufficiently to throw burning embers over the established fireline. Although some potential roosts may become unsuitable for eagles, others are created as small numbers of hardwood and pine trees are damaged and killed by fire, so there would be no overall, net negative or positive, indirect effect on the eagles ability to find roosting sites as a result of Alternative 2.

All burning as planned will be outside of known bald eagle nesting or wintering areas. Burning will also not result in any net change in unoccupied, suitable habitat for the species. Burning disturbances in the project area would be short term (1-2 days) and should not have any measurable, adverse effects on potential nesting or roosting activities by any, unknown bald eagles in the project areas. No live nest or roost trees would be destroyed by prescribed burns since burns would not directly affect these large, mature, live trees.

#### Cumulative Effects

Alternative one would have no direct or indirect effects on bald eagles. Therefore, there would be no cumulative effects on them as well as no occupied or unoccupied, suitable habitat for the species would be affected.

There would be a very small beneficial effect of the shoreline stabilization project for the bald eagle. However, overall the proposed action is not predicted to have any measurable effects on bald eagles. Local populations of bald eagles on the Forest would remain stable or continue to increase.

Neither alternative would result in the species trending toward federal listing.

#### **Eastern small-footed bat**

This is a relatively rare, insectivorous bat species in the midwest and only recently identified from Southern Illinois and the Forest. It was found under surface rocks in a large sandstone outcropping area on the Forest in Johnson County, Illinois. It is also thought to be a rare inhabitant in hibernation caves and mines in Southern Illinois in fall and winter. They are also thought to occasionally roost in

hollow trees in spring and summer (Bat Conservation International 2001). The species is not known from Jackson County, Illinois but is suspected to occur based upon the presence of unoccupied, suitable habitat for the species being present. Some karst and cave areas exist within the project area along with many rock outcroppings that provide unoccupied, suitable winter and summer roosting and hibernation habitat for the species. The eastern small-footed bat is one of the bat species that has had mortality associated with white-nose syndrome in the northeast (USFWS 2008). There have been no reports on mortality of the species to date in Illinois (Kath, personal communication to Steve Widowski 2008)

Alternative one, the no action, would not have any direct effects on the species since the species is not known from the project area. Some indirect, negative effects on suitable, unoccupied roosting and hibernation habitats could result from high intensity wildfires that might occur in the heavy, untreated fuel beds within the project area.

Alternative 2 would also have no direct effects on the species as it is not known from the project area. Prescribed burns in this alternative would not be done during the time (late spring and early summer season) when any non-volant, young of the species could be present. Any adults and volant juveniles of the species would be able to flee the area during burning if needed.

Smoke from spring and fall burns could have a minor, direct effect on any Eastern small-footed bats that might be roosting in the small caves and sink holes. This effect should be short duration and cause the animals to temporarily move from these habitats until smoke clears, usually the same day or next day. No actual negative effects on individuals of the species are predicted from smoke from the burns since none are currently known from the area.

Any effects on the species from this alternative would most likely be indirect effects on unoccupied, suitable habitats. While effects of fire on the eastern small-footed myotis are largely unknown, vegetation changes that ultimately alter the microclimate (temperature, humidity, cover, etc.) could have some possible, negative effects. Indirect effects of this alternative on unoccupied, suitable habitat would be limited as very limited actions would actually occur in or adjacent to rock outcroppings and caves due to the general sparsity of fuels in these areas. Rock outcroppings and cave entrances in the project areas would not be intentionally ignited by burn crews. No fire lines would be constructed in or immediately adjacent to cave habitats in order to protect them as identified in the Forest Plan (Shawnee National Forest Plan 2006, p 297).

Some live and dead trees with cavities which are another possible roosting habitat for the species could be negatively affected by fire. These habitats may also be created by fire in some areas as well. Prescribed fires should not result in any major losses in overstory trees that have not already been affected by the tornado damage.

Therefore, alternative 2 is predicted to have very limited and immeasurable, indirect effects primarily on unoccupied, suitable habitat for the eastern small-footed bat.

#### Cumulative Effects

Alternative one could indirectly result in an increased risk of a high intensity fire because of the higher fuel levels. A high intensity wildfire could have some negative effects to unoccupied, suitable habitat for the species. Small caves and rock outcrops in the project area have not been affected to date by

actions or modifications that would be detrimental to bat use. No negative effects on them in the future from recreation use are predicted. These areas are generally avoided by vegetation management actions due to their steep and/or uneven terrain that does not favor equipment operation. These small rock outcrops are also not heavily used for recreation also do to their difficult terrain. White-nose syndrome is not known from Illinois to date (Kath, 2008, personal communication to Steve Widowski) and is not considered a likely cumulative effect on the species in the temporal period for cumulative effects analysis. Taking the above past, present and future actions along with no prescribed burning actions proposed in Alternative one, there would be no measurable cumulative effects on the species or on unoccupied, suitable habitat for the species.

Past, present, and future effects listed for Alternative one above would be the same that would combine with effects of Alternative two. The species could use caves, rock outcrops, or hollow trees in the project area during the burning seasons but there are currently no records for the species from the project area. Roosting areas would generally not be affected by burning because there are usually limited fuels around these rocky, roosting areas and areas would not be intentionally ignited by burn crews during prescribed fires. At worst, a few, unknown individuals would have to flee (by taking flight) the flames of the fires and temporarily move. No negative effects are predicted on these individuals other than a very short term, temporary disturbance during daytime roosting periods. None of the past, present, or future actions would combine with the project effects to create a cumulative effect since there would be no negative effects on individuals that would reduce their vigor or viability and few if any effects on unoccupied, suitable habitat for the species.

Neither alternative would result in the species trending toward federal listing.

### **SPECIES WITH VIABILITY CONCERNS**

Species of viability concern are indicators of biodiversity whose viability has been determined to be under stress.

#### **Gray treefrog**

The gray treefrog is an amphibian species that commonly occurs in upland and bottomland, hardwood forests across the Forest including within upland, hardwood forests within the project area (Phillips et. al. 1999). The species is arboreal in live, hardwood trees except during breeding seasons when it is on the ground and in water around ponds, streams, and water-filled road ruts. In the late fall and winter the species is known to be inactive hiding in tree holes, under bark, in rotten logs, under leaves, and under tree roots late fall through early spring (Nature Serve 2008). Breeding season for the species in Southern Illinois is late April to August (Phillips et. al. 1999).

Alternative one, no action, would have no direct or indirect effects on the species since there would be no disturbance of soils, water or forests in the project area from project actions.

Burning planned in Alternative 2 could have direct effects on some individuals hiding under bark and leaves should these leaves or bark be consumed by fire during burns in late fall-early spring and in late April when the species is on the ground moving to breeding ponds, streams, and water-filled road ruts. Indirect effects of prescribed fires would be the maintenance of the diverse, hardwood forests that are habitat for the species.

Cumulative Effects

Alternative one would have no cumulative effects since it did not have any direct or indirect effects on the gray treefrog.

When looking at the proposed action only future prescribed burning would have a measureable impact and only in the first year or two. If the burning is done when the frogs are out, it could have a negative impact, similar to those discussed for the proposed action. The cumulative effects would be more individual frogs killed but overall it would not have long-term effect (beyond two years) on the population because of the fecundity of the species. Taking into account the past, present and future actions listed above, losses of some individuals as a direct result of burning would not affect overall populations of the species in the project area as long as diverse, hardwood habitats are maintained.

Neither alternative would reduce the overall, viability of the species on the Forest.

### **Northern bobwhite quail and Yellow-breasted chat (Both are SVE and MIS)**

The northern bobwhite quail is a resident, native, ground-nesting, gallinaceous bird species that is found in old fields, grasslands, crop field edges and early successional Forests and woodlands in Southern Illinois and in the project area. The yellow-breasted chat is a native, neo-tropical migrant, songbird that utilizes old fields, and early successional forests, and field and forest edges in Southern Illinois and in the project area. Bobwhites are a ground nesting species and the yellow-breasted chat is a shrub nesting species. Both are considered early successional bird species of forests and fields and both are also Management Indicator Species (MIS) for early successional forest, old fields, grasslands, and shrublands for the Forest. Both nest after May 1 each year.

Alternative one would have no direct effects on these two species since no actions would occur on National Forest or private land in suitable habitats for them. Indirect effects of Alternative one on both species would be loss of most, suitable, old field and early successional forest habitats in the project area on National Forest without management (disturbances) to maintain early successional forests and old fields. This would result in lower populations of each in the project area in the future.

Alternative two would have no direct effects on either species since actions would occur outside the nesting and brood-rearing seasons for each. Nesting for both species usually begins after May 1. Indirect effects on habitats include some reduction of residual nesting-cover for each in old fields and along forest edges; but since these areas would be burned only periodically, residual cover would remain most years. Indirect effects would also include increases in herbaceous groundcover and herbaceous plant seed production, increased plant diversity, increased oak-hickory regeneration, and more, high quality, early-successional habitats for both quail and chats in the project area than currently exist. This should result in higher populations of each in the project area in the future.

### **Cumulative Effects**

Under the no action alternative future fire, both prescribed fire and wildfire would result in an increase in early successional habitat, preferred by the quail and chat. Similarly road and utility right of way maintenance and openland management tend to increase quail habitat suitability. These actions all improve quail and chat habitat and therefore would have a beneficial cumulative effect. However when combined with the no action alternative these slight improvements would not increase habitat suitability and populations of both species would still probably decline over time in the area..

The same past, present and future actions listed above for Alternative 1 would be part of the cumulative effects with Alternative 2 actions. The actions in Alternative two and those on right of ways and openlands in the project area vicinity, all improve quail and chat habitat and therefore would have a beneficial cumulative effect when combined with the habitat enhancing effects of the proposed action that should result in maintenance or slight improvements of populations of both species in the project area vicinity.

Neither alternative would reduce the overall, viability of the species on the Forest.

### **Worm-eating warbler and Wood thrush (Both are SVE and MIS)**

Both the worm-eating warbler and the wood thrush are native, neo-tropical, migrant songbirds. Both occur in mature, upland forests in the project area. Both are also MIS for the Forest for mature forest habitats. Both begin nesting and using the Forest in late April and early May and leave the forest as part of fall and winter migration sometime in September each year. The worm-eating warbler is a ground-nesting species and the wood thrush is a shrub/small tree nesting species. The project area forests are fragmented by private land agriculture, powerline corridors, level 3 and 4 (surfaced or paved) roads, and a large reservoir and there are no large tracts (over 500 acres) of unfragmented hardwood forest. Therefore the area is not high quality habitat for either species.

Prescribed burns would not be done in mature forests during the breeding seasons for these species and thus neither Alternative would have any direct effects on either species. Alternative one, no action, would not have any indirect effects on either species as well as mature forest habitats and forested understories that include much hardwood leaf litter would not be affected.

Indirect effects of Alternative 2 would be short term loss of ground and shrub nesting cover in late spring and summer seasons on National Forest immediately following burns. However, usually the entire area is not burned in any one year and many nesting habitats would be unaffected and remain available for each. The net, indirect effects would be some, small reductions in populations of both species in the short term and no changes in populations or habitat quantity or quality in the long term for either species.

### **Cumulative Effects**

Alternative one would have no cumulative effects on either species since it did not have any direct or indirect effects due to no actions.

Historic actions impacting warbler and thrush habitat include fragmentation of most mature, hardwood forest in the project area by private land agriculture, powerline corridors, construction and maintenance of surfaced and paved, county and state roads, and a large reservoir. These actions are now for the most part considered in the baseline for this effects analysis.

Future actions include additional prescribed burning and openland management north of the project area and continued agricultural and residential developments on private lands. These actions would further fragment the habitat leading to a slight decrease in populations of both species and short term reductions of nesting habitats for each and no net habitat or population change in the long term. The population viability of both species would not change on the Forest in either alternative as unfragmented, mature hardwood forests are unaffected by planned actions.

Neither alternative would reduce the overall, viability of the species on the Forest.

### **Red-headed woodpecker**

This is a cavity-dependent, bird species on the Forest that utilizes open, upland and bottomland, oak woodlands and forests with many dead trees for nesting and foraging. The species is not known from the project area but the area contains much, unoccupied, suitable habitat for the species, re. all the dead trees from the tornado damage.

Since all standing, dead trees are protected in Forest Plan standards and guidelines for Indiana bats under all alternatives; and the species is not presently known from the project area; no direct effects on the redheaded woodpecker are anticipated from either alternative. The indirect effect of Alternative one, the no action, would be the continued decline in oak/hickory forest abundance and subsequently no improvement in population of the species in the project area as a result.

There will be positive, indirect effects of Alternative 2 on the red-headed woodpecker from prescribed burning that maintains oak-hickory forests in the uplands in the project area. Hardwood snags that provide nesting and foraging habitats would decrease slightly in this alternative as some are consumed by fire. A number of new snags would also be created by the burns (Widowski, 31 years of personal observations of post-burned areas). As a result of all of the above effects on suitable habitats, increases in populations of the species in the project area are predicted as a result of Alternative 2.

### **Cumulative Effects**

Historic actions in the project area that have affected this species included timber harvests and fire suppression and agricultural and residential type conversions of hardwood forests. These are now considered part of the baseline for this analysis. Present actions include private land timber harvest and timber stand improvement which would improve the oak-hickory forest. Similarly the future prescribed fire would be beneficial to the hardwood forest ecotype preferred by this species. These actions would improve the habitat for the woodpecker. However, when combined with the effects of the no action alternative there would still be a downward trend in habitat and population for the species in the project area.

Taking into account the above described, past, present, and future actions in the project area vicinity, the proposed action would result in positive, cumulative effects on the species as oak forest habitats are improved. Populations of red-headed woodpeckers are predicted to increase slightly in the project area and on the Forest as a result of these cumulative effects.

Neither alternative would reduce the overall, viability of the species on the Forest.

### **American woodcock**

The American woodcock is a species dependent on wet areas in hardwood forests, oldfields and grasslands for foraging, and early-successional areas in forests and oldfields for nesting. The species uses these habitats on the Forest and in the project area. The species has always been considered an uncommon nesting species in Illinois and on the Forest (Kleen et. al. 2004). It is known to nest just north of the project area in openlands west of Kinkaid Lake. The species is an early spring nester, laying eggs in early March in Southern Illinois (Robinson 1996).

This species would benefit indirectly through effects on its habitats from prescribed burning to maintain early-successional, hardwood forests in both the uplands and bottomlands in the even-aged, hardwood forest management areas and openings and old fields in the project area. Vegetation disturbances that create areas of early-successional forests in these areas are beneficial for this species.

Alternative one would have no direct effects on the species since no actions would occur in suitable habitats for it. Indirect effects of Alternative one on the American woodcock would be loss of most, suitable, old field habitats in the project area without management. This would subsequently result in lower populations of the species in the project area.

Alternatives 2 could have some direct, negative effects on a few individual American woodcocks that may lose their first nests by burning after March 1 in the Spring in the project area. Since the entire project area would not burn each spring, many nesting habitats would be left unburned, and individuals would be able to re-nest. Overall, direct negative effects on populations of woodcocks in the area would be minimal. Indirect effects of Alternative 2 on the American woodcock would be the maintenance of early successional forest and old field habitats that provide breeding and feeding habitat for the species in Southern Illinois.

#### Cumulative Effects

Historic actions in the project area that affected the American woodcock were timber harvest, creation of old fields, and creation, management, and lack of maintenance of wildlife openings. These actions are now considered as part of the baseline for this analysis. Openland management, road/utility right-of-way maintenance and timber stand improvement generally increase the early successional habitat favored by this species. When combined with the effects from the no action alternative, populations of American woodcocks are predicted to be maintained in the short term and decrease in the long term.

Taking into account the above past, present, and future actions, cumulative effects of the proposed action would be improvements of habitats and thus populations of the species being maintained or improved in the short term and increasing slightly in the long term in the project area.

Neither alternative would reduce the overall, viability of the species on the Forest.

#### **Northern river otter**

The northern river otter is a medium-sized, mammal that may occur in the project area in Kinkaid lake and small sections of perennial streams adjacent to the Lake. The species is primarily aquatic and confined to the lakeshore and streambanks. The lake and perennial streams in the project area would not be directly or indirectly affected by Alternative 1, no action because no action would not affect existing water quality in Lake Kinkaid or the riparian, shoreline vegetation around the Lake in the project area.

Alternative 2 would likewise have no direct effects on Kinkaid Lake or the few small, perennial streams adjacent to it in the project area and thus would have no direct effects on the river otter. Prescribed fires may result in some small, indirect effects on the species from some small amounts of increased sediments that might wash into the Lake or adjacent perennial streams immediately following fires and subsequent rain events in the areas prior to plant green-ups that follow the prescribed fires. Small and localized, increases in sediments can have both positive and negative, indirect effects on the species through effects on its fish and aquatic invertebrate prey. Negative

effects would result from any short term changes in water quality that might alter fish and aquatic invertebrate breeding or foraging habitats resulting in less survival of young. This effect would be small, short term and localized. Positive effects would be the increased nutrients and food availability for the fish and aquatic invertebrates from small pulses of sediments and their nutrients into lake and stream habitats resulting in possible increased production. Both negative and positive, indirect effects would be insignificant in their effects on any river otter populations in the project areas, especially since river otters are such opportunistic predators and can easily shift to alternative prey sources depending upon their availability.

#### Cumulative Effects

Alternative one would have no cumulative effects since it did not have any direct or indirect effects on the river otter.

The proposed shoreline stabilization would slightly improve habitat conditions for the otter. However, this improvement would not be perceivable. Overall the proposed action would have no net, measurable cumulative effects river otters in the project area vicinities.

#### *Summary of Effects*

##### **Regional Forester's Sensitive Species**

Effects of the project alternatives on Regional Forester's Sensitive Species are summarized in Table 4. The increase habitat quality for the rodents in project area will have a secondary positive effect on those species that hunt the area for rodents. A Regional Forester's Sensitive species (RFSS) which will be helped by this increase in the prey base is the timber rattlesnake. The rattlesnakes may also benefit directly from the opening of the forest canopy. The added sunlight reaching the forest floor may provide additional basking areas for this species. This alternative will have an overall positive effect on the habitat available to RFSS species. Implementation of this alternative will have no large scale, adverse, direct or indirect effects nor is it likely to result in a loss of range-wide viability or a trend towards federal listing of any RFSS.

<b>Table 4. Summary of Effects on RFSS Terrestrial Animals</b>		
<b>Scientific Name</b>	<b>Alt. 1 (No Action)</b>	<b>Alt. 2 (Proposed Action)</b>
<b><i>Invertebrates</i></b>		
Subtle cave amphipod <i>Stygobromus subtilis</i>	No direct effects on species or habitats. Possible negative, indirect effect on cave habitats from future large and/or very hot wildfires in the karst watersheds in the project area..	Some minor, short term, indirect, negative and positive effects on habitats from slight increases in sedimentation in small caves immediately following burns. No long term effects on the known populations on the Forest.
<b><i>Reptiles</i></b>		
Timber rattlesnake <i>Crotalus horridus</i>	Continued loss of habitat, downward trending of population in project area as oak/hickory forests are replaced by beech/maple forests.	Some minor, direct, negative effects on a few individuals. Indirect effects are increases in quantity and/or quality of available denning and foraging habitat. Net improvement of habitats and populations in the project area and on the Forest.
<b><i>Birds</i></b>		
Cerulean warbler <i>Dendroica cerulean</i>	No effects on existing populations or habitats.	Positive effects of some, increase in quantity and quality of available, unoccupied, suitable habitat. No effect on populations.
Loggerhead shrike <i>Lanius ludovicianus</i>	Continued loss of habitat, downward trending of population in project area.	Positive effects of increase in quantity and quality of available, unoccupied, suitable habitat. No effect on populations.
Bald eagle <i>Haliaeetus leucocephalus</i>	No effects on existing populations or habitats.	No effects on existing populations or habitats.
<b><i>Bats</i></b>		
Eastern small-footed bat <i>Myotis leibii</i>	No direct effects on species or habitats. Possible negative, indirect effect on cave habitats from future large and/or very hot wildfires in the karst watersheds in the project area..	Some minor, short term, indirect, negative and positive effects on habitats from smoke in small caves immediately following burns. No long term effects on the known populations on the Forest.

### ***Species of Viability Concern (SVC)***

The effects of project alternatives on SVC are summarized in Table 5. The proposed project may cause minimal negative effects on the SVC during project implementation. Alternative 2 would promote early successional habitat, control shade tolerant competing species and promote hardwood regeneration and result in a more diverse mixed hardwood forest component that would provide habitat on and near the forest floor.

<b>Table 5. Summary of Effects – Species of Viability Concern (SVC)</b>		
<b>Species</b>	<b>Alternative 1 (No Action)</b>	<b>Alternative 2 (Proposed Action)</b>
Gray treefrog <i>Hyla chrysoscelis</i> and <i>H. versicolor</i>	No effects on habitats or populations.	Slight negative, direct effect on few individuals. No net effects on populations.
Northern bobwhite <i>Colinus virginianus</i> (MIS)	Continued loss of habitat, downward trending of population in project area.	Improvement of habitat, Increase in herbaceous ground cover, seed production, plant diversity, increase in oak/hickory forests, and more early successional forest and field habitats. Increase in population in project area.
Worm-eating warbler <i>Helmitheros vermivorum</i> (MIS)	No effects on habitats or populations.	No direct effects. Net indirect effects resulting in small, short term, decrease in populations. No change in long term populations in area or on Forest.
Wood thrush <i>Hyoicichla mustelina</i> (MIS)	No effects on habitats or populations.	No direct effects. Net indirect effects resulting in small, short term, decrease in populations. No change in long term populations in area or on Forest.
Yellow-breasted chat <i>Icteria virens</i> (MIS)	Continued loss of habitat, downward trending of population in project area.	Improvement in woodland class size, stem densities, and vegetative and herbaceous cover. Moderate predicted increase in quantity and quality of early successional habitat. Increase in population in project area.
Red-headed woodpecker <i>Melanerpes erythrocephalus</i>	Indirect effects are continued loss of habitat, downward trending of population in project area.	Improvement of habitat and populations.
American woodcock <i>Scolopax minor</i>	Continued loss of habitat, downward trending of population in project area.	Improvement of habitat by maintaining old fields and improvement of early successional forests. Improvements in populations in the project area.
Northern river otter <i>Lontra canadensis</i>	No effects.	Some slight, short term negative and positive effects on riparian foraging habitats. No effects on populations in area or on the Forest.

### **Recommended Conservation Measures and Monitoring to Avoid, Minimize, or Mitigate Adverse Effects**

Mitigation incorporated into the action alternative will be used to reduce or eliminate potential effects on RFSS and Species of Viability Concern. The following effects analysis assumes that any potential impacts will be mitigated by the following:

Wildlife Resources	Retain all standing dead trees unless necessary to cut for human safety or to accomplish project objectives. Suitable Indiana bat summer roost trees cannot be removed April 1 - Sept. 30 unless documented as non-use by roosting bats.	These design criteria are required “terms and conditions” or “reasonable and prudent measures” in December. 2005 US Fish & Wildlife Service Biological Opinion for the Forest Plan.
	To reduce the chances of affecting maternity roosts and foraging habitats, no prescribed burns shall be done in upland forests from May 1 - Sept. 1	
	Burning near known timber rattlesnake den locations will be done only during hibernation seasons when individuals are in dens (11/1-3/31).	Den sites are extremely important to the maintenance of populations.
	In order to protect Eastern small-footed bats, rock outcroppings and cave entrances in the project area will not be intentionally ignited by burn crews. No fire-lines would be constructed in or immediately adjacent to cave habitat.	These habitats require additional protection, which is specifically identified in the Forest Plan (USDA 2006).

**Mitigation Measure:** Retain all standing dead trees unless necessary to cut for human safety or to accomplish project objectives. Suitable Indiana bat summer roost trees cannot be removed April 1 - Sept. 30 unless documented as non-use by roosting bats.

*Purpose of Mitigation Measure:* To protect suitable Indiana Bat summer roost trees.

*How we know mitigation will be effective:* These design criteria are required “terms and conditions” or “reasonable and prudent measures” in December. 2005 US Fish & Wildlife Service Biological Opinion for the Forest Plan.

*Mitigation Monitoring:* see monitoring table below.

*Responsible Person:* The Mississippi Bluffs Ranger District Wildlife Biologist will be responsible for assuring that mitigation is implemented.

**Mitigation Measure:** No prescribed burns shall be done in upland forests from May 1 - Sept. 1.

*Purpose of Mitigation Measure:* To reduce the chances of affecting maternity roosts and foraging habitats.

*How we know mitigation will be effective:* These design criteria are required “terms and conditions” or “reasonable and prudent measures” in December. 2005 US Fish & Wildlife Service Biological Opinion for the Forest Plan.

*Mitigation Monitoring:* see monitoring table below.

*Responsible Person:* The Mississippi Bluffs Ranger District Wildlife Biologist will be responsible for assuring that mitigation is implemented.

**Mitigation Measure:** Burning near known timber rattlesnake den locations will be done only during hibernation seasons when individuals are in dens (11/1-3/31).

*Purpose of Mitigation Measure:* To protect known den sites and maintain populations of timber rattlesnakes.

*How we know mitigation will be effective:* Past studies and Forest monitoring have shown that protection of den sites is critical to maintaining viable populations.

*Mitigation Monitoring:* see monitoring table below.

*Responsible Person:* The Mississippi Bluffs Ranger District Wildlife Biologist will be responsible for assuring that mitigation is implemented.

**Mitigation Measure:** Rock outcroppings and cave entrances in the project area will not be intentionally ignited by burn crews. No fire-lines would be constructed in or immediately adjacent to cave habitat.

*Purpose of Mitigation Measure:* To protect Eastern small-footed bats.

*How we know mitigation will be effective:* These habitats require additional protection, which is specifically identified in the Forest Plan (USDA 2006).

*Mitigation Monitoring:* see monitoring table below.

*Responsible Person:* The Mississippi Bluffs Ranger District Wildlife Biologist will be responsible for assuring that mitigation is implemented.

**Monitoring:** The following specific monitoring actions will be conducted to monitor compliance with Forest-Wide and Management Prescription Standards and Guidelines:

**Objective:** To monitor achievement of wildlife snag habitat objectives.

**Desired Result:** There will be a minimal loss of snags within treatment area.

**Methods:** No snags will be intentionally felled during thinning operations. Twenty snag/cavity survey plots were established and surveyed in 2007. The center of each plot was marked with a metal T-post, and a GPS location recorded. Each plot was .5 acre in size. All snags and cavity trees were surveyed in 2007. Snags will be marked in accordance with Table H-1, Appendix H, and direction provided on pages 288-290 in the 2006 Forest Plan. Timber operations will be monitored during and after the project. A report will be prepared documenting the success in protecting snag habitat within the project activity area.

**Responsibility:** Hidden Springs Wildlife Biologist

**Objective:** To monitor achievement of wildlife cavity habitat objectives.

**Desired Result:** There will be a minimal loss of cavity trees within treatment area.

**Methods:** Twenty snag/cavity survey plots were established and surveyed in 2007. The center of each plot was marked with a metal T-post, and a GPS location recorded. Each plot was .5 acre in size. All snags and cavity trees were surveyed in 2007. Cavity trees will be marked in accordance with Table H-I, Appendix H in the 2006 Forest Plan. Timber operations will be monitored during and after the project. A report will be prepared documenting the success in protecting cavity habitat within the project activity area.

**Objective:** To monitor maintenance of key wildlife successional stages and vegetation types.

**Desired Results:** To monitor the ability of the Forest to provide for diverse plant communities and successional stages.

**Methods:** Track acres restored from pine to hardmast producing forest types, and important successional stages and entered into NRIS.

**Responsibility:** Forest GIS/NRIS Coordinator

**Objective:** To monitor changes in bird diversity and abundance within the project area.

**Desired Results:** To be able to document changes in avian species and abundance resulting from the implementation of hardwood restoration activities.

**Methods:** A network of permanent bird monitoring points will be established and surveyed prior to

implementation of hardwood restoration activities. Bird points will be run one time a year, immediately prior to implementation of activities, and each year thereafter.

**Responsibility:** Mississippi Bluffs RD Wildlife Biologist

**Objective:** To monitor the change in the frequency and diversity of plant species within treatment areas over time.

**Desired Results:** To be able to track changes in species composition and abundance over time.

**Methods:** Vegetation monitoring plots will be surveyed during the growing season: 1) one year after completion of thinning; and, 2) the immediate year following prescribed burning, out to 15 years.

**Responsibility:** Hidden Springs Ecologist/Botanist

Table 6. Proposed monitoring to ensure the effectiveness of mitigation measures necessary to protect the Indiana bat, timber rattlesnake, and Eastern small-footed bat.		
Wildlife Resources	Snags will be monitored to determine if snag retention standards and guidelines are effective.	Operations will be monitored during and after the project. A report will be prepared documenting the success in protecting snag habitat within the project area.
	Number of cavity trees retained post-treatment will be monitored to determine if standards and guidelines are effective.	Cavity trees will be monitored during and after project implementation.
	To determine the balance between early, mid- and late-successional habitat conditions is appropriate-tiers to Forest-level monitoring objectives.	Post-treatment, and then every five years within the project area.
	Permanent monitoring points would be surveyed annually to determine changes in avian management indicator species populations.	Monitor annually an established network of permanent bird monitoring points in treated stands and untreated pine stands.

This evaluation and many hours of field work in the project areas were done by Stephen P. Widowski, Wildlife Biologist on the Mississippi Bluffs Ranger District.

*/s/ Stephen P. Widowski*

Stephen P. Widowski, Wildlife Biologist

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