BIOLOGICAL OPINION

on the

LAND AND RESOURCE MANAGEMENT PLAN
WAYNE NATIONAL FOREST, OHIO

Prepared by:

Angela L. Boyer
U.S. Fish and Wildlife Service
6950 Americana Parkway, Suite H
Reynoldsburg, Ohio 43068

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INTRODUCTION

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the continued implementation of the Wayne National Forest Land and Resource Management Plan, as amended (Forest Plan) and projects predicated upon it, and its effects on the Indiana bat (*Myotis sodalis*), bald eagle (*Haliaeetus leucocephalus*), and American burying beetle (*Nicrophorus americanus*), in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.). This biological opinion is based on information provided in the March 12, 2001 Wayne National Forest Programmatic Biological Assessment Land and Resource Management Plan. A complete administrative record of this consultation is on file at the Service's Reynoldsburg, Ohio Field Office (ROFO).

CONSULTATION HISTORY

In 1986, the Wayne National Forest (NF) initiated informal consultation on their Forest Plan with ROFO, under the ESA. At that time, the management standards and guidelines in the Forest Plan stated that there were, "no Federally-listed endangered, threatened, or proposed species in the vicinity of the Wayne National Forest which might be affected by management activities on the forest" (USFS 1986). In July 1992, the Forest Plan was amended to recognize the presence or possible presence of four Federally-listed threatened or endangered species in the vicinity of the Wayne NF (Indiana bat, bald eagle, peregrine falcon and Kirtland's warbler) (USFS 1986). Until initiation of formal consultation on April 4, 2001, the effects of proposed actions on Federally-listed species have been addressed by the Wayne NF through informal consultation with the Service on a project-by-project basis.

In 1998, the Indiana bat was discovered on the Wayne NF. This new discovery, along with reports of several other Federally-listed species occurring near Wayne NF, prompted the Wayne NF to begin the process of amending their Forest Plan. On June 7, 2000, Wayne NF contacted ROFO with a letter from the Wayne NF Supervisor, requesting that informal consultation continue on Federally-listed species occurring on or near the Wayne NF. Nine Federally-listed species were identified in the June 7, 2000 letter as being present on or near the Wayne NF. The nine species identified were the Indiana bat (*Myotis sodalis*), bald eagle (*Haliaeetus leucocephalus*), American burying beetle (*Nicrophorus americanus*), northern wild monkshood (*Aconitum noveboracense*), running buffalo clover (*Trifolium stoloniferum*), small whorled pogonia (*Isotria medeoloides*), Virginia spiraea (*Spiraea virginiana*), fanshell mussel (*Cyprogenia stegaria*), and the pink mucket pearly mussel (*Lampsilis abrupta*).

Subsequent meetings and telephone conversations took place between the Service and the Wayne NF to discuss the format of the pending biological assessment (BA) addressing Federally-listed species under the current Forest Plan. The Service has been provided with review copies of the numerous drafts of the BA.

On February 14, 2001, the Service met with the Wayne NF Supervisor and Wayne NF biologists to discuss the formal consultation process. On March 15, 2001, representatives of the Service

and Wayne NF met at the Service's Regional Office at Fort Snelling, Minnesota to discuss the formal consultation process with the Service. The final BA was completed by the Wayne NF on March 12, 2001 and received by the Service at the March 15, 2001 meeting.

In response to the Wayne NF's June 7, 2000 letter, the Service sent a letter dated March 18, 2001 to the Wayne NF stating that we concur with the list of species noted in Mr. Zambrana's letter. In this letter, the Service identified six species that could be addressed through the informal consultation process. These six species are northern wild monkshood, running buffalo clover, small whorled pogonia, Virginia spiraea, fanshell mussel, and pink mucket pearly mussel. In the Service's March 18, 2001 letter, three species, the Indiana bat, bald eagle, and American burying beetle, were identified as species for which the Wayne NF should address through formal consultation with the Service.

In its request for formal consultation received by the Service on April 6, 2001, the Wayne NF determined that activities outlined in the Forest Plan are likely to adversely affect the Indiana bat (*Myotis sodalis*) and are not likely to adversely affect the bald eagle (*Haliaeetus leucocephalus*), American burying beetle (*Nicrophorus americanus*), northern wild monkshood (*Aconitum noveboracense*), running buffalo clover (*Trifolium stoloniferum*), small whorled pogonia (*Isotria medeoloides*), Virginia spiraea (*Spiraea virginiana*), fanshell mussel (*Cyprogenia stegaria*), and pink mucket pearly mussel (*Lampsilis abrupta*).

The Wayne NF further requested our concurrence on these effect determinations. In a letter dated April 19, 2001, the Service: (1) concurred with the Wayne NF's determination that certain actions to implement the Forest Plan would be likely to adversely affect the Indiana bat, (2) indicated that the initiation package associated with the Forest Service's request for formal consultation was adequate, and (3) announced that formal consultation between the two agencies had begun. In the same letter, the Service concluded that activities outlined in the Forest Plan were also likely to adversely affect the bald eagle and American burying beetle.

The Service provided a draft biological opinion to the Forest Service on July 12, 2001 for review. The Service learned through discussions with the Wayne NF, that the Forest Service comments on the draft biological opinion would be received by the Service on August 20, 2001. Because the 135-day formal consultation period would conclude on August 17, 2001, the Service sent a letter dated August 8, 2001 to the Forest Service requesting an 30-day extension to the formal consultation period. On August 22, 2001, the Service received a letter from the Forest Service agreeing to the request for a 30-day formal consultation extension.

On August 20, 2001, the Service met with the Wayne NF Supervisor and Wayne NF biologists to receive and discuss the Wayne NF's comments on the draft biological opinion. A revised draft biological opinion was provided to the Wayne NF on September 7, 2001. On September 11, 2001, the Service met with the Wayne NF Supervisor and Wayne NF biologists to receive and discuss additional comments.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The action considered in this biological opinion is the continued implementation of the existing Wayne NF Forest Plan, as amended. The goal of Forest Plan is to provide for multiple-use and a sustained yield of products and services in a way that maximizes long-term net public benefits in an environmentally sound manner (USFS 1986). The Wayne NF will undertake a host of management actions to achieve this goal. Detailed descriptions of the proposed actions are provided in the Programmatic Biological Assessment Land and Resource Management Plan (BA); these descriptions are hereby incorporated by reference.

Wayne NF estimates the following activities may benefit the Indiana bat and its habitat:

- Timber harvest
- Reforestation/Timber stand improvement
- Prescribed fire
- Special Area and Research Natural Areas
- Land exchange/purchase
- Creation of lakes, ponds and marshes
- Closing of underground entrances (gating and fencing)

Wayne NF estimates the following activities may affect but are not likely to adversely affect the Indiana bat and its habitat:

- Prescribed fire
- Land exchange/purchase
- Special used (agriculture permits and utility corridors)
- General recreation use
- Pesticide use

Wayne NF estimates the following activities may adversely affect the Indiana bat and its habitat:

- Timber harvest
- Creation of wildlife openings
- Special Areas and Research Natural Areas
- Mineral development
- Road construction , maintenance and use
- Recreation facility/trail construction, maintenance and use
- Closing of Underground Entrances (backfilling)

Wayne NF estimates the following activity would have no effect on the Indiana bat and its habitat:

- Maintenance of wildlife openings
- Grazing

Table 1. Wayne NF estimates the following management activities that could modify Indiana bat habitat modification may occur over the next five years.

MANAGEMENT ACTIVITY	Forested acres affected	DESCRIPTION OF ACTIVITY
Timber harvest (2,500 total acres)	2250	hardwood thinning and uneven-aged cuts
	250	pine thinning and uneven-aged cuts
Timber stand improvement	2500	treatments to improve the composition, structure, health and vigor of the trees in a stand
Prescribed fire	2500	management of plant communities
Road construction (94 total acres)	32	permanent road construction
	37	temporary road construction
	25	oil/gas well road construction
Trail construction	160	hiking, horse, and ORV trails
Creation of wildlife openings	352	forest openings construction
Mineral development (2125 total acres)	25	oil/gas well development
	2100	Strip mining
Special Use Permits	125	utility corridors and special use roads
Hazard Tree Removal	125 **trees**	hazard trees that must be cut between April 15 and September 15.
Closing Underground Entrances	250	Closing subsidence openings and old mine portals
TOTAL ACRES	**10,606**	10,606 acres + an additional 125 hazard trees

According to the Wayne NF Forest Plan, 5 dead or dying trees are to be left standing per acre when any timber is cut. Of these 5 trees, one is to be at least 18 inches in diameter or larger, two are to be 14 inches or larger and the remaining three are to be greater than 6 inches in diameter. In addition, 10 hickory trees between 2 and 6 inches dbh are to remain standing. Approximately 3,400 acres or 1.7 percent of the forest was harvested between 1988 and 1997, leaving the vast majority of the Wayne NF untouched.

In the next five years, the Forest Service estimates that prescribed fire may occur at the rate of 500 acres per year on the Wayne NF for the restoration of native communities. Fire may create additional snags for roost trees by killing large trees without completely burning them to the ground or removing all of their bark. These newly created snags could be useful to males for roosting (USFS 1998). Snags created through burning may also be used by female Indiana bats for maternity colonies. The trees must have a large diameter and contain the majority of their bark cover.

The Wayne NF currently has 8 designated Special Areas. The total acreage of Special Areas on the forest is 2,835 acres. The Wayne NF also has two designated Research Natural Areas (RNA). Reas Run RNA, located in the Marietta Unit, is 78 acres. Reas Run consists of an approximately 35-acre mature Virginia Pine stand surrounded by oak-hickory and maple-beech-birch stands, intermixed by younger, smaller Virginia Pine (USFS 1987). These areas would provide a substantial amount of large, mature trees and snags for male and maternity colony roosting during summer months. Depending on the density of the forest areas, these mature trees may not have the amount of sun exposure necessary for proper fetal and juvenile bat development.

Acquisition of land by the Forest Service, creating larger, contiguous areas of public ownership, would reduce potential disturbance to roosting or hibernating Indiana bats from private owner actions. These areas could then be monitored and surveyed for bat activity as well as managed to provide more advantageous forest conditions for the Indiana bat.

According to the Forest Plan monitoring reports, reforestation was conducted on 7,839 acres in the forest between 1988 and 1996. Between 1,000 and 1,500 acres of reforestation are projected to occur each year in the future. Reforestation and timber stand improvement would eventually create roosting and foraging habitats for the Indiana bat as the trees mature and create canopy cover.

Construction of approximately one acre of small lake, marsh or pond habitat per year is permitted by the Forest Plan in the future. Also, the standards and guidelines state that two waterholes per
square mile may be created on the Wayne NF.

Mineral exploration and development is on-going throughout the forest. The Wayne NF has controlling interest on approximately 28 percent of the mineral estates on the forest (USFS 1987). Currently, there are approximately 800 oil and gas wells on the forest in various stages of development, production, or abandonment. Per Forest Plan standards and guidelines, all surface-disturbing activities must assure that mitigation measures for protected species are complied with. In addition, an assessment of impacts to species must be completed before commencement of any specific forest activity.

The following measures are proposed by the Forest Service to minimize adverse effects from Wayne NF activities to the Indiana bat or its habitat on the Wayne NF (USFS 2001a). These measures are not in the current Forest Plan.

1. Protect hibernacula:

    a. Prevent unauthorized entry to hibernacula using methods and designs approved by the Service.

    b. Properly sign all sites.

    c. Deter human access to areas surrounding hibernacula by closing or relocating trails that lead to or pass within easy viewing distance of hibernacula.

    d. Retain, depending on local circumstances, one-quarter mile of undisturbed forested buffer surrounding all hibernacula on Wayne NF land.

    e. When developing prescribed burn plans, ensure smoke management in the vicinity of hibernacula.

2. Protect potential roost trees:

    a. Protect any known roost trees and coordinate with the Service if the tree must be removed for any reason.

    b. During non-hibernation season, retain all standing dead trees greater then 9 inches diameter at breast height (dbh) unless they are a safety hazard or under special circumstances after coordination with a Wayne NF biologist.

    c. Demolish buildings or other structures that can harbor bats only during the hibernation season or after coordination with a forest biologist, unless there in an immediate safely hazard.

    d. During the non-hibernation season, retain all shagbark and shellbark hickory trees over 6 inches dbh and all trees over 6 inches dbh with large areas of loose bark, that are hollow, have major splits, or have broken tops unless they are a safety hazard or under special circumstances after coordination with a Wayne NF biologist.

3. Protect water sources:

    a. Do not repair road ruts or natural depressions where water collects unless they are contributing to soil erosion or sedimentation problems or public safety is compromised.

The following measures are proposed by the Forest Service to further the conservation and recovery of the Indiana bat or its habitat on the Wayne NF (USFS 2001a). These measures are not in the current Forest Plan.

1. Make the purchase of area with known hibernacula and willing sellers a high priority.

2. During timber harvest:

    a. Retain at least three snags per acre over 9 inches dbh, girdling live trees if necessary to achieve the minimum number.

    b. Retain enough live trees around large snags (over 12 inches dbh) to provide partial shading and to protect from wind throw.

    c. Retain at least 10 to 15 square feet of basal area per acre of suitable roost trees (6 inches dbh or greater). A Wayne NF wildlife biologist will be informed if any of these trees are accidentally felled.

    d. Leave all standing dead trees greater then 22 inches dbh and at least 8 standing dead trees per acre between 9 and 20 inches dbh during salvage harvests, where the majority of trees are dead or dying.

3. To improve foraging habitat, reduce canopy closure to 60 to 80 percent with thinning or uneven age harvests.

4. Inventory, monitoring, research, and outreach:

    a. Continue to monitor Indiana bats and document their habitat needs.

    b. Promote overall awareness of the species and its habitat requirements.

Wayne NF estimates that all activities permitted under the Forest Plan will have no effect on nesting Bald eagles based on the fact that there are no known nesting populations of the Bald eagle within the Wayne NF. However, the Forest Service recognizes that some Wayne NF activities could have an impact on potential Bald eagle habitat.

Wayne NF estimates the following activities may benefit Bald eagle potential habitat:

< Reforestation and timber stand improvement
< Land exchange/purchase
< Lake/pond/marsh construction/maintenance

Wayne NF estimates the following activities may affect but are not likely to adversely affect Bald eagle potential habitat:

- Timber harvest
- Prescribed fire
- Land exchange/purchase
- Road construction, maintenance and use
- Recreation facility and trail construction, maintenance and use
- General recreation
- Mineral development
- Pesticide use
- Agricultural permits and utility corridors

Wayne NF estimates the following activity would have no effect on Bald eagle potential habitat:

- Creation and maintenance of wildlife openings
- Livestock grazing

There are no known bald eagle nests within the proclamation boundaries of the Wayne NF. Habitat for the eagle is present throughout the forest and would increase over time as forest stands mature, so long as sufficient foraging areas remain present. The Wayne NF has a forest cover of more than 95 percent or 201,214 acres. Of that forested acreage, mature hardwoods (80 years or older) are found on approximately 30 percent or approximately 63,000 acres (USFS 1987, USFS 2000a). These mature forest areas exist along the Ohio River, Little Muskingum River, Hocking River, Lake Vesuvius, and Timbre Ridge Lake. Large riparian corridors with open water are limited on the Wayne NF. The Little Muskingum River could potentially be used by the bald eagle, but the Ohio River, Hocking River, Lake Vesuvius, Timbre Lake, or Burr Oak Reservoir would be more likely.

Reforestation activities would provide additional habitat in the future, as the new trees mature. Standards and guidelines are in place to protect the stands surrounding these sites and all riparian resources where the bald eagle would likely roost and hunt. All snags and den trees will also be left in place in accordance with established guidelines. Although these requirements vary by management area, an average of 5 dead or dying trees per acre with a minimum snag size of 6 inches in diameter are to remain following timber harvest and timber stand improvement. Of these five trees, two per acre are to be of 14 inches in diameter or larger and one for every two acres is to be 18 inches or greater in diameter. Prior to conducting activities which would remove trees, an assessment will be conducted by the Wayne NF to ensure no adverse impacts to protected species would occur. If bald eagles or indications of eagle use are present on the site, coordination with the Service would occur to prevent impacts to the species.

Ridgetop waterholes and floodplain wetlands have been created in the Wayne NF and are projected to continue at a rate of one acre per year in the future. These waterholes and wetlands aid in the

settling of sediment eroded from surrounding areas. Several standards are listed in the Wayne NF's Forest Plan that create and protect marshes, waterholes, fish habitat and fish populations as well as preserve water quality (USFS 2001a). These standards would increase the bald eagle's food supply and perhaps create a more attractive environment for eagles to roost and nest in the future.

Land exchange or purchase could be beneficial to the bald eagle. Forest Service acquisition of land from other owners could contain potential habitat for the species and create more consolidated areas of public ownership. The larger areas of ownership would afford the Forest Service the opportunity to manage these areas more efficiently for wildlife objectives.

The following measures are proposed by the Forest Service to further the conservation and recovery of the Bald eagle or its habitat on the Wayne NF (USFS 2001a). These measures are not in the current Forest Plan.

1. Wayne NF will cooperate with the Service the Ohio Department of Natural Resources (ODNR) on any reintroduction efforts that affect the Wayne NF.

2. Should the bald eagle be found on the Wayne NF, populations would be monitored and managed as directed by the species recovery plan.

3. Potential habitat for the bald eagle, if identified, would be managed to minimize activities that would threaten the habitat.

4. Continue and improve cooperation with State and private owners to conserve water quality and ensure healthy fish populations.

Wayne NF estimates that all activities permitted under the Forest Plan will have no effect on the American burying beetle since the beetles are not currently found on the forest. However, the Wayne NF recognizes that some Wayne NF activities could have an impact on potential American burying beetle habitat.

Wayne NF estimates the following activities may benefit potential habitat for the American burying beetle:

- Land purchase
- Maintenance of wildlife openings

Wayne NF estimates the following activities may affect but are not likely to adversely affect the potential habitat for the American burying beetle:

- Timber harvest (site preparation)
- Reforestation/timber stand improvement (site preparation)
- Prescribed fire

- Land exchange
- Road construction and maintenance
- Recreation facility and trail construction
- Mineral development
- Pesticide use
- Special uses (agricultural permits and utility corridors)

Wayne NF estimates the following activity would have no affect on potential habitat for the American burying beetle:

- Creation of wildlife openings
- Livestock grazing
- General recreation
- Creation of lakes, ponds and marshes
- Closing of underground openings

Even though the American burying beetle is not currently found on the Wayne NF, a reintroduction occurred at a nearby site bordering the Athens Ranger District. Since the beetle is heavily dependent upon the availability of carrion, activities that would improve habitat for their primary carrion source, the wild turkey, would be beneficial. The wild turkey prefers upland hardwood and mixed forest habitats. The Wayne NF works with the ODNR to maintain upland wildlife habitats as early successional maintenance, which benefits the wild turkey and ruffed grouse (King 2000c).

Land purchase could be beneficial to the American burying beetle. Wayne NF acquisition of land from other owners could contain potential habitat or better habitat for the species and create more consolidated areas of public ownership. The larger areas of ownership would afford the Wayne NF the opportunity to manage these areas more efficiently for wildlife objectives.

The following measures are proposed by the Forest Service to further the conservation and recovery of the American burying beetle or its habitat on the Wayne NF (USFS 2001a). These measures are not in the current Forest Plan.

1. Should the American burying beetle be found on the Wayne NF, populations would be monitored and managed as necessary to perpetuate the species.

2. Wayne NF will cooperate with the Service and the ODNR on any reintroduction efforts that affect the Wayne NF.

3. Potential habitat for the American burying beetle would be managed to minimize activities which would threaten the habitat, or threaten populations of potential carrion for the species.

To assess the landscape effects of the proposed actions and to facilitate Wayne NF's section 7(a)(2) responsibilities, a tiered programmatic consultation approach will be implemented. As individual projects are proposed under the Forest Plan, Wayne NF shall provide project-specific information to ROFO that (1) describes the proposed action and the specific area to be affected, (2) identifies the species that may be affected, (3) describes the manner in which the proposed action may affect listed species, and the anticipated effects, (4) specifies that the "anticipated effects from the proposed project are similar to those anticipated in the programmatic biological opinion," (5) a cumulative total of take that has occurred thus far under the tier I biological opinion, and (6) describes any additional effects, if any, not considered in the tier I consultation.

The Service will review the information provided by the Wayne NF for each proposed project and this project-specific review is appropriately documented. During this review if it is determined that an individual proposed project is not likely to adversely affect listed species, the Service will complete its documentation with a standard concurrence letter that refers to this BO, the tier I programmatic document (i.e., it "tiers" to it), and specifies that the Service concurs that the proposed project is not likely to adversely affect listed species or designated critical habitat. If it is determined that the proposed project is likely to adversely affect listed species or designated critical habitat, then the Service completes a tier II biological opinion with a project-specific incidental take statement.

The Service has determined that action area for this consultation includes the entire Wayne NF lands. This biological opinion addresses only those actions for which the Service believes adverse effects may occur.

STATUS OF THE SPECIES

Indiana Bat

The Indiana bat was officially listed as an endangered species on March 11, 1967 (32 FR 4001) under the Endangered Species Preservation Act of October 15, 1966 (80 Stat. 926; 16 U.S.C. 668aa[c]). The Endangered Species Act of 1973 extended full protection to the species. The Service has published a recovery plan (USFWS 1983b) which outlines recovery actions. Briefly, the objectives of the plan are to: (1) protect hibernacula; (2) maintain, protect, and restore summer maternity habitat; and (3) monitor population trends through winter censuses. The recovery plan is currently being updated to reflect new information concerning summer habitat use.

Thirteen winter hibernacula (11 caves and two mines) in six states were designated as critical habitat for the Indiana bat in 1976 (41 FR 187). Based on censuses taken at hibernacula, the total known Indiana bat population is estimated to number about 352,000 bats. The most severe declines in wintering populations have occurred in two states: Kentucky, where 145,000 bats were lost between 1960 and 1975, and Missouri, where 250,000 Indiana bats were lost between 1980 and 1995. In Indiana, populations dropped by 50,000 between the earliest censuses and 1980, but have rebounded to former levels in recent years. On the Wayne NF, one abandoned mine, specifically a limestone mine, provides a winter hibernaculum for approximately 150 Indiana bats (USFS 2001a).

A variety of factors have contributed to Indiana bat population declines (USFWS 1983b). Sometimes their winter hibernacula are flooded, ceilings of the hibernacula collapse, or cold temperatures kill the bats through hypothermia. Exclusion of bats from hibernacula through blocking of entrances, installations of gates that do not allow for bat ingress and egress, disruption of cave air flow, and human disturbance during hibernation have been documented causes of Indiana bat declines. Because many known threats are associated with hibernation, protection of hibernacula has been a management priority.

Despite the protection of most major hibernacula, population declines have continued. Continued population declines of Indiana bats, in spite of efforts to protect hibernacula, have led scientists to the conclusion that additional information on summer habitat is needed (Romme *et al.* 1995). In addition to increased focus on summer habitat, attention is also being directed to pesticide contamination. Insecticides have been known or suspected as the cause of a number of bat die-offs in North America, including endangered gray bats in Missouri (Clark *et al.* 1978). The insect diet and longevity of bats also exposes them to persistent organochlorine chemicals which may bioaccumulate in bat tissue and cause sub-lethal effects such as impaired reproduction.

Description and Distribution

The Indiana bat is a medium-sized bat with a head and body length that ranges from 41 to 49 mm. It is a monotypic species that occupies much of the eastern half of the United States, from Oklahoma, Iowa, and Wisconsin east to Vermont, and south to northwestern Florida. The Indiana bat is migratory, and the above described range includes both winter and summer habitat. The winter range is associated with regions of well-developed limestone caverns. Major populations of this species hibernate in Kentucky, Indiana, and Missouri. Smaller winter populations have been reported from Alabama, Arkansas, Georgia, Illinois, Maryland, Mississippi, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Tennessee, Virginia, and West Virginia. More than 85 percent of the entire known population of Indiana bats hibernates in only nine caves.

Life History

Generally, Indiana bats hibernate from October through April (Hall 1962, LaVal and LaVal 1980), depending upon local weather conditions. Bats cluster on cave ceilings in densities ranging from 300-484 bats per square foot. Hibernation facilitates survival during winter when prey are unavailable. However, the bat must store sufficient fat to support metabolic processes until spring. Substantial risks are posed by events during the winter that interrupt hibernation and increase metabolic rates.

After hibernation ends in late March or early April, most Indiana bats migrate to summer roosts. Female Indiana bats emerge from hibernation in late March or early April, followed by the males. The period after hibernation but, prior to migration, is typically referred to as staging. Most populations leave their hibernacula by late April. Migration is stressful for the Indiana bat, particularly in the spring when their fat reserves and food supplies are low. As a result, adult mortality may be the highest in late March and April.

Summering Indiana bats roost in trees in riparian, bottomland, and upland forests. Roost trees generally have exfoliating bark which allows the bat to roost between the bark and bole of the tree.

Cavities and crevices in trees also may be used for roosting. A variety of tree species are known to be used for roosts including (but not limited to) silver maple (*Acer saccharinum*), shagbark hickory (*Carya ovata*), shellbark hickory (*Carya laciniosa*), bitternut hickory (*Carya cordiformis*), green ash (*Fraxinus pennsylvanica*), white ash (*Fraxinus americana*), Eastern cottonwood (*Populus deltoides*), northern red oak (*Quercus rubra*), post oak (*Quercus stallata*) , white oak (*Quercus alba*), shingle oak (*Quercus imbricaria*), slippery elm (*Ulmus rubra*), American elm (*Ulmus americana*), sassafras (*Sassafras albidum*), and sugar maple (*Acer saccharum*) (Romme *et al.* 1995). Structure is probably more important than the species in determining if a tree is a suitable roost site; tree species which develop loose, exfoliating bark as they age and die are likely to provide roost sites. Male bats disperse throughout the range and roost individually or in small groups. In contrast, reproductive females form larger groups, referred to as maternity colonies.

Maternity colonies, which may be occupied from mid-May to mid-September, usually contain 100 or fewer adult female bats. Females each give birth to a single young in late June or early July . Young Indiana bats are capable of flight within a month of birth. They spend the latter part of the summer foraging to accumulate fat reserves for the fall migration and hibernation. Maternity colonies occupy roost sites in trees in forested riparian, flood plain, or upland habitats (Romme *et al.* 1995). Female Indiana bats exhibit strong site fidelity to summer roosting and foraging areas, that is, they return to the same summer range annually to bear their young. Traditional summer sites are essential to the reproductive success of local populations. It is not known how long or how far female Indiana bats will search to find new roosting habitat if their traditional roost habitat is lost or degraded. If they are required to search for new roosting habitat, it is assumed that this effort places additional stress on pregnant females at a time when fat reserves are low or depleted and they are already stressed from the energy demands of migration.

Indiana bat roosts are ephemeral and frequently associated with dead or dying trees. Most roost trees may be habitable for only 2-8 years (depending on the species and condition of the roost tree) under natural conditions. Gardner *et al.* (1991a) evaluated 39 roost trees and found that 31 percent were no longer suitable the following summer, and 33 percent of those remaining were unavailable by the second summer. A variety of suitable roosts are needed within a colony's traditional summer range for the colony to continue to exist. Indiana bat maternity sites generally consist of one or more primary maternity roost trees which are used repeatedly by large numbers of bats, and varying numbers of alternate roosts, which may be used less frequently and by smaller numbers of bats. Bats move among roosts within a season and when a particular roost becomes unavailable from one year to the next. It is not known how many alternate roosts must be available to assure retention of a colony within a particular area, but large, nearby forest tracts appear important (Callahan 1993). In addition to having exfoliating bark, roost trees must be of sufficient diameter. Trees in excess of 40 cm dbh are considered optimal for maternity colony roost sites, but trees in excess of 22 cm dbh appear to provide suitable maternity roosting habitat. Male Indiana bats have been observed roosting in trees as small as 8 cm dbh.

In Illinois, Gardner *et al.* (1991b) found that forested stream corridors, and impounded bodies of water, were preferred foraging habitats for pregnant and lactating Indiana bats, which flew up to 2.4 km from upland roosts to forage. Females typically utilize larger foraging ranges than males (Garner and Gardner 1992). Bats forage at a height of approximately 2-30 meters under riparian and

flood plain trees (Humphrey *et al.* 1977). They forage between dusk and dawn and feed exclusively on flying insects, primarily moths, beetles, and aquatic insects. Riparian habitat is occupied by Indiana bats from mid-April to mid-September. Romme *et al.* (1995) cite several studies which document that Indiana bats also forage in upland forests.

After the summer maternity period, Indiana bats migrate back to traditional winter hibernacula. Some male bats may begin to arrive at hibernacula as early as July. Females typically arrive later and by September numbers of males and females are almost equal. Autumn "swarming" occurs prior to hibernation. During swarming, bats fly in and out of cave entrances from dusk to dawn, while relatively few roost in the caves during the day. By late September many females have entered hibernation, but males may continue swarming well into October in what is believed to be an attempt to breed late arriving females.

Swarming is important to the life history of the bat as most copulation occurs during this time. Females store sperm through the winter and fertilization occurs in the spring. Females are pregnant when they arrive at the maternity roost. Fecundity is low; female Indiana bats produce only one young per year.

Bald Eagle

The bald eagle was officially listed as endangered throughout the lower 48 states, except in Michigan, Minnesota, Wisconsin, and Oregon, where it was designated as threatened, on February 14, 1978 (43 FR 6233). On June 12,1995, the Service published a final rule reclassifying the status of the bald eagle from Federally endangered to threatened throughout the lower 48 states (60 FR 36000). No critical habitat has been designated for the species. Currently, the Service has published a proposed rule to remove the bald eagle in the lower 48 states from the Federal list of endangered and threatened wildlife. A final decision on the delisting has not yet been made and may not occur until mid-2001, or later. If delisting should occur, the bald eagle would continue to be protected under the Bald and Golden Eagle Protection Act of 1962, as amended, the Migratory Bird Treaty Act of 1918 and the Lacey Act of 1900.

The bald eagle was listed under the ESA due to population losses caused by pesticide pollution, hunting, and habitat destruction. The use of DDT as a pesticide from 1940 through the 1960's caused the drastic decline in the bald eagle. Consumption of DDT contaminated prey resulted in eggshell thinning and nesting failures. With the banning of DDT and strong enforcement of recovery measures, the eagle has successfully recovered. However, two major threats to the bald eagle remain: habitat loss and contaminants. Even though the widespread elimination of DDT and reduction of other pesticides has been greatly successful, other contaminants exist on a localized level although these contaminants are not believed to cause widespread suppression of the population. Their habit of returning to the same nesting and winter roosting sites, as well as their tendency to congregate makes each site of great importance to the entire population of bald eagles. Shootings, disease, human disturbance, electrocution and vehicle collisions are also continuing threats to the eagle.

Five recovery regions (Pacific, Southwestern, Southeastern, Chesapeake Bay, and Northern States) have been designated for the eagle in the lower 48 states. Ohio is within the Northern States Recovery Region. The Service published the Northern States Bald Eagle Recovery Plan in 1983. Major recovery steps outlined in the plan include: (1) determine current population and habitat status; (2) determine population and habitat levels needed to achieve recovery; (3) protect, enhance, and increase bald eagle populations and habitats; and (4) establish and maintain communication to coordinate and conduct recovery efforts.

In Ohio specifically, the two problems that continue to threaten the bald eagle are the loss of wetlands and swamp forests, among the preferred nesting and staging areas for the eagle, and damage to the State's waters. Channelization, erosion, and water pollution all adversely affect the water resource and its inhabitants, which potentially impact the eagle's food source (ODNR no date (1)).

Description and Distribution

The bald eagle is a large, long-lived bird of prey that occurs only in North America. The adults have brown bodies with white heads and tails. The young are all brown, and can be distinguished from young golden eagles by their lower bare legs (golden eagles have feathered legs all the way to their feet). They do not take on the coloring of the adults or reach sexual maturity until age four (USFWS 1983a).

In Ohio, the highest numbers of bald eagles occur in the marsh region of western Lake Erie. Nesting pairs also occur in northeast Ohio, along the Sandusky River, and in north-central Ohio (ODNR no date (1)). Counties listed as harboring bald eagles are: Ashtabula, Delaware, Coshocton, Erie, Geauga, Hamilton, Henry, Hocking, Holmes, Huron, Knox, Lake, Licking, Lorain, Lucas, Mercer, Mahoning, Marion, Muskingum, Noble, Ottawa, Portage, Sandusky, Seneca, Stark, Summit, Trumbull, Wood, and Wyandot; of which Hocking and Noble contain Wayne NF property. Three additional counties containing bald eagle nests were found in 2000. They are Harrison, Ross and Wayne counties (ODNR 2000b). According to the USFWS (1983a), areas associated with large bodies of water should be studied closely for eagle nests and wintering roosts. If a previously-used site is located or the potential for eagle habitat exists in the absence of eagles, the area should still be considered for protection, because bald eagles are now re-occupying old territory and new habitat as their numbers grow. The bald eagle's numbers in Ohio have grown significantly since the early 1980's. In 1982, there were 7 known nesting pairs in Ohio; in 1998 there were 47 documented nesting pairs, and just one year later an additional 16 nesting pairs were counted (ODNR 2000c). In January 2000, a record 193 wintering bald eagles were counted in the 29 counties noted above (ODNR 2000a). Figure 7-3 shows the Ohio range for the bald eagle.

Life History

The bulk of the bald eagle's diet is fish, however they will also feed on waterfowl, small mammals, and carrion, especially in winter (USFWS 1983a).

It is believed that eagles mate for life, but there is little documentation to substantiate this claim. In the event that the mates are separated, new mates likely are found. Pairs of eagles usually raise one

to two young per season, originating from one to three eggs. The entire breeding cycle from initial breeding activity to fledging is about six months.

Many do not breed for the first time until they are six years of age or older. The time period before sexual maturity is a time of significant mortality, and many eagles do not reach two years of age. After the first couple of years, chances for survival improve, and eagles are thought to live up to thirty years (USFWS 1983a).

Eagles usually nest near large bodies of water (within one-half mile), although they will occasionally have nests in upland areas where there is good access to food. Bald eagles tend to return to the same breeding area, and often the same nest sites, each year. Although there are reports of nests on the ground or on cliff faces, the majority of eagles build their nests in supercanopy trees with large diameters and canopies (USFWS 1983a). The nests typically occur in live coniferous or dead trees (USFS 1998). They construct the nests of sticks and add to them each year (USFWS 1983a). The nest tree is usually within one-half mile of water and have a clear flight path to water (USFS 1998). Suitable nest site characteristics are found throughout the Wayne NF.

When the nesting period is over, the wintering period begins. At this time, the eagles generally leave their nest site for more protected locales with abundant food supplies. According to the 1981 eagle count done by the National Wildlife Federation, during the months between November and March, bald eagles make their way into all of the contiguous 48 states. As with their nests, the eagles revisit many of the same wintering sites. The sites are chosen for their shelter from the wind to reduce energy use. The wintering population of eagles is split between large groups that congregate at recurring communal sites, and those that have smaller gatherings. Both the large and small wintering meeting and roosting sites are equally important to the survival of the species. In addition to shelter from the weather, roost sites provide isolation from humans. When human disturbance of a night roost occurs, eagles may abandon the location (USFWS 1983a).

Survival of individual bald eagles, particularly those in their first year of life, depends heavily on conditions they encounter during the wintering period. In previous studies, it was thought that their reproduction rate was the most important dynamic for the preservation of the species, but it is now believed that their survival rate may play a more crucial role. It appears likely that eagle populations may be more successful with lower reproduction rates and higher survival rates, than vice versa (USFWS 1983a).

During winter, night roost trees are used by an individual bald eagle or group of eagles for protection from wind and harsh weather. These trees are also thought to aid in mate location and communication of food sources. Night roost trees have a large diameter, dense canopy cover in wind-protected areas and may be located either adjacent to foraging areas or at distances up to 17 miles away (USFS 1998).

Daytime roosts are usually located near foraging areas within 100 feet of shoreline and are used for eating, resting and hunting. Tall dead trees or mature trees with strong branches are the eagle's preference. The availability of prey is the most important characteristic of wintering sites used by bald eagles (USFS 1998).

American Burying Beetle

The American burying beetle was officially listed as endangered, pursuant to the ESA, throughout its historic range on 13 July 1989 (54 FR 29652). The Service has published a recovery plan (USFWS 1991) which outlines recovery actions for the beetle. Briefly, the objectives of the plan are to: (1) protect and manage extant populations, and (2) maintain captive populations for reintroduction.

There has been considerable controversy about the cause of the American burying beetle decline. It has been pointed out that the extirpation of the species in most areas preceded the widespread use of pesticides. An unknown disease vector specific to the beetle cannot be totally ruled out, but no other species of the genus are affected. The prevailing theory is that because they are the largest species in the genus, and require the largest carcasses, they have been more adversely affected than other members of their genus by habitat fragmentation. As stated in the recovery plan, "fragmentation of large areas of natural habitat that historically supported high densities of indigenous species (exacerbated by the direct taking of birds and other vertebrates) may have been a contributing factor in the decline of the beetle by changing the species composition and lowering the reproductive success of prey species required for optimum reproduction." In locations where the American burying beetle has been extirpated or greatly reduced in population, other species of the genus *Nicrophorus* have increased. It has been noted that some of the species that once probably provided important carcasses for the beetle are now rare. The passenger pigeon is extinct, and greater prairie chicken is much less common than they once were. Scavengers including dogs, cats, and coyotes always increase at forest edges and where civilization occurs and now compete with the American burying beetle for prey. With increasingly localized populations, the American burying beetle's genetic variability that is important for adapting to changing habitat would have been further reduced by genetic drift. The lack of optimal sized carcasses for reproduction of the species is now seen as the primary cause for the species precipitous decline (USFWS 1991, USFWS 1994).

Description and Distribution

The American burying beetle is the largest member of the group of beetles that breed and raise their larvae on carcasses of vertebrates (mammals and birds). It is 25 to 45 mm in size with a shiny black body and is the only one of the genus *Nicrophorus* with an orange-red marking on the first thoracic segment (pronotum). Each of the front wings (elytra) has two scalloped orange-red markings and the antennae are red-orange tipped. It is often covered with phoretic mites with which it shares a symbiotic relationship (USFWS 1991).

The range of the American burying beetle has decreased to less than 10 percent of the species historic range. Historic records for the American burying beetle include 150 counties in 35 states in the eastern United States and southern Canada. It ranged from Nova Scotia to Montana and Nebraska, but was poorly documented from the Appalachians and the lower Coastal Plain (USFWS 1991). In 1991, there were several new discoveries of the beetle, which now list wild populations in Rhode Island, Oklahoma, Nebraska, and Arkansas (USFWS 1994). A captive breeding and introduction program is underway using the Block Island, Rhode Island populations from the Roger Williams Park Zoo.

Life History

The American burying beetle uses larger carrion, both birds and mammals of 100 to 200 grams in weight, on which to raise their broods. A pair of beetles will stake a claim to a carcass and defend it against congeneric beetles and other competitors, such as flies. After the pair buries the carcass, the female lays 36 to 42 eggs in a side chamber near the carcass. The eggs hatch in six days and the larvae require 12 to 16 days to develop. Both parents initially defend and guard the eggs, and usually the female will remain with and feed the larvae until pupation. The male typically leaves within 10 to 15 days (Keeney 2001, USFWS 1991).

The adults themselves feed on carrion and also consume live prey. They are nocturnal and active only when the temperature is above 60 degrees Fahrenheit, usually from April to September. The beetle spends the winter months below ground. They lay their eggs on the buried carcass in June or July. They are univoltine (have a single yearly brood) animals and usually live only about a year. Prey carcass size is more important than prey species. The carcass must be of the optimal size and weight to raise a maximum brood. American burying beetles will raise a brood on carcasses as small as 35 grams, but research has shown them to raise a smaller number of larvae on the reduced food supply (USFWS 1991).

American burying beetles have been found in pastures, pasture/forest transition areas, old fields, open woodland and forests, specifically oak-hickory forests, and grasslands (USFWS 1991). The beetle does prefer upland ridgetop areas versus riparian areas, since carrion found in the uplands are typically warmer and have a greater odor plume for locating carrion (Keeney 2000). The availability of carcasses of sufficient size appears to be the most important factor in their habitat requirements. Also, their habitat must have soils capable of excavation for the burial of carcasses. Level topography, well-drained soils and a well-formed detritus layer are characteristics noted at American burying beetle sites (USFWS 1991).

ENVIRONMENTAL BASELINE

This section is an analysis of the effects of past and ongoing human and natural factors leading to the current status of species, its habitat, and ecosystem within the action area.

The Wayne NF proclamation boundary encompasses 833,990 acres in twelve Ohio counties. Within the Wayne NF proclamation boundary, 229,749 acres are currently managed by the Forest Service (USFS 1992). Approximately 95 percent, or 218,000 acres, of the Wayne NF lands are forested (USFS 2001a). Wayne NF has two Ranger Districts: the Athens Ranger District, comprised of the Athens Unit and the Marietta Unit, and the Ironton Ranger District, comprised of the Ironton Unit. The Athens Unit is comprised of properties in five Ohio counties (Perry, Hocking Vinton, Athens, and Morgan counties). The Marietta Unit is comprised of properties occurring in three Ohio counties (Washington, Noble, and Monroe County). The Ironton Unit is comprised of properties occurring in four Ohio counties (Scioto, Jackson, Lawrence, and Gallia counties).

The Wayne NF consists of 14 different management areas. A management area is an area of the Wayne NF that has common management direction, with one management prescription applied to

achieve the desired future condition of the land. Selection of a management prescription to create a desired future condition requires matching its suitability and capability to produce a mix of goods, services, and desired uses. The assignment of management areas on the Wayne NF best reflects a wide variety of vegetative conditions and recreation opportunities (USFS 1987). These management areas are further described in Section 3.2 and in Appendix E of the BA and are hereby incorporated by reference.

All watercourses on the Wayne NF are tributaries to the Ohio River. There are 27 major streams on the Wayne NF, totaling 343 miles in length (USFS 1987). Wayne NF water resources are owned by the state of Ohio and are bordered by Wayne NF lands. In addition, many miles of stream within Wayne NF boundaries are bordered by private land. Neither the Ohio River nor the Muskingum River mainstem is within the proclamation boundaries of the Wayne NF. However, all of the Wayne NF is within the Ohio River watershed. The Muskingum River watershed does not currently include any National Forest lands (USFS 2001a).

The Wayne NF is intermixed and surrounded by private and State owned lands. Of the 833,990 acres comprising the Forest Purchase Unit for the Wayne NF, only 229,749 acres (about 25 percent of the area) are National Forest Service (NFS) lands managed by the Forest Service. The landscape of the Wayne NF, including both NFS lands and other ownerships, is fragmented by roads, farms, mines and quarries, industrial developments, towns, and utility corridors. The scattered pattern of Forest Service ownership, including ownership of subsurface mineral rights, has resulted in numerous access roads and utility lines being built across NFS lands for privately-owned mineral access (USFS 1992).

Most private lands within the Wayne NF proclamation boundary are used for rural activities, such as cropland, pasture, rural structures, and recreation (USFS 1987, USFS 1992). Nearly all of these lands are now in woodland or other rural use, cultivated, pastured, or residential (USFS 1992)

Indiana Bat

Mine surveys and mist netting done in 1979-80 did not detect the Indiana bat on the Wayne NF (Bookhout and Lacki 1981). Mist net surveys were conducted during the summer of 1998 at 11 sites in the Bluegrass Ridge portion of the Ironton Ranger District, but failed to capture the Indiana bat (Eco-Tech 1998). Additional surveys and netting done during the summers of 1997, 1999, and 2000; however, did find the bat on the Athens and Ironton Districts of the Wayne NF. Males, young of the year, and lactating females were found. Fall swarming surveys have also been conducted in the Athens and Ironton units annually since 1997. A passive survey for observation was conducted in September 1998 and a harp trap survey was conducted at the same location one month later in October. During the October 1998 harp trap survey, the first Indiana bat discovered on the Wayne NF, a male, was caught and released, indicating that Indiana bats may have been using the mine for hibernation. In February of 1999, Indiana bat presence was confirmed when the limestone mine was entered and approximately 150 Indiana bats were found. This mine has since been designated as a Priority 3 hibernaculum (hibernaculum with < 500 Indiana bats). Bat gates were installed during June 2001on three portals of the mine. One male Indiana bat was netted at an abandoned mine

approximately one half mile from the known hibernaculum in 1999. This mine has not yet been confirmed as an Indiana bat hibernaculum (USFS 1999b). Other mines were entered in February of 2000, but no Indiana bats were found (Flegel 2000).

Radiotelemetry was used during surveys on the Athens and Ironton Ranger Districts during the summer of 1999 to track three male Indiana bats. Bats were tracked as long as battery life lasted, usually 10 to 21 days. The Ironton survey found five Indiana bats -- three males, a post-lactating female and a young-of-year male. These findings indicate that reproduction is occurring within the Wayne NF and Lawrence County, Ohio. These bats were found in an area dominated by chestnut oak, northern red oak, scarlet oak, white oak, and shagbark hickory. An adult male was found on the Athens Ranger District in Hocking County. It was caught in an area dominated by black oak, chestnut oak, northern red oak, and shagbark hickory (ATS 1999). Since the Indiana bat has been found both in the summer and winter, it is likely using the Wayne NF year-round, for hibernation and breeding.

Numerous mines are located throughout the Wayne NF on each of the ranger districts, however the majority of limestone mines are found in the Ironton Ranger District. These mines may provide additional hibernacula for Indiana bats; however, surveys have not yet found any of this species. Characteristics of mines that may become Indiana bat hibernacula in the future include a large, unobstructed opening, air movement, and no signs of flooding such as sticks and debris in the ceiling of the mine (Andrews 2000). Microclimate is not currently monitored on the Wayne NF.

During June and July 2000, three male Indiana bats were captured on the Wayne NF. Two of the bats were found on the Athens units and the other was found on the Ironton unit just outside the known Indiana bat hibernaculum (Schultes 2000).

Maternity colonies have not been found on the Wayne NF. However, lactating and post-lactating females have been found during summer surveys, which indicate the presence of at least one maternity colony. About 82 percent or 164,995 acres of the Wayne NF is in hardwood stands. Of this, 106,106 acres is an oak-hickory forest type. Oak-maple forest constitutes 1,240 acres of the Wayne NF. Pine and pine-hardwood forest types are found on 25,778 acres of the Wayne NF. These areas provide suitable habitat for Indiana bats. Open fields, grass, and water areas are found on 7,847 acres.

Indiana bats use small impoundments including ponds and small lakes, as well as road ruts and streams for drinking water (USFS 1998). There are approximately 410 acres of lakes, marshes and ponds on the Wayne NF. In addition, 27 major streams with a total length of 343 miles are located on the Wayne NF.

Based on the results of Indiana bat captures on both Ranger Districts of the Wayne NF, the Service concurs with the BA conclusion that Indiana bats may be present in all suitable habitat on the Wayne NF. Further, the Service believes that maternity colonies of Indiana bats are present on the Wayne NF based on the evidence provided by the recent mist-net studies .

Bald Eagle

There are no known bald eagle nests within the proclamation boundaries of the Wayne NF. Habitat for the eagle is present throughout the Wayne NF and would increase over time as forest stands mature, so long as sufficient foraging areas remain present. The Wayne NF has a forest cover of more than 95 percent or 201,214 acres. Of that forested acreage, mature hardwoods (80 years or older) are found on approximately 30 percent or approximately 63,000 acres (USFS 1987, USFS 2000a). These mature forest areas exist along the Ohio River, Little Muskingum River, Hocking River, Lake Vesuvius, and Timbre Ridge Lake. Large riparian corridors with open water are limited on the Wayne NF. The Little Muskingum River could potentially be used by the bald eagle, but the Ohio River, Hocking River, Lake Vesuvius, Timbre Lake, or Burr Oak Reservoir would be more likely.

Bald eagles have been occasionally sighted on or near the Wayne NF, mostly in the winter along the Ohio River in the Marietta unit, and Burr Oak Reservoir. During summer months, bald eagles are sighted along the Ohio River near the Ironton and Marietta units. At this time, bald eagles occurring on the Wayne NF are probably migrating through or wintering there. The bald eagle is expanding its nesting range, however, and has made one known unsuccessful nesting attempt within a few miles of the Wayne NF Marietta unit on Blennerhassett Island on the Ohio River near Parkersburg, West Virginia. This is the first bald eagle nest to be built along the upper Ohio River in recent years.

The Little Muskingum River in the Marietta unit also provides winter roosting habitat for the bald eagle, and also the larger watercourses of the Athens and Ironton units including the Hocking River, Pine Creek, Symmes Creek, and Burr Oak. Lake Vesuvius and Timbre Ridge Lake may also provide adequate wintering habitat for the eagle. Based on the presence of nesting and roosting habitat and nearby occurrences, the Service believes the bald eagle could be affected by the Wayne NF's activities.

American Burying Beetle

In Ohio, Athens, Hocking, and Vinton counties have current, recent (within 25 years) known or possible occurrences of the American burying beetle. The beetle has been reintroduced to Athens County. The last known naturally-occurring collection was a single beetle near Old Man's Cave in Hocking County in 1974 (Keeney and Horn 1998). The species was reintroduced in 1998 in an area in Athens County, Ohio within a few miles of the Wayne NF. (ODNR no date (2)). This reintroduction was successful in that a follow-up trapping found 2 newly-emerged individuals (one male and one female) (Keeney 1998). On June 9, 1999, 20 pairs and 16 single females were released in a recently mowed field near bordering woods at the same location as the 1998 reintroduction and also at one-half mile distances from that location. Within 2 weeks, approximately 66 larvae were found (Keeney 1999). There was a release of 36 pairs of beetles in 2000. A single large male was captured on October 3, 2000. The populations will be monitored annually for the foreseeable future. There will possibly be other releases to other areas in the future (Keeney 2001).

Although there are no known populations of the American burying beetle within the proclamation boundaries of the Wayne NF, given the general preferences of the American burying beetle, potential habitat may exist throughout the forest in each of the three Wayne NF units. The reintroduction sites are adjacent to the Athens unit. Since American burying beetles have the capability to travel two to four miles on an average day and the known record for beetle travel is 10 miles within a 24-hour period, it is possible for the beetle to become established on the forest. The large population of wild turkey within the Wayne NF would provide ideal carrion, since juvenile turkeys are within the correct weight range for a substantial period of time. These juveniles also tend to experience a high degree of mortality due to circumstances other than predation, such as temperature changes (Keeney 2000).

Horn et.al. (1998) stated that "Two essentials for the American burying beetle's survival are a ready source of fresh whole items of carrion…..and relatively loose, porous, deep soil in which to bury the carrion. In 1999, the American burying beetle was released in Athens County on Wellston silt loam soil with two different slopes; WdB at 3-8 percent and WdC at 8-15 percent slope. Both have a 1-3 percent organic matter content. They are also well-drained with moderate permeability, moderate available water capacity, good tilth, medium to strong acidity, moderately low organic matter and medium natural fertility.

Comparing the soil type at the release site to other silt loam soils in Athens, Hocking and Perry counties there were a total of 17 soil types that were considered close matches to the soil type and slopes used at the reintroduction site (Andrews 2001). The American burying beetle is known to have successfully reproduced at the reintroduction sites but further work is needed as to evaluating the overwintering success or distribution from the sites.

Within a 10-mile radius of the site of reintroduction, there is approximately 23,998 acres of National Forest lands. Within this acreage approximately 1502 acres, or 6.3 percent, of the land is considered of high potential for American burying beetle reintroduction or are of similar characteristics to the soil and slope types found at the reintroduction site (Andrews 2001).

EFFECTS OF THE ACTION

This section includes an analysis of the direct and indirect effects of the proposed action on the species and/or critical habitat and its interrelated and interdependent activities.

The remainder of this document deals only with those activities that have been identified as may affect the Indiana bat, Bald eagle, or the American burying beetle. The Service accepts and agrees to the activities listed by the Wayne NF as having "No Effect".

Indiana Bat

Introduction

Of the 229,749 acres of Wayne NF land, about 95 percent is forested (USFS 2001a). About 50 percent of these forested acres are oak-hickory forest. The other 50 percent of the forested acres are comprised of lowland and upland hardwoods, pine, mixed pine-hardwoods, yellow poplar, and

beech-maple. These forested lands are in various stages of succession (USFS 2001a). Little change in the amount and composition of the forested lands on the Wayne NF is expected within the next five years. It is anticipated, however, that additional forested lands, in some phase of succession, and some water sources could be added to the Wayne NF through land acquisition and/or land exchange (Ewing 2001b).

While individual actions necessary to implement the Forest Plan may result in adverse effects to the species over the next five years, the amount of suitable habitat available for the species on the Wayne NF will be approximately the same. By implementing the tiered consultation approach, the adverse impacts of individual actions will be minimized by utilizing conservation measures identified in this tier I biological opinion and tier II opinions to be developed for individual projects that are likely to adversely affect the species.

Implementation of Forest Plan management activities that require or allow the loss of trees have the greatest potential to affect the Indiana bat. Cutting of trees that alters Indiana bat habitat may have a beneficial or negative effect on the habitat and/or individual bats. Cutting of trees relates to any Wayne NF activity requiring or allowing cutting trees, not just commercial timber sales. Disturbance is of concern only during the non-hibernating season and it mainly related to management activities that would disturb an occupied roost tree. A description of those management activities, as detailed in the BA is hereby incorporated by reference.

Cutting an Indiana bat roost tree when bats are present in the tree is likely to result in bats being injured or killed. Cutting of trees during the Indiana bat hibernation season may result in the loss of some traditional summer roost trees, including maternity trees. As previously noted, female Indiana bats establish traditional summer ranges which they return to annually. Loss of traditional roost trees through Wayne NF management activities will require females to expend more energy locating new roosting habitat than they would have expended had the management activity not occurred. Weight loss and stress associated with hibernation, migration, and pregnancy would be magnified. These stresses could potentially result in lower reproductive success and/or lower survival of juvenile bats.

Cutting trees may alter foraging habitat. The cutting may improve foraging habitat, such as by opening-up a stand with a closed understory, or it may degrade the foraging habitat, forcing bats to fly farther to forage. The quality of foraging habitat may also be degraded due to erosion, and subsequent sedimentation of stream corridors, associated with Wayne NF management activities. Sedimentation could affect the production of insects associated with aquatic habitats, which make up a portion of the prey base of Indiana bats. The Wayne NF has standards and guidelines in place in the Wayne NF Forest Plan to protect and conserve riparian areas. These requirements would minimize sedimentation and the inadvertent degrading of foraging habitat used by Indiana bats.

Disturbance of suitable roost trees is of concern only during the non-hibernating season. Disturbance near or in known hibernacula is of concern during the fall swarming and hibernating season. Disturbance may be caused by Wayne NF management activities that happen in close proximity to roost trees and known hibernacula. Disturbance can cause alteration of normal migration, hibernation, foraging, and maternity activities of the bat, causing the same or similar

effects as described for the loss of traditional roost trees.

Other Wayne NF management activities that may affect Indiana bats or Indiana bat habitat are discussed in more detail later in this section.

Permanent Removal of Habitat

Based on the analysis conducted for the BA, approximately 2,504 acres of suitable habitat for Indiana bats for summer roosting and/or foraging may be permanently removed over the next five years. That total is the sum of five management activities: minerals development, 2,100 acres; road construction, 94 acres; trail construction, 160 acres; oil and gas well development, 25 acres; and special use permits, 125 acres. and. These four management activities are discussed in more detail later in this section.

Hardwood Timber Harvest

A total of 2,250 acres of hardwood timber harvest is proposed over the next five years. That harvest will be completed using two management practices, including of group selection and commercial thinning. These types of timber harvesting do not result in the removal of a significant proportion of the canopy, resulting in only minor and short-term Indiana bat foraging habitat impacts. Timber harvesting using uneven-aged management and commercial thinning can, in many instances, improve foraging habitat for the Indiana bat. The Wayne NF has indicated that hardwood timber harvests will not include clearcuts. The Wayne NF has also indicated that during harvest, an average of 5 dead or dying trees per acre will be left standing with minimum dbh of 6 inches. Of these trees, at least 2 per acre will be 14 inches dbh and at least one per 5 acres will be 18 inches dbh (USFS 2001a).

The most patent effect of hardwood timber harvest is the loss of current or future male roost trees and maternity colony trees. Most management areas call for a percentage of the Wayne NF to remain over 100 years old at all times. Those mature forest areas may rotate on the ground through the harvest schedule, but a percentage would remain mature forest. Under the maximum projected timber harvest, there would be a loss of 2,500 acres of suitable habitat. This loss, however, as explained above, is unlikely to affect the population status of the species on the Wayne NF. These conservation measures will help insure that an adequate number of roost trees are maintained on the forest.

Pine Timber Harvest

A total of 250 acres of pine timber harvest is proposed over the next five years. That harvest will be completed using two management practices, including of group selection and commercial thinning. These types of timber harvesting do not result in the removal of a significant proportion of the canopy, resulting in only minor and short-term Indiana bat foraging habitat impacts. Timber harvesting using uneven-aged management and commercial thinning can, in many instances, improve foraging habitat for the Indiana bat. The Wayne NF has indicated that pine timber harvests will not include clearcuts. The Wayne NF has also indicated that during harvest, an average of 5 dead or dying trees per acre will be left standing with minimum dbh of 6 inches. Of these trees, at least 2 per acre will be 14 inches dbh and at least one per 5 acres will be 18 inches dbh (USFS 2001a). These conservation measures will help insure that an adequate number of roost trees are

maintained on the forest.

Timber Stand Improvement

Timber stand improvement (TSI) over the next five years is proposed on 2,500 acres of the Wayne NF. TSI is a treatment made to improve the composition, structures, condition, health, and/or growth of trees in a stand. TSI activities can occur before, during and after commercial timber sales, and they can occur in areas unrelated to timber sales. TSI does not include the commercial removal of trees. Examples of types of TSI that may occur on the Wayne NF include: control of grape vines, cutting or girdling trees to favor crop trees, pruning, and prescribed burning. The Wayne NF has indicated that during timber stand improvements, an average of 5 dead or dying trees per acre will be left standing with minimum dbh of 6 inches. Of these trees, at least 2 per acre will be 14 inches dbh and at least one per 5 acres will be 18 inches dbh (USFS 2001a). These conservation measures will help insure that an adequate number of roost trees are maintained on the forest.

Prescribed Fire

The Wayne NF proposes to conduct up to 2,500 acres of prescribed fires over the next five years. Prescribed fire is used to manage plant comminutes for wildlife habitat improvement and forest regeneration. Burns are conducted under conditions that generally result in low intensity under burns, that is, only ground cover, shrubs, and trees less than two inches in diameter are burned. Under these conditions very few snags are lost; while at the same time a small number of snags are created by the fire. The burns are conducted in late winter and early spring. The Indiana bat habitat changes that result from these prescribed burns are very minor and may be beneficial in cases where the under story is reduced in mature hardwood stands. Romme *et al.* (1995) found that Indiana bats preferred foraging in forests with a reduced understory component. During preparations for prescribed fires, snags near the edge of the burn area may be felled to eliminate the hazard to personnel and to prevent fire from climbing the tree and throwing sparks outside the planned burn area. This preparation work normally occurs during the Indiana bat hibernation season. If burns occur after April 15 there is a chance that direct take could occur if an occupied roost tree is destroyed.

Maternity colonies may also be adversely impacted by prescribed fire. Adults bats would be capable of fleeing smoke, however if a maternity colony of flightless young were inundated with smoke, it may severely injure or kill the young. Since Wayne NF burns usually take place in the spring and occasionally in the fall, young bats will not likely be present. However, the Forest Plan does not restrict summer burns; therefore, the potential for incidental take of an Indiana bat does occur and this activity is likely to adversely affect the species. The Forest Plan does not make any projections of the average area to be prescribed burned each year. However, the Wayne NF anticipates that up to 2,500 acres may need to be prescribed burned over the next five years (USFS 2001a).

Smoke generated during a fire could injure or kill Indiana bats, if a substantial amount of smoke enters a hibernaculum during fall or winter. When a prescribed burn is planned, wind direction and the likely movement of smoke will be considered by the Wayne NF in relation the known or suspected bat hibernacula. The affects of the smoke from a prescribed fire are generally short lived; however, if the smoke enters a cave/old mine it remains and can be smelled for days or weeks. In the open air, the smoke is most intense for the few hours while the burn is actually taking place.

Some smoke may linger in the area of a prescribed burn but usually does not last more than two days. Coordination with the Wayne NF wildlife biologist will be necessary prior to commencement of any burn; therefore, known hibernacula would not be impacted.

Road and Trail Construction

The Wayne NF proposes to construct approximately 19 miles of new permanent and temporary roads within the next five years. Wayne NF has also estimated that an additional 12.5 miles of oil well access roads will be constructed during the next five years. According to the Forest Plan annual monitoring reports, the total lengths of permanent and temporary roads constructed or reconstructed from 1988 to 1996 were 5.00 and 14.19 miles, respectively. Temporary and permanent road construction and reconstruction is projected to be between 10 and 15 miles per year in the future. The average clearing width for roads constructed in the Wayne NF is 30-feet (Gianniny 2001). The total forested area that will be affected by road construction activities on the Wayne NF for the next five years is estimated to be 94 acres.

From 1988 to 1996, approximately 130 miles of trails were constructed or reconstructed. Over the next five years, it is estimated that 160 miles, or approximately 160 acres, of trails (hiking, horse, and ORV) could be constructed or reconstructed on the Wayne NF (Ewing 2001a).

Impacts to foraging habitat from road and trail construction should be minimal due to the acreage of individual projects. That is, while the overall acreage lost might appear substantial if it was all in one contiguous block, each individual project is typically small, linear, and would only remove a small portion of an otherwise forested landscape.

Wildlife Habitat Improvement

Wildlife openings on the Wayne NF are usually created through the acquisition of new lands which have existing openings, where no additional trees need to be cleared. However, creation of wildlife openings through timber cutting is permitted by the Forest Plan at a rate of 352 acres over the next five years. If the forest does clear timber for wildlife openings, this activity may result in the loss of a potential roost trees. The Wayne NF has stated that an average of two to three standing dead trees per acre will be retained in each wildlife opening.

Mineral Development

Mineral exploration and development is on-going throughout the forest. Since most of the minerals under NFS lands are owned by others, the Forest Service has controlling interest on only about 28 percent of the mineral estates (USFS 1987). Currently, there are approximately 800 oil and gas wells on the forest in various stages of development, production, or abandonment. The 2,100 acres of potential coal strip mining are privately held rights under Wayne NF lands. Because these mineral resources could be mined with the Wayne NF only being able to influence the reclamation and off-site impacts, the Service considers these acres as potentially permanent loss of habitat areas. Coal strip mining permits are also found on approximately 700 acres of the forest, and another 2,100 unpermitted acres have been established for coal strip-mining. These development and production activities will continue as long as the demand for coal, oil, and gas remains high. Mineral development in the forest may inadvertently remove potential roost trees during construction of well

pads, pipeline corridors, or access roads, which are not restricted from summer construction. Incidental take of one or more Indiana bats may result from the removal of a roost tree.

Forested riparian areas, which are used by Indiana bats for foraging, may be lost during activities including strip mining and oil and gas development (USFS 1987). Per Forest Plan standards and guidelines, all surface-disturbing activities assure that mitigation measures for protected species are complied with. In addition, an assessment of impacts to species must be completed before commencement of any specific forest activity. These activities are not expected to affect the Indiana bats usage of riparian foraging areas. The clearing of trees for these activities may open forest canopies to a level that is preferred by the Indiana bat, since dense areas with greater than 70 percent canopy cover are used less frequently (USFS 1998).

Runoff from production wells may contaminate nearby ponds, waterholes or natural collections of water, such as in road ruts, which may be used by the bat for drinking sources. Established Forest Plan standards require replacement of any waterholes that are destroyed during mineral development activities with equal or larger-sized non-acid waterholes. Also, no surface occupancy is permitted for USA-owned minerals on several management areas including Wayne NF's Management Areas 6.2, 7.1, 8.1, 8.2, and 9.2, which would reduce disturbance of existing or potential future roosting trees. Surface occupancy for private mineral rights require mitigation measures including seasonal restrictions, road construction and maintenance requirements, setbacks from streams, marshes and ponds, noise abatement, wildlife coordination, and visual resource coordination. Mineral development activities are likely to cause an adverse impact to Indiana bat from the potential for incidental take during tree removal during the non-hibernating period of April 15 through September 15.

Special Uses

Special uses including utility corridors could adversely affect the Indiana bat through the inadvertent removal of a current or potential future roost tree or maternity colony tree. However, as previously noted, the long-term landscape goal will facilitate the persistence of the Indiana bat on the Wayne NF. With the amount of suitable habitat found on the Wayne NF remaining relatively stable, it is unlikely that the removal of trees for utility corridors would affect the bat's usage of the Wayne NF. New utility corridors that are developed in the future would be required to complete mitigation measures.

Hazard Tree Removal

When live or dead trees pose an imminent safety concern, the Wayne NF removes the specific tree or trees causing concern in an activity called hazard tree removal. Hazard tree removal most typically takes place in developed recreation areas, along trails and roads, and along utility corridors, but it may occur any place where a tree or trees are causing an imminent safety hazard to the public or to employees. Hazard tree removal is most frequently carried out during the early spring or late fall, when Indiana bats would not be present, but on occasion may occur during the late spring and summer months, when Indiana bats may be present, if these trees pose an imminent safety concern. The Wayne NF estimates that over the next five years, up to 125 hazard trees may need to be removed on Wayne NF lands during the non-hibernation period when Indiana bats may be present.

Closure of Underground Entrances

The closing of underground entrances, like that of a mine, is conducted on the forest to protect human safety and to improve water quality through reducing acid mine drainage. These openings are dangerous but offer unique habitat features for the Indiana bat on the forest. Backfilling and obstruction of the openings prevents bats and other wildlife species from utilizing the underground feature. This type of closure can have a direct impact on bats, depending on the time of year this type of closure is implemented, by entombing bats within the underground structure or can indirectly affect Indiana bats by changing the airflow, temperature and humidity at the opening in question or possibly one in close proximity rendering it unsuitable for bat use. The Wayne NF also closes some of these openings by fitting them with gates and/or fencing which ensures human safety and also allows for continued use of the underground structure by the Indiana bat. Currently, there are seven bat-friendly gates on underground mines on the forest.

Land Exchange

The removal of Indiana bat habitat from Federal ownership could have adverse impacts to the species. Although Indiana bats are protected wherever they occur, private landowners do not have a mandate to further the conservation of Federally-listed species. Thus, transfer of Indiana bat habitat to private ownership could lessen the conservation protection provided to such habitat. However, plant and animal surveys will be conducted on lands affected by land exchange, and consultation with the Service would occur if these activities would impact known locations of species of concern or sensitive species, riparian zones, existing wetlands or other open water, rock shelters or faces, open sandy sites, intermittent and perennial stream terraces, hardwood stands over 100 years old, or other uncommon or unique sites.

Pesticide Use

Pesticides may be used on certain areas of the Wayne NF, but only after analysis of alternative methods has determined that their use is essential to meet the Wayne NF management goals. Herbicides are used on utility corridors that have outstanding rights. Herbicide application by hand-held squeeze bottles may sometimes be used on the forest. This method involves the direct application of a very small quantity of herbicides to the newly cut stem ensuring good coverage with no overspray. The use of the biological, species-specific insecticide, Bacillus thuringiensis (B.t.) may be necessary in the future if a gypsy moth outbreak arises (King 2000a). Established standards and guidelines for the proper use of B.t. and other pesticides are provided in the Forest Plan and would minimize adverse impacts to the species. No known pesticides are used on agriculture permits (Greatorex 2001).

Bald Eagle

Timber Harvest

Timber harvest activities of both even-aged and uneven-aged management could remove potential nesting and roosting trees within the forest as well as create noise and human disturbance. Between 1988 and 1997, 2.94 million board feet (MMBF) per year of hardwoods were harvested from the forest and 0.27 MMBF per year of pine were harvested, which is approximately1.7 percent of the total forest cover. These activities are projected to continue in

the future, although at a decreased rate between 1998 and 2002. Per Amendment 11, 1.80 and 0.20 MMBF per year of hardwoods and pine, respectively are projected for the time period from 1998 to 2002. Given the minimal amount of harvesting, the potential for removal of a bald eagle tree is present, however slight and remote. Assessment of an area prior to timber harvest, as well as the requirement to allow 5 dead or dying trees per acre to remain after harvest would reduce the chances of accidental habitat removal.

Prescribed Fire

Use of prescribed fire on the forest in the past has been minimal with an average of approximately 80 to 90 acres being burned per year. Smoke generated from fires may cause eagles to temporarily flee their nesting or roosting areas. The affect of the smoke from a prescribed fire is short lived. It is most intense for the few hours while the burn is actually taking place. Some residual smoke may linger in the area of a prescribed burn but usually does not last more than two days. Forest management, law enforcement, and wildfire suppression activities may accidentally displace bald eagles depending on the length and intensity of human presence. Repeated disturbance could cause eagles to abandon a nest or roost (Flegel, 2000). Most Wayne NF management actions would take place during the day, with the exception of emergency situations; therefore, any previously unknown night roosts on the forest would not likely be disturbed. The Forest Plan does not make any projections of the average area to be prescribe burned each year. It is anticipated that the prescribed burning program will increase with up to 2,500 acres being prescribed burned in the next five years.

Road Construction

According to the Forest Plan annual monitoring reports, the total lengths of permanent and temporary roads constructed or reconstructed from 1988 to 1996 were 5.00 and 14.19 miles, respectively. Temporary and permanent road construction is projected to be between 10 and 15 miles per year in the future. Noise would be created by road construction and maintenance, which may also disturb bald eagles in nearby areas. The construction impacts would be temporary and based on the season and location in which they are conducted, may not constitute an adverse impact to eagles in the area.

Mineral Development

Mineral development including strip mining, underground mining and oil and gas production would create noise and human disturbance that may disrupt eagle activities. Acid mine drainage from these activities may also degrade water quality in downstream areas used by the eagle. Under Section 303(d) of the Clean Water Act, each state must prepare a list of waters that are not meeting water quality standards. Several sections of streams and rivers on the Athens and Ironton units have been classified as impaired waters. Surface occupancy for private mineral rights require mitigation measures including seasonal restrictions, road construction and maintenance requirements, setbacks from streams, marshes and ponds, noise abatement, wildlife coordination, and visual resource coordination. These mitigation measures would minimize the amount of runoff and sedimentation to forest watersheds. Noise created from the construction of access roads and well pads as well as the operation of the well itself may cause eagles to relocate. All drilling and exploration activities must be coordinated with the Wayne NF wildlife biologist to ensure that no adverse impacts to protected species will occur.

Special Uses

Special uses including agriculture permits and construction of pipeline corridors could also impact the bald eagle depending on the extent of human disturbance. In accordance with Forest Plan standards and guidelines, plant and animal surveys will be conducted on lands affected by surface-disturbing activities and consultation with the Service would occur if these activities would impact known locations of Federally-listed species, species of concern or sensitive species.

Land Exchange

Exchanging National Forest lands with other owners may adversely affect the bald eagle if land is transferred out of federal ownership that contains potential habitat for the species. However, plant and animal surveys will be conducted on lands affected by land exchange, surface-disturbing activities, or timber harvesting, and consultation with the Service would occur if these activities would impact known locations of Federally-listed species, species of concern or sensitive species, riparian zones, existing wetlands or other open water, rock shelters or faces, open sandy sites, intermittent and perennial stream terraces, hardwood stands over 100 years old, or other uncommon or unique sites.

Recreational Facility Construction and Maintenance

Noise would be created by Wayne NF recreational facility construction and maintenance, which may also disturb bald eagles in nearby areas. From 1988 to 1996, approximately 1.5 million recreation visitor days of developed recreation facilities were added to the Wayne NF. These activities are projected to continue in the future at a similar rate. The construction impacts would be temporary and based on the season in which they are conducted, may not constitute an adverse impact to eagles in the area.

Recreational Activities

General recreation activities throughout the forest may affect the bald eagle depending on the level and season of human disturbance. From 1988 to 1996, approximately 130 miles of trails were constructed or reconstructed. Over the next five years, it is estimated that approximately 160 acres of trails (hiking, horse, and ORV) could be constructed or reconstructed on the Wayne NF. Hiking and horseback riding are not typically disruptive activities. Noise from cars, trucks, motorcycles and/or ORVs might cause temporary disturbance to roosting eagles or interrupt feeding. Public access to Lake Vesuvius, Timbre Ridge Lake, Burr Oak Reservoir and the Ohio, Hocking, and Little Muskingum Rivers for recreation may also disturb daytime activities of the bald eagle. Since this type of recreation is temporary and of a low frequency, bald eagles are not expected to be permanently displaced from their riparian roosts. Nighttime roosting may be disturbed from the use of these areas for night fishing and overnight camping. Recreation activities are not new on the forest and with the successful recovery of the species throughout its range, many bald eagles have become accustomed to these activities. However, repeated disturbance could cause eagles to abandon a nest or roost (Flegel 2000).

Pesticide Use

Pesticides (including herbicides and insecticides) may be used on certain areas of the Wayne NF, but only after analysis of alternative methods has determined that their use is essential to meet

the Wayne NF management goals. Although selective vegetation management is preferred for utility or other rights-of-way or easements, broadcast use of herbicides may be permitted on a case-by-case basis. Herbicides may be used on utility corridors that have outstanding rights on the Wayne NF. Most special use permits for utility corridors would contain provisions for all herbicide use (King 2000b). If all standards and guidelines for herbicide usage are followed on the Wayne NF, the potential for herbicides to affect water quality and bald eagle food sources would be low.

The insecticide B.t. is not currently used on the Wayne NF, but is permitted for emergencies as in the case of a gypsy moth outbreak (King 2000a). This biologic control affects any species in Order Lepidoptera that feeds on leaves during the time it is sprayed (USFS 2000b). Fish species would not be affected by B.t. spraying, since it does not harm aquatic species and only a minimal amount of the chemical would pass through the canopy (USFS 1995). Standards and guidelines have been established in the Forest Plan to protect surrounding resources during insecticide use are included in Appendix C of the BA and are hereby incorporated by reference. These activities would not be likely to adversely affect the water quality or food sources of the bald eagle.

American Burying Beetle

The Service recognizes that in Ohio, the American burying beetle only occurs in Athens, Hocking, and Vinton counties so the following incidental take statement for American burying beetle is limited to those counties.

Timber Harvest

Timber harvest, reforestation and timber stand improvement is permitted on Management Areas 3.3, which is the closest Wayne NF property to a known beetle population. While the removal or planting of trees would not directly impact the American burying beetle, site preparation tasks including soil ripping may disturb or destroy underground beetle broods or hibernating beetles during the winter months. In addition, the equipment activity and removal of hardwood and mixed forest trees by commercial thinning and uneven-aged management would displace wild turkey to adjacent or nearby stands.

Construction Activities for Roads, Trails, and Recreational Facilities

The Wayne NF proposes to construct approximately 19 miles of new permanent and temporary roads within the next five years. Wayne NF has also estimated that an additional 12.5 miles of oil well access roads will be constructed during the next five years. According to the Forest Plan annual monitoring reports, the total lengths of permanent and temporary roads constructed or reconstructed from 1988 to 1996 were 5.00 and 14.19 miles, respectively. Temporary and permanent road construction and reconstruction is projected to be between 10 and 15 miles per year in the future. The average clearing width for roads constructed in the Wayne NF is 30-feet (Gianniny 2001). The total forested are that will be affected by road construction activities on the Wayne NF for the next five years is estimated to be 94 acres.

During the same time period, approximately 1.5 million of recreation visitor days of developed recreation facilities were added to the Wayne NF and 130 miles of trails were constructed or reconstructed. The Wayne NF allows the construction or reconstruction of up to 160 miles of trails in the next five years. This would equate to impacting approximately 160 acres of ground.

Site preparation, construction, maintenance and use of these areas for roads, trails and facilities may adversely affect the beetle, if subsoil disturbance occurs or small amounts of habitat are permanently removed from availability.

Prescribed Fire

Use of prescribed fire on the forest in the past has been minimal with an average of approximately 80 to 90 acres being burned per year. It is anticipated that the prescribed burning program will increase with up to 2,500 acres being prescribed burned in the next five years. If as yet undetected beetles were present in a fire area, the fire could overtake individual beetles; however, most would fly to safety or be below ground and remain unharmed.

Mineral Development

Mineral development in areas where surface occupancy is not permitted including Management Areas's 6.2, 7.1, 8.1, 8.2, and 9.2 would not be expected to adversely impact the beetle. However, in areas where surface occupancy is permitted, site preparation activities could disrupt or destroy the beetle. These surface occupancy areas involving private mineral rights require mitigation measures including seasonal restrictions, road construction and maintenance requirements, setbacks from streams, marshes and ponds, noise abatement, wildlife coordination, and visual resource coordination. Acid mine drainage may also affect the beetle by altering soils characteristics along impacted streams.

Special Uses

Special uses, including agriculture permits and pipeline corridors, could also impact the beetle depending on the extent of soil disturbance. In accordance with Forest Plan standards and guidelines, plant and animal surveys will be conducted on lands affected by surface-disturbing activities, land exchange or timber harvesting, and consultation with the Service would occur, if these activities would impact known locations of Federally-listed species, species of concern or sensitive species. A complete list of standards and guidelines applicable to the American burying beetle are found in Appendix C of the BA and are hereby incorporated by reference.

Land Exchange and Acquisition

Between 1988 and 1997, the Wayne NF acquired 48,451 acres of land. Purchasing, acquisition and exchange of land are projected to continue in the future at a rate of 2,900 acres per decade. Exchanging National Forest lands with other owners may adversely affect the American burying beetle, if land is transferred out of Federal ownership that contains potential habitat for the species.

Pesticide Use

Pesticides may be used on certain areas of the Wayne NF, but only after analysis of alternative methods has determined that their use is essential to meet the Wayne NF management goals.

Although selective vegetation management is preferred for utility or other rights-of-way or easements, broadcast use of herbicides may be permitted on a case-by-case basis. Aerial spraying of herbicides is conducted on utility corridors that have outstanding rights on the Wayne NF. Most special use permits for utility corridors would contain provisions for all herbicide use (King 2000b). If all standards and guidelines for herbicide usage are followed on the Wayne NF, the potential for herbicides to affect potential American burying beetle habitat would be low.

The insecticide B.t. is not currently used on the Wayne NF, but may be necessary in the future if a gypsy moth epidemic arises (King 2000a). Even if this pesticide were used in the area of the American burying beetle, it would not be expected to harm the species, since B.t. is a biological insecticide that affects only Order Lepidoptera. Established standards and guidelines for the proper use of pesticides are provided in the Forest Plan and would minimize any unexpected adverse impacts to the species.

Summary

At the landscape level, no adverse impacts are expected as the extent and arrangement of suitable habitat will remain amenable to Indiana bat, bald eagle, and American burying beetle conservation. However, implementation of the landscape strategy will have adverse effects on all three species. The extent of these actions will be minimized by proposed conservation measures, and are unlikely to negatively affect the population status of the species.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, 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.

Future Federal, State, local or private actions that are reasonably certain to occur on Forest Service lands, actions will either be carried out by, or will require authorization from the Forest Service, and which are deemed to be outside the scope of this biological opinion, will require a separate section 7 consultation (For example, the Nelsonville-U.S. 33 bypass could potentially occur on Wayne NF lands). The Service is not aware of any future state, local or private actions that could occur within the action area that would not be subject to a section 7 review. Therefore, cumulative effects, as defined in the ESA, are not expected to occur with the action Area and will not be addressed further in this opinion.

CONCLUSION

After reviewing the current status of the Indiana bat, the bald eagle, the American burying beetle, the environmental baseline for the action area, the effects of the continued implementation of the existing Forest Plan, and the cumulative effects, it is the Service's biological opinion that the continued implementation of the existing Wayne NF's Forest Plan is not likely to jeopardize the

continued existence of the Indiana bat, bald eagle, and American burying beetle. No critical habitat has been designated for these three species in the action area; therefore, none will be affected.

The amount of suitable Indiana bat habitat found on the Wayne NF will remain relatively stable over the next five years. Only a small fraction of the Wayne NF's forested acres will be altered over the next five years by the continued implementation of the Forest Plan. Over the next five years, an estimated 10,606 acres of habitat, plus an additional 125 hazard trees, might be temporarily or permanently lost due to a variety of activities that are expected to occur on the forest. The estimated total acreage affected by the proposed action is approximately 5 percent of the Wayne NF's forested acreage and most of the activities only alter Indiana bat habitat, not eliminate it. At the same time the Wayne NF will be adding new forested acres through reforestation, land purchase, and land exchange. The proposed activities are not anticipated to reduce the status of Indiana bats on the Wayne NF, and thus, the implementation of the Forest Plan will not appreciably reduce the likelihood of survival and recovery of the Indiana bat.

Bald eagles have been occasionally sighted on or near the Wayne NF, mostly in the winter along the Ohio River in the Marietta unit, and Burr Oak Reservoir. During summer months, bald eagles are sighted along the Ohio River near the Ironton and Marietta units. No nests have been found in the area. Thus, at this time, bald eagles on the Wayne NF are probably migrating through or wintering on the forest. The bald eagle is expanding its nesting range, however, and has made one known, unsuccessful nesting attempt within a few miles of the Wayne NF. There is a chance, although it is slight, that a few birds may be adversely affected on the Wayne NF by the implementation of the Forest Plan. Thus, the implementation of the Forest Plan will negligibly affect the bald eagle and will not appreciably reduce the likelihood of survival and recovery of the species.

There are no known populations of American burying beetles within the proclamation boundaries of the Wayne NF. Due to the recent reintroduction effort which occurred only a few miles from the Wayne NF in Athens County, the American burying beetle is being considered in this biological opinion. The implementation of the Forest Plan will negligibly affect the species and will not appreciably reduce the likelihood of survival and recovery of the American burying beetle.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulation pursuant to section 4(d) of the ESA prohibits the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent 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 defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. 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 to be prohibited taking under the ESA, 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 undertaken by the Wayne NF for the exemption in section 7(o)(2) to apply. The Wayne NF has a continuing duty to regulate the activity covered by this incidental take statement. If the Wayne NF fails to assume and implement the terms and conditions, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Wayne NF must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(3)].

Indiana Bat

AMOUNT OR EXTENT OF TAKE

The Service anticipates that incidental take of Indiana bats will occur in the form of harm through habitat loss. Based on our knowledge of the ecology of Indiana bats, and the distribution of Indiana bats on the Wayne NF, we assume that the habitat that will be lost will affect the roosting and foraging habitat of Indiana bats.

It is unlikely that direct mortality of bats will be detected; that is, we do not expect that dead or moribund bats will be found. Behavioral or physiological effects, which impair reproduction and recruitment, or other essential behavioral patterns are anticipated; there is no practical means to directly measure these impacts to bats. Therefore, the anticipated level of take for the next five years is expressed as 10,606 acres (permanent loss of 2,504 acres of forest and the alteration of 8,102 acres of forest) plus the loss of an additional 125 hazard trees, as designated in the Biological Assessment, that is currently suitable summer roosting and foraging habitat for Indiana bats and that may be cleared for the activities listed in Table 2.

Table 2. The anticipated level of take of Indiana bat habitat that may occur the next five years on the Wayne NF with the continued implementation of the Forest Plan.

Type of Incidental Take	Activity	Acres
Permanent loss of habitat (2,504 total acres)	coal strip mining	2,100
	road construction	94
	trail construction	160
	oil and gas wells	25

	special use permits	125
Alteration of habitat (8,102 total acres + 125 trees)	timber harvest	2,500
	timber stand improvement	2,500
	prescribed fire	2,500
	creation of wildlife openings	352
	closing underground entrances	250
	hazard tree removal	125 **trees**

EFFECT OF THE TAKE

The Service has determined that the level of anticipated take of Indiana bats is not likely to result in jeopardy to the species. The amount of suitable Indiana bat habitat found on the Wayne NF will remain relatively stable over the next five years. Only a small fraction of the forested acres will be altered over the next five years by the continued implementation of the Forest Plan. Furthermore, most of the activities only alter Indiana bat habitat, not eliminate it. The proposed activities are not anticipated to reduce the status of Indiana bats on the Wayne NF, and thus, the implementation of the Forest Plan will not appreciably reduce the likelihood of survival and recovery of the Indiana bat.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take of Indiana bats. The terms and conditions listed in the next section are specific actions on how the reasonable and prudent measures must be met.

1. Maintain adequate canopy cover in hardwood stands (depending on the size of the stands) to provide Indiana bat foraging habitat.

2. Provide roosting habitat by preserving shagbark hickory (*Carya ovata*) or shellbark hickory (*Carya laciniosa*) trees.

3. No snag removal (snags with a dbh $6 inches), except where they pose an imminent threat to human safety.

4. Maintain a component of large, over-mature trees, in hardwood stands, when possible. These trees will ensure a continuous supply of large roost trees for the bat.

5. Tree removal activity will be closely monitored and reported on a project-by-project basis to

ensure that impacts of incidental take associated with future proposed projects are appropriately minimized.

6. Protect all known Indiana bat hibernacula on the Wayne NF.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the ESA, the Wayne NF must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

1. When conducting hardwood timber harvests and completing TSI within hardwood stands, maintain at least 60 percent canopy cover whenever possible.

2. Shagbark hickory or shellbark hickory trees shall not be cut during TSI activities, unless the density of trees of these 2 species, combined, exceeds 16 trees/acre. If present, at least 16 live shagbark and shellbark hickory (combined) greater than 11 inches dbh must be maintained per acre.

3. Snags that are potential Indiana bat habitat shall not be removed for TSI purposes. Firewood cutting permits should clearly state that standing dead trees may not be taken.

4. To maintain a component of large, over-mature trees, at least 3 live trees per acre > 20 inches dbh should be maintained in the stand. The 3 trees should be any of the preferred species listed below or a combination of the species listed below. (A tree with < 10 percent live canopy should be considered a snag and would not count towards the 3 trees to be left). These must be among the largest trees of these species remaining in the stand. An additional 6 live trees per acre > 11 inches dbh (of the species listed below) must also be maintained. (The "per acre" requirement can be expressed as the average per acre on a stand-wide basis, depending on the definition of a stand).

shagbark hickory (*Carya ovata*)
shellbark hickory (*Carya laciniosa*)
bitternut hickory (*Carya cordiformis*)
silver maple (*Acer saccharinum*)
green ash (*Fraxinus pennsylvanica*)
white ash (*Fraxinus americana*)
eastern cottonwood (*Populus deltoides*)
northern red oak (*Quercus rubra*)
post oak (*Quercus stallata*)
white oak (*Quercus alba*)
slippery elm (*Ulmus rubra*)
American elm (*Ulmus americana*) (This list is based on review of literature and data on Indiana bat roosting

black locust (*Robinia pseudoacacia*) requirements. Possibility of adding other species as identified)

If there are no trees > 20 inches dbh to leave standing, 16 live trees per acre must be left, and these must include the largest specimens of the preferred species remaining in the stand.

5. During non-hibernation season, Wayne NF will retain all shagbark and shellbark hickory trees over 6 inches dbh and all live trees, of any species, over 6 inches dbh that are hollow, have major splits, or have broken tops, unless they are a safety hazard. Additionally, the Wayne NF will retain a minimum of 12 live trees per acre over 6 inches dbh, of any species, with large areas of loose bark, unless they are a safety hazard. Harvesting of shagbark and shellbark hickory is allowed on the forest during the Indiana bat hibernating season (after September 15 and before April 15) except as might be restricted by the preceding terms and conditions #2 and #4.

6. To ensure that the exemption of incidental take is appropriately documented, the Service will implement an tiered programmatic consultation approach. As individual projects are proposed under the Forest Plan, Wayne NF shall provide project-specific information to ROFO that (1) describes the proposed action and the specific area to be affected, (2) identifies the species that may be affected, (3) describes the manner in which the proposed action may affect listed species, and the anticipated effects, (4) specifies that the "anticipated effects from the proposed project are similar to those anticipated in the programmatic biological opinion," (5) a cumulative total of take that has occurred thus far under the tier I biological opinion, and (6) describes any additional effects, if any, not considered in the tier I consultation.

The Service will review the information provided by the Wayne NF for each proposed project and this project-specific review is appropriately documented. During this review if it is determined that an individual proposed project is not likely to adversely affect listed species, the Service will complete its documentation with a standard concurrence letter that refers to this BO, the tier I programmatic document (i.e., it "tiers" to it), and specifies that the Service concurs that the proposed project is not likely to adversely affect listed species or designated critical habitat. If it is determined that the proposed project is likely to adversely affect listed species or designated critical habitat, then the Service completes a tier II biological opinion with a project-specific incidental take statement.

Because habitat manipulation acreage is being used to monitor levels of incidental take, for each proposed individual project, within the tree removal activities listed below, provide ROFO with a description of the project that includes the location, type of activity, and total acreage to be disturbed by individual project. When reporting the type of activity it must correspond to one of the following management activities:

<	Hardwood thinning and uneven-aged cuts	2250 acres
<	Pine thinning and uneven-aged cuts	250 acres
<	Timber stand improvement	2500 acres
<	Prescribed fire	2500 acres
<	Permanent road construction	32 acres
<	Temporary road construction	37 acres

<	Oil and gas wells road construction	25 acres
<	Trail construction (hiking, horse and ORV)	160 acres
<	Creation of wildlife openings	352 acres
<	Mineral development	2125 acres
<	Special use permits (roads and utility corridors)	125 acres
<	Hazard tree removal	125 **trees**
<	Closing of underground entrances	250 acres

Each project proposal must report how the individual project increases the cumulative forested acres (or number of trees) affected within each of the above management activities and report on the total acreage (or number of trees) remaining in each management activity. Your letter requesting the project specific review must include your determinations that the proposed project is consistent with this programmatic biological opinion and incidental take statement and request that the proposed project be tiered to this programmatic biological opinion.

7. Any dead bats located on the Wayne NF where the species determination is unclear, should be immediately reported to ROFO [(614) 469-6923], and subsequently transported on ice to that office. No attempt should be made to handle any live bat, regardless of its condition; report bats that appear to be sick or injured to ROFO. ROFO will make the final species determination on any dead or moribund bats found on the Wayne NF. If an Indiana bat is identified, ROFO will contact the appropriate Service Law Enforcement office. (The handling part of this term and condition does not apply to those specific individuals who are permitted, as agents of the State, for conducting work on Federally listed bat species.)

8. If additional Indiana bat hibernacula are discovered on the Wayne NF, bat-friendly gates shall be installed, as funding allows, to prevent unauthorized entry. Human access to areas surrounding the known hibernacula will be deterred by closing or relocating trails that lead to or pass within easy viewing distance of known hibernacula. A one-quarter mile of undisturbed forested buffer should be retained surrounding all known hibernacula where the Forest Service has jurisdiction. Undisturbed forested buffer is defined as an area where trail and road construction and tree harvesting activities are prohibited. Prescribed fires should not occur within one-quarter mile of all known hibernacula on the Wayne NF, where the Forest Service has jurisdiction, during the fall swarming and hibernation period of the Indiana bat. When developing prescribed burn plans, Wayne NF personnel should ensure that smoke management in the vicinity of known hibernacula will prevent smoke from entering into the known hibernacula.

9. Before backfilling any mine openings, such as a portal entrance or subsidence depression with a developed opening, a survey for potential bat presence will be required during the fall swarming period. This period usually falls between mid-August to mid-October. The survey is optional if the closure will be accomplished by installing a bat-friendly gate.

Summary

In conclusion, the Service believes that no more than 10,606 acres of forest that is currently suitable summer roosting and foraging habitat for Indiana bats will be lost over the next five years. Coal strip mining, road construction, trail construction, oil and gas wells, and special use permits may remove up to 2,504 acres of suitable summer roosting and foraging habiat. Further, the Service believes that the alteration of currently suitable summer roosting and foraging habitat for Indiana bats will be limited to 8,102 acres for pine thinning and uneven-aged cuts, hardwood thinning and uneven-aged cuts, TSI, prescribed fire, creation of wildlife openings, and closing of underground entrances. Additionally, up to125 hazard trees (25 per year) may be removed from the Wayne NF during the period from April 15 to September 15.

The Service believes that the reasonable and prudent measures outlined above will significantly reduce the impacts of incidental take of Indiana bats on the Wayne NF and that these measures are reasonable and fall within the Forest Service's responsibilities to conserve Federally-listed species as outlined in sections 2(c)(1) and 7(a)(1) of the ESA.

Bald Eagle

AMOUNT OR EXTENT OF TAKE

The Service anticipates that incidental take of bald eagles as a result of forest management activities or other actions implemented from the Forest Plan on the Wayne NF (including timber management operations, human disturbance, prescribed fires, and indirect effects) will be difficult to quantify and detect for the following reasons: 1) there is an abundance of roost trees available to eagles throughout the forest; it would therefore, be difficult to document that the harm or harass provisions of take resulted from the loss of a particular tree when numerous, alternative roosts are available for roosting, 2) eagles have become acclimated to some level of human activity on the Wayne NF (USFS 1998), 3) the Service is unaware of any study that has accurately identified the degree of impact to bald eagles from drifting smoke that originated from prescribed fires adjacent to occupied areas, and 4) it is unlikely that activities that could adversely impact the water quality of rivers, lakes, creeks, and streams where the species forages would be of such magnitude to appreciably decrease this species forage base.

EFFECT OF THE TAKE

The Service has determined that the level of unquantifiable, anticipated take of bald eagles is not likely to result in jeopardy to the species. Bald eagles have been occasionally sighted on or near the Wayne NF. At this time, bald eagles are not nesting on the forest but are migrating through or wintering there. While timber harvest activities could remove potential nesting and roosting trees within the forest as well as create noise and human disturbance, the proposed activities are not anticipated to reduce the status of bald eagles on the Wayne NF. Therefore, the implementation of the Forest Plan will not appreciably reduce the likelihood of survival and recovery of the bald eagle.

REASONABLE AND PRUDENT MEASURES

Although the Service has determined that the level of incidental take for this species is unquantifiable, the following reasonable and prudent measures are necessary and appropriate to minimize any adverse impacts to bald eagles on the Wayne NF:

1. Reduce the potential of removing unknown communal night roosts.

2. Discourage continuous and/or repeated human disturbance where wintering eagles (November 15 and March 15) are known to have communal night roosts or form daily congregations [as defined in the Northern States Bald Eagle Recovery Plan (USFWS 1983a)] on all lands or waters managed by the Wayne NF.

3. Use appropriate smoke management techniques to minimize potential impacts of smoke inversion to occupied communal night roosts, daytime concentrations, or occupied breeding territories.

4. In association with the predicted removal of this species from the list of endangered and threatened wildlife, assist the Service and the Ohio Division of Wildlife in monitoring the status of the species on the Wayne NF up through the five years following delisting, according to requirements outlined in the ESA.

The Service believes that the reasonable and prudent measures outlined above will significantly reduce the impacts of incidental take of bald eagles on the Wayne NF and that these measures are reasonable and fall within the Forest Service's responsibilities to conserve Federally-listed species as outlined in sections 2(c)(1) and 7(a)(1) of the ESA.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the ESA, the Forest Service (Wayne NF) must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline the required reporting/monitoring requirements. These terms and conditions are non-discretionary.

In order to decrease the potential of removing of unknown communal night roosts, the following is necessary:

1. Conduct a minimum of three annual winter (early, middle, and late) searches, as funds are available, (aerial and/or ground) to locate any previously unknown communal night roosts or eagle concentrations on areas of the Wayne NF where actions are being planned that may affect the species following criteria outlined in the Northern States Bald Eagle Recovery Plan (USFWS

1983a). Searches will focus on areas eagles are known to frequent, where congregations of eagles have been previously documented, or where there are concentrated food sources (such as poultry farms, hog lots, aquiculture facilities, etc.) near lands or waters managed by the Wayne NF.

2. Any bald eagle communal night roosts and concentrations (including nests), discovered during winter surveys or during any additional field surveys of proposed project areas, shall be protected following guidelines outlined in the Northern States Bald Eagle Recovery Plan (USFWS 1983a).

3. Any bald eagle nests discovered on Wayne NF lands shall be immediately reported to ROFO and the Ohio Department of Natural Resources, Division of Wildlife (ODNR-DOW).

4. By June 1 of each year, provide an annual report to ROFO and the ODNR-DOW, that includes the following information: (1) results of any winter searches for communal night roosts and concentrations, including mid-winter surveys conducted in cooperation with the Service/ODNR-DOW, and (2) discovery of any nesting territories on lands managed by the Wayne NF. If no surveys have been conducted and no nesting territories discovered on Wayne NF lands during an annual reporting period, an annual report should be submitted with a statement to this effect.

In order to decrease human disturbance, the following is necessary:

5. Protect super-canopy (Tyrell *et al.* 1998) or other identified congregation roost trees along major river corridors, lakes and lands managed by the Wayne NF, in addition to adhering to standards and guidelines outlined in the Forest Plan for riparian corridors.

In order to minimize potential impacts of smoke inversion to occupied communal night roosts, daytime concentration sites, or occupied breeding territories, it is necessary to:

6. Consider all bald eagle communal night roosts, daytime concentration sites, or breeding sites (if and when discovered on the Wayne NF) as occupied bald eagle sites. Prescribed fires should not be conducted within ½ mile of occupied bald eagle sites. In order to prevent smoke inversion from occurring at all occupied bald eagle sites, Wayne NF should conduct any planned prescribed fire (in areas outside the ½ mile radius of occupied sites) only when the following have been considered: wind direction, speed, mixing height and transport winds needed in burn planning and implementation, to minimize smoke from drifting toward and occupied sites.

7. By June 1 of each year, provide an annual report to ROFO, that includes any documented case of a prescribed fire that behaved contrary to predicted movement patterns and which resulted in a confirmed adverse impact to bald eagles.

8. For any prescribed fire that could potentially impact Bald eagles, provide ROFO with the opportunity to review burn plans with Wayne NF Fire Management Officer prior to the burn plan being approved.

In order to assist with the Service and Ohio Division of Wildlife in monitoring the status of the species on the Wayne NF up through the five years following delisting according to requirements outlined in the ESA, it is necessary to:

9. Should the bald eagle be found on the Wayne NF, populations should be monitored and managed as directed by this biological opinion and the species delisting monitoring plan for a period of five years after delisting.

American Burying Beetle

AMOUNT OR EXTENT OF TAKE

The Service recognizes that in Ohio, the American burying beetle only occurs in Athens, Hocking and Vinton counties so the following incidental take statement for American burying beetle is limited to those counties. The Service does not anticipate the continued implementation of the Forest Plan will incidentally take any American burying beetles.

EFFECT OF THE TAKE

The Service has determined that no incidental take is anticipated and therefore the continued implementation of the Forest Plan is not likely to result in jeopardy to the species.

REASONABLE AND PRUDENT MEASURES

The Service has determined that no incidental take for this species is anticipated, therefore, no reasonable and prudent measures are necessary and appropriate to minimize incidental take of American burying beetles on the Wayne NF.

TERMS AND CONDITIONS

Terms and conditions, which implement the reasonable and prudent measures, are not required because the Service believes that incidental take of American burying beetles on the Wayne NF will not occur.

REINITIATION NOTICE

This concludes formal consultation on the continued implementation of the Wayne National Forest Land and Resource Management Plan (as amended) and projects predicated upon it, as outlined in the Biological Assessment. As provided in 50 CFR §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 continued implementation of the Wayne National Forest Land and Resource Management Plan (as amended) and projects predicated upon it may affect listed species in a manner or to an extent not considered in this opinion; (3) the continued implementation of the Wayne National Forest Land and Resource Management Plan (as amended) and projects predicated upon it is subsequently modified in a manner that causes an effect to Federally-listed species 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. Requests for reinitiation, or questions regarding reinitiation, should be directed to the U.S. Fish and Wildlife Service's Reynoldsburg, Ohio Field Office.

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 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.

The Service provides the following conservation recommendations for the Wayne NF; these activities may be conducted at the discretion of the Wayne NF as time and funding allow. The Service requests notification of the implementation of any conservation recommendations that minimize or avoid adverse effects or provide a benefit to Federally-listed species or their habitats.

Indiana Bat

The Service recommends that the Wayne NF implement the following conservation measures for the benefit of the Indiana bat:

1. Conduct a mist netting and radio telemetry study of Indiana bats on the Marietta unit of the Wayne NF, as funds are available.

2. In consultation with the Service, continue to identify and support Indiana bat studies to gain a better understanding of the bat on the Wayne NF and throughout the range. The Wayne NF, in cooperation with the Service, has recently provided funding to a multi-year study concerning diurnal roost tree usage on the forest. We encourage continued participation between our agencies in the future as an aid to the recovery of the species.

3. In consultation with the Service and the ODNR-DOW, conduct training for employees of the Wayne NF on bats (including Indiana bat) occurring on the Wayne NF. Training should include

sections on bat identification, biology, habitat requirements, and sampling techniques (including instructions on applicability and effectiveness of using mist net surveys vs. Anabat detectors to accurately determine the presence of various bat species). The proper training of Wayne NF biologists on bat identification and a reliable methods for counting roosting bats will enable the Wayne NF to continue to monitor the status of this species independently of other agencies and research institutions.

4. Create upland waterholes for Indiana bats, as funding allows.

5. A quarter mile of undisturbed forested buffer should be retained surrounding all openings that are known Indiana bat fall swarming sites, where the Forest Service has jurisdiction. Undisturbed forested buffers should be maintained by reducing or eliminating human disturbances whenever possible.

Bald Eagle

The Service recommends that the Wayne NF implement the following conservation measure for the benefit of the bald eagle:

1. Provide field training for new Wayne NF employees so they will be able to recognize bald eagle signs at night roosts, even when eagles are absent.

Note: the Service will not refer the incidental take of any bald eagle for prosecution under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. §§ 703-712), or the Bald and Golden Eagle Protection Act of 1940, as amended (16 U.S.C. §§ 668-668d), if such take is in compliance with the terms and conditions specified in this opinion.

American Burying Beetle

The Service recommends that the Wayne NF implement the following conservation measures for the benefit of the American burying beetle:

1. New road construction, within 10 air miles of known occupied American burying beetle habitat, could be planned in such a way as to involve the least amount of ground disturbance, measured in terms of the area compacted to the point it is no longer American burying beetle habitat, and designed with the minimum safe width necessary for planned use of the road.

2. We recommend that ground disturbance during the reconstruction and maintenance of existing roads be kept to a minimum within 10 air miles of known occupied American burying beetle habitat. Width of road, ditches, and surface materials could be the minimum necessary to allow safe movement of all permitted vehicular traffic.

3. To limit American burying beetle habitat loss, we recommend that improved areas, such as campgrounds, recreation area, and trails, should be planned for and constructed outside areas with known American Burying beetle populations.

4. We recommend that the wildlife and forestry management practices for the Wayne NF continue to incorporate the principals of forest ecosystem management and that management for the American burying beetle be included among the high priority species and goals of the Wayne NF. Forestry management should implement activities which benefit the American burying beetle, when this is compatible with the overall productivity and vitality of the Wayne NF.

5. Develop and carry out a monitoring strategy to evaluate the reintroduction of the American burying beetle, as funding allows. The monitoring strategy should follow approved American burying beetle monitoring guidelines, and focus of the monitoring should be within 10 air miles of the release site where the Forest Service has jurisdiction.

6. Because of the sensitivity of most insects to chemical applications, use of pesticides could be restricted within the known range of the American burying beetle on the Wayne NF. Restriction could be in the method of application, the location, and the type of pesticide or herbicide used.

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

APPLICABILITY OF BIOLOGICAL OPINION TO SITE SPECIFIC PROJECTS

The Service believes that scope of effects for specific projects developed through the continued implementation of the Forest Plan on the Wayne NF falls under the umbrella of this consultation for the following reasons:

< The terms and conditions associated with the reasonable and prudent measures outlined in this opinion will minimize the impact of the incidental take identified for the Indiana bat, bald eagle, and American burying beetle on both a programmatic and site specific level; the protective measures outlined herein for the entire Wayne NF are applicable to individual projects yet to be identified.

< If, after adhering to the terms and conditions associated with the reasonable and prudent measures provided in this opinion, the Forest Service determines that activities on a project level are likely to adversely affect the Indiana bat, bald eagle, and American burying beetle, the Service would request that formal consultation be initiated.

< Any individual project that results in the level of incidental take identified in this opinion to be exceeded would necessitate the reinitiation of formal consultation as outlined above.

< The Forest Service will continue to conduct site-specific project analyses to ensure that each individual action follows recommendations set forth in this opinion.

< The Service will continue to review all site-specific projects to ensure that there is strict adherence to the terms and conditions associated with the reasonable and prudent measures outlined in this opinion and that incidental take levels identified in this opinion are not exceeded.

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