United States Department of the Interior

FISH AND WILDLIFE SERVICE

IN REPLY REFER TO:

2651 Coolidge Road, Suite 101
East Lansing, Michigan 48823-6360

July 19, 2018

Jacob Lubera, District Ranger
Huron-Manistee National Forest
Baldwin/White Cloud Ranger Station
650 N. Michigan Avenue
P.O. Box Drawer D
Baldwin, MI 49304

Re: Formal Section 7 Consultation and Biological Opinion on the Gilbert Lake Project, Huron-Manistee National Forests – Log # 18-R3-ELFO-03

Dear Mr. Lubera:

This letter transmits the U.S. Fish and Wildlife Service's Biological Opinion (BO) for the Gilbert Lake Project on the Huron-Manistee National Forests (HMNF) in accordance with Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (Act). The HMNF determined that the proposed actions were "Likely to Adversely Affect" the Indiana bat (*Myotis sodalis*), and northern long-eared bat (*Myotis septentrionalis*; NLEB); and "Not Likely to Jeopardize" the eastern massasauga rattlesnake (*Sistrurus catenatus,* EMR).

We base the enclosed Biological Opinion on information provided in several documents, including your Biological Assessment (BA) for the Gilbert Lake Project, the Programmatic BA and March 2, 2006, programmatic BO for the HMNF Forest Plan, and the January 5, 2016, Programmatic BO on the Final 4(d) Rule for the NELB and Activities Exempted from Take Prohibitions. Other sources of information include telephone conversations and e-mails with the HMNF. A complete administrative record of this consultation is on file at the Service's Michigan Ecological Services Field Office.

Species Likely To Be Adversely Affected By the Proposed Action

Indiana Bat

After reviewing the current status of the Indiana bat, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the species.

Mr. Jacob Lubera

Northern long-eared bat

Your project is consistent with the framework set forth in the January 5, 2016, Programmatic Biological Opinion on the Final 4(d) Rule for the NLEB and Activities Exempted from Take Prohibitions. Therefore your Section 7(a)(2) responsibilities have been met in respect to the NLEB.

Species Not Likely To Be Adversely Affected By the Proposed Action

Eastern massasauga rattlesnake

You determined that the proposed action is "not likely to adversely affect" EMR. We concur with that determination for the following reason:

- There are no known records of EMR occurring within the project area. The nearest documented occurrence is 4.5 miles from the project boundary and is outside the HMNF's conservation and potential EMR habitat zones. The potential for EMR to be present during project activities and experience adverse effects is extremely unlikely.

Based on this information, we expect any potential effects from this project on EMR to be discountable.

With respect to the Act's compliance, all aspects of the project description are binding. Reasonable and Prudent Measures and the accompanying Terms and Conditions provided within the enclosed biological opinion are nondiscretionary and are designed to minimize incidental take of listed species.

We appreciate the opportunity to cooperate with the Huron-Manistee National Forests in conserving endangered species. If you have any questions, please contact Chris Mensing of this office at 517-351-8316 or chris_mensing@fws.gov.

Sincerely,

Acting for Scott Hicks
Field Supervisor

cc: Mr. Dan Kennedy, MDNR, Lansing, MI
Mr. Phil Delphey, USFWS, Bloomington, MN

BIOLOGICAL OPINION

Effects to the
Indiana Bat (*Myotis sodalis*)
from the
Gilbert Lake Project,
Huron-Manistee National Forests

Prepared by:
U.S. Fish and Wildlife Service
Michigan Ecological Services Field Office
East Lansing, MI

Log # 18-R3-ELFO-03

July 19, 2018

INTRODUCTION

This document transmits the U.S. Fish and Wildlife Service's (Service) Biological Opinion (BO) based on our review of the U.S. Forest Service's (USFS) proposed Gilbert Lake Project on the Huron-Manistee National Forests (HMNF) and the Project's effects on the Indiana bat (*Myotis sodalis*) in accordance with Section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). The HMNF determined that the proposed project was "likely to adversely affect" Indiana bat and the northern long-eared bat (*Myotis septentrionalis*, NLEB), and was "not likely to adversely affect" the eastern massasauga rattlesnake (*Sistrurus catenatus*, EMR). The HMNF's request for formal consultation was received on January 24, 2018. Additional information about the proposed project and the project's effects to listed species was provided on March 15, 2018.

On March 2, 2006, the Service issued a programmatic Biological Opinion (programmatic BO) for the HMNF revised 2006 Land and Resource Management Plan (Forest Plan). In the programmatic BO, we evaluated the effects of HMNF Forest Plan activities on bald eagle *(Haliaeetus leucocephalus)*, Kirtland's warbler (*Setophaga kirtlandii)*, piping plover *(Charadrius melodus)* and its critical habitat, Pitcher's thistle *(Cirsium pitcheri)*, Indiana bat, and Karner blue butterfly *(Lycaeides melissa samuelis).* We concurred that implementation of the Forest Plan was *likely to adversely affect* these species, but *not likely to adversely affect* piping plover critical habitat. The programmatic BO concluded that the Forest Plan was *not likely to jeopardize* these listed species. The programmatic BO established a two-level consultation process for activities completed under the Forest Plan. Evaluation of the Forest Plan at the plan level represented a Level 1 consultation and all subsequent project-specific evaluations for future actions completed under the Forest Plan are Level 2 consultations. Under this approach, the Level 1 programmatic opinion established guidelines and conditions that each individual future project must adhere to and operate within to remain consistent with the scope of the Level 1 opinion; these individual projects are subject to Level 2 consultations. Projects that are *likely to adversely affect* listed species or designated critical habitat are reviewed to determine: 1) whether they were contemplated in the Level 1 programmatic opinion and 2) if they are consistent with the guidelines established in the Level 1 programmatic opinion and whether the reasonable and prudent measures and terms and conditions provided in the incidental take statement are applicable. This ensures that the effect of any incidental take resulting from individual projects is minimized. In response, a Level 2 opinion is prepared and appended to the original programmatic opinion. Future projects that are likely to adversely affect listed species or critical habitat, and do not adhere to the guidelines and conditions evaluated during the programmatic consultation, or any future projects that are considered to be outside the scope of the proposed action or Forest Plan, may require separate formal consultations.

On April 2, 2015, the Service listed the NLEB as threatened under the Act and published a species-specific interim 4(d) rule (80 FR 17973). On January 14, 2016, a final 4(d) rule (81 FR 1900) and accompanying Programmatic Biological Opinion (dated January 5, 2016) was published that defined the take prohibitions for the species and established a streamlined consultation process. Your project is consistent with the framework set forth in the January 5, 2016, Programmatic Biological Opinion on the Final 4(d) Rule for the NLEB and Activities Exempted from Take Prohibitions. Therefore your Section 7(a)(2) responsibilities have been met in respect to the NLEB and this Biological Opinion only addresses the proposed project's effects on Indiana bat.

Additionally, on September 30, 2016 the Service listed the EMR as threatened (81 FR 67193). While the proposed action incorporates and maintains consistency with the applicable standards and guidelines as outlined in the Forest Plan, the Programmatic BO did not address effects of the Forest Plan on EMR or NLEB. Therefore, this consultation is not considered a Level 2 project-level consultation; instead, it is a "stand-alone" consultation.

We base this opinion on information provided in several documents, including the January 23, 2018 Biological Assessement (BA) for the Gilbert Lake Project, the March 15, 2018, revised BA, and the Programmatic BA and BO for the HMNF Forest Plan. Other sources of information include telephone conversations, and e-mails with the HMNF. A complete administrative record of this consultation is on file at the Service's Michigan Ecological Services Field Office.

Consultation History

March 2, 2006	A Programmatic Biological Opinion for the HMNF's Forest Plan was completed, establishing a two-level consultation process. EMR and NLEB were not listed or proposed at this time.
April 2, 2015	The Service listed the NLEB as threatened with an interim 4(d) rule.
January 14, 2016	The Service published a final 4(d) rule for NLEB.
September 30, 2016	The Service listed the EMR as threatened.
January 23, 2018	The Service received the HMNF's request to initiate formal consultation for the Gilbert Lake project. The HMNF also provided a Biological Assessment for the Project.
March 15, 2018	The Service received a revised BA from the HMNF, clarifying the proposed action and impact to listed species.
June 8, 2018	Draft BO submitted to HMNF
July 20, 2018	Final BO submitted to HMNF

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

As defined in the ESA Section 7 regulations (50 CFR 402.02), "action" means "all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas." The "action area" is defined as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." The direct and indirect effects of the actions and activities must be considered in conjunction with the effects of other past and present Federal, State, or private activities, as well

as the cumulative effects of reasonably certain future State or private activities within the action area.

Action Area

The proposed Gilbert Lake project area is located within the Baldwin/White Cloud District of the HMNF in Beaver and Troy Townships, Newaygo County, and Colfax, Crystal, and Leavitt Townships, Oceana County, Michigan (Figure 1). The proposed action area encompasses approximately 32,087 acres, of which approximately 11,422 acres are National Forest System lands. Proposed activities would occur on 5,914 acres within the project boundary. While both private and federal lands are contained within the proposed action area, no proposed activities would occur on private lands.

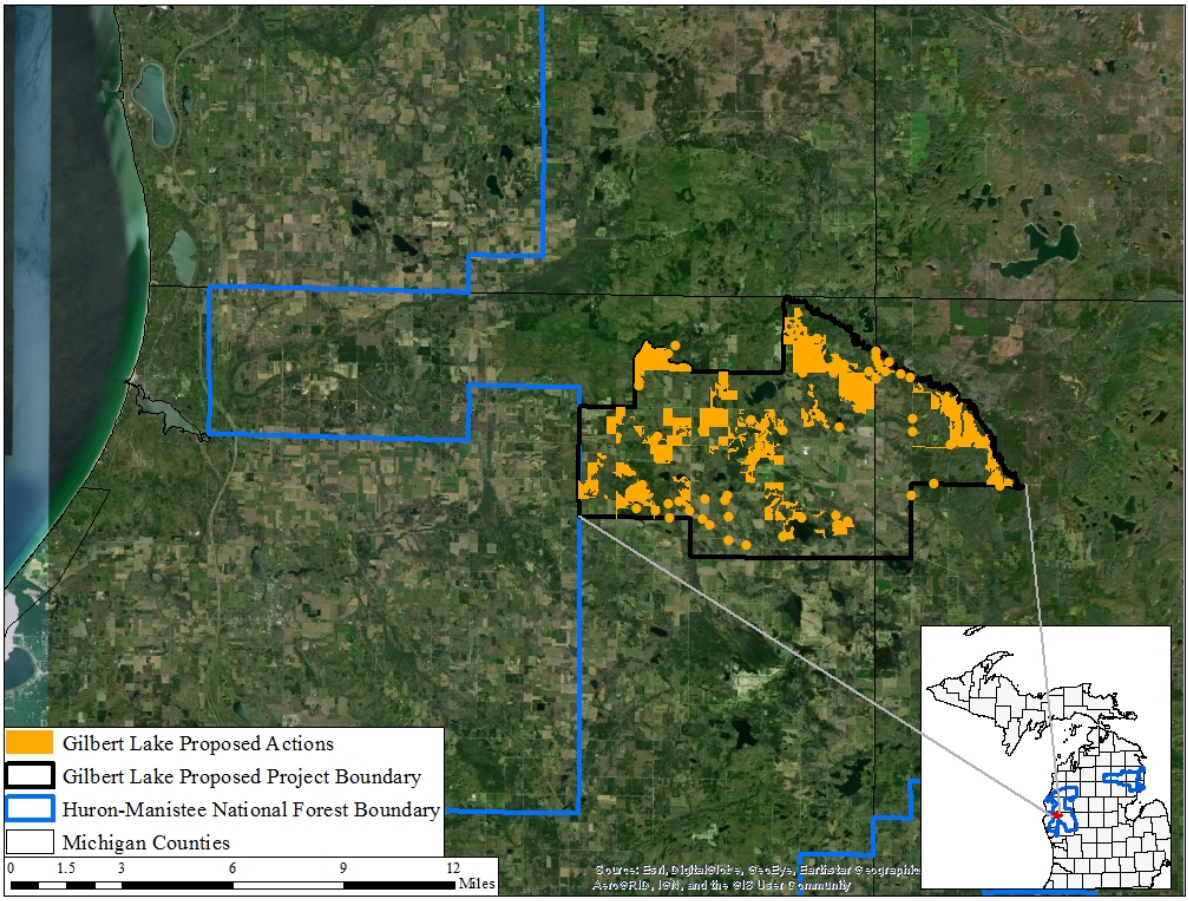

Figure 1: Map of the Action Area; Newaygo and Oceana Counties, Huron-Manistee National Forests.

Project Description

The Gilbert Lake project would occur over a 15-year period and consist of the following actions (all acre and mile calculations are approximate):

- 1,493 acres of aspen regeneration

- 21 acres of jack pine regeneration
- 513 acres of oak thinning and regeneration
- 1,578 acres of prescribed burning with silvicultural treatments
- 3,110 acres of red pine thinning, regeneration, and timber stand improvements
- 55 acres of scotch pine treatment
- 9 acres of fireline construction
- 148 acres of prescribed burning
- 120 acres of alder and aspen handcut
- Up to 605 acres of non-native invasive plant (NNIP) control projects
- 284 acres of wildlife opening management
- 37.9 miles of transportation system modifications (e.g. closure, construction, reconstruction)
- 33 road/stream crossing improvements or erosion control projects
- Recreational opportunity improvements

Multiple activities may occur at the same location but at a later time. For example, a prescribed burn and /or invasive species treatment may follow a timber harvest.

Conservation Measures

Conservation Measures are those actions taken to benefit or promote the recovery of the species. The Forest Service has proposed the following conservation measures/design criteria to minimize or compensate for project effects on Indiana bat and have been included in the proposed action.

- If any previously unknown Indiana bat roost trees or individuals are discovered during project implementation, they will stop the activity within the area of concern until the District Wildlife Biologist, Timber Management Administrator and District Ranger are informed and adequate protection measures are applied, if needed, to avoid potential impacts.

- Reserve existing snags that are not a safety hazard in all treatment units to maintain wildlife habitat. Incorporate retention of snags, den trees, mast trees, and down wood as specified in Table II-12 in the HMNF Forest Plan. Where feasible, large overstory oak trees, also known as "oak veins," would be left in red pine thinning and red pine regeneration areas. In regeneration harvests, consider leaving reserve trees in clumps/groups.

- To protect juvenile and adult Indiana bats, implement the design criteria for Indiana bat outlined in the Biological Opinion on the Programmatic Biological Assessment for the Huron-Manistee National Forests Land and Resource Management Plan in stands where potential breeding habitat occurs (USDA FS 2006a). Specifically: conduct management activities (excluding prescribed burns) outside the summer maternity period between May 1 and August 31; retain snags (preferably > 9"dbh), den trees, cavity trees, mast trees, and down wood as prescribed in Table II-12 in the Forest Plan; preferably retain Class 1

and Class 2 trees, trees > 26" dbh, and trees with greater than 25% exfoliating bark, if available; and design tree retention to minimize wind throw.

- Apply herbicides following the manufacturer's label instructions and the Forest Service Manual (FSM 2150). Avoid damage to non-target plans by using treatments (e.g. spot application with a wick applicator) that minimizes exposure and avoiding herbicides that transport/travel through the ground layer (e.g. imazapyr). Conduct applications when weather conditions do not result in the drift or spread of chemicals.

- Recommendations included in the State of Michigan Sustainable Soil and Water Quality Practices on Forest Land (MDNR 2009) and USDA-Forest Service Handbook 2550, supplement #R9 RO 2550-2012-1 will be incorporated. These practices limit activities where soils are saturated or when rutting is likely to occur, encouraging the activities to occur when soils in riparian areas are frozen, outside the Indiana bat's active period.

STATUS OF THE SPECIES

Description of the species

The Indiana bat is a temperate, insectivorous, migratory bat that hibernates in mines and caves in the winter and spend summers in wooded areas. The key stages in their annual cycle are hibernation, spring staging and migration, pregnancy, lactation, volancy/weaning, and fall swarming and migration. While varying with weather and latitude, the species hibernates between mid-fall through mid-spring each year. Spring migration likely runs from mid-March to mid-May each year with females departing shortly after emerging from hibernation and are pregnant when they reach their summer area. Young are born between late May and early June, with nursing continuing until weaning, which is shortly after young become volant (able to fly) in mid- to late-July. Fall migration likely occurs between mid-August and mid-October.

Summer Habitat and Ecology

Suitable summer habitat for Indiana bat consists of a wide variety of forested/wooded habitats where they roost, forage, and travel. This habitat may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields, and pastures. This includes forests and woodlots containing potential roosts, as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure.

Many species of bats, including the Indiana bat, consistently avoid foraging in or crossing large open areas, choosing instead to use tree-lined pathways or small openings (Patriquin and Barclay 2003, Yates and Muzika 2006). Thus, isolated patches of forest may not be suitable for foraging or roosting unless the patches are connected by a wooded corridor.

Maternity Colonies and Roosts

Upon emergence from the hibernacula in the spring, females seek suitable habitat for maternity colonies. Coloniality is a requisite behavior for reproductive success. Indiana bats maternity colonies can vary greatly in size, with most documented maternity colonies containing less than 100 adult females. Maternity colonies use networks of roost trees often centered around one or more primary roost trees and the species shows some degree of interannual fidelity to single roost trees and/or maternity areas. Indiana bat maternity colonies use a minimum of 8-25 trees per season and switch roosts every 2-5 days throughout the season, using primary roosts more often than alternate roosts (Callahan et al. 1997; Kurta et al. 2002).

Indiana bats are known to use a wide variety of tree species (≥5 inches dbh) for roosts, most commonly based on presence of loose or peeling bark. A typical Indiana bat primary roost is located under exfoliating bark of a dead ash, elm, hickory, maple, oak, or poplar, although any tree that retains large, thick slabs of peeling bark may be suitable. Primary Indiana bat roosts usually are in trees that are in early-to-mid stages of decay. Indiana bats have also been occasionally found roosting in structures like barns and sheds (particularly when suitable tree roosts are unavailable).

Reproduction

Indiana bats are typically born in late-May or early June, with females giving birth to a single offspring. Lactation then lasts 3 to 5 weeks, with pups becoming volant between early July and early August.

Migration

Very little is known of the specific details on how Indiana bats migrate between their summer roots and wintering hibernacula. Males and non-reproductive females may summer near hibernacula, or migrate to summer habitat some distance from their hibernaculum. Indiana bats are known to often migrate hundreds of kilometers from their hibernacula (USFWS 2007). Kurta and Murray (2002) documented movement of bats between banding locations in southern Michigan and caves in Indiana and Kentucky. Migration is an energetically demanding behavior for Indiana bat, particularly in the spring when their fat reserves and food supplies are low and females are pregnant.

Winter Habitat and Ecology

Suitable winter habitat (hibernacula) includes underground caves and cave-like structures (e.g., abandoned or active mines, railroad tunnels, and other locations where bats hibernate in winter). Generally, Indiana bats hibernate from October to April depending on local weather conditions (November-December to March in southern areas and as late as mid-May in some northern areas).

Caves that meet temperature requirements for Indiana bats are rare. Most Indiana bats hibernate in caves or mines where the ambient temperature remains below 10ºC (50.0ºF), but infrequently drops below freezing (Hall 1962, Myers 1964, Henshaw 1965, Humphrey 1978). Caves that historically sheltered the largest populations of hibernating Indiana bats were those that provided

the largest volumes and structural diversity, thus ensuring stable internal temperatures over wide ranges of external temperatures, with a low likelihood of freezing (Tuttle and Kennedy 2002).

Indiana bats generally hibernate in large clusters, sometimes with other species, with densities of 300 to 484 bats per square foot (USFWS 2007) and have shown a high degree of philopatry to the hibernacula used, returning to the same hibernacula annually.

Spring Staging and Fall Swarming Habitat and Ecology

Upon arrival at hibernacula in mid-August to mid-November, Indiana bats "swarm," a behavior in which large numbers of bats fly in and out of cave entrances from dusk to dawn, while relatively few roost in caves during the day. Swarming continues for several weeks and mating occurs during the latter part of the period. After mating, females enter directly into hibernation but not necessarily at the same hibernaculum where mating occurred. A majority of bats of both sexes hibernate by the end of November (by mid-October in northern areas).

After hibernation ends in late March or early April (as late as May in some northern areas), most Indiana bats migrate to summer roosts. Females emerge from hibernation prior to males. Reproductively active females store sperm from autumn copulations through winter. Ovulation takes place after the bats emerge from hibernation in spring. The period after hibernation and just before spring migration is typically referred to as "staging," a time when bats forage and a limited amount of mating occurs. This period can be as short as a day for an individual, but not all bats emerge on the same day.

In general, Indiana bats use roosts in the spring and fall similar to those selected during the summer. Suitable spring staging/fall swarming habitat happens in forested/wooded habitats where they roost, forage, and travel, which is most typically within 5 miles of a hibernaculum. This includes forested patches as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Isolated trees are considered suitable habitat when they exhibit the characteristics of a suitable roost tree and are less than 1,000 ft. from the next nearest suitable roost tree, woodlot, or wooded fencerow.

Distribution and Status

The current range of the Indiana bat includes much of the eastern half of the United States, from Oklahoma, Iowa, and Wisconsin east to Vermont, and south to northwestern Florida. The species has disappeared from, or greatly declined, in most of its former range in the northeastern United States due to the impacts of white-nose syndrome. The current draft recovery plan (USFWS 2007) delineates recovery units based on population discreteness, differences in population trends, and broad level differences in land use and macrohabitats. There are currently four proposed recovery units for the Indiana bat: Ozark-Central, Midwest, Appalachian Mountains, and Northeast.

The historical summer range of the Indiana bat is thought to be similar to its modern range. However, the bat has been locally extirpated due to fragmentation and loss of summer habitat. The majority of known maternity sites have been located in forested tracts in agriculturally dominated landscapes such as Missouri, Iowa, Indiana, Illinois, southern Michigan, western Ohio, and western Kentucky, as well as the Northeast.

Historically, the Indiana bat had a winter range restricted to areas of cavernous limestone in the karst regions of the east-central United States. Hibernacula are divided into priority groups that have been redefined in the USFWS's Draft Recovery Plan (USFWS 2007):

- Priority 1 (P1) hibernacula typically have a current and/or historically observed winter population of greater than or equal to 10,000 Indiana bats;
- P2 have a current or observed historic population of 1,000 or greater, but fewer than 10,000;
- P3 have current or observed historic populations of 50 to 1,000 bats; and
- P4 have current or observed historic populations of fewer than 50 bats.

From 1965 to 2001, there was an overall decline in the range-wide population of the Indiana bat (USFWS 2007). Despite the discovery of many new, large hibernacula during this time, the range-wide population estimate dropped approximately 57% from 1965 to 2001, which has been attributed to causes such as habitat loss/degradation, forest fragmentation, winter disturbance, and environmental contaminants. Between 2001 and 2007, the estimated range-wide population increased, from 526,026 to 664,632 Indiana bats (USFWS 2017). According to the 2017 Indiana Bat (*Myotis sodalis)* Population Status Update (USFWS 2017), the total known Indiana bat population is estimated to be approximately 530,705, a 133,927 (20.2%) decrease from the 2007 range-wide estimate.

Based on the 2017 Status Update, there were 229 hibernacula occurring in 17 states (USFWS 2017) of which 27 were identified as P1 and 58 identified as P2. The largest hibernacula is the Sodalis Nature Preserve in Missouri which was recently discovered in 2012. Nearly 200,000 hibernating Indiana bats were counted during the 2017 season, consisting of 37% of the range-wide population (USFWS 2017).

Critical Habitat

Critical habitat has been designated for the Indiana bat. Thirteen winter hibernacula (11 caves and 2 mines) in six States were designated as Critical Habitat for the Indiana bat on September 24, 1976 (Federal Register, Volume 41, No. 187). At the time the Critical Habitat was designated, no primary constituent elements were identified. Therefore, the USFWS has identified the physical and biological features that make the designated caves or mines important to the conservation of Indiana bats. The important conservation features include:

- The mine or cave's physical structure, configuration, and all openings that create and regulate suitable microclimates for hibernating bats within
- The associated karst hydrology and stream recharge area/watershed
- The amount and condition of surrounding forested habitat that is used by the bats during the pre-hibernation swarming period each fall.

ENVIRONMENTAL BASELINE

The environmental baseline includes past and present impacts of all Federal, State, or private actions in the action area; the anticipated impacts of all proposed Federal actions in the action area that have undergone formal or early section 7 consultation; and the impact of state and

private actions that are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform to assess the effects of the action.

Status of the Species in the Action Area

In Michigan, the Indiana bat's potential range encompasses the southern half of the Lower Peninsula and the western counties adjacent to Lake Michigan (Figure 2). The Indiana bat has been documented through mist net reports or acoustic monitoring in seventeen counties; the majority of records are located in the southern three tiers of counties. Tippy Dam, a hydroelectric facility on the Manistee River in Manistee Co is the only known hibernacula of Indiana bat in Michigan.

The current status of Indiana bat in the project area is unknown due to a lack of surveys in the project area and the surrounding landscape and there are no known records of Indiana bat within the proposed Gilbert Lake Project area. Tippy Dam and associated Indiana bat records are located approximately 31 miles north of the proposed project area. The nearest known maternity roost to the proposed Gilbert Lake Project area is approximately 92 miles to the southeast, near Vermontville, Michigan.

Habitat Conditions in the Action Area

Of the HMNF's ownership within the Gilbert Lake Project area, 24.9% is aspen/birch, 10.1% is high site oak, 1.9% is low site oak, 3.6% is short-lived conifer, 32.9% is long-lived conifer, 4.1% is northern hardwood, 10.3% is lowland hardwood, 3.0% is lowland conifer, and 9.1% is non-forested. Approximately 10,386 acres (91%) of the HMNF's ownership in the Gilbert Lake Project area is forested. Some of the non-forested habitat consists of aquatic habitats of open and emergent wetlands, and upland openings.

Based on information provided by the HMNF, the Indiana bat's potential range includes 441,214 acres on the Manistee National Forest and 9,700 acres of potential Indiana bat habitat within the proposed Gilbert Lake project area. After a review of survey data, GIS vegetative data layers, and tree record data, the HMNF identified 730 acres (33 stands) proposed for treatment that contained the appropriate tree species, tree bark conditions, and size suitable for Indiana bat habitat. The HMNF is assuming presence of Indiana bat within those 730 acres.

Factors Affecting the Species in the Action Area

<u>Threats</u>

Current threats to the Indiana bat are discussed in detail in the 2007 Draft Recovery Plan (USFWS 2007) and the most recent 5-Year Review (USFWS 2009). Traditionally, habitat loss/degradation, forest fragmentation (lack of connectivity), winter disturbance, and environmental contaminants have been considered the greatest threats to Indiana bats. The Draft Recovery Plan identified and expounded upon additional threats including collisions with man-made objects (e.g., wind turbines).

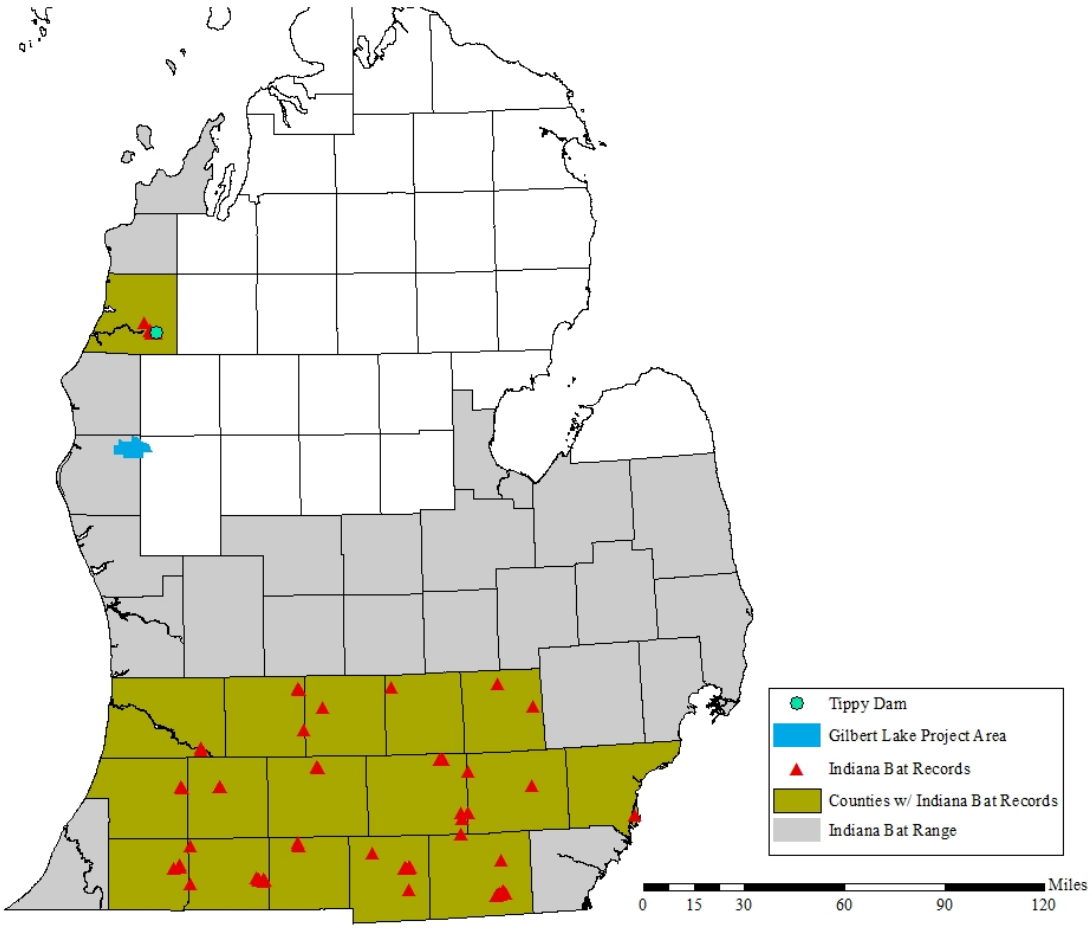

Figure 2: Map of Indiana bat occurrence records in Michigan

The reasons for listing the Indiana bat were summarized in the original Recovery Plan (USFWS 1983) including: declines in populations at major hibernacula despite efforts to implement cave protection measures, the threat of mine collapse, and the potential loss of the largest known hibernating population at Pilot Knob Mine, Missouri. Additionally, other hibernacula throughout the species range were not adequately protected. Documented historical causes of Indiana bat population decline included: 1) human disturbance of hibernating bats; 2) improper cave gates and structures rending them unavailable or unsuitable as hibernacula; and 3) natural hazards like cave flooding and freezing. Suspected causes of Indiana bat declines included: 1) changes in the microclimate of caves and mines; 2) dramatic changes in land use and forest composition; and 3) chemical contamination from pesticides and agricultural chemicals.

No other threat, however, is as severe and immediate for the Indiana bat as the disease white-nose syndrome (WNS). Since the disease was first observed in New York in 2006, WNS has spread rapidly throughout bat populations from the Northeast to the Midwest and Southeast, and recent observations have occurred in the Great Plains and Washington State. Diseased bats were found at several Michigan hibernacula beginning in spring 2014 (Kurta and Smith 2014), and bat mortalities related to WNS were recorded in Keweenaw County in January 2015 (Michigan Department of Health and Human Services 2017). Hibernacula surveys in Michigan during early

2017 have documented widespread population declines consistent with observations in other WNS-affected states. WNS-related reductions in all *Myotis* species in Michigan have been estimated at 86%, and range-wide Indiana bat populations estimated at up to 75% (Kurta pers. comm). For this reason, the Service believes that WNS has significantly reduced the redundancy and resiliency of the Indiana bat.

Kurta and Smith (2017) noted that Indiana bats still occur in Tippy Dam, and that populations of all bats at that site remain consistent with pre-WNS levels. As such, the winter population of Indiana bats in Michigan is still best estimated at 20 individuals. It is speculated that the colder temperatures present inside Tippy Dam inhibit the growth of *Pseudogymnoascus destructans*, providing a potential refuge for the bats (Kurta pers. comm, 2018). It is unclear, however, if Tippy Dam can act as a long-term refuge for bats or if the apparent resistance to WNS and its related fungus is short-lived.

In addition to WNS, current threats from changes in land use and forest composition include forest clearing within the summer range, woodlot management and wetland drainage, and other land management activities that affect the structure and abundance of forest resources.

Destruction and degradation of the bat's summer habitat (i.e., forests) is identified as a longstanding and ongoing threat to the species (USFWS 2009). The U.S. Forest Service (USFS) (2014) summarized U.S. forest trends and found a decline from 1850 to the early 1900s and a general leveling off since that time; therefore, conversion from forest to other land cover types has been fairly stable with conversion to forest (cropland reversion/plantings). However, between 2001 and 2006 there has been a net loss of 1.2% of forest across the U.S. with most losses in the southeast and west and a net loss of 4.3% of interior forest leading to increased forest fragmentation and smaller remaining forest patches (USFS 2014). Not all forest is suitable for the bats and there is interest in locating the bats in the summer to ensure conservation of Indiana bat habitat. Depending on their characteristics and location, forested areas can function as summer maternity habitat, staging and swarming habitat, migration or foraging habitat, or sometimes, combinations of more than one habitat type. Impacts to forested areas can have a variety of impacts on the bat depending on the quality, amount, and location of the lost habitat, and the time of year of the impacts. These impacts could directly affect bats during the active season, or indirectly via habitat loss during the hibernation season.

There is growing concern that bats, including Indiana bat, may experience additional threats by the recent increase in construction and operation of wind turbines across the species' range. Mortality of Indiana bats has been documented at multiple operating wind turbines/farms. As a result, the Service is working with wind farm operators to avoid and minimize incidental take of bats and assess the magnitude of the threat.

<u>Previous Section 7 Consultations</u>

Tippy Dam Indiana Bat Management Plan

In response to Article 412 of the Federal Energy Regulatory Commission's (FERC) relicensing order of July 15, 1994 for Tippy Dam, Consumer's Power developed a management plan for the Indiana bat at Tippy Dam (Kurta 1995). The Indiana Bat Management Plan represents Part V of the Manistee River Land Management Plan for Tippy Dam (FERC Project No. 2580) filed with FERC on January 16, 1996. The plan for the bat addresses two threats to the species at Tippy

Dam: 1) disturbance to hibernating bats and 2) destruction/degradation of non-hibernating bat habitat.

To prevent disturbance to hibernating Indiana bats, the plan prohibits unnecessary entry into the spillway between September 1 and June 1 of each year. The plan also prohibits unnecessary operation of the spill gates during the same period. To protect any Indiana bats that may roost outside the spillway during the summer and swarming seasons, the plan prohibits tree-cutting on Consumer's Power Tippy Project land within a 3.1 mi (5 km) radius around Tippy Dam from May 1 through October 1 of each year. Use of pesticides is prohibited during this same period to prevent effects on the bats and their food supply (insects). In addition, the plan mandates the preservation of a suitable density of potential roost trees (>4 trees per acre) on forested portions of Consumer's Power Tippy Project land.

The plan also calls for monitoring population trends and environmental parameters to establish baseline conditions. Monitoring both population levels and environmental parameters during the hibernation season immediately following the spillway rehabilitation work was initiated to assess potential long-term effects on all bats within the spillway. Monitoring of population levels began in February 1995, and temperature and humidity recordings started in August 1995. Monitoring occurred through the 2001-2002 season.

Huron-Manistee National Forests' Land and Resource Management Plan

A Biological Opinion was provided to the HMNF on March 2, 2006 for effects of implementing their revised Forest Plan on bald eagle, Kirtland's warbler, piping plover and its critical habitat, Pitcher's thistle, Indiana bat, and Karner blue butterfly.

The programmatic biological opinion established a two-level consultation process for activities completed under the Forest Plan. Evaluation of the Forest Plan at the plan level represented the Level 1 consultation and all subsequent project-specific evaluations for future actions completed under the Forest Plan are the Level 2 consultations. Under this approach, the Level 1 programmatic opinion established guidelines and conditions that each individual future project must adhere to and operate within to remain consistent with the scope of the Level 1 opinion; these projects are subject to Level 2 consultations. The Level 1 programmatic opinion and incidental take statement (ITS) estimated the level of incidental take that is anticipated to occur from future Level 2 projects. Due to the temporal and spatial uncertainty that exists at the Forest Plan level regarding this anticipated incidental take, incidental take will be exempted in the Level 2 biological opinions for site-specific actions.

Projects that are likely to adversely affect listed species or critical habitat and do not adhere to the guidelines and conditions evaluated during the programmatic consultation, or any projects that are considered to be outside the scope of the proposed action or Forest Plan, would require separate formal consultations.

Incidental take of Indiana bats was expected to be in the form of injury, death, or harassment, and we believed that the standards and guidelines within the Forest Plan sufficiently limited summer season activities so that only lower quality alternate roost trees may be cut. These trees, if occupied, would likely have either lone roosting males or non-reproductive females. It was reasonable to assume that only a subset of these individuals would be directly taken through injury or death (Bellwood 2002) and that most of the individuals in the occupied roost tree would

escape. We anticipated that such a roost tree could be cut during timber harvest, prescribed burning, minerals and geology activites, and wildlife, fish, and sensitive plant management activities. Although very difficult to predict with certainty, we believed such an event was unlikely. Thus, we anticipated that no more than 4 occupied roost trees would be incidentally cut, and no more than 16 individuals could be injured, killed, or harassed over the next ten years of plan implementation.

To date, no Level 2 consultations for Indiana bat have made a determination of "likely to adversely affect" and no take has been documented on HMNF project activities. Consultation with the HMNF has occurred on a number of projects with the assumption that the Indiana bat was present where suitable habitat existed. The outcome of these informal consultations was "not likely to adversely affect." This determination was reached by either avoiding stands with suitable Indiana bat habitat, or by incorporation of a variety of conservation measures including:

- Seasonal harvest and prescribed burning prohibition in potential Indiana bat habitat between May 1 and August 31.
- Seasonal harvest prohibition in the Tippy Management Zone between May 1 and October 20.
- Prohibition of prescribed burns in the Tippy Management Zone between May 1 and October 20.
- Maintain an average of four suitable roost trees per acre where timber harvest occurs in potential Indiana bat habitat.
- Design regeneration units with irregular borders to provide edges for solar exposure of roost trees, interspersion of roosting and foraging habitats, and travel corridors.
- Prohibition of removing standing dead trees for firewood cutting in potential Indiana bat habitat between May 1 and August 31.

Since 2009, the HMNF has harvested timber on approximately 3,636 acres in the potential Indiana bat range of the Manistee NF, which is less than one percent of the total potential Indiana bat habitat available (441,214 acres). We believe that the use of these conservation and avoidance measures in each individual project has cumulatively, for all projects, maintained the status of this species in the action area by reducing the possibility of take of an Indiana bat, maintaining or increasing the long-term number of available suitable roost trees, and improving potential roosting habitat on the HMNF.

Federal Highway Administration Programmatic

A Programmatic Biological Opinion was provided to the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), and Federal Transit Administration (FTA) [Transportation Agencies] on May 26, 2016 (revised on February 5, 2018), for the effects of common types of transportation projects with federal funding and/or approval on Indiana bat and the NLEB. The purpose of the consultation was to streamline the Endangered Species Act consultation process and promote better conservation outcomes from these projects for both species.

The USFWS anticipated incidental take of a small number of Indiana bats per project resulting from tree removal under this Program. Tree removal during the active season (0-300 ft. from

road surface) in documented or assumed Indiana bat habitat may result in harassment, injury or death. Tree removal during the winter season in documented or assumed Indiana bat habitat from 100-300 ft. from road/rail surface may result in harm to returning individuals.

We anticipated harm from winter tree removal to a small percentage of Indiana bats associated with a maternity colony that travels, roosts, and forages within the project action area during the active season. Such harm was limited to approximately 20 acres of forest per project (per 5-mile segment) and the associated degradation of remaining forest in close proximity to expanded road/rail surfaces. Projects with more than 20 acres of tree removal, but that are distributed across more than 5 miles, may have similar impacts to multiple maternity colonies rather than one colony. This harm was anticipated during the first spring/summer after tree removal has occurred by causing a shift in roost trees, foraging patterns, and home range. We expect that alternative roosting and foraging areas are generally available for each maternity colony to use near the action area; therefore, the impact of winter tree removal would likely diminish in subsequent years.

Because of the difficulty in determining the number of Indiana bats that tree removal would take, it was appropriate to measure the level of exempted incidental take using the anticipated annual acreage of tree removal. The number of bats taken within this acreage is greatly influenced by the implementation of the proposed avoidance and minimization measures including:

- No tree-removal will occur within suitable Indiana bat habitat outside of documented areas between May 1 and July 31 of any year except under the following circumstances:
    - The project affects a limited number of trees such that all trees can be visually assessed as potential roost trees; and
    - Visual bat emergence surveys are conducted on larger trees; or
    - No trees greater than 9 inches dbh are removed.
- No tree removal will occur within documented Indiana bat roosting/foraging habitat or travel corridors between May 1 and July 31 (except in the case of emergency removal);
- No known occupied maternity trees will be removed during the active season;
- No known or potential roost trees within 0.5 miles of a known or suspected hibernaculum will be removed;
- The maximum acreage of tree removal anticipated for any given project is approximately 20 acres per five linear miles of project.

The State Departments of Transportation and Transportation Agencies estimated the annual acreage of cleared trees from edge of road surface to 300 ft. To calculate anticipated take using this surrogate measure, we used the average annual tree clearing within a State from 0 to 300 ft. (320 acres) multiplied by the numbers of states within the range of the Indiana bat (22 states). We estimated that 7,040 acres of trees per year could be removed during the implementation of the program.

However, not all tree removal will cause take of individuals for the following reasons:

- The acreage estimates were based on trees cleared, but not all the trees cleared are suitable habitat.

- FHWA estimates that 25% of the projects will implement winter tree clearing, which reduces the direct impacts to Indiana bats.
- Some of the projects will conduct bat surveys that indicate bats are not likely present.
- Some projects will assume species presence incorrectly.
- It is reasonably likely that many projects will involve less than 5 acres of tree removal in a widely dispersed arrangement across the range of the Indiana bat.

Additionally, the Service also anticipated that Indiana bats may be taken during bridge projects as a result of bridge assessments for bat occupancy failing to detect bats. The USFWS anticipated the take of five Indiana bats per project at up to 10 bridge projects (maximum of 50 bats) per year resulting from false-negative bat bridge assessments.

EFFECTS OF THE ACTION

Effects of the action refer to direct and indirect effects of an action on the species, together with the effects of other activities that are interrelated and interdependent with that action that will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur. We are not aware of any actions that are interdependent or interrelated to the proposed action being considered in this Opinion.

The actions that will be analyzed in this section include all activities proposed with the Gilbert Lake project that occur within stands identified as having suitable Indiana bat habitat.

Within suitable Indiana bat habitat, proposed activities include timber harvest and regeneration, wildlife opening creation and maintenance, prescribed burning, fire line construction, transportation system management, trail reroutes, erosion control, road/stream crossings, and invasive species control. Those actions, if conducted during the Indiana bat's summer occupancy period, could have adverse impacts to Indiana bats.

Felling of occupied roost trees during summer occupancy may injure or kill both non-volant pups and adult bats. Indiana bats may also be hit by felling trees adjacent to roost trees. We believe that adult male and non-reproductive females may be able to move out of the treatment areas temporarily during project activities, however it has been observed that not all volant bats would be able to escape the disturbance unharmed (Cope et al. 1974, Belwood 2002, J. Whitaker, pers. comm, 2005). Additionally, non-volant pups (and to some extent pregnant females) are immobile and likely to be killed/injured during tree felling or by contact with mechanical equipment.

Proposed treatments and vehicle and foot traffic associated with project implementation may temporarily increase the level of disturbance near active roost trees, potentially resulting in bats temporarily leaving the area, abandonment of roost sites, or abandonment of pups. Bats that abandon roost sites during the day may be exposed to a higher likelihood of predation. Management activities that remove roost trees and/or temporarily alter foraging habitat and dispersal corridors may reduce fitness. We anticipate that individuals that are disrupted may

abandon a portion of their traditional home range during the disturbance, but are likely to readily locate new roosting or foraging areas within or near to their traditional home range.

Prescribed burning activities may expose individuals to temporary noise, physical disturbance, smoke, and airborne particulates. Noise and physical disturbance may cause any Indiana bats present to permanently or temporarily abandon the roosting area. These activities may also result in the burning of occupied roosting areas. Indiana bats that remain in the area may be exposed to fire, smoke, or roost trees burning and falling. A summer fire that consumes or surrounds an occupied roost tree could injure or kill Indiana bats, especially non-volant young. We generally assume that volant bats could escape fires. A slow moving fire could conceivably be sensed by the bats early enough to allow both adults and young to escape; however, bats may not be able to respond quickly enough such that smoke, heat, and flames could interfere with the bats ability to navigate out of danger (Dickinson et al. 2010). Non-volant pups, if not rescued by an adult, would be exposed to smoke, heat and flames. Indiana bats may also be exposed to smoke inhalation, which could induce respiratory distress or even death. Smoke could occur in the burn area itself, or drift into adjacent areas outside of the burn. Heat and flames could cause the death on any individuals not able to escape them. Effects from prescribed fire can be minimized by keeping fireline intensities low enough to avoid scorch heights that approach Indiana bat mean roosting height (~30feet) (Dickinson 2010).

In the short- and long-term, implementing the proposed prescribed fire actions should increase the amount of suitable habitat by creating and maintaining potential roost trees, opening the forest canopy in roosting habitat, and designing stands with irregular borders and openings. In some situations, this will improve habitat suitability for roosting and reproduction by increasing solar exposure for a number of potential roost trees. Proposed methods should increase the overall tree size in a stand and increase the potential for large dead trees or snags that are suitable for roosting. These activities may improve the roosting potential, increasing the survival of adult and young Indiana bats. Prescribed burning may also benefit bats by improving the foraging habitat and increasing the arthropod prey abundance (Lyon et al. 2000, Carter et al. 2002). Burning may also control and reduce some types of NNIP, which should benefit Indiana bat in the long-term by improving biodiversity, and hence prey availability.

Habitat changes may occur through implementation of the proposed project. The amount of breeding and foraging habitat for Indiana bat may be reduced within the Project Area. Management activities would convert over 2,250 acres of mature forest and potential Indiana bat habitat to open land habitats and early-successional forests and reduce the availability of key habitat features in treated areas that remain in a forested condition. However, reductions in foraging and breeding habitat would not likely decrease the overall numbers of Indiana bat or habitat suitability because management activities would affect a relatively small percentage (18%) of the total Project Area, and only 7.5% of the potential Indiana bat habitat available within the Project Area. Mid- to late-seral forests would continue to be well-distributed across the Project Area and suitable foraging and roosting habitat for Indiana bat would continue to be available.

Treatment of NNIP and persistent woody vegetation by herbicides (i.e. glyphosate or triclopyr) may expose Indiana bat and its prey by:

- Direct contact with herbicide spray or recently treated foliage,

- Consuming prey items that have come in direct contact with herbicide spray, recently treated foliage, or consumed parts of treated plants,
- Consuming treated foliage, or
- Drinking from water sources that have received contaminated surface runoff.

Risk assessments for glyphosate and triclopyr conclude that small birds and animals that consume vegetation or insects from areas treated with the maximum application rate for an extended period of time could experience adverse effects. However, this type of treatment would not occur. Because strip/patch or spot application would be used to treat small areas when weather conditions are unlikely to result in drift, it would be unlikely that Indiana bat and its prey species would come into direct contact with herbicide spray or recently treated foliage. Glyphosate and triclopyr are not expected to bioaccumulate in the food chain (USDA FS 2011a, USDA FS 2011b) and herbicide treatments would be performed during daylight hours when nocturnal species such as Indiana bat are inactive, further reducing potential exposure to herbicides. Forest Service ecological risk assessment information and the analysis presented in the HMNF NNIP Project Environmental Assessment suggest that the herbicides proposed for use in terrestrial and wetland settings are generally safe to wildlife and are not expected to contribute to the degradation of wildlife habitat when applied carefully, following manufacturer's label instructions, Forest Service Manual direction, and the conservation measures and designed criteria outlined in the document (USDA FS 2009). Thus, any effects of chemical removal of NNIP on Indiana bat would be insignificant.

Use of borax on freshly cut pine stumps is proposed to control the spread of Heterobasidion root disease (HRD) through spot application. Similar to herbicides, Indiana bats may be exposed to borax through direct contact or indirectly through prey consumption or from contaminated water sources. Borax can be toxic to non-target organisms such as nectar plants, insects, and soil organisms at concentrations used to control HRD. However, the risk is expected to be minimal and any effects to Indiana bat would be insignificant due to the targeted application methods, short-term toxicity, repeated exposure is not anticipated, only a small proportion of the available habitat would be treated, and adherence to the manufacturer's label directions.

Prescribed burning is the only management activity that is proposed to occur during the summer occupancy period (May 1 to September 1). The HMNF has stated that the desired fire behavior for successful implementation is low to moderate fire intensities with flame lengths anywhere from half a foot to a couple feet in length and low rates of spread (5-20 chains per hour). At a single point within a burn area, heavy smoke concentration during implementation may occur depending upon time of year and fuel moistures. Heavier smoke also may occur in isolated areas in association with logs or slash piles. In general, it is desired to have wind speeds that quickly disperse smoke associated with the burn and to minimize heat scorch on overstory (bole scorch varies from 0 – 8 feet depending upon tree species, time of year, and fuel moistures). With low fire intensity and heat scorch, and quick smoke dispersal, the risk of direct mortality and injury to adult bats from prescribed burning is expected to be low, however adverse effects may still occur.

Further minimizing the risk of effects from prescribed burning and associated activities (e.g. fire line construction, hazard tree removal) could occur by defining specific parameters for wind speed and smoke dispersal, fire speed, firing techniques, and flame height, or by prohibiting the activities outside the non-volant or summer occupancy period. These restrictions, however, would not be practicable as limiting the timing and methodology would fail to meet fuel hazard reduction and vegetation management objectives. Repeated burns on a rotational basis during spring, summer, and fall would increase understory diversity, resilience and viability. Seasonality depends upon the desired species in the understory. If warm season grasses and associated communities are desired, burns need to be conducted in the late spring and summer. If cool season grasses and associated communities are desired, burns need to be conducted in the spring or late fall. Often times these objectives need to be met with different burns. For example, spring burns often are best at meeting the objective of reducing hazardous fuels accumulations because fuel moistures are at their lowest and consumption is better. In some cases, multiple burn objectives need to be meet within the same area. Following a burn to reduce hazardous fuels, a second with higher burn intensities may be conducted in the summer to put pressure on undesirable understory vegetation (e.g., top kill saplings) and provide nutrients to encourage the growth of warm season grasses. Only conducting prescribed fires in the early spring would have little to no effect on undesirable understory vegetation and may encourage oak regeneration/sprouting, which result in more closed conditions on the landscape.

Conducting all other management activities outside the summer occupancy period would protect Indiana bat from additional potential adverse effects. In addition, the retention of habitat features such as den, cavity, snags (preferably >9” dbh), and mast trees, and preferably retaining Class 1 and Class 2 trees (as identified in Appendix A of the BA), trees larger than 26” dbh, trees with greater than 25% exfoliating bark, and trees to minimize wind throw would further reduce the potential for adverse effects.

Based on the known status of the species in the action area, the Indiana bat is likely to be present in the action area only in very small numbers. Given the amount of potentially suitable habitat available in the proposed project area and on the HMNF, the likelihood of an individual bat or colony occupying an area where a management activity is implemented and incurring impacts on the Indiana bat is very low. The large geographic area and low potential number of individuals significantly reduces the potential for Indiana bat to be exposed to these actions. Throughout the project activities, the risk to individual Indiana bats is reduced because most would likely be able to escape harm after sensing noise, vibration, smoke, and/or movement from these activities. An individual bat may also escape harm because it is an area that is protected or not impacted by the activity; some activities do not impact the entire area being treated. However, Indiana bats may still burned or otherwise killed or injured by prescribed fire activities. While the effects to Indiana bat from prescribed burning in areas of suitable habitat during the summer occupancy period has been minimized to the extent practicable, adverse effects are still likely to occur.

Determination

Prescribed fire and associated activities that occur within suitable Indiana bat habitat is *likely to adversely affect* the Indiana bat. Design criteria and conservation measures can reduce the likelihood of adverse effects to Indiana bat; however, potential adverse impacts to individuals due to injury and death may still occur. Approximately 730 acres are planned for treatment in the Gilbert Lake project area.

The effects of all other activities are expected to be insignificant and discountable because of the type of work, the limited area affected, the time of year the activities occur, or the likelihood of encountering Indiana bat.

Cumulative Effects

Cumulative effects include the effects of future state, tribal, local or private actions that are reasonably certain to occur within the action area. 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 act.

Timber management and prescribed fire on non-federal lands would have the greatest potential to have a cumulative effect on the Indiana bat because of potential for bats to be injured or killed. Other private, public, tribal and commercial lands within the analysis area may or may not be managed similar to NFS lands.

We assume that timber management and prescribed fire activities may occur on non-federal lands, however we are not aware of any specific actions that are reasonably certain to occur within the action area. Timber management and prescribed fire activities on private lands is estimated to be the same or lower than federal lands because many private landowners lack interest in forest or fire management, and small parcels may not be economical to manage. When considering vegetative management activities on all ownership annually, it is estimated that no more than 3.5% percent of the analysis area would receive a treatment (H. Keough, pers. comm. 2018).

Most prescribed burn activities occurring on federal lands within the analysis area will be low to moderate intensity. Prescribed burning generally affects less than one percent of the Huron-Manistee National Forests annually. No data is available on the amount of prescribed burning on non-NFS lands within the analysis area, but it is estimated to be very minor when compared to burning on NFS lands, and is almost always low intensity (H. Keough, pers. comm. 2018).

Conclusion

When considered with future State, county, tribal and private actions that that have occurred in the past, those occurring in the present, and those that are reasonably certain to occur in the future, the proposed activities would have a minor adverse cumulative effect on Indiana bat within the analysis area. This is based on the relatively low level of vegetation management within Indiana bat habitat, the presence of considerable areas where disturbance would be infrequent or absent, and the implementation of design criteria to protect Indiana bat. In addition, implementation of the proposed projects and ongoing activities is expected to be completed within the next 15 years, and therefore the potential for adverse effects would be relatively short term.

CONCLUSION

Regulations define “jeopardize the continued existence of a species” as “to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction,

numbers, or distribution of that species." We must analyze how the proposed action and potential effects could impact reproduction, number, and distribution of the Indiana bat.

A proposed 730 acres of prescribed burning and associated activities (fire line construction, removal of hazard trees) would occur within suitable Indiana bat habitat and has the potential to kill or injure Indiana bats. We therefore anticipate the taking of all Indiana bats associated with prescribed fire of up to, but no more than 730 acres.

The 730 acres of prescribed fire that has the potential to take Indiana bat represents only a small fraction of suitable habitat available throughout the surrounding area. Additionally, the effect to Indiana bat may not rise to the level of take for each individual as some bats occurring within the proposed action area will be able to avoid adverse impacts. There are approximately 9,700 acres of potential Indiana bat habitat within the Gilbert Lake project area, therefore, we do not expect that any take resulting from the actions taken as a result of the HMNF's Gilbert Lake Project will exceed more than a small proportion of individual Indiana bats within the action area at any one time. A total of In addition, many of the proposed actions will provide a benefit to Indiana bat in the long-term by improving the quality of foraging, sheltering, and breeding habitats.

After reviewing the current status of Indiana bat, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, we conclude that the proposed action was not likely to reduce reproduction, numbers, or distribution of Indiana bat to such an extent as to reduce appreciably the likelihood of survival and recovery of the species. It is the Service's biological opinion that the proposed action will not jeopardize the continued existence of Indiana bat.

Designated critical habitat for Indiana bat is not present in the action area, thus, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit 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 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 (50 CFR § 17.3). Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering (50 CFR § 17.3). 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.

AMOUNT OR EXTENT OF TAKE

If Indiana bats are present or utilize an area proposed for prescribed fire, incidental take of Indiana bats could occur. The Service anticipates incidental take of the Indiana bats will be difficult to detect for the following reasons: (1) the individuals are small and occupy summer habitats where they are difficult to find; (2) Indiana bats form small, widely dispersed maternity colonies under loose bark of trees, and males and non-reproductive females may roost individually which makes finding the species or occupied habitats difficult; (3) finding dead or injured specimens during or following project implementation is unlikely; (4) the extent and density of the species within its summer habitat in the action area is unknown; and (5) in many cases incidental take will be non-lethal and undetectable.

Monitoring to determine actual take of individual bats within an expansive area of forested habitat is a complex and arduous task. However, the areal extent of potential roosting and foraging habitat affected can be used as a surrogate to monitor the level of take.

The Service anticipates that no more than 730 acres of suitable Indiana bat habitat will be taken as a result of prescribed burning and associated activities. This represents 7.5% of the potential Indiana bat habitat available within the Gilbert Lake project area.

If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation. In this case, the HMNF must also immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures provided.

EFFECT OF THE TAKE

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to Indiana bat. No critical habitat for Indiana bat is present in the action area, so none would be impacted.

REASONABLE AND PRUDENT MEASURES

The following reasonable and prudent measures (RPMs) are necessary and appropriate to minimize incidental take of Indiana bat:

1. Avoid the removal of known Indiana bat roost trees.

2. Report on the progress of project activities on the Forest and the impact on the species as required pursuant to 50 CFR 402.14 (i) (3).

TERMS AND CONDITIONS

Exemption from the prohibitions of section 9 of the ESA requires the Forest Service to comply with the following terms and conditions, which implement the RPMs described above and outline required reporting and monitoring requirements. These RPMs with their implementing terms and conditions are non-discretionary.

The following term and condition implements the first RPM:

1.1 If any Indiana bat roost trees are identified within the project area, these roosts will be marked and not felled during any project-related activities, unless required to address public or worker safely. The HMNF will evaluate planned activities around the roosts and establish appropriate buffers or protective measures in coordination with the USFWS so that project-related activities are not likely to damage or destroy the roosts, or make them unsuitable.

The following terms and conditions implement the second RPM:

2.1 Due to the difficulty to detect and quantify the actual incidental take of Indiana bat, the areal extent of potential roosting and foraging habitat affected will be used as surrogate to monitor the level of take. To track the amount of take that occurred during the year and cumulatively to date, the HMNF will provide the Service with a report that identifies the number of acres where project activities were implemented. The annual report, to be provided by April 1 of each year, will also include the number of live or dead Indiana bats encountered and the results of any Indiana bat surveys conducted.

2.2 The Forest Service shall immediately notify the Service upon locating an injured or dead Indiana bat. Report the discovery of an injured or dead Indiana bat within 24 hours (48 hours if discovered on a Saturday) to the East Lansing Field Office (517) 351-2555.

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. As described in the Conservation Measures section, the HMNF has already been pro-active in participating in a number of efforts to contribute to the conservation of the Indiana bat. These efforts contribute to the conservation and recovery of the Indiana bat consistent with Section 7(a) (1) of the ESA. The Service strongly supports these efforts and encourages the HMNF to continue these efforts in the future.

The Service has identified the following additional actions that, if undertaken by the Forest Service, would further the conservation and assist in the recovery of the Indiana bat. We recognize that limited resources and other agency priorities may affect the ability of the USFS to conduct these activities at any given time.

- Continue to gather information on the Indiana bat's distribution and use of the HMNF during the spring, summer, and fall. For example:
    - Conduct inventory surveys
    - Conduct radio telemetry to monitor status of Indiana bat colonies
    - Participate in North American Bat Monitoring Program (NABat) surveys

    - Investigate habitat characteristics of the forest in areas where post-WNS Indiana bat occurrences have been documented (e.g. forest type, cover, distance to water)
    - Investigate Indiana bat use (acoustics, radio telemetry) of recently managed areas of different prescriptions

- Provide support to expand on scientific studies and educational outreach efforts on Indiana bat and White Nose Syndrome. For example:
    - Monitor the status/health of the known colonies
    - Collect samples for ongoing or future studies
    - Provide funding for WNS research activities (on or off USFS lands)
    - Allow USFS staff to contribute to administrative studies (on or off of USFS lands)

- The Service encourages the HMNF to participate in meetings with the Service and other partners to update the status of the species and discuss progress on the species' recovery.

- The HMNF should continue to work with the Service to reassess these Conservation Recommendations using best available science.

In order to be kept informed of actions minimizing or avoiding adverse effects, or benefitting listed species or their habitats, the Service requests notification if any of these additional conservation actions are carried out or if additional measures consistent with these conservation recommendations are implemented.

REINITIATION NOTICE

This concludes formal consultation for the HMNF actions outlined in your request dated January 23, 2018, as it pertains to the Indiana bat. As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over an action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take, as measured by 730 acres of potential Indiana bat habitat, is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat is designated that may be affected by the action. For the proposed Gilbert Lake project, the HMNF is authorized to prescribe burn no more than 730 acres of potential Indiana bat habitat. In instances where this amount or the extent of incidental take is exceeded, any operations causing such a take must cease pending reinitiation.

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