



## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
East Lansing Field Office (ES)  
2651 Coolidge Road, Suite 101  
East Lansing, Michigan 48823-6316

IN REPLY REFER TO:

May 1, 2015

Leslie Auriemmo, Forest Supervisor  
Huron-Manistee National Forests  
1755 South Mitchell St.  
Cadillac, MI 49601-8533

Re: Formal Section 7 Consultation on the Huron-Manistee National Forests' Ongoing and Planned Actions – Log # 10-R3-ELFO-03

Dear Ms. Auriemmo:

This letter transmits the U.S. Fish and Wildlife Service's Biological Opinion for the Huron-Manistee National Forests' (HMNF) ongoing and planned actions in accordance with Section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). The HMNF determined that the proposed actions were "Likely to Adversely Affect" the northern long-eared bat (*Myotis septentrionalis*).

We base the enclosed Opinion on information provided in several documents, including your northern long-eared project matrix and Biological Assessment, the Programmatic Biological Assessment and Opinion for the HMNF's Land and Resource Management Plan, and our April 1, 2015, Conference Opinion. Other sources of information include previous telephone conversations, e-mails and meetings. A complete administrative record of this consultation is on file at our East Lansing Field Office.

After reviewing the current status of northern long-eared 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 northern long-eared bat

With respect to ESA 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](mailto:chris_mensing@fws.gov).

Sincerely,



Scott Hicks  
Field Supervisor

cc: Jennifer Szymanski, Onalaska, WI

# BIOLOGICAL OPINION

Effects to the  
Northern Long-eared Bat  
from Ongoing and Planned Activities on the  
Huron-Manistee National Forests,  
Michigan

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

May 1, 2015

## 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 activities on the Huron-Manistee National Forests (HMNF) and their effects on the northern long-eared bat (*Myotis septentrionalis*; NLEB) 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 USFS' April 7, 2015, request for formal consultation was received on April 13, 2015, for ongoing and planned activities on the HMNF. The USFS determined that all activities addressed have had prior coordination/consultation for all other involved federally-listed species. Therefore, this BO only addresses the NLEB.

## CONSULTATION/CONFERENCE HISTORY

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 (*Myotis sodalis*), 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 October 2, 2013, the Service proposed to list the NLEB as endangered (78 FR 61045). Pursuant to Section 7(a)(4) of the Endangered Species Act (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*), Federal action agencies are required to confer with the Service if their proposed actions are likely to jeopardize the continued existence of a proposed listed species such as the NLEB (50 CFR 402.10(a)). To prepare for meeting ESA consultation requirements if the species was to be listed, the HMNF conducted voluntary conferencing for all ongoing

activities and planned projects with a National Environmental Protection Act (NEPA) decision document that have not been fully implemented. A Conference Opinion was submitted to the HMNF on April 1, 2015.

This BO is based on information provided to the Service in preparation of the Conference Opinion. Minor modifications and amendments to the request have been made in the course of completing this biological opinion. The Service and the HMNF met informally several times during the preparation of the conference request and subsequent to the species' listing to discuss the conservation of the NLEB, the effect of HMNF actions on the species, and to ensure that both agencies agree with the content and direction of the consultation process. A complete administrative record of this consultation is on file at the Service's East Lansing Field Office.

Interim 4(d) rule for the northern long-eared bat

On April 2, 2015, the Service has published a species-specific rule pursuant to section 4(d) of the ESA for NLEB (80 FR 17974). Section 4(d) of the ESA states that:

*Whenever any species is listed as a threatened species ... the Secretary shall issue such regulations as he deems necessary and advisable to provide for the conservation of such species (16 U.S.C. 1533(d)).*

The Service's 4(d) rule for NLEB exempts the take of NLEB from the section 9 prohibitions of the ESA, as follows:

- (1) Take that is incidental to forestry management activities, maintenance/limited expansion of existing rights-of way, prairie management, projects resulting in minimal (<1 acre) tree removal, provided these activities:
  - a. Occur more than 0.25 mile (0.4 km) from a known, occupied hibernacula;
  - b. Avoid cutting or destroying known, occupied roost trees during the pup season (June 1–July 31); and
  - c. Avoid clearcuts (and similar harvest methods, *e.g.*, seed tree, shelterwood, and coppice) within 0.25 (0.4 km) mile of known, occupied roost trees during the pup season (June 1–July 31).
- (2) Removal of hazard trees (no limitations)
- (3) Purposeful take that results from
  - a. Removal of bats from and disturbance within human structures and
  - b. Capture, handling, and related activities for NLEB for one year following publication of the interim rule.

Thus any take of NLEB occurring in conjunction with these activities that complies with the conservation measures, as necessary, is exempted from section 9 prohibitions by the 4(d) rule, and does not require incidental take authorization. We distinguish these activities from other actions throughout the accompanying BO.

However, 4(d) rules do not afford exemption from the ESA's section 7 procedural requirements. Therefore, consultation remains appropriate when actions (even those within the scope of a 4(d)

rule) are funded, authorized or carried out by a federal agency. This is because the purpose of section 7 consultation is broader than the mere evaluation of take and issuance of an Incidental Take Statement; such consultations fulfill the requirements of section 7(a)(2) of the ESA, which directs that all Federal actions insure that their actions are not likely to jeopardize the continued existence of any listed species, or result in the destruction or adverse modification of designated critical habitat.

## **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.

The HMNF reviewed all their ongoing actions and determined that a total of 702 project activities and 814 special use permits were likely to continue beyond the time when the NLEB would be listed. They then reviewed these projects, including their previous consultation documents, to determine how these projects would affect the NLEB. The HMNF included conservation measures to minimize potential adverse impacts of various activities as part of their project description. The Service has analyzed the effects of the proposed actions considering that the projects will be implemented as proposed (including all conservation measures).

The following project background and area descriptions are summarized from the Conference Opinion and the Forest Plan.

### **Action Area**

In general, the action area for the purposes of this analysis is all lands, under any ownership, within the proclamation boundary of the Forest. During their analysis, the Forest did not identify any direct or indirect effects that moved outside of this area.

The proclamation boundary of the HMNF includes 2,025,769 ac (819,817 ha) located in two forest units, one in eastern and one in western Lower Michigan (Figure 1). The Huron National Forest (Huron NF), located in Alcona, Crawford, Iosco, Ogemaw, and Oscoda counties in the northeastern portion of the Lower Peninsula of Michigan, is divided into three Ranger Districts: Tawas, Harrisville, and Mio. These districts are managed out of two ranger stations, one at Mio and the other at Oscoda, Michigan. The Huron NF boundary encompasses 694,098 ac (280,898 ha), 438,627 ac (177,506 ha; 63 percent) of which are National Forest System lands managed by the Forest Service. The Manistee National Forest (Manistee NF), located in Lake, Manistee, Mason, Mecosta, Montcalm, Muskegon, Oceana, Newaygo, and Wexford counties in the northwestern one-quarter of Michigan’s Lower Peninsula, is divided into four Ranger Districts:

Baldwin, Cadillac, Manistee, and White Cloud. These districts are managed out of two ranger stations, one at Manistee and one at Baldwin, Michigan. The Manistee NF boundary encompasses 1,331,671 ac (538,920 ha), 540,369 ac (218,680 ha; 40 percent) of which are National Forest System lands managed by the Forest Service (USFS data, 2015).



Figure 1: Map of the Action Area

### **Project Description**

The HMNF reviewed all their ongoing and planned actions and determined that a total of 1,462 actions (702 project activities and 814 special use permits) over approximately 212,975 acres were likely to continue beyond the time when the NLEB would be listed (Appendix A, Table 1). Previous Biological Assessments and Tier-2 Consultation documents provided full descriptions of the proposed actions for each of the projects, and are incorporated herein by reference. Due to the number of ongoing and planned projects, for purposes of this consultation, the projects will be combined together and collectively evaluated to determine the projects' effects on NLEB. The HMNF, in conjunction with the Hiawatha National Forest, Ottawa National Forest, and Service created 23 separate categories where all existing projects and actions are classified (Table 1).

Table 1: List of actions and affected acres

Activity	Activity Code	Affected Acres
Hardwood timber harvest / non-commercial cutting / timber stand improvement	HWDCUT	19,574
Hardwood low / moderate intensity burning	HWDLMB	30,120
Hardwood high intensity burning	HWDHIB	628
Conifer timber harvest / non-commercial cutting / timber stand improvement	CONCUT	21,816
Conifer low / moderate intensity burning	CONLMB	34,333
Conifer high intensity burning	CONHIB	1,241
Mechanical maintenance in openings, barrens, savannahs, and fuel breaks where trees = > 3" DBH will be felled	OPNMM	7,352
Burning in openings, barrens, savannahs, and fuel breaks where trees = > 3" DBH will be felled or burned	OPNBRN	3,938
Mechanical maintenance in openings, barrens, savannahs, and fuel breaks where trees < 3" DBH will be felled	OPN<3	3,669
Burning in openings, barrens, savannahs, and fuel breaks where trees < 3" DBH will be felled or burned	OPNB<3	1,634
Site preparation including tree planting, roller chopping, chaining, trenching, scalping, raking, etc.	SPREP	1,203
Firewood cutting	FIREWD	9,708
Christmas tree cutting	HOLIDAYTREES	5
Hazard tree removal	HAZTREE	8,805
Tree pruning	PRUNE	2,500
Roadside brushing	RDBRUSH	9,610
Road closures	RDCLOSE	1,318
Special Use Permits with vegetation management	SUP	7,210
Landline surveys, mineral seismic surveys, cruise volume validation, and other minor activities with tree cutting	MINORTREE	194
Insect and disease destructive studies (e.g. girdling, felling, collecting nurse logs, etc.)	STUDIES	5
Wildlife and fisheries structural habitat improvement / restoration (e.g. girdling, topping, down wood, large wood placement, etc.)	WLFISHSTR	19,792
Building maintenance or demolition	BUILDING	155
Herbicide spraying (backpack, vehicle broadcast, wick application) and bio-control insect releases	HERB	28,165

## Conservation Measures

Conservation Measures are those actions taken to benefit or promote the recovery of the species. These actions taken by the Forest Service serve to minimize or compensate for project effects on the species under review and have been included in the proposed actions. The HMNF has been pro-active in incorporating measures into their actions that contribute to the conservation of forest bats.

For any listed project to be in compliance with the interim 4(d) rule for NLEB, the HMNF has committed to the following conservation measures as part of the project description:

- All proposed activities will occur more than 0.25 mile (0.4 km) from a known, occupied hibernacula.
- The USFS will avoid cutting or destroying known, occupied roost trees during the pup season (June 1–July 31).
- The USFS will avoid clearcuts (and similar harvest methods, *e.g.*, seed tree, shelterwood, and coppice) within 0.25 (0.4 km) mile of known, occupied roost trees during the pup season (June 1–July 31).

The HMNF has one known, occupied hibernacula present (Tippy Dam), and 31 known, occupied NLEB roost trees. No project activities considered in this biological opinion will occur within ¼ mile of these features.

In addition, the HMNF will continue implementing the following conservation measures where possible and practicable in an effort to minimize adverse effects to NLEB:

- The Forest Plan contains guidelines to maintain snags and mast/den trees which provide wildlife structure and would also serve to maintain NLEB roost trees. Individual project descriptions include these guidelines as design criteria and will be followed unless the prescriptions are not feasible or prudent.
- The HMNF will continue monitoring bat presence on the forest using vehicle-based acoustic surveys (*e.g.* Anabat surveys), as funding permits.
- The HMNF will continue to incorporating design criteria and other management restrictions used for protection of Regional Forester Sensitive Species, watershed management, and other resource considerations. Many of these design criteria include actions that may also be beneficial to NLEB.
- Of the HMNF's 978,996 acres, approximately 674,930 acres (69%) are identified for timber production. Alternatively, approximately 178,416 acres are designated as old growth, 3,271 acres as wilderness, 10,452 acres as research natural areas, and 25,560 acres as potential research natural areas. These areas will experience infrequent disturbance or where disturbance would be virtually absent. Continuing to minimize management in those areas benefits the NLEB by providing large tracts of suitable habitat where direct or indirect effects will be unlikely to occur.

- The HMNF vegetation management program is the primary tool for restoring and sustaining a diverse range of habitats for wildlife and plants (including the NLEB), enhancing forest health, and providing wood fiber. Timber sales, prescribed fire, and noncommercial mechanical treatments will continue to be carefully planned and applied to accomplish management objectives and move toward desired conditions which will also provide a long-term benefit to NLEB.
- Indiana bat guidelines within the Indiana bat's range (west half of the Manistee NF) and Tippy Management Area will also contribute to the conservation of NLEB. These guidelines will continue to be followed where possible and practicable until the best available science suggests that they be revised to more appropriately conserve both the Indiana bat and NLEB. They include:
  - Where vegetation management occurs, an average of nine high quality summer roost trees – snags or live trees greater than nine inches DBH per acre will be maintained. Trees 16 inches DBH or greater will be left where available.
  - Prohibit removal of standing dead trees for firewood between May 1 and August 31. Within the five-mile radius Tippy Management Zone, firewood permits will be prohibited.
  - Generally, prescribed burns are prohibited within designated Indiana bat habitat between May 1 and August 31.
  - Prescribed burns and vegetation management in the Tippy Management Zone are to be conducted, as feasible and prudent, outside the spring staging period from May 1 to June 15 and the fall swarming period from September 1 to October 20.
  - In optimal summer maternity habitat, prescribed burns and vegetation management will be conducted as feasible and prudent, outside the summer maternity period from May 1 to August 31.
  - Protection zones will be established around maternity colonies where discovered.

## **STATUS OF THE SPECIES**

This section will provide an overview of the biology and conservation needs of the NLEB and that is pertinent to the “Effects of the Action” section (e.g., a description of the annual life cycle, spring emergence habitat, fall swarming habitat, etc.).

Additional information on the NLEB's life history, biology, current range-wide population and trends, and threats are thoroughly described in the final rule (80 FR 17974).

### **Life history and biology**

The NLEB is a temperate, insectivorous, migratory bat that hibernates in mines and caves in the winter and spends summers in wooded areas. The key stages in its annual cycle are: hibernation,

spring staging and migration, pregnancy, lactation, volancy/weaning, fall migration and swarming. Throughout the species' range, the NLEB will hibernate between mid-fall through mid-spring each year. The spring migration period likely runs from mid-March to mid-May each year, as females depart shortly after emerging from hibernation and are pregnant when they reach their summer area. Young are typically born in late-May or early June, with nursing continuing until weaning, which is shortly after young become volant in mid- to late-July. Fall migration likely occurs between mid-August and mid-October. These dates are variable depending on weather conditions and latitude.

### *Summer habitat and ecology*

Suitable summer habitat for NLEB consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and 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. NLEBs seem to be focused in upland, mature forests (Caceres and Pybus 1997) with occasional foraging over forest clearings, water and along roads (Van Zyll de Jong 1985). However, most NLEB hunting occurs on forested hillsides and ridges, rather than along riparian areas (Brack and Whitaker 2001; LaVal et al. 1977).

Many species of bats, including the NLEB, consistently avoid foraging in or crossing large open areas, choosing instead to use tree-lined pathways. Further, wing morphology suggests that the species is adapted to moving in cluttered habitats. Thus, isolated patches of forest may not be suitable for foraging or roosting unless the patches are connected by a wooded corridor.

For purposes of this consultation, the NLEB's summer occupancy period is defined as the time when bats are reasonably expected to be present at their summer home range. In Michigan, the summer occupancy period is between May 1 and September 1 in the Lower Peninsula (LP) and between May 15 and September 1 in the Upper Peninsula (UP).

### *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. NLEB maternity colonies range widely in size, although 30-60 bats/colony may be most common (USFWS 2013). Maternity colonies contain networks of approximately 10-20 roost trees often centered around one or more primary or central-node roost trees. NLEB show some degree of interannual fidelity to single roost trees and/or maternity areas. Male and non-reproductive female NLEBs may also roost in cooler places, like caves and mines. NLEB roost in cavities, underneath bark, crevices, or hollows of both live and dead trees and/or snags (typically  $\geq 3$  inches dbh). The bats are known to use a wide variety of roost types, using tree species based on presence of cavities or crevices or presence of peeling bark and have also been occasionally found roosting in structures like barns and sheds (particularly when suitable tree roosts are unavailable).

### *Reproduction*

Throughout the species' range, young NLEB are typically born in late-May through mid-June, with females giving birth to a single offspring. Lactation then lasts 3 to 5 weeks, with pups

becoming volant (able to fly) between early July and early August. In Michigan the non-volant period occurs between June 15 and August 1.

### *Migration*

Males and non-reproductive females may summer near hibernacula, or migrate to summer habitat some distance from their hibernaculum. NLEB are not considered to be a long distance migrant, typically migrating up to 40-50 miles. However, some NLEB detections have been documented in areas further than 100 miles from any known hibernacula. Migration may be stressful for NLEB, 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). There may be other landscape features being used by NLEB during the winter that have yet to be documented. The species hibernates 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). In Michigan, hibernation typically occurs from October 15 to May 15 in the LP, and from October 1 to May 31 in the UP.

Hibernacula for NLEB typically have significant cracks and crevices for roosting; relatively constant, cool temperatures (0-9 degrees Celsius) and with high humidity and minimal air currents. Specific areas where they hibernate have very high humidity, so much so that droplets of water are often seen on their fur. Within hibernacula, surveyors find them in small crevices or cracks, often with only the nose and ears visible.

NLEB tend to roost singly or in small groups (USFWS 2013), with hibernating population sizes ranging from a just few individuals to around 1,000 (USFWS unpublished data). NLEB display more winter activity than other cave species, with individuals often moving between hibernacula throughout the winter (Griffin 1940, Whitaker and Rissler 1992, Caceres and Barclay 2000). NLEB 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, NLEBs “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. 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 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, NLEB use roosts in the spring and fall similar to those selected during the summer. Suitable spring staging/fall swarming habitat consists of the variety of 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 feet from the next nearest suitable roost tree, woodlot, or wooded fencerow.

Spring staging in Michigan occurs between April 1 and May 15 in the LP, and between April 15 and May 31 in the UP. Fall swarming occurs between August 15 and November 1 in the LP, and between August 15 and October 15 in the UP.

### **Threats**

No other threat is as severe and immediate for NLEB as the disease white-nose syndrome (WNS). It is unlikely that NLEB populations would be declining so dramatically without the impact of WNS. Since the disease was first observed in New York in 2006, WNS has spread rapidly to 29 states and four Canadian Provinces throughout the Northeast, to the Midwest and the Southeast. Population numbers of NLEB have declined by up to 99 percent in the Northeast, which along with Canada, has been considered the core of the species' range. Although there is uncertainty about how quickly WNS will spread through the remaining portions of these species' ranges, it is expected to spread throughout their entire ranges. In general, the Service believes that WNS has significantly reduced the redundancy and resiliency of the NLEB.

Although significant NLEB population declines have only been documented due to the spread of WNS, other sources of mortality could further diminish the species' ability to persist as it experiences ongoing dramatic declines. Impacts to hibernacula (e.g. human disturbance, changes in the hibernacula's microclimate) and loss or degradation of summer habitat (e.g. highway and commercial development, timber harvest, forest management) are additional stressors that may affect NLEB on two levels. First, individual NLEBs sickened or struggling with infection by WNS may be less able to survive other stressors. Second, NLEB populations impacted by WNS, with smaller numbers and reduced fitness among individuals, may be less able to recover making them more prone to extirpation. The status and potential for these impacts will vary across the range of the species.

Bats affected but not killed by WNS during hibernation may be weakened by the effects of the disease and may have extremely reduced fat reserves and damaged wing membranes. These effects may reduce their capability to fly or to survive long-distance migrations to summer roosting or maternity areas. Affected bats may also be more likely to stay closer to their hibernation site for a longer time period following spring emergence.

In areas where WNS is present, there are additional energetic demands for northern long-eared bats. For example, WNS-affected bats have less fat reserves than non-WNS-affected bats when they emerge from hibernation (Reeder et al. 2012; Warnecke et al. 2012) and have wing damage (Meteyer et al. 2009; Reichard and Kunz 2009) that makes migration and foraging more challenging. Females that survive the migration to their summer habitat must partition energy

resources between foraging, keeping warm, successful pregnancy and pup-rearing, and healing and may experience reduced reproductive success. In addition, with wing damage, there may be an increased chance of WNS-affected bats being killed or harmed as a result of proposed action, particularly if timber harvest or burns are conducted early in the spring (April – May).

Over the long-term, sustainable forestry benefits NLEB by maintaining suitable habitat across a mosaic of forest treatments. However, forest practices can have a variety of impacts on the NLEB depending on the quality, amount, and location of the lost habitat, and the time of year of clearing. 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 from tree removal to individuals or colonies would be expected to range from indirect impact (e.g., minor amounts of forest removal in areas outside NLEB summer home ranges or away from hibernacula) to minor (e.g., largely forested areas, areas with robust NLEB populations) to significant (e.g., removal of a large percentage of summer home range, highly fragmented landscapes, areas with WNS impacts).

Lastly, there is growing concern that bats, including the NLEB (and other bat species) may be threatened by the recent surge in construction and operation of wind turbines across the species' range. Mortality of NLEB has been documented at multiple operating wind turbines/farms. The Service is now working with wind farm operators to avoid and minimize incidental take of bats and assess the magnitude of the threat.

### **Species status**

The NLEB ranges across much of the eastern and north central United States, and all Canadian provinces west to the southern Yukon Territory and eastern British Columbia (Nagorsen and Brigham 1993, Caceres and Pybus 1997, Environment Yukon 2011). In the United States, the species' range reaches from Maine west to Montana, south to eastern Kansas, eastern Oklahoma, Arkansas, and east to the Florida panhandle (Whitaker and Hamilton 1998, Caceres and Barclay 2000, Wilson and Reeder 2005, Amelon and Burhans 2006). The species' range includes the following 37 States and the District of Columbia: Alabama, Arkansas, Connecticut, Delaware, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Vermont, Virginia, West Virginia, Wisconsin, and Wyoming. Historically, the species has been most frequently observed in the northeastern United States and in Canadian Provinces, Quebec and Ontario, with sightings increasing during swarming and hibernation (Caceres and Barclay 2000). However, throughout the majority of the species' range it is patchily distributed, and historically was less common in the southern and western portions of the range than in the northern portion of the range (Amelon and Burhans 2006). More than 1,100 hibernacula have been identified throughout the species' range in the United States, although many hibernacula contain only a few (1 to 3) individuals (Whitaker and Hamilton 1998, p. 100). Known hibernacula (sites with one or more winter records) include: Alabama (2), Arkansas (41), Connecticut (8), Delaware (2), Georgia (3), Illinois (21), Indiana (23), Kentucky (119), Maine (3), Maryland (8), Massachusetts (7), Michigan (103), Minnesota (11), Missouri (more than 269), Nebraska (2), New Hampshire (9), New Jersey (8), New York (58), North Carolina (22), Oklahoma (7), Ohio (7), Pennsylvania (112), South Carolina (2), South Dakota (7), Tennessee (58), Vermont (14), Virginia (8), West Virginia (104), and Wisconsin (67). NLEB are documented in hibernacula in 29 of the 37 States in the species'

range. Other States within the species' range have no known hibernacula (due to no suitable hibernacula present, lack of survey effort, or existence of unknown retreats).

The current range and distribution of NLEB must be described and understood within the context of the impacts of WNS. Prior to the onset of WNS, the best available information on NLEB came primarily from widespread surveys and research projects, primarily focused on Indiana bat (*Myotis sodalis*) or an array of other bat species. In these efforts, NLEB was very frequently encountered and was considered the most common myotid bat in many areas. Overall, the species was considered to be widespread and abundant throughout its historic range (Caceres and Barclay 2000).

WNS has been particularly devastating for NLEB in the northeast, where the species was believed to be the most abundant. There are data also reporting substantial declines in NLEB populations in portions of the Midwest due to WNS. In addition, WNS has been documented at more than 100 NLEB hibernacula in the southeast, with apparent population declines at most sites. WNS has not been found in any of the western states to date and the species is considered rarer in the western extremes of its range. We expect further declines as the disease continues to spread across the species' range.

### **Conservation Needs of the Species**

The species' conservation needs define what is needed in terms of reproduction, numbers, and distribution to ensure the species is no longer in danger of extinction. The conservation needs should be defined in the species' recovery outline or plan. Since there is no recovery plan or recovery outline available at this time, we will outline the conservation needs based on our current understanding of the species.

We find that the primary conservation need of the NLEB is to reduce the threat of WNS. This includes minimizing mortality in WNS-affected areas, and slowing the rate of spread into currently unaffected areas. In addition, NLEB that continue to exist within WNS-affected areas need to be able to continue to survive and reproduce in order to stabilize and/or increase the populations. This can be done by reducing the other threats to the species, as listed above. Therefore, efforts to protect hibernacula from disturbances need to continue. This should include restricting human access to hibernacula particularly during the hibernation period, constructing and maintaining appropriately designed gates, and restoring microhabitat conditions in hibernacula that have been altered. Efforts should also be made to protect and restore (in some cases) adequate fall swarming habitat around hibernacula. Known maternity habitat should be maintained, and the removal of known roost trees, particularly when pregnant females and/or young are present should be reduced. Research to identify important hibernacula and summer areas and to delineate the migratory relationship between summering and wintering populations should also be pursued.

### **Critical Habitat**

Critical habitat has not been proposed for the NLEB.

## ENVIRONMENTAL BASELINE

The Environmental Baseline describes the species status and trend information, and analyzes the effects of past and ongoing human and natural factors leading to the current status of the species, its habitat, and the ecosystem within the action area. Additional detailed information is available in the Forest Plan that is hereby incorporated by reference.

### Status of the NLEB in Michigan and the Action Area

In Michigan, NLEB have been captured or physically detected (i.e., observed in winter hibernacula counts) in 38 of 83 total counties and acoustically identified in 4 additional counties (See Figure 2). The species appears to be more abundant in the UP and northern LP than in southern parts of the state (Kurta 1982, Kurta and Smith 2014). For instance, during 1968-1980, NLEB represented 15.3% of 111 bats of 6 species submitted for rabies testing north of 44° north latitude; whereas the species comprised only 0.3% of bats submitted from south of the 44<sup>th</sup> Parallel (Kurta 1982). Likely, the species' higher density in the north is a result of most known and potential hibernacula being contained in the UP (predominantly abandoned copper and iron mines in Dickinson and Ontonagon Counties; Kurta 1982, Winhold 2007, Kurta 2008a). Although NLEB have been identified at 3 LP hibernacula (Bear Cave in Berrien County, Rockport Quarry in Alpena County, and Tippy Dam in Mason County), it is suspected that a majority of the bats that summer in the southern LP may hibernate in adjacent states (Kurta 1982).

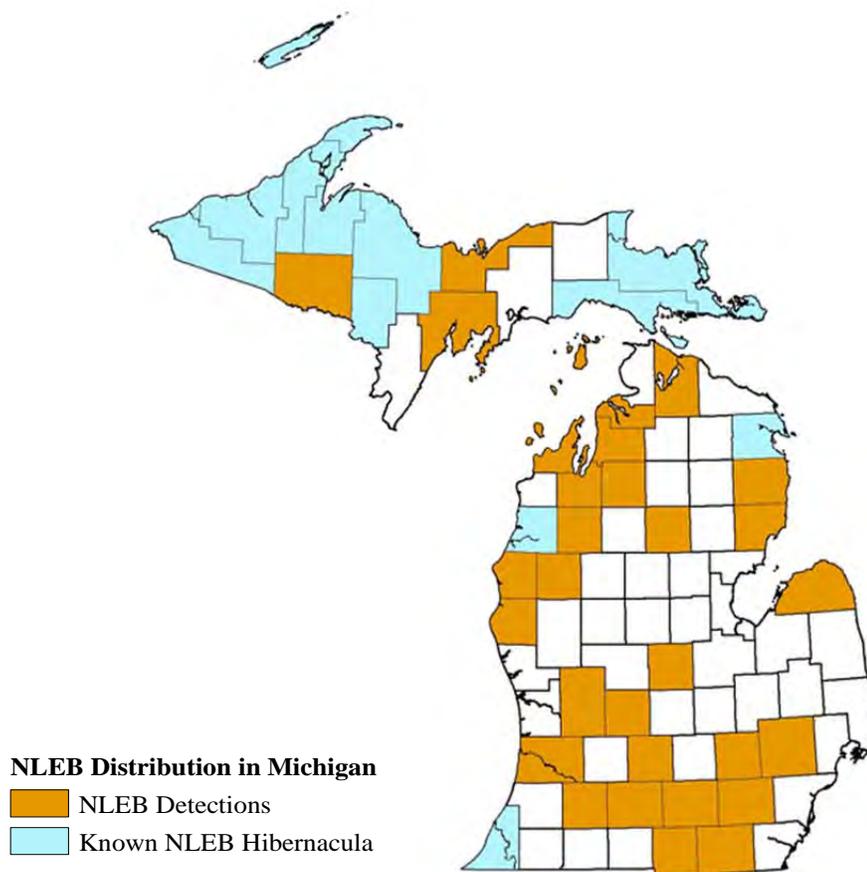


Figure 2: Michigan counties with known NLEB occurrences

### Upper Peninsula

Some of the earliest records of the species in Michigan include sightings from Isle Royale, Mackinac Island (Burt 1946) and Big Summer Island (Long 1978, as cited in Kurta 1982) in the UP. Between 1904 and 1968, the University of Michigan collected a total of 15 NLEB specimens from 7 UP counties (Baraga, Chippewa, Dickinson, Mackinac, Marquette, Keweenaw and Ontonagon; University of Michigan Mammal Research Department Museum Records), and Michigan State University has collected 116 NLEB specimens from 7 UP counties (Chippewa, Delta, Dickinson, Iron, Mackinac, Marquette, and Ontonagon) to date (Michigan State University Mammal Research Department Museum Records).

Although few bat surveys have been conducted in the UP, evidence suggests that NLEB occur there in the highest densities. During the summer of 1979, NLEB represented 81.7% of the total bats captured outside 4 Mackinac County caves in the eastern UP (Kurta 1980). In 2009, Kurta and Smith examined 25 mines in the Ottawa National Forest and concluded that 4 of the sites likely harbor hibernating bats (Kurta and Smith 2009). Finally, during 2010-2014, prior to the arrival of white-nose syndrome (WNS), the team observed bats hibernating in 82 of 119 UP mines, including 91 copper mines, 26 iron mines, 1 dolomite mine, and 1 putative gold mine (Kurta and Smith 2014). Overall, NLEB was the second most commonly observed species, representing almost 10% of the 244,341 total hibernating bats observed.

### *Hiawatha National Forest*

During 2012, NLEB comprised 59% of summer mist net captures in the Hiawatha National Forest (Cuthrell et al. 2012, Gehring and Klatt 2013). Additionally, mobile acoustic surveys during 2009-2012 and 2014 yielded several potential NLEB detections, although the results are considered preliminary.

### *Ottawa National Forest*

In 2004-2006, NLEB comprised 19.3-23.6% of captures as well as 6.4-9.6% of acoustic call sequences at vernal pools in or near the Ottawa National Forest in Gogebic County, MI and Vilas County, Wisconsin (Francl 2005, 2008). Additionally, mobile acoustic surveys conducted in the Ottawa National forest yielded NLEB detections during 2011-2012, although the results are considered preliminary.

### Northern Lower Peninsula (north of 44°N latitude)

In the northern LP, NLEB appear to occur at somewhat lower densities but are still commonly detected at certain sites. During 1910-1939, the University of Michigan collected 3 NLEB specimens from 2 northern LP counties (Cheboygan and Charlevoix, and to date, Michigan State University collected a total of 14 specimens from 7 northern LP counties (Alpena, Antrim, Grand Traverse, Iosco, Kalkaska, and Roscommon). In the Manistee National Forest, NLEB represented 6% (22 of 389) of the total bats captured during the summers of 1998 and 1999, and 27 NLEB roost trees were identified in Lake, Manistee and Wexford Counties (Kurta 2000). Additionally, mobile acoustic surveys conducted in the Huron-Manistee National forest yielded NLEB detections during 2011-2012, although the results are considered preliminary.

NLEB are consistently found hibernating in Tippy Dam, a hydroelectric facility in Mason County, comprising an estimated 2.6% of the approximately 19,000 bats that hibernate there (Kurta et al. 1997). NLEB were 11.9% (203) of bats captured swarming at Tippy Dam during August 1995 and 3% (30) of the bats captured in September of the same year (Kurta et al. 1997). During 12 nights of sampling in the fall of 1998 and 1999, NLEB were 12.26% (1,037) of the total bats captured near the dam (Kurta 2000). In addition to Tippy Dam, NLEB have been observed hibernating in a surge tunnel in Rockport Quarry, an abandoned limestone quarry in Alpena County (Slider and Kurta 2011), although they appear to use the hibernaculum in relatively low numbers (Travis 2014).

#### *Manistee National Forest*

In the Manistee National Forest in the northwestern LP, NLEB represented 6% (22 of 389) of the total bats captured during the summers of 1998 and 1999; moreover, 27 NLEB roost trees were identified in in Lake, Manistee and Wexford (Kurta 2000). In addition, mobile acoustic surveys conducted within the Manistee National Forest during 2011-2012 yielded several potential NLEB detections, although the results are considered preliminary. In 2014, NLEB captures totaled 6% of bats (7 of 115) at one study site in Wexford County on the Manistee National Forest. During subsequent radio-tracking, 13 additional roost trees were identified in 2014, including several maternity roosts (George and Kurta 2014).

#### *Huron National Forest*

In the Huron National Forest in the northeastern LP, NLEB were 32% (21 of 66) of bats captured mist net captures in Alcona County, approximately 50 km from Rockport Quarry, during July of 2008 (Kurta 2008a).

#### *Southern Lower Peninsula (north of 44°N latitude)*

In the southern LP, NLEB are considered relatively uncommon (Winhold 2007). During 1910-1939, a single NLEB specimen was collected from Washtenaw County for the University of Michigan Museum, and Michigan State University has collected an additional 20 specimens from 4 southern LP counties (Berrien, Calhoun, Eaton, and Kent) to date. In Eaton County, NLEB were 1.8% (4 of 223) of bats captured along the Thornapple River during 1978-1979, 3% (4 of 120) of bats captured along the River in 1982 (Brack et al. 1984), and 4.6% (10 of 217) of bats captured there during 1993-1994 (Winhold 2007). Additionally, 32 NLEB roost trees were identified in Eaton County during 1993-1994 (Foster and Kurta 1999), including several large maternity roosts. During the summers of 2004-2006, NLEB represented only 0.6% (6 of 948) of bats captured in mist nets at 75 rural sites in MI's southern four county tiers (Winhold and Kurta 2008b, Winhold 2007). However, in 2007, NLEB were 11% (50 of 457) bats captured in Lenawee County (Kurta 2007), and during 2007-2008, 35 NLEB were tracked to a total of 78 roost trees along Bear Creek, Black Creek, and the River Raisin in Lenawee County (Kurta 2008b). Moreover, NLEB comprised 24.4% of the bats captured at Bear Cave (a tufa cave in Berrien County) on 2 nights in September 1978 and 5 nights in September 1979 (Kurta 1980), and were 55.8% (91 of 163) of bats captured outside the hibernaculum in August of 2005 (Kurta et al. 2007, Winhold 2007).

In addition to Bear Cave, one additional potential hibernaculum has been identified in the southern LP (Silas Doty Cave in Hillsdale County), although inspections in the fall of 2004 and

spring of 2006 revealed a high degree of human disturbance and did not contain bats (Winhold 2007).

WNS was first confirmed in Michigan in the winter of 2013-2014. As of March 25, 2015, mortality has been documented at hibernacula in at least 5 counties (Alpena, Dickinson, Keweenaw, Mackinac, and Ontonagon); however, mortality has not been specifically confirmed for NLEB. Additionally, evidence of WNS was discovered in Tippy Dam in the winter of 2014-2015 and a case of WNS in a big brown bat (*Eptesicus fuscus*) was recently confirmed in Clare County.

### **Habitat Conditions in the Action Area**

Of the HMNF's total ownership, 16% is aspen/birch, 14% is high site oak, 16% is low site oak, 12% is short-lived conifer, 20% is long-lived conifer, 8% is northern hardwood, 5% is lowland hardwood, 3% is lowland conifer, and 7% is non-forested. Approximately 904,849 acres (97%) of the HMNF is forested. Some of the non-forested habitat consists of aquatic habitats of open and emergent wetlands, savannas, and grasslands. The entire HMNF is comprised of glacial sediment and no karst geology is present. Aside from Tippy Dam, no other NLEB hibernacula are known to be on the HMNF.

### **Conservation Needs of the Species in the Action Area**

The conservation needs of the species in the action area are similar to the needs range-wide. The HMNF provides habitat for swarming, migrating, and summering NLEB. WNS has not been detected on the HMNF; however WNS has been detected at Tippy Dam, and the fungus has been detected in six counties in Michigan and suspected in another and mortality has been detected in six counties. It is likely the bat's population on the HMNF will experience significant declines over the next several years directly attributable to WNS. Therefore, within the action area the conservation needs include: 1) reducing WNS-related mortality and injury; 2) conducting research to discover ways to prevent bats from being infected with WNS or treat bats who are infected; 3) providing suitable habitat conditions for NLEB; 4) maintaining suitable habitat conditions in identified maternity areas and reducing the removal of occupied roost trees; 5) searching for previously unidentified areas of maternity and hibernation activity; and 6) conducting research to understand the migration patterns of NLEB that use the area during the summer or winter.

### **Ongoing Stressors in the Action Area**

The Service believes the following State, local, and private actions are currently occurring within the Action Areas and are likely to be adversely affecting some percentage of NLEB to variable degrees, and are likely to continue into the reasonably foreseeable future.

- Loss and degradation of roosting and foraging habitat – Most of the forest habitat within the Action Area is on Forest Service lands and is being maintained and available for use by NLEB. However, on lands outside of the Forest Service's ownership, an unknown amount of forest habitat is being lost and/or degraded by private and public, commercial and residential developments, which are converting, fragmenting, or otherwise degrading forest habitat available for roosting and foraging, especially near incorporated areas

centers and along primary and heavily traveled secondary roadways and their main intersections.

- Commercial and private timber harvesting – Some private timbering likely occurs on private lands within the Action Area while bats are roosting in trees. Therefore, some unknown number are likely exposed to this stressor and may be directly killed, harmed, or displaced as trees are felled in the summer.
- Cutting of Snags - While most primary and many alternate roost trees are dead snags that are ephemeral/short-lived, some small proportion are likely to be cut down before they would naturally fall in order to reduce safety risks (i.e., hazard tree removal), to provide firewood, or to improve aesthetics.
- Degraded water quality – Point and non-point source pollution and contaminants from agricultural, commercial, and residential areas are likely present in waterways within the Action Area and may at times reduce aquatic insect biomass that form a portion of the NLEB prey base and/or have direct or other indirect adverse effects on the bats themselves (e.g., females may have reduced reproduction in heavily contaminated areas).

### **EFFECTS OF THE ACTION**

This BO evaluates the effects of 702 ongoing and planned project activities and 814 special use permits on the HMNF. These projects will affect a total of 212,975 acres of potential NLEB habitat on the HMNF. Potential effects to the NLEB include direct effects and indirect effects. Direct effects occur when bats are present while the activities are being conducted; indirect effects occur later in time. Effects will vary based on the type of the proposed activity.

We deconstructed the ongoing activities into its various project elements and determined the direct and indirect environmental consequences that NLEB would be exposed to. We conducted various exposure analyses for each proposed activity that may directly or indirectly affect the bats and determined the likely responses of the bats to each potential stressor.

While analyzing direct and indirect effects of the proposed action on NLEB, we considered the following factors:

- proximity of the action to known occupied or likely suitable habitat,
- distribution of the disturbances and impacts,
- timing of the effects in relation to sensitive periods in the species' lifecycle,
- nature of the effects - how the effects of the action may be manifested in elements of a species' lifecycle, population size or variability, or distribution, and how individual animals may be affected,
- duration of effects - short-term, long-term, permanent,
- disturbance frequency - number of events per unit of time, and

- disturbance severity - what is the relative impact in comparison to unimpacted individuals.

In addition, our analysis of effects for northern long-eared bat entails integrating those individual effects to discern the consequences to the populations to which those individuals belong, and determining the consequences of any population-level effects to the species rangewide. If, at any point, we demonstrate that the effects are unlikely, we conclude that the agency has insured that their action is not likely to jeopardize the continued existence of the species and our analysis is completed.

### **Hardwoods - Timber Harvest / Non-commercial cutting / TSI**

#### Description of Action

The actions that will be analyzed in this section include all commercial timber harvest, non-commercial tree felling, and timber stand improvement activities (TSI) that will occur in hardwood forest types. This action also includes the construction of temporary roads and landings for the removal of timber products. These actions are described in more detail in Appendix A. Approximately 19,574 acres of hardwood forests are planned to be harvested or felled on the Huron-Manistee National Forests.

Commercial timber harvest in the hardwood forest type includes all tree felling activities conducted on National Forest System lands by a purchaser, where trees are felled and removed. A number of silvicultural techniques may be used including clearcutting, thinning, shelterwood and seed tree harvest. These techniques are used most often to regenerate or manage a stand that will remain forested over the long term. Sometimes hardwood timber harvest is used to create openings, barrens and fuelbreaks, roads, or other permanent openings.

Non-commercial felling is occasionally used to accomplish the same vegetation management objectives described above without commercial harvest. Trees are felled non-commercially to meet specific forestry, wildlife habitat, or other resource management objectives.

Timber Stand Improvement (TSI) activities typically include forest management practices that improve the vigor, stocking, composition, productivity, and quality of forest stands. The improvement usually results from removing poor quality trees and allowing crop trees to fully use the growing space. Snags and wildlife (e.g. relict) trees are generally retained unless they pose a safety hazard or prevent access.

To minimize effects to NLEB, the HMNF has developed the following design criteria to be incorporated into projects as feasible and prudent:

- Conduct felling outside of the summer occupancy period.
- Reserve snags and den trees according to Forest Plan guidelines; focus on retaining trees with features beneficial to the NLEB.

## Environmental Baseline

Timber harvest, non-commercial cutting, and timber stand improvement activities in hardwood forests are ongoing activities on National Forest System lands to: 1) promote forest health, restoration, and use; 2) provide habitat for wildlife, plants, and fish; 3) provide recreational opportunities; 4) reduce risk to users and enhance public safety; 5) meet other resource management objectives in the Huron-Manistee National Forests' Land and Resource Management Plan (USDA Forest Service, 2006).

A majority of NLEB roosts reported were in deciduous (i.e. hardwood) forest types (e.g., Mumford and Cope 1964, Sasse Thesis 1995, Foster and Kurta 1999, Lacki and Schwierjohann 2001, Schultes Thesis 2002, Broders and Forbes 2004, Jackson Thesis 2004, Carter and Feldhamer 2005, Ford et al. 2006, Bales Thesis 2007, Winhold Thesis 2007, Garroway and Broders 2008, Kurta 2008, Dickinson et al. 2009, Johnson et al. 2009, Lacki et al. 2009, Krynak Thesis 2010, Timpone et al. 2010, Silvis et al. 2012, Sinander 2012, Bohrman and Fecske 2013, Brown 2013, Lereculeur Thesis 2013, Badin Thesis 2014). Broders and Forbes (2004) reported that female NLEB roosts in New Brunswick were 24 times more likely to be in shade-tolerant, deciduous trees than conifers. These data suggest that hardwood trees most often provide the structural and microclimate conditions preferred by maternity colonies and groups of females, which have more specific roosting needs than solitary males (Perry and Thill 2007), although softwood snags may occasionally offer more suitable roosting habitat for both sexes than hardwoods (e.g., Perry and Thill 2008, Cryan et al. 2001).

Additionally, it has been suggested that NLEB does not often forage in intensively managed stands (Patriquin and Barclay 2003, Ford et al. 2005, Sheets et al. 2013). However, Owen et al. (2002) and Menzel et al. (2002) concluded that intensively managed hardwood forests in the central Appalachians provide adequate roosting habitat for NLEB. Badin (Thesis, 2014) found that NLEB roosted at greater abundances in undisturbed forest (n = 65) than harvested forests, with a few roosts in patch-cuts (n = 4), and none in larger clear-cuts. When using disturbed areas, NLEB were found to use plots with more trees (i.e. vegetative clutter) than random locations (Cryan et al. 2001, Owen et al. 2002, and O'Keefe 2009).

## Direct and Indirect Effects

Although the probability is relatively small (based on total forest size), some of the trees harvested or felled may be roosting habitat for the NLEB. While the probability of this is difficult to quantify, it may vary depending on the extent of trees removed (i.e. size of harvest area and treatment type, as well as age, size, and condition of tree). Trees may be felled in the spring, summer, and fall when NLEBs may be present. Harvesting or felling trees during this period may directly affect NLEBs because of the possibility of a tree containing roosting bats. Bats may leave a roost tree prior to it being felled due to the noise, vibration and disturbance from saws or other equipment. However, some bats might remain in a tree and could be injured or killed if the tree strikes the ground. If bats are present in trees adjacent to the tree being felled, these bats may be disturbed by the activity, however, the bats are not likely to be injured or killed, unless the felled tree damages the roost site on the retained tree. The design criteria for retention of snags and den trees offer additional protection because many potential roost trees would be protected from cutting.

Potential adverse effects are reduced during the spring staging and fall swarming periods. During spring staging, most bats would be expected to be staging near their hibernaculum; during swarming, most NLEBs would be expected to be swarming near their hibernaculum.

If a roost tree is felled any time of year, it could cause a local loss of roosting habitat. The roost tree would no longer be available to NLEBs and cause the bats that were occupying it to find an alternate roost tree. However, depending on the prescribed treatment for the specific treatment area, the bats may find suitable habitat in adjacent trees or neighboring stands. The size of the treatment areas may impact the social structure of bats in maternity colonies by losing preferred roost trees and the loss of roost trees may also potentially affect home ranges of bats using the treated areas. Silvis et al. (2014) used simulations to demonstrate that >20% roost removal was required to fragment social networks for maternity colonies in Kentucky. While harvests are generally concentrated to localized landscape types or ecological regions, the timber harvests are generally conducted in smaller blocks of payment units (anywhere from 5-100 acres in size) over the course of several years (duration of the timber contract). This incremental timber removal may help minimize loss of habitat by dispersing it over time and space.

### *Uneven-aged Management*

In the short term, uneven-aged management treatments could have a moderate indirect effect on NLEBs because of changes in forest structure. These stands would lose the poor condition trees that may offer cavities for roosting bats and canopy cover that may serve as maternal roost sites. However, the amount of trees removed would be relatively low compared to even age management treatments and the stand would retain most of its prior structure. The removal of trees may open up the understory and provide greater foraging areas, presenting a beneficial effect. The limited removal of trees should be low enough not to affect prey (insects) abundance or prey habitat. Retained snags and cavity trees would provide some roosting habitat, however these trees will likely fall over within 10 years.

Some areas of hardwood timber harvest used to create openings, barrens, fuelbreaks, roads or other permanent openings would not be reforested. These actions could result in a minor loss of roosting and foraging habitat over the long term. The impact depends on the size and density of the trees removed, and size and shape of the permanent openings created. Areas where the trees are large (> 3" dbh) and not densely stocked could be roosting and foraging habitat for NLEBs; hardwood timber harvest in these areas may result in habitat loss. Harvest that creates large or wide openings could result in a loss of foraging habitat for NLEBs, while harvest that creates small or narrow openings could provide foraging habitat.

In the long term, the remaining trees would continue to age and provide additional roosting habitat in the future (10-20 years depending on stand characteristics). The hardwood stands that are thinned would promote larger trees and an increase in stand diversity. Owen et al. (2003) suggest that partial timber harvests (thinning) in the Allegheny Mountains that left a relatively closed canopy could be beneficial to NLEB, and Lacki and Schwierjohann (2001) reported NLEB in higher abundances in stands with higher diversity of tree species. This diversity should be more conducive to NLEB by providing additional foraging opportunities and prey habitat and prey abundance. The long term effects should be beneficial to the NLEB and its prey base.

### *Even-aged Management*

Even-aged management in hardwoods is most often conducted on aspen vegetation types, usually in older aged stands which are often at higher risks of succeeding out of the landscape and being replaced by other species. Without efficient even-aged regeneration, aspen and aspen dominated stands currently face a long-term decline across the Forest. However, aspen stands can be structurally diverse and provide cavities and other characteristics which NLEB and other bats can use for optimal roost selection (Parson et al. 2002).

No direct negative effects to NLEB maternity roosting communities would occur from even-aged timber harvests when conducted outside the summer occupancy period. A brief window of direct risk may exist in the fall, for adult and volant-staged NLEB pups prior to bats entering winter hibernacula. However, risks are considered minimal. Avoidance capabilities of NLEB would be strong during this time because once NLEB are capable of flight, their ability to flush and evade injury and mortality from certain forest management actions is enhanced. Flight strength and skills would continue to develop after the summer period, especially pups actively flying and preparing for fall migrations and subsequent hibernation. Even-aged hardwood management represents only a small portion of active timber sales at any given time. Aspen is more frequently cut in the winter or early spring when resource damages (e.g., sensitive soils, road issues) can be avoided, which coincides with when NLEB are restricted to hibernacula. In the short term, even-aged management treatments could have a significant indirect effect on NLEBs because of a loss in forest structure. Snags and cavity trees would be retained, but overall canopy loss may make the stand unsuitable for NLEB roosting. Some home ranges could be affected with the cutting of an entire stand of trees, depending on the size of the stand treated and location of the home range. This would most likely disrupt the social structure of any colonies inhabiting the stand, but colonies utilizing the edge of the cut stand may be able to make use of the adjoining stand. The overall removal of trees may affect local moisture and evaporation levels enough to affect prey (insects) abundance or prey habitat. However, NLEBs using neighboring stands for roosting may use the newly cut stands for foraging purposes if prey base is unchanged. Some short-term benefits may occur as a result of new edges for foraging. Hogber et al. (2009) noted NLEB tended to use edges of patches of residual trees left in clearcuts, and avoided open areas near the center of them. However, these impacts are not expected because stands suitable for even-aged treatment are not likely to be primary roosting habitat, and because even-aged cuts are small and not done over large contiguous areas of the Forest.

Some areas of hardwood timber harvest used to create openings, barrens, fuelbreaks, roads or other permanent openings would not be reforested. These actions could result in a minor loss of roosting and foraging habitat over the long term. The impact depends on the size and density of the trees removed, and size and shape of the permanent openings created. Areas where the trees are large (> 3" dbh) and not densely stocked could be roosting and foraging habitat for NLEBs; hardwood timber harvest in these areas may result in habitat loss. Harvest that creates large or wide openings could result in a loss of foraging habitat for NLEBs, while harvest that creates small or narrow openings could provide foraging habitat.

In the long term, the regenerated stand may return to near pre-disturbance conditions in canopy closure and structural features in 40-60 years depending on forest type. This would be a long-term benefit to NLEB and help provide for a sustained supply of future live trees as well as snags. Snags and cavity trees would become more abundant and foraging opportunities would

become available as the stand matures. Non-aspen hardwood forest types regenerating from a previous clearcut would continue to age and transition to uneven-aged management improving their suitability for NLEB. Aspen forest types would be retreated with even-aged management techniques to enhance diversity in age classes (across the forest) and promote retention of the species through regeneration. Any change in prey base may not fully rebound until a canopy is restored (20-40 years depending on forest type) and foraging opportunities in interior portions of stands may not mature to the point where NLEB can effectively navigate. However, this may be off-set by NELB using stand edges or younger age classes of regenerating trees. The long term effects should be mild to the NLEB and its prey base as the stands replace themselves. Overall, northern hardwood forests (i.e. non-aspen) are rarely treated with even-aged management techniques. Aspen type forests are the most common forest type treated with even-aged techniques and NLEB use of aspen forests is still not well understood, but may vary depending on proportional availability.

### *Non-commercial Cutting*

The unplanned non-commercial removal of trees would likely have very limited indirect effects on NLEBs due to the low number of trees removed. Trees that serve as roosts and maternity colony sites may be removed from the landscape; however the limited tree removal likely would not disrupt social assemblages or home ranges. Additionally, prey bases should not be disturbed by this limited tree removal. Any effects should be short-term in nature and would most likely be mitigated by other surrounding habitat. The removal of a few trees could also be beneficial by creating an opening in the canopy that could serve as a foraging location.

### *Timber Stand Improvement*

The removal of small diameter trees to improve the regeneration, health and vigor of future hardwood stands would likely have a very limited negative indirect effect on NLEBs due to the low suitability of the trees removed, and in some cases would be beneficial to NLEB. Site prep activities would most likely have no effect on NLEB due to the fact that the treated stand age is so young that it would not be suitable to NLEB and that the trees removed are generally young trees less than 3" dbh. Other TSI activities in developed stands may remove live trees larger than 3" dbh, but these trees are generally located in the sub-canopy and their removal would be beneficial to NLEB by removing clutter and allowing greater foraging opportunities. TSI activities most likely would not affect prey abundance or habitat.

### Determination

Timber harvest, non-commercial cutting, and timber stand improvement activities in hardwood forests are likely to adversely affect the NLEB because of potential adverse impacts to individuals due to injury and death from felling trees, and harassment due to social structure changes and roost tree removals. Actions that are able to incorporate both design criteria are not likely to adversely affect the NLEB because tree would be felled outside the summer occupancy period.

Actions Likely to Adversely Affect the NLEB (HWDCUT-LAA) (No design criteria)  
Approximately 11,858 acres are planned for treatment on the Huron-Manistee National Forests.

Actions Not Likely to Adversely Affect the NLEB (HWDCUT-NLAA)

Approximately 7,716 acres are planned for treatment on the Huron-Manistee National Forests.

### **Hardwoods– Low to Moderate Intensity Prescribed Burning**

#### Description of Action

The action that will be analyzed in this section includes all low to moderate intensity prescribed burning that will occur in hardwood forest types. These actions are described in more detail in the Appendix A. Approximately 30,120 acres of hardwood forests are planned for low to moderate intensity prescribed burning on the Huron-Manistee National.

Low to moderate intensity prescribed burning includes all prescribed burning activities conducted on National Forest System lands, where the flame lengths are generally 2 to 4 feet, and no greater than 6 feet. Low to moderate intensity prescribed burns are typically intended to consume ground level litter and vegetation, and usually have little to no impact on overstory trees.

A summary of NLEB roost trees (USFWS unpublished) shows a range of roost heights from 16 to 52 feet, well above the height of flames of a low to moderate intensity prescribed burn.

To minimize effects to NLEB, the HMNF has developed the following design criteria to be incorporated into projects as feasible and prudent:

- Conduct burning outside of the non-volant period.

#### Environmental Baseline

Prescribed fire activities in hardwood forest types are used to improve forest health and restoration, reduce fuel loading, invasive species management, and site preparation activities. Hardwood forests are important habitats that NLEB use for foraging, roosting, pup rearing and social interactions. Lacki et al. (2009) reported that although NLEB in Kentucky roosted preferentially in hardwoods, they foraged in or near pine-dominated stands more often than hardwood-dominated stands and in burned habitats more than unburned habitats. They argued that the lower subcanopy clutter observed in both pine stands and burned habitats were preferred for foraging. In a large majority of NLEB telemetry studies, roost tree species reported were hardwoods. Of 1443 total roost trees described in 30 studies across the species' range (Sasse 1995, Foster and Kurta 1999, Cryan et al. 2001, Lacki and Schwierjohann 2001, Schultes 2002, Scott 2007, Swier 2003, Broders and Forbes 2004, Jackson 2004, Carter and Feldhamer 2005, Ford et al. 2006, Bales 2007, Henderson 2007, Perry and Thill 2007, Winhold 2007, Garroway and Broders 2008, Dickinson et al. 2009, Johnson et al. 2009, Lacki et al. 2009, Krynak 2010, Timpone et al. 2010, Olson 2011, Silvis et al. 2012, Sinander 2012, Park and Broders 2012, Bohrman and Fecske 2013, Brown 2013, Lereculeur 2013, Badin 2014, George and Kurta 2014), 1185 (84.6%) were reported as deciduous, and 882/1005 (87.8%) of total female NLEB roosts were deciduous. Broders and Forbes (2004) reported that female NLEB roosts in New Brunswick were 24 times more likely to be shade-tolerant, deciduous trees than conifers. In Newfoundland, even though approximately 83% of forests are dominated by coniferous species, female NLEB were tracked to nearly the same number of deciduous as coniferous roosts (Park

and Broders 2012). However, these pooled data were skewed toward the preferences of reproductive female bats (which were targeted by most of the telemetry studies), and it appears that solitary male NLEB may use coniferous roosts to a greater extent (Broders and Forbes 2004, Jung et al. 2004, Henderson et al. 2008, Lausen 2009).

### Direct and Indirect Effects

Trees potentially containing NLEB may be burned or felled as part of the preparation (fire line creation and maintenance) or burning process resulting in a direct effect on the bats. Areas may be treated at any time in the spring, summer, and fall when NLEBs may be present. When conducted in the summer occupancy period, particularly the non-volant period, some pups might not be capable of flight or have enough experience to safely relocate from fire related dangers.

Fire line creation or maintenance may include felling and cutting of standing woody materials greater than 3 inches. Burning during this period may also directly affect NLEBs primarily due to smoke, heat and possible flame length. Some bats may remain in the trees and may potentially be injured or killed. Additionally bats may leave a roost tree prior to the area being burned due to the noise, vibration and disturbance from chainsaws or other equipment. If bats are present in stands adjacent to an area being burned, those bats may be disturbed by the activity though the risk would be varied by factors such as wind direction and speed. Bats may also avoid the burned area for a short period after the burn, causing them to relocate to other suitable areas. Temporary relocation is not considered harmful because suitable habitat is not a limiting factor.

To meet the low to moderate intensity objectives within a prescribed burn prescription, burn plans only allow burning when weather and vegetation conditions are favorable. Conservation measures from the NLEB Interim Conference and Planning Guidance (D-5) states “direct effects to NLEB are minimized when prescribed burns are of low/moderate intensity during the summer maternity season” (USFWS 2014).

If a roost tree is rendered unusable by burning, it could cause a local loss of roosting habitat. The roost tree would no longer be available to NLEBs and cause the bats that were occupying it to find an alternate roost tree. Depending on the location and quantity of roost trees rendered unusable, the social structure of the NLEBs may also change. Additionally, if the burn area is large enough it could cause a temporary change in home range. Using simulations, researchers found that NLEB colony social structure is robust to fragmentation from small, random loss of roosts, suggesting >20% roost trees could be removed before network breakdowns occurred (Silvis et al. 2014). Loss of roost trees is unlikely though given the low intensity of the fire. The intended action is to remove low level vegetation, not large structures like roost trees.

In the long term, burning in hardwood stands with low to moderate intensity fire may benefit the NLEB by making the stands less dense and improving stand structure for foraging (Humes et al. 1999, Menzel et al. 2002, Erikson and West 2003, Owen et al. 2003). Stand structure may be more conducive to NLEB foraging because of an expected increase in vegetative diversity that may improve insect diversity and abundance (Lacki et al. 2009). Burning may thin portions of hardwood stands, promoting larger trees, reducing stem density, and increasing solar exposure for potential roost trees. Some trees may be killed or damaged by fire; the exfoliating bark, crevices, cavity, or cracks in the damaged or dead trees could provide new roosting habitat. Lacki et al. (2009) reported a higher number of NLEB roosts in burned habitats in Kentucky

(74.3%) after fires than in unburned habitats (25.7%). Similarly, Johnson et al. (2009) found that NLEB were more likely to establish maternity colonies in stands with a higher percentage of fire-killed stems than random trees, corresponding with their observation that suitable roosts were disproportionately higher in fire-treated areas.

### Determination

Low to moderate intensity prescribed burning projects in hardwood forest without design criteria are likely to adversely affect the NLEB because of potential adverse impacts to individuals, especially non-volant bats, due to injury and death from smoke, heat, flame length, and felling roost trees, and harassment due to social structure changes and roost tree impacts. Actions that are able to incorporate the design criteria are not likely to adversely affect the NLEB because activities would occur outside the non-volant period.

Actions Likely To Adversely Affect the NLEB (HWDLMB-LAA) (No design criteria)  
Approximately 20,929 acres are planned for treatment on the Huron-Manistee National Forests.

Actions Not Likely to Adversely Affect the NLEB (HWDLMB-NLAA)  
Approximately 9,191 acres are planned for treatment on the Huron-Manistee National Forests.

### **Hardwoods – High Intensity Burning**

#### Description of Action

The actions that will be analyzed in this section include all high intensity prescribed burning that will occur in hardwood forest types. These actions are described in more detail in Appendix A. Approximately 628 acres of hardwood forests are planned for high intensity prescribed burning on the Huron-Manistee National Forests.

High intensity prescribed burning includes all prescribed burning activities conducted on National Forest System lands, where the flame lengths are generally greater than 6 feet. High intensity prescribed burns are typically intended to kill overstory trees, as well as consume ground level litter and understory vegetation. These burns may occur in hardwood stands with the objective of converting the stands to other forest types, reducing fuel loading and improving habitat for wildlife. The resulting change in stem density, canopy closure, and other forest stand characteristics is highly variable and depends on treatment prescriptions and Timber Stand Improvement activities.

#### Environmental Baseline

Prescribed fire activities in hardwood forest types are used to improve forest health and restoration, reduce fuel loading, invasive species management, and site preparation activities.

Hardwood forests are important habitats that NLEB use for foraging, roosting, pup rearing and social interactions. Lacki et al. (2009) reported that although NLEB in Kentucky roosted preferentially in hardwoods, they foraged in or near pine-dominated stands more often than hardwood-dominated stands and in burned habitats more than unburned habitats. They argued that the lower subcanopy clutter observed in both pine stands and burned habitats were preferred for foraging. In a large majority of NLEB telemetry studies, roost tree species reported were

hardwoods. Of 1400 total roost trees described in 29 studies across the species' range (Mumford and Cope 1964, Sasse Thesis 1995, Foster and Kurta 1999, Cryan et al. 2001, Lacki and Schwierjohann 2001, Schultes Thesis 2002, Swier Thesis 2003, Broders and Forbes 2004, Jackson Thesis 2004, Carter and Feldhamer 2005, Ford et al. 2006, Bales Thesis 2007, Perry and Thill 2007, Winhold Thesis 2007, Garroway and Broders 2008, Kurta 2008, Dickinson et al. 2009, Johnson et al. 2009, Lacki et al. 2009, Krynak Thesis 2010, Timpone et al. 2010, Silvis et al. 2012, Sinander 2012, Park and Broders 2012, Bohrman and Fecske 2013, Brown 2013, Lereculeur Thesis 2013, Badin Thesis 2014), 1185 (84.6%) were reported as deciduous, and 852/974 (87.4%) of total female NLEB roosts were deciduous. Broders and Forbes (2004) reported that female NLEB roosts in New Brunswick were 24 times more likely to be shade-tolerant, deciduous trees than conifers. In Newfoundland, even though approximately 83% of forests are dominated by coniferous species, female NLEB were tracked to nearly the same number of deciduous as coniferous roosts (Park and Broders 2012). However, these pooled data were skewed toward the preferences of reproductive female bats (which were targeted by most of the telemetry studies), and it appears that solitary male NLEB may use coniferous roosts to a greater extent (Broders and Forbes 2004, Jung et al. 2004, Henderson et al. 2008, Lausen 2009).

### Direct and Indirect Effects

Trees containing NLEB may be burned or felled as part of the preparation (fire line creation and maintenance) or burning process resulting in a direct effect on the bats. Areas may be treated in the spring, summer, and fall when NLEBs may be present. Fire line creation or maintenance may include felling and cutting of standing woody materials greater than 3 inches. Burning during this period may also directly affect NLEBs primarily due to smoke, heat and possible flame length. Additionally bats may leave a roost tree prior to the area being burned due to the noise, vibration and disturbance from chainsaws or other equipment. As with low and moderate intensity burns, some bats may remain in the trees and may potentially be injured or killed. Higher intensity burns increase these risks, because of higher flame lengths and heat plumes at or above minimum roosting heights. In addition, fire fronts may advance quickly, thus decreasing the time required by bats to detect threats, become physically active, and escape from roost sites or burn areas. If bats are present in adjacent stands to the area being burned, these bats may be disturbed by the activity, however, the degree is weather dependent (e.g. wind direction and speed). High intensity burns in hardwood stands may result in direct loss of roost habitat. Snags and cavity trees would be at a higher risk for destruction or loss of suitability because the decaying wood and loose bark in them would likely burn.

If a roost tree is rendered unusable by burning, it could cause a local loss of roosting habitat. The roost tree would no longer be available to NLEBs and cause the bats that were occupying it to find an alternate roost tree. However, Lacki et al. (2009) reported that structural integrity of only 2 of ~40 roosts trees appeared to have been compromised from extensive smoldering combustion during a prescribed fire which burned 80% of the study area on 67.6% of sample plots surrounding roost trees with charred surfaces reaching 14.6 m in height. Depending on the location and quantity of roost trees rendered unusable, the social structure of the NLEBs may also change. Silvis et al. (2014) used simulations to demonstrate that >20% roost removal was required to fragment social networks for maternity colonies in Kentucky. Additionally, if the burn area is large enough it could cause a temporary change in home range.

Burning in hardwood stands may benefit the NLEB by making the stands less dense and improving stand structure for foraging. Lacki et al. (2009) reported higher NLEB activity,

corresponding with increased insect prey abundances, following prescribed burning in Kentucky. Hart (Dissertation, 2004) also reported that prescribed burning and invasive species removal were positively related to general bat activity and insect abundance in Ohio. Burning may thin portions of hardwood stands, promoting larger trees, reducing stem density, and increasing solar exposure for potential roost trees. Stand structure may be more conducive to NLEB foraging because of an expected increase in vegetative diversity that may improve insect diversity and abundance. Trees that are killed or damaged by fire may develop exfoliating bark, crevices, cavities, or cracks providing new roosting habitat. In support of this, Lacki et al. (2009) reported a higher number of NLEB roosts in burned habitats in Kentucky (74.3%; n = 26) after fires than in unburned habitats (25.7%; n = 9). Similarly, Johnson et al. (2009) found that NLEB were more likely to establish maternity colonies in stands with a higher percentage of fire-killed stems than random trees, corresponding with their observation that suitable roosts were disproportionately higher in fire-treated areas.

In the short term, high intensity prescribed burning in hardwood stands could have an overall minor to moderate indirect effect on NLEBs because of changes in forest structure. These stands may transition from well suited NLEB habitat to less suitable habitat, depending on severity of burn and how much forest structure is lost. If enough forest structure is retained there may be a positive response by the bats capitalizing on newly creating roosting structure. Insect flushed after the fire may also provide a beneficial indirect effect.

In the long term, the hardwood stands that are burned with high intensity fire would likely retain a moderate amount of forest structure and would regenerate lost pockets of hardwoods in approximately 60-80 years, depending on hardwood forest type. Generally, treated stands would transition from moderately suitable NLEB habitat (depending on condition of stand after fire) to well suited NLEB habitat over the long term as hardwood forests mature.

### Determination

High intensity burning projects in hardwood forests without design criteria are likely to adversely affect the NLEB because of the possibility roosting bats may be injured or killed during prescribed burn activities.

Actions Likely To Adversely Affect the NLEB (HWDHIB-LAA)

Approximately 628 acres are planned for treatment on the Huron-Manistee National Forests.

### **Conifer - Timber Harvest / Non-commercial felling / TSI**

#### Description of Action

The actions that will be analyzed in this section include all commercial timber harvest, non-commercial tree felling, and timber stand improvement activities (TSI) that will occur in coniferous forest types. This action also includes the construction of temporary roads and landings for the removal of timber products. These actions are described in more detail in Appendix A. Approximately 21,816 acres of coniferous forests are planned to be harvested or felled on the Huron-Manistee National Forests.

Commercial timber harvest in the coniferous forest type includes all tree felling activities conducted on National Forest System lands by a contractor, where trees are felled and removed.

A number of silvicultural techniques may be used including clearcutting, thinning, shelterwood and seed tree harvest. These techniques are used most often to regenerate or manage a stand that will remain forested over the long term. Sometimes coniferous timber harvest is used to create openings, barrens and fuelbreaks, roads, or other permanent openings.

Non-commercial felling is occasionally used to accomplish the same vegetation management objectives described above without commercial harvest. Trees are felled non-commercially to meet specific forestry, wildlife habitat, or other resource management objectives.

Timber Stand Improvement (TSI) activities typically include forest management practices that improve the vigor, stocking, composition, productivity, and quality of forest stands. The improvement usually results from removing poor quality trees and allowing crop trees to fully use the growing space.

To minimize effects to NLEB, the HMNF has developed the following design criteria to be incorporated into projects as feasible and prudent:

- Conduct felling outside of the non-volant period.
- Reserve snags and den trees according to Forest Plan guidelines; focus on retaining trees with features beneficial to the NLEB.

### Environmental Baseline

Timber harvest, non-commercial cutting, and timber stand improvement activities in coniferous forest are ongoing activities on National Forest System lands with the objective of supplying timber products, enhancing wildlife habitat, reducing fire risk and meeting other resource management objectives in Huron-Manistee National Forests' Land and Resource Management Plan (USDA Forest Service, 2006).

In a study of red pine plantations on the Manistee National Forest in Michigan, found that "red pine plantations, even after thinning, most likely are too structurally complex and have low insect abundance, making them a largely unsuitable habitat for bats." However, Lacki et al. 2009 reported that although NLEBs in Kentucky roosted preferentially in hardwoods, they foraged in or near pine-dominated stands more often than hardwood-dominated stands. Tibbels and Kurta (2003) believe that the lower vegetative clutter observed in pine stands improved foraging. Additionally, they suggested that coniferous habitats are likely to provide poor habitat for many species of bats. In their study, they found that the majority of bat activity was in openings within red pine plantations. Given the availability of deciduous trees in the Action Area that more commonly provide the structural features used by roosting NLEB, in particular maternity colonies, the likelihood of this species roosting in coniferous stands in the Action Area is relatively low.

A majority of NLEB roosts reported are deciduous (e.g., Mumford and Cope 1964, Sasse Thesis 1995, Foster and Kurta 1999, Lacki and Schwierjohann 2001, Schultes Thesis 2002, Broders and Forbes 2004, Jackson Thesis 2004, Carter and Feldhamer 2005, Ford et al. 2006, Bales Thesis 2007, Winhold Thesis 2007, Garroway and Broders 2008, Kurta 2008, Dickinson et al. 2009, Johnson et al. 2009, Lacki et al. 2009, Krynak Thesis 2010, Timpone et al. 2010, Silvis et al. 2012, Sinander 2012, Bohrman and Fecske 2013, Brown 2013, Lereculeur Thesis 2013, Badin

Thesis 2014). Broders and Forbes (2004) reported that female NLEB roosts in New Brunswick were 24 times more likely to be shade-tolerant, deciduous trees than conifers. In Newfoundland, even though approximately 83% of forests are dominated by coniferous species, female NLEB were tracked to nearly the same number of deciduous as coniferous roosts (Park and Broders 2012). In contrast, several studies reporting male NLEB roosts documented a preference for conifers (Broders and Forbes 2004, Perry and Thill 2007, Jung et al. 2004). These data suggest that hardwood trees most often provide the structural and microclimate conditions preferred by maternity colonies and groups of females, which have more specific roosting needs than solitary males (Perry and Thill 2007), although softwood snags may occasionally offer more suitable roosting habitat for both sexes than hardwoods (e.g., Perry and Thill 2008, Cryan et al. 2001).

Of the few NLEB telemetry studies in which conifers represented a large proportion of roosts, most were reported as snags (Cryan et al. 2001, Jung et al. 2004, Perry and Thill 2007, Park and Broders 2012, Yates et al. 2012) with bark remaining.

### Direct and Indirect Effects

Even though the probability is very small, northern long-eared bats could occur in coniferous stands outside the hibernation period. Therefore, a remote possibility exists that felling trees in coniferous stands by timber harvest, non-commercial cutting and timber stand improvement may have a direct effect on individual NLEBs. If NLEBs are present, felling trees may affect individual northern long-eared bats because of the possibility of a tree containing roosting bats. Although bats may leave the roost tree prior to it being felled due to the noise, vibration and disturbance from chainsaws or other equipment, some bats may remain in the tree and may be injured or killed when the tree strikes the ground or is mechanically processed. If bats are present in trees adjacent to the tree being felled, these bats may be disturbed by the activity, or they may be injured or killed if the roost tree is struck by the tree being felled. The design criteria for retention of snags and den trees offer additional protection because many potential roost trees would be protected from cutting.

Potential adverse effects are reduced during the spring staging and fall swarming periods. During spring staging, most bats would be expected to be staging near their hibernaculum or migrating to their summer range and during swarming, most NLEBs would be expected to be migrating to or swarming near their hibernaculum.

Felling a roost tree any time of year may have an indirect effect on NLEB due to the local loss of roosting habitat. If a roost tree is felled any time of year, it would no longer be available and cause the bats that were occupying it to find an alternate roost tree. Depending on the location of the tree, the social structure of the NLEBs may also change, however those effects are likely to be insignificant due to the small number of hazard trees removed in relation to the total number of roost trees that would remain available in the immediate project area. Silvis et. al. (2014) found that colony social structure is robust to fragmentation caused by random loss of small numbers of roosts.

In the short term, coniferous stands that are clearcut or have other types of regeneration treatments could have a minor indirect effect on NLEBs because of changes in forest structure. These stands would transition from poorly suited NLEB habitat to unsuitable habitat. In the long term, the coniferous stands that are clearcut would be regenerated and would mature in approximately 60 years. These stands would transition back from unsuitable habitat to poorly

suited NLEB habitat and could offer some foraging or roosting habitat for the NLEB. Although retained snags would not last 60 years, retained live den trees could provide habitat over the long term.

Some areas of hardwood timber harvest used to create openings, barrens, fuelbreaks, roads or other permanent openings would not be reforested. These actions could result in a minor loss of roosting and foraging habitat over the long term. The impact depends on the size and density of the trees removed, and size and shape of the permanent openings created. Areas where the trees are large (> 3" dbh) and not densely stocked could be roosting and foraging habitat for NLEBs; hardwood timber harvest in these areas may result in habitat loss. Harvest that creates large or wide openings could result in a loss of foraging habitat for NLEBs, while harvest that creates small or narrow openings could provide foraging habitat.

In the short term, thinning coniferous stands could improve NLEB habitat by making the stands less dense, improving forest structure for foraging. Retained snags and den trees could provide roosting habitat. In the long term, thinning coniferous stand would promote larger trees and an increase in vegetative diversity. This could have beneficial effects on northern long-eared bat habitat because the stand structure would be more conducive to NLEB foraging and the increase in vegetative diversity may improve insect diversity and abundance. Retained snag would not likely provide habitat in the long term because they would likely fall within 10 years of harvest. Live den trees could provide habitat in the long term.

#### Determination

Timber harvest, non-commercial cutting, and timber stand improvement activities in coniferous forest with no design criteria are likely to adversely affect the northern long-eared bat due to killing or injuring bats roosting in trees while being felled. Actions that are able to incorporate the design criteria are not likely to adversely affect the NLEB because activities would occur outside the non-volant period.

Actions Likely To Adversely Affect the NLEB (CONCUT-LAA) (No design criteria)  
Approximately 16,351 acres are planned for treatment on the Huron-Manistee National Forests.

Actions Not Likely to Adversely Affect the NLEB (CONCUT-NLAA)  
Approximately 5,465 acres are planned for treatment on the Huron-Manistee National Forests.

#### **Conifer – Low/Moderate Intensity Prescribed Burning**

##### Description of Action

The action that will be analyzed in this section include all low to moderate intensity prescribed burning that will occur in coniferous forest types. These actions are described in more detail in Appendix A. Approximately 34,333 acres of coniferous forests are planned for low to moderate intensity prescribed burning on the Huron-Manistee National Forests.

Low to moderate intensity prescribed burning includes all prescribed burning activities conducted on National Forest System lands, where the flame lengths are generally 2 to 4 feet, and no greater than 6 feet. Low to moderate intensity prescribed burns are typically intended to consume ground level litter and vegetation, and usually have little to no impact on overstory

trees. These burns often occur in red pine plantations with the objective of reducing fuel loading and improving habitat for wildlife.

To minimize effects to NLEB, the HMNF has developed the following design criteria to be incorporated into projects as feasible and prudent:

- Conduct burning outside of the non-volant period.

### Environmental Baseline

Low to moderate intensity burning projects in coniferous forest occurs on National Forest System (NFS) lands with the objective of reducing fire risks, enhancing wildlife habitat, and meeting other objectives in Huron-Manistee National Forests' Land and Resource Management Plan (USDA Forest Service, 2006).

In a study of red pine plantations on the Manistee National Forest in Michigan, Tibbels and Kurta (2003) found that "red pine plantations, even after thinning, most likely are too structurally complex and have low insect abundance, making them a largely unsuitable habitat for bats." Additionally, they suggested that coniferous habitats are likely to provide poor habitat for many species of bats. In their study, they found that the majority of bat activity was in openings within red pine plantations. Given the availability of deciduous trees in the Action Area that more commonly provide the structural features used by roosting NLEB, in particular maternity colonies, the likelihood of this species roosting in coniferous stands in the Action Area is relatively low.

The literature suggests that coniferous trees (especially live, healthy ones) are rarely used as roosts by female NLEBs, with solitary male NLEB using them a greater extent (Broders and Forbes 2004, Jung et al. 2004, Henderson et al. 2008, Lausen 2009). Lacki et al. 2009 reported that although NLEB in Kentucky roosted preferentially in hardwoods, they foraged in or near pine-dominated stands more often than hardwood-dominated stands and in burned habitats more than unburned habitats. They argued that the lower sub-canopy clutter observed in both pine stands and burned habitats were preferred for foraging.

A summary of NLEB roost trees (USFWS unpublished) shows a range of roost heights from 5 to 16 meters, well above the height of flames of a low to moderate intensity prescribed burn.

NLEB use of immature and mature jack pine is likely limited due to the high stem density and lack of flight corridors. Sheets et al. 2013 noted, forest stands that are "solid walls" of vegetation provide little usable habitat for the northern myotis. This is especially true for stands that have been planted for Kirtland's warbler breeding habitat (Philip Huber, prof. opinion).

### Direct and Indirect Effects

Even though the probability is very small due to coniferous forest being poor habitat for northern long-eared bats, NLEBs could potentially occur in coniferous stands outside the hibernation period. A remote possibility exists that low to moderate intensity prescribed burning in coniferous stands during this period may have a direct effect on individual NLEBs.

If NLEBs are present, burning may affect individual northern long-eared bats because of the possibility of a tree within the burn area containing roosting bats. During the non-volant period, pups may not be able to leave a roost tree if heat and smoke from a burn are not tolerable. These individuals may be injured or killed. The risk to NLEBs is reduced substantially by design criterion that does not permit burning when pups are non-volant. Low to moderate intensity burning would only occur when all NLEBs are able to leave their roost trees if heat and smoke from a burn are not tolerable. According to Dickinson, et al. 2009, radio-tracked bats (NLEB) were observed leaving their respective roosts well before harm from heat or smoke affected them. Most NLEBs utilized the prescribed burn as a foraging opportunity; gleaning insects forced up and out of the burn area from the heat and smoke plume. Furthermore, most bats in the study were found to utilize live oaks for roosting, versus dead snags that could catch fire and burn during the prescribed burn process.

To meet the low to moderate intensity objectives within a prescribed burn prescription, burn plans only allow burning when weather and vegetation conditions are favorable. Conservation measures from the NLEB Interim Conference and Planning Guidance (D-5) states “direct effects to NLEB are minimized when prescribed burns are of low/moderate intensity during the summer maternity season” (USFWS 2014).

If a roost tree is rendered unusable by burning, it could cause a local loss of roosting habitat. The roost tree would no longer be available to NLEBs and cause the bats that were occupying it to find an alternate roost tree. Depending on the location of the tree and quantity of trees rendered unusable, the social structure of the NLEBs may also change. However those effects are likely to be insignificant due to the small number of trees affected in relation to the total number of roost trees that would remain available in the immediate project area. Silvis et. al. (2014) found that colony social structure is robust to fragmentation caused by random loss of small numbers of roosts.

In the long term, burning in coniferous stands with low to moderate intensity fire may benefit the northern long-eared bat by making the stands less dense and improving stand structure for foraging. Burning may thin portions of coniferous stands, promoting larger trees, reducing stem density, and increasing solar exposure for potential roost trees. Stand structure may be more conducive to NLEB foraging because of an expected increase in vegetative diversity that may improve insect diversity and abundance. Some trees may be killed or damaged by fire; the exfoliating bark, crevices, cavity, or cracks in the damaged or dead trees could provide new roosting habitat. Of the few NLEB telemetry studies in which conifers represented a large proportion of roosts, most were reported as snags (Cryan et al. 2001, Jung et al. 2004, Perry and Thill 2007, Park and Broders 2012, Yates et al. 2012). Therefore, increasing the number of dead or dying trees in a coniferous stand is likely to enhance habitat for NLEBs.

### Determination

Low to moderate intensity prescribed burning projects in coniferous forest without design criteria are likely to adversely affect the northern long-eared bat because of the possibility roosting bats may be injured or killed during prescribed burn activities. Actions that are able to incorporate the design criteria are not likely to adversely affect the NLEB because 1) coniferous stands are poor habitat for NLEBs, and NLEBs are not likely to be present, 2) burning would not be conducted when the pups are non-volant, and 3) if NLEBs were present, they are likely to leave their roosts well before harm from heat or smoke affected them.

Actions Likely To Adversely Affect the NLEB (CONLMB-LAA) (No design criteria)  
Approximately 24,969 acres are planned for treatment on the Huron-Manistee National Forests.

Actions Not Likely to Adversely Affect the NLEB (CONLMB-NLAA)  
Approximately 9,364 acres are planned for treatment on the Huron-Manistee National Forests.

### **Conifer – High Intensity Prescribed Burning**

#### Description of Action

The actions that will be analyzed in this section include all high intensity prescribed burning that will occur in coniferous forest types. These actions are described in more detail in Appendix A. An estimated 1,241 acres of coniferous forests are planned for high intensity prescribed burning on the Huron-Manistee National Forests.

High intensity prescribed burning includes all prescribed burning activities conducted on National Forest System lands, where the flame lengths are generally greater than 6 feet. High intensity prescribed burns are typically intended to kill overstory trees, as well as consume ground level litter and understory vegetation. These burns often occur in immature jack pine stands with the objective of regenerating the stands (usually for Kirtland's warbler breeding habitat), reducing fuel loading and improving habitat for wildlife.

#### Environmental Baseline

High intensity burning projects in coniferous forest occur on National Forest System lands with the objective of creating breeding habitat for the federally endangered Kirtland's warbler, enhancing habitat for other wildlife species, reducing fire risks, and meeting other objectives in Huron-Manistee National Forests' Land and Resource Management Plan (USDA Forest Service, 2006).

In a study of red pine plantations on the Manistee National Forest in Michigan, Tibbles and Kurta (2003) found that "red pine plantations, even after thinning, most likely are too structurally complex and have low insect abundance, making them a largely unsuitable habitat for bats." Additionally, they suggested that coniferous habitats are likely to provide poor habitat for many species of bats. In their study, they found that the majority of bat activity was in openings within red pine plantations. Since the northern long-eared bat is a forest dwelling bat, this information suggests that the likelihood of this species being present in coniferous habitats in Michigan is low.

The literature suggests that coniferous trees (especially live, healthy ones) are rarely used as roosts by female NLEBs, with solitary male NLEB using them a greater extent (Broders and Forbes 2004, Jung et al. 2004, Henderson et al. 2008, Lausen 2009). Lacki et al. 2009 reported that although NLEB in Kentucky roosted preferentially in hardwoods, they foraged in or near pine-dominated stands more often than hardwood-dominated stands and in burned habitats more than unburned habitats. They argued that the lower sub-canopy clutter observed in both pine stands and burned habitats were preferred for foraging.

NLEB use of immature and mature jack pine is likely limited due to the high stem density and lack of flight corridors. This is especially true for stands that have been planted for Kirtland's warbler breeding habitat (Philip Huber, prof. opinion).

## Direct and Indirect Effects

Even though the probability is very small, northern long-eared bats could potentially occur in coniferous stands during the summer occupancy period. A possibility exists that high intensity prescribed burning in coniferous stands during these periods may have a direct effect on individual NLEBs.

To meet the high intensity objectives within the prescription, burn plans only allow burning when weather and vegetation conditions are favorable. Generally, high intensity burns are conducted in the spring when humidity is low and vegetation is cured.

If in the unlikely event NLEBs are present during the summer occupancy period, high intensity burning may affect individual northern long-eared bats because of the possibility of a tree within the burn area containing roosting bats. High intensity burning could occur when NLEBs may not be able to leave their roost trees if heat and smoke from a burn are not tolerable. Some NLEBs may not be able to escape quickly enough due to rapidly advancing fire. During the non-volant period, pups may not be able to leave a roost tree if heat and smoke from a burn are not tolerable. Any of these individuals may be injured or killed. However, the probability of this occurring is low because: 1) when deciduous trees are available, coniferous habitats are less commonly used by NLEB and the bat is less likely to be present, and 2) high intensity burning typically occurs in dense stands of immature jack pine less than 40 years old. The structure of these stands is not likely to provide habitat for NLEBs, and NLEBs are not likely to be present.

If a roost tree is rendered unusable by high intensity burning, it could cause a local loss of roosting habitat. The roost tree would no longer be available to NLEBs and cause the bats that were occupying it to find an alternate roost tree. Depending on the location of the tree and quantity of trees rendered unusable, the social structure of the NLEBs may also change. However those effects are likely to be insignificant due to the small number of trees affected in relation to the total number of roost trees that would remain available in the immediate project area. Silvis et. al. (2014) found that colony social structure is robust to fragmentation caused by random loss of small numbers of roosts.

In the short term, high intensity prescribed burning in coniferous stands could have a minor indirect effect on NLEBs because of changes in forest structure. These stands could potentially transition from poor NLEB habitat to better habitat. Buchalski et al. 2013 examined the effects of wildfire severity on bat activity, including Myotis, in the Sierra Nevada region of California. One year after fire, acoustic surveys were conducted in unburned, moderate, and high severity burned habitats. Bat activity in burned areas was either equivalent or higher than in unburned stands for all six phonic groups measured, and some Myotis species showed highest activity in stands of high-severity burn. The authors concluded that forest bats are resilient to fire in mixed-conifer forests of California, and that some species are preferentially selecting burned areas for foraging, perhaps facilitated by reduced clutter and increased post-fire availability of prey and roosts.

In the long term, burning in coniferous stands with high intensity fire will not benefit the northern long-eared bat because the mature trees in the stand are killed and the stand is regenerated. While mature coniferous stands provide relatively poor habitat for NLEBs, regenerating coniferous stand provide no habitat. However, coniferous stands that are burned with high intensity fire would likely regenerate and would mature in approximately 60 years. These stands would transition back from unsuitable habitat to poorly suited NLEB habitat, and could offer some foraging or roosting habitat for the NLEB.

## Determination

High intensity burning projects in coniferous forest without design criteria are likely to adversely affect the northern long-eared bat because of the possibility roosting bats may be injured or killed during prescribed burn activities.

Actions Likely To Adversely Affect the NLEB (CONHIB-LAA) (No design criteria)  
Approximately 1,241 acres are planned for treatment on the Huron-Manistee National Forests.

## **Openings (I.E. Barrens, Savannahs) and Fuel Breaks Where Trees Greater Than or Equal to 3" Dbh and In Areas with Trees Less Than 3"Dbh Will Be Mowed, Felled or Burned**

### Description of Action

The actions analyzed in this section include implementing prescribed fire operations and using mechanical and hand tools to burn, mow and fell vegetation in openings. Openings will be maintained to provide a diverse array of vegetative cover types from grass-herbaceous to shrub-brush land to barrens. A variety of methods could be used to stimulate native vegetation growth, release nutrients to the soil, and maintain areas in the desired conditions. The openings are divided into those with trees greater than or equal to 3" diameter breast high (dbh) and those with trees less than 3" dbh. The actions are described in Appendix A. An estimated 16,593 acres of openings are planned for maintenance activities on the Huron-Manistee National Forests.

Pine barren, savanna, openings and upland openland are interchangeable terms used to describe complexes characterized by herbaceous and shrub cover, with scattered live and dead trees. Maintenance is directed towards fuels management and restoration of habitat. Since the areas are non-forested, very little large material or coarse woody debris is present. Large wood that is present will be left on site to decompose into the soil.

Management techniques will include activities such as:

- Prescribed fire
- Mechanical maintenance (brush hog, roller-chop, disc, etc.)
- Hand tool use, such as axe, brush-saw and chainsaw or axe
- Site preparation and planting of native grasses, forbs and seedlings

A small tractor or other vehicle with rubber tires might be used to pull mechanical implements, such as a brush mower, seed drill, or seed harvester. Periodically, a larger machine might be used to operate a rotating drum cutter, or plow. Project areas will be accessed from the existing transportation system in the area. Therefore, no new road construction or reconstruction will occur.

To minimize effects to NLEB, the HMNF has developed the following design criteria to be incorporated into projects as feasible and prudent:

- Conduct mechanical maintenance outside the non-volant period, reserving snags and den trees according to Forest Plan guidelines where possible. Retain trees with features beneficial to the NLEB.
- Conduct burns outside of the non-volant period. Retain burning snags by extinguishing the fire, rather than by felling.

### Environmental Baseline

Maintenance occurs on Michigan National Forests with the objective of maintaining openings that will provide wildlife habitat and function as fuel breaks. Since fire frequency and extent have been reduced over time, active management is needed to restore fire-ecosystem components and maintain species viability. Openings provide important breeding and foraging habitat for many animal species, including the Kirtland's warbler, Karner blue butterfly, sharp-tailed grouse, sandhill crane, upland sandpiper, eastern bluebird, black-backed woodpecker, eastern wild turkey, and others. Openings could constitute suitable habitat for NLEB. Individual trees, equal to and greater than 3" dbh, may be considered habitat when they exhibit characteristics of roost trees and are within 1000 feet of forested or wooded habitat (FWS 2014, Interim NLEB Guidance). Bats have been documented to follow linear features on the landscape, such as an edge between forest and openings. The features of this interface may increase commuting and foraging opportunities, and afford greater protection from predators than crossing an open area (Erickson and West 2003).

### Direct and Indirect Effects

In openings and fuel breaks, consisting of shrubs and trees less than 3" dbh and herbaceous cover, there would be minimal direct and indirect effects, since these areas are not considered to be roosting, maternity or winter habitat. However, they could function as foraging habitat, especially areas adjacent to forest boundaries. Mechanical maintenance, such as use of a mower or brush hog would have transient effects from noise and movements that may disturb bats roosting in nearby wooded edge or briefly affect insect availability. However, these effects are expected to be minimal and very short-term in duration to the point of not being measurable. Likewise for prescribed burning in areas devoid of snags and live trees greater than or equal to 3" dbh. Smoke, radiant heat and convective heat might briefly disturb bats in adjacent wooded habitat and temporarily decrease insect abundance and alter foraging opportunities. However, the effects would be limited in area and duration.

In openings where trees greater than or equal to 3" dbh are present, conducting mechanical maintenance and burning outside of the non-volant period would limit impacts, since all bats would likely vacate roosting areas before individuals might be injured or killed from smoke, heat or mechanized operations. By reserving snags and den trees according to Forest Plan guidelines, and protecting trees with features beneficial to the NLEB, habitat would be retained in the area for future roosting and maternity use. Retaining snags that catch fire, by extinguishing the flames, rather than felling, would preserve the location for roosting and maternity purposes. These actions would reduce the duration of impacts to the short time period of the burn. Any risk of injury or mortality to individual NLEBs is expected to be very low and discountable. Not implementing design criteria where trees and snags greater than or equal to 3" are present would increase both the risk of injury and mortality to individuals, especially non-volant bats in the

immediate project area. Bats without flight capabilities could be injured or killed if maternity trees were burned, inundated with smoke or struck with heavy equipment. Roosting bats could also be affected if suitable trees are rendered unusable by burning or felled by mechanical equipment. The roost trees would no longer be available to NLEBs. Consequently, individual bats would be displaced and forced to find alternate roost trees. However, the magnitude of risks for all of the effects would be small in scale in any given year relative to the total habitat available for NLEB as foraging, roosting and maternity habitat.

Overall, adverse impacts caused by implementing mechanical treatments and prescribed burning would be small in scale and temporary. The beneficial impacts from maintaining openings across the forest system lands could be long-term. It is expected that maintaining openings will augment insect numbers and insect diversity which could lead to increases in NLEB fitness and greater productivity.

### Determination

Implementing mechanical maintenance and burning where trees or snags greater than or equal to 3" dbh are present, incorporating no temporal design criteria, is likely to adversely affect the NLEB because of potential adverse impacts to individuals due to injury and death from felling trees, and heat and fire from burning vegetation. Implementing mechanical maintenance and burning where trees greater than or equal to 3" are present is not likely to adversely affect the NLEB if working outside of the non-volant period, extinguishing rather than felling snags, reserving snags and den trees according to Forest Plan guidelines, and retaining trees with features beneficial to the species. This is because the risk of injury or mortality to individual NLEBs is expected to be very low and discountable.

Implementing mechanical maintenance and burning where trees and snags less than 3" dbh are present, using no temporal design criteria, is not likely to adversely affect the NLEB. This is because NLEBs are not likely to be present in the described areas.

Actions Likely to Adversely Affect the NLEB (OPNMM-LAA, OPNBRN-LAA) (No design criteria)

Approximately 6,047 acres are planned for treatment on the Huron-Manistee National Forests.

Actions Not Likely to Adversely Affect the NLEB (OPNMM-NLAA, OPNBRN-NLAA, OPN<3-NLAA, OPNB<3-NLAA)

Approximately 10,546 acres are planned for treatment on the Huron-Manistee National Forests.

- Openings, Barrens, Savannahs and Fuelbreaks where trees greater than or equal to 3" dbh will be mowed, felled or burned (5,243 acres).
- Openings, Barrens, Savannahs and Fuelbreaks where trees less than 3" dbh will be mowed, felled or burned (5,303 acres).

## **Site Preparation (including mechanical tree planting, roller chopping, chaining, trenching, scalping, raking, and other activities)**

### Description of Action

The actions that will be analyzed in this section include all site preparation activities including, but not limited to mechanical tree planting, roller chopping, chaining, trenching, scalping and raking. These actions are described in more detail in Appendix A. An estimated 1,203 acres of site preparation activities are planned to be implemented on the Huron-Manistee National Forests.

Site preparation is the act of preparing an area for artificial or natural regeneration of trees. Site preparation can also be used to reduce competition from undesirable vegetation to increase the survival and growth rate of the desired trees, treat slash and logging debris if the site has been harvested, and to prepare or modify the soil.

A variety of site preparation methods are employed on the Huron-Manistee National Forests. Mechanical tree planting is typically accomplished with a bulldozer pulling a planting machine. Roller chopping is usually accomplished with a bulldozer or skidder pulling a roller chopper, a large drum with blades to chop up slash and other remaining vegetation. Chaining is typically accomplished by pulling large anchor chains behind a piece of equipment to scarify the ground, and is often accomplished with roller chopping. Trenching creates furrows in the ground to expose mineral soil for the planting of trees. Trenching is usually accomplished with a skidder or bulldozer pulling a trencher. Scalping creates patches of bare ground, exposing mineral soil for tree planting. Scalping is usually accomplished with a skidder or bulldozer pulling a Bracke scarifier or a moulder. Raking usually is the piling of brush with a rake mounted on the front of a bulldozer. Sometimes a rake is used to scarify the soil, or remove roots and stumps.

### Environmental Baseline

Site preparation activities are ongoing actions on National Forest System lands, typically with the objective of regenerating harvested sites by planting trees, or preparing harvested sites for natural regeneration or planting. Most of these actions (~90%) occur after coniferous stands have been harvested, but may occasionally occur in hardwood stands. Most often, these stands have been clearcut, but have live reserve trees or areas, and standing dead snags.

Since the northern long-eared bat is a forest dwelling bat, the likelihood of individuals being present in these treatment areas is extremely low because the areas are typically large openings (>16 ha; 40 ac), with scattered live and dead trees. In addition, work specifications typically state that live reserve trees/areas and standing dead trees are to be avoided. However, the possibility exists that a few trees within a site preparation area may be knocked down by site preparation equipment. These trees are almost always dead conifer snags. No live hardwood trees would likely be impacted by these activities because the equipment would be damaged if these trees were struck.

In addition, Tibbels and Kurta (2003) suggested that coniferous habitats are likely to provide poor habitat for many species of bats, and therefore the likelihood of individuals being present in these treatment areas in coniferous forest types is further reduced.

A majority of NLEB roosts reported are deciduous (e.g., Mumford and Cope 1964, Sasse Thesis 1995, Foster and Kurta 1999, Lacki and Schwierjohann 2001, Schultes Thesis 2002, Broders and Forbes 2004, Jackson Thesis 2004, Carter and Feldhamer 2005, Ford et al. 2006, Bales Thesis 2007, Winhold Thesis 2007, Garroway and Broders 2008, Kurta 2008, Dickinson et al. 2009, Johnson et al. 2009, Lacki et al. 2009, Krynak Thesis 2010, Timpone et al. 2010, Silvis et al. 2012, Sinander 2012, Bohrman and Fecske 2013, Brown 2013, Lereculeur Thesis 2013, Badin Thesis 2014). Broders and Forbes (2004) reported that female NLEB roosts in New Brunswick were 24 times more likely to be shade-tolerant, deciduous trees than conifers. In Newfoundland, even though approximately 83% of forests are dominated by coniferous species, female NLEB were tracked to nearly the same number of deciduous as coniferous roosts (Park and Broders 2012). In contrast, several studies reporting male NLEB roosts documented a preference for conifers (Broders and Forbes 2004, Perry and Thill 2007, Jung et al. 2004). These data suggest that hardwood trees most often provide the structural and microclimate conditions preferred by maternity colonies and groups of females, which have more specific roosting needs than solitary males (Perry and Thill 2007), although softwood snags may occasionally offer more suitable roosting habitat for both sexes than hardwoods (e.g., Perry and Thill 2008, Cryan et al. 2001).

### Direct and Indirect Effects

Northern long-eared bats could potentially occur in site preparation areas during the spring staging, summer occupancy, and fall swarming periods. However, the probability of northern long-eared bats being impacted by site preparation activities is extremely small. NLEBs would not likely be roosting in areas where site preparation activities occur because:

- Site preparation areas are usually open and not forested and do not typically provide NLEB roosting habitat,
- Live hardwood trees within the openings that could be potential roosts for NLEBs are not likely to be impacted by the activities because the equipment would be damaged if these trees were struck, and,
- Work specifications usually state that dead coniferous trees that could serve as NLEB roost trees are to be avoided.

Nevertheless, a small probability exists that NLEBs could occur in live or dead trees with holes, cracks or loose bark within or near areas of high canopy closure. Therefore, a remote possibility exists that site preparation activities during these periods could have a direct effect on individual NLEBs. If NLEBs are present in a site preparation area, a remote possibility exists that a tree containing roosting bats may be knocked down by equipment. Although bats may leave the roost tree prior to it being knocked down due to the noise, vibration and disturbance from chainsaws or other equipment, some bats may remain in the tree and may be injured or killed when the tree strikes the ground or is mechanically processed. If bats are present in trees adjacent to the tree being felled, these bats may be disturbed by the activity, or they may be injured or killed if the roost tree is struck by the tree being felled. However, the avoidance of snags and other live trees offers a substantial degree of protection for NLEBs because almost all potential roost trees would be protected.

If a roost tree is knocked down any time of year, it may have an indirect effect on NLEB due to the local loss of roosting habitat. If a roost tree is felled any time of year, it would no longer be available and cause the bats that were occupying it to find an alternate roost tree. Depending on the location of the tree, the social structure of the NLEBs may also change, however those effects are likely to be insignificant due to the small number of hazard trees removed in relation to the total number of roost trees that would remain available in the immediate project area. Silvis et al. (2014) found that colony social structure is robust to fragmentation caused by random loss of small numbers of roosts.

In the short term, stands that have had site preparation activities could have a minor indirect effect on NLEBs because of changes in forest structure. If a stand is habitat for NLEBs, some site preparation activities may improve foraging conditions. However, it is likely that these stands would transition from suited NLEB habitat to unsuitable habitat because of the growth of young trees over time. In the long term, stands with site preparation treatments would likely regenerate and mature in 60 to 100 years. These stands would transition back from unsuitable habitat to poorly suited NLEB habitat and could offer some foraging or roosting habitat for the NLEB. Although retained snag would not last 60 years, retained live trees could provide roosting habitat over the long term. However, retaining snags would gradually create tree fall gaps and woody debris, enhancing vertical complexity and offering increased solar radiation to certain standing trees. These are features thought to be important for forest-dwelling bats (Badin Thesis 2004, Kalcounis et al. 1999, López-González et al. 2014).

### Determination

Site preparations activities are not likely to adversely affect the northern long-eared bat. The effects would be insignificant and discountable. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur. The effects would be insignificant and discountable because: 1) site preparation areas are usually open and not forested and do not typically provide NLEB roosting habitat, 2) live hardwood trees within the openings that could be potential roosts for NLEBs are not likely to be impacted by the activities because the equipment would be damaged if these trees were struck, and 3) work specifications usually state that dead coniferous trees that could serve as NLEB roost trees are to be avoided.

### Actions Not Likely to Adversely Affect the NLEB (SPREP-NLAA)

Approximately 1,203 acres are planned for treatment on the Huron-Manistee National Forests.

### **Firewood Cutting**

#### Description of Action

Firewood cutting is an ongoing activity on the HMNF that typically results in the cutting of individual standing or down dead trees scattered across a very large landscape. The HMNF intends to issue permits with the objective of supplying firewood to the public, as stated in Huron-Manistee National Forest's Land and Resource Management Plan (USFS 2006).

The objectives are to implement a Forest Firewood Program which:

1. Will make available to the general public, now and in the future, a stable source of low cost firewood for home heating. Availability to the public means without regard to race, creed, color, national origin, or sex and without restriction regarding the wealth of the user, or the available supply on their own lands.
2. Will be consistent with other resource management and protection policies.
3. Will be applied uniformly across the Forest in a manner clearly understood by the public.
4. Will be coordinated with other public land management agencies in the State.

To minimize effects to NLEB, the HMNF has developed the following design criteria to be incorporated into the firewood program as feasible and prudent:

- With each permit, the HMNF would provide the permit holder with a handout to provide information on the NLEB and asks them to voluntarily take measures to help conserve the bat. Such measures would include asking the permit holder to refrain from felling standing dead trees during the non-volant period if possible.
- The handout would ask the permit holder to voluntarily create a noise/vibration disturbance, providing bats a modest amount of time to rise and exit the roost that before cutting standing dead trees. The permit holder would be asked to voluntarily report back on any bat activity observed.
- Forest Protection Officers or other Forest Service employees that encounter firewood cutters in the field will attempt to collect information on when, where, how much, and what kind of timber was gathered. This data may provide information for future discussions and help determine the impact of firewood cutting on NLEBs.

### Environmental Baseline

#### *Permits*

Firewood permits are issued starting April 1 each year, and are valid for one year. Permit holders are allowed to cut five standard cords (4 CCF [CCF=100 cubic feet]) per permit within areas open to firewood cutting. More than one permit can be purchased in a single season, for a maximum of five permits per year.

#### *Regulations*

On the Huron-Manistee National Forests, firewood cutting regulations are as follows:

- Cutting and gathering is allowed only on areas shown as open to cutting or gathering on the firewood maps. Firewood gatherers receive a map when they purchase a permit.
- No cutting or gathering of dead and/or down wood is permitted within 200 feet of any lake, pond, stream or river or within 200 feet of any recreation area.

- On the western half of the Manistee National Forest, cutting and gathering from standing dead trees is authorized only between September 1 and April 30 for protection of the endangered Indiana Bat.
- Live trees may not be cut.
- All dead and down trees may be gathered. (See first bullet for areas open to cutting and gathering.)
- Standing dead trees may be cut only if they are within 200 feet of a legal public road. (Roads are displayed on the firewood maps. Firewood maps are created using HMNF Motor Vehicle Use layer).
- No gathering or harvest of any dead trees identified by having paint marks at breast height and stump height or dead trees which have directional, trail, den tree, Animal Inn or land survey signs attached.

### *Area Open to Firewood Cutting*

From September 1 to April 30, the estimated area open for firewood cutting is approximately 116,299 acres, or 12% of the HMNF. From May 1 to August 31, no firewood cutting is permitted west of the Indiana Bat line on the Manistee National Forest (Figure 3), reducing the area open for firewood cutting to approximately 97,075 acres, or 10% of the HMNF (2014 data; Tracy Miller, USFS GIS Specialist, pers. comm.). No firewood cutting is permitted within the Tippy Management Zone, a five-mile radius around the Tippy Dam hibernaculum (Figure 3).

### *Permits and Volume of Wood Removed*

From 2012 to 2014, an average of 2,585 firewood permits were issued annually (Table ; Mike Stimak, Timber Program Manager, pers. comm.). Five cords (4 CCF [CCF=100 cubic feet]) of wood can be cut on each permit. Stimak estimates that 66% of trees collected are standing, and 33% of the trees are down. If the average diameter at breast height (DBH) is 13.7 inches, that would equate to 9.5 trees/cord; if the average DBH is 25.0 inches, that would equate to 1.3 trees/cord. Therefore, if an average of 10,369 ccf (12,961 cords) is sold (Table 2), approximately 123,130 trees were sold if the average DBH was 13.7 inches. If the average DBH was 25.0 inches, approximately 16,849 trees were sold. If 66 percent of the trees collected were standing, approximately 81,265 (13.7 DBH) and 11,120 (25.0 DBH) standing dead trees were sold. However, most people do not cut the full five cords of wood allowed by their permit because it is more wood than most people need in a year. Most of the firewood that is gathered is hardwood (oak, maple, ash) because of the higher BTU value (Stimak, pers. comm).

### Direct and Indirect Effects

During the Spring Staging, Summer Occupancy, and Swarming Periods, northern long-eared bats could occur in areas that are open for firewood cutting. However, Tippy Dam is the only known hibernaculum on the Huron-Manistee National Forests, and the five-mile zone around this hibernaculum is closed to firewood cutting. This is where NLEBs are most likely to occur

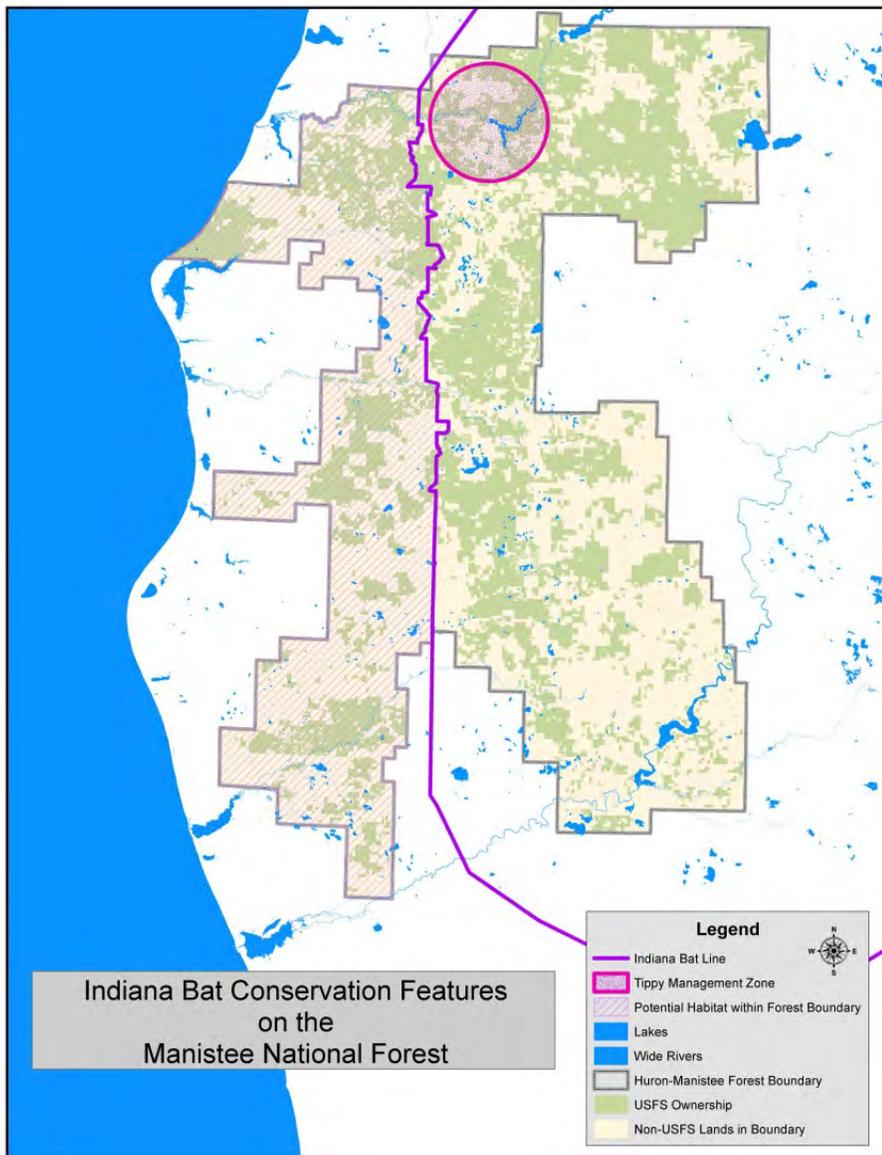


Figure 3: Indiana Bat Conservation Features on the Manistee National Forest

during the Spring Staging and Swarming periods. Therefore, the greatest risk to NLEBs is during the Summer Occupancy Period.

Permit holders could potentially fell standing dead trees that are roosts, injuring or killing roosting NLEBs. If a permit holder fells a tree that is a roost, the roosting bats may leave the tree prior to it being felled due to the noise, vibration and disturbance from chainsaws or other equipment. However, some bats may remain in the tree and may be injured or killed when the tree strikes the ground or is processed further. The potential for individuals to be injured or killed is even greater during the non-volant period (June 15 to August 1) because the non-volant pups would be unable to leave the roost tree. NLEBs present in trees adjacent to the tree being felled may be disturbed by the activity; however, these bats would not likely be injured or killed, unless an adjacent tree is struck by the tree being felled.

Table 2: Firewood permits and volume of wood removed from 2012 to 2014

District	Fiscal Year	# of Permits	Volume (CCF)	% of Total Permits
2012				
Baldwin		1,107	4,128	41%
Manistee		597	2,388	24%
Mio		385	1,540	16%
Huron Shores		466	1,864	19%
Sub-Total		2,465	9,920	100%
2013				
Baldwin		1,062	4,256	41%
Manistee		694	2,792	27%
Mio		406	1,624	16%
Huron Shores		451	1,804	17%
Sub-Total		2,613	10,476	100%
2014				
Baldwin		1,095	4,385	41%
Manistee		751	3,004	28%
Mio		394	1,576	15%
Huron Shores		436	1,747	16%
Sub-Total		2,676	10,712	100%
Avg # Permits/Year		2,585		
Avg CCF/Year			10,369	

The probability of NLEBs being directly impacted by firewood cutting is reduced by the following factors:

- 90% of the HMNF is not open to firewood cutting during the summer occupancy period. Approximately 97,075 acres or 10% of the HMNF is open to firewood cutting during the summer occupancy period. However, Mike Stimak (pers. comm.) estimates that less than 10% of the area open for firewood cutting actually has the standing dead or down hardwood available for cutting. In addition, not many people are willing to cut and transport firewood more than 100 feet to their vehicle on an open road. If most of the firewood is cut within the 100-foot zone, the actual acreage affected is less than 4,854 acres per year, or 0.5% of the HMNF ( $[97,075 \times 0.1] / 2 = 4,854$ ).
- Firewood cutting is not permitted during the summer occupancy period on west side of the Manistee National Forest (Indiana Bat Zone). (This restriction was put in place during the 2006 Forest Plan revision to protect the small number of Indiana bats that have been documented roosting in Tippy Dam at the northern edge of their range.)

- Standing dead trees may be cut only if they are within 200 feet of a legal public road. Standing dead trees beyond 200 feet are protected from felling. As mentioned previously, dead wood beyond 100 feet from a legal public road is unlikely to be cut.
- Standing dead trees targeted by firewood gatherers are less likely to be roost trees than dead trees outside of open firewood areas. Because of the high demand for firewood, standing dead trees within the 200-foot zone are usually cut quickly after they die, and are less likely to develop structural components (sloughing bark, cavities, etc.) that would attract northern long-eared bats.
- Permit holders would be asked to voluntarily refrain from actions that could cause harm to NLEBs.

From a habitat perspective, firewood cutting in hardwoods likely reduces the number of potential roost trees for NLEBs. However, the effects are judged to be minimal for the reasons stated above.

### Determination

Issuing firewood permits and permitting the cutting of firewood is likely to adversely affect the northern long-eared bat due to the potential for injury or death of individuals. Individual NLEBs may be injured or killed by the felling standing dead trees that are roosts.

#### Actions Likely To Adversely Affect the NLEB (FIREWD-LAA)

Impacts from firewood cutting are expected to occur on approximately 9,708 acres (4,854 acres per year) on the Huron-Manistee National Forests.

This opinion is for the 2015 and 2016 firewood permit periods (April 1 to March 31 each year). If new information about the effects of firewood cutting becomes available that indicates the NLEB or its habitat may be affected in a manner or extent not previously considered, the HMNF will reinitiate consultation.

### **Holiday Tree Harvest**

#### Description of Action

The actions analyzed in this section include implementing a holiday tree harvest program. A permit is required to participate and a fee is charged. The period for issuing permits is November and December. By permit conditions, live trees must be less than 20 feet tall, and consist of pine, balsam fir or spruce. Topping of trees larger than 20 feet is not allowed. No harvest is permitted in Wilderness areas. The actions are described in Appendix A. An estimated 30 holiday trees are harvest each year on the Huron-Manistee National Forests.

#### Environmental Baseline

Harvesting holiday or Christmas trees is an ongoing activity on National Forest System lands. The activity is intended to engage with the public in an outdoor recreation setting to provide an opportunity to harvest a tree at a nominal cost. The activity is usually very limited in area and

extent. The 15-year average harvest on the Huron-Manistee National Forests is 138 trees per year, with a high of 228 in 2001 low of 65 in 2008. Cumulatively, holiday tree harvest represents less than 0.5 acres per year (Mike Stimak, pers. comm.). Over 10 years, this would amount to approximately 5 acres.

The period for issuing permits is November and December. Therefore, the trees are being felled outside of the spring, summer and fall occupancy period for NLEB. By permit conditions, trees must be less than 20 feet tall, and limited to pine, balsam fir or spruce. Topping of trees larger than 20 feet is not allowed. NLEB roosts have been reported as average more than 20 feet in height with diameters, on average, greater than 12 inches dbh (Lacki et al. 2009). Thus, removing holiday trees is unlikely to impact suitable roosting habitat for NLEB. Across the species' range, NLEBs also show a general preference for dead/dying trees over live, healthy trees (e.g., Lacki et al. 2009), as well as a preference for hardwoods over conifers (e.g., Henderson and Broders 2008).

### Direct and Indirect Effects

Tree harvest would occur outside of the summer occupancy period of May 1 to September 1. It would also occur outside of the fall swarming period, which ends on November 1. Therefore, no NLEB injury or mortality is expected to occur from the activity. The trees that are felled could be larger than 3 inches in diameter. Therefore, they could be suitable for NLEB roosting. However, the trees are unlikely to be sufficient height (greater than 20 feet) and diameter (greater than 12 inches) observed as utilized roosting structure. Pine, spruce and fir are also unlikely roost trees for NLEB. Thus, removal of the trees would have a negligible impact on future NLEB habitat.

### Determination

Implementing a holiday tree harvest program is not likely to adversely affect the NLEB. This is because the activity will occur when the bats are not present in habitat. Trees that will be removed are very few in number, and are not recognized as the species or the height and diameter used as roosting habitat by NLEB.

Actions Not Likely To Adversely Affect the NLEB (HOLIDAYTREES-NLAA)  
Approximately 5 acres are planned for treatment on the Huron-Manistee National Forests.

### **Felling Hazard Trees**

#### Description of Action

Felling hazard trees is an ongoing activity within recreation sites and other areas on National Forest System lands to reduce risk to users and enhance public safety. Trees that pose a serious risk to forest users are felled to reduce the risk to users, particularly in high use areas like campgrounds, picnic areas, parking lots and boat launches. The trees typically have a structural defect that increases the probability that they may fall on a forest user, causing injury or death. Forest Service sawyers or contractors fell these trees to mitigate this hazard.

To minimize effects to NLEB, the HMNF has developed the following design criteria to be incorporated into projects as feasible and prudent:

- Fell trees outside the non-volant period when possible. For additional protection, fell trees outside of the summer occupancy period when possible

### Environmental Baseline

Hazard tree felling is usually limited to a small area like a trail, campground, picnic area or boat launch. Annually, hazard trees are felled on approximately 880 acres of the HMNF; 800 acres for trail maintenance, 64 acres for develop recreation sites, 16 acres for dispersed/developed sites (Kristen Thrall, pers. comm.). Over a period of approximately 10 years of implementation remaining in the Forest Plan, approximately 8805 acres would be treated. However, many of the acres would be repeatedly treated from year to year. A list of the hazard tree projects can be found in Appendix A.

### Direct and Indirect Effects

Felling hazard trees may have an adverse effect on NLEB. Hazard trees typically have defects that may provide roosting habitat for the species. When possible, the HMNF will attempt to fell hazard trees outside of the summer occupancy period to reduce the likelihood of impacts to the NLEB. If a hazard tree is a roost tree for NLEB, felling it outside the summer occupancy period would not result indirect effects on the bats because they would not likely be present. If it is not possible to fell hazard trees outside of the summer occupancy period, the HMNF will attempt to fell hazard trees outside of the non-volant period.

Occasionally, some trees may need to be felled during the non-volant or summer occupancy periods because the trees pose an imminent danger to the public. Felling hazard trees during this period may directly affect NLEBs because of the possibility of a hazard tree to contain roosting bats, especially if the tree is felled during the non-volant period. Although bats may leave the roost tree prior to it being felled due to the noise, vibration and disturbance from chainsaws or other equipment, some bats may remain in the tree and may be injured or killed when the tree strikes the ground. This risk is greatest for pups during the non-volant period. If bats are present in trees adjacent to the tree being felled, these bats may be disturbed by the activity, or they may be injured or killed if the roost tree is struck by the tree being felled.

Felling a roost tree may have an indirect effect on the NLEB due to the local loss of roosting habitat. If a roost tree is felled any time of year, it would no longer be available and cause the bats that were occupying it to find an alternate roost tree. Depending on the location of the tree, the social structure of the NLEBs may also change, however those effects are likely to be insignificant due to the small number of hazard trees removed in relation to the total number of roost trees that would remain available in the immediate project area. Silvis et. al. (2014) found that colony social structure is robust to fragmentation caused by random loss of small numbers of roosts.

Felling hazard trees causes a very small change in forest structure, and is therefore likely to have discountable effects on foraging habitat and prey abundance. The action may reduce the supply of locally available roost trees available in the short term. In the long term, the remaining trees will age and some of these trees will likely provide habitat for the NLEB.

## Determination

Felling hazard trees is likely to adversely affect the NLEB because they may be injured or killed if they are roosting in hazard trees while it is being felled or if their roost tree is struck by the tree being felled.

### Actions Likely To Adversely Affect the NLEB (HAZTREE-LAA)

Approximately 8,805 acres are planned for treatment on the Huron-Manistee National Forests.

## **Tree Pruning**

### Description of Action

Tree pruning is an ongoing activity on National Forest System lands that is intended to improve the quality of wood of the tree being pruned, to remove hazardous limbs, to improve aesthetics in developed areas (campgrounds, picnic areas, etc.), or to improve travel access on trails and roads. This activity is usually very limited in area and extent, but can occur any time of year. On average, approximately 250 acres of trees are pruned each year on the Huron-Manistee National Forests (Carol Young, pers. comm.). Over 10 years, this would amount to approximately 2,500 acres.

### Direct and Indirect Effects

Trees that are pruned to increase quality of the wood are usually conifers, immature, and have no defects that would provide habitat for northern long-eared bats. When this activity does occur, entire stands (ex. red pine plantation) are usually pruned. The branches that are pruned do not typically provide roosting habitat for northern long-eared bats because they are usually less than 20 feet from the ground. Among 9 NLEB telemetry studies reporting the height of individual NLEB roosts, 228 of 253 (90.12%) total roosts were  $\geq 20$  feet tall (Sasse 1995, Foster and Kurta 1999, Swier 2003, Scott 2007, Dickinson et al. 2009, Brown 2013, Lereculeur 2013, Bohrman and Fecske [Unpublished Data], George and Kurta 2014). Among 14 NLEB telemetry studies reporting the DBH of individual NLEB roosts, 333/375 (88.8%) were  $\geq 5$  in (Sasse 1995, Foster and Kurta 1999, Schultes 2002, Carter 2003/Carter and Feldhamer 2005, Perry and Thill 2007, Scott 2007, Kurta 2008, Dickinson et al. 2009, Krynak 2010, Lowe 2012, Bohrman and Fecske 2013/Unpublished Data, Brown 2013, George and Kurta 2014). Moreover, there is some evidence that tree size and colony size are correlated in tree-roosting bats (Gardner et al. 1991, Callahan et al. 1997, Britzke et al. 2003, Kitchell 2008, Whitaker and Sparks 2008, Olson 2011), suggesting that while individual bats may occupy relatively small trees, preserving larger potential roost trees should protect local maternity colonies.

Pruning may improve foraging habitat for NLEBs because it may provide access to stands not previously accessible due to high limb density.

Some defective limbs that are pruned may provide roosting habitat for the northern long-eared bat. These limbs may be pruned during the Summer Occupancy Period because they pose an imminent danger to the public. Pruning during this period may directly affect northern long-eared bats because of the possibility of a defective limb containing roosting bats. However, any bats present are likely to leave the limb prior to it being felled due to the noise, vibration and disturbance from chainsaws or other equipment. A slight possibility exists that some bats may

remain in the limb and may be injured or killed when the limb strikes the ground. This risk is greater for pups during the non-volant period. In the unlikely event that NLEBs are present, the likelihood of injury or death is extremely small because the person conducting the pruning would likely notice bat activity prior to the limb becoming detached and stop work.

Pruning that is conducted during the Summer Occupancy Period to improve aesthetics in developed areas or improve travel access is not likely to adversely affect NLEBs. These limbs are generally small diameter with no defect, and are not likely to provide crevices as roosting habitat for NLEBs.

If a limb containing a roost is pruned any time of year, it could possibly cause a local loss of roosting habitat. The limb would no longer provide roosting habitat for NLEBs and cause the bats that were occupying it to find an alternate roost tree. Depending on the location of the tree from which the limb was removed, the social structure of the NLEBs may also change, however those effects are likely to be insignificant due to the small number of trees affected in relation to the total number of roost trees that would remain available in the immediate project area. Silvis et. al. (2014) found that colony social structure is robust to fragmentation caused by random loss of small numbers of roosts.

Pruning could cause small changes in forest structure. Pruning to improve tree quality may improve NLEB foraging habitat by opening up a stand and increasing vegetative diversity. Improved vegetative diversity may also improve insect prey abundance.

### Determination

Pruning is not likely to adversely affect the northern long-eared bat. The effects would be insignificant and discountable because: 1) most pruning occurs in coniferous stands, 2) most trees that are pruned are immature with no defect, 3) most limbs that are pruned are not likely to provide NLEB roosting habitat because they are less than 20 feet above the ground, 4) a person conducting the pruning of a limb with defect would likely notice bat activity prior to the limb becoming detached and stop work, and 5) habitat changes would have little or no effect on NLEBs.

Actions Not Likely To Adversely Affect the NLEB (PRUNE-NLAA)

Approximately 2,500 acres are planned for treatment on the Huron-Manistee National Forests.

### **Roadside Brushing**

#### Description of Action

Delimiting, brushing, or felling of trees, snags, and shrubs on National Forest System lands is conducted annually to set-back encroaching woody vegetation. The removal of vegetation aids in the daylighting of roads, improves visibility for vehicle operators, increases public safety by reducing hazard trees and limbs, reduces vehicle damage by overgrown vegetation, and allows for easier road maintenance.

Equipment used typically consists of tractor powered mowers, with hydraulically controlled decks. The decks can be adjusted so that mowing can be above the ground, or tilted perpendicular then raised up and down to shear limbs or stems. Some site-specific cutting may also be done with chainsaws, shears, or line-fed mowers. Brushing/mowing occurs in road right-

of-ways (up to 15 feet off the road), and may occur annually at some locations, or periodically (every few years) at others, depending on maintenance needs, funding, and/or scheduling. The vast majority of vegetation treated is in the form of shrubs and trees less than 3 inches in diameter. This repeated treatment inherently limits the amount of trees reaching the suitable habitat size of 3 inches. An estimated 961 acres of roadway work occurs on the Huron-Manistee National Forests each year (pers. comm. Scott Peedle, HMNF Engineer), and over 10 years this would amount to approximately 9,610 acres. However, many of these acres are retreatments. Peedle stated that they occasionally have the need to cut trees larger than 3" DBH or larger, but only cut hazard trees that are posing safety threat. He estimates that approximately 100 trees per year equal to or larger than 3" DBH are cut annually on the HMNF.

To minimize effects to NLEB, the HMNF has developed the following design criteria to be incorporated into projects as feasible and prudent:

- Fell trees outside the non-volant period when possible. For additional protection, fell trees outside of the Summer Occupancy Period when possible.

### Environmental Baseline

Locations may occur along any roadway and in any forest type. Although large highways or interstates may deter roosting bats, pose barriers to movements and restrict home ranges, there is a lack of evidence that minor roads and trails are avoided by NLEB. On the HMNF, most forest roads are not considered large enough and/or contain enough traffic use to be considered a deterrent to the NLEB roosting. Numerous studies have reported high NLEB activity on or near minor roads (Krusic and Neefus 1996, Lacki and Schwierjohann 2001, Owen et al. 2003, Broders et al. 2006, Brooks 2009) suggesting they may be important foraging and commuting corridors. Roosting near forested roads may thus enhance accessibility to foraging areas. Perry et al. (2008) and O'Keefe (2009) found that NLEB roosts were closer to unpaved, forested roads than random.

### Direct and Indirect Effects

Most vegetation cut during brushing would be small diameter shrubs and young trees unsuitable for roosting, and there would be no direct loss of habitat associated with these kinds of woody materials. At some treatment sites, larger diameter (=> 3" DBH) trees, shrubs, or snags would be cut or de-limbed. These could be structurally suitable (e.g. loose or furrowed bark, broken limbs, snags) as roosting habitat.

Most of the roadside brushing would occur during the summer occupancy period due to a limited operating window because of favorable weather and generally dry conditions. If roost trees were to be encountered, some direct effects could occur. Use of equipment or activities by personnel may cause NLEB to displace away from noise and vibrations. Bats may leave a roost tree prior to it being felled or contacted because of noise, vibration and disturbance from saws or other equipment. However, some bats could remain in a tree and be injured or killed if the tree strikes the ground. If bats are present in trees adjacent to the tree felled, these bats may be disturbed by the activity, however, the bats are not likely to be injured or killed, unless the felled tree damages the roost site on the retained tree. Displacement would not be expected to result in mortality, but could elevate short-term stresses. However, these stresses should be short in duration as the

equipment and treatment progress down the roadway away from the area just treated. These risks may be slightly higher during spring emergence when fat reserves can be low or during summer occupancy when pups may be exposed. Trees felled during the non-volant period would have a higher potential for adverse effects than other periods because non-volant pups could be present and unable to avoid disturbances or physical harm. Any NLEB that becomes expelled from a roost site would face some unplanned exposure to climate, predators, or extra caloric expenditures. On the HMNF, suitable roosting is assumed to be abundant, therefore minimizing the amount of time and effort needed to relocate in most instances.

Felling a roost tree could cause a local loss of roosting habitat. If a roost tree is felled any time of year, it would no longer be available and cause the bats that were occupying it to find an alternate roost tree. Depending on the location of the maternity roosting colony, the social structure of the NLEBs may be affected. Silvis et al. (2014) used simulations to demonstrate that >20% roost removal was required to fragment social networks for maternity colonies in Kentucky. However, roadside brushing generally does not extend beyond 15 feet from the edge of roads, so the chance of removing >20% of roost trees is unlikely.

Foraging bat behavior would not be directly affected by roadside brushing because this type of cutting and mowing would occur when bats would be inactive. Indirectly, foraging spaces may be maintained which provides some foraging benefits. Potential changes to prey abundance and availability may or may not change per treatment site, depending on many variables such as; insect type or species present, drainage, and weather variables. These roadside vegetation areas are also routinely treated. As the vegetation grows and fills in along the roadside it is cut back and the cycle is repeated. So it is not often that trees grow to maturity along these road shoulders. These vegetation treatment actions are not expected to have any measurable indirect effect to NLEB

Overall, direct negative effects to NLEB by activities associated with roadside brushing are considered low. There are no long-term effects anticipated from these activities. However, there is a possibility of injury or mortality to NLEB if roost trees are removed during the non-volant period.

#### Determination

Roadside brushing along all maintenance level roads, within the period summer occupancy period without design criteria is an activity that could result in adverse effects to the NLEB. Effects to NLEB could include adverse impacts to individuals in the form of injury and death, or harassment and /or displacement due to social structure changes and roost tree removals.

Actions Likely to Adversely Affect the NLEB (RDBRUSH-LAA)

Approximately 9,610 acres are planned for treatment on the Huron-Manistee National Forests.

### **Road Closures and Decommissioning**

#### Description of Action

Several means or processes exist to make roads unusable including, restricting access and decommissioning/obliteration. Access restriction may allow for future use of roads, but targets exclusion of vehicles through gating, berms, felling or pushing over trees, or bouldering. Road decommissioning and obliteration on National Forest System lands is the process of converting

roads with little or no future intended use back to a natural habitat state. This may be accomplished by passive means (allowing natural regrowth) or more active measures of felling trees, reseeding, soil scarification of road bed, or planting of herbaceous and woody materials. The majority of roads that are closed or decommissioned are temporary roads used in the timber harvest process and those actions are usually considered part of the overall harvesting effects.

Road closures and decommissioning accomplished outside of timber harvests are typically user-created roads that are not on the Forests' Motor Vehicle Use Map or system roads that are no longer needed. Annually, approximately 40 miles (range of 20-60 miles) of non-system roads are planned for closure or decommissioning on the HMNF. Over the estimated 10 years left in this Forest Plan, a maximum of 1,318 acres would be affected. Most of these closures do not involve tree felling (Scott Peedle, pers. comm.). A few trees are sometimes felled or pushed over at the closure site. On rare occasion, trees are felled or pushed over the entire length of the road.

The actions analyzed in this section include all road closures and decommissioning listed in Appendix A.

To minimize effects to NLEB, the HMNF has developed the following design criteria to be incorporated into projects as feasible and prudent:

- Fell trees outside the non-volant period, when possible. For additional protection, fell trees outside of the summer occupancy Period, when possible.

### Environmental Baseline

Road closure and decommissioning is an ongoing process across the HMNF. Roads are closed to help protect resources from unnecessary use or harm. Decommissioning roads helps in the stabilization and restoration of unneeded roads to a more natural state (36 CFR 212.1). Most of the roads across the Forest are low vehicle volume transport and/or haul roads with relatively narrow widths. The lack of traffic and general wooded state surrounding the roadways means NLEB may use trees and snags in ROWs or in adjoining areas for roost sites. If trees are felled to close or decommission a road, they are usually smaller diameter and within 12 feet of the road edge. Therefore, the maximum area affected would be approximately 1,318 acres. However, the actual area affected would likely be much less because most of the closures do not involve tree felling.

The responses of bats to roads appear to be largely dependent on road size and traffic levels (Sparks 2010, Bennett et al. 2013). Wide, busy roads may be a deterrent of bats, while minor roads, such as the type that exist on the HMNF are not. As a reference, Pauli et al. (2014) defined a "major road" as one with traffic rates exceeding 2 cars/minute based on Bennett et al. (2013), who used simulation modeling to determine that roads acted as filters to Indiana bat movements when the rate of traffic was 10 vehicles/5 minutes and barriers to bat movements when the rate was 200 vehicles/5 min. Bats, including NLEBs, are expected to use HMNF roadways for foraging activities, and potentially roost in trees along roadsides or in adjoining habitat away from paved and unpaved roadways. Numerous studies have reported high NLEB activity on or near minor roads (e.g., Krusic and Neefus 1996, Lacki and Schwierjohann 2001, Owen et al. 2003, Broders et al. 2006, Brooks 2009).

## Direct and Indirect Effect

Access restriction of roads may require the felling or pushing of trees near the start of a road, or along its entire length. These trees may be potential roost trees. Harvesting or felling trees during the summer occupancy period may directly affect northern long-eared bats because of the possibility of a tree containing roosting bats. Bats may leave a roost tree prior to it being felled or contacted because noise, vibration and disturbance from saws or other equipment. However, some bats could remain in a tree and be injured or killed if the tree strikes the ground. If bats are present in trees adjacent to the tree felled, these bats may be disturbed by the activity, however, the bats are not likely to be injured or killed, unless the felled tree damages the roost site on the retained tree. Trees felled during the non-volant period would have a higher potential for adverse effects than other periods because non-volant pups could be present and unable to avoid disturbances or physical harm. Direct effects could include displacement from active sites where roads are in the process of being closed. Displacement from a roost tree would not be expected to result in mortality, but could elevate short-term stresses. These risks may be slightly higher during spring emergence when fat reserves can be low. Any NLEB flushed from a roost site would potentially face some additional exposure to climate, predators, or expenditure of energy. On the HMNF, suitable roosting is considered abundant and widespread. Therefore the amount of time and effort needed for NLEB to relocate should be minimal. Restricting access of vehicles may provide some benefits to NLEB, by reducing disturbances from motorized vehicles.

Road decommissioning or obliteration generally involves the permanent conversion of a road back to a natural state. Direct effects are similar to those of access restriction; however the intended conversion of an open area (roadway) to a forested environment results in a loss of open space and diminished edge-effect. Depending on the proportional availability of openings (foraging habitat) and woodlands (roosting habitat) at the landscape level this may be seen as either a beneficial or negative indirect effect. For instance, losing foraging habitat and gaining roosting habitat when there is already a limited supply of foraging habitat and an abundance of roost habitat may be compounding negative indirect effects. However, a loss of foraging habitat in an already abundant supply and gains in roosting habitat where it's already lacking is most likely beneficial. Over the long-term, tree canopy would close-in, reducing canopy gaps and road edges. Interior stand qualities, including more roost suitable trees would develop and become available. This process would result in short-term loss of foraging habitat, but a long-term gain in habitat more suitable overall for the NLEB which can efficiently use interior type habitats more than some other species. The effects are likely beneficial at the individual scale; however at the population level, the benefits are likely insignificant because of the small amount of area in proportion to the overall Forest area.

## Determination

Road closures and decommissioning conducted within the summer occupancy period and without design criteria is an activity that could result in adverse effects to the NLEB. Effects to NLEB could include adverse impacts to individuals in the form of injury and death, and/or harassment due to social structure changes and roost tree removals.

Actions Likely to Adversely Affect the NLEB (RDCLOSE-LAA)

Approximately 1,318 acres are planned for treatment on the Huron-Manistee National Forests.

## **Special use permits with vegetation management**

### Description of Action

The actions analyzed in this section include implementing special use permits that typically results in the cutting of individual standing dead trees scattered across a very large landscape. Special use permits are legal agreements the Forest Service enters with private individuals, groups, businesses, government agencies and others. They can cover long-term scenarios, such as a road easement of several decades, or one-time events, such as a recreation event program. Permits and easements allowing vegetation removal may authorize the holder to remove trees equal to or greater than 3" DBH. Some of the permits and easements with approved vegetation removal are in place to maintain safe conditions. These may be expected to have infrequent tree removal. Others, such as utility corridor easements and road permits, would be expected to have tree removal occurring at greater frequency, since there is a need, or requirement, to maintain safety, services, and access. In some cases trees that are dead or dying would be identified for removal due to safety concerns and the need to maintain utility service, traffic or access. In other cases, live trees might be identified for removal. Trees that are cut can be left on site or removed.

The individual permits are listed in Appendix B, and are summarized on a single line in Appendix A. The activities listed are those determined to have tree removal as a component of the special use permit. The permits listed in the file cover an estimated 7,210 acres of the Huron-Manistee National Forests. While the permits cover many acres, it is likely that only a small fraction of these acres include tree felling or other actions that may be harmful to NLEBs in any single year.

### Environmental Baseline

In accordance with conditions included in approved special use permits on Michigan National Forests, removal or felling of trees may occur. Hardwood species and conifer trees equal to and greater than 3" DBH can be removed. Some easements and permits allow vegetation removal to occur without additional approval, in that, the removal of trees is pre-approved in order to maintain services, access, safety, etc. Other easements and permits may allow for vegetation to be removed, as long as the permit holders request approval and the requests are granted. Both live and dead trees may be removed. However, since live trees have commercial value, there is likely to be an approval process identified for that activity. It is not likely that there are any time constraints in the existing permits that would preclude cutting vegetation during the non-volant and summer occupancy. Since existing special use permits are legal documents, there is no identified process for requesting permit holders to avoid felling trees during the non-volant and summer occupancy periods. However, a voluntary conservation approach may be possible for permit holders where approval is required before trees can be removed, if it is consistent with other permit conditions.

### Direct and Indirect Effects

Trees could be felled at any time of the year. Although the probability is small, some of the trees that could be felled might be roosting habitat for NLEB. There may be a higher risk of removal of suitable and occupied structure, since snags would be removed due to potential for safety, service and access needs. Bats may leave the roost tree prior to it being felled due to the noise,

vibration and disturbance from chainsaws, vehicles, other equipment, and personnel. However, individual bats might remain in the tree and be injured or killed when the tree strikes the ground. If bats are present in trees adjacent to the tree being felled, they may be disturbed by the activity. However, the individuals are unlikely to be injured or killed while in proximity to the activity.

Roosting bats could also be affected if suitable trees are removed by permit holders. The roost trees would no longer be available to NLEBs. Consequently, bats would be displaced and forced to find alternate roost trees. However, the magnitude of risks for all of the effects would be small in scale in any given year relative to the total habitat available for NLEB as foraging, roosting and maternity habitat. Overall, adverse impacts caused by implementing tree removal in approved special use permit would be small in scale and temporary in duration.

### Determination

Felling trees as allowed or conditioned in a special use permit is likely to adversely affect the northern long-eared bat due to potential for injury or death of individual NLEBs roosting in a tree being felled. Special use permits are legal documents. Time constraints in existing permits, which would preclude cutting vegetation during the non-volant and summer occupancy, are not likely to exist. No identified process exists for requesting permit holders to avoid felling trees during the non-volant and summer occupancy periods in order to decrease the likelihood of injury or mortality.

### Actions Likely to Adversely Affect the NLEB (SUP-LAA)

Approximately 7,210 acres are planned for treatment on the Huron-Manistee National Forests.

### **Landline surveys, mineral seismic surveys and other minor activities with tree cutting**

#### Description of Action

Geophysical exploration activities occur intermittently across the Huron-Manistee National Forests. Oil and gas operators utilize geophysical exploration methods as a first cut at delineating potential oil and gas targets prior to exploratory drilling. Geophysical activities can include non-seismic proposals such as magnetic or gravity surveys. They also include conventional 2-D or 3-D seismic activities. Typically, seismic proposals run in either a line (2-D) or grid pattern (3-D). Non-seismic proposals do not require clearing. An operator would walk along a line with an instrument on a tripod, set the instrument down at a pre-determined interval and take a reading. Typically, no clearing is necessary. For seismic proposals, small shot holes are drilled along a set pattern. Holes are drilled with either a backpack drill or a drill mounted on an ATV, if motorized access is permitted. Minor brushing may occur to clear lines of sight for surveying in the lines. At the completion of the survey, the crew would pick up and remove all flagging and evidence of the survey work. It is estimated that up to 10 miles of either non-seismic or seismic survey lines (maximum 3 feet wide) could be run per year. This activity would impact a maximum of 36 acres over a 10 year period, but no trees would be felled. 3-D activity is estimated to affect a maximum of 13 acres over a 10-year period, but no trees are felled during the 3-D surveys. All mineral surveys are typically completed in less than one week (pers. comm. Terry Saarela, Minerals Program Manager).

The amount of landline cleared on the Huron-Manistee National Forests varies from year to year. On the upper end, 40 miles of line is cleared each year for landlines. Clearing typically entails the cutting of small trees and brush along the line. The clearing width is generally 2 to 3 feet. So at the high end, approximately 14.5 acres would be cleared each year ( $[40 \text{ miles} * 5280 \text{ feet} * 3 \text{ feet}] / 43560 \text{ ft}^2 = 14.5 \text{ acres}$ ). Our surveyor has also asked contract surveyors to not cut dead trees along or near the line unless they pose a safety hazard (pers. comm., Carol Waite, Surveyor). 145 acres are scheduled to be implemented and are listed in the Project List (14.5 acres/year \* 10 years).

To minimize effects to NLEB, the HMNF has developed the following design criteria to be incorporated into projects as feasible and prudent:

- Fell trees outside the non-volant period when possible. For additional protection, fell trees outside of the summer occupancy Period when possible.

### Environmental Baseline

Felling of trees is very limited with these activities. A minimal number of trees are cleared during landline surveys.

### Direct and Indirect Effects

Of the trees that are felled, some of the trees felled may be roosting habitat for the NLEB. While the probability of this is difficult to quantify, it may vary depending on the extent of trees removed (i.e., age, size, and condition of tree). Trees may be felled in the spring, summer, and fall when NLEB may be present. Harvesting or felling trees during this period may directly affect NLEB because of the possibility of a tree containing roosting bats. Bats may leave a roost tree prior to it being felled due to the noise, vibration and disturbance from saws or other equipment. However, some bats might remain in a tree and could be injured or killed if the tree strikes the ground. If bats are present in trees adjacent to the tree being felled, these bats may be disturbed by the activity, however, the bats are not likely to be injured or killed, unless the felled tree damages the roost site on the retained tree. The design criteria for retention of snags and den trees offer additional protection because potential roost trees may be protected from cutting. In addition to the clearing of trees, surveys may cause disturbances to the bats while the surveys are being conducted. The activity could disturb the bats during roosting or activity periods, depending on the type of survey being conducted. All equipment producing noise are capable of disturbing bats from their roosts, which may require them to relocate to another suitable area until the activity is completed. Repetitive or long term disturbances of this type may disrupt the social structure of bats, but given the small size of these treatment areas and duration of surveys, it is unlikely.

If a roost tree is felled any time of year, it could cause a local loss of roosting habitat. The roost tree would no longer be available to NLEBs and cause the bats that were occupying it to find an alternate roost tree. However, depending on the size of the cleared area, the bats may find suitable habitat in adjacent trees or neighboring stands. The size of the treatment areas may impact the social structure of bats in maternity colonies by losing preferred roost trees and the loss of a roost trees may also potentially affect home ranges of bats using the treated areas. Silvis et al. (2014) used simulations to demonstrate that >20% roost removal was required to

fragment social networks for maternity colonies in Kentucky. Therefore, the fragmenting of social networks is unlikely given the small size of most cleared areas (<5 acres); however, larger areas may need to be cleared which may disrupt foraging and roosting activities leading to fragmented social networks.

### Determination

Landline surveys, mineral seismic surveys and other minor activities with tree cutting in forested stands with no design criteria are likely to adversely affect the NLEB because of potential adverse impacts to individuals due to injury and death from felling trees, roost tree removal, noise harassment, and other effects from activities listed above.

#### Actions Likely to Adversely Affect the NLEB (MINORTREE-LAA)

Approximately 194 acres are planned for treatment on the Huron-Manistee National Forests.

### **Insect and disease destructive studies (felling trees, girdling trees, collecting cones and seeds, removing nurse logs)**

#### Description of Action

The actions analyzed in this section include implementing insect and disease destructive studies. Live trees and branches, dead trees and downed wood may be cut and removed from the forest during the studies. Trees might be cut down and peeled to inspect for insects, then left on site to decompose. The actions are described in Appendix A. An estimated 50 trees are felled each year on the Huron-Manistee National Forests. This equates to less than 0.5 acres per year, or 5 acres over the estimated remaining life of the current Forest Plan (10 years).

#### Environmental Baseline

Felling, girdling and removing standing and down deciduous and conifer trees for insect and disease studies and for collection of pine cones and other seeds, occurs periodically within approved management areas on National Forest System lands. The activities constitute important stewardship, as it is necessary to monitor detrimental changes or improvements to forest health that occur over time, as well as provide seed for a variety of purposes. On the HMNF, activity related to emerald ash borer (EAB) has been of recent interest. Nurse logs, known to be key sites of forest regeneration in lower elevation temperate forests, are infrequently collected for various research activities. Standing live trees and standing dead are known to be used as roosting habitat (e.g. Lacki et al. 2009). Some studies indicate that NLEB prefer hardwood species over conifer species for roosting habitat (e.g. Henderson and Broders 2008).

To minimize effects to NLEB, the HMNF has developed the following design criteria to be incorporated into projects as feasible and prudent:

- Fell trees outside the non-volant period when possible. For additional protection, fell trees outside of the summer occupancy Period when possible.

## Direct and Indirect Effects

Trees may need to be felled, girdled and collected in spring, summer, and fall when NLEBs may be present in forested habitats. Although the probability is very small, some of the trees that would be removed might be roosting habitat for NLEBs. Bats may leave the roost tree prior to it being felled or girdled due to the noise, vibration and disturbance from chainsaws, vehicles, other equipment, and personnel. However, some bats might remain in the tree and may be injured or killed when the tree strikes the ground. If NLEBs are present in trees adjacent to the tree being felled, they might be disturbed by the activity. However, the individuals are unlikely to be injured or killed while in proximity to the activity. Overall, the activity is expected to involve very few bats, since felling of trees for disease and insect studies occurs infrequently. The situation is also the same for felling of trees for seed and acorn collection. Additionally, seeds and cones are gathered late in the growing season, and after the summer occupancy period, which further reduces exposure of bats to the activities. Considering the infrequent nature and low intensity of the tree felling activities, the adverse impacts are expected to be of very short duration, likely measured in hours or days. Girdled trees could indirectly affect bats since the action removes structure when individual trees die and fall. Habitat would be present until natural processes cause trees to fall. Once on the ground, the trees would be unlikely to provide habitat for bats. Nurse logs could potentially be suitable roosting habitat. However, lying on the forest floor, the decaying and soft quality of the wood and bark would render the boles or trunks very unlikely habitat. Therefore, the removal of the logs would be of discountable effect to NLEB.

## Determination

Felling of trees and removing branches for insect and disease studies is likely to adversely affect the NLEB because of potential injury and death to individuals. Even though the activity would be conducted outside of the non-volant and summer occupancy periods when possible, the potential for NLEB injury and mortality exists during the summer occupancy period

Actions Likely to Adversely Affect the NLEB (STUDIES-LAA).

Approximately 5 acres are planned for treatment on the Huron-Manistee National Forests.

## **Wildlife and Fisheries Structural Habitat Improvement and Restoration**

### Description of Action

These actions include all structural habitat improvement for wildlife and fish, including the felling, topping, or girdling of trees to improve habitat for wildlife and/or fish, and waterhole construction. For a complete list of actions, see Appendix A.

Many of the actions analyzed in this section include the treatment of standing timber by mechanical means or hand treatment occurring in multiple forest types and using various tree species. Mechanical treatment generally involves the use of hand power tools (e.g. chainsaw) to fell, top or girdle live trees. Felled trees would be cut to directionally lay on the forest floor or into a stream bed. Trees are generally not bucked nor are tops removed. Trees that are topped for snags are generally cut 15 to 20 feet above the ground, and the tops are generally not removed. Girdled trees will have rings (generally 2 or more) cut through the cambium to sever nutrient flow and extinguish the life of the tree. Girdled trees may remaining standing for 5-10

years, depending on the species, condition of the tree when girdled, tree density within the stand, and weather events. Trees treated with hand equipment (i.e. handsaw) are generally smaller in size (<5" dbh) and felled, rather than girdled. These actions are described in more detail in Appendix A. An estimated 19,792 acres (assuming one acre of disturbance per structure) are planned for treatment on the Huron-Manistee National Forests.

To minimize effects to NLEB, the HMNF has developed the following design criteria to be incorporated into projects as feasible and prudent:

- Fell trees outside the non-volant period when possible. For additional protection, fell trees outside of the summer occupancy period when possible.

### Environmental Baseline

To aid in the enhancement of wildlife and fisheries habitat, dead woody material is often added to the landscape to supplement existing conditions. This is often achieved through the felling, topping or girdling of live trees with chainsaws or handsaws. Treatment location is often dictated by existing conditions, but generally treatments occur in the interior of forest stands and along riparian corridors.

### Direct and Indirect Effects

Although the probability is very small, some of the felled, topped or girdled trees may be roosting habitat for the NLEB. Trees may be felled, topped or girdled in the spring, summer, and fall when NLEBs may be present. Felling trees during the Non-volant Period and Summer Occupancy Period may directly affect NLEBs because of the possibility of felling or disturbing a tree containing roosting bats. Although bats may leave the roost tree prior to it being felled due to the noise, vibration and disturbance from chainsaws, other equipment or people, some bats may remain in a tree and be injured or killed when the tree strikes the ground. If bats are present in trees adjacent to or near a tree being felled or girdled, those bats may be disturbed by the activity. Such disturbances would not result in injury or death, but may cause some displacement or avoidance while treatments occur. If a felled tree were to collide with a retained tree containing bats, there is the chance that bats could be injured or killed. The process of girdling could result in the same short-term disturbance responses as felling a tree because of the saws and people using them. Girdled trees typically stand for several years after treatment, and would not pose any meaningful risk in the form of injury or mortality to bats.

Felling or topping a roost tree could cause a short-term, local loss of roosting habitat. This could cause the bats occupying it to find an alternate roost tree, thus create shifts to the occupancy range. Depending on the location a roost, some adjustments to individual home ranges or a maternal range could occur, but would likely be minor. Any changes would be minor, short-term, and not exceed thresholds which alter maternal networks, because structural improvement projects tend to be small relative to the amount of untreated area and/or trees.

While the disturbance and felling of trees may present immediate hazards to local bats, indirectly the creation of snags via girdling or topping would have long-term beneficial effects. The death of the tree generally would occur within the next growing season, but loosening of bark and other features beneficial to the bat may take a few years. Additionally, the scattered removal of select trees within a forest stand may create small openings providing foraging habitat. This may

also allow more solar radiation to reach certain standing trees, potentially improving microclimate conditions suitable for roosting. However, it's possible that already-suitable conditions could also be disrupted in this way. NLEB generally select roosts with higher canopy cover than Indiana bats (Foster and Kurta 1999, Carter and Feldhamer 2005, Lacki et al. 2009, Timpone et al. 2010.) As quoted from Badin (Thesis 2014): "NLEB selected roost trees with lower canopy cover and thus more solar exposure than random trees in the undisturbed forest, similar to Foster and Kurta (1999) and O'Keefe (2009), although many other studies have not identified higher solar exposure as important for this species (Sasse and Pekins 1996, Menzel et al. 2002, Carter and Feldhamer 2005, Perry and Thill 2007)." In fact, Carter and Feldhamer (2005) found that NLEB roosted in areas with higher canopy closure than in random plots.

### Determination

Wildlife and Fisheries Structural Habitat Improvement and Restoration activities with no design criteria are likely to adversely affect the NLEB because of potential adverse impacts to individuals due to injury and death from felling and topping trees, and roost tree removals. Actions that are able to incorporate design criteria are not likely to adversely affect the NLEB because trees would be felled, topped or girdled outside the summer occupancy period.

#### Actions Likely to Adversely Affect the NLEB (WLFISHSTR-LAA)

Approximately 16,971 acres are planned for treatment on the Huron-Manistee National Forests.

#### Actions Not Likely to Adversely Affect the NLEB (WLFISHSTR-NLAA)

Approximately 2,821 acres are planned for treatment on the Huron-Manistee National Forests.

### **Building Maintenance or Demolition**

#### Description of Action

Maintenance of buildings owned by the Forest Service is an ongoing activity. Building maintenance may include activities like replacing shingles on a roof, painting, structure repair, weather sealing or installing insulation. An estimated 30 structures are planned to be maintained on the HMNF annually (pers. comm. Jim Strezishar, Engineer). Each structure maintained would typically not impact more than 0.5 acres. Over 10 years, a maximum of 150 acres would be impacted.

Demolition of buildings owned by the Forest Service is uncommon, but does occasionally occur. For example, the Forest Service may acquire a property with a building. The building would be demolished to restore the site to natural conditions. Approximately 2 structures are demolished annually on the HMNF (pers. comm. Paul Salvatore, Lands Specialist). Each structure demolished would typically not impact more than 0.5 acres. Over 10 years, a maximum of 5 acres would be impacted.

To minimize effects to NLEB, the HMNF has developed the following design criteria to be incorporated into projects as feasible and prudent:

- Perform maintenance or demolition outside the non-volant period when possible. For additional protection, perform maintenance or demolition outside of the summer occupancy period when possible.

### Environmental Baseline

Most buildings are well sealed and are not likely to provide summer roosting habitat. However, some older structures and those with an open design may provide roosting habitat for NLEB.

### Direct and Indirect Effects

Maintaining or demolishing a building with the above design criteria could have a direct effect on northern long-eared bats. These activities could occur when NLEBs are present in structures during the Summer Occupancy Period. Although uncommon, demolition during this period poses the greatest risk because destroying a structure could injure or kill individual roosting bats. Maintenance activities like sealing, reroofing, and shutter replacement could have impacts, but these activities are likely to be more disturbing than life threatening. If the maintenance activity is longer in duration, it could be considered harassment because of the possibility of disrupting normal behavioral patterns.

If a building was used by NLEBs and is then rendered unusable by maintenance or demolition, it could cause a local loss of roosting habitat in the short term. The roost site would no longer be available and cause the bats that were occupying it to find an alternate roost site. Depending on the location of the site, the social structure of the NLEBs may also change, however those effects are likely to be insignificant due to the small number of roosts removed (typically only one) in relation to the total number of roosts that would remain available in the immediate project area. Silvis et. al. (2014) found that colony social structure is robust to fragmentation caused by random loss of small numbers of roosts.

In the long term, a site where a building was demolished would likely be allowed to succeed to a natural forest. Depending on the site, building demolition could provide foraging habitat in 1-20 years, and potential roosting sites in 50 or more years.

### Determination

Building maintenance or demolition is likely to adversely affect the northern long-eared bat due to killing or injuring bats roosting in buildings during project activities.

Actions Likely To Adversely Affect the NLEB (BUILDING-LAA)

Approximately 155 acres would be affected on the Huron-Manistee National Forests.

### **Herbicide treatments (e.g. backpack, vehicle broadcast, wick application, injection) and Bio-control insect releases**

#### Description of Action

The actions analyzed in this section include application of herbicide and releases of biological control insects to manage infestations of non-native invasive plants (NNIP). The actions are

described in Appendix A. Approximately 28,165 acres of herbicide treatments and bio-control insect releases are planned on the Huron-Manistee National Forests.

Herbicides could be applied using numerous methods. Examples include dabbing the chemical on the cut stump, brushing it on the basal bark of woody shrubs, injecting a liquid or capsules into the plant trunk or stem, and wand (or glove) application directly to foliage. For foliar spray applications, a backpack or hand-held apparatus that can direct controlled spray of chemical on target plants with minimal drift will be used. Truck, tractor, off-highway vehicle-mounted (or similar vehicle) or hose spray devices may be used to cover large areas. Herbicides will not be applied using airplanes or helicopters. Generally there would be one chemical application per site per year. It is anticipated multiple years of herbicide treatment might be required to gain adequate control or eradication at many sites. The timing of treatments will vary by NNIP species and to avoid negative impacts on non-target species. All herbicides will be applied according to label directions by applicators that hold a current Commercial Pesticide Applicator certification from the Michigan Department of Agriculture. The chemicals to be used are listed in Table 3.

Biological control of NNIP involves releasing insects that feed on or parasitize specific plant species. The insects are typically native to Europe, Asia, or other parts of the world where the target plant occurs naturally, but have been approved for release in the United States by the United States Department of Agriculture. Biological control methods generally suppress host NNIP populations, but may not contain or eradicate them. Biological control of plants is a common practice on state, tribal, county, and private land in Michigan, Minnesota, and Wisconsin (Landis et al. 2004, Van Driesche et al. 2002). Insects used as biological control agents are generally released as adults (not as eggs or larvae) between June and August. Some releases are performed by simply emptying a container of insects at an NNIP site. Other releases are accomplished by placing an insect-bearing plant in the middle of an infestation of NNIP. If a release is successful, the insects will continue to thrive at the infestation, as long as the host plant remains. The biological control agents (all insects) that could be used are listed in Table 4.

### Environmental Baseline

Herbicide spraying is an ongoing activity on National Forest System lands. Non-native invasive plants are not known to be adversely affecting NLEB on the Michigan National Forests. However, NNIP can be aggressive invaders of disturbed habitats and native plant communities. When left untreated, some NNIP may become the dominant component of the vegetative community, thus reducing native plant survivorship, dispersal and diversity and impacting wildlife habitat, visual resources and future management of infested sites. Aggressive, non-native shrubs in the forest can also reduce growth rates of native overstory trees (Hartman and McCarthy 2007). Infestations are generally treated once annually by licensed applicators, using approved chemicals and following label mixing and application directions. Applications are conducted during daylight hours. The majority of treatments are in upland herbaceous areas not considered NLEB habitat. However, some treatments may be in, or near, areas NLEB use for foraging, roosting, pup rearing and social interactions. Approximately 1,364 acres and 1,268 acres of herbicide and bio-control treatments have occurred in 2013 and 2014, respectively, on the HMNF.

Table 3: Herbicides to be used for controlling non-native invasive plants (NNIP)

Common Chemical Name	Some Examples of Trade Names	Application Method & Chemical Selectivity	Example Targeted NNIP Species *
Triclopyr	Garlon3A, Brush-B-Gone Habitat, Vine-X	Stump and/or basal bark treatment, foliar spot spray; broadleaf-selective	Buckthorn, barberry, honeysuckle, wild parsnip, crown vetch
Glyphosate	Roundup Pro, Roundup, Accord	Stump treatment, foliar spray; non-selective	Honeysuckle, buckthorn, barberry, garlic mustard, wild parsnip, St. Johnswort, crown vetch
Glyphosate aquatic formulation	Rodeo	Foliar treatment, weeds near open water; non-selective	Purple loosestrife, swamp thistle, reed canary grass, common reed grass, and any species near open water
Dicamba	Banvel, Clarity, Vanquish	Foliar treatment, typically applied as mix with other herbicides; broadleaf selective	Knapweed, leafy spurge, thistle, tansy
Imazapic	Plateau, Plateau Eco-Pak, Cadre	Foliar treatment; non-selective	Leafy spurge
Clopyralid	Transline, Stinger, Confront	Foliar spray; broadleaf-selective	Canada thistle, swamp thistle, spotted knapweed, common burdock, crown vetch
2,4-D	Weedar 64	foliar spray; selective for broad-leaved plants	Bull thistle, Canada thistle, common burdock
Imazapyr	EZ-Ject herbicide shells	injection into woody NNIP	Privet, Lombardy poplar
Sethoxydim	Poast, Poast-Plus	foliar spray; broad-spectrum	NNIP grasses

\* Note: The label for each herbicide provides a list of plants that can be treated.

Table 4: Biological control agents (insects) and target plants

Biological Control Insect	Scientific Name	Target Plant
Banded gall fly	<i>Urophora affinis</i>	Spotted knapweed
UV knapweed seed head fly	<i>Urophora quadrifasciata</i>	Spotted knapweed
Knapweed root weevil	<i>Cyphocleonus achates</i>	Spotted knapweed
Lesser knapweed flower weevil	<i>Larinus minutus</i>	Spotted knapweed
Copper leafy spurge flea beetle	<i>Aphthona flava</i>	Leafy spurge
Brown-legged leafy spurge flea beetle	<i>Aphthona lacertosa</i>	Leafy spurge
Black dot leafy spurge flea beetle	<i>Aphthona nigricutis</i>	Leafy spurge
Black-margined loosestrife beetle	<i>Galerucella californiensis</i>	Purple loosestrife
Golden loosestrife beetle	<i>Galerucella pusilla</i>	Purple loosestrife
Loosestrife root weevil	<i>Hylobius transversovittatus</i>	Purple loosestrife
Milfoil weevil	<i>Euhrychiopsis lecontei</i>	Eurasian water milfoil

#### *Herbicide Toxicity Information for NLEB*

Tables 5 and 6 provide herbicide information relevant to NLEB. Thus, they preface the effects analysis.

Table 5 presents mammalian toxicity data for the herbicides used on the Michigan Forests. There is no data specific to NLEB. Rather, the data reflect the potential for toxicity to terrestrial mammalian wildlife exposed to areas treated with the herbicides. The data consist of LD50, LC50, and NOEL values. A LD50 (Lethal Dose50) represents the dose (amount supplied orally) to a test animal species in a controlled laboratory experiment that causes 50 percent mortality. An LC50 (Lethal Concentration50) represents the concentration causing 50 percent mortality when a test animal species is externally exposed to the chemical in a controlled laboratory experiment. A NOEL (No Observed Effects Level) represents the highest dose or concentration (expressed as mg per kg body weight per day) observed not to cause noticeable effects in a test animal in a controlled laboratory experiment. For all three parameters, a higher value indicates a safer (less toxic) chemical.

Data are presented for two categories of toxicity: acute and chronic. Acute toxicity results from exposure to the chemical for a short time, for example when an animal enters an area immediately after herbicide application when the foliage is still wet. Chronic toxicity results from continuous exposure to the chemical over an extended time, for example should an animal inhabit an area that is repeatedly sprayed with a herbicide at regular intervals over multiple years. Because the proposed program would consist mostly of single applications, or at most, an initial application and one to three subsequent over approximately five years, the acute toxicity data is most relevant. For each herbicide separate rows of data are provided for the technical product (unformulated active ingredient) and for several common formulations. How a product is formulated can significantly affect its toxicity. Because it is the formulations and not the technical product that are used in the field, formulation data are more relevant, if available. While data based on exposure of mammalian test organisms are a useful predictor of toxicity to

mammalian wildlife, they are less useful as a predictor of toxicity to birds, fish, and other wildlife whose physiology substantially differs from that of mammals.

Table E-2 includes information related to minimum, average and maximum application rates, when available, for the chemicals used on the Michigan Forests. The table presents summarized ecological risk assessments, considering potential toxicity of herbicides to ecological receptors, such as the data presented in Table 5, but also the likelihood of exposure of receptors to the herbicides. Thus, they provide a more realistic assessment of risk to ecological receptors from herbicide use than do toxicity data alone.

Herbicides on the market today are generally regarded as safe to both humans and to wildlife if used in accordance with the manufacturer label. For purposes of comparison against data in Table 5, the oral LD50 for rats exposed in their diet to table salt (sodium chloride) is reported at 3,000 mg/kg body weight (BW) (Mallinckrodt Baker Inc. 2004).

### Direct and Indirect Effects

#### *Chemical Treatment*

The mammalian toxicological data presented in Table 5 suggests that the toxicity of the herbicides used to treat infestations would be low. Bats, and specifically NLEB, are insectivorous, capturing prey by hawking and gleaning behaviors (Ratcliffe and Dawson 2003). Gleaning behaviors could expose bats to chemicals or to insect treated with chemicals. Some research indicates demonstrated that glyphosate is toxic to aquatic invertebrates at doses lower than those expected to be present in the environment and toxicity to aquatic invertebrates might have been underestimated in the past (Cuhra et al. 2013). Since NLEB may use aquatic insects as a food source the information suggests that glyphosate may pose more of an indirect threat than previously assumed. Gleaning also increases NLEB's risk of pesticide exposure because they are thought to consume a particularly high proportion of spiders, in which chemical concentrations can accumulate to higher levels than in lower-trophic-level invertebrates (Dodd et al. 2012). However, these risks are considered very small on Michigan National Forests since the low intensity of herbicide spraying, generally one application per site per year, points to a very low probability of NLEB exposure through food resources. Also, upland herbaceous plants are the frequent targets for spraying, not wetland plants and habitats or canopy trees and shrubs. While herbaceous areas can be foraging locations, NLEB foraging is most likely to occur in upland and lowland woodlots and tree-lined corridors, where they catch insects in flight using echolocation and by gleaning insects from vegetation and water surfaces (FWS, 2014, NLEB Interim Guidance). Thus any risk from foraging exposure to chemicals is very low. Bats could theoretically experience dermal toxicity by brushing against recently treated NNIP foliage or through direct spray. However, as evidenced by the dermal LD50 data in Table 5, the dermal exposure pathway is of low hazard. Furthermore, NLEB would not be roosting in herbaceous areas where most treatments occur and would not be actively foraging until the crews depart for the day, giving the sprayed foliage a chance to dry. Because herbicides would be applied directly to target foliage in a manner that prevents drift or runoff (i.e. label directions), the risk of herbicides contaminating drinking waters sources for bats would be low. NLEB could potentially be affected if herbicide treatment results in a reduction in numbers of insects. However, in the low probability this were to occur, the effect is expected to be temporary, as insect populations would likely recover within a short period of time after treatment of an area. While there is no specific risk information for bats in Table 6, overall ecological risk of the

studied herbicides at rates commonly used by the Forest Service pose little or no risk to terrestrial mammals. Control of invasive species would have the effect of preserving native plant diversity and abundance, which could be beneficial for retaining native insect populations consumed by NLEB.

### *Biological Control*

There is no available evidence that the insects with potential for use as biological control agents are harmful to bats or other mammals. None are biting or stinging insects. All have a record of safe use in the Midwestern United States. Releasing biological control agents does not require the use of motorized equipment other than a vehicle for basic transportation. In most cases release would likely take place close to existing roads decreasing risk of a minor physical disturbance in remote habitat. The agent would be expected to spread on its own to remote areas. Insects used as biological control agents for invasive plants, such as leafy spurge, purple loosestrife, spotted knapweed, are neither competitors, nor identified prey of NLEB. Thus, their abundance or absence would have no effect on NLEB.

### *Both NNIP Control Methods*

Northern long-eared bats do not utilize any of the NNIP weed species or the plant species that they displace. None of the NNIP herbicide or bio-control treatments would fragment habitat for NLEB. No permanent human intrusions would result from the NNIP control program. The low level of vegetation change in suitable bat habitat would have no detectable impact on the NLEB.

### Determination

Implementing herbicide treatment and bio-control insect releases is not likely to adversely affect the NLEB. By using approved herbicides and following manufacturer's product label with application by Michigan certified personnel, the effects to NLEB would be insignificant and discountable because: 1) NLEBs are not likely to be present in these areas, and 2) if present, not likely to be exposed to the herbicide treatments either directly or indirectly through eating prey that has come in contact with the herbicide, and 3) if present in areas treated with bio-control insects would be unaffected by the activity.

### **Actions Not Likely To Adversely Affect the NLEB (HERB-NLAA)**

Approximately 28,165 acres are planned for treatment on the Huron-Manistee National Forests.

Table 5: Mammalian toxicity data for herbicides used for invasive plant (NNIP)

Herbicide (Technical product unless specific formulation noted)	Acute Toxicity						Chronic Toxicity		
	Oral LD <sub>50</sub> (rat)	Dermal LD <sub>50</sub> (rabbit)	4-Hour Inhalation LC <sub>50</sub> (rat)	Skin Irritation (rabbit)	Skin Sensitization (guinea pig)	Eye Irritation (rabbit)	24-Month Dietary NOEL (mouse)	24-Month Dietary NOEL (rat)	12-Month Dietary NOEL (dog)
	mg/kg BW		mg/L				mg/kg BW/day		
<b>Glyphosate</b>									
Glyphosate acid	5600	>5000	NA	None	No	Slight	4500	400	500
Glyphosate isopropylamine salt	>5000	>5000	NA	None	No	Slight	Chronic toxicity data available only for technical glyphosate acid		
Glyphosate trimethylsulfonium salt	748	>2000	>5.18 (unspec.)	Mild	Mild	Mild			
ROUNDUP	>5000	>5000	3.2	None	No	Moderate			
RODEO	>5000	>5000	1.3	None	No	None			
<b>Imazapic</b>									
Imazipic acid	>5000	>5000	NA	None	No	Slight	Long-term dietary administration produced no adverse effects in mice and rats.		
Imazipic ammonium salt	>5000	>5000	2.4	None	No	None	Chronic toxicity data available only for technical imazipic acid		
PLATEAU	>5000	>5000	2.4	None	No	None			
CADRE	>5000	>5000 (rat)	2.4	None	No	None			
<b>Triclopyr</b>									
Triclopyr acid	713	>2000	NA	None	Positive	Mild	5.3 (22mo)	3	NA
GARLON 3A	2574	>5000	>2.6 (unspec.)	NA	NA	Severe	Chronic toxicity data available only for technical triclopyr acid		
GARLON 4	1581	>2000	>5.2 (unspec.)	Moderate	Positive	Slight			
<b>Clopyralid</b>									
Clopyralid acid	>5000	>2000	>1.3 (unspec.)	V. Slight	No	Severe	500 (18mo) (mouse)	50 (rat)	100 (dog)

Herbicide (Technical product unless specific formulation noted)	Acute Toxicity						Chronic Toxicity		
	Oral LD <sub>50</sub> (rat)	Dermal LD <sub>50</sub> (rabbit)	4-Hour Inhalation LC <sub>50</sub> (rat)	Skin Irritation (rabbit)	Skin Sensitization (guinea pig)	Eye Irritation (rabbit)	24-Month Dietary NOEL (mouse)	24-Month Dietary NOEL (rat)	12-Month Dietary NOEL (dog)
	mg/kg BW		mg/L				mg/kg BW/day		
STINGER	>5000	NA	NA	NA	NA	NA	Chronic toxicity data available only for technical clopyralid acid		
<b>Dicamba</b>									
Dicamba acid	1707	>2000	9.6	Slight	Possible	Extreme	115 (18mo)	125	60
BANVEL	2629	>2000	>5.4	Moderate	No	Extreme	Chronic toxicity data available only for technical dicamba acid		
BANVEL 720	2500	NA	NA	NA	NA	NA			
BANVEL SGF	6764	>20000	>20.23	Slight	N/A	Minimal			
WEEDMASTER Dicamba+2,4-D	>5000	>20000	>20.3	Minimal	N/A	Minimal			
<b>Imazapyr</b>									
Isopropyl or isopropylamine salt	>5000	>2000	>1.3 – >4.62	Mildly irritating	No	Mildly to irritating	>100	>100	>100
ARSENAL™	>5000	>2000	>4.62	Mildly irritating	No	Non-irritant	Long-term studies in rats and mice produced no carcinogenic effect.		NA
CHOPPER™	>5000	>5000	1.58	Irritating	Slightly sensitizing	Moderately irritating			
HABITAT™	>10000	>2000	4.62	Mildly	No	Non-irritating	NA	NA	NA
<b>Sethoxydim</b>									
Sethoxydim	2676	>5000 (rat)	6.1	None	No	None	18	NA	8.86
POAST™	4.1	>5000 (rat)	>4.6	Moderate	No	Moderate	Chronic toxicity data available only for technical sethoxidim		
POAST PLUS™	>2200	>2000 (rat)	>7.6	Slight	No	Slight	Chronic toxicity data available only for technical sethoxidim		

Herbicide (Technical product unless specific formulation noted)	Acute Toxicity						Chronic Toxicity		
	Oral LD <sub>50</sub> (rat)	Dermal LD <sub>50</sub> (rabbit)	4-Hour Inhalation LC <sub>50</sub> (rat)	Skin Irritation (rabbit)	Skin Sensitization (guinea pig)	Eye Irritation (rabbit)	24-Month Dietary NOEL (mouse)	24-Month Dietary NOEL (rat)	12-Month Dietary NOEL (dog)
	mg/kg BW		mg/L				mg/kg BW/day		
2,4-D									
2,4-D acid	639	>2000	1.79	None	No	Severe	5	5	1
2,4-D Dimethylamine salt	>1000	909	3.5	None	No	Severe	Chronic toxicity data available only for technical 2,4-D acid		
2,4-D Isooctyl ester	1045	>5000	5.7	None	Yes	Moderate			

Source: Herbicide Handbook (WSSA 2002, 2006), Greenbook (2006); Cornell University (1986); NA = Not Available

Table 6: Risk assessment information for herbicides used for invasive plant (NNIP) control on the HMNF

Risk Assessment Application Rate	Terrestrial Mammals	Birds	Insects	Fish & Other Aquatic Receptors
<b>Glyphosate (Source: SERA 2003a; Tu et al. 2001, USDA Forest Service 2003b )</b>				
2 lb a.e./acre (average rate)	Effects resulting from average application rate are minimal.	Effects resulting from average application rate are minimal. Some risk exists for small birds	Effects resulting from average application rate are minimal. Some risk from maximum application rate to bees exposed to direct spray.	Effects resulting from average application rate are minimal. Some risks exists to fish near areas treated with maximum application rate using some of the more toxic formulations not labeled for use in aquatic settings.
7 lb a.e./acre (maximum rate)	Some risk exists for large mammals consuming foliage for an extended period of time in areas treated with maximum application rate.	consuming insects for an extended period of time from areas treated with maximum application rate.		
<b>Imazipic (Source: SERA 2004c, Tu et al. 2004, USDA Forest Service 2004c )</b>				
0.100 lb a.e. /acre (average rate)	No substantial risk to small mammals at maximum rates.	No substantial risk at maximum rates.	No substantial risk at maximum rates. Non-toxic to bees	No substantial risk at maximum rates. However, limited toxicological data available.
0.1875 lb/acre (maximum rate)	Some risk exists for large mammals, if consumed over long period (i.e. 2 years).			Potential for risk to aquatic plants from maximum rates is border-line.
<b>Imazapyr (as Arsenal, Chopper, Stalker) (Source: USDA Forest Service 2004d)</b>				

Risk Assessment Application Rate	Terrestrial Mammals	Birds	Insects	Fish & Other Aquatic Receptors
0.45 lb a.i./acre	Available toxicity studies are relatively complete, including studies in three mammalian species (dogs, rats, and mice) and several reproduction studies in two mammalian species (rats and rabbits) indicate that imazapyr is not likely to be associated with adverse effects at relatively high-dose levels.	While toxicity studies on birds are less extensive than those on mammals, no adverse effects have been noted in birds.	Limited toxicological data is available. However, the toxicity of imazapyr to insects may be similar to the toxicity of this compound to mammals, that is, relatively non-toxic.	Limited toxicological data is available. There exists some research that suggests imazapyr is moderately toxic to other fish species.
<b>Sethoxydim (Source: USDA Forest Service 2001b)</b>				
0.09375 lb/acre (minimum rate)  0.375 lb/acre (maximum rate)	No substantial risk at maximum rates.	No substantial risk at maximum rates.	Studies on beetle larvae suggest that rates exceeding maximum rates are relatively non-toxic.	No substantial risk at maximum rates. However, limited toxicological data available. Potential for risk to aquatic plants from maximum rates is borderline.
<b>Triclopyr (Source: SERA 2003b, Tu et al. 2003, USDA Forest Service 2003c)</b>				

Risk Assessment Application Rate	Terrestrial Mammals	Birds	Insects	Fish & Other Aquatic Receptors
1 lb a.e./acre (average rate) 10 lb a.e./acre (maximum rate)	No substantial risk at average rate. Some risk for mammals exposed via direct spray or consuming sprayed vegetation when applied at maximum rate.	No substantial risk at average rate. Some risk for large bird exposed via direct spray or consuming sprayed vegetation when applied at maximum rate.	No substantial risk to terrestrial vertebrates and invertebrates from salt and ester formulations. Risk to aquatic invertebrates when if exposed to the butoxyethyl ester (BEE) formulation.	No substantial risk when triethylamine (TEA) salt formulations are applied at average rate. Some risk to aquatic species when butoxyethyl ester (BEE) formulations are applied at average rate. Substantial risk when BEE formulations applied at maximum rate.
Clopyralid (Source: SERA 2004b, Tu et al. 2001, USDA Forest Service 2004a )				
0.1 lb a.e./acre (typical rate) 1.0 lb a.e./acre (maximum rate)	Reported to be relatively non-toxic, with little potential for adverse effects.	Reported to be relatively non-toxic, with little potential for adverse effects.	Reported to be relatively non-toxic to bees, with little potential for adverse effects. Low toxicity to soil invertebrates and microbes	Reported to be relatively non-toxic, with little potential for adverse effects.
Dicamba (as Vanquish, diglycolamine salt of dicamba) (Source: SERA 2004a, Cornell 1993, USDA Forest Service 2004b)				

Risk Assessment Application Rate	Terrestrial Mammals	Birds	Insects	Fish & Other Aquatic Receptors
2 lb a.i./acre (foliar application) 1.5 lb a.i./acre (cut surface application)	No plausible and substantial hazard under normal conditions of Forest Service use.	No plausible and substantial hazard under normal conditions of Forest Service use.	Reported to be non-toxic to bees.	No plausible and substantial hazard under normal conditions of Forest Service use.
<b>2,4-D (Source: USDA Forest Service 2006a)</b>				
1.0 lb a.i./acre (average rate) 2.0 lb a.i./acre (maximum rate)	<p>Except for accidental exposures, applications at average or maximum rates are not likely to cause adverse effects.</p> <p>Small mammals exposed to direct spray could display subclinical toxic effects.</p> <p>If foliage treated with 2,4-D is the sole diet of a mammal, subclinical toxic effects are possible.</p>	<p>Except for accidental exposures, applications at average or maximum rates are not likely to cause adverse effects.</p> <p>Acute toxicity studies suggest that birds are somewhat less sensitive than mammals.</p> <p>Studies suggest that 2,4-D sprayed directly onto avian eggs at rates up to 10 lb/Ac. (substantially higher than label rate) have no effect.</p>	Bees exposed to direct sprays could experience substantial mortality.	Direct application of 2,4-D to water at rates used by the Forest Service could cause mortality of aquatic receptors (including MIS brook trout or mottled sculpin).. Formulations approved for aquatic use would be used for Eurasian water-milfoil control.

## **Effects to Hibernating Bats and Hibernacula**

No effects are anticipated to wintering NLEB or their hibernacula from the proposed action.

## **Effects Related to White-nose Syndrome**

This BO assumes that WNS will affect all NLEB present within the action area over the proposed life of the project. Bats affected but not killed by WNS during hibernation may be weakened by the effects of the disease and may have extremely reduced fat reserves and damaged wing membranes. These effects may reduce their capability to fly or to survive long-distance migrations to summer roosting or maternity areas. Affected bats may also be more likely to stay closer to their hibernation site for a longer time period following spring emergence. One known NLEB hibernacula (Tippy Dam) occurs within the action area and bats affected by WNS may be more likely to use the action area for at least temporary foraging and roosting rather than migrating longer distances to established summer home ranges.

While none of the HMNF's proposed actions will alter the amount or extent of mortality or harm to NLEB resulting directly from WNS, the proposed action does have the potential to increase or decrease the chances that WNS-affected bats present in the action area will survive and recover. For example, WNS-affected bats roosting in the area immediately after emerging from hibernation may have damaged wings and therefore could be less able to quickly fly away from fire and smoke during a prescribed burn. As a result, there may be an increased chance of WNS-affected bats being killed or harmed as a result of the project, particularly if burns are conducted early in the spring (April –May). However, research into how WNS affects bat physiology and behavior is ongoing, and current information is not sufficient to quantify or predict the full range and scope of potential effects, or compare the relative likelihood and significance of the potential adverse and beneficial effects described above.

## **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.

When considered with future State, county, tribal and private actions that are reasonably certain to occur in the future, the forest management and other actions listed in Table 1 would have a minor adverse cumulative effect on the NLEB. Non-federal tree cutting activities would have the greatest potential to have a cumulative effect on the NLEB because of potential for bats to be injured or killed during summer occupancy, loss of roost trees, or loss of forested habitat. Other public, tribal and commercial lands within the analysis area may or may not be managed similar to HMNF lands. Tree cutting activities on non-commercial private lands is estimated to be substantially lower than federal lands because many private landowners lack interest in forest management, small parcels may not be economical to manage, or activities remove very few trees annually (ex. ROW maintenance). Therefore, when considering tree cutting activities on all ownership annually, it is estimated that no more than two percent of the analysis area would receive a treatment, providing substantial forest habitat and roost trees over the long term. In

addition, most timber harvest activities (58%, Mike Stimak, pers. comm.) on the HMNF would occur outside of the summer occupancy period, further reducing the risk NLEBs could be injured or killed while in a roost. Stimak believes this is true for most years, with small changes from year to year. Tree cutting activities on non-Federal lands may retain snags and den trees that could be roost trees for NLEBs. Snag creation activities may improve roosting habitat. Thinning of hardwood and conifer stands would likely improve NLEB foraging habitat. Furthermore, considerable areas on the HMNF exist where disturbance would be infrequent or absent (Appendix C: HMNF NLEB Infrequent Vegetation Management Map). These areas also provide substantial forested habitat and roost trees for NLEBs over the long term.

Prescribed burning on other lands within the analysis area is estimated to be minor when compared to burning on the HMNF, and is almost always low intensity. Low intensity burning would pose a lower risk to roosting NLEBs because roosts generally occur much higher than flame heights. At the landscape level, prescribed burning would likely be a source of new roost trees for NLEBs because some trees within a burn area are likely to be killed by fire. Therefore, prescribed burning activities would have a minor cumulative effect on the northern long-eared bat.

Site preparation activities would have an extremely small adverse cumulative effect on the NLEB. State, county, tribal and private site preparation activities within the analysis area is estimated to be small when compared to Forest Service actions on an annual basis. As stated in the direct/indirect effects, the likelihood of NLEBs being impacted on by site preparation activities on the HMNF would be remote and similar effects would be expected on State, county, tribal and private activities.

Building maintenance and demolition occurs on non-federal lands annually, but to a greater degree on lands in private ownership simply because more structures are present. Maintenance and demolition activities would have a potential to disturb, injure or kill NLEBs in buildings and could cause a loss of roosting habitat. However, when considering these potential impacts to NLEBs across the landscape, buildings are much less commonly used for roosts than trees with cracks, crevices or holes. Therefore, although these effects would be cumulative to activities on the HMNF, the loss of roosting habitat would be extremely small on an annual basis, and therefore would have a minor adverse cumulative effect on the northern long-eared bat.

State, county, tribal and private herbicide use and biocontrol would likely have a cumulative effect when considered with Forest Service use of herbicides and biocontrol. Herbicide use by non-federal entities within the analysis area likely equals or exceeds use by the Forest Service, primarily to control woody vegetation under powerlines and along roadways, and to control non-native invasive species. Considering the size of the analysis area, the limited amount of herbicide used annually by the Forest Service and the non-federal entities, and the limited exposure of NLEBs, herbicide use and biocontrol would have minor adverse cumulative effects on NLEBs.

Many activities would implement design criteria that would help protect NLEBs. Therefore, 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 forest management and other actions listed in the Matrix would have a minor adverse

cumulative effect on the NLEB. This is based on the low level of vegetation management on the HMNF (<2% of land base, annually), protection of known hibernacula, the presence of considerable areas where disturbance would be infrequent or absent (approximately 31% of total land base) and the implementation of design criteria to protect NLEBs.

### **Summary of Effects**

Potential effects of the action include direct effects to NLEB present within the action area when activities are being conducted, and indirect effects as a result of changes in habitat suitability. The conservation measures included through the Forest Plan and associated programmatic BO and individual project decisions will serve to reduce the potential for direct effects to the NLEB. However, direct effects to NLEB including mortality, injury, harm, or harassment as a result of the removal, burning, or modification of occupied or established roost trees remain. The potential for direct effects to NLEB are greatest when activities are conducted during the species' non-volant period.

Indirect effects from the action may result from habitat modification and primarily involve changes to roosting and foraging suitability. Timber harvests and tree clearing associated with road-related activities could have both adverse and beneficial effects on habitat suitability for the NLEB. Prescribed fire may also result in both adverse and beneficial effects on roosting habitat through loss and creation of existing roosts, and long-term changes in forest composition towards a greater abundance of suitable roosts in the future. Prescribed fire may also have a short-term adverse and long-term beneficial effect on prey abundance, and thus foraging habitat suitability in the action area. The overall effect of the prescribed fire portion of the proposed action on habitat suitability may be neutral to potentially beneficial. Given the scope of the projects in relation to the overall action area, these projects will not substantially alter the overall availability or suitability of NLEB roosting or foraging habitat.

Throughout the course of conducting the above actions, the NLEB may also experience disturbance from other project-related activities such as, increased noise during the day, artificial lighting and increased noise at night, increased presence of people, etc. These effects are typically short-term and temporary in nature, and limited in size compared to the amount of available habitat and NLEB home range size. We expect that the response of NLEB to these disturbances to be minor (e.g. startle, alarm, possible temporary abandonment of roost site, etc.) and do not anticipate that the level of disturbance would have a significant effect on individuals or the local NLEB population.

In any given year, less than 2% of HMNF lands receive any type of treatment, and approximately 58% of all timber harvests occur outside the summer occupancy period.

While the HMNF's proposed action will not alter the amount or extent of mortality or harm to NLEB resulting directly from WNS, the proposed action does have the potential to both increase and decrease the chances that WNS-affected bats present in the action area will survive and recover.

Based on the analysis above, the proposed action should not significantly reduce the ability of the action area to meet the conservation needs of the species. The proposed action will not affect

any hibernating NLEB and the project area will continue to provide suitable roosting and foraging habitat during the spring staging, summer occupancy, and fall swarming periods. While there is potential for direct and indirect effects to the species, given the small-scale of the proposed action in relation to the action area, and the current distribution and abundance of the NLEB on the HMNF, the NLEB should be able to continue to survive and reproduce on the HMNF.

There is no proposed critical habitat for the NLEB, and thus, none will be adversely affected.

## **CONCLUSION**

WNS is the primary threat to species continued existence. All of the other (non-WNS) threats, including forestry management, combined did not lead to imperilment of the species. However, in those areas of the country impacted by WNS, the conservation measures in the interim 4(d) rule for NLEB, and adopted as a part of these proposed actions, focus on protecting individual bats in known roosts and hibernacula to minimize needless and preventable deaths of bats during the species' most sensitive life stages. Although not fully protective of every bat, these conservation measures help protect some roosting and hibernating individuals.

According to the interim 4(d) rule, the Service projected that forest management activities will affect approximately 2 percent of all forests in States within the range of the northern long-eared bat to (Boggess et al. 2014). Further, only a portion of this forested habitat will actually be harvested during the NLEB active season (April–October), and a smaller portion yet would be harvested during the pup season. Given these estimated impacts to suitable habitat (i.e., forest within the range of the species), the Service estimated that a number of NLEB will be directly affected by forest management activities during the active season. Implementation of the interim 4(d) rule conservation measures should further reduce the take of those individual bats where there are known roost trees. When occupied roosts are cut during the active season (outside of the pup season) or if undocumented NLEB roosts are cut while occupied, some portion of these individuals will flee the roost and survive. The conservation measures will further protect known NLEB hibernacula, including a portion of the surrounding habitat. Thus, the Service, in the interim 4(d) rule, anticipated only a small percentage (estimated less than 1 percent) of NLEB will be directly impacted by forestry management activities.

In addition, according to the interim 4(d) rule, the Service anticipated that hazard tree removal, right-of-way maintenance, and minimal tree removal will only have a minimal impact on NLEB habitat and individuals. This activity will collectively impact only small percentages of NLEB habitat and individuals in the season during which they occur.

36 activities are not exempted from take through the interim 4(d) rule. The total amount of potential NLEB habitat affected by those 36 activities is approximately 4,599 acres. These activities include building maintenance/demolition, hardwood conversion to non-forested landscapes (i.e. fuelbreaks, wildlife openings, habitat conversion, recreation sites), and structure placement.

Similar to the actions included in the interim 4(d) rule, the HMNF's conservation measures would look to limit the amount of habitat affected during the active season and pup season. When compared to the area of potential habitat affected by exempted activities, and the amount

of total available habitat throughout the action area that is not affected by project activities, only a very small percentage of NLEB habitat and individuals would be affected by activities not included in the interim 4(d) rule.

Impacts to NLEB through direct injury/mortality, loss of roost trees, and maternity colony structure changes are unlikely to result in net reductions in the number of maternity colonies as well as associated wintering population fitness. In fact, we find that many of the proposed actions of the USFS are likely to result in benefits to the species over the long term due to the maintenance of a mosaic of forest types. Thus, no component of the proposed action is expected to reduce the reproduction, numbers, or distribution of the NLEB rangewide. While we recognize that the status of the species is uncertain due to WNS, given the environmental baseline, and the intensity, frequency, and duration of the project impacts, we found that the proposed project is unlikely to have population-level impacts, and thus, is also unlikely to decrease the reproduction, numbers, or distribution of the NLEB.

Based on the analysis above, despite the anticipated loss of individuals and population impacts, given the analysis in the interim 4(d) rule, the proposed action should not decrease the reproduction, numbers, or distribution of the NLEB. Therefore, we do not anticipate an appreciable reduction in the likelihood of both survival and recovery of the species as a whole

After reviewing the current status of this species, 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 northern long-eared bat.

## **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.

On April 2, 2015, the Service published an interim species-specific rule pursuant to section 4(d) of the ESA for northern long-eared bat (80 FR 17974). The Service's interim 4(d) rule for northern long-eared bat exempts the take of northern long-eared bat from the section 9

prohibitions of the ESA, when such take occurs as follows (see the interim rule for more information):

- (1) Take that is incidental to forestry management activities, maintenance/limited expansion of existing rights-of way, prairie management, projects resulting in minimal (<1 acre) tree removal, provided these activities:
  - a. Occur more than 0.25 mile (0.4 km) from a known, occupied hibernacula;
  - b. Avoid cutting or destroying known, occupied roost trees during the pup season (June 1–July 31); and
  - c. Avoid clearcuts (and similar harvest methods, *e.g.*, seed tree, shelterwood, and coppice) within 0.25 (0.4 km) mile of known, occupied roost trees during the pup season (June 1–July 31).
- (2) Removal of hazard trees (no limitations).
- (3) Purposeful take that results from
  - a. Removal of Bats From and Disturbance Within Human Structures and
  - b. Capture, handling, and related activities for northern long-eared bats for 1 Year following publication of the interim rule.

The incidental take that is carried out in compliance with the interim 4(d) rule does not require exemption in this Incidental Take Statement. Accordingly, there are no reasonable and prudent measures or terms and conditions that are necessary and appropriate for these actions because all incidental take has already been exempted. The activities that are covered by the interim 4(d) are identified in Appendix A. The remainder of this analysis addresses the incidental take resulting from those elements of the proposed action that are not covered by the 4(d) rule.

### **AMOUNT OR EXTENT OF TAKE**

If NLEB are present or utilize an area proposed for timber harvest, habitat clearing, prescribed fire, or other disturbance, incidental take of NLEB could occur. The Service anticipates incidental take of the NLEB 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) NLEB form small, widely dispersed maternity colonies under loose bark or in the cavities 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. Unless every individual tree that contains suitable

roosting habitat is inspected by a knowledgeable biologist before management activities begin, it would be impossible to know if a roosting NLEB is present in an area proposed for harvest or prescribed burn. Inspecting individual trees is not considered by the Service to be a practical survey method and is not recommended as a means to determine incidental take. However, the areal extent of potential roosting and foraging habitat affected can be used as a surrogate to monitor the level of take.

As detailed in Table 7 below, the Service anticipates that no more than 135,999 acres of potential NLEB habitat will be taken as a result of ongoing and planned project activities on the HMNF. Of the total, 131,401 acres are exempted through the interim 4(d) rule, and the resulting 4,598 acres are addressed through the ITS. Project activities would primarily occur over the next 1-5 years; however some activities may extend over the next ten years.

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.

Table 7: Acreage affected by ongoing management activities on the HMNF that may result in take of NLEB

Action type	Acres of Adverse Effects	Acres exempted through interim 4(d) rule	Acres of Incidental Take
HWDCUT	11,858	7,931	3,927
HWDLMB	20,929	20,470	459
HWDHIB	628	628	
CONCUT	16,351	16,351	
CONLMB	24,969	24,969	
CONHIB	1,241	1,241	
OPNMM	4,159	4,101	58
OPNBR	1,888	1,888	
FIREWD	9,708	9,708	
HAZTREE	8,805	8,805	
RDBRUSH	9,610	9,610	
RDCLOSE	1,318	1,318	
SUP	7,210	7,210	
MINORTREE	194	194	
STUDIES	5	5	
WLFISHSTR	16,971	16,971	
BUILDING	155		155
<b>Total</b>	<b>135,999 Acres</b>	<b>131,401 Acres</b>	<b>4,599 Acres</b>

## **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 NLEB. No critical habitat has been designated for NLEB, 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 NLEB:

1. Protect hibernacula from disturbance.
2. Avoid the removal of known NLEB roost trees.
3. 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 No woody vegetation removal or soil disturbance will occur within 100 feet of known or assumed NLEB hibernacula entrances and associated features sinkholes, fissures, or other karst features.

The following term and condition implements the second RPM:

- 2.1 If any NLEB maternity 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 safety. 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 third RPM:

- 3.1 Due to the difficulty to detect and quantify the actual incidental take of NLEB, 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 an updated project list (Appendix A) that identifies the number of acres where

project activities were implemented and if any timing restrictions were followed. The annual report, to be provided by April 1 of each year, will also include the number of live or dead NLEB encountered and the results of any NLEB surveys conducted.

- 3.2 The Forest Service shall immediately notify the Service upon locating an injured or dead NLEB. Report the discovery of an injured or dead NLEB 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 NLEB and other forest bat species. These efforts contribute to the conservation and recovery of the NLEB 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 NLEB. We recognize that limited resources and other agency priorities may affect the ability of the USFS to conduct these activities at any given time.

- Northern long-eared bats would benefit from minimizing activities with adverse effects during the period of summer occupancy (May 1 – September 1). Bats cannot be directly injured or killed if they are not present when the activities are in progress. Summer occupancy (First Tier) is defined as the time reasonably to be expected for bats to arrive at their summer home range until when most have migrated from the summer home range. If an activity with potential adverse effects cannot avoid the summer occupancy period, consideration should be made for implementation outside of the important non-volant period (Second Tier) when NLEB pups are born to the time they are flying (June 15 – August 1). Once bats are capable of flight, their ability to flush and evade injury and mortality from certain USFS actions is enhanced. Adverse effects to NLEB would be minimized by following these timing restrictions.
- To protect swarming and staging areas, the HMNF should emphasize the conservation of NLEB habitat within 5 miles of hibernacula. Incorporating NLEB habitat features into other activities compatible with NLEB conservation, where feasible or practical, would benefit the species. In addition, where feasible or practical, project activities should occur at times when impacts to the bat would be minimized.

- Continue to gather information on the NLEB'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 NLEB colonies
  - Participate in North American Bat Monitoring Program (NABat) surveys
  - Investigate habitat characteristics of the forest in areas where post-WNS NLEB occurrences have been documented (e.g. forest type, cover, distance to water)
  - Investigate NLEB use (acoustics, radio telemetry) of recently managed areas of different prescriptions
  
- Provide support to expand on scientific studies and educational outreach efforts on NLEB 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)
  
- Continue to assess (through Biological Assessments and/or NEPA associated assessments) the potential for activities (e.g., mining, drilling, fill, timber management, prescribed fire, etc.) to influence hibernacula or their microclimate.
  
- Continue to assess (through Biological Assessments and/or NEPA associated assessments) human access near hibernacula (e.g., trails and roads) that may increase the accessibility of hibernacula and evaluate for evidence of human access to hibernacula and the need for additional protective measures.
  
- 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 April 7, 2015. 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 acres of potential 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. In instances where the amount or extent of incidental take is exceeded, any operations causing such a take must cease pending reinitiation.

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Appendix A - List of Actions

District	NEPA Document Name	Activity	Cutting Veg > 3" DBH?	Vegetative Community	Take Excepted Through Interim 4d Rule?	4d Comments	Matrix Code	Will Incorporate Matrix Design Criteria?	Existing Timing Restrictions	Number of Units Planned	UOM	Number of Units Implemented	Number of Units To Be Implemented (Calculated)	Under Contract?	Indiana Bat Mitigations? (MNF Only)	Can Incorporate Additional Mitigations for NLEB?	Comments
SO	N/A	Firewood Cutting	Yes	Mixed Hardwood/Conifer	Yes	Minimal tree removal.	(FIREWD-LAA)	No		4,854	Acres	0	4854	Yes	No	No	Acres open to firewood cuttings is 116,299. Affected is less than 4,854 acres per year, or 0.5% of the HMNF. See effects. Trees cut are typically individual trees scattered over a very large area.
SO	N/A	Holiday Tree Harvesting	No	Conifer			(HOLIDAYTREES-NLAA)	No	Sell permits in November and December.	1	Acres	0	1	Yes	No	No	Generally do not sell Christmas trees greater than 3" diameter. If the tree had a 3" diameter at 4.5 feet, the total tree height would probably be in the range of a minimum of 15 to 20 feet tall (Stimak, pers. Comm.).
SO	N/A	Hazard Tree Removal	Yes	Mixed Hardwood/Conifer	Yes	Hazard tree removal.	(HAZTREE-LAA)	Yes		8800	Acres	0	8800		No	No	Annual estimate. 800 acres for trail maintenance; 64 acres for developed recreation sites (2 acre average per site). 16 acres for dispersed developed (manistee backwaters/auSable canoe, for example), - 880 acres (Kristen Thrall, pers. comm.) x 10 years remaining in Forest Plan implementation.
SO	N/A	Tree Pruning	No	Mixed Hardwood/Conifer			(PRUNE-NLAA)	No		2500	Acres	0	2500		No	No	250 acres per year over 10 years.
SO	N/A	Roadside Brushing	Yes	Mixed Hardwood/Conifer	Yes	Rights-of-way maintenance/expansion.	(RDBRUSH-LAA)	No		9610	Acres	0	9610	Yes	No	No	Approximately 961 acres per year over 10 years.
SO		Misc. Road Closures and Decommissioning	Yes	Mixed Hardwood/Conifer	Yes	Minimal tree removal.	(RDCLOSE-LAA)	No		1164	Acres	0	1164	No	No	No	20 to 60 miles closed each year. Some are reclosures. Average of 40 miles per year over the 10 years remaining in the Forest Plan. Estimated maximum acres affected. 40*5280*24/43560=1164 acres
SO	N/A	Recreational Residence Permits	Yes	Mixed Hardwood/Conifer	Yes	Minimal tree removal.	(SUP-LAA)	No		60	Each	0	60	Yes	No	No	No veg. mgmt. without prior authorizing officer approval; no veg. mgmt approval known. Maximum 3 trees per year (Kristen Thrall pers. comm.), max. 60 trees over life of plan.
SO	N/A	Special Use Permits	Yes	Hardwood	Yes	See SpecialUsePermitList Tab	(SUP-LAA)	No		7210	Acres	0	7210	Yes	No	No	See HMNF Master SUP List. Approximately 814 permits totalling approximately 7,210 acres.
SO	N/A	Landline Surveys and other minor activities with tree cutting	Yes	Mixed Hardwood/Conifer	Yes	Minimal tree removal.	(MINORTREE-LAA)	No		145	Acres	0	145		No	No	Approximately 14.5 acres per year, or 145 acres over 10 years.
SO	N/A	Mineral Sismic and non-Sismic Surveys	No	Mixed Hardwood/Conifer	Yes	Minimal tree removal.	(MINORTREE-LAA)	No		36	Acres	0	36		No	No	10 miles per year for 10 years=100 miles. 100*5280*3 feet wide/43560=36 acres over 10 years.
SO		Mineral 3-D Surveys	No	Mixed Hardwood/Conifer	Yes	Minimal tree removal.	(MINORTREE-LAA)	No		13	Acres	0	13		No	No	Estimated maximum area affected over 10 years.
SO	N/A	Insect and disease destructive studies (Girdling- felling- collecting nurse logs)	Yes	Mixed Hardwood/Conifer	Yes	Minimal tree removal.	(STUDIES-LAA)	Yes		5	Acres	0	5		No	No	Approximately 50 trees per year (less than 0.5 acres), or 10 acres over the life of the Forest Plan (20 years).
SO	N/A	Building Maintenance or Demolition	No	Other	No	No 4d exception.	(BUILDING-LAA)	Yes		155	Acres	0	155		No	No	Estimated 30 structures maintained per year, 2 structures demolished (Jim Streizhar, Paul Salvatore, pers. Comm). Over the life of the Forest Plan, an estimated maximum of 150 acres would be impacted by maintenance, a maximum of 5 acres would be impacted by demolition.
SO	Huron Manistee National Forests Non-native Invasive Plant Control Project EA	Herbicide spraying (backpack, vehicle broadcast, wick application) and Biocontrol insect releases	No	Other	No		(HERB-NLAA)	Yes		20000	Acres	0	20000	No		No	Estimated 2000 acres per year for 10 years estimated remaining life of EA.
MIO	Old Runway CE	Red pine thinning	Yes	Conifer			(CONCUT-NLAA)	Yes	May 1 to August 31	30	Acres	0	30	No		No	
MIO	Old Runway CE	Alder regeneration	No	Wetland			(NOEFFECT)	No		113	Acres	0	113	No		No	
MIO	Old Runway CE	temporary road	Yes	Conifer			(CONCUT-NLAA)	Yes	May 1 to August 31	0.5	Each	0	0.5	No		No	
MIO	Blockhouse EA	fuelbreaks	YES	Conifer	Yes	Forest management. Conifer to opening.	(CONCUT-LAA)	No		246	Acres	0	246	No		No	
MIO	Blockhouse EA	ladder fuel removal	YES	Conifer			(CONCUT-NLAA)	No		5	Acres	0	5	No		No	
MIO	Blockhouse EA	jack pine thinning	YES	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		33	Acres	0	33	No		No	
MIO	Blockhouse EA	prescribed burning	YES	Other			(HWDLMB-NLAA)	Yes		2610	Acres	0	2610	No		Yes	low - mod intensity, conifers, hardwoods, and openings
MIO	Blockhouse EA	prescribed burning	YES	Conifer	Yes	Forest management.	(CONHIB-LAA)	No		1001	Acres	0	1001	No		No	high intensity prescribed fire
MIO	Blockhouse EA	clearcut and plant	YES	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		118	Acres	0	118	No		No	
MIO	Blockhouse EA	oak and pine-oak thinning	YES	Mixed Hardwood/Conifer			(HWDCUT-NLAA)	Yes		1002	Acres	0	1002	No		Yes	
MIO	Blockhouse EA	Red Pine Thinning	YES	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		168	Acres	0	168	No		No	
MIO	Blockhouse EA	Opening creation/maintenance	YES	Other			(HWDCUT-NLAA)	Yes		372	Acres	0	372	No		Yes	Opening creation in hardwoods and conifers. Maintenance in existing openings. Could possibly mitigate for contracts but not prescribed burning.
MIO	Blockhouse EA	Road closure	YES	Other	Yes	Minimal tree removal.	(RDCLOSE-LAA)	No		6	Acres	0	6	no		No	2 miles of road closure.
MIO	Blockhouse EA	NNIS treatment	No	Other			(HERB-NLAA)	No		300	Acres	0	300			No	
MIO	Hughes Lake East Aspen EA	Aspen clearcut	YES	Hardwood			(HWDCUT-NLAA)	Yes	Apr 1 to August 31	437	Acres	0	437	No		Yes	
MIO	Hughes Lake East Aspen EA	prescribed burning	YES	Hardwood	Yes	Forest management.	(HWDHIB-LAA)	No		163	Acres	0	163	No		No	high intensity prescribed fire
MIO	Hughes Lake East Aspen EA	temporary road	YES	Hardwood			(HWDCUT-NLAA)	Yes		8	Acres	0	8	No		Yes	2.2 miles temp road construction; estimated acres (2.2x5280x30); 30' wide clearing.
MIO	Hughes Lake East Aspen EA	Forest road and trail reconstruction/maintenance	YES	Mixed Hardwood/Conifer	Yes	Rights-of-way maintenance/expansion.	(HWDCUT-LAA)	No		215	Acres	0	215			No	59 miles of road and trail maintenance; estimated acres (59x5280x30). 15' on each side of road.
MIO	Hughes Lake East Aspen EA	Opening maintenance	YES	Opening			(OPN<3-NLAA)	No		2	Acres	0	2	no		No	
MIO	Hughes Lake East Aspen EA	NNIS treatment	No	Other			(HERB-NLAA)	No		300	Acres	0	300			No	
MIO	Mio/AuSable Large Woody Debris CE	Large woody debris in river	YES	Mixed Hardwood/Conifer			(WLFISHSTR-NLAA)	Yes	May 1 to August 31	1365	Each	0	1365	no		Yes	timing restriction for NLEB
MIO	ITC Road Use Permit and McKinley Trail Camp Red Pine Thinning CE	Red Pine Thinning	YES	Conifer			(CONCUT-NLAA)	Yes		34	Acres	0	34			Yes	
MIO	2013 Motorized Trail and Resource Improvement Project CE	Red Pine Thinning	YES	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		67	Acres	67	0			No	will be cut when ground is frozen (arch mitigation)
MIO	2013 Motorized Trail and Resource Improvement Project CE	trail reconstruction and realignment	YES	Conifer	Yes	Minimal tree removal, right-of-way maintenance, hazard tree removal.	(HWDCUT-LAA)	No		6	Each	0	6			No	6 trails; in progress
MIO	2013 Motorized Trail and Resource Improvement Project CE	rehabilitate sand and gravel pit	No	Opening			(OPN<3-NLAA)	No		2	Acres	0	2			No	
MIO	Mack Lake Wildlife and Fuels Project CE	Red Pine Thinning	YES	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		65	Acres	65	0	Yes		No	Tower North KW
MIO	Mack Lake Wildlife and Fuels Project CE	fuelbreaks	No	Conifer			(OPN<3-NLAA)	No		3	Acres	0	3			No	fuelbreak has been created, may be maintained through cutting or prescribed burning
MIO	2012 Prescribed Fire and Planting Project CE	prescribed burning	YES	Mixed Hardwood/Conifer			(HWDLMB-NLAA)	Yes		40	Acres	0	40			Yes	
MIO	Abbe Road Ips Beetle Suppression Project CE	reforest	No	Conifer			(SPREP-NLAA)	No		29	Acres	29	0			No	
MIO	F-32 Project EA	Red Pine Thinning	YES	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		469	Acres	0	469			No	
MIO	F-32 Project EA	Aspen clearcut	YES	Hardwood			(HWDCUT-NLAA)	Yes	Apr 1 to August 31	55	Acres	0	55	No		Yes	
MIO	F-32 Project EA	oak clearcut	YES	Hardwood			(HWDCUT-NLAA)	Yes		49	Acres	0	49			Yes	
MIO	F-32 Project EA	oak thinning/overstory removal	YES	Hardwood			(HWDCUT-NLAA)	Yes		234	Acres	0	234			Yes	
MIO	F-32 Project EA	oak TSI	YES	Hardwood			(HWDCUT-NLAA)	Yes		133	Acres	0	133			Yes	TSI through prescribed burning, mechanical or manual cutting and/or herbicide application
MIO	F-32 Project EA	prescribed burning	YES	Other			(HWDLMB-NLAA)	Yes		1822	Acres	0	1822			Yes	habitat types include openings, conifer, and mixed hardwood/conifer
MIO	F-32 Project EA	Wynlen prescribed burning	YES	Mixed Hardwood/Conifer			(HWDLMB-NLAA)	Yes		17	Acres	0	17			Yes	private land
MIO	F-32 Project EA	fuelbreaks	YES	Conifer	Yes	Forest management. Conifer to opening.	(CONCUT-LAA)	No		64	Acres	0	64			No	
MIO	F-32 Project EA	Opening creation/maintenance	YES	Conifer			(CONCUT-NLAA)	Yes		159	Acres	0	159			Yes	
MIO	F-32 Project EA	NNIS treatment	No	Other			(HERB-NLAA)	No		2925	Acres	0	2925			No	
MIO	F-32 Project EA	Rehabilitate resource damage	YES	Hardwood	Yes	Forest management.	(HWDCUT-LAA)	No		5	Acres	0	5			No	
MIO	2011 Mio Early Successional Projects CE	Opening creation/maintenance	Yes	Opening			(OPNMM-NLAA)	Yes		316	Acres	0	316			Yes	
MIO	4001 Landing Repair and Maintenance Letter to file	Opening creation/maintenance	Yes	Opening	Yes	Minimal tree removal, right-of-way maintenance, hazard tree removal.	(HAZTREE-LAA)	No		5	Acres	0	5			No	
MIO	2010 Mio Wildlife Openings CE	Opening creation/maintenance	Yes	Opening			(OPNMM-NLAA)	Yes		734	Acres	0	734			Yes	
MIO	Au Sable Non-Motorized Trails Project CE	trail construction/maintenance	YES	Mixed Hardwood/Conifer	Yes	Minimal tree removal, right-of-way maintenance, hazard tree removal.	(HWDCUT-LAA)	No		1.2	Each	1.2	0			No	1.7 miles trail; install signs, fencing; boardwalk installation and trail construction complete
MIO	Lost Creek HFRA EA	Red Pine Thinning	YES	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		1010	Acres	546	464	Yes		Yes	Green Deeter, Sky Ranch (can add to Green Deeter)
MIO	Lost Creek HFRA EA	Barrens creation/maintenance	YES	Conifer	Yes	Forest management. Conifer to opening.	(CONCUT-LAA)	No		522	Acres	324	198	yes		No	Skyranch
MIO	Lost Creek HFRA EA	temporary road	YES	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		2	Each	0	2			No	2 miles temp roads and landings
MIO	Lost Creek HFRA EA	prescribed burning	YES	Conifer			(CONLMB-NLAA)	Yes		1387	Acres	0	1387			Yes	
MIO	Lost Creek HFRA EA	fuelbreaks	YES	Conifer	Yes	Forest management. Conifer to opening.	(CONCUT-LAA)	No		410	Acres	310	100	Yes		Yes	created (Green Deeter and ARRA) still have maintenance
MIO	Lost Creek HFRA EA	Rebilitate and reforest pit	No	Opening			(OPN<3-NLAA)	No		1	Each	1	0			No	
MIO	Lost Creek HFRA EA	NNIS treatment	No	Conifer			(HERB-NLAA)	No		300	Acres	0	300			No	

Appendix A - List of Actions

District	NEPA Document Name	Activity	Cutting Veg > 3" DBH?	Vegetative Community	Take Excepted Through Interim 4d Rule?	4d Comments	Matrix Code	Will Incorporate Matrix Design Criteria?	Existing Timing Restrictions	Number of Units Planned	UOM	Number of Units Implemented	Number of Units To Be Implemented (Calculated)	Under Contract?	Indiana Bat Mitigations? (MNF Only)	Can Incorporate Additional Mitigations for NLEB?	Comments
MIO	Big Creek HFRA Project EA	fuelbreaks	Yes	Opening			(OPN<3-NLAA)	No		146	Acres	0	146				created but will need maint
MIO	Big Creek HFRA Project EA	prescribed burning	Yes	Conifer			(CONLMB-NLAA)	Yes		713	Acres	0	713			Yes	
MIO	Big Creek HFRA Project EA	Red Pine Thinning	Yes	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		294	Acres	294	0				
MIO	Big Chase Project EA	clearcut and plant	Yes	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		737	Acres	345	392	Yes			Hermit Thrush
MIO	Big Chase Project EA	clearcut	Yes	Hardwood			(HWDLMB-NLAA)	Yes		11	Acres		11			Yes	
MIO	Big Chase Project EA	Red Pine Thinning	Yes	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		888	Acres	453	435	Yes			Chase Bridge, Hermit Thrush
MIO	Big Chase Project EA	Barrens creation/maintenance	Yes	Conifer	Yes	Forest management. Conifer to opening.	(CONCUT-LAA)	No		424	Acres	178	246	Yes		No	Chase Bridge
MIO	Big Chase Project EA	Opening creation/maintenance	Yes	Conifer	Yes	Forest management. Conifer to opening.	(CONCUT-LAA)	No		201	Acres	0	201				
MIO	Big Chase Project EA	temporary road	Yes	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		2	Each	2	0				2 miles temp roads and landings
MIO	Big Chase Project EA	reforest	No	Opening			(SPREP-NLAA)	No		33	Acres		33				
MIO	Big Chase Project EA	prescribed burning	Yes	Opening			(OPNBRN-NLAA)	Yes		1248	Acres	0	1248			Yes	
MIO	Big Chase Project EA	fuelbreaks	Yes	Conifer	Yes	Forest management. Conifer to opening.	(CONCUT-LAA)	No		214	Acres	214	0	Yes			created (Hermit Thrush, Chase Bridge, ARRA) will need maint
MIO	Big Chase Project EA	NNIS treatment	No	Other			(HERB-NLAA)	No		300	Acres	0	300				
MIO	Big Chase Project EA	stream bank stabilization	Yes	Conifer			(WLFISHSTR-NLAA)	Yes		0.5	Acres	0	0.5			Yes	cabin site - ask Karlis
MIO	Big Chase Project EA	Road closure	Yes	Mixed Hardwood/Conifer	Yes	Minimal tree removal.	(RDCLOSE-LAA)	No		20	Acres	20	0				close roads and trails at the Chase Bridge Gravel Pit
MIO	Big Chase Project EA	parking area	Yes	Conifer	Yes	Forest management. Conifer to opening.	(CONCUT-LAA)	No		4.5	Acres	4.5	0				enlarge and improve parking areas at Meridian ORV Trailhead (M-72) and Wakeley Lake (M-72)
MIO	Hilltop Fuels Reduction Project CE	fuelbreak creation and maintenance	No	Conifer			(OPNBRN-NLAA)	Yes		0		0	0			Yes	
MIO	Hilltop Fuels Reduction Project CE	Opening maintenance	No	Opening			(OPNBRN-NLAA)	Yes		0		0	0			Yes	
MIO	Hilltop Fuels Reduction Project CE	prescribed burning	Yes	Conifer			(CONLMB-NLAA)	Yes		119	Acres	0	119			Yes	
MIO	Mio Wildlife Habitat Improvement Project 2008 CE	Opening maintenance	Yes	Opening	Yes	Forest management.	(OPNMM-LAA)			450	Acres	0	450				
MIO	Luzerne/Mentor Township Fuels Reduction Project CE	prescribed burning	Yes	Conifer	Yes	Forest management.	(CONLMB-LAA)	No		505	Acres	0	505				
MIO	Meridian Road Prescribed Burn Project	Opening maintenance	Yes	Opening			(OPNMM-LAA)	Yes		135	Acres	0	135			Yes	
MIO	Meridian Road Prescribed Burn Project	prescribed burning	Yes	Other			(HWDLMB-NLAA)	Yes		21	Acres	0	21			Yes	Mio admin office site
MIO	Meridian Road Prescribed Burn Project	Red Pine Thinning	Yes	Conifer			(CONCUT-NLAA)	Yes		63	Acres	0	63			Yes	
MIO	Meridian Road Prescribed Burn Project	NNIS treatment	No	Other			(HERB-NLAA)	No		300	Acres	0	300				
MIO	Claybanks Watershed Project CE	stream bank stabilization	Yes	Other			(WLFISHSTR-NLAA)	No		1	Each	1	0				approx 150 feet of riverbank
MIO	Au Sable River Prescribed Fire Project CE	prescribed burning	Yes	Conifer			(CONLMB-NLAA)	Yes		370	Acres	0	370			Yes	
MIO	2006 Mio Opening Improvements Project CE	Opening maintenance	Yes	Opening			(OPNMM-LAA)	Yes		550	Acres	0	550			Yes	
MIO	Curtisville-Ninemile Project EA	prescribed burning	Yes	Mixed Hardwood/Conifer			(HWDLMB-NLAA)	Yes		550	Acres	0	550			Yes	
MIO	Curtisville-Ninemile Project EA	Red Pine Thinning	Yes	Conifer			(CONCUT-NLAA)	Yes		23	Acres	0	23			Yes	
MIO	Curtisville-Ninemile Project EA	erosion control	No	Other			(NOEFFECT)	No		1	Each	0	1				red shoulder impoundment
MIO	Curtisville-Ninemile Project EA	bat box installation	No	Other			(WLFISHSTR-NLAA)	No		6	Each	0	6				
MIO	Curtisville-Ninemile Project EA	trail reconstruction	Yes	Hardwood			(HWDLMB-NLAA)	Yes		1	Each	1	0			Yes	reconstruct horse trail H56 within sections 19 and 20
MIO	Curtisville-Ninemile Project EA	Road closure	Yes	Other	Yes	Minimal tree removal.	(RDCLOSE-LAA)	No		82	Acres	28	54				Close 6 miles FS roads and 22 miles unclassified roads.
MIO	Mack/McKinley Ecosystem Management Project EA	jack pine clearcut	Yes	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		1476	Acres	1476	0	Yes		No	Tower North KW, Tower KW South, Raven
MIO	Mack/McKinley Ecosystem Management Project EA	reforest	No	Opening			(SPREP-NLAA)	No		1159	Acres	0	1159				
MIO	Mack/McKinley Ecosystem Management Project EA	Red Pine Thinning	Yes	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		927	Acres	927	0	Yes		No	Tower North KW, Tower KW South, Raven (Tower North has a NGO restriction for a couple of the red pine units)
MIO	Mack/McKinley Ecosystem Management Project EA	prescribed burning	Yes	Conifer			(CONLMB-NLAA)	Yes		1013	Acres	0	1013			Yes	underburn red pine and openings
MIO	Mack/McKinley Ecosystem Management Project EA	Aspen clearcut	Yes	Hardwood			(HWDLMB-NLAA)	Yes	Apr 1 to August 31	517	Acres	287	230	yes		Yes	South Maltby, Potts Winton, North Wagner
MIO	Mack/McKinley Ecosystem Management Project EA	overstory removal	Yes	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		21	Acres	0	21				
MIO	Mack/McKinley Ecosystem Management Project EA	fuelbreak creation and maintenance	Yes	Conifer	Yes	Forest management. Conifer to opening.	(CONCUT-LAA)	No		340	Acres	340	0				created
MIO	Mack/McKinley Ecosystem Management Project EA	trail building	Yes	Conifer	Yes	Minimal tree removal.	(CONCUT-LAA)	No		2.6	Each	0	2.6				2.6 miles ATV trail built
MIO	Mack/McKinley Ecosystem Management Project EA	widen road	Yes	Conifer	Yes	Rights-of-way maintenance/expansion.	(CONCUT-LAA)	No		0.5	Each		0.5				widen and create passing turnouts along approximately 0.5 miles of East Wagner Lake Road
MIO	Mack/McKinley Ecosystem Management Project EA	plant grasses	No	Opening			(OPN<3-NLAA)	No		28	Acres		28				
MIO	Mack/McKinley Ecosystem Management Project EA	NNIS treatment	No	Opening			(HERB-NLAA)	No		28	Acres	0	28				
MIO	Mack/McKinley Ecosystem Management Project EA	Opening maintenance	Yes	Opening			(OPN<3-NLAA)	Yes		40	Acres	0	40			Yes	Watson Road barrens
HS	King WUI 2005	fuelbreak creation and maintenance	Yes	Conifer	Yes	Forest management. Conifer to opening.	(CONCUT-LAA)	No		480	Acres	0	480				
MIO	Blue Bees Project EA	prescribed burning	Yes	Conifer			(CONLMB-NLAA)	Yes		1138	Acres	0	1138			Yes	
MIO	Blue Bees Project EA	Opening creation/maintenance	Yes	opening			(OPNMM-NLAA)	Yes		113	Acres	0	113			Yes	
MIO	Blue Bees Project EA	fuelbreak creation and maintenance	No	Conifer			(OPNB<3-NLAA)	No		140	Acres	0	140				
MIO	Valley Road Dry Sand Prairie Restoration	prescribed burning	Yes	Opening			(OPNBRN-NLAA)	Yes		690	Acres	0	690			Yes	
MIO	Loosestrife Control with Bio Control	bio control of NNIS	No				(NOEFFECT)	No		0		0	0				
MIO	Foley Swamp Wildlife Project	Opening maintenance	Yes	Opening			(OPNMM-NLAA)	Yes		126	Acres	0	126			Yes	
MIO	Luzerne West Wildlife Project	Opening maintenance	Yes	Opening			(OPNMM-NLAA)	Yes		367	Acres	0	367			Yes	
MIO	Sunrise Wildlife Project	Opening maintenance	Yes	Opening			(OPNMM-NLAA)	Yes		87	Acres	0	87			Yes	
MIO	West End Wildlife Project	Opening maintenance	Yes	Opening			(OPNMM-NLAA)	Yes		72	Acres	0	72			Yes	
MIO	Harbor Dune	timber management	Yes	Hardwood			(HWDLMB-NLAA)	Yes		886	Acres	886	0			Yes	
MIO	Harbor Dune	prescribed burning	Yes	Hardwood			(HWDLMB-NLAA)	Yes		156	Acres	0	156			Yes	
MIO	Thrasher KW	fuelbreak creation and maintenance	Yes	Conifer			(CONCUT-NLAA)	Yes		11	Acres	0	11			Yes	needs maintenance; planned for FY15
MIO	Snow Bunting	fuelbreak maintenance	Yes	Opening			(OPN<3-NLAA)	No		20	Acres	0	20				
MIO	Sunshine Project EA	Red Pine Thinning	Yes	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		1233	Acres	0	1233	Yes		No	Noontime, Midnight
MIO	Sunshine Project EA	jack pine clearcut	Yes	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		234	Acres	170	64	Yes		No	Noontime, Midnight
MIO	Sunshine Project EA	Barrens creation/maintenance	Yes	Conifer	Yes	Forest management. Conifer to opening.	(CONCUT-LAA)	No		91	Acres	91	0	Yes		No	Noontime, Midnight
MIO	Sunshine Project EA	Opening creation/maintenance	Yes	Opening			(OPNMM-NLAA)	Yes		78	Acres	78	0			Yes	
MIO	Sunshine Project EA	fuelbreak creation and maintenance	Yes	Conifer			(OPNMM-NLAA)	Yes		47	Acres	47	0			Yes	created
MIO	Sunshine Project EA	temporary road	Yes	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		0		0	0				temp roads and landings
HS	Corsair FY14	Red Pine Thinning	Yes	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		683	Acres	0	683	No	No	Yes	NEPA is signed.
HS	Corsair FY14	Red Pine Thinning w Rx fire	Yes	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		484	Acres	0	484	No	No	Yes	NEPA is signed.
HS	Corsair FY14	Oak Thinning (high site)	Yes	Hardwood			(HWDLMB-NLAA)	Yes		452	Acres	0	452	No	No	Yes	NEPA is signed.
HS	Corsair FY14	Oak Shelterwood w Rx fire (low site)	Yes	Hardwood			(HWDLMB-NLAA)	Yes		1770	Acres	0	1770	No	No	Yes	NEPA is signed.
HS	Corsair FY14	Expand Monument snowmobile parking lot	Yes	hardwood	No	Hardwood conversion.	(HWDLMB-NLAA)	No		10	Each	0	10	No	No	Yes	NEPA is signed.
HS	Corsair FY14	Maintain fish structures	Yes	Conifer	Yes	Minimal tree removal.	(CONCUT-LAA)	No		2	Each	0	2	No	No	Yes	NEPA is signed.
HS	Corsair FY14	Non merchantable fuel reduction w Rx fire	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDLMB-LAA)	No		2293	Acres	0	2293	No	No	Yes	NEPA is signed.
HS	Corsair FY14	Create Fuelbreaks	Yes	Conifer	Yes	Forest management. Conifer to opening.	(CONCUT-LAA)	No		361	Acres	0	361	No	No	Yes	NEPA is signed.
HS	Corsair FY14	Apply Rx fire	No	Mixed Hardwood/Conifer	Yes	Forest management.	(CONLMB-LAA)	No		9033	Acres	0	9033	No	No	Yes	NEPA is signed.
HS	Tawas New Dawn FY12	Regenerate jack pine for KW	Yes	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		1370	Acres	420	950	No	No	Yes	
HS	Pine River Snowbird FY11	Regenerate jack pine for KW	Yes	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		693	Acres	419	274	Yes	No	No	Turner Deer
HS	Clear Lake Aspen FY11	Clearcut Aspen	Yes	Hardwood			(HWDLMB-NLAA)	Yes		620	Acres	0	620	No	No	Yes	
HS	Clear Lake Aspen FY11	Red Pine Thinning	Yes	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		18	Acres	0	18	No	No	Yes	
HS	Clear Lake Aspen FY11	Apply Rx fire to regen aspen	NO	Hardwood			(HWDLMB-NLAA)	Yes		29	Acres	0	29	No	No	Yes	
HS	Clear Lake Aspen FY11	Create Snags downed woody debris	Yes	Conifer			(WLFISHSTR-NLAA)	Yes		18	Acres	0	18	No	No	Yes	
HS	Brittle II Fuels Reduction FY 10	Fuelbreak Creation and/or maintenance (Rx fire)	Yes	Hardwood	No	Hardwood conversion.	(HWDLMB-NLAA)	No		236	Acres	73	163	Yes	No	Yes	Britt
HS	Brittle II Fuels Reduction FY 10	Red Pine Thinning	Yes	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		58	Acres	0	58	No	No	Yes	
HS	Brittle II Fuels Reduction FY 10	Remove decadent trees from Rollways H-4 and H-5	Yes	Hardwood			(HWDLMB-NLAA)	Yes									

Appendix A - List of Actions

District	NEPA Document Name	Activity	Cutting Veg > 3" DBH?	Vegetative Community	Take Excepted Through Interim 4d Rule?	4d Comments	Matrix Code	Will Incorporate Matrix Design Criteria?	Existing Timing Restrictions	Number of Units Planned	UOM	Number of Units Implemented	Number of Units To Be Implemented (Calculated)	Under Contract?	Indiana Bat Mitigations? (MNF Only)	Can Incorporate Additional Mitigations for NLEB?	Comments
HS	Huron Shores Restoration Fuels FY08	Fuelbreak Creation and/or maintenance (Rx fire)	YES	Hardwood	No	Hardwood conversion.	(HWDCUT-LAA)	No		1024	Acres	1024	0	Yes	No	No	Britt, Iargo Webb, Wells Road, Turner Deer
HS	Huron Shores Restoration Fuels FY08	Red Pine Thinning	YES	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		985	Acres	985	0	Yes	No	No	Britt, Iargo Webb, Wells Road, Turner Deer
HS	Huron Shores Restoration Fuels FY08	Apply Rx fire to Red Pine	YES	Conifer			(CONLMB-NLAA)	Yes		1178	Acres	0	1178	No	No	Yes	
HS	Huron Shores Restoration Fuels FY08	Pine Barrens creation and/or maintenance	YES	Conifer	Yes	Forest management. Conifer to opening.	(CONCUT-LAA)	No		767	Acres	767	0	Yes	No	No	Wells Road, Turner Deer
HS	Huron Shores Restoration Fuels FY08	Apply Rx fire to landscape	YES	Conifer	Yes	Forest management.	(CONLMB-LAA)	No		4461	Acres	0	4461	No	No	Yes	
HS	Huron Shores Restoration Fuels FY08	Aspen clearcut	YES	Hardwood	Yes	Forest management.	(HWDCUT-LAA)	No		14	Acres	14	0	Yes	No	No	Britt
HS	Mix N Match II FY06	Oak Shelterwood	YES	Hardwood	Yes	Forest management.	(HWDCUT-LAA)	No	April 15-July 15	109	Acres	109	0	Yes	No	No	Kimberlin Oak
HS	Mix N Match II FY06	Oak Thinning (high site)	YES	Hardwood	Yes	Forest management.	(HWDCUT-LAA)	No	April 15-July 15	250	Acres	250	0	Yes	No	No	Kimberlin Oak
HS	Mix N Match II FY06	Oak regen from Rx fire	NO	Hardwood	Yes	Forest management.	(HWDLMB-LAA)	No	April 15-July 15	528	Acres	0	528	No	No	Yes	
HS	Mix N Match II FY06	Red Pine Thinning	YES	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		206	Acres	41	165	No	No	Yes	
HS	Mix N Match II FY06	Aspen clearcut	YES	Hardwood			(HWDCUT-NLAA)	No	April 1 to Sept 30	162	Acres	162	0	Yes	No	No	Lighter
HS	Mix N Match II FY06	Aspen Balsam fir clearcut regen	YES	Hardwood			(HWDCUT-NLAA)	No	April 15-July 15 May 1-Aug 31	66	Acres	66	0	No	No	Yes	
HS	Mix N Match II FY06	Northern hardwood select cut	YES	Hardwood	Yes	Forest management.	(HWDCUT-LAA)	No	April 15-July 15	29	Acres	29	0	Yes	No	No	Kimberlin Oak
HS	Mix N Match II FY06	Spruce clearcut regen	YES	Conifer	Yes	Forest management.	(CONCUT-LAA)	No	April 15-July 15	11	Acres	11	0	Yes	No	Yes	
HS	Mix N Match II FY06	Create opening thru clearcut	YES	Hardwood	No	Hardwood conversion.	(HWDCUT-LAA)	No	April 15-July 15	3	Acres	3	0	Yes	No	Yes	
HS	Mix N Match II FY06	Cut white poplar (NNIS)	YES	Hardwood	Yes	Forest management.	(HWDCUT-LAA)	No	April 15-July 15	3	Acres	0	3	Yes	No	Yes	
HS	Fountain FY06	Regenerate jack pine for KW	Yes	Conifer			(CONCUT-NLAA)	No	March 1 - Sept 1	413	Acres	413	0	No	No	Yes	
HS	Fountain FY06	Create opening thru clearcut	YES	Conifer			(CONCUT-NLAA)	No	March 1 - Sept 1	99	Acres	99	0	No	No	Yes	
HS	Fountain FY06	apply Rx fire to maintain opening	No	Conifer			(CONLMB-NLAA)	Yes	May 15- Sept 30	194	Acres	0	194	No	No	Yes	Rx fire permitted from Oct 1 to May 15 to protect EMASS
HS	Fountain FY06	Oak Shelterwood w Rx fire (low site)	YES	Hardwood			(HWDCUT-NLAA)	Yes	May 15- Sept 30	111	Acres	0	111	No	No	Yes	Rx fire permitted from Oct 1 to May 15 to protect EMASS
HS	Fountain FY06	Apply Rx fire to	NO	Hardwood			(HWDLMB-NLAA)	Yes	May 15- Sept 30	28	Acres	0	28	No	No	Yes	Rx fire permitted from Oct 1 to May 15 to protect EMASS
HS	Tawas KW 4 FY05	Red Pine Thinning	YES	Conifer			(CONCUT-NLAA)	Yes	March 1 - Sept 1	200	Acres	200	0	No	No	Yes	
HS	Tawas KW 4 FY05	Regenerate jack pine for KW	Yes	Conifer			(CONCUT-NLAA)	Yes	March 1 - Sept 1	700	Acres	700	0	No	No	Yes	
HS	Mix N Match FY05	Conifer thinning	YES	Conifer			(CONCUT-NLAA)	Yes	March 1 - Sept 1	240	Acres	240	0	Yes	No	Yes	Mix, Trix
HS	Mix N Match FY05	Hardwood selection cut	YES	Hardwood			(HWDCUT-NLAA)	Yes	March 1 - Sept 1	92	Acres	92	0	Yes	No	Yes	Mix, Trix
HS	Mix N Match FY05	Aspen clearcut	YES	Hardwood			(HWDCUT-NLAA)	Yes	March 1 - Sept 1	46	Acres	46	0	Yes	No	Yes	Mix, Trix
HS	Mix N Match FY05	Aspen/Oak Clearcut	YES	Hardwood			(HWDCUT-NLAA)	Yes	March 1 - Sept 1	54	Acres	54	0	Yes	No	Yes	Mix, Trix
HS	Mix N Match FY05	Oak Thinning (high site)	YES	Hardwood			(HWDCUT-NLAA)	Yes	March 1 - Sept 1	31	Acres	31	0	Yes	No	Yes	Mix, Trix
HS	Mix N Match FY05	Expand Opening	YES	Hardwood			(HWDCUT-NLAA)	Yes	March 1 - Sept 1	4	Acres	4	0	Yes	No	Yes	Mix, Trix
HS	South Branch Wicker FY04	Conifer thinning	YES	Conifer			(CONCUT-NLAA)	Yes	March 1 - Sept 1	980	Acres	923	57	No	No	Yes	Goshawk Nest protection
HS	South Branch Wicker FY04	Apply Rx fire to Red Pine	NO	Conifer			(CONLMB-NLAA)	Yes	March 1 - Sept 1	730	Acres	0	730	No	No	Yes	
HS	South Branch Wicker FY04	Jack pine/oak clearcut to regen oak/aspens	YES	Hardwood			(HWDCUT-NLAA)	Yes	March 1 - Sept 1	16	Acres	16	0	No	No	Yes	
HS	South Branch Wicker FY04	Aspen clearcut	YES	Hardwood			(HWDCUT-NLAA)	Yes	March 1 - Sept 1	35	Acres	35	0	No	No	Yes	
HS	South Branch Wicker FY04	Oak Shelterwood w Rx fire (low site)	YES	Hardwood	Yes	Forest management.	(HWDCUT-LAA)	No	May 15- Sept 30	22	Acres	0	22	No	No	Yes	Created (Rx fire permitted from Oct 1 to May 15 to protect EMASS)
HS	South Branch Wicker FY04	Oak Thinning (high site)	YES	Hardwood			(HWDCUT-NLAA)	Yes	March 1 - Sept 1	31	Acres	31	0	No	No	Yes	
HS	South Branch Wicker FY04	Fuelbreak Creation and/or maintenance (Rx fire)	YES	Conifer			(CONLMB-NLAA)	Yes	May 15- Sept 30	120	Acres	0	120	No	No	Yes	Created (Rx fire permitted from Oct 1 to May 15 to protect EMASS)
HS	South Branch Wicker FY04	create wildlife openings maintain w fire	YES	Hardwood	No	Hardwood conversion.	(HWDCUT-LAA)	No	May 15- Sept 30	75	Acres	0	75	No	No	Yes	Created (Rx fire permitted from Oct 1 to May 15 to protect EMASS)
HS	Long Lake FY04	Aspen clearcut	YES	Hardwood			(HWDCUT-NLAA)	Yes	March 1 - Sept 1	75	Acres	75	0	No	No	Yes	Harvest operations will occur only on frozen ground but not after March 1 or before August 31
HS	Long Lake FY04	Aspen non comm cut regen	YES	Hardwood			(HWDCUT-NLAA)	Yes	March 1 - Sept 1	24	Acres	24	0	No	No	Yes	
HS	Long Lake FY04	White pine release	YES	Conifer			(CONCUT-NLAA)	Yes	March 1 - Sept 1	6	Acres	6	0	No	No	Yes	
HS	Warbler FY03	Regenerate jack pine for KW	YES	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		1750	Acres	1750	0	No	No	Yes	
HS	Warbler FY03	Regen submerchantable jack pine	YES	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		300	Acres	300	0	No	No	Yes	
HS	Warbler FY03	create emass habitat	YES	Hardwood	No	Hardwood conversion.	(HWDCUT-LAA)	No		35	Acres	35	0	No	No	Yes	
HS	Pine Gate FY03	Red Pine Thinning w Rx fire	YES	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		846	Acres	0	846	No	No	Yes	
HS	Pine Gate FY03	Aspen regeneration	YES	Hardwood	Yes	Forest management.	(HWDCUT-LAA)	No		80	Acres	0	80	No	No	Yes	
HS	Pine Gate FY03	Pine Barrens creation and/or maintenance w fire	YES	Hardwood	No	Hardwood conversion.	(HWDCUT-LAA)	No		224	Acres	0	224	No	No	Yes	
HS	Pine Gate FY03	White pine release	YES	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		35	Acres	0	35	No	No	Yes	
HS	Pine Gate FY03	Create Fuelbreaks	YES	Hardwood	No	Hardwood conversion.	(HWDCUT-LAA)	No		19	Acres	0	19	No	No	Yes	
HS	HFI Fuels Reduction FY03	Fuelbreak Creation and/or maintenance (Rx fire)	YES	Conifer	Yes	Forest management. Conifer to opening.	(CONCUT-LAA)	No		132	Acres	0	132	No	No	Yes	
HS	HFI Fuels Reduction FY03	Fuelbreak Creation and/or maintenance (Rx fire)	YES	Conifer	Yes	Forest management. Conifer to opening.	(CONCUT-LAA)	No		79	Acres	0	79	No	No	Yes	
HS	HFI Fuels Reduction FY03	Fuelbreak Creation and/or maintenance (Rx fire)	YES	Conifer	Yes	Forest management. Conifer to opening.	(CONCUT-LAA)	No		192	Acres	0	192	No	No	Yes	
HS	HFI Fuels Reduction FY03	Fuelbreak Creation and/or maintenance (Rx fire)	YES	Conifer	Yes	Forest management. Conifer to opening.	(CONCUT-LAA)	No		321	Acres	0	321	No	No	Yes	
HS	Britt II FY02	Red Pine Oak Jack Pine Thinning	YES	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		2557	Acres	0	2557	Yes	No	Yes	
HS	Britt II FY02	Red Pine Release	YES	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		28	Acres	0	28	No	No	Yes	
HS	Britt II FY02	Jack pine clearcut	YES	Conifer	Yes	Forest management.	(CONCUT-LAA)	No		212	Acres	0	212	No	No	Yes	
HS	Britt II FY02	Aspen clearcut	YES	Hardwood	Yes	Forest management.	(HWDCUT-LAA)	No		18	Acres	0	18	No	No	Yes	
HS	Britt II FY02	Pine barrens creation and/or maintenance w fire	YES	Hardwood	No	Hardwood conversion.	(HWDCUT-LAA)	No		61	Acres	0	61	No	No	Yes	
HS	Britt II FY02	Pine barrens maintenance w fire	YES	Hardwood	Yes	Forest management.	(HWDLMB-LAA)	No		28	Acres	0	28	No	No	Yes	
HS	FB Opening Maintenance FY10	Maintain Fuelbreaks, Openings or savannahs w mechanical and/or fire	NO	Hardwood	Yes	Forest management.	(OPNMM-LAA)	No		2150	Acres	0	2150	No	No	Yes	
HS	Large woody debris project (AuSable)	Whole tree placement into river	YES	Conifer			(WLFISHSTR-NLAA)	Yes		2250	Each	1100	1150	No	No	Yes	
HS	2008 HS Wildlife Project	Maintain openings w/mech and/or Rx fire	YES	Hardwood	Yes	Forest management.	(OPNMM-LAA)	No		73	Acres	0	73	No	No	Yes	
HS	2008 HS Wildlife Project	Create opening thru clearcut, maintain w mech and/or fire	Yes	Hardwood	No	Hardwood conversion.	(HWDCUT-LAA)	No		36	Acres	0	36	No	No	Yes	
HS	2007 HS Wildlife Project	Maintain openings w/mech and/or Rx fire	NO	Hardwood	Yes	Forest management.	(OPNMM-LAA)	No		4	Each	4	0	No	No	Yes	
HS	2007 HS Wildlife Project	Create savannah and maintain w mechanical and/or fire	YES	Hardwood	No	Hardwood conversion.	(OPNMM-LAA)	No		4	Each	0	4	No	No	Yes	
HS	2006 Clarks Marsh NNIS and Rx Burn	Rx burn to suppress NNIS	NO	Conifer	Yes	Forest management.	(CONLMB-LAA)	No		300	Acres	0	300	No	No	Yes	
HS	King Wui 2005	Maintain Fuelbreaks, Openings or savannahs w mechanical	No	Hardwood			(OPN<3-NLAA)	No		470	Acres	470	0	No	No	Yes	
HS	King Wui 2005	Maintain Fuelbreaks, Openings or savannahs w Rx fire	NO	Hardwood			(OPNB<3-NLAA)	No		25	Acres	0	25	No	No	Yes	
HS	2002 Alcona Fuels	Create Fuelbreaks maintain mechanically	YES	Conifer	Yes	Forest management. Conifer to opening.	(CONCUT-LAA)	No		167	Acres	0	167				
HS	2002 Alcona Fuels	Maintain existing fuelbreak mechanically	NO	Conifer			(OPN<3-NLAA)	No		319	Acres	0	319				
HS	2009 Dali Aspen	Aspen clearcut	Yes	Hardwood			(HWDCUT-NLAA)	Yes		259	Acres	0	259	No		Yes	
HS	2009 Dali Aspen	Red pine thinning	Yes	Conifer			(CONCUT-NLAA)	Yes		143	Acres	0	143	No		Yes	
CM	Udell Hills EA	Red and White Pine Thinning	Yes	Conifer			(CONCUT-NLAA)	No	May 1 - August 31	570	Acres	235	335	Yes	YES	No	Ongoing timber sale.
CM	Udell Hills EA	Snag Creation	Yes	Conifer	Yes	Forest management.	(WLFISHSTR-LAA)	No	None	2280	Each	0	2280	No	YES	No	Ongoing timber sale.
CM	Udell Hills EA	Jack Pine Shelterwood and Site Prep	YES	Conifer			(CONCUT-NLAA)	No	May 1 - August 31	70	Acres	0	70	Yes	YES	No	Ongoing timber sale.
CM	Udell Hills EA	Jack Pine Overstory Removal and Site Prep	YES	Conifer			(CONCUT-NLAA)	No	May 1 - August 31	29	Acres	0	29	Yes	YES	No	Ongoing timber sale.
CM	Udell Hills EA	Aspen Clearcut and Site Prep	YES	Hardwood			(HWDCUT-NLAA)	No	May 1 - August 31	154	Acres	0	154	Yes	YES	No	Ongoing timber sale.
CM	Udell Hills EA	Upland Opening Improvement	YES	Opening			(OPNBRN-NLAA)	Yes		29	Acres	0	29	Yes	YES	No	Brushing Contract
CM	Udell Hills EA	Upland Opening Burning	NO	Opening			(OPNB<3-NLAA)	No	May 1 - August 31	14	Acres	0	14	No	YES	No	
CM	Udell Hills EA	Shrub Planting	NO	Hardwood			(NOEFFECT)	No	May 1 - August 31	17	Acres	0	17	No	YES		

Appendix A - List of Actions

District	NEPA Document Name	Activity	Cutting Veg > 3" DBH?	Vegetative Community	Take Excepted Through Interim 4d Rule?	4d Comments	Matrix Code	Will Incorporate Matrix Design Criteria?	Existing Timing Restrictions	Number of Units Planned	UOM	Number of Units Implemented	Number of Units To Be Implemented (Calculated)	Under Contract?	Indiana Bat Mitigations? (MNF Only)	Can Incorporate Additional Mitigations for NLEB?	Comments
CM	Toman School EA	Aspen Clearcut and Site Prep	YES	Hardwood			(HWDCUT-NLAA)	No	April 1 to Sept. 30	218	Acres	67	151	Yes	NO	No	Ongoing timber sale.
CM	Toman School EA	Red Pine Overstory Removal	YES	Conifer			(CONCUT-NLAA)	No	April 1 to Sept. 30	28	Acres	28	0	Yes	NO	No	Ongoing timber sale.
CM	Toman School EA	Hardwood Shelterwood and Site Prep	YES	Hardwood			(HWDCUT-NLAA)	No	April 1 to Sept. 30	60	Acres	24	36	Yes	NO	No	Ongoing timber sale.
CM	Toman School EA	Hardwood Overstory Removal and Site Prep	YES	Hardwood	Yes	Forest management.	(HWDCUT-LAA)	No	Nov. 15 to Sept. 14	15	Acres	11	4	Yes	NO	No	Ongoing timber sale.
CM	Toman School EA	Hardwood Thinning	YES	Hardwood	Yes	Forest management.	(HWDCUT-LAA)	No	None	33	Acres	0	33	Yes	NO	YES	Ongoing timber sale.
CM	Toman School EA	Opening Creation	YES	Hardwood			(HWDCUT-NLAA)	Yes	None	3	Acres	3	0	No	NO	YES	
CM	Toman School EA	TSI	YES	Hardwood	Yes	Forest management.	(HWDCUT-LAA)	No	None	13	Acres	6	7	Yes	NO	YES	
CM	Toman School EA	Tree Planting	NO	Conifer			(SPREP-NLAA)	No	None	11	Acres	0	11	Yes	NO	YES	
CM	Toman School EA	Upland Opening Maintenance	YES	Opening	Yes	Forest management.	(OPNMM-LAA)	No	None	163	Acres	0	163	Yes	NO	YES	Brushing Contract
CM	Toman School EA	Upland Opening Burning	NO	Opening			(OPNB-3-NLAA)	No	None	62	Acres	0	62	No	NO	YES	
CM	Toman School EA	NNIS Treatment	NO	Opening			(HERB-NLAA)	No	None	41	Acres	0	41	No	NO	YES	
CM	Toman School EA	Road Activity	YES	Hardwood			(HWDCUT-NLAA)	Yes	None	23.9	Each	0	23.9	No	NO	YES	
CM	Wagon Wheel EA	Red and White Pine Thinning	YES	Conifer	Yes	Forest management.	(CONCUT-LAA)	No	None	315	Acres	112	203	Yes	NO	YES	Ongoing timber sale.
CM	Wagon Wheel EA	Snag Creation	YES	Conifer	Yes	Forest management.	(WLFISHSTR-LAA)	No	None	1260	Each	1260	0	No	YES	No	
CM	Wagon Wheel EA	Aspen and Hardwood Clearcut and Site Prep	YES	Hardwood			(HWDCUT-NLAA)	No	April 1 to Sept. 30	171	Acres	143	28	Yes	NO	No	Ongoing timber sale.
CM	Wagon Wheel EA	Hardwood Shelterwood and Site Prep	YES	Hardwood	Yes	Forest management.	(HWDCUT-LAA)	No	None	87	Acres	0	87	Yes	NO	YES	
CM	Wagon Wheel EA	Upland Opening Improvement	YES	Opening	Yes	Forest management.	(OPNMM-LAA)	No	None	129	Acres	0	129	Yes	NO	YES	
CM	Wagon Wheel EA	Hardwood Overstory Removal and Site Prep	YES	Hardwood	Yes	Forest management.	(HWDCUT-LAA)	No	None	65	Acres	0	65	Yes	NO	YES	Ongoing timber sale.
CM	Wagon Wheel EA	TSI	YES	Hardwood	Yes	Forest management.	(HWDCUT-LAA)	No	None	21	Acres	0	21	Yes	NO	YES	
CM	Wagon Wheel EA	NNIS Treatment	NO	Opening			(HERB-NLAA)	No	None	1.5	Acres	0	1.5	No	NO	YES	
CM	Wagon Wheel EA	Road Activity	YES	Hardwood			(HWDCUT-NLAA)	Yes	None	11.7	Each	0	11.7	No	NO	YES	
CM	Wagon Wheel EA	Stream Improvement	NO	Hardwood			(WLFISHSTR-NLAA)	No	None	2	Each	0	2	No	NO	No	
CM	Marilla Too EA	Red Pine Thinning	YES	Conifer			(CONCUT-LAA)	No	May 1 - October 20	567	Acres	0	567	No	YES	No	Ongoing timber sale.
CM	Marilla Too EA	Snag Creation	Yes	Conifer	Yes	Forest management.	(WLFISHSTR-LAA)	No	None	2268	Each	0	2268	No	YES	No	
CM	Marilla Too EA	Aspen Clearcut and Site Prep	YES	Hardwood			(HWDCUT-NLAA)	No	May 1 - October 20	360	Acres	0	360	No	YES	No	Ongoing timber sale.
CM	Marilla Too EA	Upland Opening Maintenance	YES	Opening			(OPNMM-LAA)	Yes	None	255	Acres	0	255	Yes	YES	No	Brushing Contract
CM	Marilla Too EA	Upland Opening Burning	NO	Opening			(OPNB-3-NLAA)	No	May 1 - October 20	83	Acres	0	83	No	YES	No	
CM	Marilla Too EA	NNIS Treatment	NO	Opening			(HERB-NLAA)	No	May 1 - October 20	4	Acres	0	4	No	YES	No	
CM	Marilla Too EA	Waterhole Construction	NO	Opening			(WLFISHSTR-NLAA)	No	None	4	Each	0	4	No	NO	No	
CM	Marilla Too EA	Road Activity	YES	Hardwood			(HWDCUT-NLAA)	No	May 1 - October 20	10	Each	0	10	No	YES	No	
CM	County Line EA	Red Pine Thinning	YES	Conifer			(CONCUT-NLAA)	No	May 1 - August 31	304	Acres	165	139	Yes	YES	No	Ongoing timber sale.
CM	County Line EA	Snag Creation	Yes	Conifer	Yes	Forest management.	(WLFISHSTR-LAA)	No	None	1216	Each	0	1216	No	YES	No	
CM	County Line EA	Aspen Clearcut and Site Prep	YES	Hardwood			(HWDCUT-NLAA)	No	May 1 - August 31	31	Acres	9	22	Yes	YES	No	Ongoing timber sale.
CM	County Line EA	Jack Pine-Oak Shelterwood and Site Prep	YES	Conifer			(CONCUT-NLAA)	No	May 1 - August 31	417	Acres	28	389	Yes	YES	No	Ongoing timber sale.
CM	County Line EA	Barren Restoration	YES	Conifer			(CONCUT-NLAA)	No	May 1 - August 31	322	Acres	0	322	Yes	YES	No	
CM	County Line EA	Upland Opening Maintenance	YES	Opening			(OPNMM-LAA)	Yes	None	42	Acres	0	42	No	YES	No	
CM	County Line EA	Develop Water Source	NO	Opening			(WLFISHSTR-NLAA)	No	None	4	Each	0	4	No	YES	No	
CM	County Line EA	NNIS Treatment	NO	Opening			(HERB-NLAA)	No	May 1 - August 31	22	Acres	0	22	No	YES	No	
CM	County Line EA	Broadcast Burning	NO	Conifer			(CONLMB-NLAA)	No	May 1 - August 31	460	Acres	0	460	No	YES	No	
CM	County Line EA	Upland Opening Burning	NO	Opening			(OPNB-3-NLAA)	No	May 1 - August 31	78	Acres	0	78	No	YES	No	
CM	County Line EA	Pile and Burn	YES	Conifer			(CONLMB-NLAA)	No	May 1 - August 31	77	Acres	0	77	No	YES	No	
CM	County Line EA	Fuelbreak Creation/ Maintenance	YES	Conifer			(CONCUT-NLAA)	No	May 1 - August 31	77	Acres	0	77	No	YES	No	
CM	Manistee Barrens EA	Red Pine Thinning	YES	Conifer			(CONCUT-NLAA)	No	May 1 - August 31	1501	Acres	247	1254	Yes	YES	No	Ongoing timber sale.
CM	Manistee Barrens EA	Snag Creation	Yes	Conifer	Yes	Forest management.	(WLFISHSTR-LAA)	No	None	6004	Each	0	6004	No	YES	No	
CM	Manistee Barrens EA	Jack Pine-Oak Overstory Removal and Site Prep	YES	Conifer			(CONCUT-NLAA)	No	May 1 - August 31	580	Acres	272	308	Yes	YES	No	Ongoing timber sale.
CM	Manistee Barrens EA	Sanitation Harvesting	YES	Conifer			(CONCUT-NLAA)	No	May 1 - August 31	31	Acres	20	11	Yes	YES	No	Ongoing timber sale.
CM	Manistee Barrens EA	Shelterwood and Site Prep	YES	Conifer			(CONCUT-NLAA)	No	May 1 - August 31	228	Acres	139	89	Yes	YES	No	Ongoing timber sale.
CM	Manistee Barrens EA	Opening Maintenance	YES	Opening			(OPNMM-LAA)	Yes	None	146	Acres	47	99	Yes	YES	No	Brushing Contract
CM	Manistee Barrens EA	Broadcast Burning	YES	Conifer			(CONLMB-NLAA)	No	May 1 - August 31	722	Acres	0	722	No	YES	No	
CM	Manistee Barrens EA	Piling and Burning	YES	Conifer			(CONLMB-NLAA)	No	May 1 - August 31	314	Acres	0	314	No	YES	No	
CM	Manistee Barrens EA	Fuelbreak Construction/Maintenance-Linear	YES	Conifer			(CONCUT-NLAA)	No	May 1 - August 31	94	Acres	66	28	No	YES	No	
CM	Manistee Barrens EA	Fuelbreak Construction/Maintenance-Non-Linear	YES	Conifer			(CONCUT-NLAA)	No	May 1 - August 31	522	Acres	125	397	No	YES	No	
CM	Manistee Barrens EA	Develop Water Source	NO	Opening			(WLFISHSTR-NLAA)	No	None	3	Each	0	3	No	YES	No	
CM	Grant EA	Broadcast Burning	NO	Hardwood			(HWDLMB-NLAA)	No	May 1 - August 31	2347	Acres	0	2347	No	NO	No	
CM	Grant EA	Red Pine Broadcast Underburning	NO	Conifer			(CONLMB-NLAA)	No	May 1 - August 31	98	Acres	0	98	No	YES	No	
CM	Bristol EA	Red Pine Thinning	YES	Conifer			(CONCUT-NLAA)	Yes	None	626	Acres	626	0	No	NO	Yes	
CM	Bristol EA	Red Pine Shelterwood and Site Prep	YES	Conifer			(CONCUT-NLAA)	No	April 1 to March 15 and Dec. 1 to Sept. 30	30	Acres	30	0	No	NO	No	
CM	Bristol EA	Aspen Clearcut and Site Prep	YES	Hardwood			(HWDCUT-NLAA)	No	April 1 to March 15 and Dec. 1 to Sept. 31	140	Acres	140	0	No	NO	No	
CM	Bristol EA	Jack Pine Clearcut and Site Prep	YES	Conifer			(CONCUT-NLAA)	Yes	Nov. 16 to Sept. 14	65	Acres	65	0	No	NO	Yes	
CM	Bristol EA	Opening Maintenance	YES	Hardwood			(OPNMM-LAA)	Yes	None	40	Acres	40	0	No	NO	Yes	
CM	Bristol EA	Lowland Conifer Planting	NO	Conifer			(SPREP-NLAA)	No	None	105	Acres	105	0	No	NO	YES	
CM	Bristol EA	Pine Understory Burning	NO	Conifer			(CONLMB-NLAA)	Yes	None	575	Acres	0	575	No	NO	Yes	
CM	Bristol EA	NNIS Treatment	NO	Opening			(HERB-NLAA)	No	None	4	Acres	4	0	No	NO	YES	
CM	Bristol EA	Road Closures	Yes	Conifer	Yes	Minimal tree removal.	(RDCLSE-LAA)	No	None	26	Acres	4	22	No	NO	No	9 miles.
CM	Bristol EA	Stream Improvement	YES	Hardwood			(HERB-NLAA)	Yes	None	2.5	Each	0	2.5	No	NO	Yes	
CM	Nixon Ravine EA	Red Pine Thinning	YES	Conifer			(CONCUT-NLAA)	Yes	None	1031	Acres	1031	0	No	NO	Yes	
CM	Nixon Ravine EA	Red Pine Overstory Removal and Site Prep	YES	Conifer			(CONCUT-NLAA)	No	March 1 - Aug. 31	50	Acres	50	0	No	NO	No	
CM	Nixon Ravine EA	Aspen Clearcut and Site Prep	YES	Hardwood			(HWDCUT-NLAA)	No	April 1 to Sept. 30	510	Acres	510	0	No	NO	No	
CM	Nixon Ravine EA	Hardwood Thinning/Shelterwood and Site Prep	YES	Hardwood	Yes	Forest management.	(HWDCUT-LAA)	Yes	None	137	Acres	137	0	No	NO	Yes	
CM	Nixon Ravine EA	Jack Pine Clearcut and Site Prep	YES	Conifer			(CONCUT-NLAA)	No	Nov. 16 to Sept. 14	44	Acres	44	0	No	NO	No	
CM	Nixon Ravine EA	Jack Pine Shelterwood and Site Prep	YES	Conifer			(CONCUT-NLAA)	No	Nov. 16 to Sept. 14	152	Acres	152	0	No	NO	No	
CM	Nixon Ravine EA	Opening Maintenance	YES	Opening			(OPNMM-LAA)	Yes	Mowing not conducted March 1 to Aug. 31	301	Acres	256	45	Yes	NO	No	Brushing Contract
CM	Nixon Ravine EA	Opening Burning	YES	Opening			(HERB-NLAA)	No	None	22	Acres	0	22	No	NO	YES	
CM	Nixon Ravine EA	NNIS Treatment	NO	Opening			(HERB-NLAA)	No	None	5	Acres	1	4	No	NO	YES	
CM	Nixon Ravine EA	Road/Stream Crossing Improvement	Yes	Hardwood			(WLFISHSTR-NLAA)	Yes	None	3	Each	0	3	No	NO	Yes	
CM	Nixon Ravine EA	Road Closures	YES	Hardwood	Yes	Minimal tree removal.	(RDCLSE-LAA)	Yes	None	87	Acres	25	62	No	NO	Yes	30 miles.
CM	Nixon Ravine EA	Snowmobile Trail Reconstruction	YES	Hardwood			(HWDCUT-NLAA)	Yes	None	1	Each	0	1	No	NO	Yes	
CM	Colfax School EA	Red Pine Thinning	YES	Conifer			(CONCUT-NLAA)	Yes	None	450	Acres	450	0	No	NO	Yes	
CM	Colfax School EA	Aspen Clearcut and Site Prep	YES	Hardwood			(HWDCUT-NLAA)	No	April 1 to Sept. 30	230	Acres	230	0	No	NO	No	
CM	Colfax School EA	Hardwood Thinning	YES	Hardwood			(HWDCUT-LAA)	Yes	None	40	Acres	40	0	No	NO	Yes	
CM	Colfax School EA	Opening Maintenance	YES	Opening			(OPNMM-LAA)	Yes	None	60	Acres	20	40	No	NO	Yes	Brushing Contract
CM	Colfax School EA	Road Closures	YES	Hardwood	Yes	Minimal tree removal.	(RDCLSE-LAA)	Yes	None	15	Acres	5	10	No	NO	Yes	5 miles.
CM	Colfax School EA	NNIS	NO	Opening			(HERB-NLAA)	No									

Appendix A - List of Actions

District	NEPA Document Name	Activity	Cutting Veg > 3" DBH?	Vegetative Community	Take Excepted Through Interim 4d Rule?	4d Comments	Matrix Code	Will Incorporate Matrix Design Criteria?	Existing Timing Restrictions	Number of Units Planned	UOM	Number of Units Implemented	Number of Units To Be Implemented (Calculated)	Under Contract?	Indiana Bat Mitigations? (MNF Only)	Can Incorporate Additional Mitigations for NLEB?	Comments
CM	SE Peacock	Opening Creation	YES	Hardwood	No	Hardwood conversion.	(HWDCUT-LAA)	No	None	4	Acres	0	4	No	No	Yes	
CM	SE Peacock	Opening Burning	YES	Opening	Yes	Forest management.	(OPNBRN-LAA)	Yes	June 1 to Aug. 31	50	Acres	0	50	No	No	Yes	
CM	SE Peacock	Aspen Clearcut and Site Prep	YES	Hardwood	Yes	Forest management.	(HWDCUT-LAA)	Yes	None	19	Acres	0	19	No	No	Yes	
CM	SE Peacock	NNIS	YES	Opening			(HERB-NLAA)	No	None	8	Acres	0	8	No	No	Yes	
CM	SE Peacock	Broadcast Burning	YES	Conifer	Yes		(HWDLMB-NLAA)	Yes	June 1 to Aug. 31	1436	Acres	0	1436	No	No	Yes	
CM	SE Peacock	Piling and Burning	YES	Conifer			(CONLMB-NLAA)	Yes	None	156	Acres	0	156	No	No	Yes	
CM	SE Peacock	Fuelbreak	YES	Conifer	Yes		(CONCUT-NLAA)	Yes	None	197	Acres	0	197	No	No	Yes	
CM	Sheep Dip EA	Red Pine Thinning	YES	Conifer	Yes	Forest management.	(CONCUT-LAA)	No	None	621	Acres	0	621	No	No	Yes	
CM	Sheep Dip EA	Hardwood Overstory Removal and Site Prep	YES	Hardwood			(HWDCUT-NLAA)	No	April 1 to September 30	17	Acres	0	17	No	NO	No	Marten restrictions
CM	Sheep Dip EA	Conifer Overstory Removal and Site Prep	YES	Conifer			(CONCUT-NLAA)	No	April 1 to September 30	107	Acres	0	107	No	NO	No	Marten restrictions
CM	Sheep Dip EA	Hardwood Shelterwood and Site Prep	YES	Hardwood			(HWDCUT-NLAA)	Yes	April 1 to September 30	21	Acres	0	21	No	NO	Yes	Marten restrictions
CM	Sheep Dip EA	Conifer Shelterwood and Site Prep	YES	Conifer			(CONCUT-NLAA)	Yes	Some units Dec. 1 to August 31 for snow trail	228	Acres	0	228	No	NO	Yes	
CM	Sheep Dip EA	Opening Maintenance Burn	YES	Opening			(OPNBRN-NLAA)	Yes	None	56	Acres	0	56	No	No	Yes	
CM	Sheep Dip EA	Opening Creation	YES	Conifer			(CONCUT-NLAA)	Yes	None	21	Acres	0	21	No	NO	Yes	
CM	Sheep Dip EA	Aspen Clearcut and Site Prep	YES	Hardwood			(HWDCUT-NLAA)	No	April 1 to September 30	181	Acres	0	181	No	NO	No	
CM	Sheep Dip EA	NNIS	YES	Opening			(HERB-NLAA)	No	None	23	Acres	0	23	No	NO	Yes	
CM	Black Locust EA	Broadcast Burning	YES	Hardwood	Yes	Forest management.	(HWDLMB-LAA)	Yes	None	23	Acres	0	23	No	NO	Yes	
CM	Black Locust EA	Opening Creation	YES	Hardwood			(HWDCUT-NLAA)	Yes	None	23	Acres	0	23	No	NO	Yes	
CM	Black Locust EA	NNIS - Black Locust cutting / herbicide	Yes	Hardwood	Yes	Forest management.	(HWDCUT-LAA)	No	None	23	Acres	0	23	No	NO	No	
CM	Tippy South	Tree Cutting	Yes	Hardwood			(HWDCUT-NLAA)	No	No cutting April 1 to October 15	100	Each	0	100	No	YES	No	Forest Plan Ibat restrictions
CM	2011 WL Hab Impr	Rx Burning	NO	Opening			(OPNB-3-NLAA)	No	None	107	Acres	0	107	No	NO	Yes	3-5 year rotation
CM	2011 WL Hab Impr	Brushing	YES	Opening	Yes	Forest management.	(OPNMM-LAA)	No	None	84	Acres	0	84	Yes	NO	Yes	Brushing Contract; 10 year rotation
CM	2011 WL Hab Impr	Mowing	NO	Opening			(OPN-3-NLAA)	No	After July 15	29	Acres	0	29	No	NO	No	3-5 year rotation
CM	2011 WL Hab Impr	Plant Shrubs	NO	Opening			(OPNB-3-NLAA)	No	None	4	Acres	0	4	No	NO	No	
CM	2011 WL Hab Impr	Rehab ATV damage	YES	Opening			(OPNMM-LAA)	Yes	None	5	Acres	0	5	No	NO	Yes	
CM	2011 WL Hab Impr	NNIS Treatment	YES	Opening			(HERB-NLAA)	Yes	None	229	Acres	0	229	No	NO	No	
CM	2010 WL Hab Impr	Rx Burning	NO	Opening			(OPNB-3-NLAA)	No	May 1 to Oct. 20	82	Acres	0	82	No	YES	No	Within Ibat habitat (Comp 377) apply this timing restriction; 3-5 year rotation
CM	2010 WL Hab Impr	Brushing	YES	Opening	Yes	Forest management.	(OPNMM-LAA)	No	None	109	Acres	0	109	Yes	YES	No	Stem size restriction to less than 5" DBH; Ibat habitat; 10 year rotation
CM	2010 WL Hab Impr	Mowing	NO	Opening			(OPN-3-NLAA)	No	After July 15	13	Acres	0	13	No	NO	No	3-5 year rotation
CM	2009 WL Hab Impr	Rx Burning	NO	Opening			(OPNB-3-NLAA)	No	None	174	Acres	0	174	No	NO	Yes	3-5 year rotation
CM	2009 WL Hab Impr	Rx Burning	NO	Opening			(OPNB-3-NLAA)	No	Burn only Nov 1-March 31	19	Acres	0	19	No	NO	No	massasauga habitat burn; 3-5 year rotation
CM	2009 WL Hab Impr	Rx Burning	NO	Opening			(OPNB-3-NLAA)	No	Burn only Nov 1-Jan30	4	Acres	0	4	No	NO	No	massasauga habitat burn, bald eagle nest site protectin; 3-5 year rotation
CM	2009 WL Hab Impr	Rx Burning	NO	Opening			(OPNB-3-NLAA)	No	Burn only Oct 20-April 30	22	Acres	0	22	No	NO	No	massasauga habitat burn; 3-5 year rotation
CM	2009 WL Hab Impr	Brushing/Mow/Prune Apple	YES	Opening			(OPNMM-NLAA)	Yes	Mow After July 14	108	Acres	0	108	No	NO	Yes	Brushing 10 year rotation
CM	2009 WL Hab Impr	Shrub Planting	NO	Opening			(OPN-3-NLAA)	No	None	47	Acres	0	47	No	NO	Yes	
CM	2008 WL Hab Impr	Rx Burning	NO	Opening			(OPNB-3-NLAA)	No	None	6	Acres	0	6	No	NO	Yes	3-5 year rotation
CM	2008 WL Hab Impr	Rx Burning	NO	Opening			(OPNB-3-NLAA)	No	April 16 to March 1	125	Acres	0	125	No	NO	No	Piping Plover and bald eagle timing restriction; 3-5 year rotation
CM	2008 WL Hab Impr	Rx Burning	NO	Opening			(OPNB-3-NLAA)	No	May 1 to August 31	64	Acres	0	64	No	NO	No	Piping Plover and LMRA timing restriction; 3-5 year rotation
CM	2008 WL Hab Impr	Brushing	YES	Opening			(OPNMM-NLAA)	Yes	None	8	Acres	0	8	No	NO	Yes	10 year rotation
CM	2008 WL Hab Impr	Shrub Planting	NO	Opening			(OPN-3-NLAA)	No	Early spring	10	Acres	0	10	No	NO	No	
CM	2007 WL Hab Impr	Rx Burning	NO	Opening			(OPNB-3-NLAA)	No	None	91	Acres	0	91	No	NO	YES	3-5 year rotation
CM	2007 WL Hab Impr	Rx Burning	NO	Opening			(OPNB-3-NLAA)	No	Burn Spt 1 to April 30	57	Acres	0	57	No	YES	No	3-5 year rotation
CM	2007 WL Hab Impr	Rx Burning	NO	Opening			(OPNB-3-NLAA)	No	Burn Oct 21 to April 30	68	Acres	0	68	No	YES	No	3-5 year rotation
CM	2006 WL Hab Impr	Rx Burning	YES	Opening			(OPNBRN-NLAA)	Yes	None	27	Acres	0	27	No	Yes	Yes	3-5 year rotation
CM	2006 WL Hab Impr	Brushing	YES	Opening			(OPNMM-NLAA)	Yes	None	27	Acres	0	27	No	Yes	Yes	10 year rotation
CM	2006 TSI and WL Hab Imp	Brushing	YES	Opening			(OPNMM-NLAA)	Yes	None	17	Acres	0	17	No	NO	Yes	10 year rotation
CM	2006 TSI and WL Hab Imp	Rx Burning	NO	Opening			(OPNB-3-NLAA)	No	Forest Plan Ibat guidelines	17	Acres	0	17	No	YES	No	3-5 year rotation
CM	2005 WL Hab Impr	Brushing	YES	Opening			(OPNMM-NLAA)	Yes	None	47	Acres	0	47	No	NO	Yes	
CM	2005 WL Hab Impr	Rx Burning	NO	Opening			(OPNB-3-NLAA)	No	Forest Plan Ibat guidelines	9	Acres	0	9	No	YES	No	
CM	2004 WL Hab Impr	Rx Burning	NO	Opening			(OPNB-3-NLAA)	No	Forest Plan Ibat guidelines	270	Acres	0	270	No	YES	No	3-5 year rotation
CM	2004 WL Hab Impr	Mowing	NO	Opening			(OPN-3-NLAA)	No	None	60	Acres	0	60	No	YES	No	3-5 year rotation
CM	2003 WL Hab Impr	Rx Burning	NO	Opening			(OPNB-3-NLAA)	No	Forest Plan Ibat guidelines	113	Acres	0	113	No	YES	No	3-5 year rotation
CM	Big Sable River	Streambank Stabilization	NO	Hardwood			(WLFISHSTR-NLAA)	Yes	None	1	Each	0	1	No	YES	No	
BWC	CEs	prescribed burn for savanna creation - annual	Yes	Mixed Hardwood/Conifer	No	Hardwood conversion.	(HWDLMB-LAA)	No	NONE	450	Acres	0	450	No	No	Yes	
BWC	Baldwin Fuels Management	Broadcast burning	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDLMB-LAA)	No	NONE	1075	Acres	0	1075	No	No	Yes	
BWC	Baldwin Fuels Management	Prescribed Burning (total acres)	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDLMB-LAA)	No	NONE	2589	Acres	0	2589	No	No	Yes	3-5 year rotation
BWC	Baldwin Fuels Management	burning piles	Yes	Other	Yes	Forest management.	(CONHIB-LAA)	No	NONE	240	Acres	0	240	No	No	Yes	
BWC	Baldwin Fuels Management	Certification of Natural Regeneration with Site Prep	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	38	Acres	0	38	No	No	Yes	
BWC	Baldwin Fuels Management	Clearcut	YES	Mixed Hardwood/Conifer			(HWDCUT-NLAA)	No	10/1-3/31	22	Acres	0	22	Yes	No	No	Acres under contract
BWC	Baldwin Fuels Management	Clearcut	YES	Mixed Hardwood/Conifer			(HWDCUT-NLAA)	No	9/1-12/1	4	Acres	0	4	Yes	No	No	Acres under contract
BWC	Baldwin Fuels Management	Commercial Thin	Yes	Conifer	Yes	Forest management.	(CONCUT-LAA)	No	NONE	135	Acres	0	135	No	No	Yes	
BWC	Baldwin Fuels Management	Control of Understory Vegetation- Burning	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDLMB-LAA)	No	NONE	329	Acres	0	329	No	No	Yes	
BWC	Baldwin Fuels Management	Fill-in or Replant Trees	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	38	Acres	0	38	No	No	Yes	
BWC	Baldwin Fuels Management	fuels break	Yes	Mixed Hardwood/Conifer	No	Hardwood conversion.	(HWDCUT-LAA)	No	NONE	323	Acres	0	323	No	No	Yes	
BWC	Baldwin Fuels Management	Overstory Removal Cut (from advanced regeneration) (EA/RH/FH)	Yes	Hardwood	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	5	Acres	0	5	No	No	Yes	
BWC	Baldwin Fuels Management	piling of fuels	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	253	Acres	0	253	No	No	Yes	
BWC	Baldwin Fuels Management	plantation survival survey	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	142	Acres	0	142	No	No	Yes	
BWC	Baldwin Fuels Management	Post Treatment Exam Fuels Mgt	No	Other			(NOEFFECT)	No	NONE	23	Acres	0	23	No	No	Yes	
BWC	Baldwin Fuels Management	Post Treatment Vegetation Monitoring	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	54	Acres	0	54	No	No	Yes	
BWC	Baldwin Fuels Management	rearrangement of fuels	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	32	Acres	0	32	No	No	Yes	
BWC	Baldwin Fuels Management	Removal of Range Structural Improvements	No	Other			(WLFISHSTR-NLAA)	No	NONE	1	Each	0	1	No	No	Yes	
BWC	Baldwin Fuels Management	Sanitation Cut	Yes	Conifer	Yes	Forest management.	(CONCUT-LAA)	No	NONE	5	Acres	0	5	No	No	Yes	
BWC	Baldwin Fuels Management	Scarify and Seed Landings	No	Opening			(OPN-3-NLAA)	No	NONE	6	Acres	0	6	No	No	Yes	
BWC	Baldwin Fuels Management	Sensitive Species Protection	No	Other			(NOEFFECT)	No	NONE	2	Acres	0	2	No	No	Yes	
BWC	Baldwin Fuels Management	Shelterwood	Yes	Hardwood			(HWDCUT-NLAA)	No	Cut only 10/1-3/31	83	Acres	0	83	Yes	No	No	Acres under contract
BWC	Baldwin Fuels Management	Shelterwood	Yes	Hardwood			(HWDCUT-NLAA)	No	9/1-12/1	19	Acres	0	19	Yes	No	No	Acres under contract
BWC	Baldwin Fuels Management	Shelterwood Establishment Cut (with or without leave trees) (EA/RH/NFH)	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	21	Acres	0	21	No	No	Yes	
BWC	Baldwin Fuels Management	Site Preparation for Natural Regeneration	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	191	Acres	0	191	No	No	Yes	
BWC	Baldwin Fuels Management	Stocking survey	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	831	Acres	0	831	No	No	Yes	
BWC	Baldwin Fuels Management	Tree Release and Weed	Yes	Other	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	81	Acres	0	81	No	No	Yes	
BWC	Baldwin Fuels Management	Wildlife Habitat Activities	Yes	Opening	Yes	Forest management.	(OPNMM-LAA)	No	NONE	14	Acres	0	14	No	No	Yes	
BWC	Baldwin Fuels Management	Wildlife Habitat Create openings	Yes	Hardwood	No	Hardwood conversion.	(HWDCUT-LAA)	No	NONE</								

Appendix A - List of Actions

District	NEPA Document Name	Activity	Cutting Veg > 3" DBH?	Vegetative Community	Take Excepted Through Interim 4d Rule?	4d Comments	Matrix Code	Will Incorporate Matrix Design Criteria?	Existing Timing Restrictions	Number of Units Planned	UOM	Number of Units Implemented	Number of Units To Be Implemented (Calculated)	Under Contract?	Indiana Bat Mitigations? (MNF Only)	Can Incorporate Additional Mitigations for NLEB?	Comments
BWC	BARREN PLAINS HFRA PROJECT	cone collection	Yes	Conifer	Yes	Forest management.	(CONCUT-LAA)	No	NONE	3	Acres	0	3	No	No	Yes	
BWC	BARREN PLAINS HFRA PROJECT	cone collection	Yes	Conifer	Yes	Forest management.	(CONCUT-LAA)	No	NONE	2	Each	0	2	No	No	Yes	
BWC	BARREN PLAINS HFRA PROJECT	fish structure	Yes	Water	Yes	Minimal tree removal, fish habitat.	(WLFISHSTR-LAA)	No	NONE	1	Each	0	1	No	No	Yes	
BWC	BARREN PLAINS HFRA PROJECT	Fuel Break	Yes	Mixed Hardwood/Conifer	No	Hardwood conversion.	(HWDCUT-LAA)	No	NONE	186	Acres	0	186	No	No	Yes	
BWC	BARREN PLAINS HFRA PROJECT	Native Species Established	No	Opening	No		(OPN<3-NLAA)	No	NONE	151	Acres	0	151	No	No	Yes	
BWC	BARREN PLAINS HFRA PROJECT	Piling of Fuels, Hand or Machine	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	148	Acres	0	148	No	No	Yes	
BWC	BARREN PLAINS HFRA PROJECT	precommercial thin	Yes	Conifer	Yes	Forest management.	(CONCUT-LAA)	No	NONE	10	Acres	0	10	No	No	Yes	
BWC	BARREN PLAINS HFRA PROJECT	road decommissioning	Yes	Other	Yes	Minimal tree removal.	(HWDCUT-LAA)	No	NONE	1.6	Acres	0	1.6	No	No	Yes	
BWC	BARREN PLAINS HFRA PROJECT	road obliteration - wildlife	Yes	Other	Yes	Minimal tree removal, wildlife habitat.	(HWDCUT-LAA)	No	NONE	2	Each	0	2	No	No	Yes	
BWC	BARREN PLAINS HFRA PROJECT	Sanitation Cut	Yes	Conifer	Yes	Forest management.	(CONCUT-LAA)	No	NONE	10	Acres	0	10	No	No	Yes	
BWC	BARREN PLAINS HFRA PROJECT	Shelterwood	Yes	Hardwood	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	32	Acres	0	32	No	No	Yes	
BWC	BARREN PLAINS HFRA PROJECT	Site Preparation for Natural Regeneration	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	259	Acres	0	259	No	No	Yes	
BWC	BARREN PLAINS HFRA PROJECT	Stand Clearcut (EA/RH/FH)	Yes	Conifer	Yes	Forest management.	(CONCUT-LAA)	No	NONE	25	Acres	0	25	No	No	Yes	
BWC	BARREN PLAINS HFRA PROJECT	Stocking survey	No	Mixed Hardwood/Conifer	No		(NOEFFECT)	No	NONE	380	Acres	0	380	No	No	Yes	
BWC	BARREN PLAINS HFRA PROJECT	Underburn - Low Intensity	Yes	Hardwood	Yes	Forest management.	(HWDLMB-LAA)	No	NONE	690	Acres	0	690	No	No	Yes	
BWC	BARREN PLAINS HFRA PROJECT	Prescribed Burning (total acres)	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDLMB-LAA)	No	NONE	779	Acres	0	779	No	No	Yes	
BWC	BARREN PLAINS HFRA PROJECT	Wildlife Habitat Mechanical treatment	Yes	Hardwood	No	Hardwood conversion.	(HWDCUT-LAA)	No	NONE	28	Acres	0	28	No	No	Yes	
BWC	BARREN PLAINS HFRA PROJECT	Wildlife Habitat Prescribed fire	Yes	Hardwood	Yes	Forest management.	(HWDLMB-LAA)	No	NONE	7	Acres	0	7	No	No	Yes	
BWC	Big Star	Prescribed Burning (total acres)	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDLMB-LAA)	No	NONE	839	Acres	0	839	No	No	Yes	
BWC	Big Star	Certification-Planted	No	Mixed Hardwood/Conifer	No		(NOEFFECT)	No	NONE	21	Acres	0	21	No	No	Yes	
BWC	Big Star	Invasives - Pesticide Application	No	Other	No		(HERB-NLAA)	No	NONE	11	Acres	0	11	No	No	Yes	
BWC	Big Star	Plantation Survival Survey	No	Mixed Hardwood/Conifer	No		(NOEFFECT)	No	NONE	21	Acres	0	21	No	No	Yes	
BWC	Big Star	Wildlife Habitat Prescribed fire	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDLMB-LAA)	No	NONE	20	Acres	0	20	No	No	Yes	
BWC	Big Star	Yarding - Removal of Fuels by Carrying or Dragging	No	Opening	No		(OPN<3-NLAA)	No	NONE	90	Acres	0	90	No	No	Yes	
BWC	Big Star Project	certification -planted	No	Mixed Hardwood/Conifer	No		(NOEFFECT)	No	NONE	31	Acres	0	31	No	No	Yes	
BWC	Big Star Project	fill-in or replant trees	No	Mixed Hardwood/Conifer	No		(NOEFFECT)	No	NONE	31	Acres	0	31	No	No	Yes	
BWC	Big Star Project	plantation survival survey	No	Mixed Hardwood/Conifer	No		(NOEFFECT)	No	NONE	93	Acres	0	93	No	No	Yes	
BWC	Big Star Project	prescribed fire - wildlife	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDLMB-LAA)	No	NONE	84	Acres	0	84	No	No	Yes	
BWC	Big Star Project	Reforestation Need created by Regeneration Failure	No	Mixed Hardwood/Conifer	No		(NOEFFECT)	No	NONE	31	Acres	0	31	No	No	Yes	
BWC	BOWMAN SALVAGE	Wildlife Habitat Prescribed fire	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDLMB-LAA)	No	NONE	34	Acres	0	34	No	No	Yes	
BWC	CDS_ACCOMP_MIG_TO_FACTS	Animal Damage Control for Reforestation	No	Mixed Hardwood/Conifer	No		(NOEFFECT)	No	NONE	45	Acres	0	45	No	No	Yes	
BWC	CDS_ACCOMP_MIG_TO_FACTS	Certification-Planted	No	Mixed Hardwood/Conifer	No		(NOEFFECT)	No	NONE	21	Acres	0	21	No	No	Yes	
BWC	CDS_ACCOMP_MIG_TO_FACTS	commercial thin	Yes	Conifer	Yes	Forest management.	(CONCUT-LAA)	No	NONE	46	Acres	0	46	No	No	Yes	
BWC	CDS_ACCOMP_MIG_TO_FACTS	Fill-in or Replant Trees	No	Mixed Hardwood/Conifer	No		(NOEFFECT)	No	NONE	10	Acres	0	10	No	No	Yes	
BWC	CDS_ACCOMP_MIG_TO_FACTS	Inland Fish Trees or platforms	Yes	Water	Yes	Minimal tree removal, fish habitat.	(WLFISHSTR-LAA)	No	NONE	3	Acres	0	3	No	No	Yes	
BWC	CDS_ACCOMP_MIG_TO_FACTS	Maintenance of Animal Damage Control for Reforestation	No	Mixed Hardwood/Conifer	No		(NOEFFECT)	No	NONE	33	Acres	0	33	No	No	Yes	
BWC	CDS_ACCOMP_MIG_TO_FACTS	Plantation Survival Survey	No	Mixed Hardwood/Conifer	No		(NOEFFECT)	No	NONE	140	Acres	0	140	No	No	Yes	
BWC	CDS_ACCOMP_MIG_TO_FACTS	Reforestation Need Change due to Stocking Changes	No	Mixed Hardwood/Conifer	No		(NOEFFECT)	No	NONE	27	Acres	0	27	No	No	Yes	
BWC	CDS_ACCOMP_MIG_TO_FACTS	Salvage Cut (intermediate treatment, not regeneration)	Yes	Conifer	Yes	Forest management.	(CONCUT-LAA)	No	NONE	15	Acres	0	15	No	No	Yes	
BWC	CDS_ACCOMP_MIG_TO_FACTS	Shelterwood Removal Cut (EA/NRH/FH)	Yes	Hardwood	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	18	Acres	0	18	No	No	Yes	
BWC	CDS_ACCOMP_MIG_TO_FACTS	Site Preparation for Natural Regeneration - Other	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	32	Acres	0	32	No	No	Yes	
BWC	CDS_ACCOMP_MIG_TO_FACTS	Wildlife Habitat Rehabilitate openings	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(OPNMM-LAA)	No	NONE	44	Acres	0	44	No	No	Yes	
BWC	CEs	aspens/alders regen cut - annual	Yes	Other	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	74	Acres	0	74	No	No	Yes	
BWC	CEs	fish structures - 5 miles annual	Yes	Water	Yes	Minimal tree removal.	(WLFISHSTR-LAA)	No	NONE	100	Each	0	100	No	No	Yes	
BWC	CEs	KBB habitat protection - annual	No	Opening	No		(OPN<3-NLAA)	No	NONE	370	Acres	0	370	No	No	Yes	
BWC	CEs	mechanical treatment for KBB - annual	Yes	Mixed Hardwood/Conifer	No	Hardwood conversion.	(HWDCUT-LAA)	No	NONE	130	Acres	0	130	No	No	Yes	
BWC	CEs	NNIS treatment in savanna - annual	No	Hardwood	No		(HERB-NLAA)	No	NONE	10	Acres	0	10	No	No	Yes	
BWC	CEs	plug plot planting for KBB - annual	No	Opening	No		(OPN<3-NLAA)	No	NONE	105	Acres	0	105	No	No	Yes	
BWC	CEs	prescribed burn to maintain openings - annual	Yes	Opening	Yes	Forest management.	(OPNBRN-LAA)	No	NONE	1750	Acres	0	1750	No	No	Yes	
BWC	CEs	seedling, mowing and hand cutting to maintain wildlife openings - annual	Yes	Opening	Yes	Forest management.	(OPNMM-LAA)	No	NONE	265	Acres	0	265	No	No	Yes	
BWC	CEs	site prep and seeding for KBB - annual	No	Opening	No		(OPN<3-NLAA)	No	NONE	105	Acres	0	105	No	No	Yes	
BWC	CEs	weeding and supplemental planting/seedling in KBB habitat - annual	No	Opening	No		(OPN<3-NLAA)	No	NONE	135	Acres	0	135	No	No	Yes	
BWC	CEs	wildlife shrub planting - annual	No	Opening	No		(OPN<3-NLAA)	No	NONE	30	Acres	0	30	No	No	Yes	
BWC	CRYSTAL VALLEY	Certification of Natural Regeneration with Site Prep	No	Mixed Hardwood/Conifer	No		(NOEFFECT)	No	NONE	53	Acres	0	53	no	No	Yes	
BWC	CRYSTAL VALLEY	Certification-Planted	No	Mixed Hardwood/Conifer	No		(NOEFFECT)	No	NONE	37	Acres	0	37	no	No	Yes	
BWC	Crystal Valley	Clearcut	YES	Other	No		(HWDCUT-NLAA)	No	10/31-3/31	81	Acres	0	81	Yes	No	No	Acres under contract
BWC	CRYSTAL VALLEY	Fill-in or Replant Trees	No	Mixed Hardwood/Conifer	No		(NOEFFECT)	No	NONE	228	Acres	0	228	no	No	Yes	
BWC	CRYSTAL VALLEY	Inland Fish Control undesirable species - Area	No	Water	No		(WLFISHSTR-NLAA)	No	NONE	1	Acres	0	1	no	No	Yes	
BWC	CRYSTAL VALLEY	Inland Fish Tree planting for fisheries habitat improvement	No	Water	No		(NOEFFECT)	No	NONE	2	Acres	0	2	no	No	Yes	
BWC	CRYSTAL VALLEY	Invasives - Pesticide Application	No	Other	No		(HERB-NLAA)	No	NONE	2	Acres	0	2	no	No	Yes	
BWC	CRYSTAL VALLEY	Plantation Survival Survey	No	Mixed Hardwood/Conifer	No		(NOEFFECT)	No	NONE	670	Acres	0	670	no	No	Yes	
BWC	CRYSTAL VALLEY	Road Decommissioning	Yes	Mixed Hardwood/Conifer	Yes	Minimal tree removal.	(HWDCUT-LAA)	No	NONE	3	Acres	0	3	no	No	Yes	
BWC	CRYSTAL VALLEY	Scarify and Seed Landings	No	Opening	No		(OPN<3-NLAA)	No	NONE	5	Acres	0	5	no	No	Yes	
BWC	Crystal Valley	Shelterwood	YES	Hardwood	No		(HWDCUT-NLAA)	No	10/31-3/31	162	Acres	0	162	Yes	No	No	Acres under contract
BWC	CRYSTAL VALLEY	Shelterwood Removal Cut (EA/NRH/FH)	Yes	Hardwood	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	291	Acres	0	291	no	No	Yes	
BWC	CRYSTAL VALLEY	Site Preparation for Natural Regeneration - Other	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	243	Acres	0	243	no	No	Yes	
BWC	CRYSTAL VALLEY	Stocking Survey	No	Mixed Hardwood/Conifer	No		(NOEFFECT)	No	NONE	664	Acres	0	664	no	No	Yes	
BWC	CRYSTAL VALLEY	Tree Release and Weed	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	57	Acres	0	57	no	No	Yes	
BWC	CRYSTAL VALLEY	Watershed Resource Activities	No	Water	No		(WLFISHSTR-NLAA)	No	NONE	191	Acres	0	191	no	No	Yes	
BWC	CRYSTAL VALLEY	Watershed Resource Road Closure - Length	Yes	Other	Yes	Minimal tree removal.	(WLFISHSTR-LAA)	No	NONE	4.1	Each	0	4.1	no	No	Yes	
BWC	CRYSTAL VALLEY	Wildlife Habitat Mechanical treatment	Yes	Opening	Yes	Forest management.	(OPNMM-LAA)	No	NONE	3	Acres	0	3	no	No	Yes	
BWC	CRYSTAL VALLEY	Wildlife Habitat Rehabilitate openings	Yes	Mixed Hardwood/Conifer	No	Hardwood conversion.	(OPNMM-LAA)	No	NONE	54	Acres	0	54	no	No	Yes	
BWC	Forest Order	KBB closure order	No	Opening	No		(NOEFFECT)	No	NONE	450	Acres	0	450	No	No	Yes	
BWC	GROUSE EA	Invasives - Pesticide Applicatio	No	Other	No		(HERB-NLAA)	No	NONE	41	Acres	0	41	No	No	Yes	
BWC	GROUSE EA	T&ES Species Survey	No	Other	No		(NOEFFECT)	No	NONE	18	Acres	0	18	No	No	Yes	
BWC	HABITAT IMPROVEMENT PROJECT - OPENING MAINTENANCE USING PRESCRIBED FIRE	Wildlife Habitat Prescribed fire	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDLMB-LAA)	No	NONE	257	Acres	0	257	No	No	Yes	
BWC	HURON-MANISTEE NON-NATIVE INVASIVE PLANT CONTROL PROJECT	Invasives - Pesticide Application	No	Other	No		(HERB-NLAA)	No	NONE	76	Acres	0	76	No	No	Yes	
BWC	IDLEWILD FUELS PROJECT	Prescribed Fire (total acres)	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDLMB-LAA)	No	NONE	481	Acres	0	481	No	No	Yes	
BWC	IDLEWILD FUELS PROJECT	Broadcast burning	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDLMB-LAA)	No	NONE	469	Acres	0	469	No	No	Yes	
BWC	IDLEWILD FUELS PROJECT	burning piles	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDLMB-LAA)	No	NONE	19	Acres	0	19	No	No	Yes	
BWC	IDLEWILD FUELS PROJECT	Certification-Planted	No	Mixed Hardwood/Conifer	No		(NOEFFECT)	No	NONE	20	Acres	0	20	No	No	Yes	
BWC	IDLEWILD FUELS PROJECT	Chipping of Fuels	No	Opening	No		(OPN<3-NLAA)	No	NONE	52	Acres	0	52	No	No	Yes	
BWC	IDLEWILD FUELS PROJECT	Fill-in or Replant Trees	No	Mixed Hardwood/Conifer	No		(NOEFFECT)</										

Appendix A - List of Actions

District	NEPA Document Name	Activity	Cutting Veg > 3" DBH?	Vegetative Community	Take Excepted Through Interim 4d Rule?	4d Comments	Matrix Code	Will Incorporate Matrix Design Criteria?	Existing Timing Restrictions	Number of Units Planned	UOM	Number of Units Implemented	Number of Units To Be Implemented (Calculated)	Under Contract?	Indiana Bat Mitigations? (MNF Only)	Can Incorporate Additional Mitigations for NLEB?	Comments
BWC	IDLEWILD FUELS PROJECT	Reforestation Need Change due to Stocking Changes	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	23	Acres	0	23	No	No	Yes	
BWC	IDLEWILD FUELS PROJECT	Site Preparation for Natural Regeneration - Manual	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	25	Acres	0	25	No	No	Yes	
BWC	IDLEWILD FUELS PROJECT	Stocking survey	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	163	Acres	0	163	No	No	Yes	
BWC	IDLEWILD FUELS PROJECT	Wildlife Habitat Release and weeding	Yes	Other	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	1	Acres	0	1	No	No	Yes	
BWC	JACK PINE BUDWORM	Broadcast Burning	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDLMB-LAA)	No	NONE	59	Acres	0	59	No	No	Yes	
BWC	JACK PINE BUDWORM	precommercial thin	Yes	Conifer	Yes	Forest management.	(CONCUT-LAA)	No	NONE	35	Acres	0	35	No	No	Yes	
BWC	JACK PINE BUDWORM	Scarify and Seed Landings	No	Opening			(OPN<3-NLAA)	No	NONE	13	Acres	0	13	No	No	Yes	
BWC	KARNER BLUE BUTTERFLY HABITAT RESTORATION	broadcast burning	Yes	Mixed Hardwood/Conifer	No	Hardwood conversion.	(HWDLMB-LAA)	No	March 15 - Aug 15	9	Acres	0	9	No	No	Yes	
BWC	KARNER BLUE BUTTERFLY HABITAT RESTORATION	T&ES non-structural improvement	Yes	Other	No	Hardwood conversion.	(HWDCUT-LAA)	No	March 15 - Aug 15	201	Acres	0	201	No	No	Yes	
BWC	KARNER BLUE BUTTERFLY HABITAT RESTORATION	Wildlife Habitat Seeding and planting	No	Opening			(OPN<3-NLAA)	No	March 15 - Aug 15	466	Acres	0	466	No	No	Yes	
BWC	KV SALES PRIOR TO TIM	Scarify and Seed Landings	No	Opening			(OPN<3-NLAA)	No	NONE	1	Acres	0	1	No	No	Yes	JACK PINE BUDWORM SALVAGE
BWC	KV SALES PRIOR TO TIM	Wildlife Habitat Prescribed fire	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDLMB-LAA)	No	NONE	13	Acres	0	13	No	No	Yes	BUTTERBALL RP
BWC	M37	Inland Fish Control undesirable species - Area	No	Water			(WLFISHSTR-NLAA)	No	NONE	1	Acres	0	1	No	No	Yes	
BWC	M37	Prescribed Fire (total acres)	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDLMB-LAA)	No	NONE	502	Acres	0	502	No	No	Yes	
BWC	M37	Invasives - Pesticide Application	No	Other			(HERB-NLAA)	No	NONE	4	acres	0	4	No	No	Yes	
BWC	M-37 PROJECT	Animal Control for TSI	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	3	Acres	0	3	No	No	Yes	
BWC	M-37 PROJECT	Animal Damage Control for Reforestation	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	5	Acres	0	5	No	No	Yes	
BWC	M-37 PROJECT	broadcast burning	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDLMB-LAA)	No	NONE	32	Acres	0	32	No	No	Yes	
BWC	M-37 PROJECT	Certification of Natural Regeneration with Site Prep	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	25	Acres	0	25	No	No	Yes	
BWC	M-37 Project	Clearcut	YES	Other			(HWDCUT-NLAA)	No	10/1-3/31	281	Acres	0	281	Yes	No	No	Acres under contract
BWC	M-37 Project	Commercial Thin	YES	Conifer			(CONCUT-NLAA)	No	10/1-3/31	17	Acres	0	17	Yes	No	No	Acres under contract
BWC	M-37 Project	Commercial Thin	YES	Conifer	Yes	Forest management.	(CONCUT-LAA)	No	NONE	37	Acres	0	37	Yes	No	No	Acres under contract
BWC	M-37 Project	Commercial Thin	YES	Conifer	Yes	Forest management.	(CONCUT-LAA)	No	9/15-5/15	111	Acres	0	111	Yes	No	No	Acres under contract
BWC	M-37 PROJECT	commercial thin	Yes	Conifer	Yes	Forest management.	(CONCUT-LAA)	No	NONE	151	Acres	0	151	No	No	Yes	
BWC	M-37 PROJECT	Inland Fish Tree planting for fisheries habitat improvement	No	Water			(NOEFFECT)	No	NONE	1	Acres	0	1	No	No	Yes	
BWC	M-37 PROJECT	Inland Fish Trees or platforms	Yes	Water	Yes	Minimal tree removal, fish habitat.	(WLFISHSTR-LAA)	No	NONE	50	Each	0	50	No	No	Yes	
BWC	M-37 PROJECT	Invasives - Pesticide Application	No	Other			(HERB-NLAA)	No	NONE	527	Acres	0	527	No	No	Yes	
BWC	M-37 PROJECT	Management & Control of Recreation to Protect Resources	No	Other			(BDCLOSE-NE)	No	NONE	7	Each	0	7	No	No	Yes	
BWC	M-37 PROJECT	permanent land clearing	Yes	Mixed Hardwood/Conifer	No	Hardwood conversion.	(HWDCUT-LAA)	No	NONE	203	Acres	0	203	No	No	Yes	
BWC	M-37 PROJECT	plant trees	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	32	Acres	0	32	No	No	Yes	
BWC	M-37 PROJECT	plantation survival survey	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	97	Acres	0	97	No	No	Yes	
BWC	M-37 PROJECT	road decommissioning	Yes	Other	Yes	Minimal tree removal.	(HWDCUT-LAA)	No	NONE	12	Acres	0	12	No	No	Yes	
BWC	M-37 PROJECT	road obliteration	Yes	Other	Yes	Minimal tree removal.	(HWDCUT-LAA)	No	NONE	10	Acres	0	10	No	No	Yes	
BWC	M-37 PROJECT	scarify and seed landing	No	Opening			(OPN<3-NLAA)	No	NONE	2.2	Acres	0	2.2	No	No	Yes	
BWC	M-37 Project	Shelterwood	YES	Hardwood	Yes	Forest management.	(HWDCUT-LAA)	No	10/1-3/31	32	Acres	0	32	Yes	No	No	Acres under contract
BWC	M-37 PROJECT	Site Preparation for Natural Regeneration - Mechanical	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	357	Acres	0	357	No	No	Yes	
BWC	M-37 PROJECT	Stand Clearcut (w/ leave trees) (EA/RH/FH)	Yes	Hardwood	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	87	Acres	0	87	No	No	Yes	
BWC	M-37 PROJECT	stocking survey	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	827	Acres	0	827	No	No	Yes	
BWC	M-37 PROJECT	T&ES non-structural improvement	Yes	Other	Yes	Forest management.	(OPNMM-LAA)	No	NONE	100	Each	0	100	No	No	Yes	
BWC	M-37 PROJECT	T&ES resource monitoring	No	Other			(NOEFFECT)	No	NONE	563	Acres	0	563	No	No	Yes	
BWC	M-37 PROJECT	Transportation Related Activities	Yes	Other	Yes	Rights-of-way maintenance/expansion.	(HWDCUT-LAA)	No	NONE	1	Each	0	1	No	No	Yes	
BWC	M-37 PROJECT	tree release and weed	Yes	Other	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	30	Acres	0	30	No	No	Yes	
BWC	M-37 PROJECT	Watershed Resource Structural Improvements Stream Channel	Yes	Water	Yes	Minimal tree removal, fish habitat.	(WLFISHSTR-LAA)	No	NONE	16	Each	0	16	No	No	Yes	
BWC	M-37 PROJECT	Wildlife Habitat Chemical treatment	Yes	Opening			(HERB-NLAA)	No	NONE	47	Acres	0	47	No	No	Yes	
BWC	M-37 PROJECT	Wildlife Habitat Nest structures, dens development	No	Mixed Hardwood/Conifer	Yes	Forest management.	(WLFISHSTR-LAA)	No	NONE	40	Each	0	40	No	No	Yes	
BWC	M-37 PROJECT	Wildlife Habitat Prescribed fire	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDLMB-LAA)	No	NONE	401	Acres	0	401	No	No	Yes	
BWC	M-37 PROJECT	Wildlife Habitat Seeding and planting	No	Opening			(OPN<3-NLAA)	No	NONE	74	Acres	0	74	No	No	Yes	
BWC	Mast Lake	Clearcut	YES	Conifer			(CONCUT-NLAA)	No	9/1-3/1	40	Acres	0	40	Yes	No	No	Acres under contract
BWC	Mast Lake	Clearcut	YES	Other			(CONCUT-NLAA)	No	10/1-3/31	110	Acres	0	110	Yes	No	No	Acres under contract
BWC	Mast Lake	Commercial Thin	YES	Conifer			(CONCUT-NLAA)	No	9/1-3/1	125	Acres	0	125	Yes	No	No	Acres under contract
BWC	MAST LAKE ENVIRONMENTAL ASSESSMENT	Animal Damage Control for Reforestation	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	10	Acres	0	10	No	No	Yes	
BWC	MAST LAKE ENVIRONMENTAL ASSESSMENT	broadcast burning	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDLMB-LAA)	No	NONE	87	Acres	0	87	No	No	Yes	
BWC	MAST LAKE ENVIRONMENTAL ASSESSMENT	Certification of Natural Regeneration with Site Prep	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	184	Acres	0	184	No	No	Yes	
BWC	MAST LAKE ENVIRONMENTAL ASSESSMENT	fill in or replant trees	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	23	Acres	0	23	No	No	Yes	
BWC	MAST LAKE ENVIRONMENTAL ASSESSMENT	fuel break	Yes	Mixed Hardwood/Conifer	No	Hardwood conversion.	(HWDCUT-LAA)	No	NONE	3	Acres	0	3	No	No	Yes	
BWC	MAST LAKE ENVIRONMENTAL ASSESSMENT	Invasives - Mechanical /Physical	No	Other			(OPN<3-NLAA)	No	NONE	3	Acres	0	3	No	No	Yes	
BWC	MAST LAKE ENVIRONMENTAL ASSESSMENT	Invasives - Pesticide Application	No	Other			(HERB-NLAA)	No	NONE	245	Acres	0	245	No	No	Yes	
BWC	MAST LAKE ENVIRONMENTAL ASSESSMENT	Native Species Established	No	Opening			(OPN<3-NLAA)	No	NONE	87	Acres	0	87	No	No	Yes	
BWC	MAST LAKE ENVIRONMENTAL ASSESSMENT	pile burning	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDLMB-LAA)	No	NONE	3	Acres	0	3	No	No	Yes	
BWC	MAST LAKE ENVIRONMENTAL ASSESSMENT	piling of fuels - machine or hand	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	3	Acres	0	3	No	No	Yes	
BWC	MAST LAKE ENVIRONMENTAL ASSESSMENT	plant trees	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	40	Acres	0	40	No	No	Yes	
BWC	MAST LAKE ENVIRONMENTAL ASSESSMENT	Plantation Survival Survey	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	120	Acres	0	120	No	No	Yes	
BWC	MAST LAKE ENVIRONMENTAL ASSESSMENT	Road Decommissioning	Yes	Other	Yes	Minimal tree removal.	(HWDCUT-LAA)	No	NONE	33	Acres	0	33	No	No	Yes	
BWC	MAST LAKE ENVIRONMENTAL ASSESSMENT	Scarify and Seed Landings	No	Opening			(OPN<3-NLAA)	No	NONE	2	Acres	0	2	No	No	Yes	
BWC	MAST LAKE ENVIRONMENTAL ASSESSMENT	Seed-tree Seed Cut (with and without leave trees) (EA/RH/NFH)	Yes	Hardwood	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	23	Acres	0	23	No	No	Yes	
BWC	MAST LAKE ENVIRONMENTAL ASSESSMENT	Shelterwood Removal Cut (EA/NRH/FH)	Yes	Hardwood	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	2	Acres	0	2	No	No	Yes	
BWC	MAST LAKE ENVIRONMENTAL ASSESSMENT	Site Preparation for Natural Regeneration - Manual	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	154	Acres	0	154	No	No	Yes	
BWC	MAST LAKE ENVIRONMENTAL ASSESSMENT	Soil Productivity Monitoring	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	162	Acres	0	162	No	No	Yes	
BWC	MAST LAKE ENVIRONMENTAL ASSESSMENT	stocking survey	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	369	Acres	0	369	No	No	Yes	
BWC	MAST LAKE ENVIRONMENTAL ASSESSMENT	Tree Release and Weed	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	23	Acres	0	23	No	No	Yes	
BWC	MAST LAKE ENVIRONMENTAL ASSESSMENT	Watershed Resource Activities	No	Water			(WLFISHSTR-NLAA)	No	NONE	20	Acres	0	20	No	No	Yes	
BWC	MAST LAKE ENVIRONMENTAL ASSESSMENT	Wildlife Habitat Create openings	Yes	Mixed Hardwood/Conifer	No	Hardwood conversion.	(HWDCUT-LAA)	No	NONE	53	Acres	0	53	No	No	Yes	
BWC	MAST LAKE ENVIRONMENTAL ASSESSMENT	Wildlife Habitat Improvement	Yes	Opening	Yes	Forest management.	(OPNMM-LAA)	No	NONE	89	Acres	0	89	No	No	Yes	
BWC	MAST LAKE ENVIRONMENTAL ASSESSMENT	Wildlife Habitat Mechanical treatment	Yes	Opening	Yes	Forest management.	(OPNMM-LAA)	No	NONE	73	Acres	0	73	No	No	Yes	
BWC	MAST LAKE ENVIRONMENTAL ASSESSMENT	Wildlife habitat monitoring - area	No	Opening			(NOEFFECT)	No	NONE	87	Acres	0	87	No	No	Yes	
BWC	MAST LAKE ENVIRONMENTAL ASSESSMENT	Wildlife Habitat Regeneration cut	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	4	Acres	0	4	No	No	Yes	
BWC	MAST LAKE ENVIRONMENTAL ASSESSMENT	Wildlife Habitat Rehabilitate openings	Yes	Opening	Yes	Forest management.	(OPNMM-LAA)	No	NONE	10	Acres	0	10	No	No	Yes	
BWC	MAST LAKE ENVIRONMENTAL ASSESSMENT	Wildlife Habitat Seeding and planting	No	Opening			(OPN<3-NLAA)	No	NONE	118	Acres	0	118	No	No	Yes	
BWC	MAST LAKE ENVIRONMENTAL ASSESSMENT	Wildlife habitat structural maintenance	Yes	Other	No	Structure placement.	(HWDCUT-LAA)	No	NONE	36	Each	0	36	No	No	Yes	
BWC	McDuffie EA	Prescribed fire	Yes	Opening	Yes	Forest management.	(OPNBRN-LAA)	No	NONE	38	Acres	0	38	No	No	Yes	
BWC	Minnie Pond	Prescribed Fire	Yes	Opening	Yes	Forest management.	(OPNBRN-LAA)	No	NONE	50	Acres	0	50	No	No	Yes	
BWC	Misc	road(re) construction/maintenance - 65 miles annual	Yes	Mixed Hardwood/Conifer	Yes	Rights-of-way maintenance/expansion.	(HWDCUT-LAA)	No	NONE	100	Acres	0	100	No			

Appendix A - List of Actions

District	NEPA Document Name	Activity	Cutting Veg > 3" DBH?	Vegetative Community	Take Excepted Through Interim 4d Rule?	4d Comments	Matrix Code	Will Incorporate Matrix Design Criteria?	Existing Timing Restrictions	Number of Units Planned	UOM	Number of Units Implemented	Number of Units To Be Implemented (Calculated)	Under Contract?	Indiana Bat Mitigations? (MNF Only)	Can Incorporate Additional Mitigations for NLEB?	Comments
BWC	NORTH AND SOUTH WINNEPESAU PROJECT	Certification of Natural Regeneration without Site Prep	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	374	Acres	0	374	No	No	Yes	
BWC	NORTH AND SOUTH WINNEPESAU PROJECT	commercial thin	Yes	Hardwood	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	155	Acres	0	155	No	No	Yes	
BWC	NORTH AND SOUTH WINNEPESAU PROJECT	Fill-in or Replant Trees	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	91	Acres	0	91	No	No	Yes	
BWC	NORTH AND SOUTH WINNEPESAU PROJECT	Inland fish habitat monitoring	No	Water			(WLFISHSTR-NLAA)	No	NONE	39	Each	0	39	No	No	Yes	
BWC	NORTH AND SOUTH WINNEPESAU PROJECT	Inland Fish habitat structural maintenance	Yes	Water	Yes	Minimal tree removal, fish habitat.	(WLFISHSTR-LAA)	No	NONE	16	Each	0	16	No	No	Yes	
BWC	NORTH AND SOUTH WINNEPESAU PROJECT	Inland Fish Log structures	Yes	Water	Yes	Minimal tree removal, fish habitat.	(WLFISHSTR-LAA)	No	NONE	70	Each	0	70	No	No	Yes	
BWC	NORTH AND SOUTH WINNEPESAU PROJECT	Inland Fish Structural Improvements	Yes	Water	Yes	Minimal tree removal, fish habitat.	(WLFISHSTR-LAA)	No	NONE	68	Each	0	68	No	No	Yes	
BWC	NORTH AND SOUTH WINNEPESAU PROJECT	Inland Fish Submerged brush or trees in lakes	Yes	Water	Yes	Minimal tree removal, fish habitat.	(WLFISHSTR-LAA)	No	NONE	65	Each	0	65	No	No	Yes	
BWC	NORTH AND SOUTH WINNEPESAU PROJECT	Inland Fish Trees or platforms	Yes	Water	Yes	Minimal tree removal, fish habitat.	(WLFISHSTR-LAA)	No	NONE	98	Each	0	98	No	No	Yes	
BWC	NORTH AND SOUTH WINNEPESAU PROJECT	Invasives - Mechanical /Physical	No	Opening			(OPN-3-NLAA)	No	NONE	0.1	Acres	0	0.1	No	No	Yes	
BWC	NORTH AND SOUTH WINNEPESAU PROJECT	Invasives - Pesticide Application	No	Opening			(HERB-NLAA)	No	NONE	48	Acres	0	48	No	No	Yes	
BWC	NORTH AND SOUTH WINNEPESAU PROJECT	plantation survival survey	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	298	Acres	0	298	No	No	Yes	
BWC	NORTH AND SOUTH WINNEPESAU PROJECT	Road Decommissioning	Yes	Other	Yes	Minimal tree removal.	(HWDCUT-LAA)	No	NONE	7	Acres	0	7	No	No	Yes	
BWC	NORTH AND SOUTH WINNEPESAU PROJECT	Scarify and Seed Landings	No	Opening			(OPN-3-NLAA)	No	NONE	1	Acres	0	1	No	No	Yes	
BWC	NORTH AND SOUTH WINNEPESAU PROJECT	Shelterwood removal	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	42	Acres	0	42	No	No	Yes	
BWC	NORTH AND SOUTH WINNEPESAU PROJECT	stand clearcut	Yes	Hardwood	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	49	Acres	0	49	No	No	Yes	
BWC	NORTH AND SOUTH WINNEPESAU PROJECT	stocking surveys	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	676	Acres	0	676	No	No	Yes	
BWC	NORTH AND SOUTH WINNEPESAU PROJECT	Watershed Resource Activities	No	Water			(WLFISHSTR-NLAA)	No	NONE	3	Acres	0	3	No	No	Yes	
BWC	NORTH AND SOUTH WINNEPESAU PROJECT	Wildlife Habitat Large woody debris placement	Yes	Mixed Hardwood/Conifer	Yes	Minimal tree removal, fish habitat.	(WLFISHSTR-LAA)	No	NONE	155	Each	0	155	No	No	Yes	
BWC	NORTH AND SOUTH WINNEPESAU PROJECT	Wildlife Habitat Regeneration cut	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	101	Acres	0	101	No	No	Yes	
BWC	NORTH AND SOUTH WINNEPESAU PROJECT	Wildlife Habitat Rehabilitate openings	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(OPNMM-LAA)	No	NONE	38	Acres	0	38	No	No	Yes	
BWC	NORTH AND SOUTH WINNEPESAU PROJECT	Wildlife Habitat Seeding and planting	No	Opening			(OPN-3-NLAA)	No	NONE	52	Acres	0	52	No	No	Yes	
BWC	NORTH AND SOUTH WINNEPESAU PROJECT	Wildlife Habitat Snags created	Yes	Conifer	Yes	Forest management.	(WLFISHSTR-LAA)	No	NONE	320	Each	0	320	No	No	Yes	
BWC	PLANTING FOR FY 2005 BALDWIN/WHITE CLOUD	Fill-in or Replant Trees	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	11	Acres	0	11	No	No	Yes	
BWC	PLANTING FOR FY 2005 BALDWIN/WHITE CLOUD	Plantation Survival Survey	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	11	Acres	0	11	No	No	Yes	
BWC	REFORESTATION & WILDLIFE 2006	Invasives - Pesticide Application	No	Other			(HERB-NLAA)	No	NONE	14	Acres	0	14	No	No	Yes	
BWC	REFORESTATION & WILDLIFE 2006	Wildlife Habitat Prescribed fire	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDLMB-LAA)	No	NONE	11	Acres	0	11	No	No	Yes	
BWC	REFORESTATION TIMBER STAND AND WILDLIFE HABITAT IMPROVEMENTS	certification - planted	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	10	Acres	0	10	No	No	Yes	
BWC	REFORESTATION TIMBER STAND AND WILDLIFE HABITAT IMPROVEMENTS	Fill-in or Replant Trees	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	16	Acres	0	16	No	No	Yes	
BWC	REFORESTATION TIMBER STAND AND WILDLIFE HABITAT IMPROVEMENTS	Invasives - Pesticide Application	No	Other			(HERB-NLAA)	No	NONE	111	Acres	0	111	No	No	Yes	
BWC	REFORESTATION TIMBER STAND AND WILDLIFE HABITAT IMPROVEMENTS	Maintenance of Animal Damage Control for Reforestation	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	10	Acres	0	10	No	No	Yes	
BWC	REFORESTATION TIMBER STAND AND WILDLIFE HABITAT IMPROVEMENTS	plant survival survey	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	30	Acres	0	30	No	No	Yes	
BWC	REFORESTATION TIMBER STAND AND WILDLIFE HABITAT IMPROVEMENTS	Reforestation Need created by Regeneration Failure	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	10	Acres	0	10	No	No	Yes	
BWC	REFORESTATION TIMBER STAND AND WILDLIFE HABITAT IMPROVEMENTS	Wildlife Habitat Seeding and planting	No	Mixed Hardwood/Conifer			(OPN-3-NLAA)	No	NONE	281	Acres	0	281	No	No	Yes	
BWC	SAVANNA ECOSYSTEM RESTORATION PROJECT	Broadcast Burning	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDLMB-LAA)	No	NONE	4111	Acres	0	4111	No	Yes	Yes	
BWC	SAVANNA ECOSYSTEM RESTORATION PROJECT	Certification of Natural Regeneration with Site Prep	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	23	Acres	0	23	No	Yes	Yes	
BWC	SAVANNA ECOSYSTEM RESTORATION PROJECT	Commercial Thin	Yes	Hardwood	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	593	Acres	0	593	No	Yes	Yes	
BWC	SAVANNA ECOSYSTEM RESTORATION PROJECT	Fill-in or Replant Trees	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	11	Acres	0	11	No	Yes	Yes	
BWC	SAVANNA ECOSYSTEM RESTORATION PROJECT	Invasives - Pesticide Application	No	Other			(HERB-NLAA)	No	NONE	418	Acres	0	418	No	Yes	Yes	
BWC	SAVANNA ECOSYSTEM RESTORATION PROJECT	Invasives - Treatment Activity Monitoring	No	Other			(NOEFFECT)	No	NONE	357	Acres	0	357	No	Yes	Yes	
BWC	SAVANNA ECOSYSTEM RESTORATION PROJECT	Permanent Land Clearing	Yes	Mixed Hardwood/Conifer	No	Hardwood conversion.	(HWDCUT-LAA)	No	NONE	1849	Acres	0	1849	No	Yes	Yes	
BWC	SAVANNA ECOSYSTEM RESTORATION PROJECT	Restoration Improvement Construction	Yes	Other	No	Hardwood conversion.	(HWDCUT-LAA)	No	NONE	11	Each	0	11	No	Yes	Yes	
BWC	SAVANNA ECOSYSTEM RESTORATION PROJECT	Road Decommissioning	Yes	Other	Yes	Minimal tree removal.	(HWDCUT-LAA)	No	NONE	10	Acres	0	10	No	Yes	Yes	
BWC	SAVANNA ECOSYSTEM RESTORATION PROJECT	stocking survey	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	46	Acres	0	46	No	Yes	Yes	
BWC	SAVANNA ECOSYSTEM RESTORATION PROJECT	T&ES non-structural improvement	Yes	Other	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	2272	Acres	0	2272	No	Yes	Yes	
BWC	SAVANNA ECOSYSTEM RESTORATION PROJECT	T&ES resource monitoring	No	Other			(NOEFFECT)	No	NONE	2890	Acres	0	2890	No	Yes	Yes	
BWC	SAVANNA ECOSYSTEM RESTORATION PROJECT	T&ES resource monitoring	No	Other			(NOEFFECT)	No	NONE	585	Acres	0	585	No	Yes	Yes	
BWC	SAVANNA ECOSYSTEM RESTORATION PROJECT	Trail Construction	Yes	Mixed Hardwood/Conifer	No	Hardwood conversion.	(HWDCUT-LAA)	No	NONE	19.7	Each	0	19.7	No	Yes	Yes	
BWC	SAVANNA ECOSYSTEM RESTORATION PROJECT	Wildlife Habitat Mechanical treatment	Yes	Opening	Yes	Forest management.	(OPNMM-LAA)	No	NONE	73	Acres	0	73	No	Yes	Yes	
BWC	SAVANNA ECOSYSTEM RESTORATION PROJECT	Wildlife Habitat Prescribed fire	Yes	Hardwood	Yes	Forest management.	(HWDLMB-LAA)	No	NONE	138	Acres	0	138	No	Yes	Yes	
BWC	SAVANNA ECOSYSTEM RESTORATION PROJECT	Wildlife Habitat Regeneration cut	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	23	Acres	0	23	No	Yes	Yes	
BWC	SAVANNA ECOSYSTEM RESTORATION PROJECT	Wildlife Habitat Seeding and planting	No	Opening			(OPN-3-NLAA)	No	NONE	399	Acres	0	399	No	Yes	Yes	
BWC	SAVANNA ECOSYSTEM RESTORATION PROJECT	Wildlife Habitat Seeding and planting	No	Opening			(OPN-3-NLAA)	No	NONE	315	Acres	0	315	No	Yes	Yes	
BWC	SCOTCH PINE	Broadcast Burning	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDLMB-LAA)	No	NONE	400	Acres	0	400	No	No	Yes	
BWC	SCOTCH PINE	Burning of Piled Material	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDHIB-LAA)	No	NONE	38	Acres	0	38	No	No	Yes	
BWC	SCOTCH PINE	Commercial thin	Yes	Conifer	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	15	Acres	0	15	No	No	Yes	
BWC	SCOTCH PINE	Fill-in or Replant Trees	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	77	Acres	0	77	No	No	Yes	
BWC	SCOTCH PINE	Initiate Natural Regeneration	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(CONCUT-LAA)	No	NONE	13	Acres	0	13	No	No	Yes	
BWC	SCOTCH PINE	Initiate Natural Regeneration	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	32	Acres	0	32	No	No	Yes	
BWC	SCOTCH PINE	Piling of Fuels, Hand or Machine	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	38	Acres	0	38	No	No	Yes	
BWC	SCOTCH PINE	Plantation Survival Survey	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	72	Acres	0	72	No	No	Yes	
BWC	SCOTCH PINE	Rearrangement of Fuels	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	38	Acres	0	38	No	No	Yes	
BWC	SCOTCH PINE	Shelterwood Establishment Cut (with or without leave trees) (EA/RH/NFH)	Yes	Conifer	Yes	Forest management.	(CONCUT-LAA)	No	NONE	9	Acres	0	9	No	No	Yes	
BWC	SCOTCH PINE	Stand Clearcut (EA/RH/NFH)	Yes	Conifer	Yes	Forest management.	(CONCUT-LAA)	No	NONE	77	Acres	0	77	No	No	Yes	
BWC	SCOTCH PINE	stocking survey	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	26	Acres	0	26	No	No	Yes	
BWC	SCOTCH PINE	stocking survey	No	Mixed Hardwood/Conifer			(NOEFFECT)	No	NONE	186	Acres	0	186	No	No	Yes	
BWC	SCOTCH PINE	T&ES resource monitoring	No	Other			(NOEFFECT)	No	NONE	5	Acres	0	5	No	No	Yes	
BWC	SCOTCH PINE	Wildlife habitat non-structural maintenance	Yes	Other	Yes	Forest management.	(CONCUT-LAA)	No	NONE	10	Acres	0	10	No	No	Yes	
BWC	SCOTCH PINE	Wildlife Habitat Rehabilitate openings	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(OPNMM-LAA)	No	NONE	7	Acres	0	7	No	No	Yes	
BWC	SOUTHEAST PEACOCK FUELS	broadcast burning	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDLMB-LAA)	No	NONE	1309	Acres	0	1309	No	No	Yes	
BWC	SOUTHEAST PEACOCK FUELS	Prescribed Burning (total acres)	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDLMB-LAA)	No	NONE	2767	Acres	0	2767	No	No	Yes	
BWC	SOUTHEAST PEACOCK FUELS	Burning of Piled Material	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDHIB-LAA)	No	NONE	220	Acres	0	220	No	No	Yes	
BWC	SOUTHEAST PEACOCK FUELS	clearcut	Yes	Conifer	Yes	Forest management.	(CONCUT-LAA)	No	NONE	159	Acres	0	159	No	No	Yes	
BWC	SOUTHEAST PEACOCK FUELS	commercial thin	Yes	Conifer	Yes	Forest management.	(CONCUT-LAA)	No	NONE	506	Acres	0	506	No	No	Yes	
BWC	SOUTHEAST PEACOCK FUELS	fuel break	Yes	Mixed Hardwood/Conifer	No	Hardwood conversion.	(HWDCUT-LAA)	No	NONE	47	Acres	0	47	No	No	Yes	
BWC	SOUTHEAST PEACOCK FUELS	Invasives - Mechanical /Physical	No	Other			(OPN-3-NLAA)	No	NONE	86	Acres	0	86	No	No	Yes	
BWC	SOUTHEAST PEACOCK FUELS	Invasives - Pesticide Application	No	Other			(HERB-NLAA)	No	NONE	112	Acres	0	112	No	No	Yes	
BWC	SOUTHEAST PEACOCK FUELS	Invasives - Pesticide Application	No	Other			(HERB-NLAA)	No	NONE	1611	Acres	0	1611	No	No	Yes	
BWC	SOUTHEAST PEACOCK FUELS	Piling of Fuels, Hand or Machine	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	220	Acres	0	220	No	No	Yes	
BWC	SOUTHEAST PEACOCK FUELS	shelterwood	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	419	Acres	0	419	No	No	Yes	
BWC	SOUTHEAST PEACOCK FUELS	Wildlife Habitat Create openings	Yes	Mixed Hardwood/Conifer	No	Hardwood conversion.											

Appendix A - List of Actions

District	NEPA Document Name	Activity	Cutting Veg > 3" DBH?	Vegetative Community	Take Excepted Through Interim 4d Rule?	4d Comments	Matrix Code	Will Incorporate Matrix Design Criteria?	Existing Timing Restrictions	Number of Units Planned	UOM	Number of Units Implemented	Number of Units To Be Implemented (Calculated)	Under Contract?	Indiana Bat Mitigations? (MNF Only)	Can Incorporate Additional Mitigations for NLEB?	Comments
BWC	UPPER BRANCH	Stand Clearcut (EA/RH/FH)	Yes	Hardwood	Yes	Forest management.	(HWDCUT-LAA)	No	NONE	51	Acres	0	51	No	No	Yes	
BWC	UPPER BRANCH DECISION NOTICE	Invasives - Pesticide Application	No	Other			(HERB-NLAA)	No	NONE	11	Acres	0	11	No	No	Yes	
BWC	UPPER BRANCH DECISION NOTICE	Wildlife Habitat Rehabilitate openings	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(OPNMM-LAA)	No	NONE	15	Acres	0	15	No	No	Yes	
BWC	WALHALLA EA	commercial thin	Yes		Yes	Forest management.	(HWDCUT-LAA)	No	NONE	33	Acres	0	33	No	No	Yes	
BWC	WALHALLA EA	Invasives - Pesticide Application	No	Other			(HERB-NLAA)	No	NONE	2	Acres	0	2	No	No	Yes	
BWC	WALHALLA EA	Road Decommissioning	Yes	Other	Yes	Minimal tree removal.	(HWDCUT-LAA)	No	NONE	1	Acres	0	1	No	No	Yes	
BWC	WALHALLA EA	Watershed Resource Road Closure - Area	Yes	Other	Yes	Minimal tree removal.	(WLFISHSTR-LAA)	No	NONE	2	Acres	0	2	No	No	Yes	
BWC	WALHALLA EA	Wildlife Habitat access management development	Yes	Other	Yes	Minimal tree removal.	(HWDCUT-LAA)	No	NONE	1	Each	0	1	No	No	Yes	
BWC	WALHALLA EA	Wildlife Habitat Prescribed fire	Yes	Mixed Hardwood/Conifer	Yes	Forest management.	(HWDLMB-LAA)	No	NONE	54	Acres	0	54	No	No	Yes	

Appendix B - List of Special Use Permits

Auth ID	Contact Name	Use Code	Acres	Take Exempt Through Interim 4d Rule?	4d Comments	Veg Clearing (Mowing Clipping Cutting Trees)	Veg Establishment (Planting Seeding Mulching)	Activity				Right to Flow
								Road/Trail Maintenance (Blading Grading Spot Surfacing Pothole Filling Repaving Ditch Clearing)	Snow Plowing	Trail Construction		
MIO290	GREEK ORTHODOX ARCHDIOCESE	113	11.90	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x				
MAN242	DAVID CASWELL	121	0.10	Yes	Rights-of-way, minimal tree or hazard tree removal.			x				
BAL165	PARSH, THOMAS	123	0.46	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL167	AVERILL, RAYMOND C.	123	0.52	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL168	LUBBERS, TED	123	0.52	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL169	KNAUF, THOMAS J.	123	0.52	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL170	ROOD, MICHAEL	123	0.52	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL171	VANDENBROEK, HARRY	123	0.52	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL173	CLEMENT, JAMES	123	0.43	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL174	CHARLES R. AND LISA K. BOWEN	123	0.60	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL175	GERMAN, DARYL	123	0.69	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL176	MCGOWAN, HARRY	123	0.69	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL177	BUYS, RICHARD	123	0.65	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL178	HARRINGTON, DENNIS	123	0.65	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL179	PAUL AND JONI ORTMAN	123	0.65	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL180	DOUGLAS AND JUDITH SMITH	123	0.66	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL184	Blanchard, Philip	123	0.52	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL197	GILMER, DEREK	123	0.52	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN622	STEEBY, THOMAS W.	123	0.67	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN623	MORSE, JACK	123	0.76	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN649	MULDER, JAY A	123	0.67	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN676	VAN BEMMELLEN, TODD	123	0.69	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIO232	DOUGLAS J. AND LAURIE A. DINNEBEL	123	0.37	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIO233	JOHN P. AND KATHLEEN M. MECH	123	0.30	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIO234	PAUL C. AND BETHANY G. COTE	123	0.36	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIO235	WAGNER, CANDY WHITNEY	123	0.39	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIO236	CORKER, ARTHUR	123	0.10	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIO238	WILLIAM AND LYNN E. COX	123	0.31	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIO240	JAMES AND MARCIA REIDY	123	0.30	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIO241	MARK AND MARY GREER	123	0.36	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIO242	THOMAS B. AND ANDREA K. FENTON	123	0.38	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIO243	MICHAEL E. AND DEBORA L. EDMONDS	123	0.37	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIO244	CECIL L. AND ALICE D. PRATT	123	0.38	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIO245	JOHN AND BARBARA WRIXON	123	0.36	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIO246	COWAN, JAMES D.	123	0.41	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIO247	HINDMARSH, ANDREW	123	0.40	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIO248	DAVID A. AND SANDRA L. GREANYA	123	0.45	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIO249	STEFFIN, SHELLEY E.	123	0.34	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIO250	KEITH B. AND SUSAN W. SPAULDING	123	0.31	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIO251	MURCHISON, PAMELA A.	123	0.35	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIO252	PHILLIPS, THOMAS B	123	0.40	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIO253	KENNETH J. AND KATHLEEN LASALLE	123	0.87	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIO254	SILUK, DORIS A.	123	0.83	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIO255	THOMAS A. AND JULIE A. BROWN	123	0.93	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIO257	PHILLIPS, SUSAN L.	123	0.88	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIO258	DOROTHY D. AND RONALD R. POTTER	123	0.80	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIO264	JOHN AND SYLVIA ROWLAND	123	0.32	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIO280	MICHAEL AND JULIA POPADICH	123	0.37	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIO401	MICHAEL AND HOLLY ANN FINLEY	123	0.36	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW268	TIMOTHY AND REBECCA BATES	123	0.32	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW269	CHRISTOPHER J. AND LISA A. PATEN	123	0.53	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW270	BRUCE M. COXWORTH AND DEBORAH A. BAYER	123	0.93	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW271	MARTIN J. AND BARBARA A. GEYER	123	0.64	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW272	NUECHTERLEIN, LEONARD	123	0.65	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW273	FINKBEINER, LARRY T.	123	0.37	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW274	FAERBER, BRUCE A.	123	0.54	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW275	BIERLEIN, ARLENE F.	123	0.70	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW277	RAADE, ROBERT	123	0.47	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW279	ALVERSON, BARBARA E.	123	0.71	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW280	ARTHUR, BRIAN AND BECKY	123	0.46	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW281	JAMES R. AND BRIDGET M. FOX	123	0.35	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW284	POWELL, DOROTHY	123	0.59	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW285	GUILSTORF, BARBARA	123	0.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW286	RANDALL J. AND KATHY J. MILLER	123	0.50	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW287	AVERY, DEAN A.	123	0.53	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW288	STEVEN AND CYNTHIA WATKINS	123	0.45	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW290	LYDDY, CRAIG	123	0.18	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW291	BURNS, GOLDIE	123	0.36	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW292	GEORGE AND MARY ATTWELL	123	0.47	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW293	STUHRBERG, WALTER	123	0.39	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW295	TUTTLE, TERENCE K.	123	0.33	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW297	TRASK, JENNIFER	123	0.67	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW299	CALLES, VICTOR M.	123	0.36	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW300	DEGENS, JOSEPH	123	0.37	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW301	WILLIAM AND ANGELA LEVITT	123	0.37	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW302	MANETTA, ROBERT B.	123	0.50	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW312	HEPWORTH, JILL LYNN	123	0.60	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW325	WILLIAM AND DENISE CRYSTLER	123	0.36	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW340	KOWALSKY, VELDA M.	123	0.60	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW371	BROWN, WILLIAM E	123	0.42	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW384	SEMPOSKI, NILA	123	0.71	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW392	RODGER AND MARY CRAWFORD	123	0.48	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW393	JOSEPH AND JENNIFER HAMEL	123	0.73	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW396	SAGER, KEN	123	0.46	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW399	BERGER, ETHAN T.	123	0.35	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW414	CRYSTLER, WILLIAM T.	123	0.36	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW413	BROWN, WILLIAM E	123	0.42	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIO354	BETHANY COTE, TRUSTEE	123	0.36	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN559	AMERICAN LAND & LEISURE	141	491.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x					
MAN659	Wolf Lake Ranch Resort, Inc.	153	5.24	Yes	Rights-of-way, minimal tree or hazard tree removal, trail	x	x	x				x
MAN803	PADDLEHEAD II LLC	153	1.00	Yes	Rights-of-way, minimal tree or hazard tree removal, trail	x	x	x				x
MAN804	BARKMAN, DAVID BRUCE	153	1.00	Yes	Rights-of-way, minimal tree or hazard tree removal, trail	x	x	x				x
MAN788	HAGLUND, GLEN	153	1.00	Yes	Rights-of-way, minimal tree or hazard tree removal, trail	x	x	x				x
MAN787	MANISTEE RIVER OUTFITTERS, LLC	153	1.00	Yes	Rights-of-way, minimal tree or hazard tree removal, trail	x	x	x				x
MAN782	PADDLEHEAD INC. DBA - BALDWIN CANOE RENTAL	153	1.00	Yes	Rights-of-way, minimal tree or hazard tree removal, trail	x	x	x				x
MAN794	HAWKINS, CHARLES	153	1.00	Yes	Rights-of-way, minimal tree or hazard tree removal, trail	x	x	x				x
MAN800	ISON, BOB	153	1.00	Yes	Rights-of-way, minimal tree or hazard tree removal, trail	x	x	x				x
MAN802	TIGHE, ANDREW	153	1.00	Yes	Rights-of-way, minimal tree or hazard tree removal, trail	x	x	x				x
MIO353	LAFKAS, ALEX	153	1.00	Yes	Rights-of-way, minimal tree or hazard tree removal, trail	x	x	x				x
BAL190	Walker, George	172	10.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x						
HAR6%	MI STATE HIGHWAY DEPT.	172	1.40	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x				
MAN392	SHERMAN TOWNSHIP	172	2.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x				
TAW56BAL100	MI STATE HIGHWAY DEPT.	172	3.80	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x				
WHC100203	MI STATE HIGHWAY DEPT.	172	4.59	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x				
BAL223	MID-UNION SLED HAULERS	181	5.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x				
BAL217	TALSMA, BEN	181	5.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x				
HAR86	BARTON CITY IMPROVEMENT ASSOCIATION	181	1.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x				
TAW423	LIONS OF MICHIGAN BAND	181	2.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x				
MAN777	NICHOLAS, CHRIS	181	5.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x				
MAN776	WALK	181	5.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x				
MIO350	OSCODA COUNTY CHAMBER OF COMMERCE	181	1.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x				
BAL222	MICHIGAN DOG DRIVERS ASSOCIATION	181	5.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x				
MAN799	PLITE, RICK	181	5.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x				
MAN798	BUCHANAN, BRIAN	181	5.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x				
BAL221	GREAT LAKES SLED DOG ASSOCIATION	181	5.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x				
MAN789	CYSTIC FIBROSIS FOUNDATION	181	5.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x				
MIO349	BENTWHEEL CONSERVATION CLUB	181	2.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x				
TAW417	TAWAS AREA HIGH SCHOOL	191	1.00	Yes	Rights-of-way, minimal tree or hazard tree removal, trail	x	x	x				x
TAW418	METRO DETROIT CHINESE ALLIANCE CHURCH	191	1.00	Yes	Rights-of-way, minimal tree or hazard tree removal, trail	x	x	x				x
TAW420	AUSABLE VALLEY TRAILRIDERS ASSOCIATION	191	1.00	Yes	Rights-of-way, minimal tree or hazard tree removal, trail	x	x	x				x
MIO338	SOUTH BRANCH, TOWNSHIP OF	222	0.80	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x				
MIO341	SOUTH BRANCH, TOWNSHIP OF	222	0.08	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x				
BAL101301	SWEETWATER TOWNSHIP	321	3.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x				
HAR101901	HARRISVILLE, CITY OF	343	0.17	Yes	Rights-of-way, minimal tree or hazard tree removal.	x						
TAW12	AUSABLE TOWNSHIP	343	1.87	Yes	Rights-of-way, minimal tree or hazard tree removal							

Appendix B - List of Special Use Permits

Auth ID	Contact Name	Use Code	Acres	Take Exempt Through Interim 4d Rule?	4d Comments	Veg Clearing (Mowing Clipping Cutting Brush)	Veg Establishment (Planting Seeding Mulching)	Activity				Right to Flow
								Road/Trail Maintenance (Blading Grading Spot Surfacing Pothole Filling Repaving Ditch Clearing)	Snow Plowing	Trail Construction		
MAN402606	MICHIGAN CONSOLIDATED GAS CO.	631	5.61	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN403201	BASIN PIPELINE LIMITED LIAB.	631	0.15	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MIO129	SAVOY EXPLORATION, INC	631	0.80	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MIO263	DCP	631	1614.49	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MIO402301	ENBRIDGE ENERGY LIMITED PARTNERSHIP	631	58.90	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MIO402601	MICHIGAN CONSOLIDATED GAS CO.	631	24.44	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
TAW402605	MICHIGAN CONSOLIDATED GAS CO.	631	35.52	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC402101	ANR PIPELINE COMPANY	631	19.06	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC402102	ANR PIPELINE COMPANY	631	0.98	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC50	ENVERON CORPORATION	631	0.14	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL202	GREAT LAKES ENERGY	641	206.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL401801	WOLVERINE POWER SUPPLY COOP.	641	445.09	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD401302	GREAT LAKES ENERGY	641	40.71	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN401201	CHERRYLAND ELECTRIC COOP.	641	25.42	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN401602	WESTERN MICHIGAN ELECTRIC COOP	641	97.64	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MIO335	GREAT LAKES ENERGY COOPERATIVE	641	92.29	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD12	MICHIGAN ELECTRIC TRANSMISSION COMPANY	643	241.15	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN67	CONSUMERS ENERGY COMPANY	643	136.88	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN765	MARTIN-MARIETTA CHEMICALS	643	2.42	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MIO313	MERIT ENERGY CO	643	2.88	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MIO69	CONSUMERS ENERGY COMPANY	643	154.42	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD67	MICHIGAN ELECTRIC TRANSMISSION COMPANY	643	243.23	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MIO104101	MDOT, BUREAU OF AERONAUTICS	711	54.56	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL102313	LAKE COUNTY ROAD COMMISSION	741	2.50	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL102604	MASON COUNTY ROAD COMMISSION	741	2.80	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL102605	MASON COUNTY ROAD COMMISSION	741	0.60	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL102607	MASON COUNTY ROAD COMMISSION	741	2.10	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL103111	OCEANA COUNTY, ROAD COMMISSION	741	0.24	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD102829	WEXFORD CO ROAD COMMISSION	741	13.46	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD103301	WEXFORD CO ROAD COMMISSION	741	1.90	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD103302	WEXFORD CO ROAD COMMISSION	741	4.20	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD103303	WEXFORD CO ROAD COMMISSION	741	9.98	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD103309	WEXFORD CO ROAD COMMISSION	741	2.70	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
HAR102003	ALCONA COUNTY ROAD COMMISSION	741	15.78	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
HAR102004	ALCONA COUNTY ROAD COMMISSION	741	6.70	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
HAR102009	ALCONA COUNTY ROAD COMMISSION	741	6.33	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
HAR103202	OSCODA COUNTY ROAD COMMISS	741	27.71	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
HAR39	MI STATE HIGHWAY DEPT.	741	4.87	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN102519	MANISTEE COUNTY ROAD COMMISSION	741	29.30	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN102520	MANISTEE COUNTY ROAD COMMISSION	741	12.50	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN642	MICHIGAN DEPARTMENT OF TRANSPORTATION	741	0.59	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MIO102101	CRAWFORD COUNTY ROAD COMMISSION	741	5.83	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MIO102803	MI STATE HIGHWAY DEPT.	741	1.42	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MIO103203	OSCODA COUNTY ROAD COMMISS	741	59.61	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MIO103205	OSCODA COUNTY ROAD COMMISS	741	31.10	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MIO103207	OSCODA COUNTY ROAD COMMISS	741	3.50	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
TAW102201	IOSCO COUNTY RD COMMISSION	741	85.11	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
TAW102202	IOSCO COUNTY RD COMMISSION	741	10.48	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
TAW102203	IOSCO COUNTY RD COMMISSION	741	15.15	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
TAW102207	IOSCO COUNTY RD COMMISSION	741	34.57	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
TAW102208	IOSCO COUNTY RD COMMISSION	741	2.83	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
TAW195	MI STATE HIGHWAY DEPT.	741	1.80	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC102902	MUSKEGON CO ROAD COMMISSION	741	3.45	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC103006	NEWAYGO CO ROAD COMMISSION	741	9.09	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC103008	NEWAYGO CO ROAD COMMISSION	741	14.90	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC103107	OCEANA COUNTY, ROAD COMMISSION	741	1.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC103401	MONTCALM CO ROAD COMMISSION	741	0.20	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL102301	LAKE COUNTY ROAD COMMISSION	751	2.40	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL102302	LAKE COUNTY ROAD COMMISSION	751	0.10	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL102303	LAKE COUNTY ROAD COMMISSION	751	22.68	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL102304	LAKE COUNTY ROAD COMMISSION	751	1.31	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL102305	LAKE COUNTY ROAD COMMISSION	751	6.44	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL102306	LAKE COUNTY ROAD COMMISSION	751	0.33	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL102307	LAKE COUNTY ROAD COMMISSION	751	13.72	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL102308	LAKE COUNTY ROAD COMMISSION	751	8.63	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL102309	LAKE COUNTY ROAD COMMISSION	751	1.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL102310	LAKE COUNTY ROAD COMMISSION	751	9.56	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL102311	LAKE COUNTY ROAD COMMISSION	751	2.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL102312	LAKE COUNTY ROAD COMMISSION	751	1.60	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL102322	LAKE COUNTY ROAD COMMISSION	751	0.70	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL102323	LAKE COUNTY ROAD COMMISSION	751	4.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL102324	LAKE COUNTY ROAD COMMISSION	751	9.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL102608	MASON COUNTY ROAD COMMISSION	751	1.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL102814	MI STATE HIGHWAY DEPT.	751	2.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL103013	NEWAYGO CO ROAD COMMISSION	751	1.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL103017	NEWAYGO CO ROAD COMMISSION	751	10.27	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL103021	NEWAYGO CO ROAD COMMISSION	751	12.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL103104	OCEANA COUNTY, ROAD COMMISSION	751	2.27	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL103110	OCEANA COUNTY, ROAD COMMISSION	751	4.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL103112	OCEANA COUNTY, ROAD COMMISSION	751	19.55	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL131	MASON COUNTY ROAD COMMISSION	751	1.73	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL63	LAKE COUNTY ROAD COMMISSION	751	3.48	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD102504	MANISTEE COUNTY ROAD COMMISSION	751	3.24	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD102505	MANISTEE COUNTY ROAD COMMISSION	751	1.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD102531	MASON COUNTY ROAD COMMISSION	751	1.20	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD102805	MI STATE HIGHWAY DEPT.	751	1.34	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD103304	WEXFORD CO ROAD COMMISSION	751	1.21	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD103305	WEXFORD CO ROAD COMMISSION	751	3.47	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD103306	WEXFORD CO ROAD COMMISSION	751	1.30	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD103307	WEXFORD CO ROAD COMMISSION	751	1.10	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD103308	WEXFORD CO ROAD COMMISSION	751	0.14	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD103310	WEXFORD CO ROAD COMMISSION	751	0.96	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD103322	WEXFORD CO ROAD COMMISSION	751	7.06	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD103323	WEXFORD CO ROAD COMMISSION	751	1.09	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD103325	WEXFORD CO ROAD COMMISSION	751	0.10	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD11	WEXFORD CO ROAD COMMISSION	751	1.42	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD41	MI STATE HIGHWAY DEPT.	751	20.19	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD46	WEXFORD CO ROAD COMMISSION	751	0.60	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
HAR102001	ALCONA COUNTY ROAD COMMISSION	751	6.50	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
HAR102010	ALCONA COUNTY ROAD COMMISSION	751	0.75	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
HAR102011	ALCONA COUNTY ROAD COMMISSION	751	20.12	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
HAR102012	ALCONA COUNTY ROAD COMMISSION	751	20.12	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
HAR102815	MI STATE HIGHWAY DEPT.	751	35.40	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
HAR103220	OSCODA COUNTY ROAD COMMISS	751	17.53	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
HAR103224	OSCODA COUNTY ROAD COMMISS	751	1.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
HAR3	HARRY GERARD	751	0.30	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
HAR83	ALCONA COUNTY ROAD COMMISSION	751	1.90	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN102501	MANISTEE COUNTY ROAD COMMISSION	751	1.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN102502	MANISTEE COUNTY ROAD COMMISSION	751	3.50	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN102503	MANISTEE COUNTY ROAD COMMISSION	751	3.25	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN102506	MANISTEE COUNTY ROAD COMMISSION	751	6.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN102507	MANISTEE COUNTY ROAD COMMISSION	751	6.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN102508	MANISTEE COUNTY ROAD COMMISSION	751	1.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN102509	MANISTEE COUNTY ROAD COMMISSION	751	1.76	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN102510	MANISTEE COUNTY ROAD COMMISSION	751	0.38	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN102511	MANISTEE COUNTY ROAD COMMISSION	751	0.58	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN102512	MANISTEE COUNTY ROAD COMMISSION	751	3.18	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN102513	MANISTEE COUNTY ROAD COMMISSION	751	0.92	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN102514	MANISTEE COUNTY ROAD COMMISSION	751	5.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN102515	MANISTEE COUNTY ROAD COMMISSION	751	6.50	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN102516	MANISTEE COUNTY ROAD COMMISSION	751	4.30	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN102517	MANISTEE COUNTY ROAD COMMISSION	751	6.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN102518	MANISTEE COUNTY ROAD COMMISSION	751	2.08	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN102521	MANISTEE COUNTY ROAD COMMISSION	751	2.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN102522	MANISTEE COUNTY ROAD COMMISSION	751	1.77	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN10252												

Appendix B - List of Special Use Permits

Auth ID	Contact Name	Use Code	Acres	Take Exempt Through Interim 4d Rule?	4d Comments	Veg Clearing (Mowing Clipping Cutting Brush)	Veg Establishment (Planting Seeding Mulching)	Activity				Right to Flow
								Road/Trail Maintenance (Blading Grading Spot Surfacing Pothole Filling Repaving Ditch Clearing)	Snow Plowing	Trail Construction		
MAN24	WEXFORD CO ROAD COMMISSION	751	0.63	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN307	MANISTEE COUNTY ROAD COMMISSION	751	32.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN308	MANISTEE COUNTY ROAD COMMISSION	751	8.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN359	MASON COUNTY ROAD COMMISSION	751	2.20	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN42	MANISTEE COUNTY ROAD COMMISSION	751	2.52	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN434	MASON COUNTY ROAD COMMISSION	751	3.18	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN524101	MICHAEL BUCKLEY	751	1.59	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIO102102	CRAWFORD COUNTY ROAD COMMISSION	751	0.43	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MIO102810	MI STATE HIGHWAY DEPT.	751	100.83	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MIO102827	MI STATE HIGHWAY DEPT.	751	2.27	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MIO103201	OSCODA COUNTY ROAD COMMISS	751	4.12	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MIO103204	OSCODA COUNTY ROAD COMMISS	751	2.18	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MIO103206	OSCODA COUNTY ROAD COMMISS	751	2.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MIO103208	OSCODA COUNTY ROAD COMMISS	751	0.16	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MIO103209	OSCODA COUNTY ROAD COMMISS	751	1.09	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MIO103219	OSCODA COUNTY ROAD COMMISS	751	4.21	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MIO103222	OSCODA COUNTY ROAD COMMISS	751	57.85	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MIO103223	OSCODA COUNTY ROAD COMMISS	751	17.63	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MIO42	OSCODA COUNTY ROAD COMMISS	751	52.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MIO73	ALCONA COUNTY ROAD COMMISSION	751	20.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
TAW102205	IOSCO COUNTY RD COMMISSION	751	3.68	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
TAW102206	IOSCO COUNTY RD COMMISSION	751	14.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
TAW102215	IOSCO COUNTY RD COMMISSION	751	2.30	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
TAW102216	IOSCO COUNTY RD COMMISSION	751	3.42	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
TAW102217	IOSCO COUNTY RD COMMISSION	751	5.88	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
TAW102218	IOSCO COUNTY RD COMMISSION	751	2.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
TAW102401	PLAINFIELD TOWNSHIP	751	1.70	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
TAW102808	MI STATE HIGHWAY DEPT.	751	151.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
TAW110	ALCONA COUNTY ROAD COMMISSION	751	4.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
TAW112	IOSCO COUNTY RD COMMISSION	751	8.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
TAW236	AUSABLE TOWNSHIP	751	0.74	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
TAW29	ALCONA COUNTY ROAD COMMISSION	751	28.87	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
TAW34	ALCONA COUNTY ROAD COMMISSION	751	7.50	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
TAW35	IOSCO COUNTY RD COMMISSION	751	2.12	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
TAW401	IOSCO COUNTY RD COMMISSION	751	1.27	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
TAW402	IOSCO COUNTY RD COMMISSION	751	0.90	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
TAW403	IOSCO COUNTY RD COMMISSION	751	2.68	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
TAW8	IOSCO COUNTY RD COMMISSION	751	2.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC102701	MECOSTA COUNTY ROAD COMMISSION	751	2.01	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC102801	MI STATE HIGHWAY DEPT.	751	0.10	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC102804	MI STATE HIGHWAY DEPT.	751	21.28	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC102806	MI STATE HIGHWAY DEPT.	751	1.12	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC102807	MI STATE HIGHWAY DEPT.	751	41.62	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC102809	MI STATE HIGHWAY DEPT.	751	32.60	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC102901	MUSKEGON CO ROAD COMMISSION	751	0.28	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC102903	MUSKEGON CO ROAD COMMISSION	751	0.23	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC103001	NEWAYGO CO ROAD COMMISSION	751	2.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC103002	NEWAYGO CO ROAD COMMISSION	751	1.12	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC103003	NEWAYGO CO ROAD COMMISSION	751	1.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC103004	NEWAYGO CO ROAD COMMISSION	751	2.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC103007	NEWAYGO CO ROAD COMMISSION	751	3.41	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC103009	NEWAYGO CO ROAD COMMISSION	751	2.02	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC103010	NEWAYGO CO ROAD COMMISSION	751	9.38	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC103011	NEWAYGO CO ROAD COMMISSION	751	3.40	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC103012	NEWAYGO CO ROAD COMMISSION	751	2.60	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC103014	NEWAYGO CO ROAD COMMISSION	751	14.40	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC103022	NEWAYGO CO ROAD COMMISSION	751	4.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC103023	NEWAYGO CO ROAD COMMISSION	751	1.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC103101	OCEANA COUNTY, ROAD COMMISSION	751	1.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC103102	OCEANA COUNTY, ROAD COMMISSION	751	1.35	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC103103	OCEANA COUNTY, ROAD COMMISSION	751	1.23	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC103106	OCEANA COUNTY, ROAD COMMISSION	751	4.70	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC103108	OCEANA COUNTY, ROAD COMMISSION	751	6.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC103109	OCEANA COUNTY, ROAD COMMISSION	751	1.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC129	NEWAYGO CO ROAD COMMISSION	751	1.16	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC148	OCEANA COUNTY, ROAD COMMISSION	751	1.18	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC169	NEWAYGO CO ROAD COMMISSION	751	0.50	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC37	OCEANA COUNTY, ROAD COMMISSION	751	1.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC38	MUSKEGON CO ROAD COMMISSION	751	2.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
HAR85	ALCONA COUNTY ROAD COMMISSION	751	2.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL104	KENNETH SINK	752	0.19	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL105	ROGER MCMEEKAN	752	0.13	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL107	SYERS, DONALD R.	752	0.15	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL108	JAMES MIERAS	752	0.11	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL110	WHEELER, JOHN	752	0.32	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL111	TARNOW, MARTIN	752	0.73	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL112	JOHN WISEMAN	752	1.75	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL116	JILL A. NERHEIM, TRUST	752	0.87	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL117	TREEHOLD, LTD.	752	0.72	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL118	DAVIDEIT-SCHWARTZ TRUST	752	0.30	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL122	DELBERT VANDALL	752	2.18	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL125	ROBERT & KATHLEEN SMITH	752	0.36	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL128	WILLIAM DORNOS	752	1.16	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL133	CRAIG, SCOTT	752	0.73	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL134	DEFOW, TODD	752	0.44	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL143	Jolly Good Fellows Association	752	0.87	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL151	RODRIGUEZ, MICHELLE	752	0.39	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL152	NELSON, MONTE	752	0.17	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL154	DAVID DEVRIES	752	0.44	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL157	HEYNE, JAMES A.	752	0.73	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL158	BEN KRILL	752	0.29	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL159	S&F ASSOCIATION	752	0.68	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL181	TERRY ANDERSON	752	1.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL182	SAUSER, DONALD H.	752	0.42	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL183	NOT-A-PE-KA-GON ESTATES	752	2.20	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL187	DeJonge, John H.	752	0.22	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL192	Michael & Barbara Yderstad	752	0.36	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL37	ZANGER, MATTHEW	752	0.29	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL45	HESLINGA, ALVIN	752	0.17	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL51	BUSSCHER, WAYNE	752	0.29	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL534101	JENKS LAKE IMPROVEMENT ASSOC.	752	1.62	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL55	NELSON, JAMES D.	752	0.04	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL68	ROBY LAKE PROP. OWNERS ASSOC.	752	0.29	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL69	KAISER, JOHN	752	0.18	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL70	SanCraint, Jay	752	0.18	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL71	DAVID SHAFFER	752	0.36	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL73	WOLGAMOTT, DALE	752	0.36	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL74	ACORN LANE ASSOCIATION	752	0.28	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL82	WINKLEY, JACK & PATRICIA	752	0.36	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL83	WHEELER, JOHN	752	0.08	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL86	LAMBRIX, BRAD	752	0.36	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL89	SOUTH BRANCH NEWCOMER'S ASSOCIATION	752	0.40	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL91	PHIL NOVAK	752	0.73	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
CAD20	ASSINK, KENNETH	752	1.10	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
CAD30	THOMAS WALCOTT	752	1.10	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
CAD32	DAVID KAZMIERCZAK	752	0.84	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
CAD47	DAVID SEAVER	752	0.03	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
CAD48	JOSEPH REJC	752	0.23	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
CAD49	WILLIAM CARR	752	0.60	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
CAD50	RONALD WING	752	0.02	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
CAD528401	JACK LUMBERT	752	0.18	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
CAD53	JACK BUCHANAN	752	1.21	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
CAD61	WHITEHOUSE, ALAN	752	0.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
HAR11	RON LARSON	752	0.19	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
HAR2	JOHN EMERY	752	1.25	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
HAR46	ALCONA COUNTY BOARD OF COMM.	752	0.44	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
HAR51	TED & JENNY KERSZYKOWSKI	752	0.60	Yes								

Appendix B - List of Special Use Permits

Auth ID	Contact Name	Use Code	Acres	Take Exempt Through Interim 4d Rule?	4d Comments	Veg Clearing (Mowing Clipping Cutting Brush)	Veg Establishment (Planting Seeding Mulching)	Activity				Right to Flow
								Road/Trail Maintenance (Blading Grading Spot Surfacing Pothole Filling Repaving Ditch Clearing)	Snow Plowing	Trail Construction		
HAR65	HARRY MORRIS	752	0.92	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
HAR66	WORTHINGTON, DONALD	752	1.29	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
HAR67	POPOUR, MARION	752	0.03	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
HAR7	PAUL SMITH	752	0.14	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
HAR70	GARY & BARBARA KAMLAY	752	0.42	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
HAR72	FISKE	752	2.12	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
HAR77	GUNN	752	0.50	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
HAR85	ALCONA COUNTY ROAD COMMISSION	752	2.50	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN100	ROBERT BOTTRELL	752	0.02	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN101	STEVEN REIF	752	0.48	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN102	CRANDELL, DANIEL	752	0.61	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN102811	MI STATE HIGHWAY DEPT.	752	0.59	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN151	HUBERT MOHNEY	752	0.73	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN152	MORSKI, PHYLIS	752	0.90	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN171	RODNEY WORCH	752	0.62	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN183	MICHAEL KRZYZANOWSKI	752	0.13	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN184	DOUGLAS WORKINGER	752	0.87	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN185	CHARLES HOUK	752	0.15	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN192	GENTZ, DAVID	752	0.30	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN193	CUMMINGS, KENNETH	752	0.30	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN194	VAN HORN, SCOTT	752	0.11	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN202	MILTON HINDMAN	752	0.21	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN204	GERALD MILLER	752	0.36	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN205	ARCHBOLD, TOM	752	0.18	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN209	MCGATH, MICHAEL W	752	0.02	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN211	GEORGE LOGAN	752	0.78	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN214	JOSEPH OLENICZAK	752	0.29	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN217	RONALD GRIFFITH	752	0.14	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN220	HAMLIN SHORES OWNERS ASSOC.	752	0.77	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN222	GROBBEL, GREGORY R.	752	0.23	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN223	RONALD GRIFFITH	752	0.24	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN225	SUE REENDERS	752	1.21	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN226	LAUDE	752	0.19	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN227	LEONARD, THOMAS M.	752	0.30	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN238	WEST NURNBERG GROUP	752	1.21	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN240	LOKERS, LARRY	752	0.76	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN250	MORSKI, RANDALL S	752	0.90	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN256	BOWMAN, MAX & EILEEN	752	0.11	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN300	SMITH, BRUCE E.	752	1.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN301	MASON COUNTY ROAD COMMISSION	752	0.09	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN302	DOODY, MICHAEL	752	0.02	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN303	GOODRICH, JAMES T.	752	0.64	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN304	SAXMAN, SANDRA C.	752	0.42	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN306	KUHN, CARL	752	0.97	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN332	PETERSON, VICKI R	752	0.50	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN336	EARL RIDER	752	0.08	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN337	SCOTT ROBINSON	752	2.26	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN338	DALE SMITH	752	0.02	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN342	BARNETT, JAMES	752	0.07	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN344	JOE SNEGOWSKI	752	0.04	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN345	GINO ORLANDI	752	0.04	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN352	CARTER, LAWRENCE P.	752	1.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN353	NUMMERDOR, DALE	752	0.08	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN361	LINDEMAN, GARY	752	1.40	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN389	KALMAN DOLGOS	752	0.50	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN397	WILLIAM & BAMBI BIRMINGHAM	752	0.50	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN400	HASTINGS, RICHARD	752	1.03	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN401	Burger, Tim	752	0.05	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN424	KOEHLER, ANTHONY & BONNIE	752	0.41	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN427	RANDALL & GAIL BADLEY	752	0.60	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN428	MICHIGAN ELECTRIC TRANSMISSION	752	1.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN430	WILLIAM F. TISON	752	0.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN435	WISNIEWSKI, TREVOR J.	752	0.03	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN436	DALE TODD & KATHY GLYNN	752	1.60	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN441	WILLIAMS, DEANNA LEE	752	0.10	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN445	Michael & Jacquelyn Brookstra	752	0.73	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN446	WESSEL, PETER & ADAM	752	1.60	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN447	PALATKA III, FRANK A.	752	0.09	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN455	JEFFREY & LEE ANN PULLEN	752	0.60	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN513	BLUNDALL, MARTYN R.	752	0.60	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN522	SMITH, GEORGE	752	1.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN524	Trujillo, John	752	0.50	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN525	Erickson, Larry L.	752	1.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN539	DAVID AND KAREN MCINTIRE	752	0.10	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN542	RICHARD L. ALTMAN	752	0.05	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN545	GOLDWATER, JOHN & RITA	752	0.06	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN553	JIM & KIMBERLYBAUER	752	0.80	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN557601	DON PICKLESIMER	752	0.50	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN589	SHEPARD, JAMES T.	752	0.23	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN592	DEWITT, THOMAS A	752	0.24	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN597	EUGENE & DIANE COWELL	752	0.80	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN599	RANDY MAIER	752	0.20	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN600	MICHAEL CORINTI	752	0.10	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN601	TIM SOBIE	752	0.36	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN602	ROBERT BALLARD	752	0.20	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN604	JOHN JONES	752	0.04	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN607	KOPS, KEVIN J. & MISHELLE L.	752	0.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN608	Comstock & Gillhepsy Properties LLC	752	0.44	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN611	SAUBLE RIVER LAND COMPANY	752	0.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN613	MEAD, HARRY S. & RUBY F.	752	0.20	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN629	L. TREVOR & CHERYL YEARY	752	0.61	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN644	Deer Path Trust	752	0.04	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN650	NILES, PAUL KELLY	752	0.50	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN658	LENARD, LARRY	752	0.50	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN721	BRZOZKA, SCOT	752	0.20	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN723	MANISTEE COUNTY ROAD COMMISSION	752	1.56	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN728	MAHAN, CALVIN J.	752	0.97	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN73	PALM, KITTIE	752	0.01	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN91	ROBERT OOSTERMAN	752	0.61	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN93	FRANK HOFFMAN	752	0.24	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN94	O'KEEFE, JAMES	752	0.10	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN95	DAVID DUTCHER	752	0.55	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN97	NORMAN TEN BRINK	752	0.72	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN98	ANDREW OLENICZAK	752	0.53	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIQ100	DARRELL RIEVERT	752	0.13	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIQ101	EVERGREEN HUNTING & FISHING CLUB, INC	752	0.60	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIQ102	CARROLL, TERRY	752	0.27	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIQ104	WILLIAM & WENDY SAMMUT	752	0.10	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIQ106	KINNE, RANDY	752	0.28	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIQ139	THOMAS & ANN BOWER	752	0.68	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIQ140	LUZERNE LEGION POST	752	0.58	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIQ141	WILLIAM & GAIL PALMER	752	0.73	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIQ143	GARY & DIANNE HOWARD	752	0.08	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIQ144	FENBY, BELINDA	752	0.75	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIQ145	PAUL & DENA CHAVERIAT	752	1.70	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIQ148	BOOTH, JAMES RANDY	752	1.42	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIQ186	KOLES, MARYANN	752	0.57	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIQ188	WHEELER, LARRY AND JANICE	752	0.40	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIQ206	KAPOUSIS, JOHN	752	2.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIQ207	WEIER, JAMES	752	1.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIQ208	DUNN	752	0.24	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIQ209	NAYLOR	752	2.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIQ210	PROCTOR REAL ESTATE HOLDINGS	752	2.22	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIQ220	TWIN LAKES SHORES ASSOCIATION	752	1.05	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIQ229	ACORN CLUB, LLC	752	1.60	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIQ279	DANNY & ERICA DAGUE	752	0.26	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MIQ281	KNIFE, MARTEL											

Appendix B - List of Special Use Permits

Auth ID	Contact Name	Use Code	Acres	Take Exempt Through Interim 4d Rule?	4d Comments	Veg Clearing (Mowing Clipping Cutting Brush)	Veg Establishment (Planting Seeding Mulching)	Activity				
								Road/Trail Maintenance (Blading Grading Spot Surfacing Pothole Filling Repaving Ditch Clearing)	Snow Plowing	Trail Construction	Right to Flow	
TAW169	BUSCH, BRIAN H.	752	0.70	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW17	FREDERICK LATTA	752	0.22	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW171	CHARLES BENNETT	752	1.60	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW172	WISELEY RUTH ANN	752	0.17	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW175	ROITER, EARL	752	2.42	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW180	STEVE & CYNTHIA LEITER	752	0.27	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW193	IOSCO COUNTY RD COMMISSION	752	1.50	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
TAW203	DOMINICK PARISE	752	0.44	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW208	ROXANNE ALLEN	752	0.17	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW210	JOE & JEAN PARISE	752	0.34	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW211	IVAN TOMLINSON	752	0.36	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW213	IOSCO COUNTY RD COMMISSION	752	1.34	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
TAW226	SOBOLEWSKI, KEVIN J.	752	1.02	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW227	ISHAM, KEITH L.	752	0.05	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW238	DONALD CLARK	752	0.35	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW239	CONARTON, NADIEN	752	1.10	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW241	LAWSON, DONALD	752	0.14	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW242	BRUCE MYLES	752	0.46	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW243	CHARLES WOOTON	752	0.03	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW266	Gapuz, Ralph M.	752	1.26	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW316	BABCOCK	752	0.13	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW323	DUJKA, MICHAEL AND KAYE	752	0.70	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW385	SATHER, RAYMOND B.	752	0.57	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW43	LABOUNTY, GREG	752	0.41	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW51	KOESTER, WILLIAM	752	0.02	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW527801	ARLENE SCHWALM	752	0.50	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW529201	WILBUR ROACH	752	0.29	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW531501	WILLIAMS TRAIL OWNER'S ASSOC.	752	0.10	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW56	DAVID BUSH	752	0.44	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW57	GERRY AND VIRGINIA WHEATON	752	0.02	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
TAW58	JULIA MAZUROWSKI	752	0.20	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC104	TRADITIONS HUNT CLUB	752	0.73	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC107	Sokel, Richard	752	0.13	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC112	OCEANA COUNTY, ROAD COMMISSION	752	2.37	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
WHC114	VANTHOF, JOHN	752	0.36	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC121	DARIN RUPPERT	752	0.03	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC122	MOORE, JOHN R.	752	0.18	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC123	SIDNEY MYS	752	0.60	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC124	MICHAEL KUHBANDER	752	0.73	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC125	JAMES CHASE	752	0.36	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC126	KENNETH HUIZINGA	752	1.50	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC130	MARY JUSTIAN	752	0.20	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC134	KENNETH JOHNSTON	752	0.36	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC135	ALEX WLODKOWSKI	752	0.07	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC137	SCOTT DAVID	752	0.36	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC138	RICHARD PRANGER	752	0.45	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC139	RED DOT ASSOCIATION	752	0.36	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC141	Hyslop, Lee and Mary	752	0.33	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC151	EIKENBERRY, ROGER L.	752	0.90	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC152	Smith, Ann	752	0.10	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC153	POLLOCK, CLAYTON	752	0.73	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC154	BERGSMAN, DAVID	752	0.58	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC155	Guetschow, Lisa	752	0.73	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC158	PEULER, DOUGLAS G.	752	0.10	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC162	CLARENCE AND JANET JOHNSON	752	0.17	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC168	NORTH5 SOUTHS ASSOC OF OTTO	752	0.42	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC44	DAY, LYLE R.	752	0.17	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC46	DONALD DEBOEF	752	0.04	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC52	DEUR, PAUL	752	0.69	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC69	CAMMENGA, RANDALL J.	752	0.65	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC75	GEERTSEN, DAWNA	752	0.60	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC77	EARL TEFFT	752	0.21	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC85	VANZALEN, DANIEL	752	0.36	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC86	RAHRIG, RANDALL T	752	0.10	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC87	TOWNSHIP SHAHEEN, RALPH M.	752	0.36	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC88	WHITE RIVER NORTH BRANCH OWNERS	752	2.90	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC89	BROWN, PHILLIP	752	0.10	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC92	JACK RASEY	752	0.36	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC93	DUANE LUPKE	752	0.73	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
WHC95	LEISURE TIME R V PARK	752	0.21	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL102	L. LAVIGNE	753	0.08	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL102314	LAKE COUNTY ROAD COMMISSION	753	4.31	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL102315	LAKE COUNTY ROAD COMMISSION	753	1.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL102316	LAKE COUNTY ROAD COMMISSION	753	2.88	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL102318	LAKE COUNTY ROAD COMMISSION	753	8.63	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL102319	LAKE COUNTY ROAD COMMISSION	753	1.60	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL102320	LAKE COUNTY ROAD COMMISSION	753	1.40	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL103	TIMOTHY CZARNOPIS	753	0.36	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL194	CONROY, PATRICK	753	0.37	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL204	MERVENNE, JAMES F	753	0.36	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL206	FOREST ROAD 6648B ASSOCIATION	753	1.02	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL207	BALDWIN MICHIGAN REAL ESTATE, LLC	753	0.76	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL210	k and k forest products	753	0.73	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL211	MERLIN AND MARLENE ZUIDERVEEN	753	0.02	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL212	SAPPI FINE PAPER NORTH AMERICA	753	0.71	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL214	TEN FORTY ASSOCIATION	753	0.29	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
BAL401006	CONSUMERS ENERGY COMPANY	753	0.33	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
BAL534901	WINGLETON PROPERTY OWNER	753	0.84	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
CAD102821	MI STATE HIGHWAY DEPT.	753	16.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD102823	MI STATE HIGHWAY DEPT.	753	27.38	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD102826	MI STATE HIGHWAY DEPT.	753	20.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD103311	WEXFORD CO ROAD COMMISSION	753	4.10	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD103312	WEXFORD CO ROAD COMMISSION	753	1.40	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD103313	WEXFORD CO ROAD COMMISSION	753	22.80	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD103314	WEXFORD CO ROAD COMMISSION	753	10.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD103315	WEXFORD CO ROAD COMMISSION	753	10.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD103316	WEXFORD CO ROAD COMMISSION	753	16.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD103317	WEXFORD CO ROAD COMMISSION	753	0.76	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD103318	WEXFORD CO ROAD COMMISSION	753	4.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD103319	WEXFORD CO ROAD COMMISSION	753	1.61	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD103320	WEXFORD CO ROAD COMMISSION	753	7.57	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD103321	WEXFORD CO ROAD COMMISSION	753	0.61	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
CAD536901	THEODORE HAGLE	753	1.09	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
HAR102002	ALCONA COUNTY ROAD COMMISSION	753	0.23	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
HAR102005	ALCONA COUNTY ROAD COMMISSION	753	5.40	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
HAR102006	ALCONA COUNTY ROAD COMMISSION	753	2.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
HAR102007	ALCONA COUNTY ROAD COMMISSION	753	2.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
HAR102816	MI STATE HIGHWAY DEPT.	753	26.97	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
HAR102817	MI STATE HIGHWAY DEPT.	753	38.87	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
HAR102819	MI STATE HIGHWAY DEPT.	753	88.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
HAR102820	MI STATE HIGHWAY DEPT.	753	6.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
HAR103501	ALCONA COUNTY ROAD COMMISSION	753	0.10	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
HAR74	SCULLY, AL	753	0.30	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
HAR75	ALCONA COUNTY ROAD COMMISSION	753	0.01	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
HAR76	DAVID AND DARLENE ROBERTS	753	0.06	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
HAR81	WASAGESHIK, JENNIFER L	753	1.23	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN102317	LAKE COUNTY ROAD COMMISSION	753	0.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN102527	MANISTEE COUNTY ROAD COMMISSION	753	2.52	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x			
MAN320	COOLWATER CAMPGROUND, INC	753	0.13	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN724	Phillips, Matt	753	0.77	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN739	STRIFGLE, DAVID J.	753	0.20	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN749	MALICKE, ROSEMARY	753	0.12	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN752	WISNIEWSKI, TREVOR J.	753	0.24	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN753	CTDA PROPERTIES, LLC	753	0.07	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN754	SPOHR, ROBERT AND CHRISTINA	753	0.45	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			
MAN758	STAPLEY, CRAIG	753	0.36	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x			

Appendix B - List of Special Use Permits

Auth ID	Contact Name	Use Code	Acres	Take Exempt Through Interim 4d Rule?	4d Comments	Veg Clearing (Mowing Clipping Cutting Brush)	Veg Establishment (Planting Seeding Mulching)	Activity Road/Trail Maintenance (Blading Grading Spot Surfacing Pothole Filling Repaving Ditch Clearing)	Snow Plowing	Trail Construction	Right to Flow
MIO102825	MI STATE HIGHWAY DEPT.	753	104.80	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
MIO102828	MI STATE HIGHWAY DEPT.	753	198.20	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
MIO103210	OSCODA COUNTY ROAD COMMISS	753	10.48	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
MIO103211	OSCODA COUNTY ROAD COMMISS	753	0.76	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
MIO103212	OSCODA COUNTY ROAD COMMISS	753	0.39	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
MIO103213	OSCODA COUNTY ROAD COMMISS	753	1.01	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
MIO103214	OSCODA COUNTY ROAD COMMISS	753	6.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
MIO103215	OSCODA COUNTY ROAD COMMISS	753	6.30	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
MIO103216	OSCODA COUNTY ROAD COMMISS	753	5.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
MIO103217	OSCODA COUNTY ROAD COMMISS	753	1.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
MIO103218	OSCODA COUNTY ROAD COMMISS	753	18.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
MIO129	SAVOY EXPLORATION, INC	753	0.80	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
MIO156	MORSE, CLIFFORD B.	753	0.14	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
MIO205	MERIT ENERGY CO	753	2.42	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
MIO211	BRIAN SCHIEFER	753	0.70	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
MIO231	KONECZNY, EDWARD	753	0.48	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
MIO261	ROY-WIEGAND	753	0.17	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
MIO276	MCKINLEY HEIGHTS HOMEOWNERS ASSOC	753	1.69	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
MIO278	JAMES IRELAN	753	0.16	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
MIO309	BLOOD, JIM	753	1.21	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
MIO310	K&M FOREST PRODUCTS	753	2.14	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
MIO316	JUNKER, KYLE AND GWEN	753	0.25	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
MIO317	MAES, RICHARD J.	753	0.10	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
MIO318	HYDROLAKE LEASING & SERVICE COMPANY	753	0.25	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
MIO319	MURRAY, FRANK & JOANNE	753	1.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
MIO328	WEYERHAEUSER	753	4.91	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
MIO329	MICHIGAN LUMBER & WOOD FIBER, INC	753	0.46	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
MIO332	WEYERHAEUSER	753	2.38	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
MIO339	POTTER, JOHN	753	1.16	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
MIO340	ROBERT H. & JOAN M. WALKER	753	1.53	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
MIO400	JAMES AND JEAN DOME	753	0.80	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
TAW102209	IOSCO COUNTY RD COMMISSION	753	0.43	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
TAW102210	IOSCO COUNTY RD COMMISSION	753	38.85	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
TAW102211	IOSCO COUNTY RD COMMISSION	753	25.19	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
TAW102212	IOSCO COUNTY RD COMMISSION	753	9.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
TAW102213	IOSCO COUNTY RD COMMISSION	753	0.50	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
TAW102214	IOSCO COUNTY RD COMMISSION	753	48.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
TAW102402	PLAINFIELD TOWNSHIP	753	2.40	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
TAW103701	GRANT TOWNSHIP	753	0.76	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
TAW347	WOODRUFF, ROBERT	753	1.73	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
TAW348	CHADWICK, JEFFREY AND BRENDA	753	0.32	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
TAW356	NEWMAN, BRENT	753	0.10	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
TAW369	SYME, DAVID AND SUZANNE	753	0.32	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
TAW379	STEVEN HASLER	753	0.29	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
TAW380	MICHIGAN LUMBER & WOOD FIBER, INC	753	2.94	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
TAW381	RICKY AND BETH WEAVER	753	0.15	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
TAW398	MICHIGAN ELECTRIC TRANSMISSION	753	8.90	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
TAW405	MICHIGAN LUMBER & WOOD FIBER, INC	753	5.35	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
TAW406	ROSE, MICHAEL D.	753	1.60	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
TAW407	RIFENBARK, ALLEN	753	2.94	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
TAW410	GRONDA, MATTHEW	753	0.10	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
TAW411	WEYERHAEUSER	753	0.62	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
WHC103005	NEWAYGO CO ROAD COMMISSION	753	0.25	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
WHC103801	MI DEPT. OF NATURAL RESOURCES	753	2.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
WHC136	ROSE, DOUGLAS	753	0.91	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
WHC140	BECKMAN BROTHERS	753	1.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
WHC166	JAMES AND CRYSTAL ANTON	753	0.40	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
WHC170	BURGESS, VERN AND SALLY	753	0.62	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
WHC172	HOEKWATER, JOHN	753	0.44	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
WHC176	MUNSON, JOSEPH	753	0.78	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
WHC94	YOBEROSA PARTNERS	753	0.50	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
TAW422	CHARLES AND GAETANE WATSON	753	0.72	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
MIO352	DRISCOLL, MATTHEW	753	0.88	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
TAW411	WEYERHAEUSER NR COMPANY	753	0.62	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
BAL218	SCHULKE, JOHN	753	1.45	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
TAW421	TR TIMBER CO	753	2.86	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
WHC178	JOHN AND KELLY REID	753	0.35	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
MAN793	JACK BUCHANAN	753	1.28	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
TAW387	BOONE, JOHN T	753	0.53	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
MAN792	BALLARD, STEPHEN J	753	0.03	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
MAN768	ALLEN AND CAROL WESOLOWSKI	753	0.02	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
MIO345	WEYERHAEUSER NR COMPANY	753	4.91	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
HAR87	ALCONA COUNTY ROAD COMMISSION	753	0.22	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
WHC179	SWITZER, FLOYD	753	0.66	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
TAW410	GRONDA, MATTHEW	753	0.10	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
CAD59	AT&T CORP	806	3.70	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
HAR62	ALCONA COUNTY BOARD OF COMM.	806	0.10	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
MAN783	MANISTEE COUNTY TRANSPORTATION	806	0.10	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
MAN780	RADIO NORTH, LLC	806	0.04	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
TAW408	IOSCO TRANSIT CORPORATION	806	0.01	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
WHC1	MENTOR PARTNERS, INC.	816	3.86	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
MAN538	BARRINGTON TRAVERSE CITY, LLC	817	2.30	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x	x	x		
BAL40	AT&T Michigan	821	19.06	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
CAD402801	ACE COMMUNICATIONS GROUP	821	21.49	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
HAR400701	CENTURY TELEPHONE, INC.	821	68.05	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
MAN580	KALEVA TELEPHONE COMPANY	821	4.16	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
MAN632	AT&T Michigan	821	9.83	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
MIO110	VERIZON NORTH INCORPORATED	821	20.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
MIO402901	ALLTEL MICHIGAN, INC.	821	10.76	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
MIO403102	AT&T Michigan	821	6.67	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
WHC175	FRONTIER NORTH INC DBA VERIZON NORTH	821	4.15	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
BAL46	CARR TELEPHONE COMPANY	822	22.31	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
BAL186	Merit Network, Inc	823	13.41	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
BAL195	AT&T Michigan	823	13.17	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
BAL196	CARR TELEPHONE COMPANY	823	0.32	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
MAN660	FRONTIER NORTH INC DBA VERIZON NORTH	823	1.91	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
MIO111	VERIZON NORTH INCORPORATED	823	5.00	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
MIO295	ALLBAND COMMUNICATIONS COOPERATIVE	823	2.56	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
MIO296	Merit Network, Inc	823	45.26	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
TAW404	GREAT LAKES COMNET INC	823	0.68	Yes	Maintenance or expansion of rights-of-way and	x	x	x	x		
MAN61	FEDERAL AVIATION ADMINISTRATION	831	0.27	Yes	Maintenance or expansion of rights-of-way and	x					
MAN647	CONSUMERS ENERGY	831	0.02	Yes	Maintenance or expansion of rights-of-way and	x					
MAN540	MASON COUNTY DRAIN COMMISSION	911	3.00	Yes	Maintenance or expansion of rights-of-way and	x	x				
WHC2	OCEANA, COUNTY, DRAIN COMMISSION	911	1.10	Yes	Maintenance or expansion of rights-of-way and	x	x	x			
BAL66	BALDWIN, VILLAGE OF	914	0.34	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x				
CAD13	CHERRY GROVE FIRE DEPARTMENT	914	0.01	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x				
MAN198	MTD PIPELINE LLC	914	0.03	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x				
MAN402501	MARTIN-MARIETTA CHEMICALS	914	28.62	Yes	Maintenance or expansion of rights-of-way and	x	x				
MAN431	LITTLE RIVER BAND OF OTTAWA INDIANS	915	0.03	Yes	Rights-of-way, minimal tree or hazard tree removal.	x					
TAW365	OSCODA TOWNSHIP	915	1.60	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x				
TAW416	AFCEC/CIBE LORING	915	1.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x	x				
MAN1	CONSUMERS ENERGY COMPANY	922	15.00	Yes	Maintenance or expansion of rights-of-way and						x
MAN543301	JOHN URKA	924	0.30	Yes	Rights-of-way, minimal tree or hazard tree removal.	x					
TAW360	OSCODA TOWNSHIP	931	0.13	Yes	Rights-of-way, minimal tree or hazard tree removal.	x					
WHC000202	U.S. GEOLOGICAL SURVEY	941	0.50	Yes	Rights-of-way, minimal tree or hazard tree removal.	x					
WHC181	U.S. GEOLOGICAL SURVEY	941	0.50	Yes	Rights-of-way, minimal tree or hazard tree removal.	x					
BAL115	STAR 9 CORPORATION	942	0.23	Yes	Rights-of-way, minimal tree or hazard tree removal.	x					
CAD62	WEXFORD SAND COMPANY	942	0.03	Yes	Rights-of-way, minimal tree or hazard tree removal.	x					
HAR68	ALCONA COUNTY ROAD COMMISSION	942	0.01	Yes	Maintenance or expansion of rights-of-way and	x					
MIO285	Merit Energy Co	942	0.25	Yes	Maintenance or expansion of rights-of-way and	x					
TAW344	OSCODA TOWNSHIP	942	0.10	Yes	Rights-of-way, minimal tree or hazard tree removal.	x					
WHC161	CSX TRANSPORTATION	942	4.00	Yes	Maintenance or expansion of rights-of-way and	x					
WHC74	JAMIESON, EMILY	942	0.87	Yes	Rights-of-way, minimal tree or hazard tree removal.	x					
TAW135	DOD, AF, AIR FORCE REAL PROPERTY AGENCY	942	1.00	Yes	Rights-of-way, minimal tree or hazard tree removal.	x					

Total number of cases 814  
 Total number of acres 7,210